



## Primo Technical Guide

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## The PNX Record

Primo harvests data from a wide range of source databases and formats. This data must be normalized and optimized to facilitate efficient discovery and delivery. The various source formats must be mapped to the Primo normalized XML (PNX) record.

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### Note

For additional information about the publishing process, refer to the [Overview of the Primo Back Office](#).

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The PNX record is created and stored in XML format, using the UTF-8 character set.

The data in the PNX record is organized in sections, each section containing information for a specific purpose. In some cases, the data is duplicated to provide flexibility to the system when it is processing the data.

This section includes:

- [PNX Record Sections](#)
- [Subfields in the PNX](#)
- [The Control Section](#)
- [The Display Section](#)
- [The Links Section](#)
- [The Search Section](#)
- [The Facets Section](#)
- [The Sort Section](#)
- [The Duplicate Record Detection Section](#)
- [The FRBR Section](#)
- [The Delivery Section](#)
- [The Ranking Section](#)
- [The Enrichment Section](#)
- [The Additional Data Section](#)
- [The Browse Section](#)
  - [Virtual Shelf Tab](#)
  - [Browse Search](#)
  - [Configuring the Normalization Rules](#)
  - [Implementation and Upgrade Information](#)
- [Example of a PNX Record](#)

## PNX Record Sections

[Return to menu](#)

The following table lists the sections in the PNX record.

Sections of the PNX Record

Section	Contains	For additional information, refer to
addata (additional data)	Data elements required for a number of functions that cannot be extracted from other sections of the PNX.	<a href="#">The Additional Data Section</a>
browse	Data that is used to create the browse lists.	<a href="#">The Browse Section.</a>
control	Formatted data that is used for control purposes.	<a href="#">The Control Section</a>
delivery (delivery and scoping)	Data required for managing delivery and scoping for searches.	<a href="#">The Delivery Section</a>
display	Data displayed in the brief and full displays in the user interface (UI).	<a href="#">The Display Section</a>
dedup (duplication detection)	A Dedup vector, which includes all the data required by the Duplication Detection algorithm to determine if two records are equivalent.	<a href="#">The Duplicate Record Detection Section</a>
enrichment	Data required by the enrichment process.	<a href="#">The Enrichment Section</a>
facets	Data used to create faceted browsing in the UI.	<a href="#">The Facets Section</a>
frbr (grouping)	A FRBR vector, which includes one or more keys that identify the group it represents.	<a href="#">The FRBR Section</a>
links	Links that can be used to create the GetIT! functionality and/or links in the record display.	<a href="#">The Links Section</a>
ranking	Two booster fields that can be used to boost the ranking of the record.	<a href="#">The Ranking Section</a>
search	Metadata and full-text data that are indexed for searching purposes.	<a href="#">The Search Section</a>

Section	Contains	For additional information, refer to
sort	Sort fields used as the basis for sorting the results set.	<a href="#">The Sort Section</a>

Each of the above sections contains various fields. Multiple and repeatable fields of the source record can be concatenated to one field in the PNX record (such as the Display section) or stored in separate fields within the PNX record (such as the Search and Facets sections).

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**Note**

In some cases, the system will take only one of the following fields:

- All fields of the Control section.
  - All fields of the Sort section.
  - All fields of the Dedup and FRBR sections.
  - Delivery section – the Delivery category field.
  - All fields of the Ranking section.
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## Subfields in the PNX

[Return to menu](#)

Some fields in the PNX record have multiple values that are delimited by two dollar signs followed by a specific character or number (similar to MARC subfields). The following table lists the various subfield delimiter types used in the PNX record.

Subfield Delimiter Types

Type	Delimiter	Description
Uppercase Alphabetic		The character denotes the content and is persistent across PNX fields.
	A	Algorithm used for FRBR key type.
	C	A constant that displays before the field. This delimiter can be used only in the Display section for the following fields: identifier, relation, and description.  The constant can be a code (lowercase with no spaces or special characters except for underscores). The code is translated to a name for display in the Front End using the Display Constants code table. If the text added has no translation in the code table, it will display as entered in the rules.
	D	Text that displays instead of the field—for example, for URLs).
	I	In most cases it is the institution code. For Browse fields it contains the following: <ul style="list-style-type: none"> <li>• Authority record ID for all Browse fields except for callnumber.</li> <li>• Institution code for the browse/callnumber field.</li> </ul>
	K	Key for FRBR
	L	Library code
	O	Origin of the field used in Deduped records - the <code>sourceid</code> .
	Q	Contains the linking portion of the display field for enhanced hypertext linking. Otherwise, linking is performed on the display portion of the display field. For more information, see <a href="#">Enhanced Hypertext Linking</a> .
	S	Status

Type	Delimiter	Description
	T	Template code
	U	In most cases it is the URL. For browse, the institution is automatically stored in this subfield in deduped records.
	V	Value of the field (to distinguish between the value of the field and the display text or constant).
Numeric		Indicates the order of data elements added to the field.

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**Note**

All text fields can be either code or text. Primo first searches for a translation of the value in the codes table. Only if it does not find the translation will Primo display the value.

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## The Control Section

[Return to menu](#)

The Control section includes formatted data used for control purposes. The following table lists the contents of the Control section.

Control Section Fields

Field Code	Description
sourceid	The source ID identifies the source repository in Primo. Every source repository has a configuration file in which the <code>sourceid</code> and other information about the source repository are recorded.
originalsourceid	This ID identifies the source repository in the source system. This is not necessarily the same as the source repository's identifier in Primo—for example, USM01.
sourcerecordid	This ID identifies the record in the source repository (such as an ALEPH system number supplied in MARC 21 tag 001). This ID must be unique and persistent within the source repository. It is derived from the OAI header.
addsrcrecordid	This ID identifies an additional ID of the source record.
recordid	The record ID is a unique identifier of the record in the Primo repository. The <code>sourceid</code> and <code>sourcerecordid</code> are concatenated to create the <code>recordid</code> (for example, ALEPH system number + tag 001).
sourcetype	Source type—not in use.
sourceformat	The source format identifies the original format of the source record (such as MARC 21, Dublin Core, and MAB2).
sourcesystem	The source system identifies the system used by the source repository (such as ALEPH, ADAM, MetaLib, SFX, and Digitool).
recordtype	Record type—not in use.
lastmodified	Date last modified—not in use.

## The Display Section

[Return to menu](#)

The Display section includes data used in the brief and full display formats of the UI.

The basis for the data elements used in the Display section is the Dublin Core element set. Dublin Core was selected as a metadata standard that is intended to support a broad range of purposes and resource types. In some cases, the names of the Dublin Core elements have been modified and a number of additional fields have been added.

### Note

- Some sources may not include all of the data elements. In other cases, it is necessary to map data to the most suitable element.
- Some formatting of the data for display is performed during the mapping process in order that this processing need not be performed online. For example, multiple occurrences of some fields are concatenated within the normalized record; it may be necessary to add or remove punctuation.
- The display form of some of the fields noted below also serve as a hyperlinks that are used to search for additional records. It is important that you add all of these strings in the display to the corresponding fields in the Search section. For more information, see [Enhanced Hypertext Linking](#).

The following table lists the fields that are available in the Display section of the PNX.

Display Section Fields

Field Name	Description
avaalinstitution	<p>The availability institution is used at runtime to calculate the availability status for the brief results set. Automatically calculated by Primo from all <code>availlibrary</code> fields that belong to the institution, using the following logic:</p> <p>Primo merges the availability status from \$\$\$ for all <code>availlibrary</code> fields for the institution and creates the merged availability status as follows:</p> <ul style="list-style-type: none"> <li>• If one of the statuses is <code>check_holdings</code>, Primo sets the merged availability status to <code>check_holdings</code>.</li> <li>• If one of the statuses is <code>available</code>, Primo sets the merged availability status to <code>available</code>.</li> <li>• If neither of the above conditions exists, Primo sets the merged availability status to <code>unavailable</code>.</li> </ul> <p>If an institution does not have an availability field, Primo creates a field with the availability status <code>does_not_exist</code>.</p>
availlibrary	<p>The library-level availability status, which includes availability information per Primo library or sub-location, in addition to location information. The field is structured with subfields as follows:</p> <ul style="list-style-type: none"> <li>• \$\$I — institution code (required)</li> <li>• \$\$L — library code (required)</li> <li>• \$\$1 — sub-location</li> <li>• \$\$2 — call number</li> </ul>

Field Name	Description
	<ul style="list-style-type: none"> <li>• \$\$\$ — availability status (available, unavailable, check_holdings) (required)</li> <li>• \$\$3 — number of items</li> <li>• \$\$4 — number of unavailable items</li> <li>• \$\$5 — multi-volume flag: Y/N</li> <li>• \$\$6 — number of loans (for ranking purposes)</li> <li>• \$\$9 — indicates that the location represents online material. For more information, refer to <a href="#">Adding \$\$9ONLINE to Library Level Availability</a>.</li> <li>• \$\$X — source institution code (required for OvP)</li> <li>• \$\$Y — source library code (required for OvP)</li> <li>• \$\$Z — source sublocation code (not required for OvP)</li> </ul>
availpnx	<p>The availability PNX. Calculated by Primo from all <code>availinstitution</code> fields in the Display section, using the following logic:</p> <p>Primo takes all <code>availinstitution</code> fields and merges the availability status from \$\$\$ as follows:</p> <ul style="list-style-type: none"> <li>• If one of the statuses is <code>check_holdings</code> or <code>available</code>, Primo sets <code>availpnx</code> to <code>available</code>.</li> <li>• If the above condition does not exist, Primo sets <code>availpnx</code> to <code>unavailable</code>.</li> </ul> <p>This field is used in the UI when filtering by availability.</p>
contributor	<p>The contributor is an entity that is responsible for making a contribution to the content of the resource. Multiple occurrences are concatenated with a semicolon.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 700/710/711 fields, stripping subfield \$\$d, and stripping from subfield \$\$t to the end. It is possible to reverse the author's last and first name by using a special routine (for example, Stephans, Mary to Mary Stephans).</li> </ul> <hr/> <p><b>Note</b></p> <p>The display form of the contributor also serves as a hyperlink to search for additional records. It is important that all of the strings in the display also be added to the <code>creatorcontrib</code> field in the Search section.</p> <hr/>
coverage	<p>The extent or scope of the content of the resource.</p>
creationdate	<p>The date or year when the resource was created or the year when the resource was published or manufactured.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 008/07-10; 260 \$\$c.</li> </ul>

Field Name	Description
creator	<p>The content creator is an entity that is responsible for creating the content of the resource. Multiple occurrences are concatenated with a semicolon.</p> <p>An example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: 245 subfields \$\$c OR if 245 \$\$c is not present, 1XX, stripping subfield \$\$d, and stripping from subfield \$\$t to the end. It is possible to reverse the author's last and first name (for example, Stephans, Mary to Mary Stephans) by using a special routine.</li> </ul> <hr/> <p><b>Note</b></p> <p>The display form of the creator also serves as a hyperlink to search for additional records. It is important that all of the strings in the display also be added to the <code>creatorcontrib</code> field in the Search section.</p> <hr/>
crsinfo	Course reserve information.
description	<p>The description is any information that describes the content of the resource. This can be an abstract, contents notes, summary, and so forth. Multiple occurrences are not concatenated.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: 502, 505, 520 fields.</li> </ul>
edition	<p>The edition of the resource. This is one of the fields of the PNX record that is not derived from Dublin Core. The edition field is a key element in grouping bibliographic records.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: 250 \$a and \$b.</li> </ul>
format	<p>The physical format—physical description, extent, or digital manifestation of the resource. Multiple occurrences are concatenated with a semicolon.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: 300 and 340 fields. Can also be created from the control data in the leader and 008, 006 fields.</li> </ul>
identifier	<p>Any unique identifier of the record. Dublin Core defines this as an unambiguous reference to the resource within a given context. In the context of the PNX record, this is intended to be used for standard identifiers like ISBN and ISSN. Multiple occurrences are concatenated with a semicolon.</p> <p>Examples of source data (MARC21):</p> <ul style="list-style-type: none"> <li>020 \$\$a: prefix the value with ISBN.</li> <li>022 \$\$a: prefix the value with ISSN.</li> </ul>

Field Name	Description
ispartof	<p>The resource from which this resource is derived (for example, in an article from a journal - the journal is the source). Multiple occurrences are not concatenated. This type of relationship has been added as a specific relationship so it can be displayed as part of the brief results display.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 773.</li> </ul> <hr/> <p><b>Note</b></p> <p>The display form of this field also serves as a hyperlink to search for additional records. It is important that all of the strings in the display also be added to the <code>title</code> field in the Search section.</p> <hr/>
language	<p>The language of the resource. The language is stored in coded form (ISO 639-2) and is translated in the UI. Multiple occurrences are concatenated with a semicolon.</p> <p>If the language is not in ISO 639-2 form, the normalization process attempts to convert it to this form. If this is not possible, the language is unknown (using the <code>und</code> code).</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 008/35-37; if blank, use 041 subfield \$\$a.</li> </ul>
oa	<p>Intended for use by Primo Central to indicate whether a record is open access or not.</p>
publisher	<p>An entity that is responsible for making the resource available. Multiple occurrences are concatenated with a semicolon.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 260 subfields \$a and \$b.</li> </ul>
relation	<p>A reference to a related resource. Multiple occurrences are not concatenated.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 440, 830, 760-787 except for 773.</li> </ul> <hr/> <p><b>Note</b></p> <p>The display form of this field also serves as a hyperlink to search for additional records. It is important that all of the strings in the display also be added to the <code>title</code> field in the Search section.</p> <hr/>
rights	<p>Information about the rights of the resource.</p>
source	<p>The source repository from which the record was derived.</p>

Field Name	Description
subject	<p>The topic of the resource's content. Multiple occurrences are concatenated with a semicolon.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: 6XX fields</li> </ul> <hr/> <p><b>Note</b></p> <p>The display form of the subject also serves as a hyperlink to search for additional records. It is important that all of the strings in the display also be added to the <code>subject</code> field in the Search section.</p> <hr/>
title	<p>The name that is given to a resource. The title can be created from a number of fields and subfields from the source record. Multiple occurrences are not concatenated.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: 245 subfields \$\$a and \$\$b.</li> </ul>
type	<p>The resource type that represents the main format of the record or the type, based on a master list of main record types. It is recommended to include only a minimum number of types (~10). Primo sites are able to modify this list so that it is suited to the content of its repository and its users. The type is used to determine which icon displays next to the record in the brief and full results list. Every record must have a single type field.</p> <p>The default resource type list includes book, journal, article, text_resource (includes text resources that cannot be identified as a book, journal, or article), image, video, audio, map, score, and other (includes records that cannot be classified as any other resource type).</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: Mapping based on the leader position 6 and the 007 and 008 fields.</li> </ul>
unititle	<p>The uniform title will be displayed with the title of the resource when the merged FRBR record is displayed.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC21: 240 subfields a, d,m,n, p, r, s</li> </ul> <hr/> <p><b>Note</b></p> <p>The display form of this field also serves as a hyperlink to search for additional records. It is important that all of the strings in the display also be added to the <code>title</code> field in the Search section.</p> <hr/>
userrank	A rank or score that is assigned by the end user for the resource.
userreview	The user review, which is added by the end user.
vertitle	The vernacular title is used when the record contains both a transliterated title and a title in the vernacular (as in the MARC format).

Field Name	Description
	<p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 880 with subfield 6 =245 and subfields a and b.</li> </ul>
Ids01 - Ids200	<p>Local display fields.</p> <hr/> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• <b>Ids50</b> is reserved for use with Primo Central and should not be used locally.</li> <li>• The display form of this field also serves as a hyperlink to search for additional records. It is important that all of the strings in the display also be added to the corresponding field in the Search section.</li> </ul> <hr/>

## The Links Section

[Return to menu](#)

The Links section contains links that can be used to create the GetIt! functionality and/or to create links in the record display (for example, a link to the table of contents). The Links section includes several fields, each of which represents a function in Primo.

The PNX Link field includes data that is based on the following types of links:

- **Static:** The Link field contains the URL. A static URL may require some attributes, including the institution to which it belongs and a display text. These are indicated by subfield delimiters (`$$UURL$$DDisplay text$$IInstitution`).
- **Calculated:** Calculated URLs are created from a template that is defined in the Primo Back Office. The Link field contains URL template code, data for the template place-holders, and the institution (if several fields of the same type are added for different institutions).

The following table lists the fields in the Links section. In addition to these fields, Primo sites can define up to fifty local link fields.

Links Section Fields

Field Name	Description
additionallinks	Additional links that are relevant to the resource.
backlink	A link back to the original record in the source repository.
linktoabstract	A link to the item's abstract.
linktoexcerpt	A link to the item's excerpt.
linktoextract	A link to an extract or first chapter of the item.
linktofindingaid	A link to a finding aid.
linktoholdings	<p>A link to the holdings display and request options in the source system.</p> <p>For multi-institution sites, the following links can be used:</p> <ul style="list-style-type: none"> <li>• <b>linktoholdings_avail</b>—A link to the holdings display and request options in the source system if the item is available in the user's institution.</li> </ul>

Field Name	Description
	<ul style="list-style-type: none"> <li>• <b>linktoholdings_unavail</b>—A link to the holdings display and request options in the source system if the item is unavailable in the user's institution.</li> <li>• <b>linktoholdings_notexist</b>—A link to the holdings display and request options in the source system if the item does not exist in the user's institution.</li> </ul>
linktoholdsavail	A link to an item's available holdings.
linktoholdsunavail	A link to an item's unavailable holdings.
linktoholdsnotexist	A link when holdings do not exist.
linktoprice	A link to the item's price.
linktorequest	A link to a form or page on which a user can place a request.
linktoreview	A link to the item's review.
linktorsrc	A link to the resource itself (for example, to the full-text or image).
linktotoc	A link to the item's table of contents.
linktouc	A link to a Union Catalog (such as WorldCat).
openurl	This URL can be created by Primo for the metadata in the PNX.
openurlfullt	An open URL that is limited to the full-text service.
openurlservice	An open URL that is limited to a specific service other than the full-text service.
sourcerecord	A link to the item's source record.
thumbnail	A link to the item's thumbnail.

Field Name	Description
uri	A link to the item's URI.
lIn01 - lIn50	Local links fields.

## The Search Section

[Return to menu](#)

The Search section includes the data (including metadata and full-text) being indexed during a search. The data is in several indexes to enable qualified searching—that is, to search for a specific index and/or enable ranking based on the field in which the query search terms were found.

### Note

Repeatable fields of the source record are mapped to repeatable fields of the PNX record.

The following table describes the fields in the Search section. In addition to these fields, Primo sites can add up to fifty local index fields.

Search Section Fields

Field	Description
addsrcrecordid	The index that is created from the additional source record ID from the Control section.
addtitle	<p>This field contains additional titles that are related to the record.</p> <p>Examples of MARC 21 source data:</p> <ul style="list-style-type: none"> <li>• 440 subfield \$\$a</li> <li>• 830 subfield \$\$a</li> </ul>
Alttitle	<p>The alternative titles.</p> <p>Examples of MARC 21 source data:</p> <p>MARC 21: 130, 210, 240, 246</p>
creationdate	<p>This field contains the publication date, which is the year when either the resource was created or the resource was published or manufactured. Valid years are one to four digits (0 - 9). For example: <b>1, 75, 910,</b> and <b>2016</b>. BCE dates are preceded by a minus sign. For example: <b>-5</b>.</p> <p>Multiple occurrences of this field are possible.</p> <p>The creation dates are used during searches and when refining dates with the date slider.</p> <hr/> <p><b>Note</b></p> <p>The following notes apply to the date slider:</p> <hr/>

Field	Description
	<hr/> <ul style="list-style-type: none"> <li>The initial date ranges that display in the date slider are based on the ranges in the creation date facet (see <a href="#">facets section</a>), not the dates from this field.</li> <li>Out of the box, the Creation Date facet ranges are hidden. If you want to display the facet ranges, change <code>display:none</code> to <code>display:block</code> in the following line of your local CSS file: <pre>.EXLFacetContainer ol li.EXLHiddenFacetCreationDate {display:none;}</pre> </li> </ul> <hr/>
creatorcontrib	<p>The normalized form of authors created for the facets.</p> <p>Examples of MARC 21 source data:</p> <p>MARC 21:1XX and 700/710/711 fields.</p>
crsdept	The course department.
crsid	The course ID.
crsinstrc	The course instructor.
crsname	The course name.
description	<p>Description of the content of the resource. This includes abstract, contents notes, summary, and so forth.</p> <p>Examples of MARC 21 source data:</p> <p>MARC 21: 502, 505, 520 fields.</p>
enddate	Contains the end date in date ranges. For more information, see <a href="#">Configuring Date Ranges</a> .
frbrid	The ID assigned to records following the FRBRization process. The field is updated by the system.
fulltext	Words from the full-text that were added in the enrichment phase.
general	A general index for fields that have not yet been added to any of the specific indexes and should be. For example, publisher.
isbn	<p>The ISBN of the item.</p> <p>Example of MARC 21 source data:</p> <p>MARC 21:020.</p>

Field	Description
issn	The ISSN of the item. Example of source data: MARC 21: 022.
orcidid	The ORCID ID.
pnxtype	An internal Primo index that defines the type of PNX record. The field is updated by the system.
recordid	The <code>recordid</code> field from the Control section, which is used to locate a specific record. This is an internal Primo index.
recordtype	Record type—not in use.
ressearscope	The restricted search scope, used to limit discovery of certain PNX records to specific user groups. In order to limit discovery, the records should be assigned a denied search scope. Access is enabled based on the denied search scopes defined in a Back Office table. Access can be enabled based on institution, on-off campus, and user group. This field is copied to the scope field for indexing by the search engine.
rsrctype	The type field from the Display section.
scope	Used in creating search scopes and denied search scopes. The values from the search scope and restricted search scope fields above should be copied to the scope field.
searchscope	Used to create search scopes values for use in Primo views. This field is copied to the scope field for indexing by the search engine.
sourceid	Based on the <code>sourceid</code> field from the Control section. It may be required to filter out certain records and is an internal Primo index.
startdate	Contains the start date in date ranges. For more information, see <a href="#">Configuring Date Ranges</a> .
subject	The topic of the content of the resource. Example of source data: MARC 21: 6XX fields.

Field	Description
syndetics_fulltext	Used for abstracts and other data loaded from Syndetics. This field is updated by the system.
syndetics_toc	Used for table of contents data loaded from Syndetics. This field is updated by the system.
title	<p>The main title.</p> <p>Examples of source data:</p> <p>MARC 21: 245 subfields \$\$a and \$\$b</p> <hr/> <p><b>Note</b></p> <p>In the UI, title searches also include the <b>alttitle</b> and <b>addtitle</b> fields, but they are given far less boost in the rankings than the main <b>title</b>.</p> <hr/>
toc	This field contains words from the table of contents.
usertag	This field contains end-user tags. This field is updated by the system.
lsr01 - lsr50	Local search fields.

## The Facets Section

[Return to menu](#)

The Facets section is used to create faceted browsing in the UI. Facets are intended to help the user refine the results list. A single record can have many types of facets, as well as multiple values for a single facet type. Sites can decide which facets they want to include in the UI.

The following table describes the fields in the Facets section. In addition to these fields, Primo sites can define up to fifty local facet fields.

Facets Section Fields

Field	Description
classificationlcc classificationddc classificationudc classificationrvk	Classification (LCC/DDC/UDC/RVK). The classification facet can be used to create a subject browse list based on the main subject classes of the classification scheme. The classification code is translated into a description in the enrichment phase. The field is updated by the system.
collection	The collection (physical, digital, electronic, or logical) to which the resource belongs. The collection facet is a code that is translated in the UI.  Examples of source data: <ul style="list-style-type: none"> <li>MARC21: 852 \$b \$c.</li> </ul>
creationdate	The creation date normalized to four digits. The following formats are supported: YYYY, YYYYMM, and YYYYMMDD. BCE dates are not supported. If the creation date cannot be normalized, the field will not be created.  Examples of source data: <ul style="list-style-type: none"> <li>MARC21: 008/07-10; 260 \$\$c.</li> </ul> <p>The Creation Date facet is created dynamically based on the results set. Note that it is created from all results, not just the top 200 results as done for dynamic facets. The system creates this facet as follows:</p> <ol style="list-style-type: none"> <li>During normalization, creation dates are normalized as follows for each PNX record: <ul style="list-style-type: none"> <li>Dates before 1899 are normalized as their century. For example, 1826 is normalized to 1800.</li> <li>Dates between 1900 and 1949 are normalized by decade. For example, 1945 is normalized to 1940.</li> <li>Dates after 1950 are not changed.</li> </ul> </li> <li>During a search, the system counts the number of different creation dates found in the search results and split the dates into five groups. For example, if the following 10 dates were found during a search: <p>1994, 1996, 1998, 2000, 2001, 2002, 2004, 2006, 2007, and 2008</p> <p>The system will display the following facets groups and the total number of records for each group:</p> <ul style="list-style-type: none"> <li>Before 1998 (500)</li> </ul> </li> </ol>

Field	Description
	<ul style="list-style-type: none"> <li>◦ 1998 To 2001 (300)</li> <li>◦ 2001 To 2004 (250)</li> <li>◦ 2004 To 2007 (1,020)</li> <li>◦ After 2007 (8234)</li> </ul> <hr/> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• If the system finds less than five dates during a search, the Creation Date facet will not display.</li> </ul> <p>The following notes apply to the date slider:</p> <ul style="list-style-type: none"> <li>• The initial date ranges that display in the date slider are based on the ranges in this field, not the dates from the search/creationdate field (see <a href="#">search section</a>).</li> <li>• Out of the box, the Creation Date facet ranges are hidden. If you want to display the facet ranges, change <code>display:none</code> to <code>display:block</code> in the following line of your local CSS file:</li> </ul> <pre style="margin-left: 40px;">.EXLFacetContainer ol li.EXLHiddenFacetCreationDate {display:none;}}</pre> <hr/>
creatorcontrib	<p>Creator/Contributor. This facet attempts to normalize personal names so that the field contains the last name and the first letter of first name (since this is common in many databases).</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 100/110/111 and 700/710/711 fields.</li> </ul> <p>If the author is a person, the field contains the last name and the first letter of each of the first names:</p> <ul style="list-style-type: none"> <li>• The second and third characters of the tag are 00.</li> <li>• The first indicator is 1 (for example, 1001).</li> <li>• Use subfield \$\$a only.</li> <li>• The first name is each word after the comma.</li> </ul> <p>If the author is a conference, the field contains only the conference name, and not particulars on time or place:</p> <ul style="list-style-type: none"> <li>• The second and third characters of the tag are 11 (for example, 711).</li> <li>• Use subfield \$\$a only.</li> </ul> <p>In all other cases, the entire field is used.</p>
crsdept	The course department.
crsid	The course ID.
crsinstrc	The course instructor.
crsname	The course name.
filesize	The size of the file for digital objects.

Field	Description
format	<p>Physical format. The physical format or file type.</p> <p>Examples of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: Can be based on the 007 control field.</li> </ul>
genre	<p>The genre of the resource.</p> <p>Examples of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 655 and subfield v from all 6XX.</li> </ul>
jtitle	<p>The journal title. This facet can be used in PNX records that represent articles.</p> <p>Sample source data: MARC21: 773 \$\$t</p>
language	<p>The language of the resource. The language is stored in coded form (ISO 639-2) and translated in the UI.</p> <p>If the language is not coded, the normalization process attempts to convert it to coded form. If this is not possible, a language facet is not created.</p> <p>Examples of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 008/35-37; if blank, use 041 subfield \$\$a.</li> </ul>
library	<p>The facet for physical libraries, which can be used instead of or in addition to the collection facet. The Library facet has a special feature intended for multi-institution sites. It allows you to configure the facet so that it is split between libraries that belong to the user's institution and libraries that belong to all other institutions.</p> <p>In addition to the number of hits and alphabetical sort, the library facet allows the following sort options:</p> <ul style="list-style-type: none"> <li>• By user institution and then by size</li> <li>• By user institution and then alphanumerically</li> <li>• By user institution only</li> </ul> <p>If any of the sort options are selected, two 'Library' facets will display. The first includes libraries that belong to the user's institution, and the second includes all libraries from other institutions.</p>
prefilter	<p>The search pre-filter that is available in the Primo UI and must be mapped as a facet. The default list of pre-filters is based on the Resource Type field in the display:</p> <ul style="list-style-type: none"> <li>• Book -&gt; Books (books)</li> <li>• Journal -&gt; Journals (journals)</li> <li>• Article -&gt; Articles (articles)</li> <li>• Text Resource -&gt; Books (books)</li> <li>• Image -&gt; Images (images)</li> <li>• Video -&gt; Audio-Video (audio-video)</li> </ul>

Field	Description
	<ul style="list-style-type: none"> <li>• Audio -&gt; Audio-Video (audio-video)</li> <li>• Maps -&gt; Maps (maps)</li> <li>• Score -&gt; Scores (scores)</li> </ul>
related	Related records—not in use.
rsrctype	<p>The nature or genre of the resource. This field is based on the rsrctype field in the Display section:</p> <ul style="list-style-type: none"> <li>• Book -&gt; books</li> <li>• Journal -&gt; journals</li> <li>• Article -&gt; articles</li> <li>• Text Resource -&gt; text resources</li> <li>• Image -&gt; images</li> <li>• Audio -&gt; media</li> <li>• Video -&gt; media</li> <li>• Score -&gt; scores</li> <li>• Map -&gt; maps</li> <li>• Other -&gt; others</li> </ul>
topic	<p>Enables the display of topics (subjects) on three levels. Every level is separate by a hyphen with a 3-byte Unicode representation. In the UI, only three levels are used.</p> <p>Examples of source data:</p> <ul style="list-style-type: none"> <li>• MARC21: 6XX (all fields which begin with the digit 6) fields: <ul style="list-style-type: none"> <li>First facet level (topic 1) is all data up to the first occurrence of subfield \$\$v, x, y, or z. Each subfield division (v, x, y, or z) constitutes the next level. The string is truncated after three levels.</li> </ul> </li> </ul>
toplevel	<p>The facet that displays on top of the results set, which is shown only in the Primo UI. The top-level facet includes the following values:</p> <ul style="list-style-type: none"> <li>• Online Resources—assigned if the delivery category is Online Resource.</li> <li>• Available in library—assigned if the availability_pnx field from the Display section is available.</li> </ul> <hr/> <p><b>Note</b></p> <p>Multiple top-level facet values may be assigned to a single PNX record.</p> <hr/>
lfc01 - lfc50	Local facet fields.

## The Sort Section

[Return to menu](#)

The fields in the Sort section can be used as the basis for sorting the results set. The following table lists the fields in the Sort section.

Sort Section Fields

Field	Description
author	<p>The author of the record. Only one author field should be created.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC 21: 100 \$\$a</li> </ul>
creationdate	<p>The date of creation should be normalized to the following date formats: YYYY, YYYYMM, or YYYYMMDD.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC 21: 008/07-10; 260 \$\$c.</li> </ul>
title	<p>The title of the record. Only one title field should be added.</p> <p>Example of source data:</p> <ul style="list-style-type: none"> <li>MARC 21: 245 \$\$a and \$\$b</li> </ul>
Iso01 - Iso50	Local sort fields.

## The Duplicate Record Detection Section

[Return to menu](#)

Refer to [Duplicate Detection Process](#) for an explanation of the duplicate record detection process and the Dedup vector section in the PNX.

## The FRBR Section

[Return to menu](#)

Refer to [FRBRization](#) for an description of the FRBR implementation in Primo and the structure of the FRBR section in the PNX.

## The Delivery Section

[Return to menu](#)

The Delivery section includes information that Primo requires to configure and manage the delivery of institutional resources.

Primo provides discovery and delivery services by linking the user to other applications, for example the ILS for placing requests, the digital repository for viewing digital objects. Access to such resources is controlled by the local application, not by Primo. However, Primo includes information concerning the availability of the item and attempts to provide a link to the best possible delivery option (the GetIt! function).

The following table describes the fields in the Delivery and Scoping section.

Delivery and Scoping Section Fields

Field	Description
delcategory	<p>The delivery resource categories for which delivery may function differently. The following are supported categories:</p> <ul style="list-style-type: none"> <li>• <b>Physical Item</b> – all physical items except for microforms.</li> <li>• <b>Microform</b></li> <li>• <b>SFX Resource</b></li> <li>• <b>Online Resource</b></li> <li>• <b>MetaLib Resource</b>—records from the MetaLib Knowledgebase</li> <li>• <b>Remote Search Resource</b>—records retrieved via MetaLib.</li> </ul> <p>This field is required. A record that does not have a delivery category will fail and display the following error message in the back office:</p> <pre>Invalid content was found starting with element 'ranking'. One of '{"":delivery}}' is expected.</pre> <p>If you define another category in this field, delivery related functionality will not be available for this record. This means that there will be no availability status or GetIt tabs.</p>
fulltext	Indicates that there is online full-text for the resource, which is used for remote search resources.
institution	The institution to which the resource belongs.
resdelscope	Restricted delivery scope that is used to define access restrictions for online resources. The restrictions (based on institution, on/off campus, user group) are defined in a table in the Back Office. Lack of a restricted delivery scope field in the PNX indicates that there are no restrictions.

## The Ranking Section

[Return to menu](#)

The Ranking section includes two booster fields that can be used to boost the ranking of the record.

The following table describes the fields that can be added to the Ranking section.

Ranking Section Fields

Field	Description
Booster1	<p>The amount of boost that is applied to a record. By default, no boost is given to a record.</p> <p>The amount of boost is determined by the following booster settings:</p> <ul style="list-style-type: none"> <li>• No boost – Assign a value of 1.</li> <li>• Negative boost – Assign a value greater than 0 and less than 1. Lower values provide less boost (such as .1). Note that 0 is not a valid setting.</li> <li>• Positive boost – Assign a value greater than 1. Higher values provide more boost.</li> </ul>
Booster2	Not in use.
pcg_type	<p>The Primo Central grouping type. Primo Central uses this field internally to select the preferred record in Primo Central FRBR groups.</p> <hr/> <p><b>Note</b></p> <p>Primo Central does not pass this field to Primo for display in the PNX record.</p> <hr/>

## The Enrichment Section

[Return to menu](#)

The Enrichment section includes data that is required by the enrichment process. The results of the enrichment process are not stored in this section, but rather in one of the following sections: Display, Search, Facets, or Links.

The following table describes the fields in the Enrichment section. In addition to the fields listed in the table, Primo sites can define up to fifty local enrichment fields.

Enrichment Section Fields

Field	Description
abstract	A link to an abstract.
availability	This field can include raw availability related data from the source for processing by an enrichment program.
classificationlcc classificationddc classificationudc classificationrvk	A classification code (LCC/DDC/UDC/RVK) that is translated into descriptive text.
fulltext	A link to full-text.
rankdatefirstcopy	The date of the first rank copy. This can be relevant for boosting ranking based on circulation date.
ranknocopies	This field contains the number of rank copies.
ranknoloans	The number of rank loans.
rankparentchild	This ranking field is relevant for records with a hierarchal relationship (parent/child). Example from MAB: Mapping based on leader pos. 23: <ul style="list-style-type: none"> <li>• h parent</li> <li>• u child</li> </ul>
review	A link to a review.

Field	Description
toc	A link to a table of contents.
lrn01 - lrn50	Local enrichment fields.

## The Additional Data Section

[Return to menu](#)

The Additional Data section contains data elements that are required for a number of functions in Primo that cannot be extracted from other sections of the PNX.

The table below lists the fields in the Additional Data section, mapping them to the equivalent data elements of the ContextObject of the OpenURL and RIS format for a reference management system.

Additional Data Section Fields

Field Name	ContextObject	RIS
Abstract (abstract)		N2
Additional Author (addau)		A2
Additional Date (adddate)		Y2
Additional ID	dat	
Additional Title (addtitle)		T2
Article Number	artnum	
Article Title	atitle	T1
Author	au	A1
Author First	aufirst	
Author Initial 1	auinit1	
Author Initial	auinit	
Author Last	aulast	

Field Name	ContextObject	RIS
Author Middle Initial	auinitm	
Author suffix	ausuffix	
Book title	btitle, title	T1
City of Publication (cop)		CP
CODEN	coden	
Corporate author	aucorp	A1
co – country of publication	co	
cc – country of publication code	cc	
Date	date	Y1
degree – degree conferred for the dissertation	degree	
advisor – dissertation advisor	advisor	
DOI	doi	
eISSN	eissn	SN
End page	epage	EP
Genre	genre	
inst – institution that issues dissertation	inst	

Field Name	ContextObject	RIS
ISBN	isbn	SN
ISSN	issn	SN
Issue	issue	IS
Journal Title	jtitle	JF
Local fields 1 - 25 (lad01 - lad25)		U1-25
Metadata Format	format	
Miscellaneous1 (mis1)		M1
Miscellaneous2 (mis2)		M2
Miscellaneous3 (mis3)		M3
Notes (notes)		N1
Object ID (objectid)	object_id	
OCLC ID (oclcid)		
oa – intended for use by Primo Central to indicate whether a record is open access or not.		
orcidid		
Pages	pages	
Part	part	

Field Name	ContextObject	RIS
PMID	pmid	
Publisher (pub)		PB
Quarter	quarter	
RISDate (risdate)		
RISType (ristype)		Type
Season	ssn	
Series author (seriesau)		A3
Series title (seriestitle)		T3
Short title	stitle	JA
SICI	sici	
Start page	spage	SP
URL url)		url
Volume	volume	VL

## The Browse Section

[Return to menu](#)

This section includes:

- [Virtual Shelf Tab](#)
- [Browse Search](#)
- [Configuring the Normalization Rules](#)
- [Implementation and Upgrade Information](#)

## Virtual Shelf Tab

[Return to menu](#)

The Virtual Shelf tab appears for each record on the search results page. It allows users to browse items based on the location of an item in the search results. The user will be able to navigate through items on the shelf, starting at the selected item's browse/callnumber value in the PNX. The system uses the call number index that is created from the callnumber field in the Browse section of the PNX. If such a field does not exist for the institution of the view in the PNX, the Virtual Shelf tab will not display.

### Note

Although the system automatically creates a scope when a new institution is created, you must make sure that a scope has been created for the institution. Otherwise, an error will display when the Virtual Shelf tab is opened.

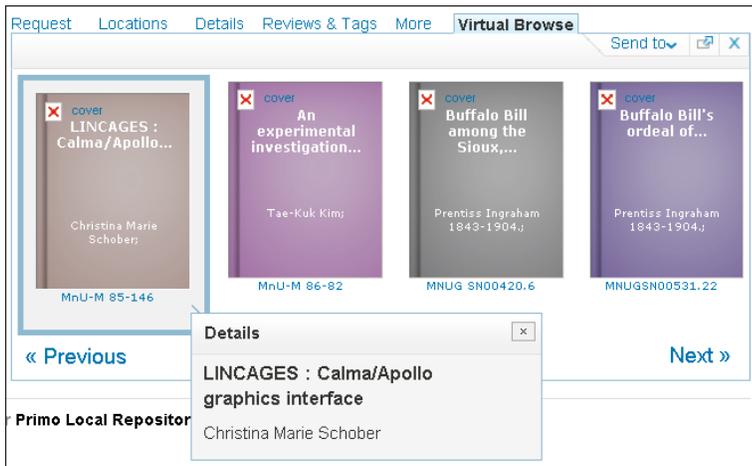
If the record contains more than one call number of different types, Primo will choose the call number according to the order defined with the Browse Lists mapping table.

The screenshot shows a web interface for a library record. At the top, it says "LINCAGES : Calma/Apollo graphics interface" and "Christina Marie Schober 1985". Below that, it indicates the item is available at "Volcano Campus Fun Library Annex Sub-Basement (MA Theses) (MnU-M 85-146)". There are navigation tabs: "Request", "Locations", "Details", "Reviews & Tags", "More", and "Virtual Browse" (which is selected). A "Send to" button and a close "X" button are also visible. The main area displays a horizontal list of four book covers. The first cover is highlighted with a blue border. The covers are: 1. "LINCAGES : Calma/Apollo..." by Christina Marie Schober, MnU-M 85-146. 2. "An experimental investigation..." by Tae-Kuk Kim, MnU-M 86-82. 3. "Buffalo Bill among the Sioux,..." by Prentiss Ingraham (1843-1904.), MNUG SN00420.6. 4. "Buffalo Bill's ordeal of..." by Prentiss Ingraham (1843-1904.), MNUGSN00531.22. At the bottom of the list are "« Previous" and "Next »" navigation buttons.

### Virtual Shelf Tab

Users may perform the following actions in the Virtual Shelf tab:

- Get additional information by holding the cursor over an item in the tab.



### Virtual Shelf Tab - Additional Information

- Browse up to 100 items to the left and right of the selected item by clicking the **Prev** and **Next** links at the bottom of the tab, or by using the keyboard arrows, the mouse wheel, or mouse drag-and-drop.
- Display the full details of an item by clicking the item in the tab.

## Back Office Configuration

Out of the box, the normalization rules are configured to support the Virtual Shelf feature, and no additional changes are required in the Back Office. For more information, see [Configuring the Normalization Rules](#).

The following table lists the related Back Office configuration for this functionality.

Virtual Shelf Configurations

Table	Description
Virtual browse tab code table (new)	<p>This table defines the labels used for the <b>Previous</b> and <b>Next</b> buttons in the Virtual browse tab:</p> <ul style="list-style-type: none"> <li>• <code>default.virtualbrowse.button.previous</code> - « Previous</li> <li>• <code>default.virtualbrowse.button.next</code> - Next »</li> </ul>
GetIT! Tab1 code table (modified)	<p>The following code is used for the Virtual Browse tab label:</p> <pre>default.brief.results.tabs.browseshelf - Virtual Browse</pre>

For more information on code tables, see the *Primo Back Office Guide*.

## Hiding the Virtual Shelf Tab

Primo allows you to disable this functionality by hiding the tab via your view's CSS.

**To hide the Virtual Shelf tab:**

1. Log on to the Back Office server as the `primo` user.
2. Enter the following commands to access and open the CSS file that is used to customize your view:

```
fe_web  
cd css  
vi <custom_css/>.css
```

---

**Note**

It is not recommended to modify the default Primo CSS, which can be overwritten during updates. For more information regarding the customization of Primo views, see the *Primo Technical Guide*.

---

3. Add the following line to the CSS file:

```
.EXLTabsRibbon div li.EXLBrowseshelfTab {display:none}}
```

4. Save the changes to the CSS file.
5. On the Primo Home > Deploy All page, select all options and click **Deploy**.
6. Perform a search to verify that the Browse Shelf tab does not appear in the view.

---

## Browse Search

[Return to menu](#)

A browse search returns an alphabetical list (based on the type of browse selected and the search terms specified by the user), whose entries return a list of related records.

To implement this functionality, you must configure and enable at least one type of browse list, which the system uses to determine the scope of the search. Although the system uses browse lists instead of search scopes to perform the search, you must have a scope code that has the same name as the institution for which you are enabling the Browse functionality. If you do not already have a scope for the institution, you must create one. Note that the system automatically creates this scope when a new institution is created. The active institution is always the institution to which the view belongs.

---

### Note

If you have a multi-institution view that belongs to a central institution, you can ensure that the central institution is linked to all of the browse entries by creating a browse list that combines all of the institutions. For more information, see [Configuring a Cross-Institutional View](#).

---

The system creates browse lists per institution from the Browse section of the PNx during the normalization stage of the pipe. For more information on the Browse section and the normalization rules, refer to [Configuring the Normalization Rules](#).

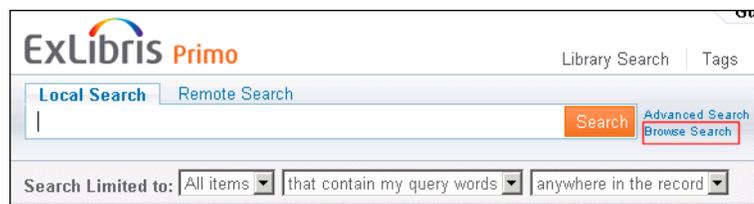
Additional space may be required in order to create indexes for each browse list. For more information, refer to [Check Browse Readiness Script](#).

In order to use the Browse searches, you may need to configure a redirect rule for the Primo X-services realm. For more information, see [Verify Primo X-Services Test](#).

---

## The Browse Search Interface

If a browse list is active for the view, the Front End displays the Browse Search link under the Advanced Search link in the simple search tile:



### Browse Search Link

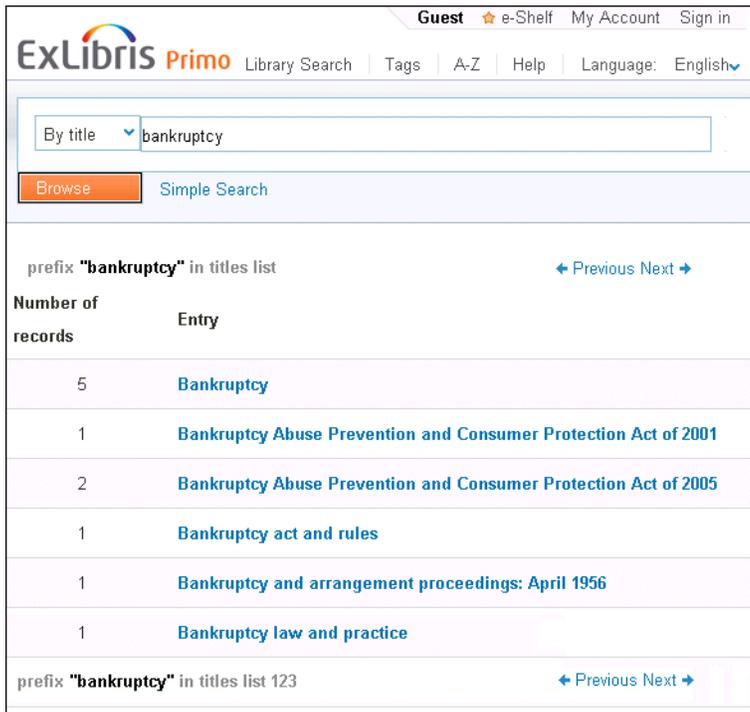
When a user clicks the link, the Browse Search Page opens and displays the Browse Search tile, which includes a drop-down list that contains the Browse lists that have been enabled.



### Browse Search Box

The area below the Browse search box is blank by default. You may configure it locally by updating the **Browse > Bottom** field on the Static HTML Tile page in the Views wizard. For more information, see [Configuring the Browse Tile](#).

To start a browse search, users must select a browse list and enter a search query in the search box. In the following example, the user has performed a search in the **By title** browse list:



### Browse Search Page

## The Headings Results List

Browse searches that use the author, title, and subject browse lists return a list of headings and the number of linked PNX records, which display in the brief results page format and include facets. Users can click the headings to display a list of the linked PNX records.

If the necessary additional data is included in the harvested records from the PNX, the list of headings may also include cross-references (as shown in the figure below) and subject authority type. For more information, see [Additional Data Needed from the ILS](#).

By subject

[Browse](#) [Simple Search](#)

prefix "cancer" in subjects list

Number of records	Entry
8	<a href="#">Cancer</a>
	<a href="#">Cancer -- Alternative therapy.</a> See: <a href="#">Cancer -- Alternative treatment</a>
2	<a href="#">Cancer -- Alternative treatment</a>
1	<a href="#">Cancer -- Alternative treatment -- Fiction</a>
1	<a href="#">Cancer -- Animal models</a>
1	<a href="#">Cancer -- Aspect psychologique -- Bibliographie</a>
	<a href="#">Cancer -- Biography.</a> See 123: <a href="#">Cancer -- Patients -- Biography</a>

### Headings Results with Cross-References

## Browse and FRBR

The headings browse list (authors, title and subjects) display a list of headings. The number that displays next to heading is the number of records that contain the heading. When the user clicks on the heading, the system displays the linked PNX records on the Brief Results page. This is done by running a regular search for the heading. As in any other results list, the system displays facets for the records in the set and it also groups the records based on FRBR. This means that the number of records that display may not match the number of records because the system displays only the preferred record and a link to the other records in the FRBR group. Also note that some of the records in a FRBR record may not contain the heading that was invoked.

## Call Number Results List

A search for call numbers lists the PNX records in tabular format, with the call number displaying in the first column. Clicking the title opens the PNX record in full display.

By call number 123

[Browse 123](#) [Simple Search](#)

prefix "DA" in call numbers list [← Previous](#) [Next →](#)

Call Number 123	Title	Author	Date
DA16.E47	<a href="#">Empire online</a>	Datagold, Ltd.; Adam Matthew Publications;	2003-
DA462.A2K55 1998IRISH	<a href="#">William of Orange : a dedicated life, 1650-1702</a>	Kilpatrick, Cecil;	
DA920.R6	<a href="#">Journal.</a>	Royal Society of Antiquaries of Ireland;	

### Call Number Results

# Back Office Configuration

The following sections describe how to configure the following aspects of the Browse page:

- [Enabling Browse Lists](#)
- [Configuring Labels for Browse Lists](#)
- [Configuring the Browse Tile](#)

## Note

For new installations, the author, title, and subject browse lists are enabled by default. Because institutions have different call number types, call number lists are not enabled by default.

## Enabling Browse Lists

The Browse Lists mapping table in the Frontend subsystem configures the following aspects of the Browse feature:

- Activate browse lists. You must configure at least one browse list in order to display the Browse page in the Front End. This can be defined per institution and view.
- Define default sort order for the list of PNX records that are linked to a heading.
- Define the call number sort procedure that the system uses to normalize the call numbers browse list.
- Define the order of lists in the Browse drop-down field.

The screenshot shows the 'All Mapping Tables' configuration page in Primo. The 'Browse Lists' table is selected, showing a list of mapping rows. The table has columns for 'Enabled', 'Browse List Type\*', 'Sort By', 'Sort Type', and 'view\*'. The rows are as follows:

Enabled	Browse List Type*	Sort By	Sort Type	view*
<input type="checkbox"/>	Select Value	Select Value		Select V
<input checked="" type="checkbox"/>	Call Number - Library of Congress	Not Relevant	0	default
<input checked="" type="checkbox"/>	Title	date		default
<input checked="" type="checkbox"/>	Subject	title		default
<input checked="" type="checkbox"/>	Call number - Sudoc	Not Relevant	3	default
<input checked="" type="checkbox"/>	Call number - Dewey	Not Relevant	1	default
<input checked="" type="checkbox"/>	Call Number	Not Relevant	Generic	default
<input checked="" type="checkbox"/>	Author	title		default
<input checked="" type="checkbox"/>	Call number - NLM	Not Relevant	2	default

Table Description: Browse Lists

### Browse Lists Mapping Table

For multi-institution environments, you can define the Browse Lists mapping table at the installation and institution levels. If the Primo installation has many institutions, it may be best to disable the lists at the installation level and customize the table per institution so that every institution can activate and configure Browse as needed.

The mapping table contains the following columns:

Browse Lists Columns

Column	Description
Enabled	Enables the mapping row.
Browse List Type	<p>Defines the type of browse list to display. The following types are valid:</p> <ul style="list-style-type: none"> <li>• Author</li> <li>• Title</li> <li>• Subject</li> <li>• Call number - Library of Congress</li> <li>• Call number - Dewey</li> <li>• Call number - SUDOC</li> <li>• Call number - NLM</li> <li>• Call number - Activate this type when the call number is unknown or not one of the above types.</li> </ul>
Sort By	Defines the field to use for sorting the list of PNX records linked to the heading. This column is not relevant for call numbers.
Sort type	<p>Defines the normalization procedure to apply to the Call number browse list (both for indexing and run-time). Currently, the following types are supported:</p> <ul style="list-style-type: none"> <li>• <b>0</b> – Library of Congress</li> <li>• <b>1</b> – Dewey</li> <li>• <b>2</b> – National Library of Medicine (NLM)</li> <li>• <b>3</b> – SUDOC</li> <li>• <b>Generic</b> – Use for all other call number types. Primo normalizes these call numbers as follows: <ul style="list-style-type: none"> <li>• Letters are converted to lowercase.</li> <li>• Multiple spaces are converted to a single space.</li> </ul> </li> </ul> <hr/> <p><b>Note</b></p> <p>Call numbers with a different type number (for example \$\$T8) or with no type number at all (no \$\$T) are defined with the <b>Generic</b> call number type.</p> <hr/>
View	<p>Allows you to define a separate Browse list drop-down list per view.</p> <hr/> <p><b>Note</b></p> <p>Once a single line is defined for the view, only those rows will be taken for the active view.</p> <hr/>

Column	Description
Order	Defines the order of the lists in the browse drop-down list, where 1 is the first item in the list.
Is Enabled	Select <b>Yes</b> from the drop-down list to enable this browse list. Note that the <b>Enabled</b> field must also be selected.

## Configuring Labels for Browse Lists

The following code tables allow you to define the labels used with the Browse functionality:

- **Browse Lists Labels** – Defines the entries that display in the Browse drop-down field in the Front End.

Primo Home > Advanced Configuration > All Code Tables

> Code Tables

Update for Owner:  Sub System:  Table Name :

Code Table Rows

Enabled	Code ▲▼	Description ▲▼	Language ▲▼	Display Order
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	en_US ▼	
<input checked="" type="checkbox"/>	default.browse.callnumber.2	By NLM call numbers	en_US	8
<input checked="" type="checkbox"/>	default.browse.callnumber.3	By SUDOC call numbers	en_US	7
<input checked="" type="checkbox"/>	default.browse.callnumber.0	By Library of Congress call numbers	en_US	5
<input checked="" type="checkbox"/>	default.browse.callnumber.1	By Dewey call numbers	en_US	6
<input checked="" type="checkbox"/>	default.browse.title	By title	en_US	2
<input checked="" type="checkbox"/>	default.browse.subject	By subject	en_US	3
<input checked="" type="checkbox"/>	default.browse.callnumber	By call number	en_US	4
<input checked="" type="checkbox"/>	default.browse.author	By author	en_US	1
<input checked="" type="checkbox"/>	default.browse.select	Select the list to browse	en_US	0

Table Description:

### Browse Lists Labels Code Table

- **Browse Labels** – Defines all other labels used for the Browse feature.

**Primo Back Office**

[Primo Home](#) > [Advanced Configuration](#) > [All Code Tables](#)

> **Code Tables**

Update for Owner:  Sub System:  Table Name:

**Code Table Rows**

Enabled	Code	Description	Language	Display Order
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="en_US"/>	<input type="text"/>
<input checked="" type="checkbox"/>	default.browse.subjecttype.DDCUT	DDC UT	en_US	93
<input checked="" type="checkbox"/>	default.browse.subjecttype.DCS	Health Sciences	en_US	90
<input checked="" type="checkbox"/>	default.browse.subjecttype.WATREST	Water resources	en_US	314
<input checked="" type="checkbox"/>	default.browse.subjecttype.RPE	RPE	en_US	253
<input checked="" type="checkbox"/>	default.browse.subjecttype.QLSP	QLSP	en_US	242
<input checked="" type="checkbox"/>	default.browse.subjecttype.GCCST	Government of Canada	en_US	119
<input checked="" type="checkbox"/>	default.browse.subjecttype.MUSA	Musa	en_US	194
<input checked="" type="checkbox"/>	default.browse.subjecttype.HENN	Hennepin	en_US	128
<input checked="" type="checkbox"/>	default.browse.subjecttype.LUA	LUA	en_US	183

### Browse Labels Code Table

You can include additional subject types by adding a new code in the following format:

```
default.browse.subject.type.
```

The label for the authority type column in the list of subjects is blank out of the box, but it can be changed locally by updating the following code:

```
default.browse.col.authoritytype
```

An authority type displays only if it is included in the data from the ILS.

---

## Configuring the Browse Tile

The **Browse > Bottom** field on the Edit HTML Attributes page (Static HTML tile) in the Views Wizard. By default, it specifies the `browse.html` file, which is blank. As with other tiles, you can customize this tile as needed.

**Primo Back Office** [About](#) [Logout](#) [Help](#)

Primo Home > Ongoing Configuration Wizards > Views Wizard

**ExLibris Primo** Hello Admin

> **Edit HTML Attributes**

View : REEF      Tile : Static HTML

**Contents of HTML Tile**

Position	Assigned HTML
<b>Home Page:</b>	
Low Right	<input type="text" value="/static_htmls/news.html"/>
Upper Right	<input type="text" value="/static_htmls/singin.html"/>
Low Left	<input type="text" value="/static_htmls/service.html"/>
Upper Left	<input type="text" value="/static_htmls/featured.html"/>
<b>Brief Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasbrief.jsp"/>
<b>Full Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasfull.jsp"/>
<b>Browse:</b>	
Bottom	<input type="text" value="/static_htmls/browse.html"/>
<b>All Pages:</b>	
Header	<input type="text" value="/static_htmls/header.html"/>
Footer	<input type="text" value="/static_htmls/footer.html"/>

**Cancel & Go back** **Save & Continue**

To Tiles List      To Tiles List

**Static HTML Tile**

## Configuring the Normalization Rules

[Return to menu](#)

This section describes what Primo needs in order to build the browse lists.

## The Browse Section of the PNX

The Browse section includes the following fields. The following table lists the contents of the Browse section.

Browse Section Fields

Field Code	Description
institution	<p>The code of the owning institution. As noted above, the browse lists are created per institution. A single Browse section can belong to one or more institutions. During the Dedup process, the system appends the institution to every author, title, and subject. The call number should include the institution in the field itself because it is local by nature.</p> <p>If you want a combined browse list for all of your institutions, refer to <a href="#">Configuring a Cross-Institutional View</a>.</p>
author	Authors for the authors browse list. The author field should have several elements as described below.
title	Titles for the titles browse list. The title field should have several elements as described below.
subject	Subjects for the subject browse list. The subject field should have several elements as described below.
callnumber	<p>Call numbers for the call numbers browse lists. The callnumber field should have several elements as described below.</p> <p>The callnumber field includes the institution in the field itself. If you want a combined call number browse list for all institutions, refer to <a href="#">Configuring a Cross-Institutional View</a>.</p>

The heading fields (author, title, and subject) should have the following elements, each as a subfield. Note that only \$\$D and \$\$E are mandatory.

Heading Subfields

Element	Description
\$\$D	Display form of the heading.
\$\$E	Normalized form of the entry for matching and sorting purposes. This is the key of the record that defines uniqueness. Most of the normalization is performed by the SE when the data is indexed. The normalization rules will remove leading articles only when this capability is enabled in the source data.

Element	Description
\$\$P	Preferred/non-preferred indication. The valid values are <b>Y</b> and <b>N</b> . If this element is missing, the system considers the heading to be preferred.  This is not used in the title field.
\$\$I	Authority ID - \$\$I. This field is used for linking the preferred and non-preferred headings.  This is not used in the title field.
\$\$T	Type of authority (subject field only). The out-of-the-box codes are derived from the following standards:  <a href="http://www.loc.gov/standards/sourcelist/subject.html">http://www.loc.gov/standards/sourcelist/subject.html</a>  You can include additional types. The display labels for the codes in the FE are defined in the Browse Labels code table, using the following format:  default.browse.subjectype.  For example:  default.browse.subjectype.MESH
\$\$U	Institution code. This subfield is used only in deduped records and is added automatically.

The call number field should have the following elements, each as a subfield. Note that only \$\$D and \$\$E are required:

#### Call Number Subfields

Element	Description
\$\$D	Display form of the call number.
\$\$E	Normalized form of the call number for sorting and matching purposes. This is the key of the record.
\$\$T	Type of call number. Currently the following types are supported (the code is based on the first indicator of the MARC 852 field): <ul style="list-style-type: none"> <li>• <b>0</b> – Library of Congress</li> <li>• <b>1</b> – Dewey</li> <li>• <b>2</b> – National Library of Medicine (NLM)</li> <li>• <b>3</b> – SUDOC</li> </ul> Each of the above types are added to a separate browse list with a dedicated normalization procedure. Call numbers with a different type or no type are added to the generic list.
\$\$I	Institution to which the relevant holdings belongs.

## Normalization Rules Templates

Rules for the Browse section are available in almost all of the out-of-the-box templates, as described in the table below. For detailed information on the templates, see [Mapping to the Normalized Record](#).

Normalization Rules Templates

Template	The Browse section
Alma Marc	<p>Alma MARC records include the data for full Browse functionality. The rules added to the browse section create all possible subfields.</p> <p>In addition to the browse section, it is also necessary to update several other sections to ensure that non-preferred fields are not added. This is done by adding a condition that checks the preferred/non-preferred indicator to ensure that it is not non-preferred.</p> <p>This includes:</p> <ul style="list-style-type: none"> <li>• Display: creator, contributor, subject, title, uniform title, relation</li> <li>• Facets: Creator/Contributor, topic</li> <li>• Dedup: F11</li> <li>• FRBR: K1, K2</li> <li>• Additional data: author last, author first, corporate author, additional author</li> </ul>
Aleph MARC	<p>Records published from Aleph v.21.1 (rep_change 002112) and v.20 (rep_change 003801) can include data for full Browse functionality. Note that some configuration is necessary in Aleph to ensure that all the data is extracted (refer to Aleph documentation). The rules in the Aleph MARC - Template template's browse section has been updated to create all possible subfields for the Browse fields (from Primo V4.3).</p> <p>In addition to the browse section, it is also necessary to update several other sections to ensure that non-preferred fields are not added. This is done by adding a condition that checks the preferred/non-preferred indicator to ensure that it is not non-preferred. Since Aleph sends the non-preferred indicator in subfield P, it was necessary to exclude this subfield in some cases. The following fields were updated to prevent creation of the field from non-preferred headings and/or to exclude \$\$P:</p> <ul style="list-style-type: none"> <li>• Display: creator, contributor, subject, title, uniform title, relation</li> <li>• Search: subject</li> <li>• Facets: Creator/Contributor, topic</li> <li>• Sort: author, title</li> <li>• Dedup: F11</li> <li>• FRBR: K1, K2</li> <li>• Additional data: author last, author first, corporate author, additional author</li> <li>• Browse: title</li> </ul>
Voyager	<p>Records published from Voyager 8.2.1 can include all of the data required for full Browse functionality. Note that some configuration is necessary in Voyager to ensure that all of the data is extracted (refer to the <i>Voyager-Primo Integration Guide</i> for more information). The rules in the Voyager - Template template's browse section has been updated to create all possible subfields in the browse fields (from Primo V4.3).</p>

Template	The Browse section
	<p>In addition to the browse section, it is also necessary to update several other sections to ensure that that the non-preferred fields are not added. This is done by adding a condition that checks the preferred/non-preferred indicator to ensure that it is not non-preferred. Such a condition has been added to the following fields:</p> <ul style="list-style-type: none"> <li>• Display: creator, contributor, subject, title, uniform title, relation</li> <li>• Search: subject</li> <li>• Facets: Creator/Contributor, topic</li> <li>• Sort: author, title</li> <li>• Dedup: F11</li> <li>• FRBR: K1, K2</li> <li>• Additional data: author last, author first, corporate author, additional author</li> <li>• Browse: title</li> </ul>
<p>ALEPH MAB</p> <p>ALEPH UNIMARC</p>	<p>For headings with no cross-references or authority type (for subjects), the system creates only \$\$D and \$\$E.</p> <p>Call numbers with no type are created from AVA/949.</p>
<p>Generic MARC</p> <p>Unicorn</p> <p>SFX</p> <p>DigiTool MARC</p> <p>Generic UNIMARC</p>	<p>For headings with no cross-references or authority type (for subjects), the system creates only \$\$D and \$\$E.</p> <p>Rules have not been added for the call number because it is not clear which tag can be used. It may be possible to add the rules locally.</p>
<p>Generic Dublin Core</p> <p>Alma Dublin Core</p>	<p>For headings with no cross-references or authority type (for subjects), the system creates only \$\$D and \$\$E.</p> <p>Rules have not been added for the call number since it is not clear which tag can be used. It may be possible to add the rules locally.</p>

## Additional Data Needed from the ILS

Because all records that are harvested from the ILS include authors, titles, subjects, and call numbers, you can create browse lists in Primo for all ILS systems. However, there are some features in the Browse functionality that require additional information. If the ILS sends this information, the following functionality is also available:

- **Cross-references** – Non-preferred headings are included in the author and subject lists with a link to the preferred heading.
- **Call number type** – Separate lists per call number type (depending on their data some customers may be able to implement this even if this is not implemented by default).
- **Authority type** – Display of the authority type for subjects.

---

## Cross-References

The harvested record should include preferred and non-preferred headings in the same tag. The tag must include an indication if the entry is preferred or non-preferred. In order to create a link between the preferred and non-preferred headings, there also needs to be a subfield with the authority record ID from which the headings are derived (or some other unique code).

The following example is from Alma, but different subfields could be used for MARC.

```
<datafield ind1="1" ind2="" tag="100"/>
<subfield code="a">Miller, Rodney,</subfield>
<subfield code="c">violinist</subfield>
<subfield code="0">11-LIBRARY_OF_CONGRESS:n 81095936</subfield>
<subfield code="9">Y</subfield>
<datafield ind1="1" ind2="" tag="100"/>
<subfield code="a">Miller, Roddy,</subfield>
<subfield code="c">violinist</subfield>
<subfield code="0">11-LIBRARY_OF_CONGRESS:n 81095936</subfield>
<subfield code="9">N</subfield>
```

---

### Note

- Preferred and non-preferred are in the same tag (100)
- Subfield 9 is preferred/non-preferred indicator
- Subfield 0 is the authority record Id to which both headings belong

---

## Authority Type

In order to display the authority type for subjects, it should be included as a subfield rather than as an indicator, because it is very difficult to do this via the normalization rules. Note that if your site only has one or two authority types, you can do this locally.

In the following MARC example from Alma, the authority type has been added to subfield 2 as a code:

```
<datafield ind1="" ind2="0" tag="650"/>
<subfield code="a">Folk dance music</subfield>
<subfield code="z">New England.</subfield>
<subfield code="0">11-LIBRARY_OF_CONGRESS:sh 2009124441</subfield>
<subfield code="2">LCSH</subfield>
<subfield code="9">Y</subfield>
```

---

## Call Number Type

The call number type used for the call number browse should represent the call number used to shelve the item. The call number type should be added to the tag from which the call number is derived.

In the following example from Alma, the call number is sent in the AVA field, and the type has been added to subfield k:

```
<datafield ind1="" ind2="" tag="AVA"/>
<subfield code="a">PRM50</subfield>
<subfield code="b">NAND</subfield>
<subfield code="c">Childrens Lit</subfield>
<subfield code="d">GT4905 .B7 1967</subfield>
<subfield code="e">available</subfield>
<subfield code="f">1</subfield>
<subfield code="g">0</subfield>
<subfield code="h">N</subfield>
<subfield code="i">0</subfield>
<subfield code="j">CLT</subfield>
<subfield code="k">0</subfield>
```

In the above case, the call number type is based on the MARC indicators for the 852 field.

## Configuring a Cross-Institutional View

For each type of browse list (author, title, and subject), you must create a browse entry in the normalization rules for the "central" institution (which is the default institution for your cross-institutional view). In addition, you must ensure that the "central" institution is defined as a scope value and that it is added to all records.

For more information on "central" institutions, see the Primo Concepts, Components, and Relationships section in the *Primo Back Office Guide*.

## Author, Title, and Subject Browse Lists

Add the following rule to the browse/institution field, entering the code of your central institution in the **Constant** field.

The screenshot shows a configuration interface with two rule entries. The first entry (labeled '1') has a Type of 'PNX' and an XPath of 'delivery/institution'. Its Transformation is 'Copy As Is' and its Parameter is empty. The second entry (labeled '2') has a Type of 'Constant' and a Value of 'Central'. Its Transformation is 'Copy As Is' and its Parameter is empty. A link 'Go to bottom of page' is visible at the top right of the interface.

### Add Rule for Headings

#### Note

The constant **Central** used in the above example should be the name of your "central" institution.

## Call Number Browse Lists

Duplicate all of the rules for the call number and then add an institution rule (\$\$!) that uses a new mapping table to convert all of the source institutions to your central institution. For example:

The screenshot shows the configuration for a rule group named 'browse\_callnumber'. The Source is 'MARC', Field is 'AVA', Ind1 and Ind2 are empty, Subfield is 'Include', 'a' is checked, and 'Enabled' is checked. Under Conditions, it says 'No conditions Specified'. Under Transformations, there are two entries: 'Use mapping table' with parameter 'tocentral' and 'Add to beginning of string' with parameter '\$\$!Central'. The Behavior is set to 'ADD'.

**Note**

The constant **Central** used in the above example should be the name of your “central” institution.

---

## Implementation and Upgrade Information

[Return to menu](#)

The following table summarizes the implementation and upgrade information used for the Browse functionality:

Step	New Installation	Updated Installation
<p>Check disk space:</p> <p>Additional disk space is needed to support the browse indexes.</p>	<p>The additional requirements for Browse is part of system requirements for a new installation.</p>	<p>See <a href="#">Check Browse Readiness Script</a>.</p>
<p>Update normalization rules</p>	<p>The normalization rule templates contain the rules to create browse lists. For more information, see <a href="#">Configuring the Normalization Rules</a>.</p> <p>In a new installation NR sets will be created from the templates and so will have the Browse section.</p> <p>It may be necessary to make changes to the out-of-the-box rules. In particular, pay attention to the call number. If the institution uses only one type, it could be added to the data.</p> <p>Deploy the NR set if any changes are made.</p>	<p>The normalization rule templates have been updated to create browse lists.</p> <p>You will need to update local normalization rule sets. For fields in the new Browse section, use the Synchronize from Template option for all fields. For more information, see <a href="#">Synchronize from Template Option</a>.</p> <p>If needed, update any other sections (for example, in the case of Alma, the Display and Facets section) either update the rules using the Synchronize from Template option or update the rules manually if you have already made changes in your local rules set. For more information, see <a href="#">Synchronize from Template Option</a>.</p> <p>It may be necessary to make changes to the out-of-the-box rules. In particular, pay attention to the call number. If the institution uses only one type, it could be added to the data.</p> <p>Deploy updated NR sets.</p>
<p>ILS data</p>	<p>If it is possible to harvest additional data from the ILS (such as cross-references, authority ID call number type, and authority type), it may be necessary to modify the extract procedures.</p> <p>For Alma (and also Aleph and Voyager in the future), you must enable the extract of the additional information. Refer to <i>Primo - Alma Integrations Guide</i> for more information.</p>	
<p>Re-pipe and Re-indexing</p>	<p>If additional data has been added to the harvested record, you must run a regular pipe that harvests the data from the source. If no new data has been added, you can run a pipe without harvesting.</p>	
<p>Verify institution scope value exists</p>	<p>Verify that a scope value of type institution with the same code as the institution exists on the Primo Home &gt; Ongoing Configuration Wizards &gt; Pipe Configuration Wizard &gt; Scope Values Configuration page. This system creates this scope automatically when you create an institution. In case it is deleted, create the scope manually. The scope value should be used for Search.</p>	

Step	New Installation	Updated Installation
Activate Browse via the Browse Lists mapping table	<p>In new installations, the author, title, and subject lists are enabled by default. You must activate call number lists as needed.</p> <p>In a site with multiple institutions, you may consider deactivating all browse lists at the installation level and then defining a separate table per institution.</p> <p>Deploy the mapping table if any changes are made. Use the <b>All code and mapping tables</b> option on the Deploy All page.</p>	<p>In upgraded installations, none of the browse lists are enabled by default.</p> <p>In a site with multiple institutions, you may consider deactivating all browse lists at the installation level and then defining a separate table per institution.</p> <p>Deploy the mapping table if any changes are made. Use the <b>All code and mapping tables</b> option on the Deploy All page.</p>
Static HTML (optional)	Replace the OTB static HTML in the View Wizard and the deploy the view if you made any changes.	

---

## Check Browse Readiness Script

When adding the Browse functionality for the first time, you must run a script to make sure that your installation has sufficient resources to support the Browse functionality. When the check completes, the system sends the results to the e-mail address that you specify while running the script.

---

### Note

You will not be able to use Browse functionality unless you run the readiness script first. If the script finds insufficient resources, you can still perform the upgrade to Version 4.1 and later releases, but you should not activate the Browse functionality until you have added the necessary resources and the script no longer finds insufficient resources. If you need more information, contact Ex Libris Support.

---

### To run the script:

1. For all of your Primo servers, enter the following command to download the `check_browse_readiness.sh` file:

```
mget check_browse_readiness.sh
```

---

### Note

The script is located in the same location as the tar.gz file for the SP.

2. For all of your Primo servers, enter the following command from any location to run the script:

```
bash check_browse_readiness.sh
```

3. At the prompt, enter the e-mail address to which you want the report sent.

---

## Verify Primo X-Services Test

Browse functionality uses Primo X-services. If you use any redirection via Apache (such as a redirect-server, load balancer, or mod-jk) and also use a pattern to redirect to Primo, test to make sure that it works with Primo X-services.

When testing Primo X-services, you must take into account that Primo and X-Services use different realms:

- **Primo** – `http://<domain>/primo_library/libweb/action/search.do`
- **X-services** – `http://<domain>/PrimoWebServices/xservice/search/brief`

### To run the Primo X-service test:

1. Make sure that your Front End server's IPs are registered in the WS and XS IP mapping table in the Front End subsystem. Note that this is not needed for Browse functionality, but it is required for the test.

If you are not certain which IP to add, perform a call (see Step 2 below) to the X-service and look for the following line in the FE log (`library_server.log`):

```
ERROR [t-http-0.0.0.0-1702-1] [c-WsXsIpFilter] - Unauthorized access 10.1.116.141
```

---

#### Note

You do not need to perform a restart or deploy after adding this IP to the table.

---

2. Use the following X-service to perform the check:

```
http://<domain>/PrimoWebServices/xservice/search/  
brief?query=any,contains,book&indx=1&bulkSize=10&institution=<institution>
```

For example:

```
http://primo-demo.exlibrisgroup.com:1702/PrimoWebServices/xservice/search/  
brief?query=any,contains,book&indx=1&bulkSize=10&institution=NORTH
```

3. If the system does not return results, you may need to configure a redirect rule for the X-services realm.

---

## Synchronize from Template Option

Your normalization rule sets are first created by duplicating rules from one of the out-of-the-box templates (such as the ALEPH MARC - Template). You can synchronize your rules with the rules in the template that you originally used to create your rules set. This allows you to incorporate new or modified rules easily into your rules set.

### To update the Browse section from the template:

1. On the Primo Home > Advanced Configuration > Full Normalization Rule Configuration page, click **Edit** next to your rules set.
2. On the Manage Normalization Rules page, perform the following:
  1. Select **Browse** in the **PNX Section** drop-down list.
  2. Select the **Display Empty PNX fields** checkbox.



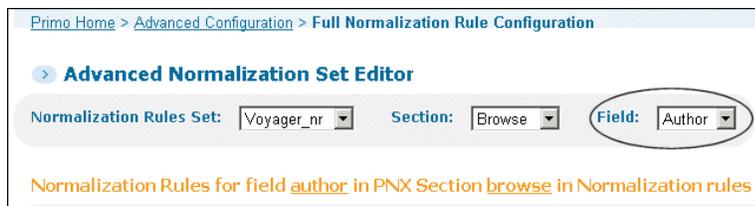
### Manage Normalization Rules Page

3. Click **Edit** next to the first field in the Browse section.
4. On the Normalization Set Editor page, click **Reset Target** in the Synchronize with Template section at the bottom of the page.



### Synchronize from Template Section

5. Select the next Browse field in the **Field** drop-down list and repeat Step 4 until you have synchronized all fields in the Browse section.



### Normalization Set Editor - Field Drop-Down List

6. Click **Save**.

## Example of a PNX Record

[Return to menu](#)

```
<?xml version="1.0" encoding="UTF-8" ?>
<record>
  <control>
    <sourcerecordid>004400000</sourcerecordid>
    <sourceid>BBI</sourceid>
    <recordid>BBI004400000</recordid>
    <originalsourceid>PRM01</originalsourceid>
    <sourceformat>MARC21</sourceformat>
    <sourcesystem>ILS</sourcesystem>
  </control>
  <display>
    <type>book</type>
    <title>The songs of the comic opera of Rosina: or, Love in a cottage. As
performed at the New Theatre,</title>
    <creator>Frances Brooke 1724?-1789.</creator>
    <contributor>William Rowson d. 1842 ed. Favart, M. (Charles-Simon), 1710-1792.;
Readex.</contributor>
    <publisher>Philadelphia: : Printed by Mathew Carey,</publisher>
    <creationdate>March 15, 1794. (Price, six cents.)</creationdate>
    <format>12 p. ; 17 cm.</format>
    <subject>Operas -- Librettos; Electronic books; Songs</subject>
    <language>eng</language>
    <relation>$$Cseries $$VEarly American imprints. 1st series no. 26702.</relation>
    <avallibrary>$$INORTH$$LNINTE$$1General
collection$$Savailable$$31$$40$$5N$$60</avallibrary>
    <source>BBI</source>
    <availinstitution>$$INORTH$$Savailable</availinstitution>
    <availpnx>available</availpnx>
  </display>
  <links>
    <backlink>$$TILS_backlink$$DThis item in the Library Catalog</backlink>
    <linktorsrc>$$Uhttp://www.lib.umn.edu/slog.phtml?url=http://opac.newsbank.com/
select/evans/26702$$DOnline Version</linktorsrc>
    <linktoholdings>$$TILS_holdings</linktoholdings>
    <openurl>$$Topenurl_journal</openurl>
    <openurlfulltext>$$Topenurlfull_journal</openurlfulltext>
  </links>
  <search>
    <creatorcontrib>Frances, Brooke</creatorcontrib>
    <creatorcontrib>Brooke, F</creatorcontrib>
    <creatorcontrib>corrected, with permission of the managers, by W. Rowson,
prompter.</creatorcontrib>
  </search>
</record>
```

```

<creatorcontrib>William, Rowson d. 1842 ed.</creatorcontrib>
<creatorcontrib>Favart, M. (Charles-Simon), 1710-1792.</creatorcontrib>
<creatorcontrib>Rowson, W</creatorcontrib>
<creatorcontrib>Favart</creatorcontrib>
<creatorcontrib>Readex.</creatorcontrib>
<creatorcontrib>Singleton, Mary, 1724?-1789</creatorcontrib>
<creatorcontrib>Translator of Lady Catesby's letters,
1724?-1789</creatorcontrib>
<creatorcontrib>Author of Lady Julia Mandeville, 1724?-1789</creatorcontrib>
<creatorcontrib>Brooke, Mrs. (Frances), 1724?-1789</creatorcontrib>
<creatorcontrib>Brookes, Mrs. (Frances), 1724?-1789</creatorcontrib>
<creatorcontrib>Lady Catesby's letters, Translator of,
1724?-1789</creatorcontrib>
<creatorcontrib>Lady Julia Mandeville, Author of, 1724?-1789</creatorcontrib>
<title>The songs of the comic opera of Rosina: or, Love in a cottage. As
performed at the New Theatre, /</title>
<subject>Operas Librettos.</subject>
<subject>Electronic books.</subject>
<subject>Songs.</subject>
<general>Printed by Mathew Carey,,</general>
<general>[electronic resource] :</general>
<creationdate>1794</creationdate>
<addtitle>Moissonneurs.</addtitle>
<addtitle>Early American imprints. 1st series no. 26702.</addtitle>
<sourceid>BBI</sourceid>
<recordid>BBI004400000</recordid>
<rsrctype>book</rsrctype>
<searchscope>NORTH</searchscope>
<searchscope>BBI</searchscope>
<scope>NORTH</scope>
<scope>BBI</scope>
</search>
<sort>
<creationdate>1794</creationdate>
</sort>
<facets>
<language>eng</language>
<creationdate>1794</creationdate>
<topic>Operas-Librettos</topic>
<collection>NINTE</collection>
<toplevel>available</toplevel>
<toplevel>online_resources</toplevel>
<creatorcontrib>Brooke, F</creatorcontrib>
<creatorcontrib>Rowson, W</creatorcontrib>
<creatorcontrib>Favart</creatorcontrib>
<creatorcontrib>Readex</creatorcontrib>
<genre>Librettos</genre>
<genre>Electronic books</genre>
<genre>Songs</genre>

```

```

    <prefilter>books</prefilter>
    <rsrctype>books</rsrctype>
</facets>
<dedup>
    <t>1</t>
    <c3>songsofthecomicooperanewtheatre</c3>
    <c4>1794</c4>
    <f5>songsofthecomicooperanewtheatre</f5>
    <f6>1794</f6>
    <f7>songs of the comic opera of rosina or love in a cottage as performed at the
new theatre</f7>
    <f8>pau</f8>
    <f9>12 p. ;</f9>
    <f10>printed by mathew carey</f10>
    <f11>brooke frances 1724 1789</f11>
</dedup>
<frbr>
    <t>1</t>
    <k1>$$Kbrooke frances 1724 1789$$AA</k1>
    <k3>$$Ksongs of the comic opera of rosina or love in a cottage as performed at
the new theatre$$AT</k3>
</frbr>
<delivery>
    <institution>NORTH</institution>
    <delcategory>Online Resource</delcategory>
</delivery>
<ranking>
    <booster1>1</booster1>
    <booster2>1</booster2>
</ranking>
<addata>
    <aulast>Brooke</aulast>
    <aufirst>Frances,</aufirst>
    <au>Brooke, Frances, 1724?-1789</au>
    <addau>Rowson, William, d. 1842 ed</addau>
    <addau>Favart, M. (Charles-Simon), 1710-1792</addau>
    <addau>Readex</addau>
    <seriestitle>Early American imprints. 1st series no. 26702</seriestitle>
    <date>1794</date>
    <risdate>March 15, 1794. (Price, six cents.)</risdate>
    <format>book</format>
    <ristype>BOOK</ristype>
    <cop>Philadelphia:</cop>
    <pub>Printed by Mathew Carey,</pub>
    <bttitle>The songs of the comic opera of Rosina: or, Love in a cottage. As
performed at the New Theatre,</bttitle>
    <genre>book</genre>
</addata>
</record>

```

## Working with Normalization Rules

This section includes:

- [Normalization Rules Sets](#)
- [The Normalization Rules Sets Page](#)
- [The Manage Normalization Rules Page](#)
- [Editing Normalization Rules Sets](#)
- [Transformation Routines](#)
- [Validation Routines](#)
- [How to Edit the Normalization Rules](#)
- [Testing Normalization Rules](#)
- [Validate FMT](#)
- [Validate UNIMARC FMT](#)

## Normalization Rules Sets

[Return to menu](#)

A normalization rule set defines how a specific data source or group of data sources is converted from the source format to the Primo Normalized XML record (PNX record). Primo has several template mapping sets that you can use to create sets for the publishing pipes. The following templates are currently available:

- Generic MARC
- Generic Dublin Core
- ALEPH MARC
- ALEPH MAB
- Voyager MARC
- DigiTool—Dublin Core
- DigiTool—MARC
- SFX
- MetaLib
- XML
- Complex XML
- Voyager
- Generic UNIMARC
- ALEPH danMARC2
- ALEPH KORMARC
- Generic danMARC2
- Unicorn

Different publishing pipes and data sources can share the same normalization rules set.

---

## The Normalization Rules Sets Page

[Return to menu](#)

The Normalization Rules Sets page allows you to manage all of the normalization sets for the site. From this page, it is possible to create new sets and to edit, delete, or deploy existing sets.

This page can be accessed in the following ways:

- Primo Home > Initial Configuration Wizards > Primo Configuration Wizard > Step 3: Pipe Configuration Wizard > Step 3: Normalization Rules configuration
- Primo Home > Ongoing Configuration Wizards > Pipe Configuration Wizard > Normalization Rules configuration
- Primo Home > Advanced Configuration > Full Normalization Rule Configuration

---

### Note

To display the templates, you must select the **Display NR Templates** field.

---

---

## Create New Set

In order to create a new set, duplicate one of the existing sets—either a predefined template set or a locally created set. Define the name of the new set and click **Create**.

---

### Note

Do not use the term **Template** in the name of the sets that you create.

---

The new set will be added to the list so that the normalization rules can be configured.

In order to link a normalization rules set to a pipe, the set must be deployed. Refer to [Deploy Sets](#) for an explanation.

---

## Edit Set

In order to edit a set, click **Edit**, which opens the Manage Normalization Rules page. From this page, you can configure the normalization rules for each source. For more information, see [The Manage Normalization Rules Page](#).

---

## Deploy Sets

The normalization rules are stored in Primo's Oracle database. However, the publishing pipe uses XML files that are generated from the rules in the database. In order to create the XML files and be able to use the updated rules in the pipe, you must deploy the set.

When a set is deployed, the XML files are created in the following directory:

```
/exlibris/primop1_n/ng/primoprimo_publishing/home/profile/publish/production/conf/  
normalizationExport/CUSTOMER/<nr_set>
```

In the `normalizationExport/CUSTOMER` directory, a sub-directory is created for every normalization set. If the normalization set is being used by a pipe, the XML files are also created in the `conf` directory of the publishing pipe.

---

## Delete Sets

Use this option to delete a normalization set. Template normalization sets cannot be deleted.

## The Manage Normalization Rules Page

[Return to menu](#)

When the edit function is invoked from the normalization rules sets list, the system displays a list of PNX fields per section. This screen lists the PNX fields and for every field gives a brief summary of the rules, displaying PNX field, source, and action. To edit the rules, click **Edit**. The edit page for the selected PNX field opens.

Using the drop-down lists at the top of the page, it is possible to switch the normalization rules set and view another set or change the PNX section within the set.

By default, the UI will display only fields that are actually in use by the normalization rules set. Click **Show empty PNX fields** to display all PNX fields.

It is also possible to modify some attributes of the set from this page, including:

- **Description** – A description of the normalization set.
- **Enable set** – Not in use.

---

## Editing Normalization Rules Sets

[Return to menu](#)

The PNX has several sections, and every section has many fields. The NRS screens never display all PNX sections at once, and the rules for the PNX fields are always edited one at a time.

Normalization rules can be edited in two modes: basic and advanced. The advanced mode includes some additional features or rule elements that can be used in the rules. Both modes are explained below.

Normalization rules have three main parts:

1. **Source** – The source data that is being normalized in the rule. The source can be of several types. The most common is a field from the source record. But the source can also be a constant. In addition, Primo needs to know the format of the source record since different formats require different layout of the input screen. The following source types are valid:
  - **MARC** – A source record field in MARC format. It is possible to define the tag, indicators, and subfields.
  - **MAB** – A source record field in MAB format. It is possible to define the tag, indicators, and subfields as well as a range of fields.
  - **XML** – A source record field from an XML record. It is possible to define the path, attribute, and value.
  - **Complex XML** – Supports the use of full X-path capabilities. It allows you to create rules for any attribute in the path, not just the last attribute as provided with the XML source type.
  - **PNX** – A field from the PNX record. It is necessary to define the section/field from the PNX record.
  - **Constant** – A constant of some kind.
  - **Config** – A field from a configuration file/table. It is necessary to define the path of the field.
2. **PNX field** (or "target") – The section/field in the PNX record that will be created by the rule. A single PNX field can be created from one or more rules.
3. **Conversion** – What needs to be done to the source data so it is converted to the target PNX field. The conversion can have several components including conditions and transformation routines.

---

## The Basic Normalization Set Editor Page

As noted above, every PNX field is edited separately. On the top of the screen it is possible to change the normalization set, PNX section and PNX field.

For every PNX field, the page will display one or more rules. All of the rules on an editor page always relate to a single PNX field.

The basic editor page is divided into the following parts:

- a top part that is relevant to all rules

**Top Part of Normalization Set Editor**

- a middle part that lists the rules

**Middle Part of Normalization Set Editor**

- a bottom part that creates new rules

**Bottom Part of Normalization Set Editor**

## The Top of the Normalization Set Editor Page

The top part includes the following elements:

- **Description** – A free text description of the rule.
- **Enable/Disable all rules** – enables you to toggle between disabling and enabling all the rules of the PNx field.
- **Advanced** – Opens the Advanced Normalization Set Editor page to perform more advanced normalizations. For more information, see [The Advanced Normalization Set Editor Page](#).

- **Action** – The basic action to be taken. On the basic edit page, all rules must share the same action. The following are possible:
  - **ADD** – new PNX fields should be added for every source field.
  - **OR** – only a single PNX field should be created. Once that field has been created, the system stops checking the remaining rules.
  - **MERGE** – merge all occurrences of the source fields to a single PNX field.

The MERGE action allows you to define a delimiter between multiple source fields. The defined delimiter will always appear before the value. The Delimiter Space field allows you to add a space before and after the delimiter, as follows:

- **None** – no blanks are added after or before the delimiter (or the source fields if no delimiter is defined). For example, if the delimiter is a semicolon, the field will look like this:

```
aaa;bbb;ccc
```

- **Before** – adds a blank before the delimiter. For example, if the delimiter is a semicolon, the field will look like this:

```
aaa ;bbb ;ccc
```

- **After** – adds a blank after the delimiter. For example, if the delimiter is a semicolon, the field will look like this:

```
aaa; bbb; ccc
```

- **Both** – adds a blank before and after the delimiter. For example, if the delimiter is a semicolon, the field will look like this:

```
aaa ; bbb ; ccc
```

For example, the following source record has multiple 700 fields (additional authors):

```
700 $$aJohnson, Melvin
700 $$aKennelman, Anne
700 $$aAdams, Mark
```

Depending on the action specified, the system will create the `display/contributor` PNX field, as follows:

- If the action is **OR**, the system will use only the first 700 field:

```
Contributor Johnson, Melvin
```

- If the action is **ADD**, the system will use all 700 fields:

```
Contributor Johnson, Melvin
```

```
Contributor Kennelman, Anne
```

```
Contributor Adams, Mark
```

- If the action is **MERGE**, the system will merge all of the 700 fields:

```
Contributor Johnson, Melvin; Kennelman, Anne; Adams Mark
```

- **Last updated by** – The user who created or last updated the rule.

---

## The Middle of the Normalization Set Editor Page

The middle part contains the rules section, which has the following elements:

- **Type** – The type of source to normalize. There are several types of sources: **MARC**, **MAB**, **XML**, **Complex XML**, **PNX**, **Config**, and **Constant**.

---

### Note

The remaining source-related fields depend on the value of the Type field.

---

- **Field** – For MARC and MAB only, specify the three-character tag.
- **Ind1** – For MARC and MAB only, specify the first indicator if needed. Leave blank for all indicators. Multiple indicators can be added with a comma. You can also exclude indicators by adding a minus sign before every indicator. For example:

```
1,2  
-0,-9
```

- **Ind2** – For MARC and MAB only, specify the second indicator if needed.
- **Subfield** – For MARC and MAB only, specify the subfields that you want to exclude or include by selecting **Include** or **Exclude** from the drop-down list. Then type the subfields that you want to include/exclude in the box to the right of the drop-down list. You can use a comma to separate multiple subfields and an asterisk to specify all of the subfields. For example:

```
Exclude d,t,u,v,w,x,y,z  
Include *
```

---

**Note**

The numeric subfields are automatically excluded unless they are specifically included. If a numeric subfield is specifically excluded, the mapping will take other numeric subfields

---

It is also possible to add control fields. For more information on how to do this, see [Using MARC/MAB Control fields](#).

- **Last** – For MAB only, allows you to specify the last tag in a range of tags. The Field tag specifies the first tag in the range and the Step field specifies the number of fields to jump in the range.
- **Step** – For MAB only, specifies the number of tags to jump in a range. For example, to specify every fourth tag in the range 208 through 296:

```
Field 208 Last 296 Step 4
```

This configuration will use tags: 208, 212, 216, and so forth.

- **Path** – For XML only, indicates the path of the XML field. The following example describes how to extract the highlighted field from the XML below:

```
<control>
  <label>text: DigiTool 3.0 Product Sheet</label>
  <note>Guy Ben-Porat CREATOR </note>
  <ingest_id>3_mets_digi_doc</ingest_id>
  <ingest_name xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"/>
  <entity_type>METS</entity_type>
  <usage_type>VIEW</usage_type>
  <preservation_level>any</preservation_level>
  <partition_a xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"/>
  <partition_b xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"/>
  <partition_c xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"/>
  <status xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"/>
  <creation_date>2005-09-22 10:08:34</creation_date>
  <creator>a:a</creator>
  <modification_date>2005-09-22 10:08:40</modification_date>
  <modified_by>a:a</modified_by>
  <admin_unit>DTL02</admin_unit>
</control>
```

The path should be entered as `control/entity_type`.

- **Attribute** and **Value** – For XML only, if the XML field uses attributes, it may be necessary to select a specific field based on an attribute value. This is added to attribute and value. For example, in order to extract the highlighted field:

```

<urls>
  <url type="stream">http://il-dtldev02:1801/webclient/
  DeliveryManager?pid=4288</url>
  <url type="descriptive_metadata">http://il-dtldev02:1801/webclient/
  MetadataManager?pid=42882&amp;descriptive_only=true</url>
  <url type="formated_metadata">http://il-dtldev02:1801/webclient/
  MetadataManager?pid=4288</url>
</urls>

```

The information described in the following table needs to be defined:

Attribute and Value Information

Source Type	Path	Attribute	Value
XML	Uris/url	Type	stream

- **XPath** – Valid only for the following types:
  - **Complex XML** – Contains the path of the XML attribute. From the following XML record, you can create a rule that uses the `AuthorName` attribute, which is a `<subitem/>` element:

```

<item name="PagesEnd">110</item>
<item name="AbstractSupplied">
  <subitem name="AbstractText"></subitem>
  <subitem name="AbstractLang">English</subitem>
  <subitem name="AbstractLangCode">EN</subitem>
  <subitem name="AbstractSource">ABSTRACT FROM AUTHOR</subitem>
</item>
<item name="Author">
  <subitem name="AuthorName">Vishnuvardhanarao,Elaprolu</subitem>
  <subitem name="AuthorAffil">1</subitem>
</item>

```

For this example, you would set XPath to the following value:

```
XPath='item[@name='Author']/subitem[@name=AuthorName]'
```

- **PNX** – A field from the PNX. It is necessary to define the XPath, which contains the section and field from the PNX. The section and field are separated by a slash. For example, to use the Resource Type field from the Display section, enter `display/type`.

---

#### Note

You must use the PNX field code, not the name.

---

- **Configuration XPath** – For Config only, a field from a configuration file. Currently, the only configuration file that can be used is the definition of the data source. It is necessary to define the name of the field in the value. The following fields are available:
  - nmrules/control\_sourceid
  - nmrules/control\_originalsourceid
  - nmrules/control\_sourcesystem
  - nmrules/control\_sourceformat
- **Value** – If the source is a Constant, specify the display constant. It is necessary to define the constant in the Value field.
- **Transformation** – Routines that enable you to manipulate the data. Every rule must have at least one transformation. The default transformation is **Copy as is**, which simply transfers the data from the source to the PNx field with no changes. Click the plus icon (+) to add an additional transformation. For a list of transformations, see [Transformation Routines](#).
- **Parameter** – In addition to the transformation drop-down list, there is a text box for adding the transformation parameter where relevant.

For every rule, the following functions are possible:

- **Delete** (indicated by a minus sign) – click Delete to delete the rule.
- **Copy rule** (indicated by a plus sign) – copy the rule to create a new rule based on an existing one.
- **Up** and **down** arrows – use the arrows to change the order of the rules.
- **Enable/Disable** – Disable or enable a specific rule by toggling the check mark.

---

## The Bottom of the Normalization Set Editor Page

The bottom part of the editor contains several functions:

- **Create** – it is possible to add additional rules (for the same PNx field) by clicking Create.
- **Test rules** – it is also possible to test the rules (refer to [Testing Normalization Rules](#) for more details).
- **Synchronize with Template** – this function lets you update the rules for the current PNx field from the template. This function may be useful in the following cases:
  - The template rules changed and you want to restore the old ones.
  - The template changed in a Service Pack or new version and you want to update your rules so that they are the same as the template.

---

## The Advanced Normalization Set Editor Page

The advanced normalization editor has all of the elements of the basic editor with the following additions:

- Rule groups

- Conditions
- Actions
- Copy Target Function

---

## Rule Groups

The Rule group field defines which rules the system will process together as a group. Before the addition of this field, the system automatically processed all rules for the same target and used the same source for the group. Now it is possible to create a group of rules that have different sources.

The Rule group field defaults to the name of the PNX section and tag for each rule. If you do not rename the rule group, the system will continue to process all rules that share the same source as a group. For example, in the MARC-based templates, the `display/creator` field has a single rule group for all of the rules called **display\_creator**. Note that the rules use different source fields (MARC tags), which include 880, 100, 110 and 111. The system processes all of the rules with the same source tags, starting with the 880 fields, followed by the 100 fields, the 110 fields, and so forth. This can be a problem if you want to process the source tags together.

### Merging Multiple Source Elements Example:

Using the following XML source, this example merges the `surname` and `given-names` elements into the `display/creator` field:

```
<contrib contrib-type="author">
  <name>
    <surname>Alarcon</surname>
    <given-names>Graciela S.</given-names>
  </name>
</contrib>

<contrib contrib-type="author">
  <name>
    <surname>Westfall</surname>
    <given-names>Andrew O.</given-names>
  </name>
</contrib>

<contrib contrib-type="author">
  <name>
    <surname>Lim</surname>
```

```
<given-names>Sam S.</given-names>
</name>
</contrib>
```

To merge these elements together, you must configure the following rules, using a modified rule group:

Rule #1:

Rule group: **display/creator\_1**

Source Type: XML

Source Path: contrib/name/given-names

Transformation: Copy as is

Action: ADD

Rule #2:

Rule group: **display/creator\_1**

Source Type: XML

Source Path: contrib/name/surname

Transformation: Copy as is

Action: MERGE, no delimiter, space After

These rules generate the following output:

```
display/creator Graciela S Alcon
display/creator Andrew O.Westfall
display/creator Sam S. Lim
```

If you had not modified the rule group, these rules would have generated the following output, processing each source separately:

```
display/creator Graciela S
display/creator Andrew O.
display/creator Sam S. Alcon Westfall Lim
```

**Merging a Source Field with a Single Instance Example:**

Using a modified rule group allows you to merge a source field that contains a single instance more than once. For example, if the source record contains the following information, you can add the call number in the 090 subfield a to every 945 field in the enrichment/availability field:

```
<datafield tag="090" ind1=" " ind2=" ">
  <subfield code="a">9ASAS90</subfield>
  <subfield code="b">TTTT999999</subfield>
  <subfield code="c">CaOTULAS</subfield>
</datafield>
....
<datafield tag="945" ind1=" " ind2=" ">
  <subfield code="c">c.1</subfield>
  <subfield code="l">loc1</subfield>
  <subfield code="g">2</subfield>
</datafield>
<datafield tag="945" ind1=" " ind2=" "/>
  <subfield code="c">c.2</subfield>
  <subfield code="l">loc2</subfield>
  <subfield code="g">2</subfield>
<datafield tag="945" ind1=" " ind2=" ">
  <subfield code="c">c.3</subfield>
  <subfield code="l">loc3</subfield>
  <subfield code="g">2</subfield>
</datafield>
<datafield tag="945" ind1=" " ind2=" ">
  <subfield code="c">c.4</subfield>
  <subfield code="l">loc4</subfield>
  <subfield code="g">2</subfield>
</datafield>
.....
```

To add the call number in 090 subfield a, you must configure the following rules, using a modified rule group:

Rule #1:

Rule group: **enrichment\_availability\_1**

Source: MARC 945 subfield I

Transformation: Copy as is

Action: ADD

Rule #2:

Rule group - **enrichment\_availability\_1**

Source: MARC 090 subfield a

Transformation: Copy as is

Action: MERGE, no delimiters first, space=After

These rules generate the following output:

```
enrichment/availability loc1 9ASAS90
enrichment/availability loc2 9ASAS90
enrichment/availability loc3 9ASAS90
enrichment/availability loc4 9ASAS90
```

**Merging a Source Field with Multiple Instances Example:**

This example is similar to the previous example, but the following source record contains a second instance of the 090 field:

```
<datafield tag="090" ind1=" " ind2=" ">
  <subfield code="a">9ASAS90</subfield>
  <subfield code="b">TTTT999999</subfield>
  <subfield code="c">CaOTULAS</subfield>
</datafield>

....

<datafield tag="090" ind1=" " ind2=" ">
  <subfield code="a">8ASAS80</subfield>
  <subfield code="b">TTTT999999</subfield>
  <subfield code="c">CaOTULAS</subfield>
```

```

</datafield>

....

<datafield tag="945" ind1=" " ind2=" ">
  <subfield code="c">c.1</subfield>
  <subfield code="l">loc1</subfield>
  <subfield code="g">2</subfield>
</datafield>

<datafield tag="945" ind1=" " ind2=" ">
  <subfield code="c">c.2</subfield>
  <subfield code="l">loc2</subfield>
  <subfield code="g">2</subfield>
</datafield>

<datafield tag="945" ind1=" " ind2=" ">
  <subfield code="c">c.3</subfield>
  <subfield code="l">loc3</subfield>
  <subfield code="g">2</subfield>
</datafield>

<datafield tag="945" ind1=" " ind2=" ">
  <subfield code="c">c.4</subfield>
  <subfield code="l">loc4</subfield>
  <subfield code="g">2</subfield>
</datafield>

.....

```

In the previous example's rules, the system uses all instances in the order in which they appear in the source record and reuses the last instance if there are not enough to generate the following output:

```

enrichment/availability loc1 9ASAS90
enrichment/availability loc2 8ASAS80
enrichment/availability loc3 8ASAS80

```

---

## Conditions

It is possible to define one or more conditions for a rule. The condition must be met for the rule to be activated. A condition has the following elements:

- **Condition logic** – a condition can be defined positively (true) or negatively (false). The condition logic is defined per set of conditions and per condition.
- **Condition relation** – this flag appears if more than one condition is added. The following values are valid:
  - **AND** – all conditions must be met. If the logic is true, this means that all conditions must be true; if the logic is false, all conditions must be false.
  - **OR** – at least one of the conditions must be met. If the logic is true, then any one of the conditions should be true; if the logic is false, then any one of the conditions is false.

For every condition, the following is defined:

- **Condition source** – the source field on which the condition is based. Any type of source can be defined.
- **General parameter** – This parameter is no longer required and should not be used. It is present for historical reasons (some older rules use it).
- **Condition routine** and **routine parameter** – it is possible to use transformation routines or validation routines. For more information, refer to [Using Conditions](#).
- **Success if** – indicates when the condition should be considered as met:
  - **Match any** – the condition must be true in any occurrence of the source field. This is the default condition.
  - **Match current** – the condition is true in the current source field. For example, if there are three source fields, the condition will be checked in the field being worked on. If you want the rule to work based on another subfield in the same field, use **match current**.
  - **Match all** – the condition must be true in all occurrences of the source fields.
  - **Match last** – the condition must be true in the first occurrence of the source field. Match last is the default type because it works fastest and in most cases there is only a single field. If you think there can be several, and they may not all match the condition, use one of the options above.

Refer to [Using Conditions](#) for instructions on how to work with conditions.

---

## Action

In the advanced editor, it is possible to assign a different action for every rule:

- **OR** – if the rule is flagged with the action OR and the PNx field has already been created, then the rule will not create another PNx field.
- **ADD** – if the rule is flagged with the action ADD, a new PNx field will be created even if the field already exists.

- **MERGE** – if a rule is flagged with the action MERGE, the PNx field that it creates will be merged with the PNx field that was created before it.

If the action is MERGE, it is necessary to define a delimiter. In the advanced editor screen, it is possible to define a "first" delimiter and an "additional" delimiter as well as a "repeat number" for the first delimiter, which defines the number of times that the first delimiter can be used. This enables you to have two different delimiters for multiple occurrences of the field.

There is a special kind of "first delimiter" called "new." Not a proper delimiter, it tells the system to start a new field even though the action is a merge. This can be useful in case of a PNx field that is created from many different source fields and one of the fields should start a new PNx field but all of its occurrences should merge. For example, in MAB the publisher is created from several fields including 418. The 418 should create a new publisher field but all its occurrences should merge.

MERGE Action

Source	Action	First Delimiter	Space	Repeat Number
418	MERGE	New	None	1

## Copy Target Function

The **Copy this Target to another Mapping Set** function allows staff users to copy all rules for a single PNx field from the active normalization rules set to another normalization rules set.

The screenshot shows the 'Advanced Normalization Set Editor' interface. At the top, there are dropdown menus for 'Normalization Rules Set' (Voyager\_nr), 'Section' (Control), and 'Field' (Source ID). Below this, there is a description field and a 'Basic' button. A 'Copy this Target to another Mapping Set' button is highlighted with a red box. Below this button, there is a dropdown menu for 'Select a Mapping to copy to' (Aleph\_nr) and a 'Copy' button. The interface also shows 'Last Updated By: Admin' and 'At: 2012-12-12 10:38:03.0'.

### Copy Target Function

When the staff user confirms the copy, the entire set of rules for the active PNx field ("target") will be overridden. There is no option to cancel the operation once it has started.

### Note

This option is available to all users who have the following roles: Admin, Data Administrator, Pipe Operator, Normalization Rules Editor, and Staff User.

This option is available only in the Advanced Normalization Rules Editor.

## Transformation Routines

[Return to menu](#)

### Note

Spaces are indicated by a ^.

Transformation routines allow you to change the source value into another value so that it can be used for searching and display in Primo. Validation routines are also considered transformation routines, but they are used within conditions for comparisons and do not transform or copy values (see [Validation Routines](#)).

The following tables list the basic and advanced transformation routines:

Transformation Routines

Routine Name	Description	Example
Add period at the end	Adds a period to the end of the field if the field does not end with one of the following symbols: '!' or '?' .	
Add to beginning of string	Adds the string defined in the parameter before the content of the field.	Parameter: ISBN: Input: 123-45-678-90 Output: ISBN: 123-45-678-90
Add to end of string	Adds the string defined in the parameter after the content of the field.	Parameter: (ISBN) Input: 123-45-678-90 Output: 123-45-678-90 (ISBN)
Assign to AZ list	Used by Journal Search and Database Search to transform titles and database names to the following categories: <ul style="list-style-type: none"> <li><b>0-9</b> – The value returned if the first character in the source field is a number (0-9).</li> <li><b>&lt;normalized letter&gt;</b> – The normalized letter (A-Z) if the first character in the source field is mapped to a letter (A-Z) with the A-Z Characters Transformations mapping table. For example, if the first character is A or Á, the routine returns A.</li> <li><b>others</b> – The value returned if the first character in the source field is not a letter or number.</li> </ul>	Input 1: Journal of Chemistry Output 1: J Input 2: 中国药理学报 Output 2: others Input 3: 1040 Instructions Output 3: 0-9

Routine Name	Description	Example
Character Conversion	Converts the characters in the field using a character conversion table.	
Complete End Date	Converts an end date (YYYY or YYYYMM) to a complete end date (YYYYMMDD) based on the input format. If the input already contains a complete date, the date is copied without transformation.	Input 1: 1990 Output 1: 19901231 Input 2: 199003 Output 2: 19900331 Input 3: 899 Output 3: 08991231
Complete Start Date	Converts a start date (YYYY or YYYYMM) to a complete start date (YYYYMMDD) based on the input format. If the input already contains a complete date, the date is copied without transformation.	Input 1: 1990 Output 1: 19900101 Input 2: 199003 Output 2: 19900301 Input 3: 899 Output 3: 08990101
ConvertISBN13to ISBN10	Converts a 13-digit ISBN to a 10-digit ISBN if possible. The input should be a 10- or 13-digit ISBN with or without hyphens. Parameters: none Output: A 10-digit ISBN without hyphens.	Input: 9780747599609 Output: 0747599602
ConvertToISBN13	Converts an ISBN to a 13-digit ISBN. The input should be a 10- or 13-digit ISBN with or without hyphens Parameters: none Output: A 13-digit ISBN without hyphens.	Input: 0747599602 Output: 9780747599609
Copy as is	This is the default transformation, which copies the source data without making any changes.	Input: 0747599602 Output: 0747599602
Define subfield delimiter	Defines a delimiter between subfields. This routine prevents the need to have a separate rule per subfield. The same delimiter will be used for all subfields.	Parameter: ^--^ Input: \$\$aUniversities and colleges \$\$xChildren\$\$xRepublicans Output: Universities and colleges - Children -- Republicans

Routine Name	Description	Example
Delete Characters	Deletes the characters specified in the parameter.	Parameter: ' Input: O'brien Output: Obrien
Delete spaces	Deletes spaces.	
Drop non-Filing Text	For MARC 0- drops filing text based on indicator 1 or 2. The parameter is the indicator: @@ind1@@ or "@@ind2@@"	Parameter: @@ind1@@ Input: The journal of the AAA Output: journal of the AAA
Extract and arrange XML elements	<p>Extracts child nodes from an XML element in a specific order when there are multiple occurrences of the XML element. The transformation handles every element separately.</p> <p>The input to the transformation should be a simple XML structure, such as the following:</p> <pre style="border: 1px solid black; padding: 5px;">           &lt;parent&gt;           &lt;child1&gt;data1&lt;/child1&gt;           &lt;child2&gt;data2&lt;/child2&gt;           &lt;child3&gt;data3&lt;/child3&gt;         </pre> <p>Parameter Notes:</p> <ul style="list-style-type: none"> <li>• At least one parameter is required.</li> <li>• The order of the parameters must be retained; if any parameter is not used, the '@@' delimiter still should be used. For example, if the <b>output order</b> and <b>delete tag names</b> parameters are the only parameters needed, enter: param1@@@@@param4.</li> <li>• To add space as a delimiter, specify 's' in the <b>delimiter string</b> parameter.</li> <li>• Default values for <b>Delete others</b> and <b>Delete tag names</b> parameters are <b>false</b>. If you want to use one of them, use <b>D</b> (Delete) as the parameter value. For example: param1@@param2@@D@@D).</li> <li>• If the <b>output order</b> parameter is not specified, and the <b>Delete others</b> parameter is not set to <b>true</b>, all data elements will be used in a random order and the XML order will not be preserved.</li> </ul>	Input: child2;child1@@s Output: <child2>data2</child2> <child1>data1</child1> <child3>data3</child3> Input: child2;child1@@s@@D Output: <child2>data2</child2> <child1>data1</child1> Input: child2;child1@@s@@D@@D Output: data2 data1 Input: child2;child1@@@@@D@@D Output: data2data1
Format Date	Formats dates to be in the structure: YYYY-MM-DD hh:mm:ss	Input: 20020418155342 Output: 2002-04-18 15:53:42 Input: 20020418

Routine Name	Description	Example
		Output: 2002-04-18
Format number	<p>Adds leading digits to create a seven digit number.</p> <p>Use another transformation to remove commas or periods within the number.</p>	<p>Input: 10000</p> <p>Output: 0010000</p>
Format End Date	<p>Transforms the date or date range specified in the input to a formatted end date. This routine handles the input as follows:</p> <ul style="list-style-type: none"> <li>• Removes all non-digits except for the following: <ul style="list-style-type: none"> <li>◦ Question mark - ? (denotes unknown dates.)</li> <li>◦ u (denotes unknown dates)</li> <li>◦ Slash (/ or \)</li> <li>◦ Hyphen-Minus sign (U002D or U2010 or U2011 or U2012 or U2013 or U2212)</li> </ul> </li> <li>• Replaces unknown dates with a 0 (for start date or BCE end date) or a 9 (end date or BCE start date).</li> <li>• For a date range, the first date is taken as the start date and the second as the end date.</li> <li>• For an open date, the end date becomes 9999.</li> </ul>	<p>Input 1: 1995-1999</p> <p>Output 1: 1999</p> <p>Input 2: [1995-1999]</p> <p>Output 2: 1999</p> <p>Input 3: 1995-</p> <p>Output 3: 9999</p> <p>Input 4: 19uu</p> <p>Output 4: 1999</p>
Format Start Date	<p>Transforms the date or date range specified in the input to a formatted start date. This routine handles the input as follows:</p> <ul style="list-style-type: none"> <li>• Removes all non-digits except for the following: <ul style="list-style-type: none"> <li>◦ Question mark - ? (denotes unknown dates.)</li> <li>◦ u (denotes unknown dates)</li> <li>◦ Slash (/ or \)</li> <li>◦ Hyphen-Minus sign (U002D or U2010 or U2011 or U2012 or U2013 or U2212)</li> </ul> </li> <li>• Replaces unknown dates with a 0 (for start date or BCE end date) or a 9 (end date or BCE start date).</li> <li>• For a date range, the first date is taken as the start date and the second as the end date.</li> <li>• For an open date, the end date becomes 9999.</li> </ul>	<p>Input 1: 1995-1999</p> <p>Output 1: 1995</p> <p>Input 2: [1995-1999]</p> <p>Output 2: 1995</p> <p>Input 3: 1995-</p> <p>Output 3: 1995</p> <p>Input 4: 19uu</p> <p>Output 4: 1901</p>
Format URL	Formats special characters for URLs:	<p>"%" -&gt; "%25"</p> <p>"\" -&gt; "%24"</p> <p>"&amp;" -&gt; "%26"</p>

Routine Name	Description	Example
		"\ " -> "%2B" ", " -> "%2C" "/" -> "%2F" ". " -> "%3A" "; " -> "%3B" "= " -> "%3D" "\ " -> "%3F" "@ " -> "%40" "\s" -> "%20" "\"" -> "%22" "<" -> "%3C" ">" -> "%3E" "#" -> "%23" "\ " -> "%7B" "\ " -> "%7D" "\ " -> "%7C" "\ " -> "%5C" "\ " -> "%5E" "~" -> "%7E" "\ " -> "%5B" "\ " -> "%5D" "" -> "%60  This transformation is not currently required.
Format Year	Gets the first four characters of the given string and replaces all characters that are not digits with the specified parameter.	Parameter: ? Input: 194u Output: 194?
Get author first name	Retrieves the author's first name. It will take all characters following the first comma.	Input: Lippe, Ole von der Output : Ole von der
Get author last name	Retrieves the author's last name. It will take all characters up to the first comma.	Input: Lippe, Ole von der

Routine Name	Description	Example
		Output: Lippe
Get author first last name	Returns the author's first and last name.	Input: Marshall, John B Output: John B Marshall
Get author last first name	Returns the author's last and first name.	Input: John B Marshall Output: Marshall, John B
GetHeadTail	<p>Returns the specified number of characters from the beginning and end of the input string. The following format is used for the Parameter field, where <i>&lt;param1&gt;</i> is the number of characters taken from the beginning and <i>&lt;param2&gt;</i> is the number of characters taken from the end:</p> <p><i>&lt;param1&gt;@@&lt;param2&gt;</i></p> <p>If you do not specify a value for <i>&lt;param2&gt;</i>, only characters from the beginning will be taken.</p> <p>If the input string has fewer characters than specified in either parameter, the system returns the entire string.</p>	<p>Parameter: 20@@5</p> <p>Input: "England and France during the hundred years war"</p> <p>Output: "England and France ds war"</p>
Get highest number	Returns the highest number from the input field.	Input: 112 pages, 2 ill Output: 112
Get highest number and normalize last digit	Returns the highest number from the input field and changes the last digit to 0.	Input: 112 pages, 2 ill Output: 110
Include/Exclude Subfields (starts with)	<p>This transformation allows the following options:</p> <ul style="list-style-type: none"> <li>• Include - This option can be used with the Split Field transformation to add each subfield value to a separate PNX field. <code>include@@&lt;starts with value to match - not case sensitive&gt;@@&lt;separator to include&gt;</code></li> <li>• Exclude - This option can be used to exclude specific subfields (starting with a particular value) from the PNX record. <code>exclude@@&lt;starts with value to match - not case sensitive&gt;</code></li> </ul> <p>For example, Alma includes in the author (1XX, 7XX) and subject (6XX) fields a subfield 0 with the authority control ID (for Browse), and are planning to add to these fields additional 0 subfields with linked data. The transformation can be used to exclude subfields '0' if they start with (URI) from Browse, and can in the future be used to include subfields '0' if they start with (URI) in a linked data field.</p>	<p>The following example also includes the Split Field BBBB transformation, which is used in case the subfield includes multiple URIs delimited by BBBB.</p> <p>Parameter: <code>include@@(Uri)@@BBBB</code></p> <p>Input:</p> <ul style="list-style-type: none"> <li>• exclude0-</li> <li>• (Uri)http://viaf.org/viaf/sourceID/LC no2008011383</li> </ul> <p>Output:</p>

Routine Name	Description	Example
		<p>(Uri)http://viaf.org/viaf/sourceID/LC no2008011383</p> <p>Parameter: exclude@@(Uri)</p> <p>Input:</p> <ul style="list-style-type: none"> <li>• 1021-01BC_ INST-98137743588801021</li> <li>• (Uri)http://www.exlibrisgroup.com/yonatan</li> </ul> <p>Output:</p> <p>1021-01BC_ INST-98137743588801021</p>
Lower case	Changes case to lower. There is no parameter.	<p>Input: History of books</p> <p>Output: history of books</p>
Normalize author	<p>Keeps the last name of the author and the first character of the first name.</p> <p>This routine normalizes authors for the Author facet.</p>	<p>Input: Lippe, Ole von der</p> <p>Output: Lippe, O</p>
Normalize Diacritics	<p>Normalizes the input string based on source and target codes defined in the DiacriticsConversion mapping table.</p> <p>Parameter: none</p> <p>Output: The normalized string.</p> <p>The DiacriticsConversion mapping table contains the following columns:</p> <ul style="list-style-type: none"> <li>• <b>Source UniCode</b> – the Unicode character from which to normalize.</li> <li>• <b>Target UniCode</b> – the Unicode character to which to normalize.</li> </ul>	<p>Source UniCode: 00D8</p> <p>Target UniCode: 004F</p> <p>Output: Converts a Latin O with stroke to upper case O</p>
Put subfields in separate fields	Creates separate PNX fields for every occurrence of a subfield within a field.	<p>Input: \$\$aeng\$\$safre\$\$gre</p> <p>Output:</p> <p>eng</p> <p>fre</p> <p>gre</p>
RemoveLeadingStringFromList	Removes a leading string from the input. The leading strings (such as articles) that you want removed must be defined in a normalization mapping table.	<p>Parameter: LeadingArticles</p> <p>Input: a report to congress</p>

Routine Name	Description	Example								
	<p>Parameter: The code for the normalization mapping table that lists the strings to be removed from the beginning of the input.</p> <p>Output: The input without the leading string.</p> <p>For example, you can create a normalization mapping table called <b>LeadingArticles</b> and include a list of articles to remove:</p> <table border="1"> <thead> <tr> <th>sourceCode1</th> <th>targetCode</th> </tr> </thead> <tbody> <tr> <td>a</td> <td>a</td> </tr> <tr> <td>an</td> <td>an</td> </tr> <tr> <td>the</td> <td>the</td> </tr> </tbody> </table> <hr/> <p><b>Note</b></p> <p>Each string must be entered in both columns as shown above.</p> <hr/>	sourceCode1	targetCode	a	a	an	an	the	the	<p>Output: report to congress</p>
sourceCode1	targetCode									
a	a									
an	an									
the	the									
RemoveString FromList	<p>Removes all occurrences of a string from the input. The strings that you want removed must be defined in a normalization mapping table.</p> <p>Parameter: The name of the normalization mapping table that lists the strings to be removed from the input.</p> <p>Output: The input with the specified strings removed.</p> <p>For example, you can create a normalization mapping table called <b>RemoveStrings</b> and include a list of strings to remove:</p> <table border="1"> <thead> <tr> <th>sourceCode1</th> <th>targetCode</th> </tr> </thead> <tbody> <tr> <td>&amp;</td> <td>&amp;</td> </tr> <tr> <td>and</td> <td>and</td> </tr> </tbody> </table> <hr/> <p><b>Note</b></p> <p>Each string must be entered in both columns as shown above.</p> <hr/>	sourceCode1	targetCode	&	&	and	and	<p>Parameter: RemoveStrings</p> <p>Input: War and Peace</p> <p>Output: War Peace</p>		
sourceCode1	targetCode									
&	&									
and	and									
Remove characters from the end	<p>Removes the last character from the input if it matches a character specified in the Parameter field.</p>	<p>Parameter: : , = ; / ]</p> <p>Input:</p> <p>New york: Blackwell,</p> <p>Output:</p> <p>New york: Blackwell</p>								

Routine Name	Description	Example
Remove HTML tags	Removes HTML tags from XML content.	<p><b>Input:</b></p> <p>Bats Adjust Their 'Field-of-View': Use of &lt;test1&gt;Biosonar&lt;/test1&gt; Is More Advanced &lt;test2&gt;Than&lt;/test2&gt; Thought,</p> <p><b>Output:</b></p> <p>Bats Adjust Their 'Field-of-View': Use of Biosonar Is More Advanced Than Thought</p>
Remove Leading Characters	Removes the first character from the input if it matches a character specified in the Parameter field.	<p><b>Parameter:</b> [({</p> <p><b>Input:</b></p> <p>[1948]</p> <p><b>Output:</b></p> <p>1948]</p>
Remove string from the end	Removes the string specified in the parameter from the end of the field.	<p><b>Parameter:</b> (ISBN)</p> <p><b>Input:</b> 675484451 (ISBN)</p> <p><b>Output:</b> 675484451</p>
Remove Leading String	Removes the string specified in the parameter from the beginning of the field.	<p><b>Parameter:</b> (ISBN)</p> <p><b>Input:</b> (ISBN) 675484451</p> <p><b>Output:</b> 675484451</p>
Remove Punctuation	<p>Removes the following punctuation from the field and changes them to blank:</p> <p>!"#\$%&amp;'()*+,-./:;&lt;=&gt;@[ \ ] ^ _ ` {   } ~</p> <p>Punctuation defined in the parameter will not be deleted.</p>	<p><b>Parameter:</b> \$</p> <p><b>Input:</b> Cost of item: 121\$</p> <p><b>Output:</b> Cost of item 121\$</p>
Replace Characters	<p>Replaces the characters specified in the parameter with characters specified in the second part of the parameter:</p> <p>&lt;characters to replace&gt;@@&lt;replacement string&gt;</p> <p>If there is no &lt;replacement string&gt;, the characters will just be removed.</p>	<p><b>Parameter:</b> .",@@^</p> <p><b>Input:</b> History of the U.S.A.</p> <p><b>Output:</b> History of the USA</p>
Replace Spaces by String	Replaces all spaces by the string defined in the parameter.	<p><b>Parameter:</b> ^;^</p>

Routine Name	Description	Example
	A parameter is required.	Input: eng fre ger Output: eng; fre; ger
Replace nonnumeric chars in range	Replaces each non-numeric character specified by the <start> and <end> character positions with a question mark. Parameter: <start>@@<end> characters specified in the start and positions character positions with a question marks	Parameter: 0@@3 Input: Ab56 Output: ??56
Replace start and end angle brackets by parentheses	Replaces < and > by ( ).	
Replace string by string	Replaces the string specified in the parameter by the second string specified in the parameter. Use @@ to separate the parameters	
Split Data of Fixed Length	Splits fixed length data to substrings of the length specified in the parameter. The resulting substrings are delimited by spaces.	Parameter: 3 Input: engfreger Output: eng fre ger
Split by pattern	Splits a string into substrings that match the defined pattern, The substrings are delimited by spaces.	Parameter: (.{3}) Input: engdutheb Output: eng dut heb
Split Field	Splits a field into separate PNX fields based on the delimiter defined in the parameter.	Parameter: ; Input: eng;spa;ger Output: eng spa ger  Every language code will be a separate field.
Upper case every first letter	Changes the first letter of every word to uppercase, leaving all others in their original case. A word is defined as text that is separated by whitespace or punctuation.	Input: A loNg and winding road Output: A LoNg And Winding Road

Routine Name	Description	Example
	<p>This transformation accepts a normalization mapping table name as a parameter, which can be used to define words that should be ignored by the transformation. The Source column contains the word that you want to exclude, and the Target column contains the transformation. The same word can be added to both the Source and Target columns to ensure that they are not transformed at all. For example:</p> <p>Source: and</p> <p>Target: and</p> <p>Input: barnes and noBle</p> <p>Output: Barnes and NoBle</p>	
Upper case every first letter (lower case others)	<p>Changes the first letter of every word to uppercase and makes sure that all other characters are lowercase. A word is defined as text that is separated by whitespace or punctuation.</p> <p>This transformation accepts a normalization mapping table name as a parameter, which can be used to define words that should be ignored by the transformation. The Source column contains the word that you want to exclude, and the Target column contains the transformation. The same word can be added to both the Source and Target columns to ensure that they are not transformed at all. For example:</p> <p>Source: and</p> <p>Target: and</p> <p>Input: barnes and noBle</p> <p>Output: Barnes and Noble</p>	<p>Input: A loNg and winding road</p> <p>Output: A Long And Winding Road</p>
Upper case every first letter - whitespace only (lower case others)	<p>Changes the first letter of every word to uppercase and makes sure that all other characters are lowercase. A word is defined as text that is separated by whitespace only.</p> <p>This transformation accepts a normalization mapping table name as a parameter, which can be used to define words that should be ignored by the transformation. The Source column contains the word that you want to exclude, and the Target column contains the transformation. The same word can be added to both the Source and Target columns to ensure that they are not transformed at all. For example:</p> <p>Source: and</p> <p>Target: and</p> <p>Input: barnes and noBle</p> <p>Output: Barnes and Noble</p>	<p>Input: A loNg and winding road</p> <p>Output: A Long And Winding Road</p>
Upper case every first letter - whitespace only	<p>Changes the first letter of every word to uppercase, leaving all others in their original case. A word is defined as text that is separated by whitespace only.</p>	<p>Input: A loNg and winding road</p>

Routine Name	Description	Example
	<p>This transformation accepts a normalization mapping table name as a parameter, which can be used to define words that should be ignored by the transformation. The Source column contains the word that you want to exclude, and the Target column contains the transformation. The same word can be added to both the Source and Target columns to ensure that they are not transformed at all. For example:</p> <p>Source: and</p> <p>Target: and</p> <p>Input: barnes and noBle</p> <p>Output: Barnes and NoBle</p>	<p>Output: A LoNg And Winding Road</p>
Take substring	<p>Retrieves a substring from a string from the defined characters number and defined number of characters. Use @@ to separate the parameters. The count starts from 0.</p> <p>This routine is useful to extract characters from specific positions in MARC control fields. For example to extract the year from 008 enter: 7@@4—that is, take 4 characters from position 7.</p>	<p>Parameter: 7@@4</p> <p>Input: 831024s1984 mau b 00110 eng</p> <p>Output: 1984</p>
Take first words	<p>Retrieves the first number of defined words. A word is any string between blanks.</p>	<p>Parameter: 5</p> <p>Input: A history of the middle ages in the 13th and 14th centuries</p> <p>Output: A history of the middle</p>
Take first subfields	<p>This transformation can be used when a single field can have multiple occurrences of a specific subfield and only a limited number of occurrences should be taken.</p>	<p>Parameter: 1</p> <p>Input: \$\$z1458998797\$\$z8976439871</p> <p>Output: 1458998797</p>
Take characters from the end	<p>Retrieves the defined number of characters from the end of the field.</p>	
Take from first occurrence	<p>Retrieves the rest of the string from the first occurrence of the substring or character specified in the first parameter. Using the second parameter it is possible to indicate whether the string defined in the first parameter should be taken or not. Use 0 to exclude the string and 1 to include it. The default is 0.</p>	<p>Parameter: ,@@0</p> <p>Input: Blackstone, John</p> <p>Output: John</p> <p>Parameter: ,@@1</p> <p>Input: Blackstone, John</p> <p>Output: , John</p>

Routine Name	Description	Example
Take from last occurrence	Retrieves the rest of the string from the last occurrence of the specified substring or character. Using the second parameter it is possible to indicate whether the string defined in the first parameter should be taken or not. Use 0 to exclude the string and 1 to include it. The default is 0.	
Take until first occurrence	Retrieves the string until the first occurrence of the specified substring or character. Using the second parameter it is possible to indicate whether the string defined in the first parameter should be taken or not. Use 0 to exclude the string and 1 to include it. The default is 0. <hr/> <b>Note</b> Do not use this transformation with a space as the parameter. Instead, use the <b>Take first words</b> routine. <hr/>	Parameter: ,@@1 Input: Blackstone, John Output: Blackstone,
Take until last occurrence	Retrieves the string until the last occurrence of the specified substring or character. Using the second parameter it is possible to indicate whether the string defined in the first parameter should be taken or not. Use 0 to exclude the string and 1 to include it. The default is 0.	
Upper Case	Changes case to upper. There is no parameter.	Input: History of books Output: HISTORY OF BOOKS
Use mapping table	Uses a mapping table to convert input values. <hr/> <b>Note</b> To prevent unexpected results, do not add more than one mapping row for each source code when defining a Normalization mapping table. <hr/>	
Write constant	Adds a constant. The parameter is the constant to add. Use this routine instead of the 'constant' source type if you want it written only if a field exists.	

In addition, the following table contains more advanced routines in which regular expressions are used:

Advanced Routines

Routine Name	Description	Example
Drop String (use reg. exp)	Removes the string that matches the pattern defined in the parameter.	Parameter: \.\$ Input: Cheever, Daniel Sargent. Output: Cheever, Daniel Sargent

Routine Name	Description	Example
ReplaceLast RegexpByString	<p>Replaces the last occurrence of the specified regular expression with the specified string.</p> <p>The Parameter field uses the following format, where <i>&lt;reg_exp&gt;</i> is a regular expression to replace, <i>@@</i> is the parameter delimiter, and <i>&lt;str&gt;</i> is the replacement string:</p> <p><i>&lt;reg_exp&gt;@@&lt;str&gt;</i></p> <hr/> <p><b>Note</b></p> <p>If the replacement string is omitted, the system will use an empty string.</p> <hr/> <p>Output: The original string with the last instance of the regular expression changed to the replacement string.</p>	<p>Parameter: <code>\([^\)]+\)\$</code></p> <p>Input: History of Germany (online)</p> <p>Output: History of Germany</p>
Substitute string (use reg. exp.)	<p>Substitutes all occurrences of a string found using a regular expression with the specified string.</p> <p>The Parameter field uses the following format, where <i>&lt;reg_exp&gt;</i> is a regular expression to replace, <i>@@</i> is the parameter delimiter, and <i>&lt;str&gt;</i> is the replacement string:</p> <p><i>&lt;reg_exp&gt;@@&lt;str&gt;</i></p> <hr/> <p><b>Note</b></p> <p>If the substitute string is omitted, the system will remove all occurrences of the string found by the regular expression.</p> <hr/> <p>Output: The original string with all instances of a string replaced by the substitute string.</p>	<p>The following example replaces every second occurrence of a colon with a semicolon.</p> <p>Parameter: <code>[(^:]*\:^.*):@@\$1\;</code></p> <p>Input: History of Germany: 1800s: 1900s</p> <p>Output: History of Germany: 1800s; 1900s</p>
Take string (use reg. exp.)	<p>Takes the string that matches the parameter. Once the first string is found, it will be returned.</p>	<p>Parameter: <code>.{7}{.4}.*</code></p> <p>Input: 831024s1984 mau b 00110 eng</p> <p>Output: 1984</p>
Take all matching strings (use reg. exp)	<p>Creates a string that consists of substrings that match the defined pattern. The string will be delimited by the delimiter defined as the second parameter.</p> <p>Unlike the <b>Take string</b> routine, this transformation takes all occurrences.</p>	<p>Parameter: <code>\("[^\"]+"\)@@::</code></p> <p>Input: LABEL="Cover Page" and LABEL="Table of Content"</p> <p>Output: Cover Page::Table of Content</p>

## Validation Routines

[Return to menu](#)

Validation routines are used by conditions for comparisons and do not transform or copy values. For lists of transformation routines, see [Transformation Routines](#).

The following validation routines are available.

### Note

Spaces are indicated by a ^.

Validation Routines

Routine Name	Description	Example
Check characters at position	<p>Validates that the string contains any of the character/s in the position specified in the parameter. Starting from the left, the first position is 0.</p> <p>Parameter: &lt;position&gt;@@&lt;characters&gt;</p> <p>This routine can be useful to check values of MARC control fields.</p>	Parameter: 6@@ab
Checks string at position	<p>Validates a specified string from a specified position. Starting from the left, the first position is 0.</p> <p>Parameter: &lt;position&gt;@@&lt;string&gt;</p>	Parameter: 35@@eng
Check string equals string	Validates that the string specified in the parameter is equal to the field.	Parameter: Y
Check that string exists	Validates that the string specified in the parameter is contained in the field.	Parameter: (OcoCL)
Check that string exists in list	<p>Validates that any of the strings (which are separated by @@ in the Parameter field) are contained in the field.</p> <p>Parameter: &lt;string 1&gt;@@&lt;string 2&gt;@@&lt;string n&gt;...</p>	Parameter: whatever@@nothing@@something

Routine Name	Description	Example						
Check that string not exists	Validates that the string specified in the parameter is not contained in the field.	Parameter: (OcoCL)						
CheckStringIn MappingTable	<p>Checks to see if the input string is not in the specified normalization mapping table. This table can be used – for example, to prevent the creation of dedup or FRBR keys for certain titles.</p> <p>Parameter - The name of the normalization mapping table that contains the strings to check.</p> <p>For example, you can create a normalization mapping table called <b>commontitles</b> and include a list of common titles to validate:</p> <table border="1"> <thead> <tr> <th>sourceCode1</th> <th>targetCode</th> </tr> </thead> <tbody> <tr> <td>acts</td> <td>acts</td> </tr> <tr> <td>review</td> <td>review</td> </tr> </tbody> </table> <hr/> <p><b>Note</b></p> <p>Each string must be entered in both columns as shown above example.</p> <hr/>	sourceCode1	targetCode	acts	acts	review	review	<p>Example Rule:</p> <p>Source: PNX - addata/jtitle</p> <p>Conditions: True</p> <p>Condition 1:</p> <p>Logic: True</p> <p>Source: PNX - frbr/t</p> <p>Success if: Match current</p> <p>Routine: Check string equals string</p> <p>Parameter: 2</p> <p>Condition 2:</p> <p>Logic: True</p> <p>Source: PNX - addata/jtitle</p> <p>Success if: Match current</p> <p>Routine: CheckStringIn MappingTable</p> <p>Parameter: commontitles</p> <p>Transformation: Copy As is</p> <p>Action: ADD</p> <p>Examples:</p> <p>Input: acts</p> <p>Output: none</p> <p>Input: journal of chemistry</p> <p>Output: journal of chemistry</p>
sourceCode1	targetCode							
acts	acts							
review	review							
Input does not exist	DO NOT USE - will be removed.							
Input exists	<p>Validates that the specified field exists.</p> <p>There is no parameter, only the source field.</p>							

Routine Name	Description	Example
Starts with character	Validates that the field starts with the character specified in the parameter.	Parameter: A
Starts with string	Validates that the field starts with the character specified in the parameter.	Parameter: (OcoLC)
Validate (use reg. exp.)	Validates that the string matches the regular expression specified in the parameter.	Parameter: Online.* Input: Online manual
Validate Alpha	Validates that the string contains only characters.  There is no parameter.	
Validate FMT equals	Validates the format of a MARC record based on pos 6 and 7 of the leader. See <a href="#">Validate FMT</a> for details.	
Validate Length	Validates that the length of the field is the same as the specified length in the parameter.	Parameter: 10
Validate UNIMARC FMT equals	Validates the format of a UNIMARC record based on pos 6 and sometimes position 7 of the leader. See <a href="#">Validate UNIMARC FMT</a> for details.	

## How to Edit the Normalization Rules

[Return to menu](#)

In order to use MARC/MAB control fields, set the Source field to the MARC control field, select the **Take substring** transformation, and then set the Parameter field to the position, which contains the following parts separated by two ampersands: the starting position within the control field and the number of characters to use from the control field.

For example, in order to extract the language from the MARC21 008/35 position, create a rule as follows:

Using MARC/MAB Control Fields

Source	Transformation	Parameter
008	Take substring	35@@3

## Using Delimiters

If you select the MERGE action type, it is necessary to define delimiters between the merged parts. It is important to keep in mind that the defined delimiter displays before the field being defined unless it is the first data element in the PNx field. For example the delimiter for multiple source subject fields to a single subject fields in the display section is a semicolon - a semicolon will not display before the first subject in the PNx subject field. Also, keep in mind that spaces should be defined using the space parameter.

The following example is from MAB in which three fields should be combined to the PNx title field in the display: 331 / 333 : 335

Since the delimiter appears in front of the field, the delimiter "/" should be defined for the 333 field and the delimiter ":" should be defined for the 335 field. For both fields the space parameter should be "both"—a space should display before and after the parameter. For the first field (331), there is no need to define a parameter or a space.

Using Delimiters

Source	Delimiter	Space
331		none
333	/	both
335	:	both

## Delimiters between Subfields from the Same Field

If you want to add a delimiter between several subfields from the same field, there are two options:

- You can use the transformation "Define subfield delimiter" to define the delimiter. The delimiter between all the subfields will be the same.
- Define a separate rule for every subfield.

## Using the Action Parameter

In its simplest form, the action parameter determines if multiple occurrences of source fields should create one or more PNx fields.

For example, in the MARC mapping, the title field in the display can be created from two different source fields, 130 or 245. The action selected in this case is an OR: only one title field should be created.

On the other hand, in the search section, multiple title fields can be created (in the MARC mapping from 130, 210, 245, and so forth). In this case, the action is an ADD—that is, for every source field, a new PNx title field is created.

In some cases, you want to merge multiple source fields into a single PNx field. For example, all source fields for the PNx subject field in the display are mapped to a single field. The action in this case is a MERGE, and a delimiter between the multiple occurrences should be selected.

There can be more complex scenarios in which, for a single PNx field, it is necessary to use more than one action. In this case, it is necessary to use the advanced editor.

## Example 1 - MARC mapping - FRBR K1

This rule creates the title key for the FRBR vector. The key is supposed to be created from the 100 OR 110 OR 111 field, but if none of these exists, then the 700, 710, and 711 fields should be used, and, in this case, a key created for all occurrences. Therefore, you need to combine the OR and the ADD actions. In order to ensure that the key is created only when 100, 110, or 111 does not exist, a condition also needs to be used.

The basic rule looks like this:

MARC mapping -FRBRK1 Basic Rule

Source	Condition	Transformation	Action
100 abcdq		Several transformations are used to normalize the field.	OR
110 abcdq		Several transformations are used to normalize the field.	OR
111 abcdq		Several transformations are used to normalize the field.	OR
700 abcdq	If 100, 110, and 111 do not exist.  Three conditions were created using the "input does not exist" validation routine.	Several transformations are used to normalize the field.	ADD

Source	Condition	Transformation	Action
710 abcdq	If 100, 110, and 111 do not exist.  Three conditions were created using the "input does not exist" validation routine.	Several transformations are used to normalize the field.	ADD
711 abcdq	If 100, 110, and 111 do not exist.  Three conditions were created using the "input does not exist" validation routine.	Several transformations are used to normalize the field.	ADD

## Example 2 - MARC mapping - FRBR K3 (title key part)

For FRBR, create title key parts from 240 and 245 unless the format is a serial, in which case a title key part is created from either 240 or 245. If no key parts have been created, then try to create key parts from 242, 246, 247, and 740. Various transformations are possible with this mapping. The rules for this field include many actions:

MARC mapping - FRBRK3

Source	Action
240	ADD
245—if FMT not SE	ADD
245—if FMT SE	OR
242	OR
246	OR
247	OR
740	OR

## Using Transformations

Transformations are used to modify the source field in some way. The default transformation is "copy as is," which does not make any change to the source data. Most rules only use a single transformation, but it is also possible to combine transformations. When combining transformations, each transformation works consecutively, working with the input that was already modified by the transformations before it.

Example: Title key for FRBR Vector

Input: 24512 \$aThe lost generation \$b:English youth and W.W.I

**Note**

Subfields are always dropped. Multiple spaces are always packed.

Using Transformations

Transformation	Parameter	Input	Explanation
Drop non-filing text	@@ind2@@	The lost generation: English youth and W.W.I	Drops non-filing text.
Delete characters	[ ]	'The lost generation: English youth and W.W.I	Deletes specified characters.
Replace characters	\$~^%*^?@.::;<>{}-()!~i @@^	The lost generation English youth and W W I	Changes specified characters to blank.
Character conversion		The lost generation English youth and W W I	Character conversion.
Lower case		the lost generation english youth and w w i	Changes to lower case.
Add to beginning of string	\$\$K	\$\$K the lost generation english youth and w w i	Adds the \$\$K subfield before the value of the key.
Add to end of string	\$\$AT	\$\$K the lost generation english youth and w w i\$\$AT	Adds the \$\$A subfield with the key type (T=title).

## Using Conditions

Conditions can be used to ensure that a rule is carried out only under a certain condition. A condition is in fact a rule within a rule and has its own source and transformation(s). Unlike rules, conditions always have a validation routine.

Conditions can be true or false. As noted above, the condition logic is defined once for the entire set of conditions used in a rule and once per rule.

The following table explains how to use the multiple condition logic:

### Multiple Condition Logic

Conditions logic	Conditions relation	Condition1 logic	Condition2 logic	Result
true	Or	True	true	At least one condition is true.
true	And	True	true	Both conditions must be true.
true	Or	True	false	The first condition is true or the second condition is false.
true	And	True	false	The first condition is true and the second condition is false.
true	Or	False	false	At least one condition must be false.
true	And	False	false	Both conditions must be false.
false	Or	True	true	Both conditions must be false.
false	And	True	true	Both conditions must be false.
false	Or	True	false	The first condition must be false and the second condition must be true.
false	And	True	false	The first condition must be false or the second condition must be true.
false	Or	False	false	Both conditions must be true.
false	And	False	false	At least one condition must be true.

## Checking if a field exists

A common use of conditions is to check if a certain field is present in the source record. This can be done using the "input exist" validation routine (remember to define subfields with this routine—use \*).

For example, the FRBR vector author key part should be created from the 700, 710, and 711 fields only if there are no 100, 110, or 111 fields. The rule for the 700, 710, and 711 source fields is that each has three conditions. The condition logic for the entire set of conditions is true and the logic of the individual conditions is false. The relation is AND because all three must be true. If any of the 100, 110, or 111 fields exist, author keys should not be created from the 7XX fields.

The following table describes the parameters for the individual conditions:

Parameters for All Conditions

Condition's Logic	Condition's Relation
False	AND

The following table describes the conditions:

Conditions

Source	Success if	Validation Transformation
100 *	Match last	Input exists
110 *	Match last	Input exists
111 *	Match last	Input exists

---

## The “Success If” Parameter

The **Success If** parameter is important if there can be multiple occurrences of the source field upon which the condition is based. If there is only a single occurrence, Ex Libris recommends that you use the **match last** parameter since it is the fastest.

It is important to use the **match current** parameter if the condition must be true in the current source field. For example, in the additional data section of the generic MARC21 rules there is a field - OCLC ID. The OCLC ID is stored in the 035 tag which can be used for other IDs - only the 035 with the prefix 'OcoLC' contains an OCLC ID. In this case, it is important to use the **match current** parameter so that the OcoLC prefix is checked for in the source field that is being normalized, not in any 035 field.

The source for the rule is 035 subfield a and the condition is defined as follows:

Success If Match Parameter

Source	Success if	Validation Transformation	Parameter
035 a	Match current	Check if string exists.	OCoLC

For example, if there is a record with two 035 fields, (NDL)ABL9111 and (OcoLC)83B52753, an OCLC ID is created depending on the **match** parameter that is being used. If **match any** or **match last** is used, an OCLC ID will be created from both of the 035 fields. If **match current** is used, an OCLC ID is created only from the last 035.

## Using Mapping Tables

Mapping tables are useful when it is necessary to translate multiple values from the source record to multiple values in Primo. For example, the Primo institution and library can normally be mapped from a single or several data elements in the source.

The **Use mapping table** routine performs transformations using a mapping table. In this mapping table, you define the following:

- **Source code:** the code or text from which to convert
- **Target code:** the code to which the source code is being converted. In the mapping tables, you do not define the location of the source data since this is done in the normalization rules.

If you create a new mapping table or update an existing table, you must deploy the normalization set that uses the table in order for the table to be used when the pipe is run.

## How to Create a Mapping Table

You can create and edit the mapping tables from the Ongoing Configuration Wizards - Pipe Configuration Wizard page. The mapping tables are divided into subsystems, one of which is called Normalization.

To edit an existing mapping table, click **Edit**.

Primo Home > Advanced Configuration > All Mapping Tables

ExLibris Primo

Hello Admin

> Mapping Tables

Update for Owner: Installation Sub System: Normalization

Table Name:  Clean Search

Mapping Tables in Normalization Sub System

Table Name	Sub System	Description	Last Updated	
007_0_MU	NORMALIZATION	Resource Type - MU	05/15/12	Edit
008_21_SE	NORMALIZATION	Resource Type - SE	05/15/12	Edit
008_24-27_BK	NORMALIZATION		05/15/12	Edit
008_25_CF	NORMALIZATION	KORMARC Resource Type - CF	05/15/12	Edit
008_26_CF	NORMALIZATION	Resource Type - CF	05/15/12	Edit
type_052_1	NORMALIZATION	Resource type based on 052_1 (MAB)	05/15/12	Edit
type_334	NORMALIZATION	Resource type based on 334 (MAB)	05/15/12	Edit

Create a New Code Table

Table Name:  Sub System: NORMALIZATION Description:

Create

Go back

To Advanced Configuration

### The Normalization Mapping Tables

To create a new mapping table:

1. In the **Table Name** field, enter the name parameter, which is used in the **Use mapping table** routine in the rules.
2. In the **Description** field, enter a description for the mapping table.
3. Click **Create** to add the new mapping table to the list.

- In the Mapping Tables list, click **Edit** next to the new mapping table to display the new mapping table's parameters.
- Enter values for the sourceCode1, targetCode, and Description fields.
- If you want to add additional mapping rows, enter values for the Source Code, Target Code, and Description fields in the Create New Mapping Row section, and then click **Create**.
- Click **Save** to save the changes to the new mapping table. Otherwise, click **Cancel** to discard your changes.

For example, the following Genre mapping table maps the resource type from the display section of the PNX to the genre that is required by the OpenURL.

Primo Home > Advanced Configuration > All Mapping Tables

ExLibris Primo

Hello Admin

> Mapping Tables

Update for Owner: Installation Sub System: Normalization

Table Name: Genre Reset Delete

Mapping Table Rows

Enabled	Source Code*	Target Code	Description	Last Updated
<input checked="" type="checkbox"/>	book	book		05/15/12 By primo <a href="#">Delete</a>
<input checked="" type="checkbox"/>	default	unknown		05/15/12 By primo <a href="#">Delete</a>
<input checked="" type="checkbox"/>	article	article		05/15/12 By primo <a href="#">Delete</a>
<input checked="" type="checkbox"/>	journal	journal		05/15/12 By primo <a href="#">Delete</a>

Table Description: Additional Data - Genre

Create a New Mapping Row

Source Code Target Code Description Create

Import Excel File

Browse... Load

Cancel & Go back To Mapping Table List Export To Excel Save

### The Genre Mapping Table

This mapping table is used for the rule that creates the Genre field in the additional data section. The source for the mapping table is defined in the rule shown in the following figure.

Primo Back Office

About Logout Help

Primo Home > Ongoing Configuration Wizards > Pipe Configuration Wizard > Normalization Rules configuration

ExLibris Primo

Hello Admin

> Normalization Set Editor

Normalization Rules Set: ALEPH MARC v.1.4.7-v.6 Section: Additional Data Field: Genre

Normalization Rules for field genre in PNX Section adddata in Normalization rules set ALEPH MARC v.1.4.7-v.6

Description: Advanced

Action: ADD

Enable all rules | Disable all rules

Last Updated By: primo At: 2008-06-03 18:22:12.0

Version: 1

Go to bottom of page

Type	XPath	Enabled
PNX	display/type	<input checked="" type="checkbox"/>

Transformation: Use mapping table Parameter: Genre

## Creating Multiple Values in Mapping Tables

It is possible to create multiple values for a single source value in the mapping tables by adding several values separated by a delimiter. An example of this is in the `format_mean` mapping table, which is used to map the resource type from the Display section of the PNx to the resource type in the Facets section.

Enabled	Source Code*	Target Code	Description
<input type="checkbox"/>			
<input checked="" type="checkbox"/>	book	books_all_text	
<input checked="" type="checkbox"/>	legal_document	legal_documents	
<input checked="" type="checkbox"/>	video	media	
<input checked="" type="checkbox"/>	technical_report	technical_reports	

### The Format\_Mean Mapping Table

For example, if the code is **book**, it should be translated to **books** and to **all text**. The delimiter in this example is a comma. In order to ensure that every value appears in a field of its own, define the **Split Field** routine. The **Split Field** routine is specified after the **Use mapping table** routine, which splits the field by the delimiter.

Primo Back Office

Primo Home > Advanced Configuration > Full Normalization Rule Configuration

Normalizing Set Editor

Normalization Rules Set: ALEPH MARC v.1.4.7-v.6 Section: Facets Field: Resource Type

Normalization Rules for field `rsrctype` in PNx Section `facets` in Normalization rules set `ALEPH MARC v.1.4.7-v.6`

Description:  Advanced

Action: ADD

Enable all rules | Disable all rules

Last Updated By: primo At: 2008-05-03 18:22:12.0

Version: 1

Go to bottom of page

Type	XPath	Parameter	Enabled
PNX	display/type		<input type="checkbox"/>
1 Transformation		format_mean	<input checked="" type="checkbox"/>
		Split Field	<input checked="" type="checkbox"/>

### The Split Field Routine

## Using Subfields in PNx Fields

In some cases, several values need to be linked together, for example, all of the data elements of the `library_availability` field (including institution, library, call number, and availability status). This is done by adding all of the data elements into the same PNx field and delimiting the elements with subfields. These are not true subfields as in a MARC record, but rather a special character to denote different data elements. Subfields are also used to add display constants or a display text that should replace the value itself (such as links that display in the Full record).

There are two types of subfield delimiters:

- Uppercase Alphabetic. The character denotes the content and is persistent across PNX fields:
  - **A:** Algorithm that is used for FRBR key type.
  - **C:** Displays the translation of the constant that follows this subfield parameter. The constant is translated via the Display Constants code table of the Front End subsystem.
  - **D:** For links that display in the full record, display the text that follows this subfield parameter instead of the preceding URL or template code. For example:

```
<linktouc>$$Tworldcat_isbn$$DThis item in WorldCat@</linktouc>
```

---

**Note**

The system displays the text as entered and it cannot be translated via code tables. For language translations, use the E subfield delimiter.

- **E:** for links that display in the full record, display the translation of the constant that follows this subfield parameter instead of the preceding URL or Template code. The constant is translated via the Full Display Labels code table of the Front End subsystem. For example:

```
<linktouc>$$Tworldcat_isbn$$Eworldcat</linktouc>
```

- **I:** Institution code – For information on suppressing local display fields based on institution, refer to [Display of Local Fields](#) in the *Primo Back Office Guide*.
  - **K:** Key for FRBR
  - **L:** Library code
  - **O:** Origin of the field (this is the source\_id that is used in deduped records)
  - **S:** Status
  - **T:** specifies the template to use from the Templates mapping table. For example:
- ```
<linktouc>$$Tworldcat_isbn$$Eworldcat</linktouc>
```
- **U:** URL
  - **V:** Value of field (used to distinguish between the field and the display text/constant)

- Numeric. Indicates the order of the data elements.

The subfield's character or number should always be prefixed by two dollar signs (\$\$).

The subfields can be added using the "Add to the beginning of string" or "Add to end of string" transformation where the parameter is the subfield. Subfields can also be added as delimiters.

The following table describes the rule that is used to create the avallibrary field (up to subfield S) in the display section, where the source is the ALEPH AVA field:

Display Section avallibrary Field Rule

| Source                         | Transformation                                  | Parameter                      | Action                        |
|--------------------------------|-------------------------------------------------|--------------------------------|-------------------------------|
| AVA a<br>(ADM)                 | Use mapping table<br>Add to beginning of string | ILS Institution Codes<br>\$\$I | MERGE—no delimiters or spaces |
| AVA b<br>(Sublibrary)          | Use mapping table<br>Add to beginning of string | ILS Library Codes<br>\$\$L     | MERGE—no delimiters or spaces |
| AVA c<br>(Collection)          | Add to beginning of string                      | \$\$1                          | MERGE—no delimiters or spaces |
| AVA d<br>(Call number)         | Add to beginning of string                      | \$\$2                          | MERGE—no delimiters or spaces |
| AVA e<br>(Availability status) | Add to beginning of string                      | \$\$S                          | MERGE—no delimiters or spaces |

## Adding Display Constants/Text

Use \$\$C to add a display constant and \$\$D to add text that should replace the actual value (used for example, for links).

Display constants can be added to the following fields in the Display section:

- Relation
- Identifier
- Description

The constant can be a code (lower case with no spaces or special characters) or text. The code is translated to a name for display in the Front End using the Display Constants code table. If the text added has no translation in the code table, then it will display as entered in the rules.

Subfield D can be used in the Links section.

If there are multiple occurrences and you do not want the display constant to appear before every occurrence, add the display constant in a separate rule. If the field before which the display constant is supposed to display is not mandatory (for example, it may not appear), add a condition that causes the display constant to be created only if the field exists.

For example, to create the constant **Series** before all occurrences of the MARC source fields (440, 490, and 840), that should be added to a single "relation" field in the display section, create the following rules:

Series Constant

| Source             | Condition | Transformation | Action |
|--------------------|-----------|----------------|--------|
| Constant - Series: | see below | Copy as is     | Add    |

This rule will be carried out only if the condition is met. The condition verifies that at least one of the source series fields exist:

Condition

| Condition's Logic | Condition's Relation |
|-------------------|----------------------|
| True              | OR                   |

The following table describes the conditions:

Condition Description

| Source | Validation   | Success if |
|--------|--------------|------------|
| 440 *  | Input exists | Match any  |
| 490 *  | Input exists | Match any  |
| 840 *  | Input exists | Match any  |

Following the rule to create the display constant, enter the rules to create the series value:

Series Value Rules

| Source | Transformation | Action | Delimiter | Space |
|--------|----------------|--------|-----------|-------|
| 440 -x | Copy as is     | MERGE  | ;         | After |
| 490 -x | Copy as is     | MERGE  | ;         | After |
| 840 -x | Copy as is     | MERGE  | ;         | After |

## Using the Write Constant Transformation Routine

Constants can also be added by using the **write constant** transformation routine. This routine is useful if you want the constant to be created for every occurrence of the field and/or only if the field exists.

### Example 1:

In the Links section of the MARC normalization rules, a "Link to Resource" field is created for 8564-, 85640, and 85641 fields. In order to have a display text instead of the URL, subfields y, z, and 3 are used. In case, these subfields are not present, a display constant "Online Version" is added. This text should display for every occurrence of the 8564 field. To ensure this, the "write constant" routine is used:

### Ensuring Write Constant Routine

### Example 2:

In the Links section, either the amazon\_toc template or the syndetics\_toc template should be added if the record has an ISBN (which is checked by using the additional data ISBN field).

### Links Section Parameter Additions

## Inserting HTML Tags into PNX Records

Primo allows you to insert HTML tags into PNX records via the normalization rules so that you can apply HTML styles and formatting to search results. The system supports the following HTML tags:

#### Supported HTML Tags

|      |       |       |    |
|------|-------|-------|----|
| span | table | tbody | th |
|------|-------|-------|----|

|    |     |     |       |
|----|-----|-----|-------|
| tr | td  | a   | s     |
| b  | br  | i   | u     |
| p  | img | !-- | style |

In addition, you can include a space by entering a caret symbol (^) in the expression.

In the following example, the system adds a bold ISBN label followed by a space before the ID in the PNX records:

The screenshot shows a configuration window for a rule group named 'display\_identifier'. The 'Source' is set to 'Complex XML' and the 'XPath' is 'Publication/ISBN'. The rule is 'Enabled'. Under 'Transformations', a new transformation is added with the following settings:

- Transformation: Add to beginning of string
- Parameter: <b>ISBN: ^</b>
- Behavior: MERGE
- First delimiter: ;
- First delimiter Space: Both
- Repeat Number: (empty)
- Remaining delimiters: (empty)
- Remaining delimiters spaces: None

### Inserting HTML into PNX Records

#### Note

Primo does not allow you to combine the use of HTML tags and constants (\$\$C). For example, **\$\$CISBN^\$\$V** is not permitted.

---

## Testing Normalization Rules

[Return to menu](#)

The normalization rules test utility allows you to test your normalization rules before deploying them. Primo provides sets of test records in various formats, but you can create and load your own test records. The test utility supports the following run levels:

- For an entire normalization rules set
- All rules for a PNX field
- Specific rules for a PNX field

In principle, it is not necessary to deploy the set in order to use the test utility. However, this is required in case you added or updated a mapping table and the rule you want to test uses that mapping table.

---

## Loading Sample Test Records

As sample records are added, they are placed in the following directories, which are located under the `/exlibris/primo/p<version>_<copy>/ng/primo/home/profile/publish/demo_data` directory on the Back Office server:

- `marc`: for records in MARC21 format
- `mab`: for records in MAB format
- `dc`: for records in Dublin Core format
- `digitool`: for records in Digital Entity format (from Digitool)

If your institution has access to the Back Office server, you can manage the records directly on the server. Otherwise, the files can be loaded and managed using the Back Office UI.

### To load a test file:

1. Place your records in a tar file and gzip them.

---

#### Note

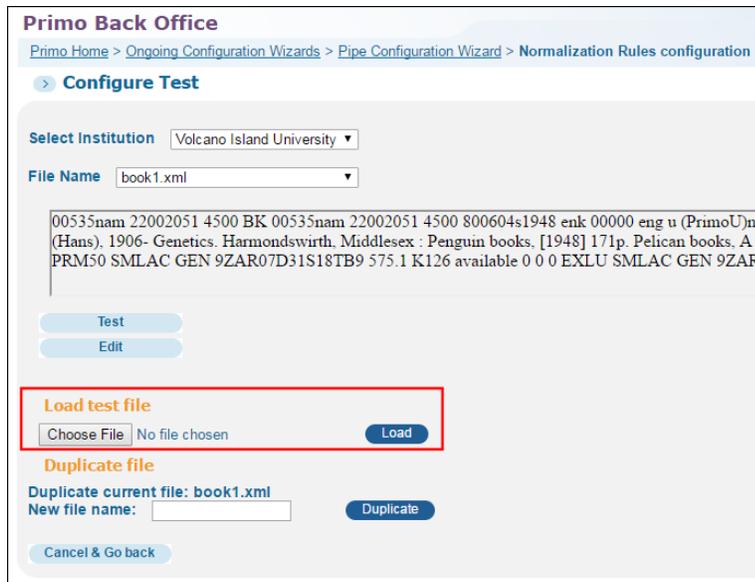
For testing, Ex Libris recommends that you have at least 100 records in your file.

- 
2. On the Normalization Rules Sets page ([Primo Home > Ongoing Configuration Wizards > Pipe Configuration Wizard > Normalization Rules Configuration](#)), click **Test** next to the Normalization Rules Set you that you want to test.



### Test Normalization Rules Set

3. On the Configure Test page, click **Choose File**.



### Configure Test Page

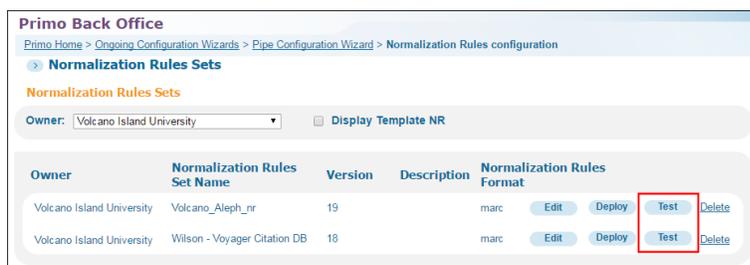
4. In the dialog box, select your sample test file and click **Open**.
5. On the Configure Test page, click **Load**.

## Duplicating Test Files

Primo allows you to duplicate test records so that you can create similar tests based on an initial test file.

### To duplicate a test file:

1. On the Normalization Rules Sets page (**Primo Home > Ongoing Configuration Wizards > Pipe Configuration Wizard > Normalization Rules Configuration**), click **Test** next to the Normalization Rules Set you that you want to test.



- 2.

## Test Normalization Rules Set

3. On the Configure Test page, select the file that you want to duplicate from the **File Name** drop-down list.

**Primo Back Office**  
Primo Home > Ongoing Configuration Wizards > Pipe Configuration Wizard > Normalization Rules configuration

> **Configure Test**

Select Institution: Volcano Island University

File Name: book1.xml

00535nam 22002051 4500 BK 00535nam 22002051 4500 800604s1948 enk 00000 eng u (PrimoU)nc  
(Hans). 1906- Genetics. Harmondswirth, Middlesex : Penguin books, [1948] 171p. Pelican books, A  
PRM50 SMLAC GEN 9ZAR07D31S18TB9 575.1 K126 available 0 0 0 EXLU SMLAC GEN 9ZAR

Test  
Edit

Load test file  
Choose File | No file chosen | Load

**Duplicate file**  
Duplicate current file: book1.xml  
New file name: | Duplicate

Cancel & Go back

### Configure Test Page

4. Enter the name of the new file in the **New file name** field and then click **Duplicate**.

---

## Editing Test Files

Primo allows you to edit test files that have been loaded into the system.

### To edit a test file:

1. On the Normalization Rules Sets page (**Primo Home > Ongoing Configuration Wizards > Pipe Configuration Wizard > Normalization Rules Configuration**), click **Test** next to the Normalization Rules Set you that you want to test.

**Primo Back Office**  
Primo Home > Ongoing Configuration Wizards > Pipe Configuration Wizard > Normalization Rules configuration

> **Normalization Rules Sets**

Normalization Rules Sets

Owner: Volcano Island University | Display Template NR

| Owner                     | Normalization Rules Set Name | Version | Description | Normalization Rules Format           |
|---------------------------|------------------------------|---------|-------------|--------------------------------------|
| Volcano Island University | Volcano_Aleph_nr             | 19      | marc        | Edit   Deploy   <b>Test</b>   Delete |
| Volcano Island University | Wilson - Voyager Citation DB | 18      | marc        | Edit   Deploy   <b>Test</b>   Delete |

2. **Test Normalization Rules Set**
3. On the Configure Test page, click **Edit**.

**Primo Back Office**

[Primo Home](#) > [Ongoing Configuration Wizards](#) > [Pipe Configuration Wizard](#) > [Normalization Rules configuration](#)

> **Configure Test**

Select Institution: Volcano Island University

File Name: book1.xml

00535nam 22002051 4500 BK 00535nam 22002051 4500 800604s1948 enk 00000 eng u (PrimoU)u (Hans), 1906- Genetics. Hammondsworth, Middlesex : Penguin books, [1948] 171p. Pelican books, A. PRM50 SMLAC GEN 9ZAR07D31S18TB9 575.1 K126 available 0 0 0 EXLU SMLAC GEN 9ZAR

Test

**Edit**

Load test file

Choose File No file chosen Load

Duplicate file

Duplicate current file: book1.xml

New file name: Duplicate

Cancel & Go back

### Configure Test Page

4. Select the file that you want to edit from the **File Name** drop-down list.

**Primo Back Office**

Welcome to Primo Back Office - monitor and configure your settings

Select Institution: Volcano Island University

File Name: book1.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<record xmlns="http://www.loc.gov/MARC21/slim" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.loc.gov/MARC21/slim http://www.loc.gov/standards/marcxml/schema/MARC21slim.xsd">
<leader>00535nam 22002051 4500</leader>
<controlfield tag="740" ind1="0" ind2="0">BK</controlfield>
<controlfield tag="LDR" ind1="0" ind2="0">00535nam 22002051 4500</controlfield>
<controlfield tag="008" ind1="0" ind2="0">800604s1948 enk 00000 eng u</controlfield>
<datafield tag="035" ind1="0" ind2="0">
<subfield code="a">(PrimoU)notisAFS7301</subfield>
</datafield>
<datafield tag="035" ind1="0" ind2="0">
<subfield code="a">(MnSU)u148951070</subfield>
</datafield>
<datafield tag="040" ind1="0" ind2="0">
<subfield code="a">MnSU</subfield>
<subfield code="b">eng</subfield>
<subfield code="c">CaOTULAS</subfield>
</datafield>
<datafield tag="100" ind1="1" ind2="1">
<subfield code="a">Kaimus, H.</subfield>
<subfield code="q">(Hans)</subfield>
<subfield code="d">1906</subfield>
</datafield>
<datafield tag="245" ind1="1" ind2="0">
<subfield code="a">Genetics.</subfield>
</datafield>
<datafield tag="260" ind1="1" ind2="0">
<subfield code="a">Hammondsworth, Middlesex :</subfield>
<subfield code="b">Penguin books.</subfield>
<subfield code="c">[1948]</subfield>
</datafield>
<datafield tag="300" ind1="1" ind2="0">
<subfield code="a">171p.</subfield>
</datafield>
<datafield tag="400" ind1="0" ind2="0">
```

view

Save

Save & Test

### Edit Test File Page

5. In the text box below the the **File Name** drop-down list, make your changes to the file and then click **Save** or **Save & Test**.

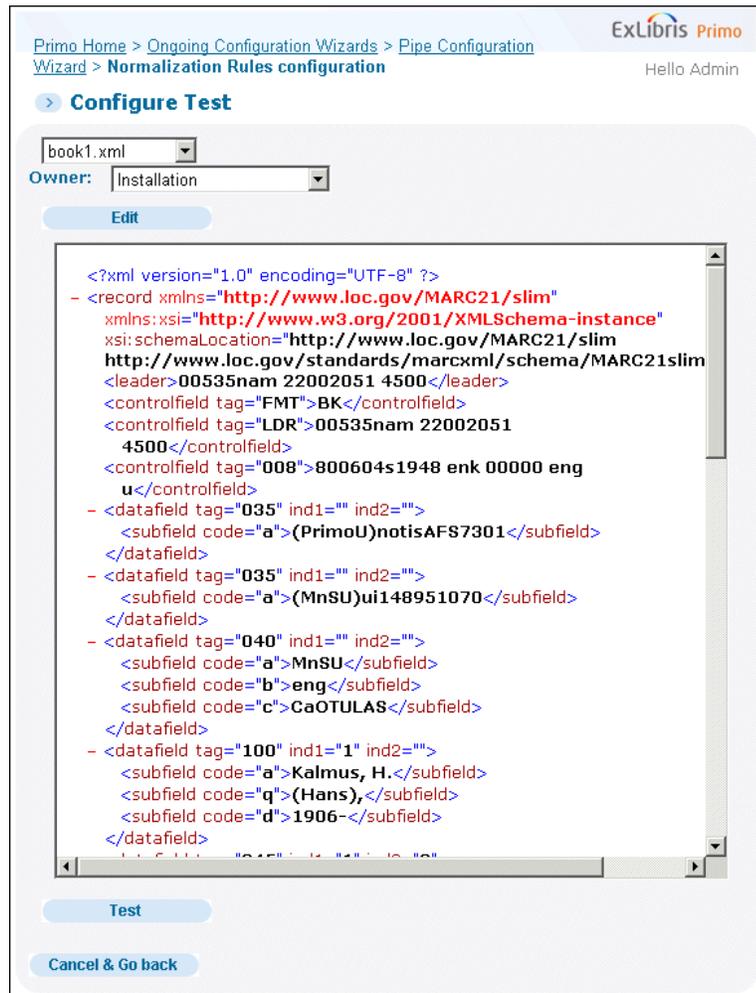
## Testing an Entire Normalization Rules Set

The Test option has been added to the list of normalization rule sets to test the entire set.

**To test an entire normalization rule set:**

1. Click **Test** next to the rule set that you want to edit in the Pipe Configuration Wizard page.

A new window opens with a drop-down list of the sample records from the `demo_data` directory. The test is performed only on a single record.



**Test Normalization Rule Window**

2. Select one of the records from the drop-down list.

In addition, you can edit the file by clicking **Edit** or redisplay the file in view-only mode by clicking **View**.

3. In the **Owner** field, select the configuration level of the normalization rules that you want to test. For installation-level staff users, select either the installation level or a specific institution. For institution-level staff users, your institution will be pre-selected.

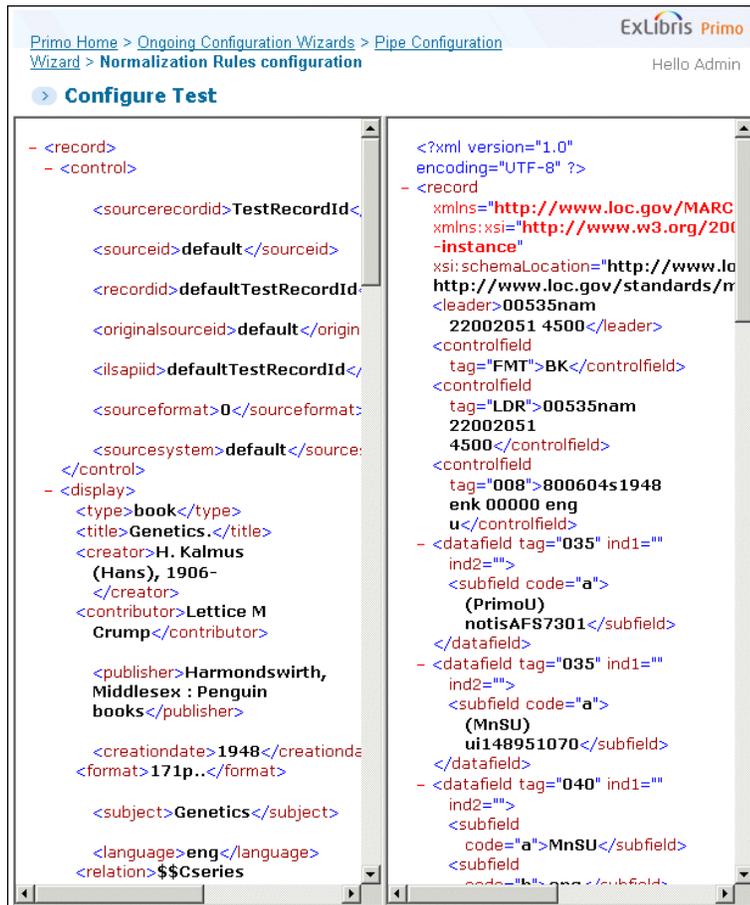
---

#### Note

When a pipe is executed, the system first looks for the normalization rules belonging to the institution. If a table does not exist, the system will use the table configured at the installation level.

---

4. Test the record by clicking **Test**. The test utility displays a two-part page, which contains the PNX on the left side and the source record on the right side.



Test Normalization - PNx and Source Record View

## Running the Test Utility for a PNx Field

In order to run a test for a specific PNx field and/or specific rules of a PNx field, it is necessary to display the basic or advanced editor.

### To run the test utility for a PNx field:

1. Access the Pipe Configuration Wizard page in the Back Office. (For instructions, refer to the *Primo Administration Guide*.)

At the bottom of the screen is a Testing section, which includes a drop-down list of the sample records for the normalization rule set on which you are working. It is possible to edit or test the record or a different record from this page.



### Running Test Utility

2. Select **Edit Record**, or if you do not want to edit the record, click **Test**.

If you clicked **Test**, a new window opens, displaying the PNX field that is being tested on the left side and the complete source record on the right side.

By default, all the rules for the PNX field are selected for testing. However, it is possible to select specific rules by clicking **Deselect** and then selecting specific rules by checking **Test**, which is located on the left side of every rule. To re-select all rules, click **Select**.

## Validate FMT

[Return to menu](#)

The format of MARC records that use the **Validate FMT** validation routine is described in the following table. Use the format code as the parameter in the rules.

Validate FMT

| Leader pos. 6/7                           | Record type          | Format Code |
|-------------------------------------------|----------------------|-------------|
| a Language material + pos.7= a,c,d,m      | Books                | BK          |
| a Language material + pos.7= b, i, s      | Continuing Resources | SE          |
| c Notated music                           | Music                | MU          |
| d Manuscript notated music                | Music                | MU          |
| e Cartographic material                   | Maps                 | MP          |
| f Manuscript cartographic material        | Maps                 | MP          |
| g Projected medium                        | Visual materials     | VM          |
| i Nonmusical sound recording              | Audio materials      | AM          |
| j Musical sound recording                 | Music                | AM          |
| k Two-dimensional non-projectable graphic | Visual materials     | VM          |
| m Computer file                           | Computer files       | CF          |
| o Kit                                     | Visual materials     | VM          |
| p Mixed material                          | Mixed materials      | MX          |

| Leader pos. 6/7                                                | Record type      | Format Code |
|----------------------------------------------------------------|------------------|-------------|
| r Three-dimensional artifact or naturally occurring object     | Visual materials | VM          |
| t Manuscript language material                                 | Books            | BK          |
| w Rare books<br><hr/> <b>Note</b><br>Used by KORMARC.<br><hr/> | Rare Books       | RB          |
| default                                                        |                  | BK          |

## Validate UNIMARC FMT

[Return to menu](#)

The format of MARC records that use the Validate UNIMARC FMT validation routine is described in the following table. Use the format code as the parameter in the rules.

Validate UNIMARC FMT

| Leader pos. 6/7                           | Record type          | Format Code |
|-------------------------------------------|----------------------|-------------|
| a Language material + pos.7= i,m          | Books                | BK          |
| a Language material + pos.7= s            | Continuing Resources | SE          |
| b                                         | Books                | BK          |
| c Notated music                           | Music                | MU          |
| d Manuscript notated music                | Music                | MU          |
| e Cartographic material                   | Maps                 | MP          |
| f Manuscript cartographic material        | Maps                 | MP          |
| g Projected medium                        | Visual materials     | VM          |
| i                                         | Audio materials      | AM          |
| j                                         | Audio materials      | AM          |
| k Two-dimensional non-projectable graphic | Visual materials     | VM          |
| l                                         | Computer files       | CF          |
| m                                         | Mixed materials      | MX          |

| Leader pos. 6/7                                            | Record type      | Format Code |
|------------------------------------------------------------|------------------|-------------|
| r Three-dimensional artifact or naturally occurring object | Visual materials | VM          |
| default                                                    | Books            | BK          |

---

## Duplicate Detection Process

The duplication detection or matching process is based on creating a dedup vector for every PNX record in the Primo database. The vector includes all the data required by the Duplication Detection algorithm to determine if two records are equivalent.

Duplicate records are assigned the same matchID. For every group of duplicate records, the dedup process creates a merged record based on a preferred record (which is selected by the Preferred Record algorithm). In the current version, the preferred record is based on the delivery category and the record with the most fields in the Display section. The default priority is:

- SFX resource
- Online resource
- Metalib resource
- Physical item
- Microform

In addition to the preferred record, fields from the Control, Links, Search, Facets, Additional Data, and Delivery sections are merged from all records and are included in the dedup merged record. All local fields are included. The availability and source fields from the Display section are also retained for every record.

---

### Note

Only the merged record is retrieved and indexed by the Search Engine.

---

The dedup vector is created during the normalization process. Duplicate record detection is a separate process carried out after the records have been loaded to the Primo database.

When a record is loaded into the Primo database, the system first checks if the record is new by searching for a record with the same record\_id. If a match is not found, the record is considered to be a new record, and the system attempts to find a matching record based on the vector. If a match is found, the record is assigned the MatchID of the record with which it matched. Once a match is found, the matching process stops. If a match is not found, the record is assigned a new MatchID.

If there is a match on the RecordID, the system compares the vector in the incoming record with its vector in the Primo database. If the vector is the same, the record is assigned its current MatchID. If it is not the same, the record is treated as a new record (the MatchID is removed) and the system attempts to find it a matching record, as described above.

Once all matching records are located, the system creates a merged record.

---

### Note

For information on the Dedup algorithm or changing the thresholds, see [Files Used by the Dedup Algorithm](#).

---

For more information about the Dedup process, see the following sections:

- [Dedup and Transitivity](#)
- [Duplicate Detection Vector](#)
- [Preventing Dedup](#)

## Dedup and Transitivity

[Return to menu](#)

Because the Dedup algorithm takes many data elements into account when matching records, it is not fully transitive (if A equals B and B equals C, then A must equal C) and may not create a group for records A, B, and C even if the transitive rule of equality applies to the records. For example, transitivity is not supported in the following scenario:

1. Record B is added to the database first and no match is found
2. Record C is added to the database and no match is found
3. Record A is added to the database, and if it matches either record B or record C, the matching process will stop and create either of the following:
  - group AB and a single record C
  - group AC and a single record B

---

### Note

the Dedup Test Utility checks if two records match based on the data, not what is actually matched and deduped in the database. In the above scenario, it will show that record A equals record B, record A equals records C, and record B is not equal to record C.

---

---

## Duplicate Detection Vector

[Return to menu](#)

The dedup vector includes the following:

- Type (T). The type defines the matching rules that will be used. Currently Primo allows the following types:
  - Non-serials (T=1)—for all other records (refer to [The Non-Serials Vector and Algorithm](#)).
  - Serials (T=2)—for serial records (refer to [The Serials Vector and Algorithm](#)).

---

### Note

These rules are based on the matching algorithms developed together with the California Digital Library (CDL).

- 
- Articles (T=3)—for articles (refer to [Deduplication Algorithm for Articles](#)).

---

### Note

If you would like to skip duplicate detection for individual records (such as analytic records for Aleph pipes), you can set this field to 99 in the normalization rules.

---

The Serials and Non-serials duplication detection algorithms have two phases: Candidate Selection and Record Matching. The Articles duplication detection algorithm has only a match phase.

- Candidate Fields (C1-C10)—The Candidate Selection phase locates up to a set number of potential records for matching. This section in the vector is indexed in the persistence layer. The indexes are used to locate candidates.
- Matching Fields (F1-F20)—During the record matching phase, fields from the Matching Fields section are compared. Fields that match are assigned weight points, as determined by the rules used. Records that cross the threshold are considered duplicates and are assigned the MatchID of the matching record.

All of the fields in the vector should be normalized. Normalization routines may be different for different sources.

The following sections describe the various vectors and matching algorithms.

---

### Note

Dedup vectors and keys are limited to 4000 bytes. If this limit is reached, you may receive an SQL exception error on the P\_DEDUP\_VECTOR table.

For more details, see [Harvesting a record fails with an UncategorizedSQLException error on the P\\_DEDUP\\_VECTOR table](#).

---

## The Serials Vector and Algorithm

The following types of vectors exist for serials:

- Candidate
- Matching

---

### Note

For information on how the MARC fields are mapped into Primo, see [Generic MARC 21 Normalization Rules](#).

---

---

## Serials Candidate Vector

The following table describes the fields in the Candidate vector.

Serials Candidate Vector Fields

| Field ID | Field Content                      | Note                                                                                                           |
|----------|------------------------------------|----------------------------------------------------------------------------------------------------------------|
| C1       | UnivID, UnivID_invalid             | This is a unique universal ID (for example, LCCN).                                                             |
| C2       | ISSN, ISSN_invalid, ISSN_cancelled |                                                                                                                |
| C3       | Short Title                        |                                                                                                                |
| C4       | Place of Publication               | Only the first occurrence is used.                                                                             |
| C5       | Single match ID                    | Intended for the Alma's MMS ID or another ID that is reliable enough to serve as the sole basis for the match. |

In the Candidate phase of the algorithm, there is an OR operator between the following candidate fields (C1, C2, C3). The fourth candidate field is added if many candidates are located. The fourth candidate is added with an AND operator.

If there is a match on C5, the records are considered a match and will not continue to the matching stage, which is based on the other metadata elements.

---

## Serials Matching Vector

The following table describes the fields in the Matching vector.

### Serials Matching Vector Fields

| Field ID | Field Content                                | Note                                               |
|----------|----------------------------------------------|----------------------------------------------------|
| F1       | UnivID                                       |                                                    |
| F2       | Univ_invalid                                 | Multiple occurrences are delimited by a semicolon. |
| F3       | ISSN                                         | Multiple occurrences are delimited by a semicolon. |
| F4       | ISSN_invalid                                 | Multiple occurrences are delimited by a semicolon. |
| F5       | ISSN_cancelled                               | Multiple occurrences are delimited by a semicolon. |
| F6       | Start publication year                       |                                                    |
| F7       | Full title                                   |                                                    |
| F8       | Brief title                                  | Remove subtitle and any additional information.    |
| F9       | Country of publication                       |                                                    |
| F10      | Place of publication                         |                                                    |
| F11      | Main entry (author, corporate body, meeting) |                                                    |

The matching takes place in two stages, quick and full.

The quick match compares the following fields:

- Single match ID
- UnivID/UnivID\_invalid
- ISSN/ISSN\_invalid/ISSN\_cancelled
- Full title

The full match compares all fields in the vector.

The following table lists the default weights for quick and full matches for serials. If 800 points are reached in the quick-match stage, the records are considered a match. If not, the record proceeds to the full-match stage, which checks all fields. As in the quick-match stage, if 800 points are reached, the records are considered a match.

In both the quick-match and full-match stages, the weight from the UnivID and ISSN matches is compared, and the higher of the two weights, not the sum, is assigned to the record.

**Note**

For every group, only the highest weight is assigned.

Default Weights for Quick and Full Matches For Serials

| Field ID         | Fields for Comparison                | Result                                        | Points |
|------------------|--------------------------------------|-----------------------------------------------|--------|
| F1/<br>F2        | UnivID/UnivID_<br>invalid            | Match on Univ_ID                              | 200    |
|                  |                                      | Match on UnivID_invalid                       | 50     |
|                  |                                      | Match between UnivID and UnivID_invalid       | 100    |
|                  |                                      | No match on UnivID                            | -470   |
|                  |                                      | No match between UnivID and UnivID_invalid    | -50    |
|                  |                                      | No match on UnivID_invalid                    | 0      |
|                  |                                      | Either or both records missing field          | 0      |
| F3/<br>F4/<br>F5 | ISSN/ISSN_invalid/<br>ISSN_cancelled | Match on ISSN                                 | 200    |
|                  |                                      | Match on ISSN_invalid                         | 50     |
|                  |                                      | Match on ISSN_cancelled                       | 10     |
|                  |                                      | Match ISSN and ISSN_invalid                   | 100    |
|                  |                                      | Match between ISSN and ISSN_cancelled         | 50     |
|                  |                                      | Match between ISSN_invalid and ISSN_cancelled | 30     |

| Field ID | Fields for Comparison | Result                                                                           | Points |
|----------|-----------------------|----------------------------------------------------------------------------------|--------|
|          |                       | No match on ISSN                                                                 | -250   |
|          |                       | No match ISSN_invalid and ISSN_cancelled                                         | 0      |
|          |                       | Either record or both records missing field                                      | 0      |
| F7       | Full Title            | Exact match on title and title NOT in table of common titles                     | 600    |
|          |                       | Exact match on title and title IS in table of common titles                      | 135    |
|          |                       | Match on truncated title and truncated title in the list of common titles        | 135    |
|          |                       | Match on truncated title and truncated title not in the list of common titles    | 175    |
|          |                       | No match                                                                         | -600   |
|          |                       | Calculate weight based on percentage of keywords from title that match x 75      | *      |
|          |                       | Calculate weight based on percentage of keywords from title that match x 75 + 50 | *      |
| F6       | Date                  | Exact match                                                                      | 225    |
|          |                       | +/- 1 year                                                                       | 50     |
|          |                       | + /- 2 years                                                                     | 25     |
|          |                       | If first three digits match, check the 4th digit and if either record has a 0    | 20     |
|          |                       | No match                                                                         | -150   |

| Field ID | Fields for Comparison  | Result                                                                                                                            | Points                                              |
|----------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| F9       | Country of Publication | The value is missing from either or both records                                                                                  | 0                                                   |
|          |                        | Match                                                                                                                             | 40                                                  |
|          |                        | No match                                                                                                                          | -20                                                 |
|          |                        | Either record or both records missing the value                                                                                   | 0                                                   |
| F10      | Place of Publication   | Exact match on normalized place of publication                                                                                    | 200                                                 |
|          |                        | Either or both records are missing the subfield                                                                                   | 0                                                   |
|          |                        | No match on normalized place of publication                                                                                       | -100                                                |
| F11      | Main Entry             | If the normalized contents of the fields match, then it is considered a full match even if the data was found in different fields | 200                                                 |
|          |                        | If one or both main entries are missing                                                                                           | 0                                                   |
|          |                        | If more than 60% of the keywords from main entry fields match and are in the same order                                           | 75 times the percentage of words that match plus 25 |
|          |                        | If more than 60% of the keywords from main entry fields match but are not in the same order                                       | 75 times the percentage of words that match         |
|          |                        | If 60% or less of the keywords in main entry fields match                                                                         | -250                                                |

---

## The Non-Serials Vector and Algorithm

The following types of vectors exist for non-serials:

- Candidate
- Matching

---

**Note**

For information on how the MARC fields are mapped into Primo, see [Generic MARC 21 Normalization Rules](#).

---

---

## Non-Serials Candidate Vector

The following table describes the fields in the Candidate vector.

Non-Serials Candidate Vector Fields

| Field ID | Field Content             | Note                                                                                                           |
|----------|---------------------------|----------------------------------------------------------------------------------------------------------------|
| C1       | UnivID and UnivID_invalid | A unique universal ID (for example, LCCN)                                                                      |
| C2       | ISBN, ISBN_invalid        | Multiple occurrences delimited by a semicolon.                                                                 |
| C3       | Short title               | The first 25 characters of the normalized title.                                                               |
| C4       | Year                      |                                                                                                                |
| C5       | Single match ID           | Intended for the Alma's MMS ID or another ID that is reliable enough to serve as the sole basis for the match. |

In the Candidate algorithm, there is an OR operator between the following candidate fields (C1, C2, C3) if more than 150. The fourth candidate field is added only if too many candidates are located. The fourth candidate is added with an AND.

If there is a match on C5, the records are considered a match and will not continue to the matching stage, which is based on the other metadata elements.

---

## Non-Serials Matching Vector

The following table describes the fields in the Matching vector.

Non-Serials Matching Vector Fields

| Field ID | Field Content  | Note                                               |
|----------|----------------|----------------------------------------------------|
| F1       | UnivID         |                                                    |
| F2       | UnivID_invalid | Multiple occurrences are delimited by a semicolon. |
| F3       | ISBN           | Multiple occurrences are delimited by a semicolon. |

| Field ID | Field Content                                | Note                                                       |
|----------|----------------------------------------------|------------------------------------------------------------|
| F4       | ISBN_invalid                                 | Multiple occurrences are delimited by a semicolon.         |
| F5       | Short title                                  | The first 25 characters of the normalized title.           |
| F6       | Year                                         |                                                            |
| F7       | Full title                                   |                                                            |
| F8       | Country of publication                       |                                                            |
| F9       | Pagination                                   | The highest number in the pagination field should be used. |
| F10      | Publisher                                    |                                                            |
| F11      | Main entry (author, corporate body, meeting) |                                                            |

The matching takes place in two stages: quick and full.

The quick match stage compares the following fields:

- Single match ID
- UnivID/UnivID\_invalid
- ISBN/ISBN\_invalid
- Short title
- Year

If 850 points are reached, the records are considered a match. If not, the record proceeds to full-match stage, which uses all fields except the full title is used instead of the short title. If 875 points are reached, the records are considered a match.

In both the quick-match and full-match stages, the weight from the UnivID and ISBN matching is compared, and the higher weight of the two stages, not the sum, is assigned to the record.

---

**Note**

For every group, only the highest weight is assigned.

---

Default Weights for Quick and Full Matches For Non-Serials

| Fields for Comparison  | Result                                     | Points |
|------------------------|--------------------------------------------|--------|
| UnivID/UnivID_invalid* | Match on valid UnivID                      | 200    |
|                        | Match on invalid UnivID                    | 50     |
|                        | Match between valid and invalid            | 100    |
|                        | Field present in both records but no match | -320   |
|                        | Either record or both records missing      | 0      |
| ISBN/ISBN_invalid*     | Match between valid ISBN                   | 85     |
|                        | Match between invalid ISBN                 | 10     |
|                        | Match between valid and invalid            | 30     |
|                        | Field present in both records but no match | -225   |
|                        | Either record or both records missing      | 0      |
| Date                   | Exact match                                | 200    |
|                        | +/- 2 years                                | -25    |
|                        | No match                                   | -250   |
|                        | Value missing                              | 0      |
| Short-Title            | Exact match on first 25 characters         | 450    |
|                        | Non match                                  | 0      |

| Fields for Comparison  | Result                                                                    | Points                      |
|------------------------|---------------------------------------------------------------------------|-----------------------------|
| Full-Title             | Exact match                                                               | 600                         |
|                        | Either title contained within the other title                             | 350                         |
|                        | Either title shorter than nine characters                                 | 0                           |
|                        | Matching keywords                                                         | 450 x (% of matching words) |
|                        | Matching keywords in order                                                | 450 x (% + 50)              |
|                        | Non-match                                                                 | -600                        |
| Country of Publication | Exact match                                                               | 40                          |
|                        | Either one missing                                                        | 0                           |
|                        | Non-match                                                                 | -205                        |
| Pagination             | Exact match, and the value is greater than 10                             | 100                         |
|                        | Exact match, and the value is less than or equal to 10                    | 50                          |
|                        | Values differ by 1-10 pages, and both values are greater than 10          | 50                          |
|                        | Values differ by 1-10 pages, and either value is less than or equal to 10 | 20                          |
|                        | Non-match (values differ by more than 10 pages)                           | -225                        |
| Publisher              | Exact match                                                               | 100                         |
|                        | Either missing                                                            | 0                           |

| Fields for Comparison | Result                                                                              | Points                      |
|-----------------------|-------------------------------------------------------------------------------------|-----------------------------|
|                       | Occur within the other                                                              | 100                         |
|                       | Non-match                                                                           | -25                         |
| Main Entry            | Exact match                                                                         | 125                         |
|                       | Both main entries missing                                                           | 75                          |
|                       | Half (or more) of the main entry keywords are common and in the same order          | % common keywords x 80 + 10 |
|                       | Half (or more) of the main entry keywords are common, but are not in the same order | % common keywords x 80      |
|                       | Present in one record but missing in the other                                      | -25                         |
|                       | Non-match                                                                           | -200                        |

## Deduplication Algorithm for Articles

The Deduplication algorithm for articles matches a single key that is also used in the candidate and matching phases. Use C1 for the candidate key and F1 for the match. In addition to remote searches, the deduplication algorithm can be used for records that are harvested into the local Primo repository. In both cases, a single key is created from the following elements:

- ISSN, DOI, or normalized journal title
- Start page, author, or author last name
- Publication year, issue, or part
- Normalized article title

In order to create a dedup key, the record must include all of the dedup key elements. Records match when the dedup keys are identical.

---

### Note

For information on how the MARC fields are mapped into Primo, see [Generic MARC 21 Normalization Rules](#).

---

If you want to load articles into the local repository, create a dedup vector as follows:

Dedup Vector

| Field ID | Field Content                                                                                                                                                                                                                                                  | Note                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T        | 3 OR 99                                                                                                                                                                                                                                                        | <p>Use type 99 for records that do not include all required data elements. This can be done by first creating rules that assign the type 99 to the records that do not have the following fields in the addata section. Create a separate rule for every group of element:</p> <ul style="list-style-type: none"> <li>• If record does not have an ISSN, DOI, or a Journal title, use type <b>99</b>.</li> <li>• If the record does not have StartPage, author, or author last name, use type <b>99</b>.</li> <li>• If the record does not have PublicationYear, Issue, or Part, use type <b>99</b>.</li> <li>• If the record does not have an ArticleTitle, use type <b>99</b>.</li> </ul> <p>All other records should get type <b>3</b>.</p> |
| C1       | <p>The match key created from the following elements as a single string:</p> <p>(ISSN, DOI, or Journal title) +<br/>           (StartPage, author, or author last name)<br/>           + (PublicationYear, issue, or part) +<br/>           (ArticleTitle)</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| F1       | <p>The match key created from the following elements as a single string:</p> <p>(ISSN, DOI, or Journal title) +<br/>           (StartPage, author, or author last name)<br/>           + (PublicationYear, issue, or part) +<br/>           (ArticleTitle)</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

The following rules are used to create a normalization article title:

- Replace the following characters with a space: !@#\$\$%^&\*()\_+={}|:~<>?./~`
- Remove all blank characters.
- Save the last 25 characters of the title.
- Change the characters to lowercase characters.

## The Deduped-Merged Record

The system creates the merged record based on the preferred record, where the fields in the following sections are merged from all records in the dedup group:

- **Control**—most fields are merged
- **Display**—the `source` and `availlibrary` fields are merged. The `availinstitution` and `availpnx` fields are re-calculated

- **Links**—all fields are merged and duplicate fields are removed
- **Search**—all fields are merged and duplicate fields are removed
- **Sort**—only fields from preferred are taken
- **Facets**—all fields are merged and duplicate fields are removed
- **Dedup**—not relevant
- **FRBR**—all fields merged and duplicate fields are removed
- **Delivery**—all fields are merged
- **Ranking**—the highest value is taken from all records
- **Enrichment**—not relevant
- **Additional data**—all fields are merged and duplicate fields are removed
- **Local fields**—all local fields are included

To enable the system to identify the original source record, the dedup process adds a subfield O (\$\$O) and a subfield V (\$\$V). The content of \$\$O is the original PNX record ID, and the content of \$\$V is the value of the original field. The system uses \$\$O when it needs to link between fields that are derived from the same source PNX record - all fields with the same \$\$O derive from the same source record.

The \$\$V and \$\$O are added to fields from the control, display, links, and delivery sections. For example, a deduped record will have multiple `<sourceid/>` fields in the control section:

```
<sourceid>$$VBBI$$OBBI004876460</sourceid>
<sourceid>$$VBBI$$OBBI004550753</sourceid>
```

In this example, the value of the original `control/sourceid` fields is **BBI**, and the record IDs of the source PNX record are **BBI004876460** and **BBI004550753**.

The following figure shows an example of a deduped-merged PNX record:

```
<record>
  <control>
    <sourceformat>MARC21</sourceformat>
    <sourcesystem>$$VILS$$OBBI004876460</sourcesystem>
    <sourcesystem>$$VILS$$OBBI004550753</sourcesystem>
    <recordid>dedupmrg2284018</recordid>
    <originalsourceid>$$VPRM01$$OBBI004876460</originalsourceid>
    <originalsourceid>$$VPRM01$$OBBI004550753</originalsourceid>
    <sourceid>$$VBBI$$OBBI004876460</sourceid>
    <sourceid>$$VBBI$$OBBI004550753</sourceid>
    <sourcerecordid>$$V004876460$$OBBI004876460</sourcerecordid>
    <sourcerecordid>$$V004550753$$OBBI004550753</sourcerecordid>
  </control>
```

```

<display>
  <type>book</type>
  <title>Language development and learning to read the scientific study of how
language development affects reading skill</title>
  <creator>Diane McGuinness</creator>
  <contributor>NetLibrary, Inc.</contributor>
  <publisher>Cambridge, Mass. : MIT Press</publisher>
  <creationdate>c2005</creationdate>
  <format>x, 494 p. : ill. ; 24 cm.</format>
  <identifier>$$CISBN$$V142372612X (electronic bk.)</identifier>
  <subject>Reading -- Research; Language acquisition -- Research; Electronic
books</subject>
  <language>eng</language>
  <source>$$VBBI$$OBBI004876460</source>
  <source>$$VBBI$$OBBI004550753</source>

<availlibrary>$$INORTH$$LNINTE$$Savailable$$33$$40$$5N$$60$$OBBI004876460</availlibrary>

<availlibrary>$$ISOUTH$$LKINTE$$1Internet$$Scheck_holdings$$OBBI004876460</availlibrary>

<availlibrary>$$ISOUTH$$LLINTE$$1Book$$Scheck_holdings$$OBBI004876460</availlibrary>
  <availlibrary>$$INORTH$$LNWILS$$1General collection$$2(LB1050.6 .M34 2005
)$$Savailable$$31$$40$$5N$$60$$OBBI004550753</availlibrary>
  <availinstitution>$$INORTH$$Savailable</availinstitution>
  <availinstitution>$$ISOUTH$$Scheck_holdings</availinstitution>
  <availpnx>available</availpnx>
</display>

<links>
  <linktotoc>$$Tamazon_toc$$DTable of Contents$$OBBI004876460</linktotoc>
  <linktoabstract>$$Tsyndetics_abstract$$DAbstract$$OBBI004876460</linktoabstract>
  <linktouc>$$Tamazon_uc$$DThis item in Amazon.com$$OBBI004876460</linktouc>
  <linktouc>$$Tworldcat_isbn$$DThis item in WorldCat@$$OBBI004876460</linktouc>
  <linktoexcerpt>$$Tsyndetics_excerpt$$DExcerpt from
item$$OBBI004876460</linktoexcerpt>
  <openurl>$$Topenurl_journal$$OBBI004876460</openurl>
  <openurlfulltext>$$Topenurl_full_journal$$OBBI004876460</openurlfulltext>
  <linktoholdings>$$V$$TILS_holdings$$OBBI004876460</linktoholdings>
  <linktoholdings>$$V$$TILS_holdings$$OBBI004550753</linktoholdings>
  <backlink>$$V$$TILS_backlink$$DThis item in the Library
Catalog$$OBBI004876460</backlink>
  <backlink>$$V$$TILS_backlink$$DThis item in the Library
Catalog$$OBBI004550753</backlink>
  <linktorsrc>$$V$$Uhttp://www.netLibrary.com/summary.asp?id=138523$$Dfor Primo
University Crookston access$$OBBI004876460</linktorsrc>
  <linktorsrc>$$V$$Uhttps://www.lib.umn.edu/slog.phtml?url=http://www.netLibrary.com/
summary.asp?id=138523$$DNorth Campus access$$OBBI004876460</linktorsrc>
  <linktorsrc>$$V$$Uhttp://www.netLibrary.com/summary.asp?id=138523$$DNorth Campus

```

```
access$$OBBI004876460</linktorsrc>
</links>

<search>
  <creatorcontrib>NetLibrary, Inc.</creatorcontrib>
  <creatorcontrib>Net Library, Inc</creatorcontrib>
  <title>Language development and learning to read the scientific study of how
language development affects reading skill </title>
  <subject>Electronic books.</subject>
  <general>[electronic resource] :</general>
  <isbn>142372612X</isbn>
  <recordid>BBI004876460</recordid>
  <searchscope>SOUTH</searchscope>
  <scope>SOUTH</scope>
  <creatorcontrib>Diane McGuinness</creatorcontrib>
  <creatorcontrib>McGuinness, D</creatorcontrib>
  <creatorcontrib>Diane McGuinness.</creatorcontrib>
  <title>Language development and learning to read : the scientific study of how
language development affects reading skill </title>
  <subject>Reading Research.</subject>
  <subject>Language acquisition Research.</subject>
  <general>MIT Press,</general>
  <isbn>0262134527</isbn>
  <creationdate>2005</creationdate>
  <sourceid>BBI</sourceid>
  <recordid>BBI004550753</recordid>
  <rsrctype>book</rsrctype>
  <searchscope>NORTH</searchscope>
  <searchscope>BBI</searchscope>
  <scope>NORTH</scope>
  <scope>BBI</scope>
</search>
<sort>
  <creationdate>2005</creationdate>
</sort>

<facets>
  <collection>NINTE</collection>
  <collection>KINTE</collection>
  <collection>LINTE</collection>
  <toplevel>online_resources</toplevel>
  <creatorcontrib>NetLibrary, Inc</creatorcontrib>
  <genre>Electronic books</genre>
  <language>eng</language>
  <creationdate>2005</creationdate>
  <topic>Reading-Research</topic>
  <topic>Language acquisition-Research</topic>
  <collection>NWILS</collection>
  <toplevel>available</toplevel>
  <creatorcontrib>McGuinness, D</creatorcontrib>
```

```

<prefilter>books</prefilter>
<rsrctype>books</rsrctype>
<classificationlcc>L - Education.-Theory and practice of education-Teaching
(Principles and practice)-Reading (General)</classificationlcc>
</facets>
<dedup>
  <t>1</t>
  <c2>142372612X</c2>
  <c3>languagedevelopmentaadingskill</c3>
  <c4>2005</c4>
  <f3>142372612X</f3>
  <f5>languagedevelopmentaadingskill</f5>
  <f6>2005</f6>
  <f7>language development and learning to read the scientific study of how language
development affects reading skill</f7>
  <f8>mau</f8>
  <f9>x, 494 p. :</f9>
  <f10>mit press</f10>
  <f11>mcguinness diane</f11>
</dedup>
<frbr>
  <t>1</t>
  <k1>$$Kmcguinness diane$$AA</k1>
  <k3>$$Klanguage development and learning to read the scientific study of how
language development affects reading skill$$AT</k3>
</frbr>

<delivery>
  <institution>$$VNORTH$$OBBI004876460</institution>
  <institution>$$VSOUTH$$OBBI004876460</institution>
  <delcategory>$$VOnline Resource$$OBBI004876460</delcategory>
  <institution>$$VNORTH$$OBBI004550753</institution>
  <delcategory>$$VPhysical Item$$OBBI004550753</delcategory>
</delivery>
<enrichment>
  <classificationlcc>LB1050.6</classificationlcc>
</enrichment>
<ranking>
  <booster1>1</booster1>
  <booster2>1</booster2>
</ranking>
<addata>
  <addau>NetLibrary, Inc</addau>
  <eissn>0262134527 0765805723</eissn>
  <isbn>142372612X</isbn>
  <oclcid>61704190</oclcid>
  <btitle>Language development and learning to read the scientific study of how
language development affects reading skill</btitle>
  <aulast>McGuinness</aulast>

```

```
<aufirst>Diane</aufirst>
<au>McGuinness, Diane</au>
<date>2005</date>
<risdate>c2005.</risdate>
<isbn>0262134527</isbn>
<format>book</format>
<ristype>BOOK</ristype>
<notes>Includes bibliographical references (p. [447]-477) and indexes.</notes>
<cop>Cambridge, Mass.</cop>
<pub>MIT Press</pub>
<lccn>2004062118</lccn>
  <btitle>Language development and learning to read : the scientific study of how
language development affects reading skill</btitle>
  <genre>book</genre>
</addata>
</record>
```

## Preventing Dedup

[Return to menu](#)

There are several scenarios in which you may want to run the dedup process for the pipe, but you want to prevent specific records from being deduped and/or you want to ensure that dedup only works within a specific institution.

As mentioned previously, it is possible to suppress specific records from taking part in the dedup process by assigning them type 99 via the normalization rules (dedup/t).

If you want to prevent cross-institution deduplication, you can consider using the **Harvesting, NEP, Dedup & FRBR** parallel processing mode. In this mode, dedup and FRBR run as part of the pipe, and only records that belong to the institution of the pipe are matched with each other. Note that the institution in this case is the owner of the data source and pipe. If the data source includes multiple institutions, they only dedup among themselves.

Another method to prevent dedup across institutions or across any type of group is to add a key (such as the institution code) to the candidate fields. This ensures that candidates, and hence the match, are only found within the group.

## FRBRization

Primo records are grouped using the principles in the *Functional Requirements for Bibliographic Records* published by the IFLA Study Group on the Functional Requirements for Bibliographic Records.

The grouping process is based on creating a vector for every record. The vector includes one or more keys that identify the group it represents. Records that have a matching key (Primo attempts to match all keys in the record) are added to a FRBR group and are assigned the ID of the group (the `FrbrID`). Each record can belong only to one group. Therefore, once a record is matched with an existing group, Primo terminates the grouping process for that record.

The Front End provides the following display options:

- **Display of a preferred record** – Primo dynamically selects one of the records from the group for display in the brief results list. This is the preferred record. The preferred record is the highest ranked record from the results set. From the preferred record, the system displays a link to the additional records in the group.
- **Display of a generic record** – Primo displays a generic record that contains work-level metadata. A link displays the records that are included in the group.

For detailed information about FRBR configuration, see the following sections:

- [The FRBR Vector](#)
- [Preventing FRBR](#)

## The FRBR Vector

[Return to menu](#)

The FRBR section in the PNX contains the FRBR vector. The vector has two parts:

1. **Type (T)**—The type can be used to FRBRize sets of records using different FRBR algorithms. Currently, there is a single type (1), which is based on creating and matching author-title keys.

---

### Note

If you would like to skip FRBRization for individual records, you can set this field to **99** in the normalization rules.

---

2. **Keys (Kn)**—The key is created from specified fields of the source record that can be used to identify the group it represents. The keys are checked in order starting from K1. The data must be normalized.

---

## Type 1 FRBR Vector and Algorithm

The FRBR vector includes part keys and the key type so they can be combined in the matching process. The keys are normalized.

There can be several types of keys, each with multiple occurrences:

- **A**—author part key – Author part keys are combined with title part keys to create a key that represents the work.
- **T**—title part key – Title part keys are combined with author part keys to create a key that represents the work.
- **TO**—title only key – This is a title key that is not combined with authors. This key should be created only from titles that are sufficient to identify the work by themselves. The MARC 130 (uniform title) tag is an example of such a field.

The key type should be added as an attribute of the field.

Part Keys

Field ID	Field Content
T	1
K1	Author part key
K2	Title only key
K3	Title part key

Every key field has the following subfields:

- \$\$K key part value
- \$\$A key type (A—Author, T—Title, TO—Title only)

For example:

```
<frbr>
<t>1</t>
<k1>$$Kshakespeare william 1564 1616$$AA</k1>
<k3>$$Khamlet$$AT</k3>
```

In the algorithm, the keys are created by joining the author and title parts using all possible combinations, unless the key part type is **TO**. This type of title part key is not joined with author keys. With the exception of a TO part, the keys must be created from an author and title part. If one part does not exist, the key is not created.

In the FRBRization process, the keys are compared. If a record has a matching key with another record, it is added to the same FRBR group. Once a match is found, the system does not continue searching for matches since a record can belong to one FRBR group only.

The following table describes the FRBR vector for MARC 21:

FRBR Vector for MARC 21

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
T	Always 1		
K1	100 or 110 or 111 OR 700, 710, 711	A	Single occurrence of 100, 110, 111; multiple occurrences of 700, 710, 711  Take subfields a, b, c, d, q and n for 111
K2	130	TO	Subfields a, d, m, n, p, r, s
K3	240	T	Subfields a, d, m, n, p, r, s
	And (if 240 exists and format is not SE) 245		Subfields a, b, e, f, g, n, p
	OR (if 240 does not exist and format is SE) 245		Subfields a, b, e, f, g, n, p



Record	Vector and keys
<p>100 1_  a Carroll, Lewis,  d 1832-1898.</p> <p>240 10  a Alice's adventures in wonderland.  l Telugu</p> <p>245 10  a Allu?billi?lo?kam?lo? amma?yikatha  h [microform] =  b Alice in wonderland /  c mu?am?, Lu?yi? Kero?l ; anukaran?am?, Va. Durga?prasa?dara?vu.</p> <p>246 31  a Alice in wonderland</p> <p>260 __  a Madara?su :  b A?ndhragranthama?la,  c [1951]</p>	<p>T1</p> <p>K1 carroll lewis 1832-1898</p> <p>K3 alice's adventures in wonderland</p> <p>K3 allu billi lo kam lo amma yikatha alice in wonderland</p> <p>The following keys are created:</p> <ul style="list-style-type: none"> <li>• carroll lewis 1832-1898 alice's adventures in wonderland</li> <li>• carroll lewis 1832-1898 allu billi lo kam lo amma yikatha alice in wonderland</li> </ul>

For example, the following records are not a match:

#### Sample Non-Matching Records

Record	Vector and keys
<p>100 1_  a Chorpenning, Charlotte B.  q (Charlotte Barrows)</p> <p>245 10  a Alice in Wonderland,  c dramatized by Charlotte B. Chorpenning, a play from the library of the Association of the Junior Leagues of America, inc.</p> <p>260 __  a Chicago,  b The Dramatic Publishing Company  c [1946]</p> <p>700 1_  a Carroll, Lewis,  d 1832-1898.  t Alice's adventures in Wonderland</p>	<p>T1</p> <p>K1 chorpenning charlotte b</p> <p>K3 alice in wonderland</p> <p>The following key is created:</p> <ul style="list-style-type: none"> <li>• chorpenning charlotte b alice in wonderland</li> </ul>
<p>050 00  a VXB 0196-0197 (viewing copy)</p> <p>245 00  a Alice in Wonderland.</p> <p>260 __  c 1999.</p> <p>300 __  a 2 videocassettes of 2 :  b sd., col. ;  c 1/2 in. viewing copy.</p> <p>710 2_  a Copyright Collection (Library of Congress)</p>	<p>T1</p> <p>K1 copyright collection library of congress</p> <p>K3 alice in wonderland</p> <p>The following key is created:</p> <ul style="list-style-type: none"> <li>• copyright collection library of congress alice in wonderland</li> </ul>

## Preventing FRBR

[Return to menu](#)

There are several scenarios in which you may want to run the dedup process for the pipe, but you want to prevent specific records from FRBRizing and/or ensure that FRBR only works within a specific institution.

As mentioned above, it is possible to suppress specific records from taking part in the FRBR process by assigning them type '99' via the normalization rules (frbr/t).

---

### Note

Another method is to create a **Delete Data Source and Reload** type of pipe with **System Last Stage** set to **DEDUP** to process all records.

---

If you want to prevent cross-institution deduplication, you can consider using the Harvesting, NEP, Dedup & FRBR parallel process mode. In this mode dedup and FRBR are run as part of the pipe and only match records that belong to the institution of the pipe. Note that in this case, the institution is the owner of the data source and pipe, and if the data source includes multiple institutions, they will dedup among themselves.

Another option to prevent FRBR across institutions or also across any type of group is to add a key (such as the institution code) to the FRBR part. This ensures that candidates and the match are only found within the group.

---

## Matching Records in the Serials and Non-Serials Dedup Algorithm

In the serials and non-serials dedup algorithms, the system attempts to match records by comparing the fields in the dedup vector. During the deduplication process, the program adds or subtracts points per field, and matches the records if they pass a required threshold.

The points and the thresholds are defined in the following XML files, which are stored under the `ng/primo/home/profile/publish/publish/production/conf` directory:

- `CDLMatchingProfile.xml`—used for the non-serials algorithm
- `CDLSeMatchingProfile.xml`—used for the serials algorithm

---

### Note

The `CDLArticlesMatchingProfile.xml` file is used for the articles dedup algorithm, but it cannot be customized since the algorithm is much simpler and uses only two keys to match.

---

Refer to [Files Used by the Dedup Algorithm](#) to view each of these files.

For additional information, refer to the following sections:

- [Customizing the Dedup Algorithms](#)
- [Structure of the XML File](#)
- [Matching Programs](#)

---

## Customizing the Dedup Algorithms

[Return to menu](#)

This task requires installation-level permissions.

You can customize the deduplication settings, if you need to make any of the following changes:

- Change the added/subtracted points
- Add or modify a threshold
- Add an additional field.

---

### Note

Some of the fields included in the XML files are not in use because the out of the box normalization rules do not create these fields. If you want to use these fields, you will need to modify the normalization rules.

---

To modify the deduplication settings, you must create the new XML files under the same directory and then use the following fields on the Primo Home > Advanced Configuration > General Configuration > Publishing subsystem page to point to the new XML files:

- `primo.dedup.CDLSeMatchingProfile` **defaults to** `CDLSeMatchingProfile`
- `primo.dedup.CDLMatchingProfile` **defaults to** `CDLMatchingProfile`

---

## Structure of the XML File

[Return to menu](#)

Primo uses the following elements to determine match criteria and thresholds:

- **Handlers**—these are the fields or group of fields that the algorithm uses for matching. The handler includes the program ("class"), which compares the fields and calculates match points by adding and subtracting points based on the comparisons.
- **Thresholds**—this section defines the matching stages. The standard algorithm includes two thresholds: quick match and full match.
- **Steps**—this section specifies the stages of the match.
- **Common title list**—this section defines a list of additional files used by the algorithm to determine matches.

---

## Handlers

The `<step type="handler">` element (see the following figure) defines each matching program to run. The handlers have the following elements:

- `<handler id>` - the handler ID. This ID is used in the steps section.
- `<fieldid>` - this is the field or group of fields from the PNX dedup section. Multiple fields should be separated by a comma
- `<name>` - the name of the program used to match the fields. The programs are explained below.
- `<arguments>` - the parameters of the specified program. These parameters also assign/subtract match points.

```
<handlers>
  <handler id="CDLID">
    <fieldID>f1,f2,f3,f4</fieldID>
    <name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLIDComparator
    </name>
    <arguments>
      <argument name="recID_match">+200</argument>
      <argument name="recID_recIDInvalid_match">+100</argument>
      <argument name="recIDInvalid_match">+50</argument>
      <argument name="recID_mismatch">-470</argument>
      <argument name="recID_recIDInvalid_mismatch">-50</argument>
      <argument name="ISBN_match">+85</argument>
      <argument name="ISBN_ISSN_match">+30</argument>
      <argument name="ISSN_ISSN_match">+10</argument>
      <argument name="ISSN_ISBN_mismatch">-225</argument>
    </arguments>
  </handler>
</handlers>
```

```
    </arguments>
  </handler>
  .
  .
  .
</handlers>
```

#### Example handlers Element

---

## Thresholds

The `<step type="threshold">` element (see the following figure) defines the threshold stages, which the Dedup algorithm uses to determine whether two records are duplicates. The `<threshold>` element defines each stage. Points, which are defined by the handlers, are transferred to subsequent stages, where they are added or subtracted to calculate a total point value.

The point values are compared to the values that are stored in the following elements:

- `<upper_threshold>`—records with point totals that meet or exceed this value are considered a duplicate and processing is stopped.
- `<lower_threshold>`—records with point totals that meet or exceed this value are considered a duplicate and processing is stopped.

If the total falls between the upper and lower thresholds, processing continues to the next stage.

Every threshold requires an upper point threshold that records must reach to be considered duplicates. Any threshold that is not the last can also have a lower threshold. If the points reached in the first stage are the same or less than the lower threshold, then the system will not go on to the next stage. If the threshold is met, the records are considered duplicates and matching stops. If the total number of points is between the lower and upper threshold the system will continue to the next stage.

---

### Note

The thresholds do not have to be the same for the first and second (and any additional) thresholds.

---

```
<thresholds>
  <threshold id="tr1">
    <upper_threshold>+850</upper_threshold>
    <lower_threshold>0</lower_threshold>
  </threshold>
  <threshold id="tr2">
    <upper_threshold>+875</upper_threshold>
  </threshold>
</thresholds>
```

#### Example thresholds Element

---

## Steps

The `<steps>` element lists the handlers and thresholds that the program will use to compare two records. This list defines the order in which the matching programs are run and the threshold stages.

For example, the `CDLSeMatchingProfile.xml` (see the following figure) has two thresholds that represent the stages, quick match and full match. In the quick match stage, the program matches the Universal ID/ISSNs and the full title. If a full match is necessary, additional fields are checked.

```
<steps>
  <step type="handler">CDLID</step>
  <step type="handler">CDLShortTitle</step>
  <step type="handler">CDLDate</step>
  <step type="threshold">tr1</step>
  <step type="handler">CDLSubShortTitle</step>
  <step type="handler">CDLLongTitle</step>
  <step type="handler">CDLCountryOfPub</step>
  <step type="handler">CDLPagination</step>
  <step type="handler">CDLPublisher</step>
  <step type="handler">CDLMainEntry</step>
  <step type="handler">PhysicalFormat</step>
  <step type="handler">Edition</step>
  <step type="threshold">tr2</step>
</steps>
```

### Example steps Element

---

## Common Title List

The `<common_title_list>` element defines a list of additional files used by the algorithm to determine matches. The serial XML has such a section for the common title list file (see [CDLSeCommonTitleList.txt](#)).

```
<common_title_list>
  <file_name>CDLSeCommonTitleList.txt</file_name>
</common_title_list>
```

### Example common\_title\_list Element

For information on configuring local titles, see [ClientCommonTitles.txt](#)

---

## Matching Programs

[Return to menu](#)

Matching programs are specified within the `<step type="handler"/>` element of the XML files. These programs tell the Dedup algorithm which field comparison to perform to determine which records are duplicates. Some of the programs are employed for general use on all data elements, while others apply to specific data elements.

The programs compare an original record to a candidate record. The description below refers to the match points, as defined in the out of the box files.

---

## General Programs

This section describes the programs that perform comparisons on specified fields in the Dedup section of the PNX record.

---

### DedupStringComparator

This program compares the string values of a specified field (such as f9) in the original and candidate records.

```
</handler>
  <handler id="CDLSubShortTitle">
    <fieldID>f9</fieldID>
    <name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator
    </name>
    <arguments>
      <argument name="match">-450</argument>
    </arguments>
  </handler>
```

#### A DedupStringComparator Handler Example

**To compare two strings, this handler performs the following steps:**

1. If the values for both records are null, return a value of **both\_missing**. Otherwise, continue with next step.
2. If one of the values is null, return a value of **one\_missing**. Otherwise, continue with next step.
3. If both values match exactly, return a value of **match** (-450). Otherwise, continue with next step.
4. If one of the values is a substring of the other, return a value of **within**. Otherwise, return a value of **mismatch** (if not specified, return 0).

---

## Note

If a return value (such as mismatch) is not defined in an <argument> element (as shown in the following figure), a return value of 0 is used.</argument>

---

---

## CDLMainEntrySerialComparator

This program compares the string value of the specified field (such as f11).

```
<handler id="CDLMainEntry_se">
  <fieldID>f11</fieldID>
  <name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLMainEntrySerial
  Comparator</name>
  <arguments>
    <argument name="match">+200</argument>
    <argument name="keywords_weight_factor" param="59">75</argument>
    <argument name="keywords_order_base_weight" param="59">25</argument>
    <argument name="mismatch">-250</argument>
  </arguments>
</handler>
```

### A CDLMainEntrySerial Handler Example

#### To Compare two string values from the dedup records:

1. If one of the values is null, then return 0.
2. If both values are identical, return the value of **match**.
3. Count the number of words that are equal in both entries and perform the following checks:
  - If more than 60% the words are equal, take the ratio between the equal words and the number of words in the longest title and multiply it by the value of **keywords\_weight\_factor** (+75).
  - If the words that are common between the two titles are a substring to the short title, or vice versa, then add the value found in the previous check with the value of **keywords\_order\_base\_weight** (+25).
4. If no match is found, return the value of **mismatch** (-600).

---

## DedupNumericComparator

This program compares the date value of the specified field (such as f6).

```
<handler id="CDLDate">
  <fieldID>f6</fieldID>
  <name>com.exlibris.primo.publish.platform.dedup.comparator.
  DedupNumericComparator</name>
```

```

<arguments>
  <argument name="match">+200</argument>
  <argument name="within" param="2">-25</argument>
  <argument name="mismatch">-250</argument>
</arguments>
</handler>

```

#### A DedupNumericComparator Handler Example

#### Compare the string values from the dedup records:

1. If one of the values is null, then return 0.
2. If both values match, return the value of **match** (+200).
3. If the difference between the two date fields is within the value of the parameter's attribute (2), then return the value of **within** (-25).
4. Otherwise, return the value of **mismatch** (-250).

## CDLMainEntryComparator

This program compares the string value of the specified field (such as f11).

```

<handler id="CDLMainEntry">
  <fieldID>f11</fieldID>
  <name>com.exlibris.primo.publish.platform.dedup.cdlimpl.
CDLMainEntryComparator</name>
  <arguments>
    <argument name="match">+125</argument>
    <argument name="both_missing">+75</argument>
    <argument name="one_missing">+25</argument>
    <argument name="keywords_weight_factor" param="49">80</argument>
    <argument name="keywords_order_base_weight" param="49">10</argument>
    <argument name="mismatch">-200</argument>
  </arguments>
</handler>

```

#### A CDLMainEntryComparator Handler Example

#### Compare two string values from the dedup records:

1. If both of the values are missing, return the value of **both\_missing** (+75). If a value is not specified, return 0.
2. If one of the values is missing, return the value of **one\_missing** (+25). If a value is not specified, return 0.
3. If both values match, return the value of **match** (+125).
4. Count the number of words that are equal in both entries and perform the following checks:

- If more than 60% of the words are equal, take the ratio between the equal words and the number of words in the longest title and multiply it by the value of **keywords\_weight\_factor** (+80).
- If the words that are common between the two titles are a substring of the short title, or vice versa, then add the value found in the previous check to the value of **keywords\_order\_base\_weight** (+10).

5. If no matches are found, return the value of **mismatch** (-200).

## Specific Programs

This section describes the programs that perform comparisons on specific fields in the Dedup section of the PNX record.

### CDLIDSerialComparator

This is a complex program that compares the record ID (usually the LCCN for MARC data sources) and the ISSN of a candidate record with the corresponding fields of the original record and assigns a point value based on the checks performed.

```
<handler id="CDLID">
  <fieldID>f1, f2, f3, f4, f5</fieldID>
  <name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLIDSerialComparator
  </name>
  <arguments>
    <argument name="recID_match">+200</argument>
    <argument name="recID_recIDInvalid_match">+100</argument>
    <argument name="recIDInvalid_match">+50</argument>
    <argument name="recID_mismatch">-470</argument>
    <argument name="recID_recIDInvalid_mismatch">-50</argument>
    <argument name="ISSN_match">+200</argument>
    <argument name="ISSNInvalid_match">+50</argument>
    <argument name="ISSNCanceled_match">+10</argument>
    <argument name="ISSN_ISSNInvalid_match">+100</argument>
    <argument name="ISSN_ISSNCanceled_match">+50</argument>
    <argument name="ISSNInvalid_ISSNCanceled_match">+30</argument>
    <argument name="ISSN_ISSN_mismatch">-250</argument>
  </arguments>
</handler>
```

#### A CDLIDSerialComparator Handler Example

To compare the IDs of the original record and the candidate record, this program performs the following checks on the f1, f2, f3, f4, and f5 fields of the Dedup section:

1. The program performs the RECID comparisons listed in the following table.

#	Original	Candidate	Return Value (# of Points)
1	RECID (f1)	RECID (f1)	recID_match (+200)

#	Original	Candidate	Return Value (# of Points)
2	RECID (f1)	RECID_INVALID (f2)	recID_recIDInvalid_match (+100)
3	RECID_INVALID (f2)	RECID (f1)	recID_recIDInvalid_match (+100)
4	RECID_INVALID (f2)	RECID_INVALID (f2)	recIDInvalid_match (+50)

2. If the program finds a match, it saves the corresponding value from the Return Value column and continues with Step 5 to check the ISSNs. Otherwise, the program continues with the next step.
3. If the original RECID (f1) and the candidate RECID (f1) exist, the program saves the value **recID\_mismatch** (-470) and continues with Step 5 to check the ISSNs. Otherwise, the program continues to the next step.
4. If either of the following statements is true, the program saves the value **recID\_recIDInvalid\_mismatch** (-50) and continues with the next step to check the ISSNs.
  - The original RECID (f1) and the candidate RECID\_INVALID (f2) exist.
  - The original RECID\_INVALID (f2) and the candidate RECID (f1) exist.

Otherwise, the program continues to the next step.

5. The program performs the ISSN comparisons listed in the following table:

Test	Original	Candidate	Return Value (# of Points)
1	ISSN (f3)	ISSN (f3)	ISSN_match (+200)
2	ISSN_INVALID (f4)	ISSN_INVALID (f4)	ISSNInvalid_match (+50)
3	ISSN_CANCELED (f5)	ISSN_CANCELED (f5)	ISSNCanceled_match (+10)
4	ISSN (f3)	ISSN_INVALID (f4)	ISSN_ISSNInvalid_match (+100)
5	ISSN (f3)	ISSN_CANCELED (f5)	ISSN_ISSNCanceled_match (+50)
6	ISSN_INVALID (f4)	ISSN_CANCELED (f5)	ISSNInvalid_ISSNCanceled_match (+30)

6. If the program finds a match, it saves the corresponding value from the Return Value column and continues with Step 8. Otherwise, the program continues with the next step.

- If the original ISSN (f3) and the candidate ISSN (f3) exist, the program saves the value **ISSN\_ISSN\_mismatch** (-250).
- The program compares the return values from the RECID and ISSN checks and returns the highest value, disregarding the sign of the number (for example, a return value of -650 is higher than +50).

## CDLIDComparator

This is a complex program that compares the record ID (usually the LCCN for MARC data sources) and the ISBN of a candidate record with the corresponding fields of the original record and assigns a point value based on the checks performed.

```
<handler id="CDLID">
  <fieldID>f1, f2, f3, f4</fieldID>
  <name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLIDComparator
  </name>
  <arguments>
    <argument name="recID_match">+200</argument>
    <argument name="recID_recIDInvalid_match">+100</argument>
    <argument name="recIDInvalid_match">+50</argument>
    <argument name="recID_mismatch">-470</argument>
    <argument name="recID_recIDInvalid_mismatch">-50</argument>
    <argument name="ISBN_match">+85</argument>
    <argument name="ISBN_ISSN_match">+30</argument>
    <argument name="ISSN_ISSN_match">+10</argument>
    <argument name="ISSN_ISBN_mismatch">-225</argument>
  </arguments>
</handler>
```

### A CDLIDComparator Handler Example

To compare the IDs of the original record and the candidate record, the program performs the following checks on the f1, f2, f3, and f4 fields of the Dedup section:

- The program performs the RECID comparisons listed in the following table:

#	Original	Candidate	Return Value (# of Points)
1	RECID (f1)	RECID (f1)	recID_match (+200)
2	RECID (f1)	RECID_INVALID (f2)	recID_recIDInvalid_match (+100)
3	RECID_INVALID (f2)	RECID (f1)	recID_recIDInvalid_match (+100)
4	RECID_INVALID (f2)	RECID_INVALID (f2)	recIDInvalid_match (+50)

2. If the program finds a match, it saves the corresponding value from the Return Value column and continues with Step 5 to check the ISBNs. Otherwise, the program continues with the next step.
3. If the original RECID (f1) and the candidate RECID (f1) exist, the program saves the value **recID\_mismatch** (-470) and continues with Step 5 to check the ISBNs. Otherwise, the program continues to the next step.
4. If either of the following statements is true, the program saves the value **recID\_recIDInvalid\_mismatch** (-50) and continues with the next step to check the ISBNs.
  - The original RECID (f1) and the candidate RECID\_INVALID (f2) exist.
  - The original RECID\_INVALID (f2) and the candidate RECID (f1) exist.

Otherwise, the program continues to the next step.

5. The program performs the ISBN comparisons listed in the following table:

#	Original	Candidate	Return Value (# of Points)
1	ISBN (f3)	ISBN (f3)	ISBN_match (+85)
2	ISBN (f3)	ISSN_INVALID (f4)	ISBN_ISSN_match (+30)
3	ISSN_INVALID (f4)	ISBN (f3)	ISBN_ISSN_match (+30)
4	ISSN_INVALID (f4)	ISSN_INVALID (f4)	ISSN_ISSN_match (+10)

6. If the program finds a match, it saves the corresponding value from the Return Value column and continues with Step 8. Otherwise, the program continues with the next step.
7. If any of the following statements is true, the program saves the value **ISSN\_ISBN\_mismatch** (-225) and continues with the next step.
  - The original ISSN\_INVALID (f4) and the candidate ISBN (f3) exist.
  - The original ISSN\_INVALID (f4) and the candidate ISSN\_INVALID (f4) exist.
  - The original ISBN (f3) and the candidate ISSN\_INVALID (f4) exist.
  - The original ISBN (f3) and the candidate ISBN (f3) exist.

Otherwise, the program continues with the next step.

8. The program compares the return values from the RECID and ISBN checks and returns the highest value, disregarding the sign of the number (for example, a return value of -470 is higher than +85).

---

## CDLTitleSerialComparator

This program compares the full title for serials (f7 - f8), as follows:

1. If the f7 fields from the original and candidate records are equal, perform the following checks. Otherwise, continue with the next step.
  - If a word is from the common word list (see [CDLSeCommonTitleList.xml File](#)), return a value of **full\_common\_match** (+135).
  - If a word is not part of the common word list, return a value of **full\_match** (+600).
2. If the f8 fields from the original and candidate records are equal, perform the following checks. Otherwise, continue with the next step.
  - If a word is in the common word list (see [CDLSeCommonTitleList.xml File](#)), return a value of **full\_truncated\_common\_match** (+135).
  - If a word is not in the common word list, return a value of **full\_truncated\_match** (+175).
3. If any words are common in both titles, perform the following checks. Otherwise, return a value of **mismatch** (-600).
  - If more than half of the words are common, divide the number of common words by the number of words in the longest title and then multiply it by the value of **keywords\_weight\_factor** (+75).
  - If any of the common words are a substring of the short title, or visa versa, return the sum of the previous value and the value of **keywords\_order\_base\_weight** (+50)

---

## CDLTitleComparator

This program compares the long title of the records for non-serials (f7), as follows:

1. If the titles are equal, perform the following checks. Otherwise, go to the next step.
  - If the length of the title is less than nine characters, return a value of 0.
  - Otherwise, return a value of **match** (+600).
2. If one title is a substring of the other title, return a value of **within** (+350). Otherwise, continue with the next step.
3. If any words are common in both titles, perform the following checks. Otherwise, return a value of **mismatch** (+350).
  - If more than half of the words are common, divide the number of common words by the number of words in the longest title and then multiply it by the value of **keywords\_weight\_factor** (+450).
  - If any of the common words are a substring of the short title, or visa versa, return the sum of the previous value and the value of **keywords\_order\_base\_weight** (+50).

---

## CDLDateSerialComparator

This program compares the year (f6) of the original and candidate records, as follows:

1. If the year does not exist for either of the records, return a value of 0. Otherwise, continue with the next step.
2. If the year is the same for both records, return a value of **match** (+225). Otherwise, continue with the next step.
3. If the difference between the year values from both records is at most 1, return a value of **within1** (50). Otherwise, continue with the next step.

4. If the difference between the year values from both records is at most 2, return a value of **within2** (25). Otherwise, continue with the next step.
5. If the year values from both records are from the same decade and either of the year values ends with a 0, return a value of **last\_digit\_zero** (+20). Otherwise, return a value of **mismatch** (-150).

---

## CDLPageHandlerComparator

This program compares the pagination of the original and candidate records by extracting the highest number within the f9 string.

1. If one of the values is null, return a value of 0. Otherwise, continue to the next step.
2. If both values match, perform the following checks. Otherwise, continue to the next step.
  - If both values are greater than 10, return a value of **matchgt** (+100).
  - If both values are less than 10, return a value of **matchlt** (+100).
3. If the difference between the two numbers is less than 10, perform the following checks. Otherwise, return a value of **mismatch** (-225).
  - If both values are greater than 10, return a value of **withingt** (+50).
  - If both values are less than 10, return a value of **withinlt** (+20).

---

## Customizing Primo's Classic User Interface

You can customize Primo's classic user interface (UI) by changing the formatting details of the view, the text, and the graphics. In addition, you can create customized HTML pages to be used with Primo. For customization information that is specific to the new Primo UI, see [New UI Customization - Best Practices](#).

Although many of the Primo Interface elements can be modified using the Primo Back Office, the following elements require changes to files on the server:

- Colors, fonts, and layout of the UI (see [Customizing the Default CSS File](#))
- Text labels that appear in the UI (see [Customizing Labels](#))
- Image files used to display icons and buttons on the UI (see [Customizing Icons](#))
- Static HTML files used to provide additional information on various pages of Primo's UI, such as the Front End home page and the Brief Results and Full Display pages (see [Customizing Static HTML Files](#))

---

### Note

In some cases, it is necessary to modify system files in order to customize them. To prevent these modifications from being lost during a SP or hot fix update, keep a backup of customized files. After the update, you may need to reapply your changes.

---

For additional configuration information, refer to the following sections:

- [The primo library-libweb.war Directory](#)
- [Customizing the Default CSS File](#)
- [Customizing the Default Primo Locale CSS Files](#)
- [Adding Locale-Specific Elements](#)
- [Customizing Labels](#)
- [Customizing Icons](#)
- [Customizing Static HTML Files](#)
- [Customizing Help Files](#)
- [Customizing the No Results Page](#)
- [Debugging CSS and JavaScript - Disabling the wro4j Tool](#)

## The primo library-libweb.war Directory

[Return to menu](#)

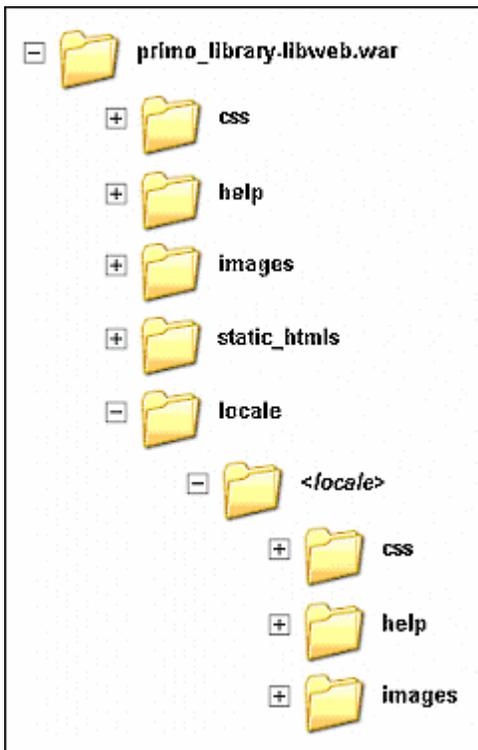
For on-premises installations the `primo_library-libweb.war` directory (`fe_web` alias) contains the files (such as HTML, images, and CSS) that are used to define the look of Primo's UI. It is located under the following path, where `<v>` is the Primo version and `<y>` is the Primo copy:

```
/exlibris/primo/p4_1/ng/primo/home/system/tomcat/search/webapps/primo_library#libweb/
```

To access this directory, enter the `fe_web` alias on the server.

The following figure shows the directory structure of the `primo_library#libweb` directory, which contains many subdirectories. The following subdirectories contain the files used for customization:

- The `css` subdirectory contains the `Primo_default.3.0.css` file and additional CSS files that are used for the customization of the Primo views.
- The `images` subdirectory contains the images displayed in the Primo views.
- The `help` subdirectory contains the html files that are used to display help information for Primo's UI.
- The `static_htmls` subdirectory contains the html files that are used to display additional information for Primo's UI.
- The `locale/<locale/>` subdirectories contain the `css`, `help`, and `images` directories, which are used to define styles, help, and icons for a specific locale, where `<locale/>` indicates the language and region (such as `en_US`). The `css` directory under the locale path contains the `Primo_locale.css` file.



Primo Customization Directories

## Customizing the Default CSS File

[Return to menu](#)

Each view loads one or more Cascading Style Sheet (CSS), which are defined in the CSS mapping table. By default, the system assigns the default CSS (which contains the `Primo_default.3.0.css` file out of the box) via the Views wizard. This file defines the default styles for the Front End views.

You can customize the formatting details of your views by modifying elements that are defined in the `Primo_default.3.0.css` file. Ex Libris does not recommend modifying this file. Instead, you can create new CSS files, modify specific elements that are defined in the `Primo_default.3.0.css` file (or add new ones), and then add these CSS files to the list of CSS files that are loaded in your view. This allows you to receive updates to the `Primo_default.3.0.css` file and retain your customizations during upgrades. Note that you can also add an import statement to your CSS file to include the `Primo_default.3.0.css` file.

The `Primo_default.3.0.css` file contains many sections that represent the Front End's tiles and dialog boxes. Each section contains the following information about the tile or dialog box:

- Location on the screen.
- Measurements and boundaries.
- Styles used, including different fonts, colors, and styles for different areas of texts.
- The directory location of any images included in the tile, along with the location of the image within the tile.

In addition, on-premises customers can modify the elements provided in the default Primo locale CSS, which defines the styles for language localization. Primo loads this CSS file last to support elements that pertain to a specific locale. For more information, see [Customizing the Default Primo Locale CSS Files](#).

The `mobile.css` file provides out-of-the-box support for devices with smaller screens. For some locales, the page in the mobile view may be too wide. You can customize the screen as needed by adding a customized version of the `mobile.css` file to the following directory, which will override the settings in the default `mobile.css` file:

```
/exlibris/primo/p4_1/ng/primo/home/system/tomcat/search/webapps/primo_library#libweb/  
locale/<locale>/css/
```

An example has been provided for Hebrew in the following file:

```
/exlibris/primo/p4_1/ng/primo/home/system/tomcat/search/webapps/primo_library#libweb/  
locale/iw_IL/css/mobile.css
```

It is never recommended to modify the out-of-the-box CSS files, because they will be overwritten by upgrades.

### To customize the default UI styles:

1. Create a new CSS file on a local Web server. If you want to view the default Primo CSS file for reference, enter the following URL in your browser.

```
http://<fe hostname>:<port>/primo_library/libweb/css/Primo_default.3.0.css
```

For on-premises installations, create a new CSS file on the server:

1. Enter the following commands to access the `css` directory:

```
fe_web
```

```
cd css
```

2. Enter the following command to make a copy of the `Primo_default.3.0.css` file:

```
cp Primo_default.3.0.css <new_css>.css
```

---

#### Note

If you would like to update styles for a specific locale, create a backup of the following file before modifying it:

```
<fe_web>/locale/<locale>/css/Primo_locale.css
```

---

2. Edit the new CSS file.
- 

#### Note

It is easier to maintain and test your customized style sheet, if it only contains elements that you have customized. In addition, you will receive updates automatically from Ex Libris for elements that are not customized.

---

3. Add the new CSS file to the CSS files mapping table by performing the following steps:

1. Click **Primo Home > Advanced Configuration > All Mapping Tables** to open the Mapping Tables page.
2. On the Mapping Tables page, select **Front End** from the Subsystem pull-down field.

The list of Front End mapping tables displays on the page.

3. Click **Edit** next to the row that contains the CSS table.

The CSS mapping table opens.

**Mapping Tables**

Update for Owner: Reef University Sub System: Front End  
 Table Name: CSS Reset Delete

**Mapping Table Rows**

Enabled	Css Name*	Css Url	Description	Last Updated
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
<input checked="" type="checkbox"/>	Mobile CSS	mobile.css	A css for mobiles	10/02/12 By Admin
<input checked="" type="checkbox"/>	iPhone view CSS	Primo_default.3.0.css	The default css in the s	10/02/12 By Admin
<input checked="" type="checkbox"/>	Classic Primo.css	Primo.css	The old default css in th	10/02/12 By Admin
<input checked="" type="checkbox"/>	Default CSS	Primo_default.3.0.css	The default css in the s	10/02/12 By Admin
<input checked="" type="checkbox"/>	Services Page View C	Primo_default.3.0.css	The default css in the s	10/02/12 By Admin
<input checked="" type="checkbox"/>	Primo Bordeaux	PrimoBordeau.css	An alternate look for the	10/02/12 By Admin
<input checked="" type="checkbox"/>	Primo Relaxed (Grey)	PrimoGrey.css	An alternate look for the	10/02/12 By Admin

Table Description: The css that are supported by the app

**Create a New Mapping Row**

Css Name  Css Url  Description  Create

[Import Excel File](#)

**The CSS Mapping Table Page**

- In the Create a New Mapping Row area, use the following table to enter the information for the new CSS file.

CSS Mapping Table Row Details

Field name	Description
Enabled	Checking this box enables the mapping row.
CSS Name	The name of the set of CSS files that you can assign to views on the View Attributes page in the Views wizard.
CSS URL	<p>The URLs of one or more CSS files that are loaded in order for each page in the FE. Duplicate elements overwrite elements that are defined in previously loaded CSS files, allowing you to modify specific elements in the default Primo CSS. You must separate each URL in the list with a semicolon. For example:</p> <pre>Primo_default.3.0.css;http://my_Web_server.com/static_htmls/MyCustomCSS.css</pre> <p>For on-premises installations:</p> <pre>Primo_default.3.0.css;../static_htmls/CUSTOM/css/MyCustomCSS.css</pre>
Description	This field describes the mapping row.

- Click **Create** to add the new CSS file to the system.
- Assign the new CSS file to the Primo view by performing the following steps:
  - Access the Views wizard in the Back Office.

- In the list of views, click **Edit** next to the view that you want to apply the new CSS file.

The Edit View Attributes page displays the attribute settings for the selected view.

Prime Home > Ongoing Configuration Wizards > Views Wizard

**Edit View Attributes**

View : Auto1

General View Attributes of Auto1 View (Volcano Island University):

**General Attributes**

View Name: Auto1 (Give the view a meaningful identification, for example the library name)

Code : Auto1

Default user institution : Volcano Island

Is Template  Yes  No

Copied From: default Inherits:  Yes  No

Description: Auto1

Enable My Library Card

Invoke automatic search when tabs are switched

Enable the "Personalize Your Results" service

Display "Personalize Your Results" pop-up page

Default Institution By IP

Session timeout URL

**Appearance**

Layout Set: customized layout

CSS: Default CSS

Mobile CSS: Mobile CSS

**Languages**

Default interface language English

To Views List  To Scopes List

#### Edit View Attributes Window

- Select the CSS name (which is defined in the CSS mapping table) from the **CSS** drop-down list.
- Select the mobile CSS name (which is defined in the CSS mapping table) from the **Mobile CSS** drop-down list.

This field defines the CSS files that your view uses for smaller devices (such as smart phones). You can also customize the out-of-the-box `mobile.css` file, which is included in **Mobile CSS** (which is defined in the CSS mapping table). If you leave Mobile CSS field blank, the system will use the `Primo_default.3.0.css` file for smaller devices.

- Click **Save & Continue** to update the view.
- Continue through the wizard until you reach the Deploy view.
- Click **Deploy** to update the Front End.

## Customizing the Default Primo Locale CSS Files

[Return to menu](#)

In addition to the default `Primo_default.3.0.css` file, on-premises customers can modify the default `Primo_Locale.css` file under each locale. Primo loads this CSS file last to support elements that pertain to a specific locale.

### To customize the default locale-specific styles:

1. Enter the following commands to access the css directory, where `<locale/>` (such as `en_US`) indicates the language and region:

```
fe_web
```

```
cd locale/<locale>/css
```

2. Create a new CSS file that includes your localized CSS classes.

To protect your locale-specific CSS files from being overwritten during service pack updates and hot fixes, make sure that your localized CSS file does not have the same name as the default `Primo_Locale.css` file.

3. Update the Locale CSS Map code table per locale:

1. On the **Primo Home > Advanced Configuration > All Code Tables** page, select **Front End** from the Subsystem drop-down list.
2. In the **Locale CSS Map** mapping row, click **Edit**.

The Locale CSS Map code table opens (see [The Locale CSS Map Code Table Page](#)).

The screenshot shows the 'All Code Tables' page in the ExLibris Primo administration interface. The breadcrumb trail is 'Primo Home > Advanced Configuration > All Code Tables'. The user is logged in as 'Hello Admin'. The 'Update for Owner' is set to 'Installation' and the 'Sub System' is 'Front End'. The 'Table Name' is 'Locale CSS Map'. Below this, there is a table of 'Code Table Rows' with columns for 'Enabled', 'Code', 'Description', 'Language', 'Display Order', and 'Default Value'. One row is visible with 'default.primo.locale.css' as the code, 'Primo\_Locale.css' as the description, 'en\_US' as the language, and '0' as the display order. Below the table is a 'Table Description' field containing 'Codes to allow for Locale CSS customization'. At the bottom, there is a 'Create a New Code Table Row' section with input fields for 'Code', 'Description', 'Language', 'Display Order', and 'Default Value', and a 'Create' button. At the very bottom, there are 'Cancel & Go back' and 'Save & Continue' buttons, both with a link 'To Code Table List'.

**The Locale CSS Map Code Table Page**

- For each locale in the **Language** drop-down list that requires customization, use the following table to enter the information for the localized CSS file.

CSS Mapping Table Row Details

Field name	Description
Enabled	Check this box to enable the mapping row.
Code	<p>Specify the following code for the default locale CSS file:</p> <pre>default.primo.locale.css</pre> <hr/> <p><b>Note</b></p> <p>If necessary, you can add mapping rows for additional languages and views. To specify a view-specific CSS file, create a mapping row that contains the <code>&lt;view/&gt;.primo.locale.css</code> code per language.</p> <hr/>
Description	<p>To receive updates to the default locale CSS and retain your localized changes between updates, add your localized CSS file to the end of the list, as follows:</p> <pre>Primo_local.css;my_local.css</pre> <p>Make sure that each file is separated by a semicolon. The files are loaded in the order in which they are listed from left to right.</p>
Language	Specify the locale.

- Click **Save & Continue**.

- On the **Primo Home > Deploy All** page, deploy the changes made to the code tables.

## Adding Locale-Specific Elements

[Return to menu](#)

In addition to modifying the styles of your default view, you can provide different styles for each locale that you support.

### To add a locale-specific element:

1. Edit the CSS file that you use for your view.
2. Add the element that you want to customize to your file. Make sure that you prefix the element with the following information:

```
body.EXLCurrentLang_<locale>
```

For example, if you want to change the color of the second-level headings in the results to red for the French language, enter the following:

```
body.EXLCurrentLang_fr_FR EXLResultsList h2 {color:red}
```

3. Save the changes to your CSS file.

---

## Customizing Labels

[Return to menu](#)

Some text labels that appear on various pages of the Front End can be updated by using the following methods:

- The Views wizard in the Back Office.
- The code tables in the Back Office.

If a label cannot be updated via the Back Office, on-premises customers can modify it in the Primo I18N resource file.

If a label can be modified via the Back Office and you use a Primo I18N resource file to modify it, the system will overwrite its value with the value defined in the code table.

### To customize the labels using the Views wizard:

1. Access the Views wizard in the Back Office.
2. Use the instructions provided in the *Primo Back Office Guide* to edit the view and its labels and to deploy the view.

---

#### Note

You can also use the Views Labels code table to update the labels defined in the Views wizard.

---

### To customize the labels using code tables:

1. On the [Primo Home > Advanced Configuration](#) page, click **All Code Tables** in the Back Office.
2. To modify a label, enter the label in the **Description** field and search for the label in the Front End and Delivery subsystems.
3. Save your changes to the table and deploy the code tables.

### To customize the labels in the Primo I18N resource files (on-premises installations only):

1. Enter the following command to access the resource files on the server, where <v> is the Primo version and <y> is the Primo copy:

```
cd /exlibris/primo/p<v>_<y>/ng/primo/home/system/search/conf/i18n
```

2. Enter the following command to edit the file that contains the text label that you want to modify:

```
vi <resource file>
```

3. Save your changes to the file.

---

## Customizing Icons

[Return to menu](#)

You can customize each of the icons appearing on the pages of the Front End UI. Customizing the icon lets you replace the existing icon with a new icon of your choice.

---

### Note

In general, it is best to customize your CSS file (not the `Primo_default.3.0.css` file) so that it points to the new and modified images. If you decide to modify a system image file, it is recommended that you keep a backup to prevent these modifications from being lost during a SP or hot fix update. After the update, you may need to reapply your changes.

---

### To customize icons:

1. Create a directory on your local server to hold your customized image files.

For on-premises installations, enter the following commands to create a directory to hold your customized image files:

```
fe_web  
  
cd images  
  
mkdir <img_directory>
```

2. Store your customized image files in the new directory.
3. Edit your CSS file to include the changes to the icons and icon sizes.

### To customize the icons for a specific locale (on-premises installations only):

1. Enter the following commands to access the images directory on the Back Office server, where `<locale></locale>` (such as `en_US`) indicates the language and region:

```
fe_web  
cd locale/<local>/images
```

2. Back up the icon that you want to customize and save the new icon under the same name. (For example, if you are replacing an item called `book.gif`, rename it `backup_book.gif`, and then name the new icon `book.gif`.)
3. On the Primo home page, click **Deploy All**.
4. Select **Views** from the Deploy List and then click **Deploy** to deploy the changes to Primo's Front End.

---

### Note

You may have to refresh your screen and clear the cache in your browser to see the changes.

---

## Customizing Static HTML Files

[Return to menu](#)

Primo's Front End UI contains tiles that allow you to display additional information that is specific to your institution (such as hours of operation, sign-in information, available services, and so forth). The information that displays in these tiles is defined in the following out-of-the-box files, which are stored under the `static_htmls` folder (see [Primo Customization Directories](#)): [news.html](#), [signin.html](#), [service.html](#), [featured.html](#), [header.html](#), [footer.html](#), [ideasbrief.jsp](#), [browse.html](#), [noResults.html](#), [atoz.html](#), [signin\\_tips.html](#), and [ideasfull.jsp](#).

For more information, see [04 Branding Primo](#).

The Edit HTML Attributes page in the Views wizard of the Back Office defines the paths for each of the static HTML files. Changing the paths allows you to rename static HTML files and place them in other locations.

Primo Home > Ongoing Configuration Wizards > Views Wizard

> **Edit HTML Attributes**

View :Auto1      Tile : Static HTML

**Contents of HTML Tile**

Position	Assigned HTML
<b>Home Page:</b>	
Low Right	<input type="text" value="/static_htmls/news.html"/>
Upper Right	<input type="text" value="/static_htmls/signin.html"/>
Low Left	<input type="text" value="/static_htmls/service.html"/>
Upper Left	<input type="text" value="/static_htmls/featured.html"/>
<b>Brief Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasbrief.jsp"/>
<b>Full Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasfull.jsp"/>
<b>Browse:</b>	
Bottom	<input type="text" value="/static_htmls/browse.html"/>
<b>No Results Page:</b>	
Bottom	<input type="text" value="/static_htmls/noResults.html"/>
<b>Login Tips Page:</b>	
Bottom	<input type="text" value="/static_htmls/signin_tips.html"/>
<b>Find Databases A-Z List:</b>	
Top	<input type="text" value="/static_htmls/atoz.html"/>
<b>All Pages:</b>	
Header	<input type="text" value="/static_htmls/header.html"/>
Footer	<input type="text" value="/static_htmls/footer.html"/>

To Tiles List       To Tiles List

**Edit HTML Attributes - Static HTML Tile**

---

## Note

- The procedures in this section use the File Uploader utility to upload and manage files on the server. The utility places the files in a view-specific subdirectory under the `uploaded_files` directory. For more information, see [The File Uploader Tool](#). For customers who have access to the Back Office server, you can enter the following commands to access the static files, but it is recommended to use the File Uploader utility to manage customized files:

```
fe_web  
  
cd static_htmls
```

- If you are updating the files under the `static_htmls` directory on the Back Office server, back up your customized files to prevent them from being overwritten during a SP or hot fix update. After the update, you may need to reapply your changes. Files stored under the `uploaded_files` directory will not be overwritten during a SP or hot fix update.
- Locale-specific files are applied automatically when users set their preferences to a locale-specific language on Primo's Front End UI.

---

## To customize the content of the Static HTML pages:

1. Click the links listed above to download a local copy of the files that you want to customize.

---

### Note

If you have already customized and uploaded the file to the server, you can use the File Uploader utility to download the latest version to modify.

- 
2. Enter the following command to edit the static HTML file, where `<filename>` is the name of the file to be modified:

```
vi <filename>
```

3. Modify and save your changes to the file.
4. Use the File Uploader utility ([Primo Home > Primo Utilities > File Uploader](#)) to upload your customized static HTML file.

Primo Home > Primo Utilities > File Uploader

> **File Uploader configuration**

**Owner:** Volcano Island University **View:** Auto1

[View Loaded Files \(/uploaded\\_files\)](#)

**Load File**

No file selected.

To Main Menu

### File Uploader Utility

- In the Views Wizard (**Primo Home > Ongoing Configuration Wizards > Views Wizard**), update the paths in the Static HTML tile to access the files placed under the `uploaded_files` directory. For more information, see [The File Uploader Tool](#).

Primo Home > Ongoing Configuration Wizards > Views Wizard

> **Edit HTML Attributes**

**View:** Auto1 **Title:** Static HTML

**Contents of HTML Tile**

Position	Assigned HTML
<b>Home Page:</b>	
Low Right	<input type="text" value="/static_htmls/news.html"/>
Upper Right	<input type="text" value="/static_htmls/singin.html"/>
Low Left	<input type="text" value="/static_htmls/service.html"/>
Upper Left	<input type="text" value="/static_htmls/featured.html"/>
<b>Brief Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasbrief.jsp"/>
<b>Full Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasfull.jsp"/>
<b>Browse:</b>	
Bottom	<input type="text" value="/static_htmls/browse.html"/>
<b>No Results Page:</b>	
Bottom	<input type="text" value="/static_htmls/noResults.html"/>
<b>Login Tips Page:</b>	
Bottom	<input type="text" value="/static_htmls/signin_tips.html"/>
<b>Find Databases A-Z List:</b>	
Top	<input type="text" value="/static_htmls/atoz.html"/>
<b>All Pages:</b>	
Header	<input type="text" value="/uploaded_files/Auto1/header.html"/>
Footer	<input type="text" value="/static_htmls/footer.html"/>

To Tiles List  To Tiles List

### Edit HTML Attributes - Static HTML Tile

- Save and deploy your changes to the view.

### To customize locale-specific Static HTML pages:

1. Download the corresponding static HTML file to use as a template.
2. Change the name of the file using the following naming convention:

```
<default name>_<locale>.html
```

For example, if you have customized the `header.html` file and you want to create a French version, you must name the file `header_fr_FR.html`.

3. Modify and save your changes to the file.
4. Use the File Uploader utility (**Primo Home > Primo Utilities > File Uploader**) to upload your customized static HTML file. For more information, see [The File Uploader Tool](#).

---

## Customizing Help Files

[Return to menu](#)

---

### Note

For details on customizing the new Primo UI, see [Creating a Custom Help Page](#).

---

The Primo's Front End contains a single help page that describes various areas of the UI. To update this page, on-premises installations must modify the contents of the `search.html` file that is stored in the following directory:

```
/exlibris/primo/p4_1/ng/primo/home/system/tomcat/search/webapps/primo_library#libweb/help
```

If you need customize help pages per language, update the relevant `search.html` files in the following directories, where `<lng>` indicates the language and geography of the help file (such as **en\_US**):

```
/exlibris/primo/p4_1/ng/primo/home/system/tomcat/search/webapps/primo_library#libweb/  
locale/<lng>/help
```

---

### Note

To prevent your changes from being lost during a service pack or hot fix update, save a copy of the file prior to performing the update. After the update, you may need to reapply your changes.

---

### To customize the content of a default help page (on-premises installations only):

1. Log on to the Back Office server.
2. Enter the following commands to access the `help` directory:

```
fe_web  
cd help
```

3. Enter the following command to edit the help file:

```
vi search.html
```

4. Modify the file.
5. Exit and save your changes to the file.
6. Create a backup of the file.

### To customize the help page for a specific language (on-premises installations):

1. Log on to the Back Office server.
2. Enter the following commands to access the `help` directory, where `<lng/>` indicates language and region:

```
fe_web
cd locale/<lng>/help
```

3. Enter the following command to edit the help file:

```
vi search.html
```

4. Modify the file.
5. Exit and save your changes to the file.
6. Create a backup of the file.

### To create a custom help page (cloud installations):

1. Create a custom help file on your local server.
2. Remove the out-of-the-box help link that appears at the top of the page in the Front End UI by adding the following line to your customized CSS file stored on your local server:

```
#exlidMainMenuRibbon li.EXLLastItem {display: none;}}
```

3. Add a link to the new help file from the Main menu in the FE:
  1. On the **Primo Home > Ongoing Configuration Wizards > Views Wizard > Tile Configuration** page, select **Home Page** from the **Page** drop-down list.
  2. In the All tiles list, click **Edit** in the row containing the Main Menu tile.
  3. On the Edit Main Menu Attributes page, select the language in the **Interface Language** drop-down list.

### Edit Main Menu Attributes Page

---

#### Note

When users select a language in the Front End, the system displays the code name if you do not define a label for the English interface or do not configure a label for the selected language.

4. In the new Label section, specify the display label and the URL of the help file that is stored on your local Web server.

Create new Label:

Label:  URL:  Link should open in:

To Tiles List To Tiles List

### Create New Label Section

---

#### Note

The system uses the **Label** field to generate the code, replacing spaces with underscores and changing uppercase characters to lowercase. After the code has been created, you cannot change its name. For example, the generated code for label **Help EN** is **help\_en**.

---

5. Click **Add**.

The system adds the new code to the list of menu items.

---

#### Note

Because this step creates a new menu item in the Front End for all languages (not just the one you selected), you must hide the non-relevant menu items in the CSS per locale. For more information, see [Hiding Menu Items in the Front End](#).

---

6. For each language that is supported in the FE, modify the label for the new menu item.
7. Return to [step c](#) if you want to link to a different help page per locale.
8. Click **Save & Continue**.
9. On the Tiles Configuration page, click **Continue**.
10. Click **Deploy Now**.

---

## Hiding Menu Items in the Front End

If you use the Main Menu tile to add a custom help link and you want it to link to a locale-specific help file, you must create a separate menu item for each interface language that you support in the FE. If you do not create separate menu items, the system uses the same link for all interface languages.

In the following example, separate menu items have been defined in the Main Menu tile for English, French, and German help links.

**> Edit Main Menu Attributes**

View : Auto1      Tile : Main Menu

Interface Language: English

Contents of Main Menu Tile

Code:	library_search	Label:	Library Search	URL:	/action/search.do
Code:	tags	Label:	Tags	URL:	/action/tagsAction.do?fn=
Code:	atoz	Label:	A-Z	URL:	
Code:	help_en	Label:	Help EN	URL:	server.com/help/eng.html
Code:	help_fr	Label:	Help FR	URL:	yserver.com/help/frn.html
Code:	help_de	Label:	Help DE	URL:	server.com/help/deu.html

### Custom Help Links per Interface Language

If the irrelevant menu items are not hidden, the system displays all menu items, as follows:

Guest    e-Shelf    My Account 123

Library Search | Tags | A-Z | **Help EN** | **Help FR** | **Help DE** | Language: English

Local Repository    Search    Advanced Search    Subscribe to Library News feeds

### Help Links Not Hidden in Front End

You can use either the CSS or JavaScript method to hide menu items per locale.

## Using CSS to Hide Links

In order to hide items via CSS, you must specify the locale, the menu item, and the display parameter. You can hide multiple items by separating the items with a comma, using the following format:

```
body.EXLCurrentLang_<locale> #exlidMainMenuItem<position>, body.EXLCurrentLang_<locale>
#exlidMainMenuItem<position> {display:none;}
```

In the following example, the help links are defined in positions 4, 5, and 6 in the Main Menu tile:

Contents of Main Menu Tile

1	Code:	<input type="text" value="library_search"/>	Label:	<input type="text" value="Library Search"/>	URL:	<input type="text" value="/action/search.do"/>
2	Code:	<input type="text" value="tags"/>	Label:	<input type="text" value="Tags"/>	URL:	<input "="" type="text" value="/action/tagsAction.do?fn="/>
3	Code:	<input type="text" value="atoz"/>	Label:	<input type="text" value="A-Z"/>	URL:	<input type="text"/>
4	Code:	<input type="text" value="help_en"/>	Label:	<input type="text" value="Help EN"/>	URL:	<input type="text" value="server.com/help/eng.html"/>
5	Code:	<input type="text" value="help_fr"/>	Label:	<input type="text" value="Help FR"/>	URL:	<input type="text" value="yserver.com/help/frn.html"/>
6	Code:	<input type="text" value="help_de"/>	Label:	<input type="text" value="Help DE"/>	URL:	<input type="text" value="server.com/help/deu.html"/>

#### Main Menu Tile Positions

#### Note

If you change the order of the menu items, you must update the CSS to reflect the change in positions.

For example, in order to hide the unnecessary help links defined above, you must configure your CSS, as follows:

```
body.EXLCurrentLang_en_US #exlidMainMenuItem5, body.EXLCurrentLang_en_US
#exlidMainMenuItem6 {display:none;}

body.EXLCurrentLang_fr_FR #exlidMainMenuItem4, body.EXLCurrentLang_fr_FR
#exlidMainMenuItem6 {display:none;}

body.EXLCurrentLang_de_DE #exlidMainMenuItem4, body.EXLCurrentLang_de_DE
#exlidMainMenuItem5 {display:none;}
```

## Using JavaScript to Hide Links

Although you do not need to consider the position of the item when using the JavaScript method, you must update every `footer.html` file that is used by your view. This allows you to execute the script after the content of the page has been loaded.

To hide a specific menu item, specify the locale, the menu item's code, and the `hide` parameter, using the following format:

```
<script type="text/javascript">
  $('body[class*=EXLCurrentLang_<locale>]
a.EXLMainMenuITEM<code>').parents('li.EXLMainMenuItem').hide();
  .
  .
  .
</script>
```

Using the example definitions provided in the previous section, add the following script to every `footer.html` file in order to hide the unnecessary help links:

```
<script type="text/javascript">
  $('body[class*=EXLCurrentLang_en_US]
a.EXLMainMenuITEMhelp_fr').parents('li.EXLMainMenuItem').hide();
  $('body[class*=EXLCurrentLang_en_US]
a.EXLMainMenuITEMhelp_de').parents('li.EXLMainMenuItem').hide();

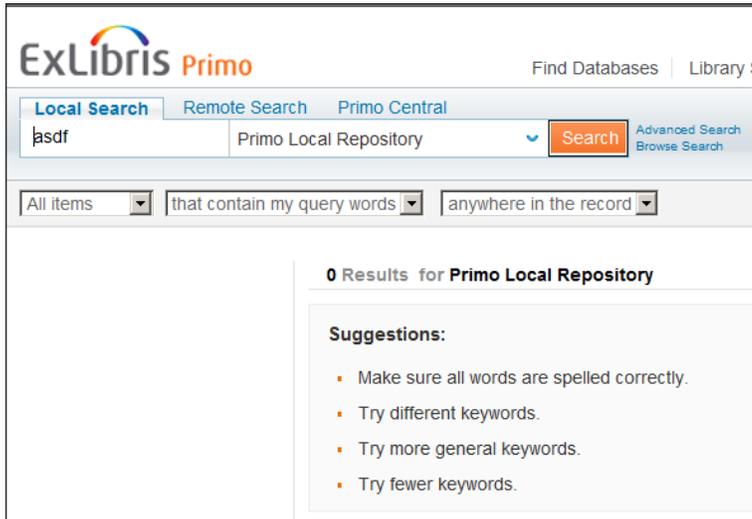
  $('body[class*=EXLCurrentLang_fr_FR]
a.EXLMainMenuITEMhelp_en').parents('li.EXLMainMenuItem').hide();
  $('body[class*=EXLCurrentLang_fr_FR]
a.EXLMainMenuITEMhelp_de').parents('li.EXLMainMenuItem').hide();

  $('body[class*=EXLCurrentLang_de_DE]
a.EXLMainMenuITEMhelp_fr').parents('li.EXLMainMenuItem').hide();
  $('body[class*=EXLCurrentLang_de_DE]
a.EXLMainMenuITEMhelp_en').parents('li.EXLMainMenuItem').hide();
</script>
```

## Customizing the No Results Page

[Return to menu](#)

The No Results page returns when a user performs a query that has no results. It allows you to provide additional instructions to users to help them perform more productive searches. For example:



No Results Page Displayed in the Front End

## Back Office Configuration

Out of the box, Primo provides a default page called `noResults.html`, which is stored in the `static_htmls` directory on the Primo server. The `static_htmls` directory is located under the following directory:

```
/exlibris/primo/p4_1/ng/primo/home/system/tomcat/search/webapps/primo_library#libweb
```

You can modify the default page or create a new file as long as you specify its path name in the No Results Page section in the Static HTML tile in the Views Wizard. For cloud installations, you can use the File Uploader tool ([Primo Home > Primo Utilities > File Uploader](#)) to upload the page to the server. For more information on the tool, see the *Primo Back Office Guide*.

**Primo Back Office**

[Primo Home](#) > [Ongoing Configuration Wizards](#) > [Views Wizard](#)

> **Edit HTML Attributes**

View : Auto1      Tile : Static HTML

**Contents of HTML Tile**

Position	Assigned HTML
<b>Home Page:</b>	
Low Right	<input type="text" value="/static_htmls/news.html"/>
Upper Right	<input type="text" value="/static_htmls/singin.html"/>
Low Left	<input type="text" value="/static_htmls/service.html"/>
Upper Left	<input type="text" value="/static_htmls/featured.html"/>
<b>Brief Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasbrief.jsp"/>
<b>Full Result:</b>	
Bottom	<input type="text" value="/static_htmls/ideasfull.jsp"/>
<b>Browse:</b>	
Bottom	<input type="text" value="/static_htmls/browse.html"/>
<b>No Results Page:</b>	
Bottom	<input type="text" value="/static_htmls/noResults.html"/>
<b>All Pages:</b>	
Header	<input type="text" value="/static_htmls/header.html"/>
Footer	<input type="text" value="/static_htmls/footer.html"/>

**Cancel & Go back** **Save & Continue**

To Tiles List To Tiles List

### No Results Page Section in Static HTML Tile

If you want to create locale-specific versions of the default file configured in the Static HTML tile, you must use the following naming convention and upload the file to the server so that it can be stored in the same directory as the default file:

```
<default_filename>_<locale>.html
```

For example:

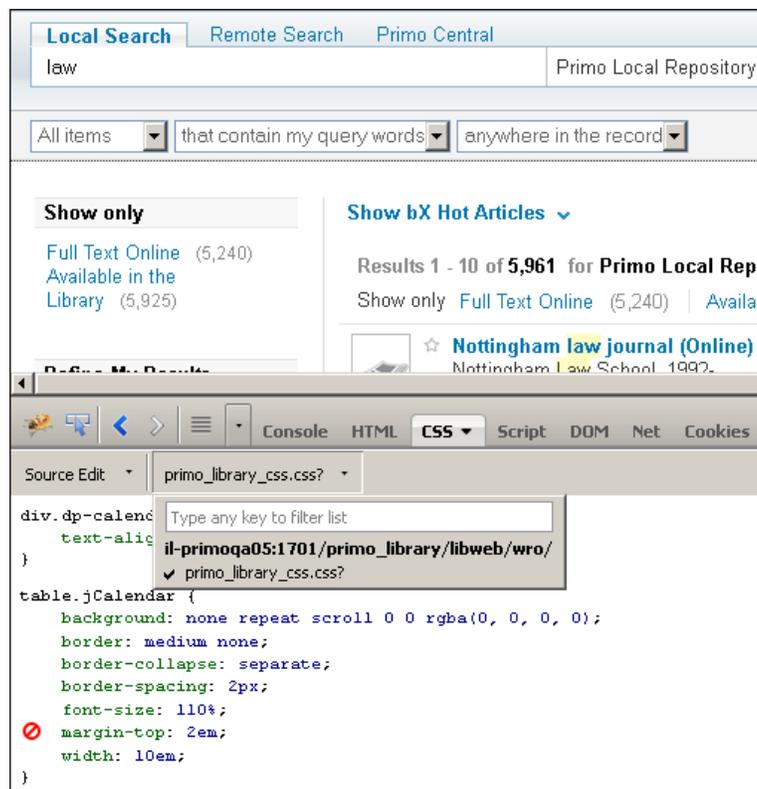
```
noResults_iw_IL.html
```

## Debugging CSS and JavaScript - Disabling the wro4j Tool

[Return to menu](#)

Primo utilizes the wro4j tool, which is used for analysis and optimization of Web resources (<https://github.com/wro4j/wro4j>). As a result of this integration, the system will no longer fetch all CSS files for every page. Instead, a virtual CSS file called `primo_library_css.css` is fetched by the browser and cached until it has changed. The same is done with JavaScript files that are part of the system. This can affect developers who use tools such as Firebug by preventing them from displaying the complete list of CSS and JavaScript files. It also means that if the hierarchy of the CSS files has changed, the change will not be seen until the code tables have been deployed.

The following figure shows the use of wro4j in a Primo search. Note that `primo_library_css.css` is a virtual file and cannot be viewed.



### wro4j Integrated in Primo Search

#### Note

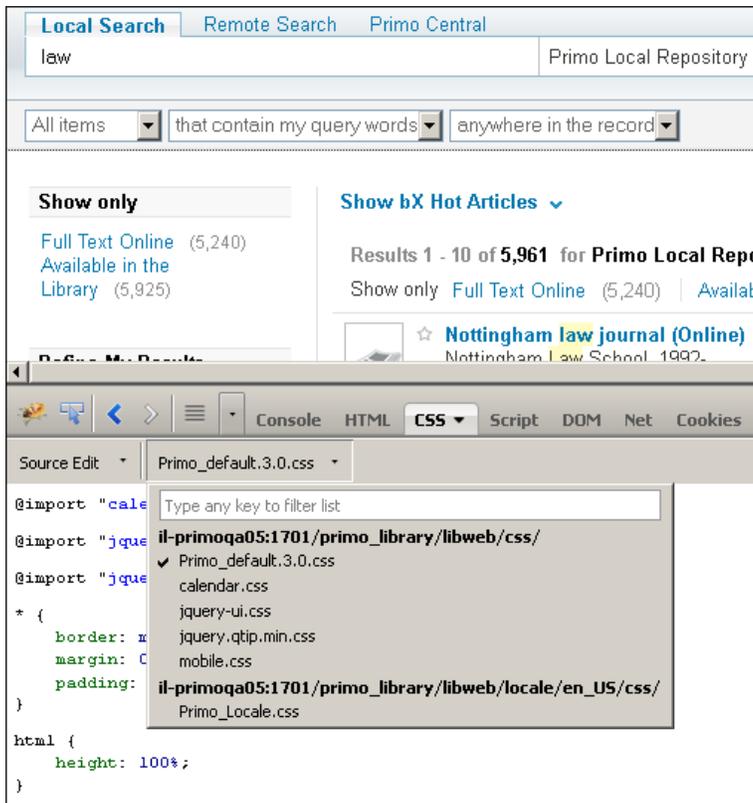
With the use of wro4j in Primo, no file locations have changed and you should not expect or need to make any changes to your CSS files.

To deactivate wro4J and display the actual CSS and JavaScript files that are being used by Primo, you can use a Web tool (such as FireBug) in your browser and append the `wroDevMode=true` parameter to the Primo URL, or you can add a

bookmark to your browser's toolbar that contains the following JavaScript line, which appends the `wroDevMode=true` parameter to the current page when the bookmark is selected:

```
javascript:var%20gotoLocation=window.location.toString()+'&wroDevMode=true';window.location=gotoLocation
```

The following figure shows the expanded list of CSS files that are being used for a Primo search.



Expanded List off CSS Files in Primo Search

## The Standard Layout

The Custom Layout Editor in the Back Office allows you to modify the layout of views, which is standard across all views. This section describes the changes that were made to the various pages in the standard layout. For information on using the Custom Layout editor, see [Custom Layout Editor](#).

This section includes:

- [Mapping the Static HTML Files to the Front End](#)
- [Translation from New Tiles to Old Tiles](#)

# Mapping the Static HTML Files to the Front End

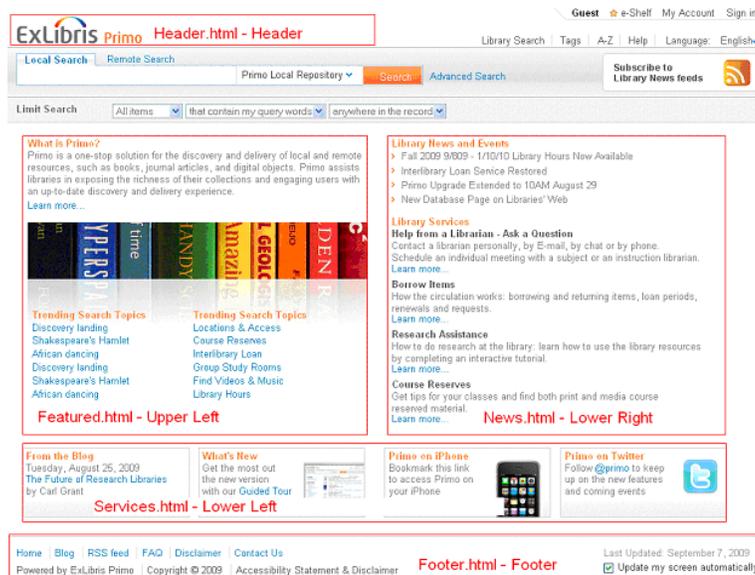
[Return to menu](#)

All of the static HTML slots used in Primo v2 have been retained in Primo v3, but some of them default to no content in Primo v3.

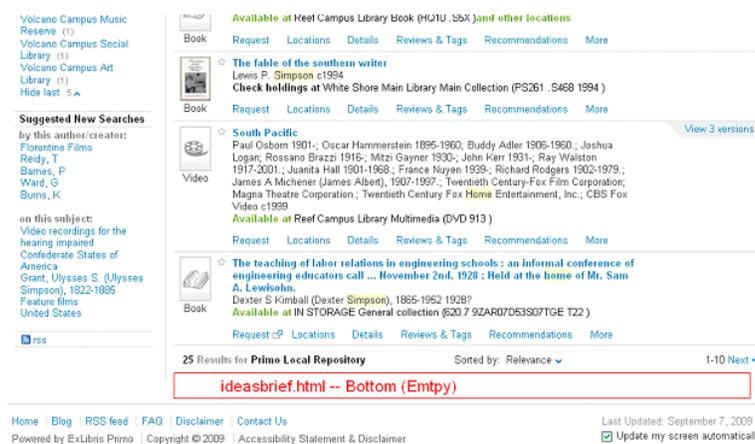
The Home Page layout no longer contains the `signin.html` static HTML file because the **sign in** link was moved to the top of the page in Primo v3. If you want to implement a layout with four static HTMLs, you can either create a custom tile via the custom layout or manually add the `signin.html` static HTML file in the custom layout.

The static HTML in the Full Display layout has been removed in Primo v3. The same instructions for adding the Static HTML via Custom Layout apply if you want to include a static HTML file in the full display. Note that this design choice was made to focus all attention on the displayed tab in the full display and to allow the display to be as large as possible. This allows users to display this information in a larger format than what is available on the Brief Results page.

The following figures show the standard slots of the static HTML within the Front End user interface:



## Static HTML Slots ( Page 1 of 2)





---

## Translation from New Tiles to Old Tiles

[Return to menu](#)

The major change to the custom layout is that it is an exact replica of the standard layout. This makes it easier to design the standard layout with CSS, move to a custom layout, and then add additional or customized tiles.

Specific changes to the standard layout are described in the following section.

---

## Home Page

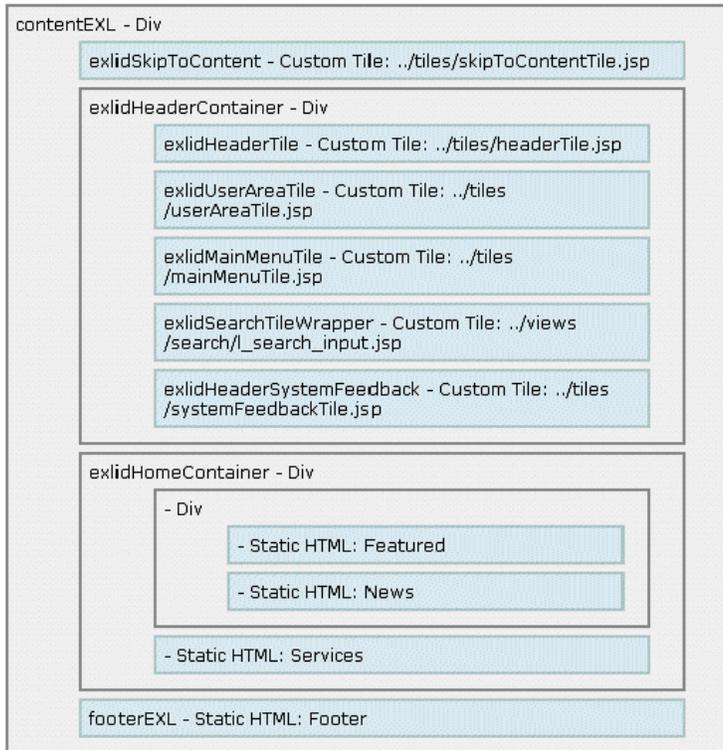
The Home Page layout is now more complicated but you will see that the header and search-related tiles are identical between the three pages. The fact that it is more complicated gives you more control in terms of customization and playing with the layout.

The following figure shows the Home Page layout for Primo v2:



### Home Page Layout (Primo Version 2)

The following figure shows the Home Page layout for Primo v3:



### Home Page Layout (Primo Version 3)

Note the placement of the static HTMLs. This structure is primarily used for the out of the box Static HTMLs. You can freely modify the structure of anything in #exlidHomeContainer.

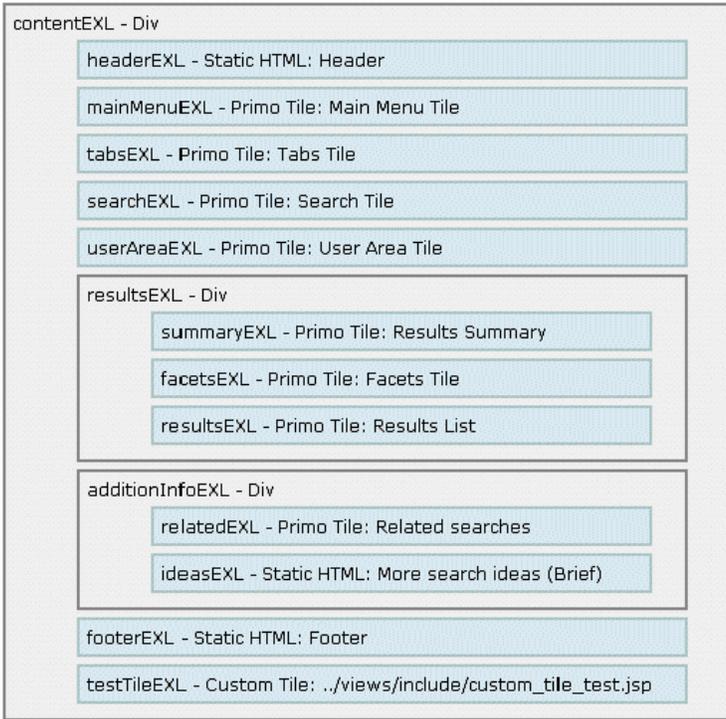
---

## Brief Display

Whereas in Version 2, the Full Record page was the most complicated layout, the Brief Display page has taken the lead in Version 3.

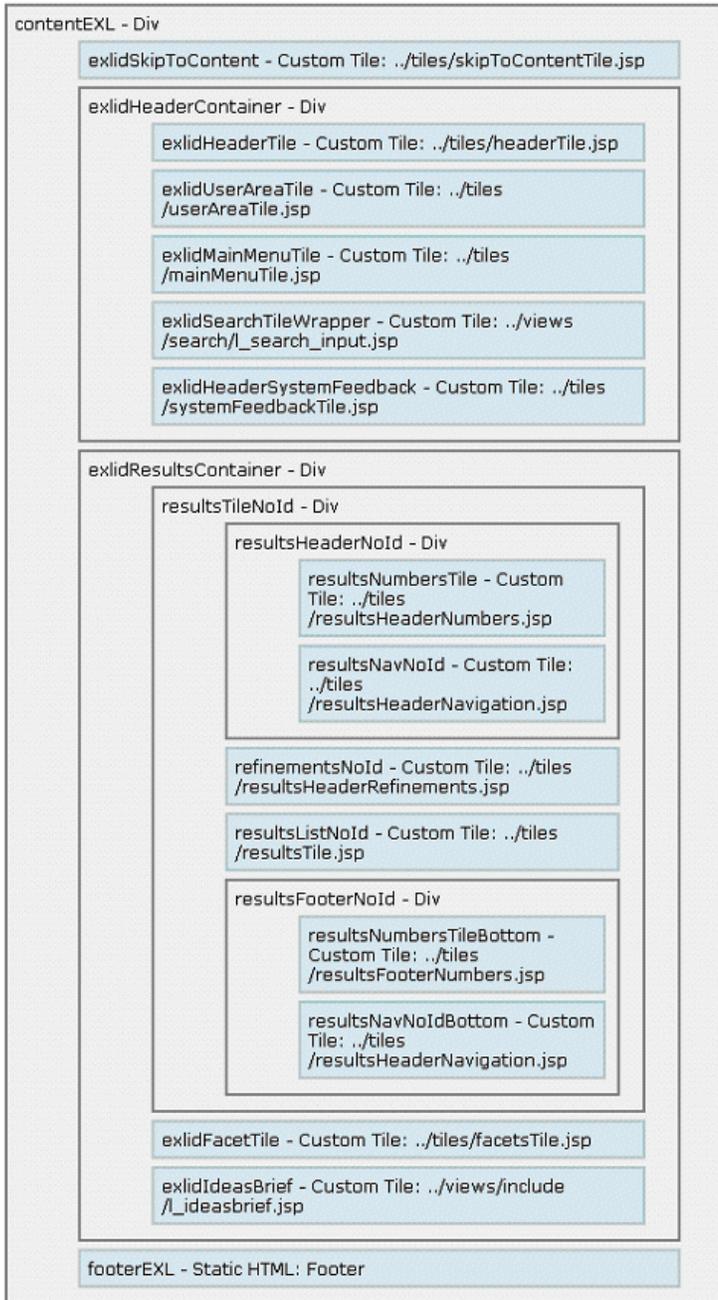
The most significant design change is the placement of the Facets tile. Although it appears visually on the left in the new layout, it still loads after the results, which results in a significant difference in how fast the search feels. This is especially true when large numbers of Facets are presented.

The following figure shows the Brief Display layout for Primo v2:



### Brief Results Layout (Primo Version 3)

The following figure shows the Brief Display layout for Primo v3:

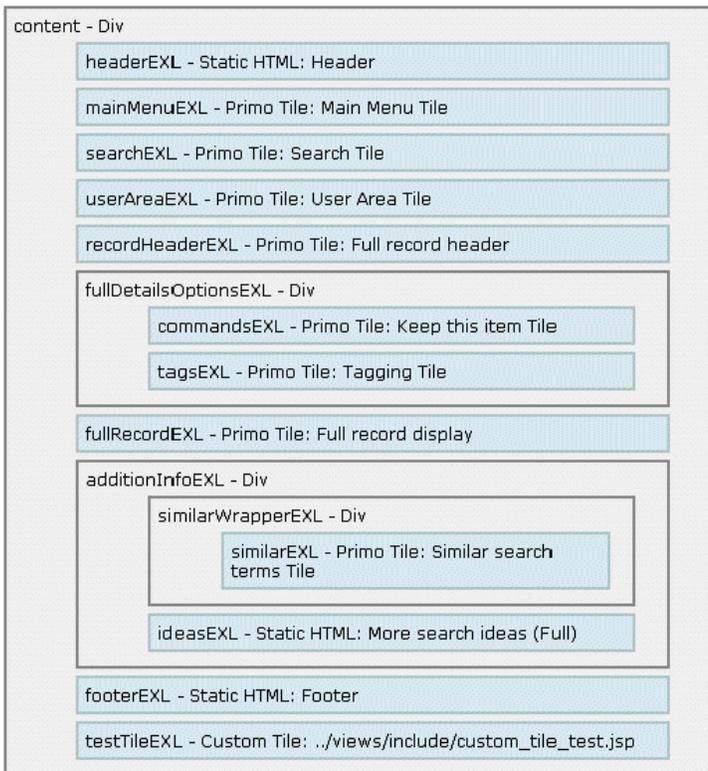


**Brief Results Layout (Primo Version 3)**

## Full Display

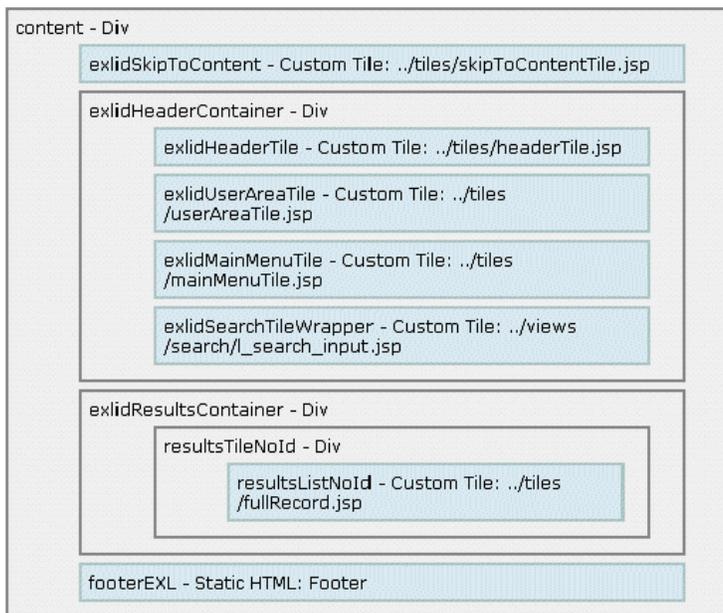
The Full Display page is now simpler and its overall layout is in line with the Home Page.

The following figure shows the Full Display layout for Primo v2:



**Full Page Layout (Primo Version 2)**

The following figure shows the Full Display layout for Primo v3:



**Full Page Layout (Primo Version 3)**

## Primo CSS Styles

This section provides a brief description of the main styles used in Primo v3. The most important design change is that tables are no longer used in the layout.

## CSS Classes and IDs

The other major advancement is that all Primo styles use new and intuitive class names, which are prefixed with **EXL-** to avoid collisions with the tiles and static HTML files that you add.

In addition, Primo styles use CSS IDs (**ids**), which are generally prefixed with **exlid-**. As a design decision, we have tried to keep much of the CSS based on CSS classes and independent of **ids** to provide backwards compatibility for legacy names.

For more information on the styles used in the Primo CSS, refer to [Primo CSS Structure](#).

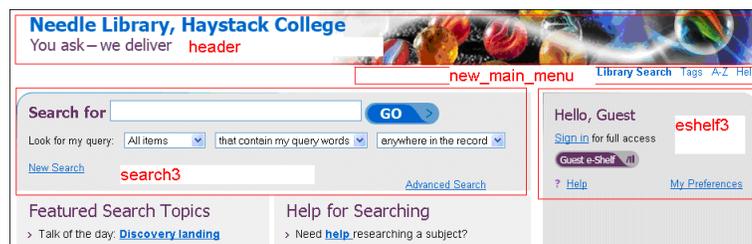
### Note

If you want to modify the layout of the Front End, you can use a Firefox plug-in, such as Firebug, to see exactly how the pages are defined.

## Mapping of V2 to V3 Classes

Because of the new Classes and CSS design, as well as the radically different HTML structure in this redesign for Version 3, providing a map of old class names to new class names is virtually impossible and mostly meaningless. Still, we'll try to do our best to give you a fighting chance of adapting your old Primo styles to your new Primo. We would recommend taking the opportunity to try out the new layouts or themes for Primo v3, because many of the features are laid out differently.

The following figure shows the Search box styles used in the Front End for Primo v2:



Search Box Styles in Primo Version 2

The following figure shows the Search box styles used in the Front End for Primo v3:



Search Box Styles in Primo Version 3

The following figure shows the results styles used in the Front End for Primo v2:

**Results for Primo Local Repository** (RSS)

2,006 Results, sorted by: relevance results

Show only: Online Resources (9)

1 **Annual report - National Book Trust, India.** (View details) itemsTable  
National Book Trust.  
fieldDelims=" " />  
New Delhi, National Book Trust.  
Add to e-Shelf Available at General collection (944.04 F418cE) (GetIt)

2 **The complete book of sewing.** (View details)  
Constance Talbot  
fieldDelims=" " />  
New York, N.Y., Book presentations 1943  
Add to e-Shelf Available at Annex Sub-Basement (658.8 W505 ) (GetIt)  
Additional locations

3 **The book of annuals.** (View details)  
Alfred Carl Hottes 1891-1955.  
fieldDelims=" " />  
New York, N.Y., A. T. De La Mare company, Inc. 1928  
Add to e-Shelf Available at General collection (SB732 .W3 1952 ) (GetIt)  
Additional locations

4 **Studies in Mediterranean archaeology. Pocket-book.** (View details)

**refines**  
Refine My Results  
Narrow my results by limiting the search to:  
**Topic:**  
> Agriculture (62)  
> Insects (35)  
> Bee culture (24)  
> United States (24)  
> Hunting (12)  
Show 15 more  
**Creator:**  
> Salle, A. (2)  
> Teale, E. (2)  
> Brumley, O. (2)  
> Sanders, E. (2)  
> Thompson, H. (2)  
Show 15 more

### Search Results Styles in Primo Version 2

The following figure shows the results styles used in the Front End for Primo v3:

**Show only** Online Resources (91,732) Available (840,118) EXLFacetTile Kenne my resusins

Topic  
United States (26,186)  
Italy (1,397)  
Presidents (1,305)  
Natural history (1,106)  
Real property (1,016)  
Show 55 more

Creator  
NetLibrary, Inc (11,258)  
Books247, Inc (4,853)  
Smith, J. (600)  
Williams, M. (162)  
Williams, E. (105)  
Show 55 more

Collection  
Volcano Campus Fun Library (390,307)  
Reef Campus

**878,420 Results for Primo Local Repository** Sorted by: Relevance 1-10 Next

Show only Online Resources (91,732) Available (840,118) EXLResultsTile

Book  
Railroadians of America, 1939.  
Available at IN STORAGE General collection (Quarto 366.06 92AR03021S13TDB R1306)  
Request Locations Details Reviews & Tags Recommendations More

Book  
A literature guide to The book of three : by Lloyd Alexander  
Norma Bagnall Book Wise, Inc. c1990  
Available at  
Request Locations Details Reviews & Tags Recommendations More

Book  
The World Book encyclopedia.  
World Book, Inc. c1993  
Check holdings at Reef Campus Library TMC (AE5 .W6 1993)  
Request Locations Details Reviews & Tags Recommendations More  
View 5 versions

Book  
Poetry Book Society : the first twenty five-years  
Poetry Book Society. Eric Walter White 1905- 1979  
Available at Volcano Campus Fun Library General collection (820.119 P7515 )  
Request Locations Details Reviews & Tags Recommendations More

### Search Results Styles in Primo Version 3

The following figure shows the full details styles used in the Front End for Primo v2:

**Annual report - National Book Trust, India.**  
Author: National Book Trust.  
Subjects: National Book Trust -- Periodicals  
Publisher: New Delhi, National Book Trust.  
Format: v. 21-28 cm.  
Language: English  
This item in the Library Catalog  
Add to e-Shelf Available at General collection (944.04 F418cE) (GetIt)

Availability and location:  
Available: General collection (944.04 F418cE)

Reviews  
Sign in to write a review

Keeping this item  
E-mail Print  
Select how to save Go

Tagging What is tagging?  
Ignore my query and look for everything tagged.  
My tags for this item:  
Sign in to see your tags and add new ones  
Everybody's tags for this item: Cloud / List  
Tags page

Haven't Found What You're Looking For?  
May we suggest:  
See similar items. (by the same author, on the same subject, in other editions, in other formats, or in other languages)  
Make sure your query is spelled correctly  
Change your query words or your selections in the Look for boxes

Similar Items  
creator: related\_tagging  
National Book Trust  
subject:  
National Book Trust -- Periodicals

footer  
Primo by Ex Libris - Find It. Get It.

### Full Details Styles in Primo Version 2

The following figure shows the full details styles used in the Front End for Primo v3:

<b>A literature guide to The book of three : by Lloyd Alexander</b> Norma Bagnall Book Wise, Inc. c1990		<b>EXLSummaryContainer</b>
<b>Available at</b>		
<a href="#">Request?</a> <a href="#">Locations</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">More</a> <b>EXLTabsRibbon</b>		Send to ▾
<b>EXLTabHeader</b>		
<b>Title:</b> A literature guide to The book of three : by Lloyd Alexander <b>Author:</b> Norma Bagnall Book Wise, Inc. <b>Subjects:</b> Alexander, Lloyd. The book of three ; Reading (Elementary) ; Reading comprehension ; Children's literature ; Children -- Books and reading <b>Publisher:</b> Cambridge, Mass: Book Wise <b>Creation Date:</b> c1990 <b>Format:</b> 50 p. ; 28 cm. <b>Language:</b> English		<b>EXLTabContent</b>  <b>Links</b> > <a href="#">This item in the Library Catalog</a> > <a href="#">Table of Contents</a> > <a href="#">Abstract</a> > <a href="#">This item in Amazon.com</a> > <a href="#">This item in WorldCat®</a>
<a href="#">Back to results list</a>		<a href="#">Previous Result 2</a> <a href="#">Next</a>

**Full Details Styles in Primo Version 3**

## Configuration Options

This section includes:

- [Displaying the Facets on the Right Side](#)
- [Changing the Add to e-Shelf Icon](#)
- [Changing the Size of the Header](#)
- [Hiding/Showing the Tabs on the Results Page](#)
- [Configuring the Title and Thumbnail Links](#)
- [Moving the Thumbnails to the Right Side](#)
- [Displaying Result Numbers in Brief Results](#)
- [Enabling Hold and Search Buttons To Be Resized](#)
- [Hiding Languages from the Language Selection List](#)
- [Modifying the Look of the Availability Indicator](#)
- [Hiding the Clear All Mechanism](#)
- [Configuring the Send To Actions](#)
- [Hiding Columns in My Account Lists](#)
- [Hiding the Citation Disclaimer](#)
- [Hiding the Boolean Operator Drop-Down Lists for Advanced Searches](#)
- [Hiding the Date Slider](#)

## Displaying the Facets on the Right Side

[Return to menu](#)

This section describes the CSS changes needed to display the facets on the right side of the Front End. The following CSS code moves the facets to the right side:

```
.EXLResultsContainer div.EXLResultsTile { padding-right:1%; padding-left:0; border-right: 1px solid #D7DDE3; border-left:none; float:left;}

.EXLFacetTile {float:right;}
```

The result for this changes appears as follows:

 <p>☆ <a href="#">Language and ontology.</a> Jack Kaminsky 1922- 1969 <b>Check holdings at</b></p> <p>Book <a href="#">Request</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">Additional services</a></p>	<p><a href="#">Genre 1950</a> (7) <a href="#">1956 To 1961</a> (4) <a href="#">1961 To 1965</a> (4) <a href="#">1965 To 1969</a> (9) <a href="#">After 1969</a> (9)</p>
 <p>☆ <a href="#">Let my people go: a journey through Exodus.</a> Jack Finegan 1908- c1963 <b>Available at</b> <a href="#">Circulating Collection (222.12 F49)</a> <b>and other locations</b></p> <p>Book <a href="#">Request</a> <a href="#">Locations</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">Additional services</a></p>	<p><b>Suggested New Searches</b> by this author/creator: <a href="#">Lewis, C</a> <a href="#">Jacks, L</a> <a href="#">George Peabody College for Teachers. Dept. of Psychology</a> <a href="#">Tapp, J</a> <a href="#">Kaminsky, J</a></p>
 <p>☆ <a href="#">Why I am a Unitarian.</a> Jack Mendelsohn 1918- 1960 <b>Available at</b> <a href="#">Circulating Collection (230.8 M52)</a></p>	

### Displaying Facets on the Right Side

## Changing the Add to e-Shelf Icon

[Return to menu](#)

With Primo v3, users add items to their e-Shelf by selecting the Star icon that displays next to the item in the brief results. In general, this icon can be changed by adding new images to the server and updating the User Interface Images code table.

### To change the Star icon to a check box:

1. Save the check box images (`icon_checkbox_on.png` and `icon_checkbox_off.png`) to a directory on your Back Office server. For example:

```
.../ng/primo/home/system/tomcat/search/webapps/primo_library#libweb/customized/images
```

2. Select the **User Interface Images** code table on the following page in the Back Office:

**Primo Home > Advanced Configuration > All Code Tables > Front Ends** subsystem

Primo Home > Advanced Configuration > All Code Tables

ExLibris Primo  
Hello Admin

> Code Tables

Update for Owner: Installation Sub System: Front End

Table Name: User Interface Images

Code Table Rows

Enabled	Code	Description	Language	Display Order	Default Value
<input checked="" type="checkbox"/>	default.ui.images.v3.iconstaron	../images/icon_star_on.png	en_US	60	<input type="checkbox"/>
<input checked="" type="checkbox"/>	default.ui.images.v3.iconstaroff	../images/icon_star_off.png	en_US	59	<input type="checkbox"/>

Table Description: Names of images used in front end

Create a New Code Table Row

Code	Description	Language	Display Order	Default Value
<input type="text"/>	<input type="text"/>	<input type="text"/>	0	<input type="checkbox"/>

Cancel & Go back To Code Table List

Save & Continue To Code Table List

### User Interface Images Code Table

3. Update the **Description** field to reference the new images that you placed on the Back Office server. For this example, you will have to update the **iconstaron** and **iconstaroff** codes, as follows:

<input checked="" type="checkbox"/>	default.ui.images.v3.iconstaroff	../customized/images/icon_checkbox_off.png	en_US
<input checked="" type="checkbox"/>	default.ui.images.v3.iconstaron	../customized/images/icon_checkbox_on.png	en_US

### Changes to the Star Icon Codes

4. Click **Save & Continue**.
5. On the **Primo Home > Deploy All** page, select the **All Code Tables and Mapping Tables** option and then click **Deploy** to update the Front End.

6. Refresh the view to see the results of the changes. For example, the result of this change displays as follows:

**413,068 Results for Primo Local Repository** Sorted by: Re

Show only [Online Resources](#) (1,804) | [Available](#) (400,840)

---

  **The World Book encyclopedia.**  
World Book, Inc. c1992  
**Available at** GWCC DWCC-Ref (AE5 .W55 1992b ) **and other lo**

Book [Request](#) [Locations](#) [Details](#) [Reviews & Tags](#) [More](#)

---

  **Kelley blue book**  
Kelley Blue Book Company. c2000-  
**Online access**

Book [View Online](#) [Locations](#) [Details](#) [Reviews & Tags](#) [More](#)

---

  **The Book of Mormon : an account written by The hand of M**  
**taken from the plates of Nephi**  
Smith, Joseph, 1805-1844.; Church of Jesus Christ of Latter-Day  
**Available at** Rancho Santiago CC MAIN (BX 8623 B77 ) **and ot**

Book

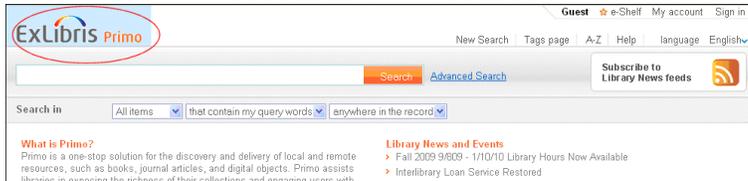
**Check Boxes Added to Brief Results**

## Changing the Size of the Header

[Return to menu](#)

In Version 3, we've significantly reduced the size of the search interface in order to make the search results and screen content more prominent. As a result, the logo area of the header has been decreased to permit these changes.

The following figure shows the default space that is allotted to the logo in the header area:



### Default Logo Area

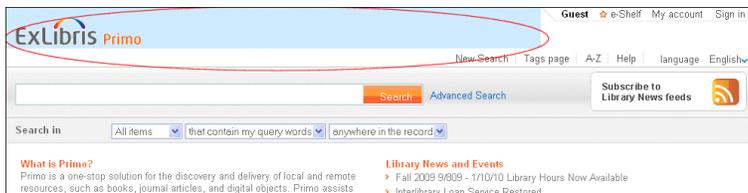
If you want to modify the header to expand the logo or add new functionality, you can make the following modification to the Primo CSS files, as follows:

```
#exlidHeaderTile{width:70%}

.EXLSearchWrapper{clear:both}

#exlidMainMenuTile {margin-top:0px}
```

The result of this code displays as follows:



### Expanded Logo Area

It pushes the MainMenuTile down slightly, but it provides a much larger logo area.

Alternatively, if you want to provide a logo area that covers the entire header space but sits beneath the Primo functions, try something like this:

```
#exlidHeaderTile{width:100%;}

.EXLSearchWrapper{clear:both;}

#exlidMainMenuTile {clear:none; z-index:20;margin-top:0px}

#exlidUserAreaTile {position:absolute;right:0px;top:0px;z-index:20;}
```

The result of this code displays as follows:



**Logo Area Expanded Over Entire Header**

## Hiding/Showing the Tabs on the Results Page

[Return to menu](#)

The most prominent feature in Primo v3 is the use of quick-browsing tabs, which display under each search result record, as shown in the following figure:

	<p>☆ <b>A literature guide to The book of three : by Lloyd Alexander</b> Norma Bagnall Book Wise, Inc. c1990 <b>Available at</b></p> <p>Book   Request <a href="#">Request</a>   Locations   Details   Reviews &amp; Tags   Recommendations   More</p>
	<p>☆ <b>The World Book encyclopedia.</b> <span style="float: right;"><a href="#">View 5 versions</a></span> World Book, Inc. c1993 <b>Check holdings at</b> Reef Campus Library TMC (AE5 .W6 1993 )</p> <p>Book   Request   Locations   Details   Reviews &amp; Tags   Recommendations   More</p>
	<p>☆ <b>Poetry Book Society : the first twenty five-years</b> Poetry Book Society. Eric Walter White 1905- 1979 <b>Available at</b> Volcano Campus Fun Library General collection (820.119 P7515 )</p> <p>Book   Request <a href="#">Request</a>   Locations   Details   Reviews &amp; Tags   Recommendations   More</p>
	<p>☆ <b>The anatomy of a book format in the hand-press period ; The making of a Renaissance book</b> Dana Atchley; Terry Belanger; Peter Herdrich; Book Arts Press.; Museum Plantin-Moretus 2003 <b>Check holdings at</b> Volcano Campus Learning Center General collection (DVD101 )and</p> <p>Video</p>

### Brief Results - All Tabs Displayed

## Hiding All Tabs in the Brief Results

If you want to hide all of the tabs from your users, update the CSS, as follows:

```
.EXLResultsList tr.EXLResult td div.EXLTabsRibbonClosed {display:none;}
```

The result of this code displays as follows:

3 Results for Primo Local Repository		sorted by: relevance ▼
Show only <a href="#">Available</a> (1)		
	<p>☆ <b>Bookmen's bedlam; an olio of literary oddities.</b> Walter Hart Blumenthal 1883-1969. 1969, c1955 <b>Check holdings at</b></p> <p>Book</p>	
	<p>☆ <b>The new Gold in your attic.</b> Van Allen Bradley 1913- 1968 <b>Available at</b> FCPMN Reference (094 B72n )</p> <p>Book</p>	
	<p>☆ <b>The book collector's handbook of values.</b> Van Allen Bradley 1913- 1972 <b>Check holdings at</b></p> <p>Book</p>	

### Brief Results - All Tabs Hidden

---

## Hiding a Specific Tab in the Brief Results

If you want to hide a particular tab, such as the Reviews tab to prevent users from adding tags or reviews, you can use FireBug to determine the class name of the tab and add the following simple CSS line to your styles:

```
.EXLResult .EXLReviewsTab {display:none;}
```

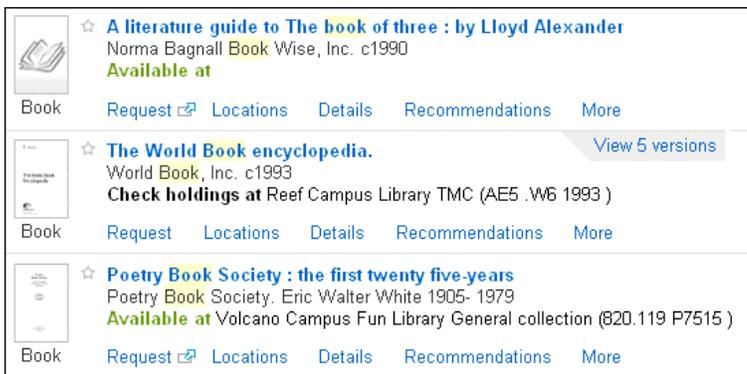
---

### Note

The CSS class for the Reviews tab is **EXLReviewsTab**.

---

The resulting view displays as follows, omitting the Reviews tab from the Brief Results page:



The screenshot shows three search results in a list. Each result has a book icon on the left and a title in blue. Below the title is the publisher and year. A green 'Available at' label is present for the first and third items. Below each result is a horizontal ribbon with tabs: 'Book', 'Request' (with a magnifying glass icon), 'Locations', 'Details', 'Recommendations', and 'More'. The 'Reviews' tab is not visible. The second result has a 'View 5 versions' link on the right side of the ribbon.

- A literature guide to The book of three : by Lloyd Alexander**  
Norma Bagnall Book Wise, Inc. c1990  
**Available at**  
Book | Request | Locations | Details | Recommendations | More
- The World Book encyclopedia.** View 5 versions  
World Book, Inc. c1993  
**Check holdings at** Reef Campus Library TMC (AE5 .W6 1993 )  
Book | Request | Locations | Details | Recommendations | More
- Poetry Book Society : the first twenty five-years**  
Poetry Book Society. Eric Walter White 1905- 1979  
**Available at** Volcano Campus Fun Library General collection (B20.119 P7515 )  
Book | Request | Locations | Details | Recommendations | More

### Hiding Tabs in Brief Results

---

## Enabling the Mouse-Over Option in the Brief Results

If you want to keep the interface feeling light and allow users to access all of the tabs, you can display the tab links only when users place the cursor over a result. To enable this option, add the following code to your styles:

```
.EXLResultsList tr.EXLResult td div.EXLTabsRibbonClosed li.EXLResultTab  
a{color:#FFFFFF; }  
  
.EXLResultsList tr:hover.EXLResult td div.EXLTabsRibbonClosed li.EXLResultTab  
a{color:#0075b0; }
```

The resulting view displays as follows:

Show only [Available \(1\)](#)

	<p>☆ <a href="#">Bookmen's bedlam; an olio of literary oddities.</a> Walter Hart Blumenthal 1883-1969. 1969, c1955 <b>Check holdings at</b></p>
Book	
	<p>☆ <a href="#">The new Gold in your attic.</a> Van Allen Bradley 1913- 1966 <b>Available at</b> FCPMN Reference (094 B72n )</p>
Book	<p><a href="#">Request</a> <a href="#">Locations</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">Additional services</a></p>
	<p>☆ <a href="#">The book collector's handbook of values.</a> Van Allen Bradley 1913- 1972 <b>Check holdings at</b></p>
Book	

### Mouse-Over Function in Brief Results

---

#### Note

Because the mouse-over CSS function does not work in IE6, either you will need to provide a JavaScript workaround for IE6, or IE6 users will need to click on the title to access the tabs from the Full Result display.

---

## Configuring the Title and Thumbnail Links

[Return to menu](#)

For the classic Primo UI, you can specify what happens when a user clicks a record's title and thumbnail on the brief results page by selecting one of the following options on the Brief Results tile in the Views Wizard (**Primo Home > Ongoing Configuration Wizards > Views Wizard**):

- Link to a specific tab (such as the Details tab) in the record's full display.
- Link to the online resource

For information on thumbnail templates, see [Thumbnails](#).

### To configure these options:

1. In the Views Wizard (**Primo Home > Ongoing Configuration Wizards > Views Wizard**), select an institution and then click **Edit** next to the view you want to update.

The Edit View Attributes page opens.

2. Click **Save & Continue** to access the Search Scopes List page.
3. Click **Continue** to access the Tiles Configuration page.
4. Select **Brief Display** from the Page drop-down list.
5. Click **Edit Tile** next to the Brief Results tile.

**Primo Back Office** [About](#) [Logout](#) [Help](#)

[Primo Home](#) > [Ongoing Configuration Wizards](#) > [Views Wizard](#) **ExLibris Primo**

Hello Admin

> **Tiles Configuration**

View : Auto1 Page : **Brief Display**

All tiles of Auto1

Page	Title	Status	More
Brief Display	Brief Results	Configured By Client	<b>Edit Tile</b>
Brief Display	Refine My Results (Facets)	Configured By Client	Edit Tile
Brief Display	Locations	Configured By Client	Edit Tile

**Go back**  
To Views List

**Continue**  
To Deploy

### Brief Results Tile in Views Wizard

6. Choose an option from the **Define link from title** area:

Define link from title

- Link to online resource
- Link to full record display
  - GetIt Link 1
  - Details
  - Locations
  - Reviews & Tags

**Define Link from Title**

---

**Note**

Shown is the default setting, which is also the default behavior for Primo v2 and later releases.

---

## Moving the Thumbnails to the Right Side

[Return to menu](#)

In Primo v3, the thumbnails display on the left side instead of the right side, as previously displayed in Primo v2.

The only way to display the thumbnails on the right side is via the following Javascript change in the footer or header of the page:

```
<script type="text/javascript">
$.EXLResult.EXLThumbnail'.each(function(){
    $(this).parents(".EXLResult").append(this);
});
</script>
```

This jQuery example (a Javascript library already included in Primo) shows off the following results:

<p>☆ <b>The Arabs and mediaeval Europe</b> Norman Daniel 1975 <b>Available at</b> Circulating Collection (301.294 D18 )</p> <p><a href="#">Request</a> <a href="#">Locations</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">Additional services</a>  Book</p>
<p>☆ <b>The new church : essays in Catholic reform</b> Daniel Callahan 1930- c1966 <b>Available at</b> Circulating Collection (282 C13n ) <b>and other locations</b></p> <p><a href="#">Request</a> <a href="#">Locations</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">Additional services</a>  Book</p>
<p>☆ <b>Coping: essays on the practice of government</b> Daniel P. Moynihan (Daniel Patrick), 1927- 1973 <b>Available at</b> FCPMN General (309.173 M67c )</p> <p><a href="#">Request</a> <a href="#">Locations</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">Additional services</a>  Book</p>
<p>☆ <b>No more plastic Jesus : global justice and Christian lifestyle</b> Adam Daniel Corson-Finnerty c1977 <b>Available at</b> Circulating Collection (261.8 F51 ) <b>and other locations</b></p> <p><a href="#">Request</a> <a href="#">Locations</a> <a href="#">Details</a> <a href="#">Reviews &amp; Tags</a> <a href="#">Recommendations</a> <a href="#">Additional services</a>  Book</p>

### Thumbnails on the Right Side of Brief Results

Note that it is also possible to display the type icon on the left side and the thumbnail on the right side if it exists, but that is beyond the scope of this document.

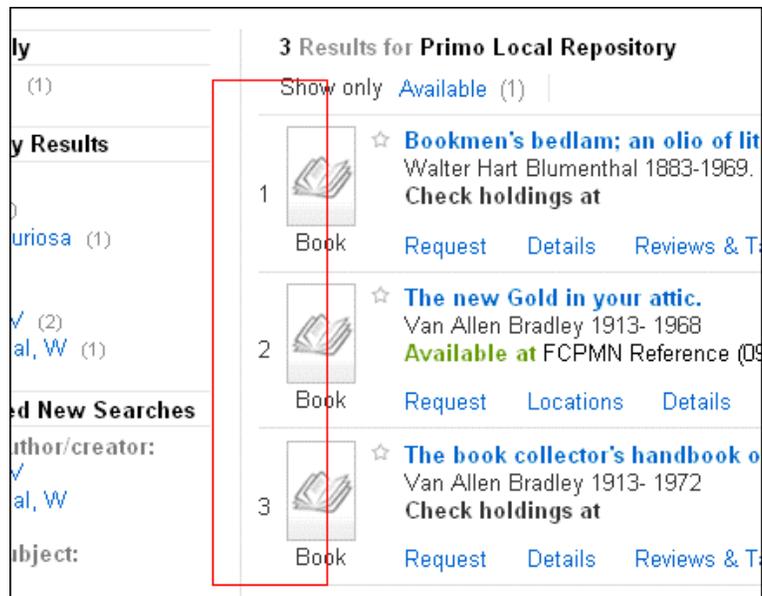
## Displaying Result Numbers in Brief Results

[Return to menu](#)

In Primo v3, the Front End user interface no longer displays the result numbers by default. The following CSS code enables result numbers:

```
.EXLResultsList td.EXLResultNumber {vertical-align: middle; display:table-cell;  
*display:block; width:1%;} /* note the *display hack for ie6/7 */
```

The result of this code displays as follows:



The screenshot shows a search results page titled "3 Results for Primo Local Repository". A red box highlights the result numbers 1, 2, and 3 next to the first three items. The items are:

- 1  **Bookmen's bedlam; an olio of lit**  
Walter Hart Blumenthal 1883-1969.  
**Check holdings at**  
[Request](#) [Details](#) [Reviews & T](#)
- 2  **The new Gold in your attic.**  
Van Allen Bradley 1913- 1968  
**Available at** FCPMN Reference (09  
[Request](#) [Locations](#) [Details](#)
- 3  **The book collector's handbook o**  
Van Allen Bradley 1913- 1972  
**Check holdings at**  
[Request](#) [Details](#) [Reviews & T](#)

Result Numbers in Brief Results

---

## Enabling Hold and Search Buttons To Be Resized

[Return to menu](#)

Because the Search and Hold buttons allow only 7 to 8 characters to display completely, non-English labels may not fit on the button.

To enable the Hold button to be resized, replace the existing classes with the following classes in your CSS file:

```
.EXLRequestTabContent form span.submit { display: inline-block; width:65px;
height:22px;float:left; margin-right:0.2em}
.EXLRequestTabContent form input.submit { background-color:#e87107; background-
image:url(..images/bg_strip_submit_temp.png); background-repeat:repeat-x;margin-
left:0em; width:auto; color:#FFFFFF; font-weight: normal;height:22px; cursor:
pointer;padding:0em 0.5em 0em 0.5em; border:1px solid #7f9db9;display:inline; }
```

To enable the Search button to be resized for a specific language style (such as French), add the following lines to your CSS file:

```
* -----Search Ribbon Styles----- */
.EXLSearchFieldRibbonFormSubmitSearch {width:13%; }
.EXLSearchFieldRibbonFormFields{width:87%;}
```

---

## Hiding Languages from the Language Selection List

[Return to menu](#)

At the installation and institution levels, the Languages mapping table in the Back Office allows you to define which languages appear in the Languages drop-down list in the Front End UI. Languages can be further hidden according to the needs of a particular view by modifying the view's CSS. To hide a language from the Languages drop-down list, use the following format, where *<add locale here>* is replaced with any locale (such as en\_US, ko\_KR, zh\_CN, ta\_IN, de\_DE, and so forth):

```
.EXLLanguageOptionLANG<add locale here> {display:none;}
```

---

### Note

There is no space between **.EXLLanguageOptionLANG** and the locale.

---

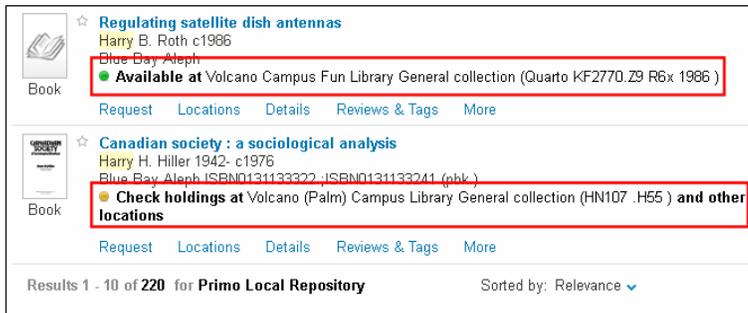
For example, to hide the Welsh language from the selection list in the Front End, add the following line to the view's CSS file:

```
.EXLLanguageOptionLANGcy_GB {display:none;}
```

## Modifying the Look of the Availability Indicator

[Return to menu](#)

The calculated availability indicator in the Full Display and Brief Results displays the item's availability text and color-coded availability icon so that users can quickly locate available items, as shown below.



The screenshot shows two search results for books. The first result is "Regulating satellite dish antennas" by Harry B. Roth, c1986, published by Blue Bay Aleph. It has a green dot icon and the text "Available at Volcano Campus Fun Library General collection (Quarto KF2770.Z9 R6x 1986)". The second result is "Canadian society: a sociological analysis" by Harry H. Hiller, 1942- c1976, published by Blue Bay Aleph. It has a yellow dot icon and the text "Check holdings at Volcano (Palm) Campus Library General collection (HN107 .H55) and other locations". Both availability indicators are enclosed in red rectangular boxes. Below the results, it says "Results 1 - 10 of 220 for Primo Local Repository" and "Sorted by: Relevance".

### Color-Coded Availability Status Indicator

The appearance of the availability indicator is controlled by the following elements in the `Primo_default.3.0.css` file.

```
.EXLResultsList em.EXLResultStatusAvailable {background-image: url(../images/
icon_available.png);background-repeat: no-repeat;background-position: 0px 3px;padding-
left: 15px;color:#000000}

.EXLResultsList em.EXLResultStatusNotAvailable {background-image: url(../images/
icon_unavailable_grey.png);background-repeat: no-repeat;background-position: 0px
3px;padding-left: 15px;color:#000000}

.EXLResultsList em.EXLResultStatusMaybeAvailable {background-image: url(../images/
icon_yellow.png);background-repeat: no-repeat;background-position:0px 3px;padding-left:
15px;color:#000000}
```

## Hiding the Clear All Mechanism

[Return to menu](#)

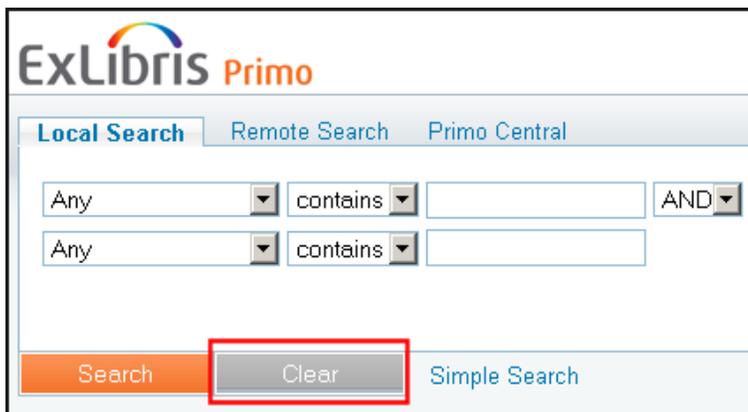
Out of the box, the Clear All mechanism appears for the various searches. You can disable them individually by changing your localized CSS file.

The following figure shows the Clear All mechanism on the Simple Search page:



Clear All on Simple Search Page

The following figure shows the Clear All mechanism on the Advanced Search page:



Clear All on Advanced Search Page

### To hide the Clear All mechanism:

1. Log on to the Back Office server as the `primo` user.

---

#### Note

Instead of accessing the server directly (as shown in steps 1 and 2), it is recommended to use the File Uploader utility (see [The File Uploader Tool](#)) to manage and publish CSS changes to the Primo Front End UI.

---

2. Enter the following commands to access and open the CSS file that is used to customize your view:

```
fe_web  
cd css
```

```
vi <custom_css>.css
```

---

### Note

It is not recommended to modify the default Primo CSS, which can be overwritten during updates. For more information regarding the customization of Primo views, see the *Primo Technical Guide*.

---

3. Add the following lines to your localized CSS file to hide the Clear All mechanism for various types of searches:

```
◦ Browse search:  
  
  .EXLBrowseSearchFieldRibbonFormSearchClear {display:none;}  
  
◦ A to Z list:  
  
  .EXLSearchEJournals .EXLSearchFieldRibbonFormSearchClear {display:none;}  
  
◦ Simple search:  
  
  #exlidSearchTile .EXLSearchFieldRibbonFormSearchClear {display:none;}  
  #exlidSearchTile.EXLSearchEJournals.EXLSearchFieldRibbonFormSearchClear  
  {display:block;}  
  
◦ Advanced search:  
  
  #exlidClearSelectedFieldsAdvancedSearch {display:none !important;}
```

4. Save the changes to the CSS file.
5. On the **Primo Home > Deploy All** page, select all options and click **Deploy**.

## Configuring the Send To Actions

[Return to menu](#)

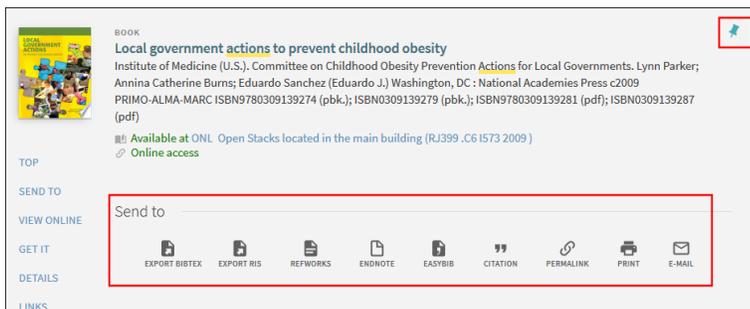
The Actions List mapping table allows you to configure the following aspects of the Send To Actions list, which displays for each record on the Brief Results and Full Display pages in the new and classic UIs:

- Enable/disable actions in the Actions list for the classic and new UIs. The following figure shows the Actions list on the Brief Results page in the classic UI.



### Send To Actions in Classic UI (Brief Results and Full Display)

- Set the order of the actions in Actions list for the classic and new UIs. The following figure shows the Actions list on the Full Display page in the new UI.



### Send To Actions in New UI (Full Display)

- Specify the up-front actions, which display on the Brief Results page in the new UI only. The following figure shows the up-front actions on the Brief Results page in the new UI.



### Up-Front Actions in New UI (Brief Results)

## Note

The PushTo Adaptors mapping table defines a URL for each of the Send To actions. Hosted and local Primo customers are permitted to add new adaptors for the classic UI only. For more information, see [PushTo Adaptors](#).

## Using the Actions List Mapping Table

The Actions List mapping table allows you to configure the Send To actions at both the institution and view levels.

### To configure the Send To actions:

1. On the Advanced Configuration page ([Primo Home > Advanced Configuration](#)), select **All Mapping Tables** to open the Mapping Tables page.
2. Select **Front End** from the **Subsystem** drop-down field and **Actions List** from the **Table Name** drop-down field.
3. Edit the **Actions List** mapping table.

The screenshot shows the 'Primo Back Office' interface for configuring the 'Actions List' mapping table. The breadcrumb trail is 'Primo Home > Advanced Configuration > All Mapping Tables'. The current configuration is for 'Volcano Island University' and 'Front End' subsystem. The table name is 'Actions List'. Below this is a table of mapping rows with columns for 'Enabled', 'Action name\*', 'Order', 'Up-front Actions', 'View\*', and 'Description'. The table contains 12 rows of actions, all of which are currently enabled. At the bottom, there is a 'Table Description' field containing 'List of actions and their order' and a 'Cancel & Go back' button.

Enabled	Action name*	Order	Up-front Actions	View*	Description
<input type="checkbox"/>			Select Value	Select Value	
<input checked="" type="checkbox"/>	e-shelf	1	1	default	
<input checked="" type="checkbox"/>	RefWorks	9	Select Value	default	
<input checked="" type="checkbox"/>	Citation	6	3	default	
<input checked="" type="checkbox"/>	Print	4	Select Value	default	
<input checked="" type="checkbox"/>	Delicious	10	Select Value	default	
<input checked="" type="checkbox"/>	EndNote	8	Select Value	default	
<input checked="" type="checkbox"/>	E-mail	3	2	default	
<input checked="" type="checkbox"/>	Permalink	5	Select Value	default	
<input checked="" type="checkbox"/>	RISPushTo	11	Select Value	default	
<input checked="" type="checkbox"/>	EasyBib	7	Select Value	default	
<input checked="" type="checkbox"/>	BibTexPushTo	12	Select Value	default	
<input checked="" type="checkbox"/>	SMS	2	Select Value	default	

Table Description: List of actions and their order

[Cancel & Go back](#)  
To Mapping Table List

### Actions List Mapping Table

4. If you haven't already customized the mapping table, click **Customize**.
5. Select the **Enabled** check box for each action that you want displayed in the UI. If you want to hide an action, clear its check box.
6. Use the **Order** field to specify the order of the actions in the UI. In the new UI, the items are ordered from right to left.

7. For the new UI only, use the **Up-front Actions** drop-down list to specify the three actions that you want to appear in the Brief Display of a record.
8. From the **View** field, select a specific view name or **default** if you want the setting to apply as the default setting for all views.
9. Click **Save**.
10. Deploy your changes to the UI.

---

## Using CSS to Hide Actions in the Classic UI

Primo allows you to hide unused Send To actions (except for the add to e-Shelf action) in the Front End.

Hosted and SaaS customers must use the [File Uploader tool](#) or the [Customization Package Manager](#) to upload CSS files to the server.

The following class has been added to control the display of Send To options in the Action drop-down list in the Front End.

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList li.EXLButtonSendTo$ <adaptor  
identifier> {display:none}
```

The `{display:none}` parameter hides the specified `<adaptor Identifier>`, which is defined in the Pushto Adaptors mapping table.

### To hide the Send To actions:

1. Log on to the Back Office server as the `primo` user.

---

#### Note

Instead of accessing the server directly (as shown in steps 1 and 2), it is recommended to use the File Uploader utility (see [The File Uploader Tool](#)) to manage and publish CSS changes to the Primo Front End UI.

- 
2. Enter the following commands to access and open the CSS file that is used to customize your view:

```
fe_web  
cd css  
vi <custom_css>.css
```

---

#### Note

It is not recommended to modify the default Primo CSS, which can be overwritten during updates. For more information regarding the customization of Primo views, see the *Primo Technical Guide*.

- 
3. Add the following lines to your localized CSS file to hide the Send To actions:

- **Email:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList li.EXLButtonSendToMail  
{display: none;}
```

- **Print:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList li.EXLButtonSendToPrint  
{display: none;}
```

- **Permalink:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList  
li.EXLButtonSendToPermalink {display: none;}
```

- **Citation:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList li.EXLButtonSendToCitation  
{display: none;}
```

- **EasyBib:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList li.EXLButtonSendToEasyBib  
{display: none;}
```

- **EndNote:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList li.EXLButtonSendToEndNote  
{display: none;}
```

- **RefWorks:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList li.EXLButtonSendToRefWorks  
{display: none;}
```

- **Delicious:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList  
li.EXLButtonSendToDelicious {display:none;}
```

- **Export RIS:**

```
.EXLTabHeaderButtons ol.EXLTabHeaderButtonSendToList  
li.EXLButtonSendToRISPushTo {display: none;}
```

4. Save the changes to the CSS file.
5. On the **Primo Home > Deploy All** page, select all options and click **Deploy**.

---

## Hiding Columns in My Account Lists

[Return to menu](#)

Primo allows you to hide columns in the following My Account lists: Loans, Requests, and Fine & Fees.

The following classes are defined in the CSS to allow you to control the display of columns in My Account lists.

- **Loans list** – The `MyAccount_Loans_<field name/type>` class allows you to hide a specific column in the Loans list.
- **Requests list** – The `MyAccount_Requests_<field name/type>` class allows you to hide a specific column in the Requests list. In addition, the `requestList` class has been added for the Requests list.
- **Fine & Fees list** – The `MyAccount_FineAndFees_<field name/type>` class allows you to hide a specific column in the Requests list.

The `{display:none}` parameter hides the specified class.

### To hide columns in My Account lists:

1. Log on to the Back Office server as the `primo` user.

---

#### Note

Instead of accessing the server directly (as shown in steps 1 and 2), it is recommended to use the File Uploader utility (see [The File Uploader Tool](#)) to manage and publish CSS changes to the Primo Front End UI.

---

2. Enter the following commands to access and open the CSS file that is used to customize your view:

```
fe_web
cd css
vi <custom_css>.css
```

---

#### Note

It is not recommended to modify the default Primo CSS, which can be overwritten during updates. For more information regarding the customization of Primo views, see the *Primo Technical Guide*.

---

3. Add the following lines to your localized CSS file to hide the columns in My Account lists:

```
◦ Loans list (hides the title column):

#LoansTable tr th.EXLMyAccountTableTitle {display:none;} // hides the column
header
```

```
#LoansTable tr td.MyAccount_Loans_title {display:none;} // hides the column in  
the row
```

- **Requests list** (hides the title column):

```
#requestList tr th.EXLMyAccountTableTitle {display:none;}  
#requestList tr td.MyAccount_Requests_title {display:none;}
```

- **Fine & Fees list** (hides the author column):

```
#FinesAndFeesTable tr th.EXLMyAccountTableTitle {display:none;}  
#FinesAndFeesTable tr td.MyAccount_FineAndFees_author {display:none;}
```

4. Save the changes to the CSS file.
5. On the [Primo Home > Deploy All](#) page, select all options and click **Deploy**.

## Hiding the Citation Disclaimer

[Return to menu](#)

The following code in the Citation Labels code table allows you to customize the disclaimer that displays to users during the creation of citations.

```
default.citation.labels.disclaimer - Remember to check citations for accuracy before including them in your work
```

The screenshot shows a window titled "Citation:" with a close button (X). It contains a table with columns "Style:" and "Citation:". The "Style:" column has three rows: "APA (6th edition)", "MLA (7th edition)", and "Chicago/Turabian (16th edition)". The "Citation:" column contains the text "Gilbert, J. (1977). *Interpreting psychological test data*. New York: Van Nostrand Reinhold." Below the table is a button labeled "Select Citation Text". At the bottom of the window, a red-bordered box contains the text "Remember to check citations for accuracy before including them in your work".

### Citation Disclaimer in Front End

#### To hide the citation disclaimer:

1. Log on to the Back Office server as the `primo` user.

#### Note

Instead of accessing the server directly (as shown in steps 1 and 2), it is recommended to use the File Uploader utility (see [The File Uploader Tool](#)) to manage and publish CSS changes to the Primo Front End UI.

2. Enter the following commands to access and open the CSS file that is used to customize your view:

```
fe_web
cd css
vi <custom_CSS>.css
```

#### Note

It is not recommended to modify the default Primo CSS, which can be overwritten during updates. For more information regarding the customization of Primo views, see the *Primo Technical Guide*.

3. Add the `{display:none;}` property to the following element in your localized CSS file, as follows:

```
#exlidSaveCitationtile div.EXLSaveCitationDisclaimerRow {display:none;} // hides  
the disclaimer
```

4. Save the changes to the CSS file.
5. On the Primo **Home > Deploy All** page, select all options and click **Deploy**.

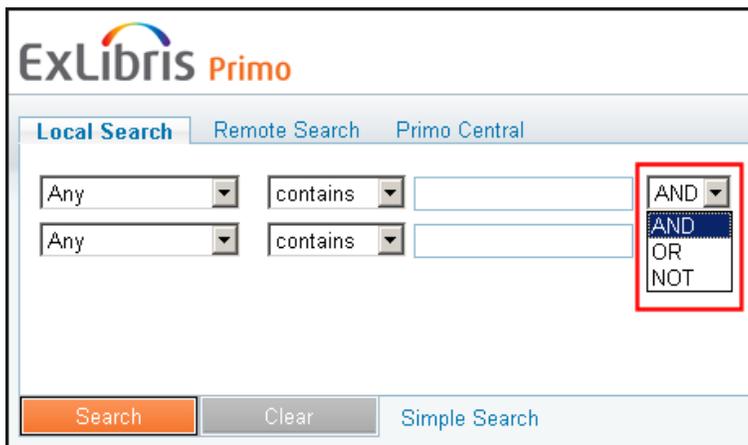
## Hiding the Boolean Operator Drop-Down Lists for Advanced Searches

[Return to menu](#)

Out of the box, the boolean operator drop-down lists appears next to each search criteria row on the Advanced Search page. You can disable the drop-down list by changing your localized CSS file.

The Advanced Precision Operators code table allows you to modify the display values for each of the boolean operators. For more information, see the *Primo Back Office Guide*.

The following figure shows the boolean operator on the Advanced Search page:



Boolean Operator Drop-Down List on Advanced Search Page

### To hide the boolean operator drop-down lists on the Advanced Search page:

1. Log on to the Back Office server as the `primo` user.

---

#### Note

Instead of accessing the server directly (as shown in steps 1 and 2), it is recommended to use the File Uploader utility (see [The File Uploader Tool](#)) to manage and publish CSS changes to the Primo Front End UI.

---

2. Enter the following commands to access and open the CSS file that is used to customize your view:

```
fe_web
cd css
vi <custom_CSS>.css
```

---

#### Note

It is not recommended to modify the default Primo CSS, which can be overwritten during updates. For more information regarding the customization of Primo views, see the *Primo Technical Guide*.

---

3. Add the following line to your localized CSS file:

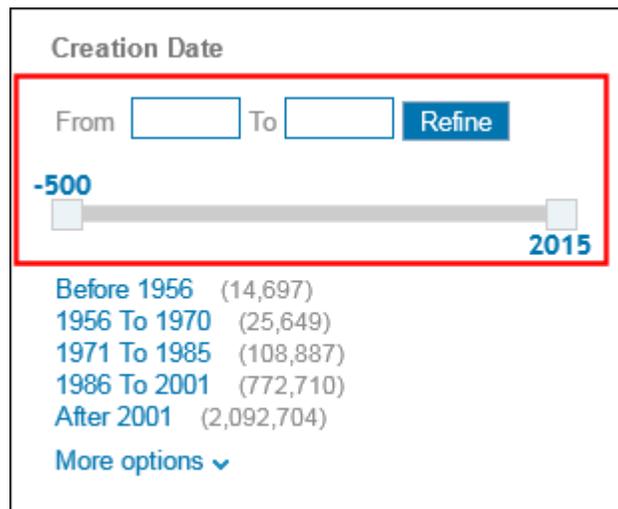
```
#exlidAdvancedSearchRibbon div.EXLAdvancedSearchFormRow fieldset  
span.EXLBooleanOperatorInput {display:none;}
```

4. Save the changes to the CSS file.
5. On the **Primo Home > Deploy All** page, select all options and click **Deploy**.

## Hiding the Date Slider

[Return to menu](#)

Primo allows you to disable the Date slider via your view's CSS.



Creation Date

From  To  Refine

-500 2015

Before 1956 (14,697)  
1956 To 1970 (25,649)  
1971 To 1985 (108,887)  
1986 To 2001 (772,710)  
After 2001 (2,092,704)

[More options](#) ▾

### Date Slider Enabled

For information on enabling the creation date categories (which are disabled out of the box), refer to the *Primo Back Office Guide*.

### To hide the Date slider:

1. Log on to the Back Office server as the `primo` user.

---

#### Note

Instead of accessing the server directly (as shown in steps 1 and 2), it is recommended to use the File Uploader utility (see [The File Uploader Tool](#)) to manage and publish CSS changes to the Primo Front End UI.

2. Enter the following commands to access and open the CSS file that is used to customize your view:

```
fe_web  
cd css  
vi <custom_CSS>.css
```

---

#### Note

It is not recommended to modify the default Primo CSS, which can be overwritten during updates. For more information regarding the customization of Primo views, see the *Primo Technical Guide*.

3. Add **display: none** to the following element in the CSS file:

```
.EXLDateRangeText {text-align: center; margin-bottom: 25px; display: none;}
```

4. Save the changes to the CSS file.
5. On the **Primo Home > Deploy All** page, select all options and click **Deploy**.
6. Perform a search to verify that the Date slider does not appear in the view.

## Primo CSS Structure

This section illustrates the mapping of styles defined in the `Primo_defaults.css` file to areas on each of the following pages in the Front End UI.

## Home Page General Layout

The screenshot shows the ExLibris Primo Home Page with several CSS class annotations:

- #exlibHeaderContainer**: Located at the top of the page, encompassing the navigation bar.
- .EXLHeader**: Located at the top right of the page, encompassing the user profile area.
- #exlibHomeContainer**: Located below the header, encompassing the main content area.
- .EXLHomeContainer**: Located below the header, encompassing the main content area.
- .EXLFooterTile**: Located at the bottom of the page, encompassing the footer area.

## Home Page Content Area

The screenshot shows the ExLibris Primo Home Page content area with several CSS class annotations:

- #exlibHomeContainer**: Located below the header, encompassing the main content area.
- .EXLHomeBlockContainer1**: Located below the header, encompassing the main content area.
- .EXLContentBlock1**: Located below the header, encompassing the main content area.
- .EXLContentBlock2**: Located below the header, encompassing the main content area.
- .EXLHomeBlockContainer2**: Located below the header, encompassing the main content area.
- .EXLContentBlock3**: Located below the header, encompassing the main content area.
- .EXLContentBlock4**: Located below the header, encompassing the main content area.

# Header

This screenshot shows the top section of the Ex Libris Primo website. Several elements are highlighted with dashed red boxes and labeled with IDs:

- #exlibHeaderTitle . EXLogo**: The Ex Libris Primo logo.
- #exlibHeaderContainer . EXLHeader**: The main header container.
- #exlibUserAreaTitle . EXLUserMenu**: The user area containing the name 'Jonathan Smith' and links for 'My Shelf', 'My Account', and 'Sign Out'.
- #exlibMainMenuTitle . EXLMainMenu**: The main navigation menu with links for 'Find Databases', 'Tags', 'Journals A-Z', 'Library Hours', and 'Help'.
- #exlibSearchTitle . EXLSearch**: The search bar area.
- #exlibSearchRibbon**: The search ribbon containing 'Books & More', 'Articles & Databases', and 'Course Reserves'.
- #exlibSearchBanner**: A banner area with a search icon.

The main content area below the header includes sections for 'What is Primo?', 'Library News and Events', 'Library Services', 'Help from a Librarian', 'Borrow Items', 'Research Assistance', and 'Course Reserves'. It also features a 'From the Blog' section and social media links for iPhone and Twitter.

# Header and Scopes

This block contains two screenshots of the Ex Libris Primo interface. The top screenshot shows the search dropdown menu open, listing various collections such as 'Volcano (Palm) Campus Library', 'Volcano Island University', and 'In Storage Collection (Restricted)'. The bottom screenshot shows the search field highlighted with a dashed red box and labeled **EXLSearchFieldRibbonFormCollectionsList**.

# Header and System Feedback

This block contains two screenshots of the Ex Libris Primo interface. The top screenshot shows a yellow feedback message: 'Did you mean: european politics'. The bottom screenshot shows the same message highlighted with a dashed red box and labeled **#exlibHeaderSystemFeedback**.

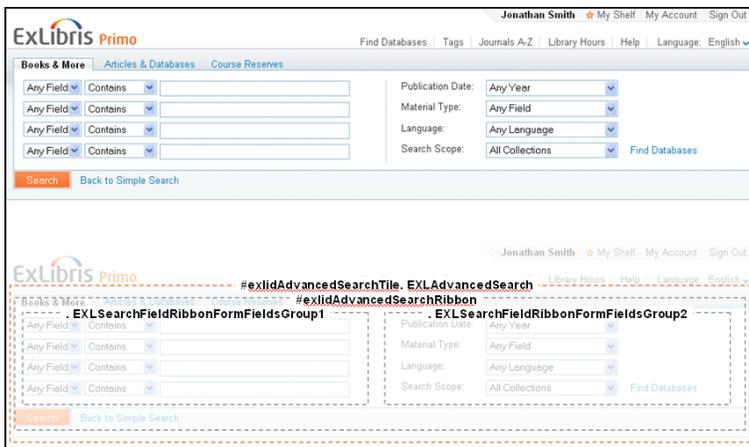
## Header and Search Limits (Optional)



## Advanced Search Link



## Advanced Search



# Footer

The screenshot shows the footer of the ExLibris Primo website. At the top, there is a navigation bar with the user name 'Jonathan Smith' and links for 'My Shelf', 'My Account', and 'Sign Out'. Below this is a secondary navigation bar with 'Find Databases', 'Tags', 'Journals A-Z', 'Library Hours', 'Help', and 'Language: English'. The main content area of the footer is divided into several sections:

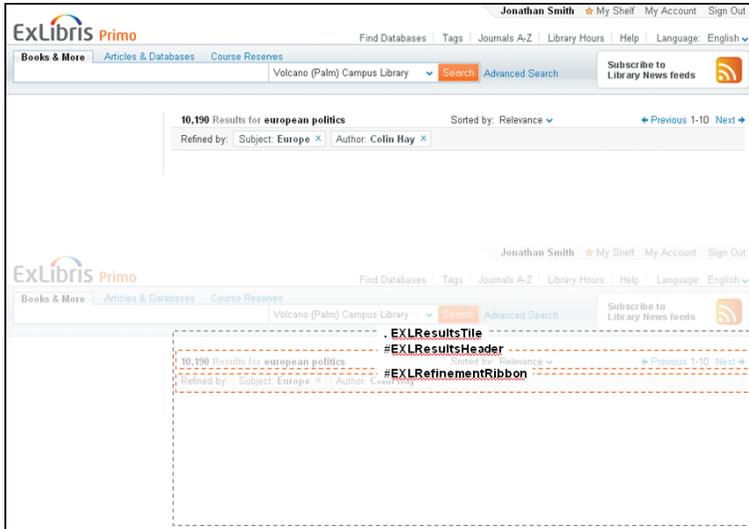
- Books & More:** Includes 'Articles & Databases' and 'Course Reserves'.
- Search:** A search bar with a dropdown menu set to 'All Collections' and a 'Search' button.
- Subscribe to Library News feeds:** An RSS icon and a subscription button.
- What is Primo?:** A section explaining the service, including links for 'Library News and Events', 'Interlibrary Loan Service Restored', 'Primo Upgrade Extended to 10AM August 29', and 'New Database Page on Libraries' Web'.
- Library Services:** A section titled 'Help from a Librarian - Ask a Question' with a 'Learn more...' link. Below it is a 'Borrow Items' section and a 'Research Assistance' section.
- Trending Search Topics:** Two columns of trending topics, including 'Shakespeare's Hamlet', 'African dancing', 'Discovery landing', 'Interlibrary Loan', 'Group Study Rooms', 'Find Videos & Music', and 'Library Hours'.
- From the Blog:** A link to 'Tuesday, August 25, 2009: The Future of Research Libraries by Carl Grant'.
- What's New:** A link to 'Get the most out of the new version with our Guided Tour'.
- Primo on iPhone:** A link to 'Bookmark this link to access Primo on your iPhone'.
- Primo on Twitter:** A link to 'Follow @primo to keep up on the new features and coming events'.
- EXLFooterLinksContainer:** A horizontal list of links: Home, Blog, RSS.
- EXLFooterUpdateContainer:** A link to 'Update my screen automatically'.
- EXLFooterTitle:** A copyright notice: 'Powered by ExLibris Primo Copyright © 2009 Accessibility Statement & Disclaimer'.

# Brief Layout

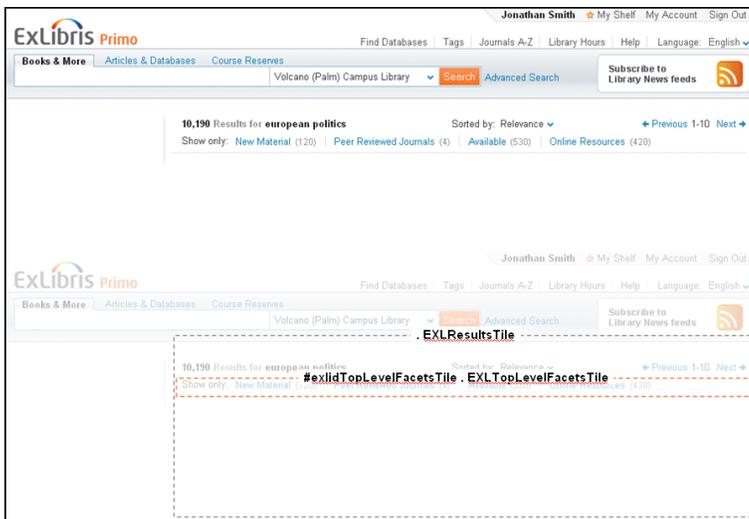
The screenshot shows the search results page of ExLibris Primo. At the top, there is a navigation bar with the user name 'Jonathan Smith' and links for 'My Shelf', 'My Account', and 'Sign Out'. Below this is a secondary navigation bar with 'Find Databases', 'Tags', 'Journals A-Z', 'Library Hours', 'Help', and 'Language: English'. The main content area of the search results page is divided into several sections:

- Books & More:** Includes 'Articles & Databases' and 'Course Reserves'.
- Search:** A search bar with a dropdown menu set to 'Volcano (Palm) Campus Library' and a 'Search' button.
- Subscribe to Library News feeds:** An RSS icon and a subscription button.
- EXLFacetTile:** A list of facets for refining results, including 'New Material (120)', 'Online Resources (22)', 'Peer Reviewed Journals (4)', 'Additional Results', 'Resource Title (140)', 'Search & Link (40)', 'Refine Results', 'Resource Type', 'Books (24)', 'Journals (22)', 'Archival Materials (20)', 'More (2) ↓', 'Subject', 'Europe countries (24)', 'European Union (22)', 'European Union countries (20)', 'World politics (20)', 'Institute of Early American History and Culture (Williamsburg, Va.) (20)', and 'RSS, Save, Search'.
- #exlidResultsContainer:** A container for the search results, showing '10,190 Results for european politics'.
- EXLResultsTitle:** A title for the search results.
- EXLResultsContainer:** A container for the search results, showing '10,190 Results for european politics'.
- EXLResultsTitle:** A title for the search results.

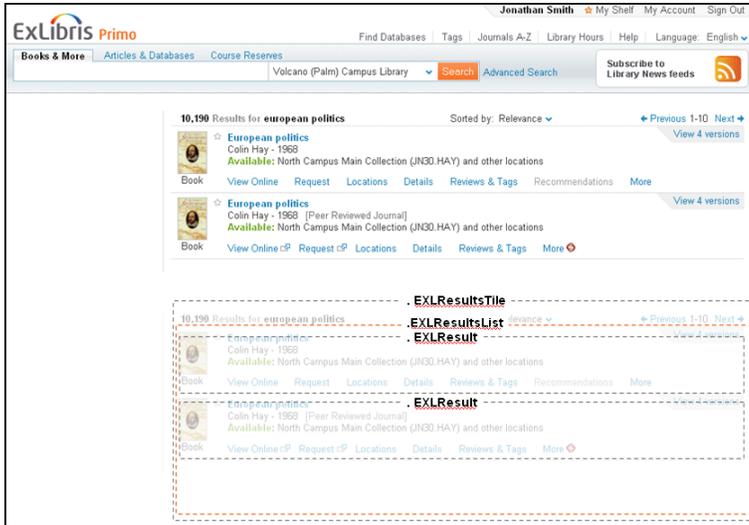
## Brief - Header and Refine Ribbon



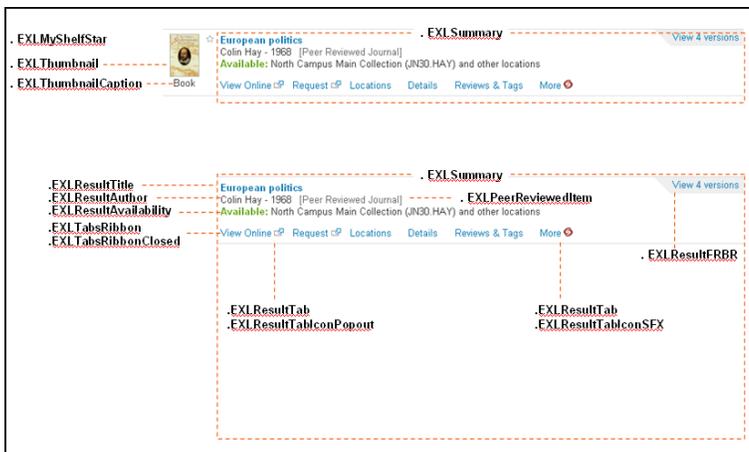
## Brief - Top-Level Facets (Optional)



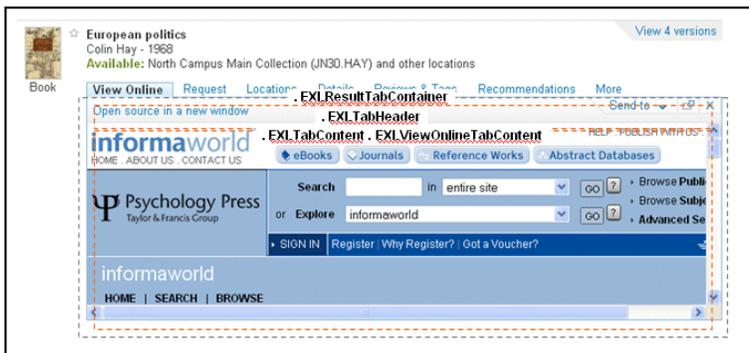
# Brief - Result List - Record Layout



# Brief - Result List - Record Details



# Brief - View Online



## Brief - View Online - Layout

This screenshot shows the 'View Online' layout for a book titled 'European politics' by Colin Hay (1968). The page features a navigation bar with tabs for 'View Online', 'Request', 'Locations', 'Recommendations', and 'More'. The main content area is divided into two columns. The left column, labeled '.EXLViewOnlineLinks', lists 'Available-Online Resources' including 'Nasa History Office', 'Digitool Viewer', and 'Another Viewer'. The right column, labeled '.EXLRequestTipsList', contains a 'Tips' section with two bullet points of placeholder text and 'Read More...' links. The page also includes a 'Book' icon, a 'View 4 versions' link, and a 'Send to' dropdown menu.

## Brief - Request - Tip

This screenshot displays the 'Request' form for a book titled 'European Politics' by William George Andrews (1930), which is currently 'Checked Out'. The form includes fields for 'Select Year' (2009), 'Select Volume' (V.1), and 'Select Issue' (Vol. 1 Issue 1 (01 Jan 2009)). Other fields include 'Pick Up At' (Circulation Desk), 'Not Needed After' (2009/02/19), and 'Comment'. A 'Rush Handling' checkbox is present, along with 'Hold' and 'Clear Selection' buttons. A 'Tip' section on the right states 'May also be available in other locations. View All Locations'. The page features a navigation bar with 'Request', 'Locations', 'Details', and 'More' tabs, and a 'Send to' dropdown menu.

## Brief - Request - Tips List

This screenshot shows the 'Request' form for a book titled 'European Politics' by Colin Hay (1972), which is 'Available' in the North Campus Main Collection (JN45.E973). The form includes fields for 'Select Year' (2009), 'Select Volume' (V.1), and 'Select Issue' (Vol. 1 Issue 1 (01 Jan 2009)). Other fields include 'Pick Up At' (Circulation Desk), 'Not Needed After' (2009/02/19), and two 'Comment' fields. A 'Tips List' section on the right contains two bullet points of placeholder text and 'Read More...' links. The page features a navigation bar with 'Request', 'Locations', 'Details', 'Tips', 'Recommendations', and 'More' tabs, and a 'Send to' dropdown menu.

## Brief - Request - System Feedback

European Politics  
By Colin Hay - 1972  
Checked Out

Request | Locations | Details | More

Request Options: **Hold** Short Loan

Your Request was successful.

Tips

- Lorem ipsum ne viris feugiat perpetua mel. [Read More...](#)
- Lorem ipsum ne viris feugiat perpetua mel, quod nonummy. [Read More...](#)

EXLRequestSystemFeedback

EXLRequestTipList

## Brief - Request - Call Slip

European Politics  
By Colin Hay in 1972  
Available North Campus Main Collection (JN45 E973)

Request | Locations | Details | More

Request Options: **Call Slip** Short Loan

Select Copy: Vol. 1 Issue 1 (01 Jan 2009)

Specify an Issue

\* Volume:   
\* Date:   
Year:

Barcode:   
Comment:

Hold

Tips

- Lorem ipsum ne viris feugiat perpetua mel. [Read More...](#)
- Lorem ipsum ne viris feugiat perpetua mel, quod nonummy. [Read More...](#)

EXLRequestTipList

## Brief - Request - Details (from Locations)

European Politics  
By Colin Hay in 1972  
Available North Campus Main Collection (JN45 E973)

Request | Locations | Details | More

Request Options: **Hold** Short Loan

Details of item you requested:

Location: North Campus Main Collection (JN45.E973)  
Description: Vol 1 Issue 1 (Jan 2009)  
Category: Regular Loan  
Pick Up At: **Circulation Desk**

Hold

Tips

- Lorem ipsum ne viris feugiat perpetua mel. [Read More...](#)
- Lorem ipsum ne viris feugiat perpetua mel, quod nonummy. [Read More...](#)

EXLRequestTipList

## Brief - Request - Form Validation

☆ **European Politics**  
 William George Andrews - 1930  
Checked Out View 4 versions

Book

Request Locations Details **EXLResultTabContainer** actions More

Request Options: **Hold** Short Loan **EXLTabHeader** Send to **EXLTabContent**

Please fix 2 errors found in the following form: **EXLRequestTabContent**

Select Year: 2009  
 Select Volume: V.1  
 Select Issue: Vol. 1 Issue 1 (01 Jan 2009)  
 Pick Up At: Circulation Desk  
 Not Needed After: 2009/02/19  
 Comment:  
 Rush Handling:

May also be available in other locations. [View All Locations](#)

**EXLRequestTip**

**EXLTabFormValidationFeedback**

## Brief - Request - UB Request

☆ **European Politics**  
 William George Andrews - 1930  
Checked Out View 4 versions

Book

Request Locations Details **EXLResultTabContainer** actions More

Request Options: Hold Call Slip **UB** **EXLTabHeader** Send to **EXLTabContent**

Select Library: Hirschn Library  
 Select Item: 6578 Main Collection  
 Pickup Library: Needle Library  
 Pick Up Location: Circulation Desk  
 Not Needed After: 2009/07/23  
 Comment:

Select the Library, Item, and pickup location using the dropdown boxes. If you do not see a pickup library or location, you are not allowed to pick up a UB request from that location.

**EXLRequestTip**

## Brief - Request - Short Loan

☆ **European Politics**  
 William George Andrews - 1930  
Checked Out View 4 versions

Book

Request Locations Details **EXLResultTabContainer** actions More

Request Options: Hold **Short Loan** **EXLTabHeader** Send to **EXLTabContent**

Select Date: Day select Month 10 Year 2009  
 Select Time Slot:

<input type="radio"/> 09:00-11:00	<input type="radio"/> 15:00-17:00
<input type="radio"/> 09:00-11:00	<input type="radio"/> 17:00-19:00
<input type="radio"/> 11:00-13:00	<input checked="" type="radio"/> 19:00-09:00
<input type="radio"/> 13:00-15:00	<input type="radio"/> 19:00-09:00
<input type="radio"/> 13:00-15:00	<input type="radio"/> 19:00-09:00
<input type="radio"/> 13:00-15:00	<input type="radio"/> 19:00-09:00

Tips

- Lorem ipsum ne viris feugiat perpetua mel. [Read More...](#)
- Lorem ipsum ne viris feugiat perpetua mel, quod nonummy. [Read More...](#)

**EXLRequestTipList**

## Brief - Request - ILL

European Politics  
William George Andrews - 1930  
Checked Out
View 4 versions

Request | Locations | Details | More

Request Options:  Hold  Short Loan

Level of Service:

Delivery Method:

ILL Unit:

Pickup Library:

Year of Serial:

Not Needed After:

Willing to pay?  Yes  No

Send to patron?  Yes  No

Add additional information about your request if needed

If you would like to request a particular issue or other part of a work, fill in the fields under 'Additional information about your request'

## Brief - Request - Copyright

European Politics  
William George Andrews - 1930  
Checked Out
View 4 versions

Request | Locations | Details | More

Request Options:  Hold  Short Loan

**Notice: Warning Concerning Copyright Restrictions**

You must read and acknowledge the following statement before submitting your request.

The Copyright law of the United States (Title 17, U.S. Code) governs the making of photocopies or other reproductions of copyrighted material. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or other reproduction is not to be used for any purpose other than private study, scholarship, or research. If a user makes a request for or later uses a photo copy or reproduction for purposes in excess of "fair use", that user may be liable for copyright infringement. This institution reserves the right to refuse to accept a copying order if, in its judgment, fulfillment of the order would involve violation of the copyright law.

## Brief - Request - Locations

European studies newsletter  
University of Oxford  
May be Available: North Campus Main Collection
View 4 versions

Request | Locations | Details | More

Location	Floor	Call Number	Availability
Compass Library		(QP360.5G43 2005)	Available
Needle Library	3rd Floor	(QP360.5G43 2005)	May be Available
North Library	3rd Floor	(QP360.5G43 2005)	Not Available
South Campus Library	3rd Floor		
Volcano Campus Med Lib	General	(advances in experimental medicine and biology, v.6)	May be Available
Volcano Campus Med Lib			
Volcano Campus	3rd Floor	(QP360.5G43 2005)	May be Available
Summary Holdings: Vol. 1 - Vol. 14 (1990-2004) - available from storage Vol. 15 (2005) in stacks			

There are no items to display for this location

## Brief - Locations - Expand

Journal

European studies newsletter  
University of Oxford  
May be Available: North Campus Main Collection

Request Locations Details More

Needle Library (QP360.5G43 2005) Available

Compass Library 3rd Floor (QP360.5G43 2005) May be Available

Summary Holdings: Vol. 1 - Vol. 14 (1990-2004) - available from storage Vol. 15 (2005) in stacks Summary Holdings: Vol. 1 - Vol. 14 (1990-2004) - available from storage Vol. 15 (2005) in stacks

Location	Call Number	Description	Status	Request Options
North Campus Veterinary	Quarto SF414	vol. 1 no. 2	Not	Hold Short Loan ILL
General collection	N88x 1980	description text	Available	
Floor1	QP 360.5G43	vol. 1 no. 3	Requested	Hold Short Loan ILL
Floor1	QP 360.5G43	vol. 1 no. 4	Due 7/1/09	Hold Short Loan ILL
Storage	QP 360.5G43	vol. 1 no. 5	Due 7/1/09	Hold Short Loan ILL

## Brief - Locations - Categories

Journal

European studies newsletter  
University of Oxford  
May be Available: North Campus Main Collection

Request Locations Details More

Locations in Miami Dade:

+	Miami Dade/Hialeah	Circulation	(QP360.5G43 2005)	Available
+	Miami Dade/InterAmerican	Circulation	(QP360.5G43 2005)	Available
+	Miami Dade/North	Circulation	(QP360.5G43 2005)	May be Available
+	Miami Dade/Kendall	Circulation	(QP360.5G43 2005)	May be Available

Locations in Other Institutions:

+	Hillsborough	Circulation	(QP360.5G43 2005)	May be Available
+	Lake City	Circulation	(QP360.5G43 2005)	May be Available
+	Palm Beach	Circulation	(QP360.5G43 2005)	May be Available
+	Tallahassee	Circulation	(QP360.5G43 2005)	Not Available

## Brief - Details - Summary

Book

Special issue on European politics: pasts, presents, futures  
Peter Mair, Gordon Smith - 1927  
Available: North Campus Main Library OpenShelf

Request Locations Details More

Summary Table of Contents

Title: Developments in European politics

Author/Creator: Paul Heywood

Subjects: European federation -- Congresses ; Europe -- Economic integration -- Congresses ; Europe -- Politics and government -- 1989 -- Congresses

Identifier: ISBN: 0230000401 (hbk.) ; ISBN: 023000041X (pbk.)

Publisher: Basingstoke England ; New York : Palgrave Macmillan

Language: English

Publication Date: 2006

Links

- > More Bibliographic Info
- > Second Line Option
- > More Bibliographic Info

## Brief - Details - TOC

☆ **Special issue on European politics: pasts, presents, futures** View 4 versions  
 Peter Mair, Gordon Smith - 1927  
**Available:** North Campus Main Library OpenShelf

Request Locations **Details** More

Summary **Table of Contents**

Content	Author	Page
Introduction	Laura Lee Downs, Stephane Gerson	1
Medievalist and Francophile Despite Himself	John W. Baldwin	21
A Mid-Atlantic Identity	Robert O. Paxton	35
Tough Love for France	Herman Lebovics	47
Fantasy Meets Reality: A Midwesterner Goes to Paris	Lynn Hunt	61
Defense d' afficher...	Steven Laurence Kaplan	73
France for Belgium	Gabrielle M. Spiegel	89
Why Paris?	Barbara B. Diefendorf	99
Conclusion	Thomas L. Bruneau	111

## Brief - Reviews and Tags

☆ **West European politics** View 4 versions  
 London: F. Cass - 1978  
**Available:** North Campus Main Collection (JN45 E973) and other locations

Request Locations **Details** More

Post Your Review Add New Tag

**Michael Anderson** ✓✓✓✓  
 "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras blandit varius adipiscing. Etiam quis augue nibh. Aliquam erat volutpat. Vivamus nunc sem, interdum vel hendrerit ut, ultricies pellentesque arcu. Curabitur luctus facilisis elit eget accumsan."

**Michael Anderson** ✓✓✓✓  
 "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras blandit varius adipiscing. Etiam quis augue nibh. Aliquam erat volutpat."

All Tags Cloud  
 The First Tag, The Second Tag, Another One, Another Long Title Example, Short One

My Tags Edit

## Brief - Reviews and Tags (Before Sign In)

☆ **West European politics** View 4 versions  
 London: F. Cass - 1978  
**Available:** North Campus Main Collection (JN45 E973) and other locations

Request Locations **Details** More

Sign in to Post Your Review Sign in to Add New Tags

**Michael Anderson** ✓✓✓✓  
 "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras blandit varius adipiscing. Etiam quis augue nibh. Aliquam erat volutpat. Vivamus nunc sem, interdum vel hendrerit ut, ultricies pellentesque arcu. Curabitur luctus facilisis elit eget accumsan."

**Michael Anderson** ✓✓✓✓  
 "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras blandit varius adipiscing. Etiam quis augue nibh. Aliquam erat volutpat."

All Tags Cloud  
 The First Tag, The Second Tag, Another One, Another Long Title Example, Short One

## Brief - Reviews - Post Your Review

The screenshot shows a library catalog entry for 'West European politics' by F. Cass (1978). The 'Post Your Review' form is highlighted with a dashed orange border. It includes an 'Item Ranking' dropdown menu set to '1', a text area for writing the review, and two checkboxes: 'Display my name next to the review' and 'I agree that the library will use this review'. At the bottom are 'Submit' and 'Cancel' buttons.

## Brief - Recommendations - BibTip

The screenshot shows a library catalog entry for 'European elections & domestic politics : lessons from the past and scenarios for the future' by Wouter van der Brug and C Eijk. The 'BibTip' recommendations section is highlighted with a dashed orange border. It lists several books related to Ruby on Rails, such as 'Build your own Ruby on Rails web applications' by Patrick Lenz (2007) and 'Praxiswissen Ruby on Rails' by Carl Denny (2007).

## Brief - Recommendations - bX

The screenshot shows the same library catalog entry as above. The 'bX' recommendations section is highlighted with a dashed orange border. It displays a list of six related items, including journal articles and books on European politics, such as 'European Politics: A Comparative Introduction' by Nicole NB Ellison (2006) and 'The Handbook of West European Pension Politics' by Jennifer J. Yurchisin (2004).

## Brief - Recommendations - More

Book View 4 versions

**Broadcasting and politics in Western Europe**  
Raymond Kuhn  
Available: North Campus Main Collection (JC573.E85) and other locations

Request Locations Details **EXLResultTabContainer** tions More

**ExLibris SFX** Language: English

**Title:** European Politics  
**Source:** New media Society

Full text  
Full text available via EBSCOhost  
Holding information  
Holdings in my library catalogue

More Options

## Find Database - All

**Find Databases** Help X

Name:  Contains  Type: All   
Publisher:  Category: All   
Keywords:  Sub-category: All

Include restricted databases

All Databases (593) Databases Results (0) Selected Databases (3)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

<input checked="" type="checkbox"/>	The European Register of Microform Masters The European Register	Show Info
<input checked="" type="checkbox"/>	Bibliography of the History of Art	Show Info
<input type="checkbox"/>	The European Register of Microform Masters The European Register (No Access)	Show Info
<input type="checkbox"/>	Bibliography of the History of Art	Show Info
<input type="checkbox"/>	The European Register of Microform Masters The European Register	Show Info
<input type="checkbox"/>	Bibliography of the History of Art	Show Info
<input type="checkbox"/>	Bibliography of the History of Art	Show Info
<input type="checkbox"/>	Bibliography of the History of Art	Show Info
<input type="checkbox"/>	Bibliography of the History of Art	Show Info

Selection Completed

## Full View - Online Tab

**ExLibris Primo** body:EXLFullView

Books & More Articles & Databases Course Reserves Tags Journals A-Z Library Hours Help Language English

Volcano (Palm) Campus Library

Open source: [Open source](#)

**European Politics**  
William George Andrews - 1930  
Checked Out View 4 versions

View Online Request Locations Details Reviews & Tags Recommendations More

**EXLViewOnlineTabContent** Send to

**The University of Iowa LIBRARIES** Iowa Digital Library

home: browse: advanced search: help 80093-998

Iowa City Town and Campus Scenes

Iowa River, Iowa City, Iowa, ca. 1890s

Back to Search Results Previous Result 1 of 10 Next

## Full View - Request Tab

Ex Libris Primo

body:EXLFullView

Books & More | Articles & Databases | Course Reserves

Volcano (Palm) Campus Library | Search | Advanced Search | Subscribe to Library News feeds

European Politics  
William George Andrews - 1930  
Checked Out

View Online | Request | Locations | Details | Reviews & Tags | Recommendations | More

Request Options: Hold | Short Loan | ILL

Select Year: 2009  
Select Volume: V1  
Select Issue: Vol. 1 Issue 1 (01 Jan 2009)  
Pick Up At: Circulation Desk  
Not Needed After: 2009/02/19  
Comment:  
Rush Handling:   
Hold

May also be available in other locations. View All Locations

Back to Search Results | Previous Result 1 of 10 Next

## Full View - Locations Tab

Ex Libris Primo

body:EXLFullView

Books & More | Articles & Databases | Course Reserves

Volcano (Palm) Campus Library | Search | Advanced Search | Subscribe to Library News feeds

European Politics  
William George Andrews - 1930  
Checked Out

View Online | Request | Locations | Details | Reviews & Tags | Recommendations | More

Compass Library OP  
Needle Library OP  
Summary Holdings: Vol. 1 - Vol. 14 (1990-2004) - available from storage Vol. 15 (2005) in stacks Summary Holdings: Vol. 1 - Vol. 14 (1990-2004) - available from storage Vol. 15 (2005) in stacks Summary Holdings: Vol. 1 - Vol. 14 (1990-2004) - available from storage Vol. 15 (2005) in stacks

Location	Call Number	Description	Status	Request Options
North Campus Veterinary General collection	Quarto SF414 N88x 1980	vol. 1 no. 2 description text	Not Available	Hold   Short Loan   ILL
Floor1	QP 360 5G43	vol. 1 no. 3	Requested	Hold   Short Loan   ILL
Floor1	QP 360 5G43	vol. 1 no. 4	Due 7/1/09	Hold   Short Loan   ILL
Storage	QP 360 5G43	vol. 1 no. 5	Due 7/31/09	Hold   Short Loan   ILL Photocopy   Recall
Stacks	QP 360 5G43	vol. 1 no. 6	Available	Hold   Short Loan   ILL
Stacks	QP 360 5G43	vol. 1 no. 7	Missing	Hold   Short Loan   ILL

View More Items

North Library	3rd Floor	(QP360-5G43 2005)	Not Available
South Campus Library	3rd Floor		
Volcano Campus Med Lib	General	(advances in experimental medicine and biology, v.6)	May be Available
Volcano Campus Med Lib	General	(advances in experimental medicine and biology, v.6)	May be Available
Volcano Campus Med Lib	General	(advances in experimental medicine and biology, v.6)	May be Available

Back to Search Results | Previous Result 1 of 10 Next

## Full View - Details Tab

Ex Libris Primo

body:EXLFullView

Books & More | Articles & Databases | Course Reserves

Volcano (Palm) Campus Library | Search | Advanced Search | Subscribe to Library News feeds

European Politics  
William George Andrews - 1930  
Checked Out

View Online | Request | Locations | Details | Reviews & Tags | Recommendations | More

Title: Developments in European politics  
Author/Creator: Paul Heywood  
Subjects: European Federation -- Congresses ; Europe -- Economic integration -- Congresses ; Europe -- Politics and government -- 1959 -- Congresses  
Identifier: ISBN: 0230000401 (hbk.) ; ISBN: 023000041X (pbk.)  
Publisher: Basingstoke England ; New York : Palgrave Macmillan  
Language: English  
Publication Date: 2006

Links  
> More Bibliographic Info Second Line Option  
> More Bibliographic Info  
> More Bibliographic Info  
> More Bibliographic Info  
> More Bibliographic Info  
> More Bibliographic Info

Back to Search Results | Previous Result 1 of 10 Next



# My Account - Blocks and Messages

The screenshot shows the 'My Account' page in ExLibris Primo. The page has a header with the ExLibris Primo logo and navigation links. Below the header, there are tabs for 'My Shelf', 'My Queries', and 'My Account'. The 'My Account' tab is active. The main content area is titled 'Blocks & Messages' and contains three entries, each with a date of 13/2009 and a placeholder text: 'Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi iaculis tempus ligula quis venenatis. Maecenas mollis suscipit eros, sed pellentesque ipsum blandit vestibulum.' There is a 'Back to Active Loans List' link at the bottom of the main content area. A left sidebar contains links for 'Loans (4)', 'Requests (16)', 'Fines & Fees (1)', 'Blocks & Messages (3)', 'Personal Settings', and 'More Information'. The 'Blocks & Messages (3)' link is highlighted.

# Personal Settings

The screenshot shows the 'Personal Settings' page in ExLibris Primo. The page has a header with the ExLibris Primo logo and navigation links. Below the header, there are tabs for 'My Shelf', 'My Queries', and 'My Account'. The 'My Account' tab is active. The main content area is titled 'Personal Settings' and contains a form with the following fields: Address (Bldg. 8-9 Malcha Technological Park, Jerusalem), Zip Code (91481), Telephone (972 2 649 9100), Email (exlibris@exlibris.co.il), and SMS (972 54 679 9100). There is an 'Edit Details' link below the form. To the right of the form is a 'Display Settings' section with a dropdown for 'Interface Language' (set to English) and a dropdown for 'Results per page' (set to 10), with a 'Save' button below. A left sidebar contains links for 'Loans (4)', 'Requests (16)', 'Fines & Fees (1)', 'Blocks & Messages (3)', 'Personal Settings', and 'More Information'. The 'Personal Settings' link is highlighted.

# Personal Settings - Form

The screenshot shows the 'Update Personal Details' form in ExLibris Primo. The page has a header with the ExLibris Primo logo and navigation links. Below the header, there are tabs for 'My Shelf', 'My Queries', and 'My Account'. The 'My Account' tab is active. The main content area is titled 'Update Personal Details' and contains a form with the following fields: Address1, Address2, Zip Code, Telephone1, Telephone2, Email, and SMS. There is an 'Update' button below the form. To the right of the form is a 'Tips' section with two bullet points: 'Lorem ipsum ne viris feugiat perpetua mel. Read More...' and 'Lorem ipsum ne viris feugiat perpetua mel, quod nonummy Read More...'. A left sidebar contains links for 'Loans (4)', 'Requests (16)', 'Fines & Fees (1)', 'Blocks & Messages (3)', 'Personal Settings', and 'More Information'. The 'Personal Settings' link is highlighted.

# My Queries - Temp

body: My Account

ExLibris Primo

Find Databases | Tags | Journals A-Z | Library Hours | Help | Language: English

Books & More | Articles & Databases | Course Reserves

Volcano (Palm) Campus Library | Search | Advanced Search | Subscribe to Library News feeds

Back to Search Results

My Shelf | My Queries | My Account

This Session's Queries (4)

Saved Queries & Alerts (0)

Query Name	Date
1 History	Sun 15:51:34
2 Art	Sun 15:51:34
3 Literature	Sun 15:51:34
4 Literature2	Sun 15:51:34

# My Queries - Saved

body: My Account

ExLibris Primo

Find Databases | Tags | Journals A-Z | Library Hours | Help | Language: English

Books & More | Articles & Databases | Course Reserves

Volcano (Palm) Campus Library | Search | Advanced Search | Subscribe to Library News feeds

Back to Search Results

My Shelf | My Queries | My Account

This Session's Queries (4)

Saved Queries & Alerts (6)

Query Name	Alert Type	Update/Set Alert	RSS Feed	Delete
1 History	Email	Update	Subscribe	Delete
2 Art	Email	Update	Subscribe	Delete
3 Literature	Email	Update	Subscribe	Delete
4 More	Email	Update	Subscribe	Delete
5 Another	Email	Update	Subscribe	Delete
6 Last One	Email	Update	Subscribe	Delete

## Embedding the Primo Search into a Local Site

Embedding the Primo Search box or tile into your institution's local site enables your institution's users to perform Primo searches from within your local site. This is similar to adding a Google search to a site.

This section includes:

- [Embedding a Primo Search Box](#)
- [Embedding a Primo Search Tile](#)

## Embedding a Primo Search Box

[Return to menu](#)

Primo allows you to add a Primo Search box to any local Web page by embedding Primo's Brief Search deep link in an HTML form.



**Brief Search Box Embedded in an HTML File**

For more information on Brief Search deep links, see [Brief Search Deep Link](#) in the Ex Libris Developer Network.

### To embed a Primo Search box in an HTML file:

1. Embed the following link in a `<form>` element of any HTML file:

```
http://FE_hostname:port/primo_library/libweb/action/dlSearch.do?
```

The following example embeds a simple Search box that will display the Primo results on the same page:

```
<script type="text/javascript">
  function searchPrimo() {
    document.getElementById("primoQuery").value = "any,contains," +
document.getElementById("primoQueryTemp").value;
    document.forms["searchForm"].submit();
  }

  function searchKeyPress(e) {
    if (typeof e == 'undefined' && window.event) {
      e = window.event;
    }
    if (e.keyCode == 13) {
      document.getElementById('go').click();
    }
  }
</script>
<p><b>Search for</b></p>
<form name="searchForm" role="search" method="get"
action="http://<FE_Hostname>:<FE_port>/primo_library/libweb/action/dlSearch.do"
enctype="application/x-www-form-urlencoded; charset=utf-8" id="simple"
target="_self" onsubmit="searchPrimo()">
  <input name="institution" value="<inst_code>" type="hidden">
  <input name="vid" value="<view_code>" type="hidden">
```

```
<input type="hidden" id="primoQuery" name="query" />
<input type="text" size="25" id="primoQueryTemp" value=" " name="queryTemp"
onkeypress="return searchPrimoEvent(event);" />
<input id="go" type="button" value="Search" title="Search"
onclick="searchPrimo();" alt="Search">
</form>
```

---

**Note**

The above example includes the `institution`, `vid`, and `query` input parameters, which are required for a Brief Search deep link.

---

2. To customize the embedded search box, append additional parameters to the `<form>` element using the following format:

```
<input name="<parameter_name>" value="<parameter_value>" type="hidden">
```

For more information on each parameter, see [Brief Search Deep Link](#) in the Ex Libris Developer Network.

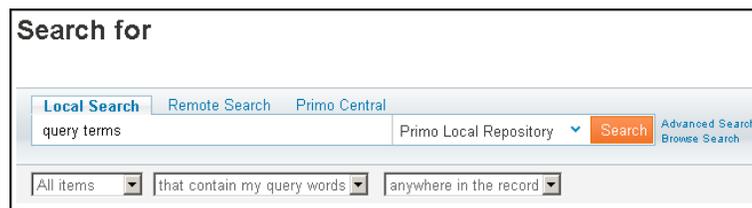
## Embedding a Primo Search Tile

[Return to menu](#)

### Note

For information regarding the new Primo UI, see [Creating a Search Box With Deep Links to the New UI](#).

The Primo Search tile displays on the Front End user interface.



### Primo Search Tile

It contains the following components:

- Search field
- pull-down lists (combo fields)
- preconfigured tabs
- links (Preferences and Advanced Search).

When you embed the search tile into an `<iframe>` element of an HTML file, you can configure these components. In addition, you can configure where the search results display.

### To embed a Primo Search Tile into an HTML file:

1. Embed the following link in an `<iframe>` element of any HTML file:

```
http://FE_hostname:port/primo_library/libweb/action/search.do?embed=true
```

2. To customize the embedded search tile, append additional parameters to the link, separating parameters by **&**. For more information on each parameter, see the following table. Note that the parameters are case sensitive.

The following example shows a link that embeds a Search tile that includes the Advanced Search link and displays search results in a new window:

```
<IFRAME ID="Primosearch" FRAMEBORDER="0" SCROLLING="NO" WIDTH="750" HEIGHT="300"  
src=http://server:1701/primo_library/libweb/action/  
search.do?vid=Auto1&embed=true&resloc=_blank&sadvanced=true>  
</IFRAME>
```

Embedded Search Tile Parameters

Parameter	Description
bgcolor	<p>Specify a CSS class name to modify the appearance of the Search tile. The default CSS class is <code>search_bg</code>.</p> <hr/> <p><b>Note</b></p> <p>For more information on modifying the look of Primo's Front End, see <a href="#">Customizing Primo's User Interface</a>.</p> <hr/>
bgcolor2	<p>Specify a CSS class name to modify the appearance of the Search tile. The default CSS class is <code>search</code>.</p> <hr/> <p><b>Note</b></p> <p>For more information on modifying the look of Primo's Front End, see <a href="#">Customizing Primo's User Interface</a>.</p> <hr/>
combo1	Specify whether to display the Resource Type drop-down list for your view. Valid values are <code>true</code> or <code>false</code> .*
combo2	Specify whether to display the Search Target drop-down list for your view. Valid values are <code>true</code> or <code>false</code> .*
combo3	Specify whether to display the Search Operators drop-down list for your view. Valid values are <code>true</code> or <code>false</code> .*
combo4	Specify whether to display the Search Scope drop-down list for your view. Valid values are <code>true</code> or <code>false</code> .*
embed	<p>Specify <code>true</code> to display the embedded Search tile in your local site. Valid values are <code>true</code> or <code>false</code>.</p> <hr/> <p><b>Note</b></p> <p>This field is required.</p> <hr/>
height	Specify the height of the Primo Search tile in pixels. If you do not specify this parameter, the height defaults to the size provided by the Primo Front End.
language	Specify a locale for the display language, such as <code>fr_FR</code> . If no locale is specified, the default locale for the view is used.
resloc	<p>Specify one of the following values to indicate where to display the results:</p> <ul style="list-style-type: none"> <li>◦ <b>_self</b>—Opens the search results in the same <code>&lt;iframe&gt;</code>.</li> <li>◦ <b>_parent</b>—Opens the search results in the parent window.</li> <li>◦ <b>_blank</b>—Opens the search results in a new window.</li> </ul>

Parameter	Description
	<hr/> <p><b>Note</b></p> <p>If you do not specify this parameter, the results display in a new window.</p> <hr/>
sadvanced	Specify <b>true</b> to display the Advanced Search link in the embedded Primo Search tile. Valid values are <code>true</code> or <code>false</code> .
sbrowse	Specify <b>true</b> to display the Browse Search link in the embedded Primo Search tile. Valid values are <code>true</code> or <code>false</code> . The default value is <code>false</code> .
sbutton	<p>Specify a CSS class name to use a different Search button on your Search tile. The default CSS class is <code>go</code>.</p> <hr/> <p><b>Note</b></p> <p>For more information on modifying the look of Primo's Front End, see <a href="#">Customizing Primo's User Interface</a>.</p> <hr/>
slabel	Specify the text that displays above the search field. If you do not specify this parameter, the Search tile displays the Primo default text: Search for.
spreferences	Specify <b>true</b> to display the Preferences link in the embedded Primo Search tile. Valid values are <code>true</code> or <code>false</code> .
vid	<p>Specify the view ID (Code field in View wizard) of the view that you want to display for the embedded Search tile.</p> <p>If you do not specify this parameter, the local site will display the default view for the Primo Front End.</p>
width	<p>Specify the width of the Primo Search tile in pixels. If you do not specify this parameter, the width defaults to the size provided by the Primo Front End.</p> <hr/> <p><b>Note</b></p> <p>The width of the search field determines the minimum width of the Search tile. See the description of the <code>sbwidth</code> parameter for more information.</p> <hr/>
tab	Specify the search tabs to display on the Search tile. If you do not specify this parameter, the Search tile displays all tabs for your view.
sbwidth	Specify the width of the Search field in em units. If you do not specify this parameter, the width defaults to the size provided by the Primo Front End.

\* By default, Primo displays all valid drop-down lists for your view. To omit this drop-down list, specify `false`.

## Linguistic Features

This section includes:

- [Language Detection](#)
- [Stop Words](#)
- [Stemming](#)
- [Synonyms](#)
- [Did You Mean](#)
- [Normalization of Characters in Primo](#)

## Language Detection

[Return to menu](#)

In order to offer language-based services, Primo must first detect the language of the indexed text and the query. Currently, Primo can detect the following languages:

- Latin-based: English, Spanish, Italian, German, French, and Danish.
- Asian: Chinese, Japanese, and Korean. If the character is Chinese and the locale of Primo is Japanese or Korean, Primo uses the locale of the selected language.
- Other languages that have a specific character range: Hebrew, Arabic, and so forth.

Language detection is based on comparing the words of the record and the query with a dictionary. If fifty percent or more of the words match, the language is identified.

---

## Stop Words

[Return to menu](#)

Stop words are included in phrase searches and omitted from keyword searches. For example, if a user searches for **the adventures of huckleberry finn**, Primo performs the following searches:

```
the adventures of huckleberry finn
```

or

```
adventures huckleberry finn
```

Primo uses stop word lists during indexing and searching. The stop words are stored in files called `stopwords_<language_code>.jsw`, where `<language_code>` indicates the language. For example, `stopwords_eng.jsw` is the English stop words list. The file is located in the following directory, where `<v/>` is the Primo version in which Primo was first installed and `<y/>` is the Primo copy:

```
/exlibris/primo/p<v>_<y>/ng/jaguar/home/profile/analysis/stopwords</y></v>
```

Each stop word must be in the normalized form and cannot contain diacritics. For example, **boök** should be entered as **boook** in the stop word file.

---

### Note

- Because stop words are indexed in Primo, you should re-index the database after making changes to the stop word files.
- Changes to the stopword configuration files have no effect on the results returned from remote searches, Primo Central, or any other deep search adaptor.

---

## Author Names

Primo treats words with O' apostrophe as a stop word in many Latin languages and indexes them as two separate words. This happens also for authors such as O'Leary, which is indexed as *o* and *leary*. As a result, a search for *Oleary* will not retrieve the same number of results as *O'Leary*. When users search for names that typically include apostrophes but do not include the apostrophe, Primo will also search for the name as if the users had included the apostrophe. For example, if the user's query is *Oleary*, Primo will change the query to search for *oleary* or *o leary*. The system uses the `apostrophe_names.txt` file to determine which common names start with an O' apostrophe. This file is located under the following directory:

```
jaguar/home/profile/analysis/authors
```

---

**Note**

- No indexing is required to benefit from this capability.
  - Changes to the author configuration files have no effect on the results returned from remote searches, Primo Central, or any other deep search adaptor.
-

## Stemming

[Return to menu](#)

Stemming is a process that reduces inflected (or sometimes derived) words to their stem, base, or root form.

Primo uses stemming when a search returns fewer results than a defined threshold. By default, Primo sets the threshold for the returned results to 25. If the search returns fewer results than this amount, Primo stems the search terms using the Kstem stemmer.

On-premises customers can customize the default threshold by editing the `min_res_for_stemming` parameter in the `search_schema.xml` file. This file is located in the following directory, where `<v>` is the Primo version and `<c>` is the copy:

```
/exlibris/primo/p<v>_<c>/ng/jaguar/home/system/conf
```

---

### Note

- Primo does not unstem terms with the exception of pluralization. If the result set is lower than the default threshold, Primo will pluralize terms, ranking their results lower. For example, a search for **wild flower** expands to **wild AND (flower OR flowers^0.5)**.
  - Changes to the stemming configuration files have no effect on the results returned from remote searches, Primo Central, or any other deep search adaptor.
-

---

## Synonyms

[Return to menu](#)

Changes to the `userSynonyms` file requires access to the server. If you are a cloud customer, open a Salesforce case if you want a synonym added.

Primo adds the following types of synonyms to a search query:

- Numbers – when a search contains a digit, Primo adds the spelled out number to the search query. For example, Primo adds the word **ninth** to a search query for **9th**.
- US or British spelling – when a search contains a word spelled according to US or British spelling, Primo adds the corresponding synonym to the search query. For example, Primo adds the word **colour** to a search query for **color**.
- Commonly misspelled words – for commonly misspelled words, Primo adds the word spelled correctly to the search query.

---

### Note

Primo does not add synonyms during indexing.

---

In addition to the synonym, Primo includes the original search term in the query. For example, if the query is **fifth dimension**, Primo searches for **(fifth OR 5th) AND dimension**.

There are two types of synonym files, which are located on your Front End servers:

- System-provided synonyms – located in the `<language>_systemSynonyms` file. For example:  
`eng_systemSynonyms`
- Site-provided synonyms – located in the `userSynonyms` file. If changes are needed, you must change this file on all of the Front End servers, and then deploy the **Search Engine Configuration** option on the **Primo Home > Deploy All** page.

Both of these synonym files are located in the following directory on the Front End servers:

```
/exlibris/primo/p<release>_<copy>/ng/jaguar/home/profile/analysis/synonyms
```

---

### Note

- Because the synonym files may be overwritten during the installation of service packs, it is recommended that you back them up.
  - Changes to the synonym configuration files have no effect on the results returned from remote searches, Primo Central, or any other deep search adaptor.
- 

A single term can map to multiple synonyms by separating each additional synonym and its rank with commas as follows:

```
Term = Synonym_1 (Rank_1), Synonym_2 (Rank 2), ..., Synonym_n (Rank_n)
```

- Term – the search word from which the synonym is created. This is usually a number, a US spelling of a word, or a commonly misspelled word.

---

**Note**

A term cannot contain more than one word, which is a series of characters delimited by white space (such as a space, non-breaking space, or tab). For details on how special characters are treated by the system, see [Normalization of Punctuation and Special Characters](#). Because hyphens are converted to spaces, a hyphenated word (such as **fire-fighter**) cannot be used as a term because it is treated as multiple words by the system.

- 
- Synonym – the synonym added to the query. This is usually the name of the number, the term (British spelling), and the correct spelling of commonly misspelled words. Synonyms may contain multiple words. For example, the synonym for **fireman** might be defined as **fire fighter** or **fire-fighter**.
  - Rank – the boost that will be given to the synonym when search results are ranked. In general, records located by a synonym should receive a lower score than records located by the term used by the user. By defining a different rank per synonym, it is possible to define the relevancy of the synonyms. Terms can be ranked as follows:
    - Very low
    - Low
    - Normal
    - High
    - Very high

For example:

```
10th = tenth (high)
tenth = 10th (high)
10 = ten (very high)
Ten = 10 (very high)
```

The boost itself is defined in the `search_schema.xml` file. The default is defined as follows:

```
<synonyms/>
<levels/>
<level desc="very high">0.8</level>
<level desc="high">0.1</level>
<level desc="normal">0.01</level>
<level desc="low">0.005</level>
<level desc="very low">0</level>
```

---

**Note**

The boost is always less than 1 (the default boost). This ensures that the synonym will receive a lower boost than the term used by the user.

---

In addition, it is possible to define the threshold rank for using synonyms. The default is `normal`, which means that search queries will not use synonyms with the rank low and very low. On-premises customers can define this threshold with the `synonyms/threshold` parameter in the `search_schema.xml` file.

---

## Did You Mean

[Return to menu](#)

Primo's Did You Mean index is based on the Levenshtein distance, which is the distance between two words using a minimum number of single-character edits (such as insertions, deletions, or substitutions) to change a word into the other word. Primo builds the Did You Mean index (which has an edit distance of a single character) from the regular titles index. Ex Libris recommends that you update this index on a weekly basis using the Primo Scheduler in the Back Office.

Primo invokes the Did You Mean algorithm on single and multiple word queries and returns a single Did You Mean suggestion per query.

---

### Note

Changes to the Did You Mean configuration files have no effect on the results returned from remote searches, Primo Central, or any other deep search adaptor.

---

---

## The Did You Mean Algorithm

A Did You Mean link does not automatically display in the Front End when the user performs a search. A threshold must be met before Primo invokes the Did You Mean function. Primo will display a Did You Mean suggestion only when a query returns less results than specified for the threshold, which is defined with the `didyoumean_threshold/res_threshold` parameter in the `search_schema.xml` file. The default threshold value is 50.

---

### Note

The system does not apply this threshold to searches that include Primo Central results.

---

In addition to this threshold, Primo checks the query terms against a dictionary and invokes the Did You Mean function if a term is found to be incorrect. If the query is a phrase, the function replaces only incorrect terms in the Did You Mean suggestion.

---

### Note

The Did You Mean algorithm works separately on every term within the query.

---

If a search query returns less than 50 results, the Did You Mean algorithm performs the following:

Primo searches for a match in the Did You Mean index. Several candidates are checked and the highest-ranking result is used. The frequency of the term in the index is one of the factors in the ranking. If the corrected query returns enough results, it will be displayed.

---

## Disabling the Did You Mean Feature

Primo provides the following methods to disable the Did You Mean feature:

- Do not create the Did You Mean index.
  - Configure the following parameters in the Did You Mean section on the Advanced Configuration > Search Engine Configuration page and then deploy the **Search Engine Configuration** option on the Deploy All page:
    - Set the **Maximum Results for Did You Mean** parameter to **-1**.
    - Clear the **Use Rank Threshold** check box.
- 

**Note**

The above parameters can be defined per institution.

---

---

## Normalization of Characters in Primo

[Return to menu](#)

Primo normalizes characters in the following contexts:

- Indexing and Searching
- Alphabetic sorting of results sets (such as for author or title sort)
- Creation of the Dedup/FRBR keys during the normalization process

The normalization mechanism is separate in each context and is described in separate sections below.

---

### Note

Changes to the normalization configuration files have no effect on the results returned from remote searches, Primo Central, or any other deep search adaptor.

---

---

## Indexing and Searching

The search engine normalizes characters during indexing and searching. This is done to ensure that the user's query matches the indexed terms. If characters are optionally configured to be normalized in multiple variations based on language, the system will index all variations, but during search time, it will normalize the character to the most appropriate variation based on the language of the query. If the language of the query cannot be determined, the system will default to the interface language. For more information, see [Support for Multiple Variations](#).

Primo is installed with out-of-the-box normalization of characters, which can be overridden by customer defined rules.

---

## Out-of-the-Box Normalization

The out-of-the-box (OTB) character normalization is defined in the following tables under the `/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/OTB/OTB` directory:

- For CJK:
  - `CJK_unicode_kana1to1_normalization.txt`
  - `CJK_unicode_trad_to_simp_normalization.txt`
  - `CJK_unicode_punct_normalization.txt`
- For non-CJK scripts:
  - `non_CJK_unicode_normalization.txt` – Provides normalization for all character sets, but CJK. For more information on this type of normalization, see [Out-of-the-Box Latin Normalization for Indexing and Searching](#).

- `<language_code>_non_cjk_unicode_normalization.txt` – Out of the box, Primo supports some normalization variations for the following languages using the language files: Danish (dan), German (ger), Norwegian (nor), and Swedish (swe). If the default locale (which is defined as English on the Search Engine Configuration page in the Primo Back Office) is changed to one of the supported languages, the character conversions defined in the relevant language file will override the character conversions defined in the following file:

`non_cjk_unicode_normalization.txt`

For more information on language-specific files, see [Out-of-the-Box Language Variations](#).

---

### Note

Out of the box, no characters are normalized in multiple variations, however, this can be done locally. For more information, see [Support for Multiple Variations](#).

---

The structure for all of the above files is the same:

- The first column contains the original character.
- The second column contains the normalized character.

Each column is separated by a tab, and comments are prefixed with the number sign #.

For example:

```
0041 0061 # LATIN CAPITAL LETTER A ( 'A' to 'a' )
0042 0062 # LATIN CAPITAL LETTER B ( 'B' to 'b' )
0043 0063 # LATIN CAPITAL LETTER C ( 'C' to 'c' )
0044 0064 # LATIN CAPITAL LETTER D ( 'D' to 'd' )
0045 0065 # LATIN CAPITAL LETTER E ( 'E' to 'e' )
0046 0066 # LATIN CAPITAL LETTER F ( 'F' to 'f' )
0047 0067 # LATIN CAPITAL LETTER G ( 'G' to 'g' )
0048 0068 # LATIN CAPITAL LETTER H ( 'H' to 'h' )
0049 0069 # LATIN CAPITAL LETTER I ( 'I' to 'i' )
004A 006A # LATIN CAPITAL LETTER J ( 'J' to 'j' )
004B 006B # LATIN CAPITAL LETTER K ( 'K' to 'k' )
004C 006C # LATIN CAPITAL LETTER L ( 'L' to 'l' )
004D 006D # LATIN CAPITAL LETTER M ( 'M' to 'm' )
004E 006E # LATIN CAPITAL LETTER N ( 'N' to 'n' )
```

Normalization from one to many characters is not supported within a single file. Additional normalizations can be created in separate language directories.

Because the default character conversion files are overwritten during upgrades, it is recommended that all customizations be performed at the installation and institution levels as described in the following sections.

---

## Out-of-the-Box Language Variations

Out of the box, Primo supports normalization variations for the following languages using the associated language file:

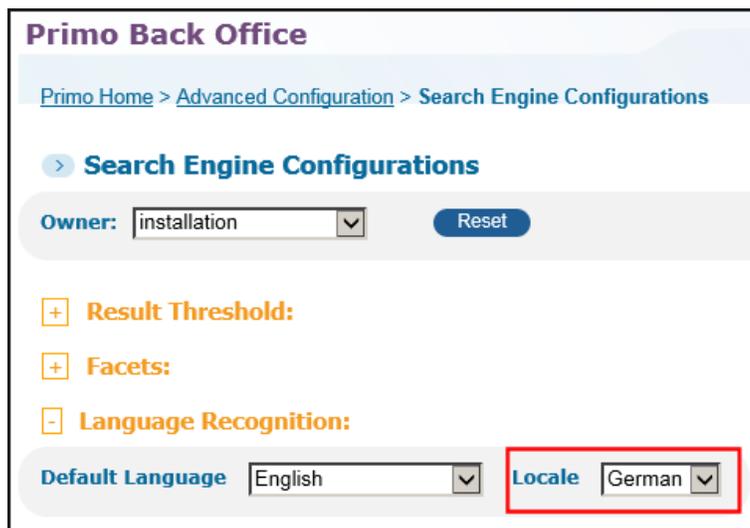
- Danish – dan\_non\_cjk\_unicode\_normalization.txt
- German – ger\_non\_cjk\_unicode\_normalization.txt
- Norwegian – nor\_non\_cjk\_unicode\_normalization.txt
- Swedish – swe\_non\_cjk\_unicode\_normalization.txt

If the Locale parameter on the Search Engine Configuration page is modified to any of the above languages, the characters defined in the relevant language file, which is stored in the following directory, will override the characters defined in the non\_cjk\_unicode\_normalization.txt file, which are stored in the same directory:

```
/exlibris/primo/p<n>_<x>/ng/jaguar/home/profile/analysis/specialCharacters/  
CharConversion/OTB/OTB/</x></n>
```

If the Default Locale parameter in the Search Engine Configuration Wizard is changed to any of the above languages, the characters defined in the <language\_code>\_non\_cjk\_unicode\_normalization.txt file will override the characters defined in the non\_cjk\_unicode\_normalization.txt file.

The following figure shows the locale set to German in the Primo Back Office:



Search Engine Configuration Wizard (Locale set to German)

---

### Note

If you change the Locale parameter, you must re-index the database from scratch to ensure consistency between indexing and searching. For more information, refer to the Deleting and Re-indexing the Database section in the *Primo System Administration Guide*.

The `<language_code>_non_cjk_unicode_normalization.txt` files include only the characters that need to be normalized differently. For example, see the following table, which lists per language the characters that are normalized differently from the previous version of Primo. The table lists only the lowercase form, but both uppercase and lowercase characters are normalized.

Normalization Differences Per Language

Unicode	Lowercase	Default	German	Danish	Norwegian	Swedish
00C5 00E5	å	a		aa	aa	aa
00C4 00E4	ä	a	ae	ae	ae	ae
00D8 00F8	ø	o		oe	oe	oe
00D6 00F6	ö	o	oe	oe	oe	oe
00DC 00FC	ü	u	ue			

---

#### Note

Any changes made to the locally-defined characters conversion tables (as described in the section below) will override the definitions based on the default locale.

---

## Locally-Customized Normalizations

If you want to customize specific character conversions, create a `user_defined_unicode_normalization.txt` file and include your customized character conversions.

For on-premises installations, you can customize the out-of-the-box normalizations by creating entries for specific characters at the following configuration levels:

- **Installation** – This level contains the customized normalization files for all institutions, which must be stored in the following directory.

```
/exlibris/primo/p<n/>_<x/>/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/CUSTOMER/CUSTOMER
```

If you want to customize specific character conversions, add a `user_defined_unicode_normalization.txt` file to the above directory and include your customized character conversions.

- **Institution** (one per institution) – This level contains the customized normalization files for individual institutions in non-sharing, multi-tenant environments only, which must be stored in the following directories:

```
/exlibris/primo/p<n/>_<x/>/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/CUSTOMER/<institution>
```

If you want to customize specific character conversions, add a `user_defined_unicode_normalization.txt` file to the above directory and include your customized character conversions.

Any characters defined in the `user_defined_unicode_normalization.txt` file will override the character conversions defined at a higher level, including characters defined in the `<language_code>_non_cjk_unicode_normalization.txt` files if the default locale is set to one of the out-of-the-box language variations.

In addition, the system allows you to index multiple variations of Latin characters per Latin language at the installation and institution levels (see [Support for Multiple Variations](#)).

---

## Note

For cloud installations, contact Ex Libris Support for assistance to add your customizations to the server.

- If you add local customizations, you will need to deploy the Search Engine option on the Deploy All page and then re-index from scratch. To re-index from scratch, follow the instructions in the Performing System Cleanup - Clean Database Scripts section in the Primo System Administration Guide.
- Character conversions at the institution level have precedence over customizations at the installation level, and customizations at the installation level have precedence over character conversions defined in the default character conversion files at the OTB level.
- For customers who do not have access to the server, contact Ex Libris Support for assistance.

---

## Support for Multiple Variations

Primo allows you to index the same character in several possible ways. During indexing, all defined variations are created per language, but only the variation that matches the detected language of the query is used. If a language is not detected, the system will use the language of the UI. By selecting only one variation based on language, unwanted results (for example, to retrieve results with u when the query is for ü) are minimized during searching.

For each language, add only the characters that require language-specific normalizations to the following files:

```
non_cjk_unicode_normalization.txt
```

---

## Note

For cloud installations, contact Ex Libris Support for assistance to add your customizations to the server.

Language-specific customizations should be added to the appropriate language directory at the following configuration levels as needed:

- **Installation** (overrides OTB level for all institutions) – `/exlibris/primo/p<n>_<x>/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/CUSTOMER/CUSTOMER`
- **Institution** (overrides installation and OTB levels for specified institution) – `/exlibris/primo/p<n>_<x>/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/CUSTOMER/<institution>`

Name	Ext	Size	Changed	Rights	Owner
..			6/10/2014 9:59:06 PM	rwxxrwxr-x	primo
dan			6/10/2014 9:59:43 PM	rwxxrwxr-x	primo
ger			6/10/2014 9:59:23 PM	rwxxrwxr-x	primo
nor			6/10/2014 10:00:03 PM	rwxxrwxr-x	primo
swe			6/10/2014 9:59:52 PM	rwxxrwxr-x	primo

### Language-Specific Directories for Character Conversion

Each language directory must be a 3-character ISO Latin 639.2-B code that contains the following file, which should include only the characters that require language-specific normalizations:

```
non_cjk_unicode_normalization.txt
```

To be certain that the language-specific directory is used to normalize search queries, the equivalent UI language must be enabled in the Languages code table (which defines 4-character codes that the system converts to the equivalent 3-character codes).

---

#### Note

Out of the box, no multiple variations are defined per language.

---

## Normalizing Decomposed Unicode to Composed Unicode

In addition to the out-of-the-box normalizations, the SE can normalize decomposed Unicode characters to the composed form. The system performs this type of normalization first, utilizing the `221_punctuation_char_normalization_range_unicode.txt` file, which is populated via the SE 221 Char conversion mapping table in the Front End subsystem. This normalization file is stored under the following directory on the Primo server:

```
/ng/jaguar/home/profile/analysis/specialCharacters/  
221_punctuation_char_normalization_range_unicode.txt
```

Out of the box, the SE 221 Char conversion mapping table is empty. To add an entry to the above file, you must add a mapping row containing the following fields in the SE 221 Char conversion mapping table:

- **From** – Original decomposed Unicode characters
- **To** – Normalized composed Unicode character

For example, to normalize A and a Diaeresis to A with a Diaeresis as a single character, enter the following:

```
0041-0308 00C4
```

After making a change to the mapping table, it is necessary to deploy the Search Engine Configuration option. It is also necessary to clear the index and then re-index.

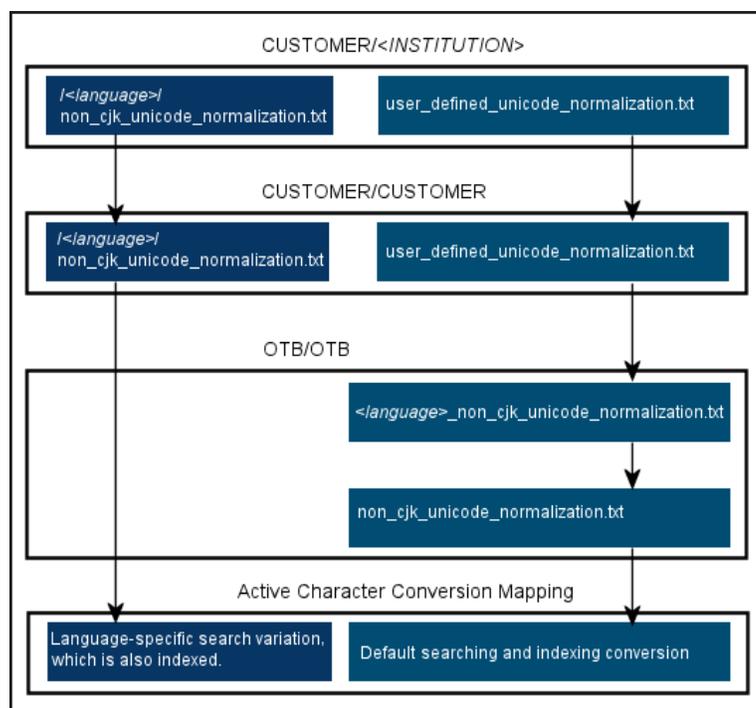
---

## The Normalization Flow for Indexing and Searching

The system creates a single active mapping from the various files described above using the following flow:

1. The SE normalizes decomposed Unicode to composed Unicode, as defined in the 221 Char conversion mapping table in the Front End subsystem.
2. The SE normalizes characters based on the tables in the `/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion` directory using the following hierarchy:
  1. `/exlibris/primop<n/>_<x/>/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/CUSTOMER/<institution/>` - Uses the institution of the active view. This is applicable in non-sharing, multi-tenant environments only.
  2. `/exlibris/primop<n/>_<x/>/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/CUSTOMER/CUSTOMER`
  3. `/exlibris/primop<n/>_<x/>/ng/jaguar/home/profile/analysis/specialCharacters/CharConversion/OTB/OTB`

The following figure shows the hierarchy of the conversion files and how each type of conversion file is used to create the default and language-specific conversion mappings. The right side of the figure shows the default conversion mapping flow used for all users regardless of the detected language. The left side shows the conversion mapping flow for characters that require an additional conversion from the default mapping, which is based on the detected language of the query or the language setting of the UI (if a language cannot be detected in the query).



#### Character Conversion Flow

The relevant language-specific mapping file (which is defined under the `.../OTB/OTB` directory) is also included in the default conversion mapping if the **Locale** parameter is set to **Danish**, **German**, **Norwegian**, or **Swedish** in the Search Engine Configuration Wizard. For more information, see [Out-of-the-Box Language Variations](#).

The language-specific directories, which are created locally, allow you to create multiple variations for a character. For more information, see [Locally-Customized Normalizations](#).

---

## Character Conversion Examples

Each of the scenarios in this section is based on the conversion of the following characters:

- 00E5 (å)
- 00F6 (ö)

### Scenario 1:

In this scenario, the following normalization files have been defined:

- /OTB/OTB/non\_cjk\_unicode\_normalization.txt

Character	Conversion
00E5 (å)	0061 (a)
00F6 (ö)	006F (o)

- /OTB/OTB/ger\_cjk\_unicode\_normalization.txt

Character	Conversion
00F6 (ö)	006F 0065 (oe)

- /OTB/OTB/swe\_cjk\_unicode\_normalization.txt

Character	Conversion
00E5 (å)	0061 0061 (aa)

- /CUSTOMER - Nothing is defined in this directory.

### Result 1a:

If the customer did not change the default locale setting, the system will use the following character conversions (which are defined in the

/OTB/OTB/non\_cjk\_unicode\_normalization.txt file) for both indexing and searching:

Character	Conversion
00E5 (å)	0061 (a)
00F6 (ö)	006F (o)

## Result 1b:

If the customer changes the default locale setting to German, the system will use the character conversion mapping that is defined for ö in the

`/OTB/OTB/ger_non_cjk_unicode_normalization.txt` file for both indexing and searching:

Character	Conversion
00E5 (å)	0061 (a)
00F6 (ö)	006F 0065 (oe)

## Scenario 2:

In this scenario, the out-of-the-box definitions are the same as in Scenario 1, the default locale has been set to Swedish, and the `/CUSTOMER/CUSTOMER/user_defined_unicode_normalization.txt` file has been added to override the Swedish conversion for å:

Character	Conversion
00E5 (å)	0061 (a)

In addition, the customer added the `/CUSTOMER/CUSTOMER/ger/non_cjk_unicode_normalization.txt` file to define the following variations for German:

Character	Conversion
00F6 (ö)	006F 0065 (oe)

The following table lists the character conversion mapping created from all of the files:

Character	Default Conversion	German Conversion
00E5 (å)	0061 (a)	
00F6 (ö)	006F (o)	006F 0065 (oe)

This indicates that å will be both indexed and searched as an “a” even though the default Locale parameter was set to **Swedish** in the Search Engine Configuration Wizard.

This also means that ö will be indexed as both o and oe. Although, if Primo detects that a search query is in German or the locale of the UI is German, ö will be converted to oe.

---

## Alphabetical Sorting

Normalization of characters for alphabetic sorting of the results set in the Front End is done in two stages: Indexing and Run-time.

---

### Indexing

The sort keys created from the fields in the Sort section of the PNX are normalized during indexing via the following mapping tables:

- **SE 221 Char conversion** – Normalizes decomposed characters to composed characters. There are no out-of-the-box values in this table. For more information, see [Normalizing Decomposed Unicode to Composed Unicode](#).
- **SE Char conversion** – Normalizes composed characters and punctuation. After changes to this table have been saved and deployed, the system saves the definitions to the following file:

```
/ng/jaguar/home/profile/analysis/specialCharacters/  
punctuation_char_normalization_range_unicode.txt
```

The SE Char conversion table comes with the following out-of-the-box definitions:

- Delete initial and trailing blanks.
- Convert the following characters to blank: hyphen (2010), back slash (005C), underline (005F), hyphen-minus (002D), slash (002F), Figure dash (2012), En dash (2013), EM dash (2014).
- Delete the following non alpha-numeric characters:
- ASCII punctuation (<http://unicode.org/charts/PDF/U0000.pdf>) – 0021-002E, 005B-005E, 007B-007E  
(does not delete characters that should be changed to a blank)
- Latin 1 punctuation (<http://unicode.org/charts/PDF/U0080.pdf>) - 00A1-00B8, 00BA-00BB, 00BF  
(does not delete superscripts and fractions – 00B2-00B3, 00B9, 00BC-00BE)
- Combining Diacritical marks (floating diacritics) (<http://unicode.org/charts/PDF/U0300.pdf>) – 0300-036F
- Compresses multiple blanks to a single blank.

---

#### Note

Any change to this table requires a deploy of the Search Engine configuration and re-indexing from scratch.

---

---

### Run-Time

During run-time the actual order of the characters is determined by files on the server. Primo supplies out-of-the-box files, but you can use locally-defined files to override them.

The following out-of-the-box character set files are located in the

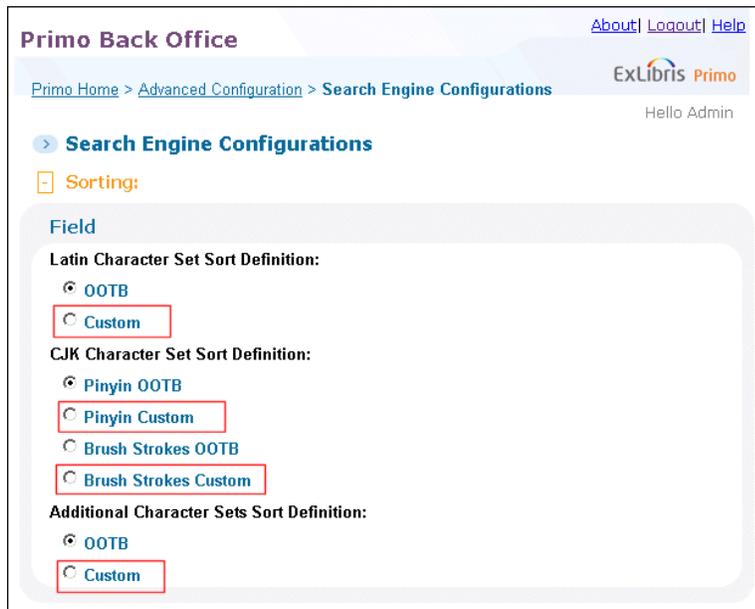
`/exlibris/primo/p3_1/ng/jaguar/home/profile/analysis/sort/system` directory:

- `latin_rules_ootb.txt` - contains the default Latin sort rules

- `cyj_pinyin_rules_ootb.txt` - contains the default CJK PINYIN sort rules
- `cyj_brushs_rules_ootb.txt` - contains the default CJK Brush sort rules
- `other_rules_ootb.txt` - contains the default Hebrew sort rules

**To override the out-of-the-box character set files:**

1. Select the **Custom** option next to the character set definitions (Latin, CJK, and Additional) that you want to override in the Advanced Configuration > Search Engine Configurations > Sorting section.



**Character Sets Sort Definitions**

2. Create the following customized files and place them in the `/exlibris/primo/p3_1/ng/jaguar/home/profile/analysis/sort/user_defined` directory on your server:
  - `latin_rules_custom.txt` - contains the custom Latin sort rules
  - `cyj_pinyin_rules_custom.txt` - contains the custom CJK PINYIN sort rules
  - `cyj_brushs_rules_custom.txt` - contains the custom CJK Brush sort rules
  - `other_rules_custom.txt` - contains custom Hebrew sort rules
3. Deploy the Search Engine configuration.
4. Re-index from scratch.

## Dedup and PNX Keys

Characters are normalized in the Dedup and FRBR keys for matching purposes. The system uses the following transformation routines for FRBR and Dedup keys:

- **Character conversion** – This transformation is used in the out of the box rules. It normalizes Latin characters. For more information, see [Character Conversion Transformation - Normalization Table](#).

- **NormalizeDiacritics** – This transformation normalizes characters based on the DiacriticsConversion mapping table in the Normalization subsystem.

The DiacriticsConversion mapping table contains the following columns:

- **Source UniCode** – the Unicode character from which to normalize.
- **Target UniCode** – the Unicode character to which to normalize. It is possible to normalize a single character to two characters by entering a hyphen between them. For example, enter 0064-0068.

Primo Back Office

Primo Home > Advanced Configuration > All Mapping Tables

Mapping Tables

Update for Owner: Installation Sub System: Normalization Table Name: DiacriticsConversion

Reset Delete

Mapping Table Rows

Enabled	Source UniCode*	Target UniCode	Description	Last
<input type="checkbox"/>				
<input checked="" type="checkbox"/>	0160	0053		
<input checked="" type="checkbox"/>	010A	0043		
<input checked="" type="checkbox"/>	026D	0077		

Table Description: Diacritics character conversion

Create a New Mapping Row

Source UniCode Target UniCode Description Create

Import Excel File

Browse... Load

Cancel & Go back To Mapping Table List Export To Excel Save

### DiacriticsConversion Mapping Table

The following example converts a Latin O with stroke to uppercase O:

Source UniCode	Target UniCode
00D8	004F

## Normalization of Punctuation and Special Characters

During normalization, the tokenizer uses the rules in the following table to determine which punctuation and special characters should be included in search indexes. Character conversion files can be used to process any punctuation or special characters that are not handled by the following rules. Any remaining punctuation and special characters are replaced with spaces and treated as word separators. For example, **a\*b** or **a\$b** are treated as two separate words (**a** and **b**) by the tokenizer.

Punctuation and Special Character Normalization Rules

Format/Description	Examples	Notes
<p>One or more alphanumeric characters followed by one or more of the following symbols:</p> <p>+ # /</p>	<p>13/A c++ c# i/o a+ ab+</p>	
<p>Two words separated by an apostrophe: &lt;word&gt;&lt;apostrophe&gt;&lt;word&gt;</p>	<p>Al-Haqa'iq al-Bah?th ?an U_rubba_</p>	<p>An apostrophe may be one of the following characters, which is converted to 0027:  2018, 2019, 201B, 0060, 00B4, 02BB, 02BC, 02BD, 02BE, 02BF</p>
<p>Two words separated by a hyphen: &lt;word&gt;&lt;hyphen&gt;&lt;word&gt;</p>	<p>standards-based performance</p>	<p>A hyphen may be represented by any of the following characters:  \u002d, \u2010, \u2011, or \u05be</p>
<p>When included with special combinations of numbers and alphanumeric characters (such as IP addresses or special volume, issue, or supplement indications in citations), the following characters are not removed:</p> <p>_ - / . ,</p>	<p>a.1 1.a a-1-a</p>	
<p>&amp; and @ symbols that separate words (such as in company names) are not removed.</p>	<p>AT&amp;T Excite@Home</p>	
<p>Periods that are part of acronyms are not removed: &lt;letter&gt;(&lt;letter&gt;.)+</p>	<p>I.E.E.E. U.N.</p>	
<p>Combining marks, which include the following characters are not removed: \uFE20 - \uFE2F, \u1DC0 - \u1DFF, \u0300 - \u036F, \u20D0 - \u20FF</p>		
<p>Modifiers, which include the following characters are not removed: \u02B0 - \u02FF, \uA700 - \uA71F</p>		<p>This excludes the Hebrew hyphen (05BE) so that words with this character are recognized as follows: &lt;word&gt;&lt;hyphen&gt;&lt;word&gt;</p>
<p>For backward compatibility with V2.1 of the tokenizer, the following characters are not removed: \u0100 - \u05BD, \u05BF - \u1FFF</p>		

Format/Description	Examples	Notes
<p>For backward compatibility with V2.2 of the tokenizer, the following characters are not removed: \uFFA0 - \uFFDC</p>		
<p>Unless a digit follows a single underscore, Primo will replace underscores with a space.</p> <p>If a query contains more than one underscore in succession (including underscores that precede a digit), Primo will replace them with a single space.</p>	<p><b>abc_3_220</b> will be searched and indexed as <b>abc_3_220</b>.</p> <p><b>abc__3_220</b> will be searched and indexed as <b>abc 3_220</b>.</p>	

---

## Sending SMS Messages

Primo allows users to send Short Message Service (SMS) messages from the Primo Front End. These messages can be sent from the Keeping this item section of the Full Results page and the e-Shelf. This option displays only for users that are authorized to use the SMS feature.

Using the standard Ex Libris SMS Proxy, Primo includes out-of-the-box support for the following SMS providers:

- Clickatell ([www.clickatell.com](http://www.clickatell.com))
- OpenMarket ([www.openmarket.com](http://www.openmarket.com)), formerly known as Simplewire

OpenMarket no longer offers a credit-based messaging platform, but their current service model supports mass messaging and provides two-way messaging for clients. This provider may be of interest if you plan to send over 10,000 SMS messages monthly.

In addition to the out-of-the-box providers, customers can add their own providers by using the SMS Proxy Adapter. For more information, see the following documents:

- [The SMS Proxy Adapter page in the Ex Libris Developer Network](#)
- [The SMS Proxy User Guide in the Ex Libris Knowledge Center](#)

Since the SMS gateway limits the length of the message sent, Primo sends only selected fields from the record. Primo selects these fields on the assumption that one of the main uses of the SMS will be to locate the item in the library. Therefore, Primo sends the following fields from the display section of the requested PNX record:

- title: at least 20 characters of the title are included. If there is no space for the complete title, then the title will end with an ellipsis (...).
- ispartof (citation for articles): the entire field is included even if this means sending more than one SMS message.
- avallibrary (availability): there can be several lines. Preference is given to the lines that match the institution of the user and that are "Available" (\$\$Savailable); second priority should be given to Check-Holdings (\$\$Scheck\_holdings). The following subfields from avallibrary will be sent:
  - \$\$L library name
  - \$\$1 sublocation
  - \$\$2 call-number

The cell phone number for the SMS field has been added to the User Preferences page of the Front End. Note that the cell phone number needs to be sent to the SMS gateway in international format. The prefix for the country is added automatically by the system via the **Country Code for SMS** parameter unless the user prefixes the number with a plus (+). Note that the country prefix will not display in the Front End.

---

## Configuring the SMS Proxy

Primo uses the standard Ex Libris SMS Proxy, which currently interfaces with the Clickatell SMS Gateway at <http://www.clickatell.com> and the OpenMarket SMS gateway at <http://www.openmarket.com/>. To use this gateway, each

site must open an account with Clickatell or OpenMarket and receive a user ID, password, and other account details. If necessary, sites can open an account for each Primo institution.

---

## Configuring SmsProxyConf.xml for Clickatell

To configure the SMS Proxy to interface with the Clickatell SMS gateway, the `SmsProxyConf.xml` file (see the following figure) defines the SMS provider and the institutions that provide the SMS service. This file is located in the following directory (`fe_conf`), where `<r>` is your initial release of Primo and `<x>` is the Primo instance:

```
/exlibris/primo/p<r>_<x>/ng/primo/home/system/search/conf
```

```
<?xml version="1.0" encoding="UTF-8" ?>
<SmsProxyRoot xmlns="http://com/exlibris/core/sms/proxy/conf">
  <Providers>
    <Provider name="clickatell" code="clickatell">
      <component>com.exlibris.core.sms.proxy.ClickatellProvider</component>
    </Provider>
  </Providers>
  <Institutions>
    <Institution name="Primo" code="Primo">
      <ProviderCode>clickatell</ProviderCode>
      <ProviderUser>smithj</ProviderUser>
      <ProviderPassword>Xabcd123:1234567</ProviderPassword>
      <ProviderMo>1</ProviderMo>
      <ProviderFrom></ProviderFrom>
    </Institution>
  </Institutions>
  <Senders>
    <Sender>111.111.111.111</Sender>
  </Senders>
</SmsProxyRoot>
```

### Sample SmsProxyConf.xml File (Clickatell)

The following elements should be defined per institution. Every institution should have a separate Institution section.

- Institution name and Code – Enter the name and code of the institution assigned by Clickatell. Primo will send the user's institution to the SMS proxy when the user sends an SMS.
- ProviderCode – Enter **clickatell**.
- ProviderUser – Enter the username assigned to you by Clickatell.
- ProviderPassword – Enter your Clickatell password, followed by a colon (:) and your Clickatell API\_ID.
- ProviderMo – Enter **1** (true) to enable two-way messaging for mobile originations.
- ProviderFrom – Enter the mobile number assigned to the Clickatell account. This parameter is required to allow messages to be sent from your USA long code (which is required to send messages to the USA).
- Senders – Enter a list of all IP addresses that are allowed to send SMS messages from the FE servers.

---

## Note

You can define additional providers in the `SmsProxyConf.xml` file by adding a `<provider>` element for each provider, but you can assign only one provider to an institution code.

After updating this file, it is necessary to restart the Front End server.

---

## Configuring SmsProxyConf.xml for OpenMarket

To configure the SMS Proxy to interface with the Open Market SMS gateway, the `SmsProxyConf.xml` file (see the following figure) defines the SMS provider and the institutions that provide the SMS service. This file is located in the following directory (`fe_conf`), where `<r>` is your initial release of Primo and `<x>` is the Primo instance:

```
/exlibris/primo/p<r>_<x>/ng/primo/home/system/search/conf
```

```
<?xml version="1.0" encoding="UTF-8"?>
<SmsProxyRoot xmlns="http://com/exlibris/core/sms/proxy/conf">
  <Providers>
    <Provider name="SimpleWire" code="simplewire">
      <component>com.exlibris.core.sms.proxy.SimpleWireProvider</component>
    </Provider>
  </Providers>
  <Institutions>
    <Institution name="PRIMO" code="PRIMO">
      <ProviderCode>simplewire</ProviderCode>
      <ProviderUser>415-562-401-59715</ProviderUser>
      <ProviderPassword>9DB13831</ProviderPassword>
    </Institution>
  </Institutions>
  <Senders>
    <Sender>127.0.0.1</Sender>
    <Sender>10.1.234.254</Sender>
  </Senders>
</SmsProxyRoot> </Senders>
</SmsProxyRoot>
```

### Sample SmsProxyConf.xml File (OpenMarket)

The following elements should be defined per institution. Every institution should have a separate Institution section.

- Institution name and Code: Enter the name and code of the institution assigned by Open Market. Primo will send the user's institution to the SMS Proxy when the user sends an SMS.
- ProviderCode: Enter **simplewire**.
- ProviderUser/ProviderPassword: Enter the user ID and password provided by Open Market.
- Senders: Enter a list of all IP addresses that are allowed to send SMS messages from the FE servers.

---

## Note

You can define additional providers in the `SmsProxyConf.xml` file by adding a `<provider>` element for each provider, but you can assign only one provider to an institution code.

After updating this file, it is necessary to restart the Front End server.

---

## Specifying the JAR File Location

If you decide to create your own SMS plug-in, you will need to perform the following on the Primo server:

- Place the JAR file for your SMS plug-in on the Primo server.
- Include the `ExternalJarLocation` element in the SMS file to let the system know where you have placed the JAR file for your SMS plug-in. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<SmsProxyRoot xmlns="http://com/exlibris/core/sms/proxy/conf">
  <Providers>
    <Provider name="SimpleWire" code="simplewire">
      <component>com.exlibris.core.sms.proxy.SimpleWireProvider</component>
    </Provider>
  </Providers>

  <Institutions>
    <Institution name="PRIMO" code="PRIMO">
      <ProviderCode>simplewire</ProviderCode>
      <ProviderUser>415-984-632-59825</ProviderUser>
      <ProviderPassword>9AD19931</ProviderPassword>
    </Institution>
  </Institutions>

  <Senders>
    <Sender>127.0.0.1</Sender>
    <Sender>10.1.234.254</Sender>
  </Senders>

  <ExternalJarLocation>/exlibris/primo/OneSMSProvider/target/
  lib</ExternalJarLocation>
</SmsProxyRoot>
```

### ExternalJarLocation Element Example

---

## Configuring the Back Office

The Back Office allows you to configure the SMS settings for the Front End views and to add institutions to the `SmsProxyConf.xml` file on the server.

### To activate the SMS feature, update the configuration settings in the Back Office:

1. The Keeping this item tile has been added to the Full Results page of the Views wizard. In this tile, it is possible to assign the user groups that should be allowed to use the SMS option. User groups can be defined using the following parameters:
  - **Function:** the function to configure. Currently, only SMS is available.
  - **Description:** the description of the function.
  - **Institution:** all or specific institution.
  - **On-Off campus:** the user IP range (should be within or without the institution IP).
  - **User Group:** To enable SMS for signed-in users only, set this field to **NOT Guest**.
2. On the E-mail and SMS Configuration page of the Advanced Configuration Wizard, enter the following parameters:
  - **Country Code for SMS:** the country code used for SMS messages. The default is +1.
  - **Maximum SMS Per Message:** The maximum number of SMS messages that are sent per message. The default is 2.

## Primo Reporting Schema and User-Defined Reports

The Primo Reporting Schema (RPT00) provides read-only access to the following types of information in the Primo database.

- PNX-related information
- Search-related information
- User-related, UI events
- System monitoring events

You can access this information via Oracle Views that are defined in `p<r><c>_rpt00`, where `<r>` indicates the release in which Primo was initially installed and `<c>` indicates the Primo copy. For more information on RPT00 views, see [RPT00 Views](#).

---

### Note

Before you can access these views, you must install the RPT00 schema on your Primo server.

---

This section includes:

- [Installing the RPT00 Schema](#)
- [Installing User-Defined Reports](#)
- [RPT00 Views](#)

---

## Installing the RPT00 Schema

[Return to menu](#)

In order to create the Primo Reporting Schema (RTP00), you must run UTIL O from the Back Office server.

---

### Note

In Primo V3 and later releases, the RTP00 schema is created automatically for new installations.

---

In addition to the RPT00 views, this utility creates the `p<r><c>_RPT00` user, which is needed to connect to the RPT00 views from the BIRT Report Designer. For more information on connecting with BIRT, see [Installing User-Defined Reports](#).

---

### Note

This operation needs to be run only once to build the RPT00 schema.

---

### To create the RPT00 schema:

1. Enter the following commands to display the Managing Oracle menu:

```
dlib prm00
util o
```

```
O. Managing ORACLE
-----
0.  Exit Procedure
1.  Oracle Server
2.  Oracle Listener
3.  Oracle Logs
4.  Resumable Space Allocation
6.  Nls
7.  Archiving
9.  Database Users
10. SQL*Plus Session
11. Oracle user password utility
12. Database Verification Utility
13. Database Files
14. Database Free/Used Space
16. Database Links
17. Database Tablespaces
18. Oracle Statistics
19. Shared Pool
20. Multi Threaded Server
21. Create/Recreate reports(RPT00) schema
Please select [exit]:
```

## Managing Oracle Menu

2. Enter option **21**. The following prompt displays:

```
Do you want to create/recreate Oracle reports (RPT00) schema? yes/[no]
```

3. Enter **yes** to continue. The following prompt displays:

```
To continue you will need to enter PRIMO_DBA username/password.  
username/password:
```

4. Enter the PRIMO\_DBA user name and password, as follows:

```
<username>/<password>
```

The following response displays:

```
To continue you will need to enter PRIMO_DBA username/password.  
username/password: Creating P21_RPT00 user  
-----  
SQL*Plus: Release 10.2.0.1.0 - Production on Wed Jan 21 21:32:17 2009  
Copyright (c) 1982, 2005, Oracle. All rights reserved.  
idle> Connected.  
idle>  
User created.  
idle>  
Grant succeeded.  
idle>  
Grant succeeded.  
idle>  
Grant succeeded.  
.  
.  
.  
View created.  
idle> idle> Disconnected from Oracle Database 10g Enterprise Edition Release  
10.2.0.1.0 - Production  
With the Partitioning, OLAP and Data Mining Scoring Engine options  
====  
Success to create reports(RPT00) schema  
====  
Enter CR to continue...
```

**Example Response for Create Report Schema**

---

**Note**

The RPT00 schema does not require additional disk space.

---

5. Press **Enter** to exit the utility.

## Installing User-Defined Reports

[Return to menu](#)

If you want to integrate locally-created reports into the Primo Back Office, you need to create the reports with Eclipse BIRT Designer Version 2.3.1 and later versions, which is an open-source reporting system (<http://www.eclipse.org/birt/phoenix/>).

To access the Primo Reporting Schema from the BIRT Designer, you will need the following connection information:

- Driver Class (which you may have to install manually):

```
oracle.jdbc.driver.OracleDriver
```

- Database URL:

```
jdbc:oracle:thin:@<your server name>:1521:<database>
```

- Username and password (where <r> is the release in which Primo was initially installed and <c> is the Primo copy):

```
p<r><c>_rpt00
```

The following figure shows a sample connection from a report file.

```
<data-sources>
  <oda-data-source extensionID="org.eclipse.birt.report.data.oda.jdbc" name=
  "Data Source" id="248">
    <text-property name="displayName"></text-property>
    <property name="odaDriverClass">oracle.jdbc.driver.OracleDriver</property>
    <property name="odaURL">jdbc:oracle:thin:@univ03:1521:prm1</property>
    <property name="odaUser">p22_rpt00</property>
    <encrypted-property name="odaPassword" encryptionID=
  "base64">cDIyX3JwdDAw</encrypted-property>
  </oda-data-source>
</data-sources>
```

### Example Connection in Report File

### To install a BIRT report:

1. Create a BIRT report using the Primo Reporting schema (RPT00).
2. Insert the BIRT report file (<filename>.rptdesign) into the following directory, where <r> indicates the release in which Primo was initially installed and <c> indicates the Primo copy:

```
/exlibris/primo/p<r><c>/ng/primo/home/system/thirdparty/opensever/server/publish/
deploy/birt.war/Report
```

3. Click **All Mapping Tables** from the **Primo Home > Advanced Configuration** page to display the Mapping Tables page.

- Select Reports from the Subsystem drop-down list to display the Report mapping tables.

Primo Home > Advanced Configuration > All Mapping Tables

ExLibris Primo

Hello Admin

> Mapping Tables

Update for Owner: Installation Sub System : Reports

All Table Name: user Clean

Search

Mapping Tables in Normalization Sub System

Table Name	Sub System	Description	Last Updated	
User Reports	Reports	User Tabular list reports	05/15/12	Edit

#### Mapping Tables Page for Reports

- Click **Edit** to open the User Reports table for editing.

Primo Home > Advanced Configuration > All Mapping Tables

ExLibris Primo

Hello Admin

> Mapping Tables

Update for Owner: Installation Sub System : Reports

Table Name : User Reports Reset Delete Customize

Mapping Table Rows

Enabled	Report Name*	Report File	Description	Last Updated
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Table Description: User Tabular list reports

Create a New Mapping Row

Report Name	Report File	Description	
<input type="text"/>	<input type="text"/>	<input type="text"/>	Create

Import Excel File

Browse... Load

Cancel & Go back To Mapping Table List Export To Excel Save

#### User Reports Mapping Table

- In the Create a New Mapping Row section, enter the following parameters:
  - Report Name:** Type the report name as it will appear in the Primo Back Office.
  - Report File:** Enter the name of the report file that you installed in Step 2.
  - Description:** Type a short description for the report.

**Create a New Mapping Row**

Report Name	Report File	Description
<input type="text"/>	<input type="text"/>	<input type="text"/>

To Mapping Table List

### Add New User Report

- Click **Create** to add the new mapping row to the table.

Primo Home > Advanced Configuration > All Mapping Tables

ExLibris Primo Hello Admin

**Mapping Tables**

Update for Owner: Installation Sub System: Reports

Table Name: User Reports

**Mapping Table Rows**

Enabled	Report Name*	Report File	Description	Last Updated
<input checked="" type="checkbox"/>	File System Events	File_System_E	Total MB on filesystem	05/20/12 By <a href="#">Delete</a>

Table Description: User Tabular list reports

### New User Report Added to Table

#### Note

Make sure that you enable the new report by selecting the **Enabled** check box.

- Click **Save** to return to the previous page.
- Click **Primo Reports** from the Back Office home page to see if the User Reports section of the Primo Reports page lists your new report.

Primo Home > Primo Reports

> **Primo Reports**

List Reports	Statistical Reports
> <a href="#">Code Tables</a>	> <a href="#">Click Through Statistics</a>
> <a href="#">Data Sources</a>	> <a href="#">Hourly Remote Statistics</a>
> <a href="#">General Parameters</a>	> <a href="#">Hourly Search Statistics</a>
> <a href="#">IPs</a>	> <a href="#">PNX Click Statistics</a>
> <a href="#">Institutions</a>	> <a href="#">PNX Statistics</a>
> <a href="#">Mapping Tables</a>	> <a href="#">Search Statistics</a>
> <a href="#">Normalization Sets</a>	> <a href="#">Search Strings Statistics</a>
> <a href="#">Pipes</a>	> <a href="#">System Monitoring</a>
> <a href="#">Processes</a>	
> <a href="#">Restrictions</a>	
> <a href="#">Scopes</a>	
> <a href="#">Staff Users</a>	
> <a href="#">Top Searches based on Processing Time</a>	
> <a href="#">Top Searches with No Results</a>	
> <a href="#">Views</a>	

**User Reports**

> [File System Events](#)

**Primo Reports Page (User Reports)**

10. Click the new report to see if it displays properly.

BIRT Report Viewer

Showing page 1 of 12      Go to page:

### File System Events

ID	Event Date	Event Type	Total MB
2037665	Jan 22, 2009 1:45 AM	File System	980
2037666	Jan 22, 2009 1:45 AM	File System	980
2037864	Jan 22, 2009 4:30 AM	File System	121

Jan 22, 2009 10:18 PM

**Sample User Report**

## RPT00 Views

[Return to menu](#)

This section describes each of the views that belong to the RPT00 schema.

## PNX-Related Information

This section describes the views that display information that is associated with the PNX data.

### PNX View

This view contains the PNX records that are harvested into Primo for local search. PNX records that are stored from remote search sources are accessed via the PNX\_REMOTE view. Various extensions to the PNX record are stored externally to the PNX table, including tags, reviews, various types of full text and calculated popularity. These records are associated with the PNX record via the PNX record ID.

PNX View

Column Name	Type	Index	Description
PNX_ID	NUMBER	Yes	The Unique ID of the row
MATCH_ID	NUMBER	Yes	The ID that uniquely identifies deduplication groups
GROUP_ID	NUMBER	Yes	The ID that uniquely identifies FRBR groups
SECONTROL	NUMBER	Yes	The Primo Publishing Platform status
SECONTROL_DESC	VARCHAR2		The Primo Publishing Platform status description: <ul style="list-style-type: none"> <li>• DELETED</li> <li>• NEW</li> <li>• UPDATED</li> <li>• IN PROCESSING</li> </ul>
TYPE	NUMBER	Yes	Type of record
TYPE_DESC	VARCHAR2		The Type description:

Column Name	Type	Index	Description
			<ul style="list-style-type: none"> <li>• FRBR_MERGE</li> <li>• DEDUP_MEMBER</li> <li>• FRBR_MEMBER</li> <li>• REGULAR</li> <li>• IN PROCESSING</li> </ul>
RECORD_ID	VARCHAR2	Yes	The Unique Primo Record ID
PIPE_NAME	VARCHAR2		The name of Pipe that is used to harvest the record
PUBLISHING_WORK_ID	NUMBER	Yes	The ID of the Pipe instance used to harvest the record
DATA_SOURCE_CODE	VARCHAR2	Yes	The Code that uniquely identifies the data source from which the record was harvested
SOURCE_ID	VARCHAR2		The unique ID of the record in the source system
EXTENSION_EXISTS	NUMBER		The PNX Extensions exist for this record
PNX	CLOB		The PNX XML
CREATION_DATE	DATE		The Date that the record was stored in the DB
UPDATED_DATE	DATE		The date of the last update
UPDATED_BY	VARCHAR2		The user who performed the last update

---

## PNX\_REMOTE View

This view displays the PNX remote search records that Primo stores. Primo only stores remote search records that are saved to e-Shelf, or records that are needed for long-term reference for some other reason.

PNX\_REMOTE View

Column Name	Type	Index	Description
PNX_ID	NUMBER	Yes	The unique ID of the row
SECONTROL	NUMBER	Yes	The Primo Publishing Platform status
SECONTROL_DESC	VARCHAR2		The Primo Publishing Platform status description: <ul style="list-style-type: none"> <li>• DELETED</li> <li>• NEW</li> <li>• UPDATED</li> <li>• IN PROCESSING</li> </ul>
RECORD_ID	VARCHAR2	Yes	The unique Primo Record ID
EXTENSION_EXISTS	NUMBER		The PNX Extensions exist for this record
PNX	CLOB		The PNX XML
CREATION_DATE	DATE		The date that the record was stored in the DB
UPDATED_DATE	DATE		The date of the last update
UPDATED_BY	VARCHAR2		The user who performed the last update

---

## PNX\_TAGS View

This view displays the Tags that are associated with PNX records.

PNX\_TAGS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
RECORD_ID	VARCHAR2	Yes	The unique Primo Record ID

Column Name	Type	Index	Description
USER_ID	VARCHAR2		The ID of the user that added the Tag
STATUS	NUMBER		The status of the extension record
STATUS_DESC	VARCHAR2		The status description: <ul style="list-style-type: none"> <li>ACTIVE</li> <li>DELETED—the tag was deleted and will not display in the FE</li> </ul>
TAG	VARCHAR2		The tag text
CREATION_DATE	DATE		The date that the record was stored in the DB
UPDATED_DATE	DATE		The date of the last update
UPDATED_BY	VARCHAR2		The user who performed the last update

---

## PNX\_REVIEWS View

This view displays the reviews that are associated with PNX records.

PNX\_REVIEWS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
RECORD_ID	VARCHAR2	Yes	The unique Primo Record ID
USER_ID	VARCHAR2		The ID of the user that wrote the review
STATUS	NUMBER		The status of the extension record
REVIEW	CLOB		The text of the review
RATING	NUMBER		The rating of the review

Column Name	Type	Index	Description
CREATION_DATE	DATE		The date that the record was stored in the DB
UPDATED_DATE	DATE		The date of the last update
UPDATED_BY	VARCHAR2		The user who performed the last update

---

## PNX\_FULL\_TEXT Views

This view displays the full-text information.

PNX\_FULL\_TEXT View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
RECORD_ID	VARCHAR2	Yes	The unique Primo Record ID.
FULL_TEXT_TYPE	VARCHAR2		The type of full-text: TOC ABSTRACT (or summary) FICTION FULL_TEXT—for future use
FULL_TEXT	CLOB		The text
CREATION_DATE	DATE		The date that the record was stored in the DB
UPDATED_DATE	DATE		The date of the last update
UPDATED_BY	VARCHAR2		The user who performed the last update

---

## PNX\_POPULARITY View

This view displays the popularity for a PNX record that Primo has calculated, based on various usage events that are included in the Full Display and Get It.

PNX\_POPULARITY View

Column Name	Type	Index	Description
ID	NUMBER	Yes	Unique ID of the row
RECORD_ID	VARCHAR2	Yes	Unique Primo Record ID.
CALCULATED_POPULARITY	NUMBER		<p>The popularity that was calculated by Primo.</p> <p>This data is used by the Sort by Popularity option. The popularity rank is a total of the number of times a record was clicked, multiplied by the popularity boost for the type of click. Three types of clicks are counted: e-Shelf, Full display, and GetIt!.</p> <hr/> <p><b>Note</b></p> <p>The boosts are defined in the Popularity Sort Boosts mapping table in the Publishing subsystem.</p> <hr/>
CREATION_DATE	DATE		The date that the record was stored in the DB
UPDATED_DATE	DATE		The date of the last update
UPDATED_BY	VARCHAR2		The user who performed the last update

## Search-Related Information

### SEARCH\_PROBLEMS View

This view displays logging of search related problems.

SEARCH\_PROBLEMS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	Unique ID of the row
EVENT_DATE	DATE	Yes	The date that the monitored information was stored
EVENT_TYPE	VARCHAR2	Yes	The type of Event: Search Problem

Column Name	Type	Index	Description
PROBLEM_DESC	VARCHAR2		The description of the problem
'IP	VARCHAR2		The IP of the computer from which the search request originated
HOST_NAME	VARCHAR2		The server name running the search request
VIEW	VARCHAR2		The Primo View in which the Event occurred
INSTITUTION	VARCHAR2		The active user Institution at the time of the Event
ON_CAMPUS	VARCHAR2		The location of the user at the time of the Event (true/false)
USER_GROUP	VARCHAR2		The User Group of the user as returned by PDS

## SEARCH\_STATISTICS View

This view displays Search statistics information.

SEARCH\_STATISTICS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
SCOPE_NAME	VARCHAR2		The name of the Primo Scope of the request
SCOPE_TYPE	VARCHAR2		The Type: Local/Remote
SEARCH_COUNT	NUMBER		<p>The number of searches in the monitored period.</p> <p>This period is determined by the following parameters:</p> <ul style="list-style-type: none"> <li>• <b>Statistics_Batch_Size</b>: defines the number of queries to be summarized.</li> <li>• <b>Statistics_Batch_Duration</b>: defines the time in seconds for which queries should be summarized.</li> </ul>

Column Name	Type	Index	Description
			These parameters are set in Advanced Configuration > General Configuration > Statistics page in the Back Office. Primo uses the first limit that is reached.
AVERAGE_RESULTS	NUMBER		The average number of records in the result set
AVERAGE_SEARCH_TIME_MILLISEC	NUMBER		The average elapsed time for the search.
AVERAGE_FULL_TIME_MILLISEC	NUMBER		The average total elapsed time required to process the search request, including the search response time.
SOURCE_VIEW	VARCHAR2		The Primo view in which the search was done
INSTITUTION	VARCHAR2		The active user institution
ON_CAMPUS	VARCHAR2		The location of the user at the time of the search (true/false)
USER_GROUP	VARCHAR2		The User Group of the user as returned by PDS
CREATION_DATE	DATE	Yes	The date that the record was stored in the DB

## SEARCH\_STRINGS View

This view displays Search strings information.

SEARCH\_STRINGS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row

Column Name	Type	Index	Description
SEARCH_STRING	VARCHAR2		The search string
SCOPE_NAME	VARCHAR2		The name of the Primo Scope of the request
SCOPE_TYPE	VARCHAR2		The Scope Type: <ul style="list-style-type: none"> <li>Local: local search</li> <li>Remote: remote search</li> <li>Deep: Deep Search</li> </ul>
SEARCH_COUNT	NUMBER		The number of searches in the monitored period. This period is determined by the following parameters: <ul style="list-style-type: none"> <li><b>Statistics_Batch_Size</b>: defines the number of queries to be summarized.</li> <li><b>Statistics_Batch_Duration</b>: defines the time in seconds for which queries should be summarized.</li> </ul> These parameters are set in the Advanced Configuration > General Configuration > Statistics page in the Back Office. Primo uses the first limit that is reached.
AVERAGE_RESULTS	NUMBER		The average number of rows in the result set
AVERAGE_SEARCH_TIME_MILLISEC	NUMBER		The average elapsed time for search portion only of handling the search requests
AVERAGE_FULL_TIME_MILLISEC	NUMBER		The average total elapsed time need to handle the search requests
VIEW	VARCHAR2		The Primo View in which the Event occurred
INSTITUTION	VARCHAR2		The active user Institution at the time of the Event

Column Name	Type	Index	Description
ON_CAMPUS	VARCHAR2		The location of the user at the time of the Event (true/false)
USER_GROUP	VARCHAR2		The User Group of the user as returned by PDS
CREATION_DATE	DATE	Yes	The date that the record was stored in the DB

## User-Related UI Usage Events

### CLICK\_EVENTS View

This view displays click events, which contain accumulative usage information that pertains to UI actions that end users perform. Among the UI events tracked are Add Tags, Add a review, Add to e-Shelf, Advanced Search, and so forth.

CLICK\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
EVENT_DATE	DATE	Yes	The date that the statistics were stored
EVENT_TYPE	VARCHAR2	Yes	The type of Event: Search Problem
CLICK_VALUE	VARCHAR2		<p>In some cases there is additional information:</p> <ul style="list-style-type: none"> <li>• Refine: the facet selected</li> <li>• Full display: the resource type selected and record number of the record selected</li> <li>• Help: the section displayed</li> <li>• GetIt!: the resource type selected &amp; record number of the record selected</li> <li>• Add to eShelf: the resource type selected</li> <li>• Add a review: the resource type selected &amp; record number of the record selected</li> <li>• Previous Page: the range of records on the page</li> </ul>

Column Name	Type	Index	Description
CLICK_COUNT	NUMBER		In Primo Version 1, the system creates a single entry in the table for all events of the same type that occur per hour. For Primo Version 2 and later releases, the system creates a separate entry for every event.
VIEW	VARCHAR2		The Primo View in which the event occurred
INSTITUTION	VARCHAR2		The active user Institution at the time of the event
ON_CAMPUS	VARCHAR2		The location of the user at the time of the event (true/false)
USER_GROUP	VARCHAR2		The User Group of the user as returned by PDS

## System Monitoring Events

Primo schedules all system-monitoring events every 15 minutes.

## FILE\_SYSTEM\_EVENTS View

This view contains monitoring information related to the space allocated to files system of monitored servers. The values are calculated using the `df -k` command output.

FILE\_SYSTETM\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
EVENT_DATE	DATE	Yes	The date that the monitored information was stored
EVENT_TYPE	VARCHAR2	Yes	The Type of Event: File System
RESOURCE_TYPE	VARCHAR2		The resource that is being monitored: Server
SEVER_NAME	VARCHAR2		The name of the server

Column Name	Type	Index	Description
MOUNT_POINT	VARCHAR2		The mount point that is being monitored. The following message may display for old data in this column:  File System Name
USED_PCT	NUMBER		The percent of space used
USED_MB	NUMBER		The used space in MBs
TOTAL_MB	NUMBER		The total allocated space in MBs

---

## ORACLE\_INDEX\_EVENTS View

This view contains monitoring information related to the validity of Oracle

ORACLE\_INDEX\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
EVENT_DATE	DATE	Yes	The date that the monitored information was stored
EVENT_TYPE	VARCHAR2	Yes	The type of Event: Indexes
RESOURCE_TYPE	VARCHAR2		The resource that is being monitored: Oracle
ORACLE_CONNECTION	VARCHAR2		The Oracle connection that is being monitored
INDEX_NAME	VARCHAR2		The Index name. If there are no invalid indexes, the following message displays:  No Invalid Indexes
INDEX_STATUS	VARCHAR2		The status: Valid/Invalid

---

## ORACLE\_TABLESPACE\_EVENTS View

This view contains monitoring information related to the space allocations of Oracle Table Spaces.

ORACLE\_TABSPACE\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
EVENT_DATE	DATE	Yes	The date that the monitored information was stored
EVENT_TYPE	VARCHAR2	Yes	The type of Event: Indexes
RESOURCE_TYPE	VARCHAR2		The resource being monitored: Oracle
ORACLE_CONNECTION	VARCHAR2		The Oracle connection monitored
TABLE_SPACE_NAME	VARCHAR2		The Table Space Name
FREE_PCT	NUMBER		The percent of free space
FREE_MB	NUMBER		The free space in MBs
TOTAL_MB	NUMBER		The total allocated space in MBs

---

## ORACLE\_FULL\_TABLE\_SCAN\_EVENTS View

This view contains a log of SQL statements that performed full table scans.

ORACLE\_FULL\_TABLE\_SCAN\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row
EVENT_DATE	DATE	Yes	The date that the monitored information was stored
EVENT_TYPE	VARCHAR2	Yes	The Type of Event: Indexes
RESOURCE_TYPE	VARCHAR2		The resource being monitored: Oracle

Column Name	Type	Index	Description
ORACLE_CONNECTION	VARCHAR2		The Oracle connection monitored.
SQL_STATEMENT	VARCHAR2		The SQL_ID and the first 240 characters of the SQL text.
EXECUTION_COUNT	NUMBER		The execution count.

---

## ORACLE\_AVERAGES View

This view contains information concerning average execution of SQL statements.

ORACLE\_AVERAGES View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row.
EVENT_DATE	DATE	Yes	The date that the monitored information was stored.
EVENT_TYPE	VARCHAR2	Yes	The Type of Event: Indexes
RESOURCE_TYPE	VARCHAR2		The resource being monitored: Oracle
ORACLE_CONNECTION	VARCHAR2		The Oracle connection monitored.
SQL_STATEMENT	VARCHAR2		The SQL_ID and the first 240 characters of the SQL text.
EXECUTION_COUNT	NUMBER		The execution count.
AVERAGE_EXECUTION_MILLISEC	NUMBER		The average execution time in milliseconds.

---

## SYSTEM\_IOWAIT\_EVENTS View

This view contains monitoring information related to the IO Waits of the servers being monitored. The IO Wait is captured using the UNIX `sar` command.

SYSTEM\_IOWAIT\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row.
EVENT_DATE	DATE	Yes	The date that the monitored information was stored.
EVENT_TYPE	VARCHAR2	Yes	The Type of Event: Indexes
RESOURCE_TYPE	VARCHAR2		The resource being monitored: Server
HOST_NAME	VARCHAR2		The name of the server that is being monitored.
IOWAIT_PCT	NUMBER		The IO Wait percent.

---

## SYSTEM\_LOAD\_EVENTS View

Description: This view contains monitoring information related to the CPU Load of the servers being monitored. The load is captured using the UNIX uptime command.

SYSTEM\_LOAD\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row.
EVENT_DATE	DATE	Yes	The date that the monitored information was stored.
EVENT_TYPE	VARCHAR2	Yes	The Type of Event: Indexes
RESOURCE_TYPE	VARCHAR2		The resource being monitored: Server
HOST_NAME	VARCHAR2		The name of the server that is being monitored.
LOAD	NUMBER		The load

---

## SYSTEM\_MEMORY\_EVENTS View

This view contains monitoring information that is related to the Linux memory of the servers being monitored. Memory usage is captured by using the following UNIX commands:

- Linux: `free -lm`
- Solaris: `vmstat` and `prtconf`

SYSTEM\_MEMORY\_EVENTS View

Column Name	Type	Index	Description
ID	NUMBER	Yes	The unique ID of the row.
EVENT_DATE	DATE	Yes	The date that the monitored information was stored.
EVENT_TYPE	VARCHAR2	Yes	The Type of Event: Indexes
RESOURCE_TYPE	VARCHAR2		The resource being monitored: Server
HOST_NAME	VARCHAR2		The name of server that is being monitored.
FREE_MB	NUMBER		The free memory in MBs.
USED_MB	NUMBER		The used memory in MBs.
TOTAL_MB	NUMBER		The total allocated memory in MBs.

---

## PRIMO\_BO\_AUDIT\_TABLE View

This view allows you to generate reports regarding database activity in the Back Office. The following table lists the valid columns:

PRIMO\_BO\_AUDIT\_TABLE View

Column Name	Type	Index	Description
ID	NUMBER(15)	Yes	The ID of the record that has been modified.
SCHEMA_NAME	VARCHAR2(11)	Yes	The name of the schema.

Column Name	Type	Index	Description
TABLE_NAME	VARCHAR2(30)	Yes	The name of the table has been updated.
ACTION	VARCHAR2(10)		The action taken on the table (insert, update, or delete).
MODIFICATION_DATE	DATE		The date the change was made.
MODIFIED_BY	VARCHAR2(255)		The name of the staff user that made the change to the record.
ROLE	VARCHAR2(255)		The role of the staff user that made the change to the record.
INSTITUTION_CODE	VARCHAR2(255)		The institution code.
INSTITUTION_NAME	VARCHAR2(255)		The institution name.
AUDITED_FIELDS	VARCHAR2(4000)		<p>The fields that have been modified. For insert and delete actions, all of the records fields are written. For update actions, only the changed fields are written.</p> <p>For example:</p> <pre>ID=4800001;TABLE_OF_TABLE_ID=2105416;MAPPING_TABLE_NAME=Datasource Index Extensions;SOURCE_CODE_1=marc_exchange;TARGET_CODE=Index If Exists;ENABLED=1;CREATION_DATE=06-APR-10;UPDATED_DATE=06-APR-10;UPDATED_BY=Admin</pre>

The following table lists the tables that are audited for each menu:

Audited Database Tables

Menu	DB Table Name
<b>Monitor Primo Status:</b>	
Pipe Monitoring	RT_PIPE_CONFIGURATION
<b>Scheduler:</b>	
	RT_SCHEDULE

Menu	DB Table Name
<b>Ongoing Configuration Wizards:</b>	
Institution Wizard	C_I_INSTITUTION C_I_INSTITUTION_IP C_I_LIBRARY
<b>Ongoing Configuration Wizards &gt; Pipe Configuration Wizard:</b>	
Data Sources Configuration	C_N_DATA_SOURCE
Scope Values Configuration	C_N_SCOPES
Normalization Rules Set	C_N_MAPPING_TARGET C_N_MAPPING_TRANSFORMATION C_N_MAPPING_SOURCE C_N_SOURCE_CONDITION C_N_MAPPING_SET
Enrichments Sets Configuration	C_N_ENRICHMENT_MAPPING C_N_ENRICHMENT_SET
<b>Ongoing Configuration Wizards &gt; Restrictions and Delivery Configuration Wizard:</b>	
Search Scopes	C_I_RESTRICTION
<b>Ongoing Configuration Wizards &gt; Views Wizard:</b>	
Views List	C_V_VIEWS C_V_LAYOUT_SET C_V_LAYOUT_SET_PAGES C_V_PAGES C_V_PAGE_TILES

Menu	DB Table Name
	C_V_TABS C_V_TAB_SCOPE C_V_UICOMPONENTS C_V_VIEW_LAYOUT_SET C_V_VIEW_TILE_CONFIG
View Scopes	C_V_SCOPES
View Scope Values	C_V_SCOPE_VALUES
Tiles	C_V_TILES
<b>Ongoing Configuration Wizards &gt; Staff Configuration Wizard:</b>	
	R_STAFF
<b>Advanced Configuration:</b>	
General Configuration Wizard	C_G_CONFIGURATION
All Code Tables	C_C_CODE_TABLES C_C_TABLE_OF_TABLES C_C_CODE_COLUMN_NAMES
All Mapping Tables	C_C_MAPPING_TABLES C_C_TABLE_OF_TABLES C_C_CODE_COLUMN_NAMES

## Creating Lateral Links for Local Fields

Primo allows you to define local display fields so that they function as hypertext links in the detailed display. The link will function in the same way as the author and subject fields currently do. The system will take the value in the display field and search for it in the parallel index. The system uses local display fields (Ids30 - Ids39) and local search fields (Isr30 - Isr39) only.

For hosted environments in which administrators do not have access to installation-level configurations in the Primo Back Office (such as Multitenant), you will need to open a Salesforce case to add local search fields.

### To create a local linkable field:

1. To enable all or some of the local search fields (Isr30 - Isr39), you must configure the **Number of active local fields in search section** field in the Result Threshold section on the [Primo Home > Advanced Configuration > Search Engine Configurations](#) page. The default value is 5.

Field	Value
Maximum Results for Stemming	25
Number of active local fields in search section	5

### Configuring Number of Local Search Fields Used by System

2. On the Deploy All page ([Primo Home > Deploy All](#)), select the **Search Engine Configuration** option and then click **Deploy**.
3. Define a local display field (**Ids30 - Ids39**) in the normalization rules and then deploy the changes.

Make sure that you add a rule for the search portion of the display field and prefix the included subfields with the **\$\$Q** parameter. For example:

**1**

Rule group display\_ids30

Type	Field	Ind1	Ind2	Subfield
MARC	440			Include a,p,v <input checked="" type="checkbox"/> Enabled

Conditions No conditions Specified **Display Portion**

**Transformations**

Transformation	Parameter
Remove characters from the end	.../=

Behavior First delimiter First delimiter Space Repeat Number Remaining delimiters Remaining delimiters spaces

Action MERGE

---

**2**

Rule group display\_ids30

Type	Field	Ind1	Ind2	Subfield
MARC	440			Include a <input checked="" type="checkbox"/> Enabled

Conditions No conditions Specified **Search Portion**

**Transformations**

Transformation	Parameter
Remove characters from the end	.../=
Add to beginning of string	\$\$Q

Behavior First delimiter First delimiter Space Repeat Number Remaining delimiters Remaining delimiters spaces

Action MERGE

#### Add Normalization Rules for Local Field

- Define the corresponding local search field (**Isr30 - Isr39**) in the normalization rules and then deploy the changes.

---

#### Note

You must use the same number for both fields — for example, **Ids30** and **Isr30**.

---

- Add the display field in the Full Results - Full Display Tile in the Views Wizard (**Primo Home > Ongoing Configuration Wizards > Views Wizard**) and then deploy the changes.
- Check to see that the **Use local fields 30-39 as lateral links** field is set to **Y** (default setting) on the **Primo Home > Advanced Configuration > General Configuration > Installation** subsystem page.
- On the Deploy All page (**Primo Home > Deploy All**), select the **System Configuration** option and then click **Deploy**.
- Run the pipes for the relevant data sources. There is no need to re-harvest the data.
- Run indexing.

## Mapping to the Normalized Record

The templates described in the following subsections map several standard formats to the PNX. The mapping is divided into PNX sections. All PNX sections and fields are included, although it is not always possible to create a generic mapping. In such a case, only the PNX field is filled.

- [Generic MARC 21](#)
- [Aleph MARC 21](#)
- [Alma MARC 21](#)
- [Voyager MARC 21](#)
- [Unicorn](#)
- [SFX](#)
- [Generic Dublin Core](#)
- [Alma Dublin Core](#)
- [Digitool](#)
- [MetaLib](#)
- [Aleph MAB](#)
- [Generic danMARC2](#)
- [Aleph danMARC2](#)
- [Generic UNIMARC](#)
- [Aleph UNIMARC](#)
- [XML and Complex XML](#)
- [WARC](#)
- [Adding \\$\\$9ONLINE to Library Level Availability](#)
- [Virtual Delivery Category](#)

Each table contains the following columns:

- PNX field – the field that is created from the PNX.
- Source/Content – the source fields that are used in the mapping or another element that is used to create the mapping. If multiple fields are listed, they will all be used to create the PNX field (as a single merged field or multiple occurrences of the field). If the PNX field can be created from several source fields, but only one source field should be used, list all the fields in order of preference with an "OR" between the fields.
- Additional normalization rules and notes.

## Generic MARC 21

[Return to menu](#)

In sections describes the mappings used for Generic MARC normalizations.

## Control Section

Generic MARC 21 Control Section

Normalized Record Field	Source/Content	Note
Source ID	From data source definitions	
Original Source ID	From data source definitions	
Source Record-ID	From header of source file	
Record ID	Source ID + Source Record-ID	
Additional Record-ID		
Source Type		Not in use.
Source Format	From data source definitions	
SourceSystem	Aleph	

## Display Section

### General Notes

- String multiple occurrences with a semicolon unless indicated otherwise. If the source data has a period at the end and it is not the final occurrence, remove the period.
- Remove the following end punctuation: : , = ; /

## Notes Regarding Subfields and Indicators

- If no subfields are listed explicitly, data from all non-numeric subfields will be displayed.
- If a field or a subfield is repeated, all instances should be displayed.
- Subfields are listed in alphabetical order for the sake of clarity, but should be displayed in the order they are recorded in the source record.
- If all the subfields or specified non-numeric subfields are taken, numeric subfields are not considered.
- If a numeric subfield is specifically included, no other numeric subfield will be included.
- If a numeric subfield is excluded, the mapping will take other numeric subfields.
- If no indicators are defined, all indicators will be taken.

### Note

880 tags are mapped together with the standard tag (the 880 tags are added first) in the following fields: Contributor, Publisher, Creator, Description, Edition, Subject (for 600, 610, 611, and 630), Relation, and Is part of.

Generic MARC 21 Display Section

Display Element	Source	Note
Source	Source from the data source definition	
Resource Type	See mapping below	
Title	<p>If FMT=SE, then use 130 OR 245; otherwise use 245 with the following subfields:</p> <p>130 ##adfklnoprs</p> <p>245 ## \$\$abfgknp</p>	<hr/> <p><b>Note</b></p> <p>The 130 was added for serials, because for serials additional information will typically be in 130.</p> <hr/>
Uniform title	<p>130 admnprs</p> <p>OR</p> <p>240 admnprs</p>	
Vernacular title	<p>880 where \$\$6=245</p> <p>subfields:</p> <p>abfgknp</p>	

Display Element	Source	Note
Creator	100 abcdejqu 110 abcde 111 abcdn	If the creator is derived from 100 and the first indicator is 1 or 2 then all of the text after the comma is taken (there must be a comma) and is displayed before the text that precedes the comma (deleting the comma itself).  For example:  Lippe, Ole von der --> Ole von der Lippe  Van Der Wise, Fred --> Fred Van Der Wise  Disabled rules do not reverse the author name.
Contributor	700, 710, and 711 except for second indicator=2  With the following subfields: 700 abcdejqu 710 abcde 711 abcdn	For 700 the first indicator is 1 or 2. Therefore all of the text after the comma is taken (there must be a comma) and is displayed before the text that precedes the comma (deleting the comma itself).  For example:  Lippe, Ole von der --> Ole von der Lippe  Van Der Wise, Fred --> Fred Van Der Wise  Analytic 7XX field are excluded. They will be added to the description.  Disabled rules do not reverse the author name.
Description	505, 520 \$a  700, 710, and 711 with the second indicator=2 using the following subfields: 700 abcdemnopst 710 abcdemnopst 711 acdenpqst	Every field is a separate occurrence.
Edition	250 \$a \$b	
Publisher	502 \$a or 260 \$a \$b	
Subject	All 6XX fields	Strip all numeric subfields.
Language	008/35-37; 041 subfields \$\$a \$d, \$e (all occurrences should be taken)	Validate code against list of ISO 639-2 codes. If the code cannot be translated, leave it as is.

Display Element	Source	Note
Physical Format	300 and 340 fields	If the 300 field does not end with a period, add it.
Identifier	020 \$\$a – prefix the value with ISBN: 022 \$\$a – prefix the value with ISSN: 024 2# \$\$a – prefix the value with ISMN	This mapping is disabled in the out-of-the-box template since the identifiers by default do not display in the Front End.
Relation	Prefix the value with Series: 400, 410, 411, 440, 490, 800, 810, 811, 830, 840 780 (first indicator -1): Prefix the value with Earlier Title: 785 (first indicator -1): Prefix the value with Later Title: Strip subfield \$w, \$x, \$y	Every field should be a separate occurrence. The prefix should be added to \$\$C and the value to \$\$V. Display constant codes are used: series earlier_title later_title
Is Part Of	773 Strip subfield \$w, \$x, \$y	
Creation Date	260 \$c OR 008/07-10	For a date created from 008, create a date only if it starts with a digit that is not zero and replace missing digits with a question mark. For example: 19-- > 19?? 19uu > 19??
Library Level Availability		The Library Level Availability field subfields include: \$\$I Primo Institution \$\$L Primo Library \$\$1 Sublocation \$\$2 Call number \$\$S Availability status \$\$3 No. of items \$\$4 No. of unavailable items \$\$5 multi-volume flag

Display Element	Source	Note
		\$\$6 number of loans

## Mapping to Resource Type

The mapping is based on the format type derived either from LDR positions 6 and 7 or tag and position. Use the following tables to determine the mapping.

LDR Positions

Leader pos. 6/7	Record type	Format
a Language material + pos.7= a,c,d,m	Books	BK
a Language material + pos.7= b, i, s	Continuing Resources	SE
c Notated music	Music	MU
d Manuscript notated music	Music	MU
e Cartographic material	Maps	MP
f Manuscript cartographic material	Maps	MP
g Projected medium	Visual materials	VM
i Nonmusical sound recording	Audio materials	AM
j Musical sound recording	Audio materials	AM
k Two-dimensional non-projectable graphic	Visual materials	VM
m Computer file	Computer files	CF
o Kit	Visual materials	VM

Leader pos. 6/7	Record type	Format
p Mixed material	Mixed materials	MX
r Three-dimensional artifact or naturally occurring object	Visual materials	VM
t Manuscript language material	Books	BK
w Rare books <hr/> <b>Note</b>  Used by KORMARC. <hr/>	Rare Books	RB
Default		BK

Record Type Derived from Tag and Position

Format	Based on (tag and position)	TYPE	Note
BK		book	The catch-all for BK if no further information is available is Book
CF	008-26 h	audio	
CF	008-26 j	database	
CF	008-26 d, e	text_resource	
CF		other	
MP		map	DC defines a map as a type of image.
AM		audio	

Format	Based on (tag and position)	TYPE	Note
MU		score	
SE	008 21 d,w	other	
SE	008 21 L	text resource	
SE	008 21 M	book	
SE		journal	
VM	008 33 l,k,l,n,s,t	image	
VM	008 33 F,m,v	video	
VM		other	
MX		other	

## Links

### Links Section

Type of Link	Source	Note
OpenURL	<p>Based on resource type from display:</p> <p>If type=article then:</p> <p>\$\$Topenurl_article</p> <p>Otherwise:</p> <p>\$\$Topenurl_journal</p>	<p>SFX has two sources for Primo: one for articles in which case the data is used and one for journals in which case the date is ignored. There is a different template per source.</p>

Type of Link	Source	Note
OpenURL_ fulltext	Based on resource type from display:  If type=article then: \$\$Topenurfull_article  Otherwise: \$\$Topenurfull_journal	SFX has two sources for Primo: one for articles in which case the data is used and one for journals in which case the date is ignored. There is a different template per source.
OpenURL_ servicetext		
Backlink		
LinktoHoldings		
Linkto Holdings_ available		
Linkto Holdings_ unavailable		
Linkto Holdings_ doesnotexist		
LinktoRequest		
LinktoResource	856 40 \$u and 856 41 \$u  Add display text (\$\$D) from \$y + \$3 + \$z. If not available, then use code: "Online version"  856 1#, 856 10, and 856 11  Add display text (\$\$D) from \$y + \$3 + \$z. If not available then use code: "Online version"	Validate that the link is to the resource by checking the content of subfield 3.
Additional links	856 42 \$u.	

Type of Link	Source	Note
	<p>Add display text (\$\$D) from \$y + \$3 + \$z. If not available then use code: "Related online content"</p> <p>506 \$u \$\$Dlink to restrictions on access</p> <p>538 \$u \$\$Dlink to system details</p> <p>540 \$u \$\$D Link to terms governing use and reproduction</p> <p>545 \$u \$\$D Link to biographical or historical information</p> <p>856 41 \$u if \$3 is "Sample Text" or "Publisher description"</p>	
Thumbnail	<p>\$\$Tsyndetics_thumb (disabled)</p> <p>\$\$Tgoogle_thumb</p>	<p>For Syndetics, this field requires an ISBN.</p> <p>For Google, this field requires an OCLC and LCCN.</p>
linktotoc	<p>505 \$u</p> <p>\$\$Tamazon_toc</p> <p>\$\$Tsyndetics_toc (disabled)</p> <p>856 4# \$u if \$3=Table of Contents</p>	<p>Create Amazon and Syndetic links only if there is an ISBN.</p>
linktoabstract	<p>\$\$Tsyndetics_abstract</p>	<p>Add if there is an ISBN (020 \$a).</p>
linktoreview	<p>520 1# \$u</p>	
linktofa	<p>555 0# \$u</p> <p>Add subfields abcd to \$\$D</p>	
linktouc	<p>\$\$Tamazon_uc – add if there is ISBN</p> <p>\$\$Tworldcat_isbn – add if there is ISBN ELSE add</p> <p>\$\$Tworldcat_oclc – if there is OCLC number</p>	
linktoexcerpt	<p>\$\$Tsyndetics_excerpt</p>	<p>Add if there is an ISBN.</p>

# Search

## Note

880 tags are mapped together with the standard tag in the following fields: Creator/Contributor, Title, Additional title, Description, Subject (for 600, 610, 611, and 630), TOC, and General (except for identifiers).

Search Section		
Index	Source tag	Notes
Creator/ contributor	100 abcdejqu	
	110 abcde	
	111 abcdn	
	245 c	
	505 r	
	508 a	
	511 a	
	700 abcdejqu	
	710 abcde	
	711 abcdn	
	720 a	
	800 abcdejqu	
	810 abcde	
	811 abcdn	
	100 a 700 a 800 a	For the 100, 700, and 800 fields, if the first indicator is 1 or 2, then take only the second uppercase character in the string, following a comma.
Title	If type = Journal: 245 a 245 a,b,f,g,n,p 130 a  Else: 245 a,b,f,g,n,p	For journals up to three exact titles are indexed.
Additional title	100 fgklnpt 110 fgklnpt	

Index	Source tag	Notes
	111 fglnpt 247 abnp 400 fklntv 410 fklntv 411 fklntv 440 anpv 490 av 700 fklmnoqrst 710 fklmnoqrst 711 fklntv 730 adfklmnoqrst 740 anp 800 fklmnoqrstv 810 fklmnoqrstv 811 fklntv 830 adfklmnoqrstv 840 adfklmnoqrstv 760,762,765,767,770,772, 773,774,775,776,777,780, 785,786,787 subfields st	
Alternative Title	130 210 240 243 246 abnp	
Description	520 \$a	
Subject	6XX fields – Strip all numeric subfields Translation of LCC by enrichment	
ISBN	020 az	

Index	Source tag	Notes
ISSN	022 ayz	
Resource type	Resource type from display	
Creation date	008/07-10 and 008/11-14 are digits and not 9999 260 \$c	
Full Text		
TOC	505 \$a	
RecordSource	Source ID from the control section	<hr/> <b>Note</b> Required to filter out certain sources. <hr/>
RecordID	Record ID from the control section	<hr/> <b>Note</b> Required to retrieve record based on system number. <hr/>
General	260 \$b 502 511 508 518 521 534 586 0242 az 0243 az 027 az 028 a	

Index	Source tag	Notes
Search scope	From PNX: delivery/institution control/sourceid (for example the data source is added as a scope)	
Restricted search scope		
Scope	Copies from the Search scope and Restricted search scope from the sections above	

## Sort

### Sort Section

Sort type	DC field
Creation Date	008/07-10 OR 260 \$c
Author	<p>A single author sort key is created from one of the following tags. Subfields are the same as in the display section:</p> <p>880/100 100 880/110 110 880/111 111 880700 700 880/710 710 880/711 711</p>
Title	<p>A single title sort key is created from one of the following:</p> <p>880/245</p>

Sort type	DC field
	130 if FMT=SE 245
Popularity	

## Facets

### Facet Section

Facet	Source	Note
Resource type	<p>Create this based on the Resource type field from display section as follows.</p> <p>Book -&gt; books</p> <p>Journal -&gt; journals</p> <p>Article -&gt; articles</p> <p>Text Resource -&gt; books</p> <p>Image -&gt; images</p> <p>Audio -&gt; media</p> <p>Video -&gt; media</p> <p>Score -&gt; Scores</p> <p>Map -&gt; Maps</p> <p>Other -&gt; other</p>	In some cases, two values should be created, each as a separate field.
Language	008/35-37 and 041 subfields a, d, e.	If the language is not a valid ISO 639 code it should not be created.
Creator/ Contributor_	100/700 \$a 110/710 \$a 111/711 \$a	<p>The normalized format.</p> <p>For 100 and 700, if the first indicator is 1 or 2 then take second upper case character in the string, following a comma.</p> <p>7XX except for second indicator 1.</p>
Topic	<p>6XX except for 655</p> <p>First facet level is all data up to the first occurrence of subfield \$\$v, x, y or z. Each subfield division (v, x, y or z) constitutes the next level.</p>	<p>Punctuation that is in the field should be retained, except for periods at the end.</p> <p>For example:</p>

Facet	Source	Note
	<hr/> <p><b>Note</b></p> <p>The first facet level might have multiple occurrences in one record; these multiple occurrences should be "de-duplicated."</p> <hr/>	<pre>&lt;datafield ind1="0" ind2="0" tag="630"/&gt; &lt;subfield code="a"&gt;Bible.&lt;/subfield&gt; &lt;subfield code="p"&gt;O.T.&lt;/subfield&gt; &lt;subfield code="p"&gt;Pentateuch&lt;/subfield&gt; &lt;subfield code="x"&gt;Sermons.&lt;/subfield&gt;</pre> <p>Should become:</p> <p>Bible - O.T. - Pentateuch-Sermons (the hyphen between Pentateuch and Sermons is for the levels).</p>
Genre	655 \$a 6XX \$v	
classification.lcc	Added by enrichment	
Creation Date	008/07-10 OR 260 \$c	Truncate 260 \$c so that it has only 4 digits. If the date cannot be normalized to 4 digits, do not create the facet.
File size	Not in use	
Collection		
Physical format	Not in use	Not in use.
Top-level	online_resources -- assign if the delivery category is <b>Online Resource, SFX Resource, or MetaLib Resource.</b> new – as tagged before load. Available in Library map based on availability information in the source record.	
Pre-filter	Based on Resource Type from the display section: Book -> books Journal -> journals Article -> articles	

Facet	Source	Note
	Text Resource -> books Image -> images Video -> audio_video Audio -> audio_video Maps -> maps Score -> scores	
Related record		

## Duplicate Record Detection Vector

Currently two types of record matching vectors exist:

- T1 – for non-serials
- T2 – for serials

The mapping of record to T1 or T2 is based on the format type. The format type is based on the extraction procedure that creates the format (FMT) field from pos. 6 and 7 in the leader.

- T1 – All formats except for SE
- T2 – SE

## Vector for T1 - "non-serials"

Vector for T1

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
T	Type	1	Created if the format is not SE.
The following fields are for the candidate selection:			
C1	UnivID, UnivID_invalid	010 \$a \$z	Take prefix and number and remove any suffixes. Multiple occurrences are delimited by a semicolon.
C2	ISBN, Invalid_ISBN	020 \$a \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
C3	Short title	245 \$abnp Use normalization routine #1 Exact match on first 20 and last 10 char.	The result is a single string of 30 characters.
C4	Year	008 7-10	
The following fields are for the matching program:			
F1	UnivID	010 \$a	Take prefix and number and remove any suffixes
F2	UnivID_Invalid	010 \$z	Take prefix and number and remove any suffixes Multiple occurrences are delimited by a semicolon.
F3	ISBN	020 \$a	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F4	ISBN_Invalid	020 \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F5	Short title	245 \$abnp	Same as C3.
F6	Year	008 7-10	
F7	Full title	245 \$abnp Use routine #2 from	
F8	Country of publication	008 15-17	
F9	Pagination	300 \$\$a	
F10	Publisher	260 \$\$b	Take only first occurrence of 260 tag and first occurrence of subfield b.

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
		Use filing routine #3 to normalize	
F11	Main entry (author, corporate body, meeting)	100 \$abcdq OR 110 \$abcdn OR 111 \$abcdenq Use normalization routine #3 to normalize	

## Vector for T2 - "serials"

### Vector for T2

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
T	Type	2	Created if the format is SE.
The following fields are for the candidate selection:			
C1	UnivID, UnivID_invalid	010 \$a \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
C2	ISSN, Invalid_ISSN, cancelled_ISSN	022 \$a \$y \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
C3	Short title	245 \$abnp Use filing procedure #1 Exact match on first 25 char.	The result is a single string of 25 characters.
C4	Place of publication	260 \$\$a normalized using routine 75	Take only first occurrence of 260 and first occurrence of subfield a.

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
		After applying routine #3 then take only the first string (up to first blank).	
The following fields are for the matching program:			
F1	UnivID	010 \$a	Use data until a blank character or the end of subfield.
F2	UnivID_Invalid	010 \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F3	ISSN	022 \$a	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F4	ISSN_Invalid	022 \$y	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F5	ISSN_Cancelled	022 \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F6	Year	008 7-10	
F7	Full title	245 \$abnp Use filing routine #2	
F8	Truncated title	245 \$a Use normalization routine #2	

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
F9	Country of publication	008 15-17	
F10	Place of publication	260 \$\$a normalized using routine #3 After applying routine, take only the first string (up to first blank).	Take only first occurrence of 260 and first occurrence of subfield a.
F11	Main entry (author, corporate body, meeting)	110 \$abcdn OR 111 \$abcdenq OR 130 \$a adlmnoprst Use filing routine #3	

## FRBRization

Refer to [Normalization Routines for Duplicate Record Detection](#), for the normalization routines for the author and title parts.

The key field has two subfields:

- \$\$K key part
- \$\$A key part type that determines the algorithm

### FRBRization

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
T	Always 1		MARC 21 algorithm
K1-Kn For every record a different number can be created	100 OR, 110 OR, 111 OR, 700 ADD, 710 ADD, 711 ADD	A	Single occurrence of 100, 110, and 111; Multiple occurrences of 700, 710, 711, 100, 110. Take subfields a, b, c, d, q 111, 711 - a, b, c, d, n, q Do not generate key from 700 or 710 if subfield e = "former owner"
Kn	130	TO	Subfield a, d, m, n, p, r, s

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
			Do not generate a key if subfield a or k contains "selections" or "census."
Kn	<p>If format is not SE:</p> <p>240 ADD</p> <p>245 OR</p> <p>242 OR</p> <p>246 OR</p> <p>247 OR</p> <p>740 OR</p> <p>245 subfield k</p> <p>If format is SE:</p> <p>240 ADD</p> <p>245 OR</p> <p>242 OR</p> <p>246 OR</p> <p>247 OR</p> <p>740 OR</p> <p>245 subfield k</p>	T	<p>240 – Subfields a, d, m, n,p,r, s</p> <p>245 – a, b, e, f, g, n, p</p> <p>242 – a, b, f, g, n, p</p> <p>246 – a, b, f, g, n, p</p> <p>247 – a, b, f, g, n, p</p> <p>740 – Subfields anp</p> <p>Do not generate a part key from 240 if it starts with any of the following: selections, laws, treaties, bills, statutes, Acts, public general acts, acts, rules, works, or census.</p> <p>Note: If the format is not a serial (FMT=SE), then the title part keys will be generated from both 240 and 245.</p>

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional normalization notes
Institution		Using ILS Institution Codes mapping table.
Delivery category		Based on algorithm in <a href="#">Defining the Delivery Category Algorithm</a> .
Restricted delivery scope		

---

## Ranking

Local mapping required as relevant.

Ranking Section

Booster Field	Source	Additional normalization notes
booster1	1 or as added by enrichment program	
booster2		Not in use.

---

## Enrichment

Local mapping required as relevant.

Enrichment Section

Enrichment Field	Source	Additional normalization notes
classification.lcc	050 \$a, 090 \$a	All occurrences added to separate fields.
fulltext		
TOC		
Abstract		
Review		
Rank-parent-child		
Rank-Number of copies		
Rank-Date first copy		
Rank-Number of loans		

## Additional Data

This includes multiple occurrences in separate fields.

Additional Data

Additional data field	Source	Additional normalization notes
Author Last	100 1# OR 100 2# OR 700 1# OR 700 2# \$a	Takes text until first comma. Only one occurrence should be created.
Author First	100 1# OR 100 2# OR 700 1# OR 700 2# \$a	Takes text after first comma and until first space. Only one occurrence should be created.
Author initials		
Author first initial		
Author middle initial		
Author suffix		
Author	100 abcdejqu	
Corporate Author	110 abcde 111 abcdn	
Additional author	700 abcdejqu 710 abcde 711 abcdn	
Series author	800 abcde	
Book Title	If resource type is not an article or a journal: 245 abfgknp	Because the PNX cannot be used in conditions, this is based on LDR and 008.

Additional data field	Source	Additional normalization notes
Article title		
Journal title	If resource type is Journal: 245 abfgknp	Since the PNX cannot be used in conditions, this is based on LDR and 008.
Short title	210 a	
Additional title	246 abnp	
Series title	400, 410, 411, 440, 490, 800, 810, 811, 830, 840	Strip subfield x.
Date	008/07-10 or 260 \$c	Normalize to 4 characters.
RISDate	260 \$c or 008/08-10	
Additional Date		
Volume		
Issue		
Part		
Season		
Quarter		
Start page		
End page		
Pages		

Additional data field	Source	Additional normalization notes
Article number		
ISSN	022 a	Use data up to a blank character or end of subfield.
eISSN	776 x	Use data up to a blank character or end of subfield.
ISBN	020 a	Use data up to a blank character or end of subfield.
CODEN	030 a	Use data up to a blank character or end of subfield.
SICI		
Metadata Format	<p>If there is a 502 -&gt; <b>dissertation</b></p> <p>Else based on Resource type from display:</p> <ul style="list-style-type: none"> <li>• book -&gt; <b>book</b></li> <li>• journal -&gt; <b>journal</b></li> <li>• article -&gt; <b>journal</b></li> <li>• conference_proceeding &amp; record has ISSN -&gt; <b>journal</b></li> </ul> <p>Else -&gt; <b>book</b></p>	
Genre	The Genre mapping table maps the resource type from the display section of the PNx to the genre that is required by the OpenURL.	Use Genre mapping table.
RISType	<p>Based on Resource type from display:</p> <p>If there is a 502 then -&gt; THES</p> <p>book -&gt; BOOK</p> <p>journal -&gt; JOUR</p> <p>map -&gt; MAP</p> <p>video -&gt; VIDEO</p> <p>audio -&gt; SOUND</p>	

Additional data field	Source	Additional normalization notes
	music -> MUSIC article -> JOUR Else -> GEN	
City of Publication	260 a	
Publisher	260 b	
Abstract	520 ab	
Miscellaneous1		
Miscellaneous2		
Miscellaneous3		
OCLC ID	035 \$\$a – if text (OCoLC) is present in 035.	Take all digits following the text OCLC and until space. Example: 035 \$\$a(OCoLC)814782
LCCN	010 \$\$a	Take prefix and number.
DOI		
URL		
Local fields 1-5		

## Browse

The system can create multiple occurrences in separate fields.

## Browse

Browse field	Source	Additional normalization notes
Institution	PNX: delivery/institution	
Author	All of the following: 100,110,111,700, 710, 711, 720, 800, 810, 811, and equivalent 880 fields	\$\$D (display form) and \$\$E (normalized form) are created.
Title	All of the following: 130, 210, 240, 243, 245, 246, 247, 440, 490, 730, 740, 830 And the following using \$\$t: 100,110,111, 700, 719, 711,800, 810, 811 And equivalent fields from 880.	\$\$D (display form) and \$\$E (normalized form) are created.
Subject	600, 610, 611, 630, 648, 650, 651, 654, 655	\$\$D (display form) and \$\$E (normalized form) are created.
Call number	Rules not added.	

---

## Normalization Routines for Duplicate Record Detection

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**Note**

Certain characters are translated in XML:

---

## Normalization Routines for Dedup Record Detection

Special character	Special meaning	Entity encoding
>	Begins a tag.	>
<	Ends a tag.	<
Quotation mark.	"	
	'Apostrophe.	'

Special character	Special meaning	Entity encoding
&	Ampersand.	&

The publishing platform removes all leading and trailing spaces and packs double spaces.

---

## Normalization Routine #1

1. Remove non-filing characters

Drop initial text using non-filing indicator. The non-filing indicator is the second indicator in the following MARC tags: 222, 240, 242, 243, 245, 440, and 830. The second indicator contains a number from 0-9 indicating how many characters to drop. (There are some fields where the non-filing indicator is in the first position: 130, 630, 730, and 740.)

Remove all text that appears within <<>> or within the Unicode characters 0088 and 0089.

2. Delete the following characters: ' "
3. Change the following characters to blank: !@#%&^&\*( )\_+ -= {} [] . " ; < > ? , / ~ `
4. Convert characters using the "FILING-KEY-01" character conversion table.
5. Change characters to lower case.
6. Remove all spaces.
7. Take first 10 and last 10 characters.

---

## Normalization Routine #2

1. Remove non-filing characters.

Drop initial text using non-filing indicator. The non-filing indicator is the second indicator in the following MARC tags: 222, 240, 242, 243, 245, 440, and 830. The second indicator contains a number from 0-9 indicating how many characters to drop. (There are some fields where the non-filing indicator is in the first position: 130, 630, 730, and 740.)

2. Remove all text that appears within <<>> or within the Unicode characters 0088 and 0089.

For example:

```
<datafield ind1="1" ind2="0" tag="245"> <subfield code="a"><<the>> book : its history in England in the middle
ages!</the></subfield> </datafield>
```

Should become:

```
"book: its history in England in the middle ages"
```

3. Delete the following characters: ' "
4. Change the following characters to blank: !@#%&^&\*( )\_+ -= {} [] . " ; < > ? , / ~ `
5. Convert characters using the "FILING-KEY-01" character conversion table.
6. Change characters to lower case.

---

## Normalization Routine #3

1. Delete the following characters: '
2. Change the following characters to blank: !@#\$%^&\*()\_+={}|:~<>?./~`
3. Convert characters using the "FILING-KEY-01" character conversion table.
4. Change characters to lower case.

### Normalization Routines for FRBR

---

#### Note

The publishing platform will delete leading and trailing blanks and remove double spaces.

---

---

## Author Part Normalization

1. Delete characters: | [ ] '
2. Change characters to space: \$~'^%\*^/?@.::;<>{}-()!¿□
3. Convert characters using the NACO\_diacritics character conversion table.
4. Change characters to lower case.

---

## Title Part Normalization

1. Remove non-filing characters.

Drop initial text using non-filing indicator. The non-filing indicator is the second indicator in the following MARC tags: 222, 240, 242, 243, 245, 440, and 830. The second indicator contains a number from 0-9 indicating how many characters to drop. (There are some fields where the non-filing indicator is in the first position: 130, 630, 730, 740.)

2. Delete characters: | [ ] '
3. Change characters to space: \$~'^%\*^/?@.::;<>{}-()!¿□
4. Convert characters using the NACO\_diacritics character conversion table.
5. Change characters to lower case.

---

## Defining the Delivery Category Algorithm

The following out-of-the-box algorithm is used for MARC 21. It should be possible to distinguish between the following resource types:

- Physical items (except for microform)
- Microform

- SFX resources
- Online resources

The algorithm is read from top to bottom. Once a record is assigned a category, the algorithm stops.

When there are several definitions for the same category the priority is given to the "safest" option.

In the algorithm, priority has been given to online resources based on the assumption that users most often prefer this option. Primo will include a display of the location and availability status of physical items.

The format is based on the definitions used for each resource type. For more information on these definitions, see [LDR Positions](#).

Defining the Delivery Category Algorithm

Condition	Delivery Category	Note
If 035=SFX	SFX Resources	
007/00=c and 007/01=r	Online Resource	
If there is a 8564- or 85640 or 85641	Online Resource	Add conditions based on \$\$3 to prevent this category from being assigned if the link is not to the resource (e.g. \$\$3 is Table of Contents, or Abstract).
If 007/00=h	Microform	
If FMT=BK or MU or SE or MX and 008/23=a or b or c	Microform	
If FMT=MP VM and 008/29=a or b or c	Microform	
If 245 \$\$h includes the string micro	Microform	
If not any of the above	Physical Item	

## Aleph MARC 21

[Return to menu](#)

In most aspects the Aleph MARC 21 mapping is the same as the Generic MARC mapping. The only exceptions are listed below.

## Control Section

Control Section

Normalized Record Field	Source/Content	Note
ILS API ID	Created from the PNX control/sourceid merged with control/sourcerecordid	Required for OPAC via Primo.

## Display Section

Display Section

Display Element	Source	Note
Creator Contributor Subject Title Uniform Title Relation	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$P.	
Library Level Availability	AVA	The Availability field subfields are created as follows:  \$\$I Institution – based on institution look-up table based on AVA \$a  \$\$L Library – based on library lookup table based on AVA \$\$b  \$\$1 Sublocation – from AVA \$\$c  \$\$2 Call number – from AVA \$\$d  \$\$S Availability status – based on AVA \$\$e  \$\$3 No. of items – from AVA \$\$f

Display Element	Source	Note
		<p>\$\$4 no of unavailable items – from AVA \$\$g</p> <p>\$\$5 multi-volume flag – from AVA \$\$h</p> <p>\$\$6 number of loans – from AVA \$\$i</p> <p>\$\$9 – For more information, refer to section <a href="#">Adding \$\$9ONLINE to Library Level Availability</a>.</p> <p>\$\$P location priority – from AVA \$\$p</p> <p>\$\$X source institution code (Aleph ADM) – from AVA \$\$a</p> <p>\$\$Y source library code (Aleph sublibrary) – from AVA \$\$b</p> <p>\$\$Z source sublocation code (Aleph collection) – from AVA \$\$j</p>

The Aleph AVA field has the following subfields:

- \$\$a – ADM code.
- \$\$b – sublibrary code.
- \$\$c – collection. Takes first collection of the sublibrary.
- \$\$d – call number. Takes first call number of collection. Subfields from 852 are selected based on the correct\_852\_subfields parameter in aleph\_start,
- \$\$e – availability status (see below for definition).
- \$\$f – number of items (for entire sublibrary not just location).
- \$\$g – number of unavailable loans (see below for definition of unavailable).
- \$\$h – multi-volume flag (Y/N).  
If first Z30 Z30-ENUMERATION-A is not blank or 0, then the flag=Y, otherwise the flag=N.
- \$\$i – number of loans (for ranking/sorting). Aleph counts the number of Z36H records.
- \$\$j – code of collection in subfield c.
- \$\$p – location priority.

---

## Definition of an Unavailable Item

An item is unavailable if it matches one of the following conditions:

- It is on loan (it has a Z36).
- It is on hold shelf (it has Z37=S).

- It has a processing status (one of the processing statuses that have been defined as available in tab\_expand) and does not have a value in Z30-DEPOSITORY-ID.

## Number of Items to Check Threshold

Aleph has a parameter that defines the maximum number of items to check per sublibrary. For more information, refer to the *Aleph Publishing Mechanism* document.

## Availability Statuses from Aleph

The availability statuses are determined as follows:

1. If the record has no linked items, the availability status is defined as **check\_holdings**.
2. If the number of items (per sublibrary) is more than the threshold, the availability status is defined as **check\_holdings**.
3. If the number of items (per sublibrary) is less than the threshold, the status is determined as follows:
4. If all items are available, then the availability status is defined as **available**.
5. If all items are unavailable, then the availability status is defined as **unavailable**.
6. If some items are available and others are unavailable, the system checks if the item is multi-volume or not (by checking if first Z30-ENUMERATION-A is not blank or 0).
7. If it is multi-volume, the availability status is defined as **check\_holdings**.
8. If it is not multi-volume, the availability status is defined as **available**.

For more information on Aleph thresholds and availability statuses, refer to the *Aleph Publishing Mechanism* document.

## Links

Links Section

Type of Link	Source	Note
Backlink	\$\$Taleph_backlink	
LinktoHoldings	\$\$Taleph_holdings	

---

## Search

Search Section

Index	Source tag	Notes
Creator/contributor	In addition to the fields used in Generic Marc also:	
AUT	For cross-references	
Subject	In addition to the fields used in Generic Marc also:	
SUB	For cross-references	

---

## Sort

Sort Section

Sort type	DC field
Popularity	AVA \$i
Author Title	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$P.

---

## Facets

Facets Section

Facet	Source	Note
Collection	In addition to Generic Marc: Aleph sublibrary – AVA \$\$b	Not in use currently
Top-level	Available in Library – records will be tagged as "Available in Library" if AVA \$\$e=available or check_ holdings	

---

## Dedup

### Dedup Section

Dedup Field	Source	Additional normalization notes
F11	Same as Generic MARC except that the conditions were added to prevent the use of non-preferred terms based on content of \$\$P.	

---

## FRBR

### FRBR Section

FRBR Field	Source	Additional normalization notes
K1 K2	Same as Generic MARC except that the conditions were added to prevent the use of non-preferred terms based on content of \$\$P.	

---

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional normalization notes
Institution	AVA a	Using institution look-up table.

---

## Additional Data

### Additional Data Section

Additional Data Field	Source	Additional normalization notes
Author First Author Last Corporate Author Additional Author	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$P.	

## Browse

The system can create multiple occurrences in separate fields.

Browse Section

Browse field	Source	Note
Author	Same as Generic MARC except that Aleph includes information on the cross-references. For more information, refer to <a href="#">Browse Search</a> .	
Subject	Same as Generic MARC except that Aleph includes the information on cross-references and subject type (such as LCSH, MESH, and so forth). For more information, refer to <a href="#">Browse Search</a> .	
Title	Same as Generic MARC except that Aleph can include cross-reference information that needs to be suppressed.	
Call number	AVA \$\$d (for call number) AVA \$\$a (for institution) AVA \$\$k (for the type)	\$\$D (display form), \$\$E (normalized form), \$\$t (type) and \$\$I (institution) are created.

## Alma MARC 21

[Return to menu](#)

In most aspects, the Alma MARC21 mapping is the same as the Generic MARC mapping. Only the exceptions are listed below. The template is named **Alma MARC - Template** in the Back Office and used for Alma-E (electronic), Alma-D (digital), and Alma-P (physical). For more details on the Alma source, see [The Format of Published Data](#).

## Control Section

Control Section

Normalized Record Field	Source/Content	Note
Alma ID	The Alma ID is the Alma institution code concatenated with a colon and the original Alma record ID.	Required for Alma-Primo interoperability.

## Display Section

Display Section

Display Element	Source	Note
Course Reserve Information	CNO	<p>The crsinfo field is created by merging the following Alma CNO subfields into a single line:</p> <ul style="list-style-type: none"> <li>• \$\$k – The course ID.</li> <li>• \$\$j – The course name.</li> <li>• \$\$l – The course department.</li> <li>• \$\$g – The course instructor.</li> </ul> <p>For example:</p> <p>MATH 465.(WI 15) : Mathematics 465 ; Mathematics ; Bube, Kenneth P.</p>
Type	<p>For Alma-D, based on the TYP field using the Alma_Type mapping table.</p> <p>For Alma-E and Alma-P, based on standard MARC field (same as Generic MARC). In addition, the database resource type is created when the ECT (electronic collection type) field is set to <b>database</b>.</p> <p>For more information on the TYP and ECT fields, see <a href="#">The Format of Published Data</a>.</p>	

Display Element	Source	Note
Library Level Availability	AVA	<p>The Availability field subfields are created from the Alma AVA field, which is created for physical records, as follows:</p> <ul style="list-style-type: none"> <li>• \$\$I Institution – based on the institution look-up table (Alma institution codes) using AVA \$a as input.</li> <li>• \$\$L Library – based on library lookup table (ILS Library codes) using AVA \$\$b as input</li> <li>• \$\$1 Sublocation – from AVA \$\$c.</li> <li>• \$\$2 Call number – from AVA \$\$d.</li> <li>• \$\$S Availability status – based on AVA \$\$e.</li> <li>• \$\$9 – Refer to section <a href="#">Adding \$\$9ONLINE to Library Level Availability</a>. This field is not required in fields created from Alma.</li> <li>• \$\$P location priority – from AVA \$\$p</li> <li>• \$\$X source institution code (Alma Institution code) – from AVA \$\$a.</li> <li>• \$\$Y source library code (Alma Library code) – from AVA \$\$b.</li> <li>• \$\$Z source sublocation code (Alma collection code) – from AVA \$\$j.</li> </ul>
Title Uniform title Creator Contributor Subject Relation	Same as Generic MARC - except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## Availability Statuses from Alma

The availability status is calculated by Alma per location, but Primo displays the availability based on all locations. For example, if the same serial holding exists in two locations, which have the **Check holding** and **Available** statuses respectively, Primo will display the **Available** status since the holding is available at one of the locations. The final availability statuses are determined as follows:

1. If there are items, but none of them is available, the availability status is defined as **UNAVAILABLE**.

2. If this is a serial holding (i.e. information appears in the chronI / enumA) and not all of them are available, the availability status is defined as **CHECK\_HOLDINGS**.
3. If there is at least one available item, the availability status is defined as **AVAILABLE**.
4. Otherwise, the availability status is defined as **CHECK\_HOLDINGS**.

## Links

### Links Section

Type of Link	Source	Note
OpenURL*	--	OpenURL fields have been removed from the Alma MARC template. Requests to Alma are sent using the OpenURL syntax but special templates defined for Alma are used. The template is not defined in the PNX but in the Delivery mapping tables.
Thumbnail	Alma_ thumbnail link added for Alma- D.	
Link to Resource	856 4# (except for 856 42)	The rules are the same as the Generic MARC rules, except that the system will not create a link to the resource if the record is Alma-D.

## Search

### Search Section

Search field	Source	Note
Course department	CNO \$\$I	
Course ID	CNO \$\$k	
Course instructor	CNO \$\$g	
Course name	CNO \$\$j	
Search Scope	<p>Added the following search scope for the A-Z list if the record is display/type is journal and delivery category type is Alma-E:</p> <p>AZ&lt;primo code="" institution=""/&gt;</p> <p>In addition, search scopes are created from AVE fields for campuses or libraries: AVE \$\$i, c and AVE \$\$i, l.</p>	

Search field	Source	Note
General	001 - the Alma MSS ID is added	

## Sort

### Sort Section

Sort field	Source	Note
Title Author	Same as Generic MARC - except that conditions were added to prevent the use of non-preferred terms based on content of \$\$9.	

## Facets

### Facets Section

Facet	Source	Note
Collection	For Alma-D the collection is created from COL \$\$b. If you want to translate the collection, you can use the code that is stored in COL \$\$a.	
Course department	CNO \$\$i	
Course ID	CNO \$\$k	
Course instructor	CNO \$\$g	
Course name	CNO \$\$j	
Top-level	In addition to the rule in Generic MARC, the system tags Available in Library-records as <b>Available in Library</b> if AVA \$\$e is <b>available</b> or <b>check_holdings</b> .	
A-Z	The A-Z facet is created for use by the A-Z e-Journal list. The A-Z facet is the first letter of the title (the sort/title field is used).	
Creator/ Contributor Topic	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

# Delivery and Scoping

## Delivery and Scoping Section

Delivery Field	Source	Additional normalization notes
Institution	INST a AVE i	Using institution look-up table - Alma Institution Codes  The rules for this field should be modified when an Alma institution is created per Alma campus. For more information, refer to the <i>Alma-Primo Integration Guide</i> .
Delivery Category	For standard publishing, use the following: <ul style="list-style-type: none"> <li>• INT a</li> <li>• 856</li> </ul> For centralized publishing, use the following: <ul style="list-style-type: none"> <li>• INST b</li> <li>• AVE i</li> </ul>	For standard publishing, the rules perform the following: <ul style="list-style-type: none"> <li>• If INT is E, then Alma-E.</li> <li>• If INT is D, then Alma-D.</li> <li>• If INT is P and 856 is present, then Online Resource.</li> <li>• If INT is P and 856 is not present, then Alma-P.</li> </ul> For centralized publishing, the delivery category is created per institution from INST subfield b. An Alma-E delivery category is also created per institution using AVE subfield i. The institution code is appended to the delivery category using <code>\$\$I&lt;institution code=""&gt;</code> .
Restricted delivery scope	ARS (for Alma-D only)	If an ARS field is included with the value <b>May be restricted</b> , then a default restricted delivery scope is added:  <b>alma_maybe_restricted</b>  This rule is not enabled. In addition to enabling the rule, you must create the scope and the restriction with the Ongoing Configuration Wizard.

# Dedup

## Dedup Section

Dedup Field	Source	Note
C5	The MMS ID has been added to C5 for deduping.	
F11	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## FRBR

### FRBR Section

FRBR Field	Source	Note
K1 K2	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## Additional Data

### Additional Data Section

Additional Data Field	Source	Note
Author last Author First Corporate Author Addiitonal author	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## Browse

### Browse Section

Browse Field	Source	Note
Author	Same as Generic MARC except that Alma includes information on cross-references. For more information, refer to <a href="#">Browse Search</a> .	
Subject	Same as Generic MARC except that Alma includes information on cross-references and subject type (such as LCSH, MESH, and so forth). For more information, refer to <a href="#">Browse Search</a> .	
Call number	AVA \$\$d (for call number) AVA \$\$a (for institution) AVA \$\$k (for the type)	\$\$D (display form), \$\$E (normalized form), \$\$t (type) and \$\$I (institution) are created.

## Voyager MARC 21

[Return to menu](#)

In most aspects the Voyager MARC 21 mapping is same as the Generic MARC mapping. Only the exceptions are listed below.

### Control Section

Control Section

Normalized Record Field	Source/Content	Note
ILS API ID	Created from the PNX control/sourceid merged with control/sourcerecordid	Required for OPAC via Primo.

### Display Section

Display Section

Display Element	Source	Note
Creator Contributor Subject Title Uniform Title Relation	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	
Library Level Availability	949 <hr/> <b>Note</b> If you use the 949 for other purposes, this tag can be replaced by another tag in extract procedure.	The Library Level Availability field subfields are created as follows: \$\$I Institution – based on institution look-up table based on 949 \$a \$\$L Library – based on library lookup table based on 949 \$\$b \$\$1 Sublocation – from 949 \$\$c \$\$2 Call number – from 949 \$\$d \$\$S Availability status – based on 949 \$\$e \$\$3 No. of items – from 949 \$\$f

Display Element	Source	Note
		<p>\$\$4 no of unavailable items – from 949 \$\$g</p> <p>\$\$5 multi-volume flag – from 949 \$\$h</p> <p>\$\$6 number of loans – from 949 \$\$i</p> <p>\$\$9 – For more information, refer to section <a href="#">Adding \$\$9ONLINE to Library Level Availability</a>.</p> <p>\$\$P location priority – from 949 \$\$p</p> <p>\$\$X Original institution source code (Voyager instance) – from 949 \$\$a</p> <p>\$\$Y Original library source code (Voyager location) – from 949 \$\$j</p>

The Voyager availability field has the following subfields:

- \$\$a – A code supplied as a parameter to the extract procedure. This will be used to generate Primo institution code.
- \$\$b – owning Library display name
- \$\$c – location display name
- \$\$d – call number
- \$\$e – availability status (see below for definition)
- \$\$f – number of items for location
- \$\$g – number of unavailable items for the location
- \$\$h – multi-volume flag (Y/N)
  - If any item associated with the availability field has a different enumeration, chronology, and year field than another availability field, then the **Multi-volume** flag will be **Y**. This also applies if the enumeration and chronology fields for all items are empty.
  - If all items associated with the availability field have the same enumeration, chronology, and year fields (including empty enumeration and chronology fields) then the multi-volume flag will be 'N'.
- \$\$i – number of historic loans (for ranking/sorting)
- \$\$j – location code
- \$\$p – location priority

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## Definition of an Unavailable Item

An item is unavailable if it matches one of the following conditions:

- It has one of the following statuses:

- Charged
  - Renewed
  - Overdue
  - Recall Request
  - Hold Request
  - On Hold
  - In Transit
  - In Transit Discharged
  - In Transit On Hold
  - Claims Returned
  - Missing
  - Lost--Library Applied
  - Lost--System Applied
  - Damaged
  - Withdrawn
  - At Bindery
  - Scheduled
  - In Process
  - Call Slip Request
  - Short Loan Request
  - Remote Storage Request
- It belongs to bibs or mfhd's that the system suppresses from the OPAC.
  - It has a MODIFY\_LOCATION\_ID that is one of the Excluded Happening Locations or it has no MODIFY\_LOCATION\_ID, but its CREATE\_LOCATION\_ID is one of the excluded Happening Locations.
  - It has a MODIFY\_OPERATOR\_ID that is one of the Excluded Operator IDs or it has no MODIFY\_OPERATOR\_ID, but its CREATE\_OPERATOR\_ID is one of the excluded operator ids.
  - An operator recently modified its holdings or bib record at a happening location in the set of Excluded Happening Locations or an operator in the set of Excluded Operators most recently modified it.

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## Availability Statuses from Voyager

There are three availability statuses: "available", "unavailable", or "check\_holdings."

- If all items are available, the status will be "available."

- If all items are unavailable, the status will be "unavailable."
- If the Multi-volume flag is 'Y', and any items are available, but not all, the status will be "check\_holdings."
- If the Multi-volume flag is 'N' and any items are available, the status will be "available."

## Links

Links Section

Type of Link	Source	Note
Backlink	\$\$Tvoyager_backlink	
LinktoHoldings	\$\$Tvoyager_holdings	

## Search

Search Section

Index	Source tag	Notes
Creator/contributor	In addition to the fields used in Generic Marc also: 950	For cross-references
Subject	In addition to the fields used in Generic Marc also: 951	For cross-references

## Sort

Sort Section

Sort type	DC field	Note
Popularity	949 \$i	Not in use currently
Author Title	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## Facets

### Facets Section

Facet	Source	Note
Collection	In addition to Generic Marc: Voyager location – 949 \$\$c	
Top-level	Available in Library – records will be tagged as "Available in Library" if 949 \$\$e=available or check_holdings	
Creator/ Contributor  Subject	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional normalization notes
Institution	949 a	Using institution look-up table.

## Dedup

### Dedup Section

Dedup Field	Source	Additional normalization notes
F11	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## FRBR

### FRBR Section

FRBR Field	Source	Additional normalization notes
K1 K2	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## Additional Data

Additional Data Section

Additional Data Field	Source	Additional normalization notes
Author First Author Last Corporate Author Additional Author	Same as Generic MARC except that conditions were added to prevent the use of non-preferred terms based on the content of \$\$9.	

## Browse

The system can create multiple occurrences in separate fields.

Browse Section

Browse field	Source	Additional normalization notes
Subject	Same as Generic MARC except that Voyager includes information on cross-references. For more information, refer to <a href="#">Browse Search</a> .	
Author	Same as Generic MARC except that Voyager includes information on cross-references. For more information, refer to <a href="#">Browse Search</a> .	
Call number	949 \$\$d (for call number) 949 \$\$a (for institution) 949 \$\$I (for the type)	\$\$D (display form), \$\$E (normalized form), and \$\$I (institution) are created.

## Unicorn

[Return to menu](#)

In most aspects, Unicorn mapping is the same as Generic MARC mapping. This section describes the exceptions only.

These mapping rules apply to a Unicorn extract developed by Vanderbilt University and require additional scripts. For more information on running such an extract, contact Ex Libris support.

## Display Section

Display Section

Display Element	Source	Note
Library Level Availability	Not in use.	A special enrichment program, Unicorn Availability Enrichment, merges and maps the availability information from the Enrichment/Availability fields to this field.  Refer to the <i>Primo Interoperability Guide</i> for more information on this enrichment program.

## Links

Links Section

Type of Link	Source	Note
Backlink	\$\$Tunicorn_backlink	Note that the template itself requires the 'pcnum' script developed by Vanderbilt University. Documentation concerning this script is available from Ex Libris support.
LinktoHoldings	\$\$Tunicorn_holdings	Note that the template itself requires the 'pcnum' script developed by Vanderbilt University. Documentation concerning this script is available from Ex Libris support.

## Search

Search Section

Index	Source tag	Notes
Creator/ contributor	In addition to the fields used in Generic Marc also:  CR100, CR700, CR110, CR111, CR710, CR711	The CRnnn fields are cross-references that are added during the extract.

Index	Source tag	Notes
Subject	<p>In addition to the fields used in Generic Marc also:</p> <p>CR650, CR651, CR600, CR610, CR611, CR630.</p> <p>In addition, the subfields with '=' and '?' are removed.</p>	The CRnnn fields are cross-references that are added during the extract.

## Facets

### Facets Section

Facet	Source	Notes
Collection	999 subfields 1 and m using the ILS Library Codes.	This adds all libraries as collections. The libraries are based on subfields l and m from the 999 field. Every 999 field represents an item that is added during the extract.
Top-level	<p>The 'online resource' facets are created same as for Generic MARC.</p> <p>Available in Library – records will be tagged as "Available in Library" if enrichment/availability \$\$\$ is available or check_holdings.</p>	

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional normalization notes
Institution	The institution should be added as a constant and should be updated locally.	

## Enrichment

### Enrichment Section

Delivery Field	Source	Additional normalization notes
Availability	The purpose of these rules is to take the 852 (from linked holdings records) and 999 fields (one field per linked item) and convert them to the format of the Library Level Availability field from the display section. In the enrichment section, the mapping process creates a separate field for every 852 and 999 field, and then the Unicorn Availability enrichment program merges these fields into a single Library Level Availability field per location.	

Delivery Field	Source	Additional normalization notes
	<p>The rules give precedence to 852 over 999 on the assumption that only multivolume records have a holding record.</p> <p>The first 5 rules deal with 852:</p> <p>Rule 1 – creates \$\$I - the Primo institution. This is a constant which is updated locally</p> <p>Rule 2 – creates \$\$L - the Primo library based on subfields b and c. Since the order of the elements differs from the order for the 999 equivalent fields, subfield l and m, use a special mapping table, ILS Library Codes2. Note that you should add all possible combinations to this mapping table.</p> <p>For example:</p> <p>BIOMEDICAL DOC-DELIV BIOMEDICAL</p> <p>BIOMEDICAL FAMRESCTR BIOMEDICAL</p> <p>Rule 3 – creates \$\$1 - the sublocation based on subfield c (unless the content is a hyphen).</p> <p>Rule 4 – creates \$\$2 - the call number based on subfields: h, i, j, and z.</p> <p>Rule 5 – creates \$\$S - the status. For multi-volumes, this is always "check_holdings"</p> <p>The remaining rules apply to 999, which are activated only if the record does not have an 852 field (hence the condition checking for the presence of 852 in every rule).</p> <p>Rule 6 – creates \$\$I - the Primo institution. This constant is updated locally.</p>	
	<p>Rule 7 – creates \$\$L - the Primo library based on subfields l and m and uses the ILS Library Codes mapping table that is automatically created from the Institution configuration defined in the Institution Wizard.</p> <p>Rule 8 – creates \$\$1 - the sublocation based on subfield l.</p> <p>Rule 9 – creates \$\$2 - the call number. This is based on subfield a.</p> <p>Rule 10, 11, 12 – create \$\$S - the status. This is based on a combination of either subfields k and m or l and m using the Library Avail Codes mapping table that matches the combinations to one of the following statuses: available, unavailable, or check_holdings.</p> <p>For example:</p> <p>LOST MUSIC unavailable</p> <p>ON-ORDER MUSIC check_holdings</p>	
LCC	Created also from 999 subfield a.	

## SFX

[Return to menu](#)

In most aspects, the SFX mapping is same as the Generic MARC mapping. This section describes the exceptions only.

## Display Section

Display Section

Display Element	Source	Note
Type	LDR pos. 7 m -> book s -> journal Default: journal	

## Links

All link fields except for Openurl and Openurlfulltext are deleted.

## Facets

Facets Section

Facet	Source	Note
Top-level	Always <b>online_resources</b>	

## Delivery and Scoping

Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution		
Delivery category	Online Resource	

Delivery Field	Source	Additional Normalization Notes
Restricted delivery scopes		Can be based on institute thresholds.

## Generic Dublin Core

[Return to menu](#)

## Control Section

Generic Dublin Core Section

Control Field	Source/Content	Additional Normalization Rules
Source ID	From data source definition.	
Record ID	Source ID + Source Record-ID	
Source Record-ID	From header of source file	
Additional Source RecordID		
SourceSystem	From data source definition	
Source Format	From data source definition	

## Display

Display Section

Display Field	Source/Content	Additional Normalization Rules
Resource type	Local mapping is required. Every record must be mapped to a single TYPE.	
Title	dc:title	
Uniform title		

Display Field	Source/Content	Additional Normalization Rules
Vernacular title		
Source	Data source from PNX: Control/sourceid	
Creator	dc:creator	<p>There are disabled rules that place the author's first name before the last name. Use these rules if you are certain of the format of the author's name.</p> <p>If there is a comma, then take all the text after the comma and add it before the text that precedes the comma, deleting the comma itself.</p> <p>For example:</p> <p>Lippe, Ole von der --&gt; Ole von der Lippe</p> <p>Van Der Wise, Fred --&gt; Fred Van Der Wise</p>
Contributor	dc:contributor	<p>There are disabled rules that place the author's first name before the last name. Use these rules if you are certain of the format of the author's name.</p> <p>If there is a comma, then take all the text after the comma and add it before the text that precedes the comma, deleting the comma itself.</p> <p>For example:</p> <p>Lippe, Ole von der --&gt; Ole von der Lippe</p> <p>Van Der Wise, Fred --&gt; Fred Van Der Wise</p>
Description	dc:description dcterms:abstract dcterms:tableOfContents	Every field is a separate occurrence.
Coverage	dc:coverage dcterms:spatial dcterms:temporal	
Publisher	dc:publisher	
Subject	dc:subject	

Display Field	Source/Content	Additional Normalization Rules
Rights management	dc:rights dcterms: accessRights	
Language	dc:language	If the language is not in ISO 639-2 it should be mapped to ISO 639-2. If the language cannot be translated, leave it as it but do not add the codens attribute.
Physical Format	dc:format dcterms:extent dcterms:medium	Take all occurrences
Resource identifier	dc:identifier	
Relation	dc:relation dcterms:isReplacedBy dcterms:replaces	
IsPartOf	dc:source OR dcterms:bibliographicCitation OR dcterms:isPartOf	
Creation Date	dc:date OR dcterms:created OR dcterms:dateCopyrighted	
Edition		
Library Level Availability		Library Level Availability subfields: <ul style="list-style-type: none"> <li>• \$\$IInstitution – based on institution look-up table</li> <li>• \$\$LLibrary – based on library lookup table</li> <li>• \$\$1Collection</li> </ul>

Display Field	Source/Content	Additional Normalization Rules
		<ul style="list-style-type: none"> <li>• \$\$2Call number</li> <li>• \$\$SAvailability status</li> <li>• \$\$3No. of items</li> <li>• \$\$4no of unavailable items</li> <li>• \$\$5multi-volume flag</li> </ul>

## Links

### Links Section

Type of Link	Source	Note
OpenURL	<p>Based on resource type from display:</p> <p>If type=article then</p> <p>\$\$Topenurl_ article</p> <p>Else:</p> <p>\$\$Topenurl_ journal</p>	SFX has two sources for Primo: one for articles in which case the date is used and one for journals in which case the date is ignored. There is a different template per source.
OpenURL_ fulltext	<p>Based on resource type from display:</p> <p>If type=article then</p> <p>\$\$Topenurlfull_ article</p> <p>Else:</p> <p>\$\$Topenurlfull_ journal</p>	SFX has two sources for Primo: one for articles in which case the date is used and one for journals in which case the date is ignored. There is a different template per source.
OpenURL_ service		
Linkto Holdings		
Linkto Holdings_ available		

Type of Link	Source	Note
Linkto Holdings_unavailable		
Linkto Holdings_doesnotexist		
LinktoRequest		
Backlink		
LinktoResource		
Additional links		
Thumbnail		
Link to TOC		
Link to Abstract		
Link to Review		
Link to Price		

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## Search

### Search Section

Index	Source	Additional Normalization Rules
Creator/ contributor	dc:creator dc:contributor	

Index	Source	Additional Normalization Rules
	dc:creator dc:contributor	Take second upper case character after a comma, for example: Stephens, Mary Becomes Stephens, M <hr/> <b>Note</b> In the template normalization set, this rule is disabled. Enable this rule only if you are certain all creators/contributors match this format. <hr/>
Title	dc:title	
Additional Title	dcterms:alternative dc:relation dcterms:hasFormat dcterms:hasPart dcterms:hasVersion dcterms:isFormat of dcterms:isPartof dcterms:isReferencedBy dcterms:isReplacedBy dcterms:isRequiredBy dcterms:isVersionOf dcterms:replaces dcterms:requires dcterms:references dc:source dcterms:bibliographicCitation	
Description	dc:description dcterms:abstract dcterms:tableOfContents	
Subject	dc:subject	

Index	Source	Additional Normalization Rules
ISBN		
ISSN		
Creation Date	dc:date dcterms:created dcterms:dateCopyrighted	
Full text		
TOC		
Resource type	Resource type field from display	
SourceID	Source ID from the control section	
RecordID	Record ID from the control section	
General	dcterms:audience dcterms:educationLevel	
Restricted search scope		
Search scope	Data source from PNX: control/sourceid Institution from PNX: Delivery/institution	
Scope	Copy from Search scope and Restricted search scope sections above.	

# Facets

## Facets Section

Facet	Source/Content	Additional Normalization Rules
Resource type	<p>Create this based on the Resource type field from display section as follows.</p> <p>Book -&gt; books</p> <p>Journal -&gt; journals</p> <p>Article -&gt; articles</p> <p>Text Resource -&gt; text_resources</p> <p>Image -&gt; images</p> <p>Audio -&gt; audio_visual</p> <p>Video -&gt; audio_visual</p> <p>Other -&gt; other</p> <hr/> <p><b>Note</b></p> <p>In some cases two values should be created, each as a separate field.</p> <hr/>	<p>Base on display/type using mapping table format_mean</p>
Language	dc:language	<p>If the language is not a valid ISO 639 code or cannot be translated to a valid code it should not be created.</p>
Creator/ Contributor	<p>dc:creator</p> <p>dc:contributor</p>	<p>Take second upper case character after a comma example.</p> <p>For example:</p> <p>Stephens, Mary</p> <p>Becomes</p> <p>Stephens, M</p> <hr/> <p><b>Note</b></p> <p>In the template normalization set, this rule is disabled. Enable this rule only if you are certain all creators/ contributors match the format.</p> <hr/>
Topic	dc:subject	
Classification		

Facet	Source/Content	Additional Normalization Rules
Creation date	dc:date OR dcterms:created Or dcterms:dateCopyrighted	Normalize year to four digits
Physical format	dc.format	
File size		
Collection		
Top-level	online_resource -- assign if the delivery category is "Online Resource" OR "SFX Resource" OR "MetaLib Resource"  new – as tagged before load.  Available in Library – based on availability information in source record	
Pre-filter	Based on resource type and general mapping from resource type to Pre-filter:  Book -> books  Journal -> journals  Article -> articles  Text Resource -> books  Image -> images  Video -> audio_video  Audio -> audio_video  Maps -> maps  Score -> scores	Base on display/type using mapping table 'pre_filter'.
Related records		

---

## Sort

Sort Section

Sort type	Source/Content	Additional Normalization Rules
Creation date	Date OR dcterms:created	Try modifying the content to a year.
Title	From PNX display/title	Only single key will be created
Author	From PNX display/creator	Only single key will be created
Popularity		

---

## Duplicate Record Detection

Currently not applied.

---

## FRBR

Currently not applied.

---

## Delivery and Scoping

Local mapping required as relevant.

Delivery and Scoping Section

Delivery Field	Note
Institution	
Delivery category	Online Resource" has been defined as the default delivery category. It can be changed as required.
Restricted delivery scope	

---

## Ranking

Local mapping required as relevant.

Ranking Section

Booster Field	Source
Booster1	1 or as added by enrichment program
Booster2	Not in use.

---

## Enrichment

Enrichment Section

Enrichment Field
classification.lcc/ddc/udc/rvk
Fulltext
TOC
Abstract
Review
Rank-father-son
Rank-Number of copies
Rank-Date first copy
Rank-Number of loans
Availability

## Additional Data

### Additional Data Section

Additional Data Field	Source	Additional Normalization Notes
Author Last	Take until comma	The rule is disabled and can be used only if the format is <i>last, first</i> .
Author First	Take following comma	The rule is disabled and can be used only if the format is: <i>last, first</i>
Author initials		
Author first initial		
Author middle initial		
Author suffix		
Author	dc:creator	
Corporate Author		
Additional author	dc:contributor	
Series author		
Book Title	If resource type not article or journal: dc:title	
Article title	If resource type Article: dc:title	

Additional Data Field	Source	Additional Normalization Notes
Journal title	If resource type Article or Journal : dc:source OR dcterms:bibliographicCitation	
Short title		
Additional title	dcterms:alternative	
Series title		
Date	dc:date OR dcterms:created OR dcterms:dateCopyrighted	Normalize to 4 characters.
RISDate		
Additional Date		
Volume		
Issue		
Part		
Season		
Quarter		
Start page		
End page		

Additional Data Field	Source	Additional Normalization Notes
Pages		
Article number		
ISSN		
eISSN		
ISBN		
CODEN		
SICI		
Metadata Format	<p>Based on Resource type from display:</p> <ul style="list-style-type: none"> <li>• book -&gt; <b>book</b></li> <li>• journal -&gt; <b>journal</b></li> <li>• article -&gt; <b>journal</b></li> <li>• conference_proceeding &amp; record has ISSN -&gt; <b>journal</b></li> </ul> <p>Else -&gt; <b>book</b></p>	Use Metadata Format mapping table
Genre	The Genre mapping table maps the resource type from the display section of the PNX to the genre that is required by the OpenURL.	Use Genre mapping table.
RISType	<p>Based on Resource type from display:</p> <p>book -&gt; BOOK</p> <p>journal -&gt; JOUR</p> <p>map -&gt; MAP</p> <p>video -&gt; VIDEO</p> <p>audio -&gt; SOUND</p> <p>music -&gt; MUSIC</p> <p>article -&gt; MGZN</p>	Use RISType mapping table

Additional Data Field	Source	Additional Normalization Notes
	Else -> GEN	
City of Publication		
Publisher	dc:publisher	
Abstract	dcterms:abstract	
Miscellaneous1		
Miscellaneous2		
Miscellaneous3		
OCLC ID		
DOI		
URL		
Local fields 1-5		

## Browse

The system can create multiple occurrences in separate fields.

### Browse Section

Browse field	Source	Additional normalization notes
Institution	PNX: delivery/institution	
Author	dc:creator	\$\$D (display form) and \$\$E (normalized form) are created.

Browse field	Source	Additional normalization notes
	dc:contributor	
Title	dc:title	\$\$D (display form) and \$\$E (normalized form) are created.
Subject	dc:subject	\$\$D (display form) and \$\$E (normalized form) are created.

## Alma Dublin Core

[Return to menu](#)

In most aspects, the Alma Dublin Core mapping is the same as the [Generic Dublin Core](#) mapping. Only the exceptions are listed in the sections below. The template is named **Alma Dublin Core - Template** in the Back Office and used for Alma-D (digital).

## Control Section

Control Section

Normalized Record Field	Source/Content	Note
Alma ID	The Alma ID is the Alma institution code concatenated with a colon and the original Alma record ID.	Required for Alma-Primo interoperability.

## Display Section

Display Section

Display Element	Source	Note
Type	Based on the TYP field using the Alma_Type mapping table.	

## Links

Links Section

Type of Link	Source	Note
OpenURL*	–	OpenURL fields have been removed from the Alma Dublin core template. Requests to Alma are sent using the OpenURL syntax, but special templates defined for Alma are used. The template is defined in the Delivery mapping tables, not the PNX.
Thumbnail	<b>Alma_thumbnail</b> link is added for Alma-D	

---

## Facets

Facets Section

Facet	Source	Note
Collection	dc:coldesc	
Top-level	The <b>online_resource</b> top level facet is always added.	

---

## Delivery and Scoping

Delivery and Scoping Section

Delivery Field	Source	Additional normalization notes
Institution	INST a	Using institution look-up table Alma Institution Codes
Delivery Category	INT a	The delivery category is always Alma-D if INT a is <b>D</b> .
Restricted delivery scope	ARS (for Alma-D only)	If an ARS field is included with the value "May be restricted" then a default restricted delivery scope is added - "alma_maybe_restricted". Note that this rule is not enabled. In addition to enabling the rule it is also necessary to actually create the scope and the restriction in the Ongoing Configuration Wizard.

## Digitool

[Return to menu](#)

Digitool has two template mappings normalization rule sets, one for Dublin Core and the second for MARC 21. Most fields have the same mappings as the Generic Dublin Core or the Generic MARC 21 respectively. The sections below only include the fields for which the rules differ.

## Display

These fields are taken from the <mds> section, where the <name>='descriptive'.

Display Section

Element	Mapping from Digitool
Title	If title cannot be created from MARC or DC data then it should be created from control/label.
Physical Format	In addition to the generic mapping: From<stream_ref> <stream_ref>: <mime_type>
Resource Type	See mapping below

## Mapping to Resource Type

The resource type can be mapped based on two different elements in the digital object:

- **Mime type** – <mime\_type> from the <stream\_ref> section. This mapping includes only the most common ones and it may be necessary to add additional ones.
- **Entity type** – <entity\_type> from the <control> section.

### Note

There is no standard list of entity types. Sites can create their own types. This mapping uses the Digitool demo list.

Mapping to Resource Type

Mime_type	Entity_type	Resource Type	Note
	VIDEO*	video	

Mime_type	Entity_type	Resource Type	Note
	COMPLEX	other	
	AUDIO	audio	
	IMAGE	image	
	DOCUMENT	text_resource	
	METS	book	
application/book		book	
application/pdf		text_resource	
application/msword		text_resource	
application/postscript		text_resource	
application/vnd.ms-powerpoint		other	
application/vnd.ms-project		other	
application/illustrator		image	
application/photoshop		image	
application/x-visio		image	
application/vnd.rn-realmedia		video	
application/x-shockwave-flash		video	

Mime_type	Entity_type	Resource Type	Note
application/<anything else=""/>		other	
text/<anything/>		text_resource	
image/<anything/>		image	
model/<anything/>		video	
video/<anything/>		video	
chemica/<anything/>		other	Requires more specification
Audio/<anything/>		audio	

## Links

### Links Section

Type of Link	Source
OpenURL	--
Backlink	\$\$T digitool_backlink\$\$DBibliographic details in DigiTool
LinktoResource	\$\$T digitool_linktorscr\$\$DDisplay Item
Thumbnail	<p>Derived from &lt;relations&gt; section where the &lt;type&gt; is <b>manifestation</b> and the &lt;usage_type&gt; is <b>THUMBNAIL</b>. Within the &lt;relation&gt; there is a &lt;urls&gt; section. Take the url where the &lt;url_type&gt; is <b>stream</b>. If there are several such links, take the first one only.</p> <p>The field should have two subfields:</p> <ul style="list-style-type: none"> <li>• \$\$T digitool_thumb</li> <li>• \$\$1 the PID from the link</li> </ul>

## Link Example

```
- <relations>
- <relation>
  <type>manifestation</type>
  <pid>DTL02000000003000001</pid>
  <label>Flag of the U.S. deployed on surface of the Moon.</label>
  <note xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" />
  <usage_type>THUMBNAIL</usage_type>
  <creation_date>2005-11-04 09:30:47</creation_date>
  <modification_date>2005-11-04 09:30:47</modification_date>
  <file_extension>jpg</file_extension>
  <mime_type>image/jpeg</mime_type>
  <external_type>-1</external_type>
  <directory_path>C:\ng\digitool\home\system\bin\..\..\profile\bin\..\storage\2005\11\
04\file_1\DTL02000000003000001</directory_path>
  <entity_type xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" />
- <urls>
  <url type="stream">http://il-dtldev02:1801/webclient/
DeliveryManager?pid=DTL02000000003000001</url>
  <url type="descriptive_metadata">http://il-dtldev02:1801/webclient/
MetadataManager?pid=
DTL02000000003000001&descriptive_only=true</url>
  <url type="formatted_metadata">http://il-dtldev02:1801/webclient/
MetadataManager?pid=DTL02000000003000001</url>
</urls>
```

The above example should create the following field:

```
thumbnail $$Tdigitool_thumb$$1 DTL02000000003000001
```

## Search

For MARC, the fields are the same as the generic MARC.

For Dublin Core the fields are as follows:

Search Section

Index	Source	Note
Full text	<indexes>/<index>	
TOC s	From <mds> where the <name> is <b>mets_section</b> and the <type> is <b>structMap</b> , take the content of all LABELS.	

Index	Source	Note
General	Same as generic and in addition: From <stream_ref>:<file_extension>	
Restricted search scope		Restricted search scopes can be created in Primo in the same way that Denied logical bases are created in DigiTool.

## Sort

For MARC, the fields are the same as the Generic MARC.

For Dublin Core, the fields are the same as Generic Dublin Core.

## Facets

For MARC, the same as for MARC 21 except for "top-level" and "Pre-filter", which use the Resource Type field from the display.

For Dublin Core:

Facets Section

Facet	Fields from DigiTool	Note
Top-level	Online_resources if there is a stream type URL.	

## Delivery and Scoping

Local mapping required as relevant.

Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution		
Delivery category	Online Resource	
Restricted delivery scope		Restricted delivery scopes can be created based on the access rights metadata that is harvested from DigiTool.

## MetaLib

[Return to menu](#)

## Control

Control Section

Control field	Source/Content	Additional Normalization Rules
Source ID	From configuration file.	Mandatory field!
Record ID	Source ID + Source Record-ID	Mandatory field!
Source Record-ID	001	Mandatory field!
Additional Source RecordID		
Source Type	Not in use	
SourceSystem	From configuration file	
Source Format	From configuration file	
Record Type	Not in use	
Last Modified Date	Not in use	

## Display

### General Notes

- Multiple occurrences are concatenated with a semicolon unless indicated otherwise.
- If the source data has a period at the end, then remove it.

Display Section

Display Field	Source/Content	Additional Normalization Rules
Source	source_id from control	
Type	database	
Title	245 \$\$a	
Vernacular title		
Uniform title		
Creator	260 \$\$b	
Contributor		
Description	655 \$\$a ,520 \$\$a	
Coverage	513 \$\$a	
Publisher	110 \$\$a	
Subject	category/main and category/sub 653 \$\$a	
Rights management	540 \$\$a	
Language	546 \$\$a	If the language is not in ISO 639-2 it should be mapped to ISO 639-2. If the language cannot be translated, leave it as.
Physical Format		
Resource identifier		

Display Field	Source/Content	Additional Normalization Rules
Relation		
IsPartOf		
Creation Date		
Edition		

## Links

### Links Section

Type of Link	Source	Note
OpenURL		
OpenURL_fulltext		
OpenURL_service		
Linkto Holdings		
Linkto Holdings_available		
Linkto Holdings_unavailable		
Linkto Holdings_doesnotexist		
LinktoRequest		
Backlink		
LinktoResource	856 41 \$u \$\$DOnline Link	

Type of Link	Source	Note
Additional links	856 42 \$u 856 49 \$u For both \$\$DRelated links	
Thumbnail		
Link to TOC		
Link to Abstract		
Link to Review		
Link to Price		

## Search

### Search Section

Index	Source	Additional Normalization Rules
Creator/ contributor	260 \$\$b, 110 \$\$a, 710 \$\$a	
Title	210 \$\$a	
Additional Title	245 \$\$a, 246 \$\$a	
Description	520 \$\$a, 513 \$a	
Subject	Categories, sub-categories and 653 \$\$a	
Identifiers		

Index	Source	Additional Normalization Rules
ISBN		
ISSN		
Creation Date		
Full text		
TOC		
Resource type	Resource type from display 655 a	
RecordType	Not in use	
SourceID	Source ID from control	
RecordID	Record ID from control	
General		
Restricted search Scope	Created based on institution affiliation when the resource is SUBSCRIPTION. The rule can be enabled by sites that do not display restricted resources. Refer to <a href="#">Additional Data</a> for an explanation of how to translate MetaLib restrictions to Primo.	
Search Scope	MetaLib institution using MetaLib Institution Codes mapping table Also create a "metalib" scope	
Scope	Copy from Search scope and Restricted search scope from the delivery section	

# Facets

## Facets Section

Facet	Source/Content	Additional Normalization Rules
Resource type	Use format_mean mapping table: Book -> books , Journal -> journals Article -> articles Text Resource -> text_resources Map -> maps Score -> scores Image -> images Audio -> media Video -> media Other -> other	
Language	546 \$a	
Creator/Contributor	260 \$b 110 \$a 710 \$a	
Topic	Category-subcategory	
Creation date		
Physical format		
File size		
Collection	Online Databases	
Top-level	online_resources	
Pre-filter		

Facet	Source/Content	Additional Normalization Rules
Related records		

---

## Duplicate Record Detection

A single Primo site may have IRD records from multiple institutions that have overlap. MetaLib IRD records require a separate dedup algorithm, type 4 based on the CKB ID OR 035 or 245.

There is no need for candidate selection in the case of this algorithm but to keep with the general process both candidate and matching fields are created.

Duplicate Record Detection

Field ID	Content of Field/
Source Tag + Subfield	Note
T	4
C1	CKB
C2	035 \$a
C3	245 \$a
F1	CKB ID
F2	035 \$a
F3	245 \$a

Algorithm: a match on any candidate field means that the records are duplicates.

---

## Delivery and Scoping

Local mapping required as relevant.

Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution	AFI Use Metalib Institution Mapping table	
Delivery category	MetaLib Resource	
Restricted delivery scope	Created based on institution affiliation in the case that the resource is "SUBSCRIPTION". The rule can be enabled by sites that display restricted resources.  Refer to <a href="#">Additional Data</a> for an explanation of how to translate MetaLib restrictions to Primo.	Can be based on AF1, AF3, AIP, but needs further infestation + 594 (free/subscription).

## Ranking

Local mapping required as relevant.

Ranking Section

Booster Field	Source	Additional Normalization Notes
booster1	1 or as added by enrichment program	
booster2	Not in use.	

## Enrichment

Enrichment Section

Enrichment Field	Source	Additional Normalization Notes
classification.lcc/ddc/udc/rvk		
fulltext		
TOC		
Abstract		

Enrichment Field	Source	Additional Normalization Notes
Review		
Rank-father-son		
Rank-Number of copies		
Rank-Date first copy		
Rank-Number of loans		
availability		

---

## Additional Data

This includes multiple occurrences in separate fields.

Additional Data

Additional data field	Source	Additional Normalization Notes
Author Last		
Author First		
Author initials		
Author first initial		
Author middle initial		
Author suffix		
Author		

Additional data field	Source	Additional Normalization Notes
Corporate Author		
Additional author		
Series author		
Book Title	245 a	
Article title		
Journal title		
Short title		
Additional title		
Series title		
Date		
RISDate		
Additional Date		
Volume		
Issue		
Part		
Season		

Additional data field	Source	Additional Normalization Notes
Quarter		
Start page		
End page		
Pages		
Article number		
ISSN		
eISSN		
ISBN		
CODEN		
SICI		
Format	journal	
Genre	unknown	
RISType	GEN	
City of Publication		
Publisher	110 a	
Abstract	520 a	

Additional data field	Source	Additional Normalization Notes
Miscellaneous1		
Miscellaneous2		
Miscellaneous3		
OCLC ID		
DOI		
URL		
Local fields 1-5		

---

## Aleph MAB

[Return to menu](#)

This mapping to the normalized record is based on the internal structure of MAB2 within Aleph 500. The description of this mapping uses the subfield structure of Aleph.

### Indicator/Subfield:

- The '#' symbol indicates the truncation sign for one or more indicators(s)/subfield(s).
- The '\$\$' symbol indicates the subfield (followed by the subfield code).
- The '\_' symbol indicates a blank indicator.

If multiple fields and/or different fields are mentioned in the Source column of each mapping section, all fields are taken as sources for the PNX field (= and). Otherwise, the "OR" term indicates that the following field should be taken if the previous field cannot be mapped or does not exist).

---

## Rules for Parent-Child Relationship

The MAB2 relationship between multipart works (record type "h") and volume records (record type "u") is referred to as a parent-child relationship.

There is a general rule concerning the integration of "parent" information into a "child" record during the extract process: All data from the parent expands to the child, including subjects and classifications.

The expand program (expand\_doc\_mab\_recursive: child - parent, if 010 is present) is used in the extract process. This program, by default, always adds the second indicator to all fields of the record itself. So the second indicator with value of 1 is present in all records, not only for child records, and the fields from the parent are added using the current convention of using the second indicator for the level: 1 = child/present record and 2 = parent). The second indicator defines which fields to use from the present records and from the parent. This is added to the mapping below. There are four general rules concerning the mapping from MAB2 to the fields of the PNX:

---

### Rule 1

Take only field(s) of the parent record OR only field(s) of the present record (in these cases the second indicator 1 or 2 is mentioned explicitly)

- field information from just one record

---

### Rule 2

Take field(s) of the parent record ADD field(s) of the present record (in these cases the second indicator is mentioned as #)

- full integration of parent field information

---

**Note**

All Aleph MAB fields of the parent are taken into the PNX field (even if this field exists in the child (for example, for creators, titles, subjects) and then all Aleph MAB fields of the child (the rule for the first indicator is mentioned in the Source column). The merging rules for the sequence/merge of the taken fields are mentioned in the Note column (mainly according to fields of the same record, sometimes grouping according to field names).

---

---

### Rule 3

Take first fields of the present record OR fields of the parent record if the field is missing in the present record; take into account the EXACT FIRST INDICATOR for the integration of field information

- partial integration of parent information WITH consideration of EXACT FIRST INDICATOR
- 

### Rule 4

Take first field(s) of the present record OR field(s) of the parent record if the field is missing in the present record; do not take into account the first indicator for the integration of field information.

- partial integration of parent information WITHOUT consideration of exact first INDICATOR
- 

**Note**

For Rules 3 and 4, if various source fields are mentioned in the table (Source column), apply the rules field for field. For example, if you apply Rule 4 to the following: Field AAA##, Field BBB##.

---

- Take child field AAA##. If not existing, take the parent field AAA##.
  - Take child field BBB##. If not existing, take parent field BBB##.
- 

## Control Section

Control Section

Normalized Record Field	Source/Content	Note
Source ID	From data source definitions	
Original Source ID	From data source definitions	
Source Record-ID	From data source definitions	
Record ID	Source ID + Source Record-ID	

Normalized Record Field	Source/Content	Note
Additional Record-ID	001#1 \$\$a	MAB identification number; may differ from Aleph system number.
ILS API ID	Original Source ID + Source Record-ID	
Source Type		Not in use.
Source Format	From data source definitions	
SourceSystem	From data source definitions	

## Display Section

### Display Section

Display Element	Source	Note
Resource Type	050 ## Pos. 10 OR 051 ## Pos. 1 OR 052 ## Pos. 1 OR 051 ## Pos. 0 OR 052 ## Pos. 0 OR 050 ## Pos. 5 OR 334 ## \$\$a	Mapping rule 4. The following mapping tables are used: <ul style="list-style-type: none"> <li>• type_050_10</li> <li>• type_051_1</li> <li>• type_052_1</li> <li>• type_051_0</li> <li>• type_052_0</li> <li>• type_050_5</li> <li>• type_334</li> </ul> If no value is assigned according to the four fields, the constant <b>Book</b> is used.
Title	331 ## \$\$a 333 ## \$\$a 335 ## \$\$a 360 ## \$\$a	Mapping rule 2. Multiple occurrences of 360 and 089 are merged and delimited by “:_” Fields are merged in the following way: 331#2_/_333#2_:_335#2_._360#2_._089#1

Display Element	Source	Note
	089 #1 \$\$a 304 #1 \$\$a 310 #1 \$\$a 340 #1 \$\$a – 352#1 \$\$a (every 4th tag) 341 #1 \$\$a	._331#1/_333#1_:335#1.360#1.304#1.310=_340
Creator	100 #1 \$\$a 104 a1 \$\$a 108 a1 \$\$a (every 4th tag, until 136_1) 200 #1 \$\$a 204 a1 \$\$a 208 a1 \$\$a	Mapping rule 1.  Transformation routines “Get author first name” and “Get author last name” are used to reverse the author’s names.  Multiple occurrences are merged and delimited by “;_” in the listed sequence of the fields: 100_1, 104a1, 108a1, ... ,136a1, 200_1, 204a1, 208a1
Contributor	100 #1 \$\$a, \$\$b Take any indicator except “_” 104 #1 \$\$a - 196#1 \$\$a, \$\$b (every 4th tag) Take any indicator except “a” 200 #1 \$\$a Take any indicator except “_” 204 #1 \$\$a - 208#1 \$\$a (every 4th tag) Take any indicator except “a”	Mapping rule 1.  Transformation routines “Get author first name” and “Get author last name” are used to reverse the author’s names.  Subfields \$\$a and \$\$b (relator term) are merged and delimited by blank.
Edition	403 ## \$\$a 407 ## \$\$a	Mapping rule 4.  Fields are merged and delimited by a semicolon: 403##;_407##
Publisher	410 ## \$\$a 412 ## \$\$a 415 ## \$\$a	Mapping rule 4.  Fields are merged and delimited by “:_”  First place/publisher: 410##:_412##

Display Element	Source	Note
	<p>417 ## \$\$a</p> <p>418 ## \$\$a, \$\$g</p>	<p>Second place/publisher: 415##_:_417##</p> <p>Third and subsequent places/publisher: 418##</p> <p>418: subfields \$\$a and \$\$g are merged and delimited by "_:_"</p>
Creation date	<p>405 #1 \$\$a</p> <p>OR</p> <p>425 b1 \$\$a, 425 c1 \$\$a</p> <p>OR</p> <p>425 #1 \$\$a</p> <p>OR</p> <p>425 a1 \$\$a</p> <p>OR</p> <p>425 p1 \$\$a</p>	<p>Mapping rule 1.</p> <p>425b1 and 425c1 are merged. Transformation routine "Add to end of string" is used to add hyphen to 425b1.</p> <p>Example: 1980_:_1985</p>
Physical format	<p>433 #1 \$\$a Take any indicator except "a".</p> <p>434 #1 \$\$a</p> <p>437 #1 \$\$a</p> <p>653 #1 \$\$a</p>	<p>Mapping rule 1.</p> <p>Fields are merged in the following way:</p> <p>433#1_:_434_1_+_437#1._:_653#1</p> <p>Multiple occurrences of 434_1 and 652#1 are merged and delimited by "_:_"</p>
Is Part Of	<p>525 #1 \$\$p, \$\$a</p> <p>590 #1 \$\$p, \$\$a - 599 #1 \$\$p, \$\$a</p> <p>Take any indicator except blank and "s".</p>	<p>Mapping rule 1.</p> <p>Subfields \$\$p and \$\$a of field 525#1 are merged and delimited by "_:_"</p> <p>Fields are merged like this:</p> <p>525#1._:_ln:_590#1_/_591#1._592#1._:_593#1._:_594#1,_595#1</p> <p>._:_596#1._:_(597#1)._:_598#1._:_599#1</p> <p>Multiple occurrences of 525#1 and 599#1 are merged and delimited by "_:_"</p>
Identifier	<p>540 #1 \$\$a, \$\$b</p> <p>541 #1 \$\$a, \$\$b</p> <p>542 #1 \$\$a, \$\$b</p> <p>543 #1 \$\$a, \$\$b</p> <p>Take 54X with any indicator except "z".</p>	<p>Mapping rule 1.</p> <p>Transformation routine "Add to beginning of string" is used to prefix fields with following values:</p> <p>540: "ISBN "</p> <p>541: "ISMN "</p> <p>542: "ISSN "</p>

Display Element	Source	Note
		<p>543: "ISRN "</p> <p>Subfields \$\$a and \$\$b are merged and delimited by "._:"</p> <p>Multiple occurrences are merged and delimited by "._:" in the listed sequence of the fields: 540#1, 541#1, 542#1, 543#1</p>
Subject	<p>902 ## \$\$a - 947 ## \$\$a (every 5th tag)</p> <p>Take any subfields except \$1 and \$9</p> <p>710 ## \$\$a</p> <p>711 ## \$\$a</p> <p>720 ## \$\$a</p> <p>740 ## \$\$a</p>	<p>Mapping rule 2.</p> <p>All repeatable fields of 902## with all subfields are considered as one subject (the same for 907### - 947##). Fields and subfields are merged and delimited by "._:".</p>
Description	<p>517 #1 \$\$p, \$\$a</p> <p>524 #1 \$\$p, \$\$a</p> <p>750 #1 \$\$a</p> <p>753 #1 \$\$a</p> <p>756 #1 \$\$a</p>	<p>Mapping rule 1.</p> <p>Subfields \$\$p and \$\$a of field 5XX#1 are merged and delimited by "._:"</p>
Language	<p>037 b# \$\$a</p> <p>OR</p> <p>037 a# \$\$a</p> <p>OR</p> <p>037 c# \$\$a</p>	<p>Mapping rule 3.</p> <p>The language is stored in ISO 639-2.</p> <p>Multiple occurrences of subfields \$\$a of 037 ## are merged with "._:"</p>
Relation	<p>451#1 \$\$a - 491#1 \$\$a (every 10th tag)</p> <p>522 #1 \$\$p, \$\$a</p> <p>526 #1 \$\$p, \$\$a - 533 #1 \$\$p, \$\$a</p> <p>534 #1</p>	<p>Mapping rule 1.</p> <p>Subfields \$\$p and \$\$a of field 52X#1 are merged and delimited by "._:"</p> <p>Multiple occurrences are merged and delimited by "._:" in the listed sequence of the fields: 451#1, 461#1, 471#1, 481#1, 491#1, 522#1, 526#1, 527#1, 528#1, 529#1, 530#1, 531#1, 532#1, 533#1, 534#1</p>
Source	From PNX:	

Display Element	Source	Note
	control/sourceid	
Coverage	---	
Rights	---	
Library level availability	AVA, created by the Aleph expand routine "expand_doc_bib_avail"	<p>The Availability subfields are created as follows:</p> <p>\$\$I Institution – based on institution look-up table based on AVA\$\$a</p> <p>\$\$L Library – based on library look-up table based on AVA\$\$b</p> <p>\$\$1 Sublocation – from AVA\$\$c</p> <p>\$\$2 Call number – from AVA\$\$d</p> <p>\$\$S Availability status – based on AVA\$\$e</p> <p>\$\$3 No. of items – from AVA\$\$f</p> <p>\$\$4 No. of unavailable items – from AVA\$\$g</p> <p>\$\$5 multi-volume flag – from AVA\$\$h</p> <p>\$\$6 number of loans – from AVA \$\$i</p> <p>\$\$9 – For more information, refer to section <a href="#">Adding \$\$9ONLINE to Library Level Availability</a>.</p> <p>\$\$P location priority – from AVA \$\$p</p> <p>\$\$X source institution code (Aleph ADM) – from AVA \$\$a</p> <p>\$\$Y source library code (Aleph sublibrary) – from AVA \$\$b</p> <p>\$\$Z source sublocation code (Aleph collection) – from AVA \$\$j</p>
Vernacular title	---	
Uniform title	304 #1 \$\$a 310 #1 \$\$a	<p>Mapping rule 1.</p> <p>Fields are merged and delimited by semicolon:</p> <p>304 #1_:_310 #1</p>

# Links

## Links Section

Type of Link	Source	Note
OpenURL	Based on resource type from display: If type=article then: \$\$Topenurl_article Otherwise: \$\$Topenurl_journal	SFX has two sources for Primo: one for articles, in which case the data is used, and one for journals, in which case the date is ignored. There is a different template per source.
Backlink	\$\$Taleph_backlink	
Link to Resource	655 #1 \$\$u, \$\$z 655 #1 \$\$g, \$\$z 552 #1 \$\$a	Mapping rule 1. 655: If \$\$z exists, take text from this subfield and add it to \$\$D as description for link. If \$\$z doesn't exist, add description "Link to Resource" to \$\$D.
Thumbnail	\$\$Tamazon_thumb OR \$\$Tsyndetics_thumb OR \$\$Tgoogle_thumb	
Link to TOC	---	
Link to Abstract	---	
OpenURL_fulltext	Based on resource type from display: If type=article then: \$\$Topenurl_article Otherwise: \$\$Topenurl_journal	SFX has two sources for Primo: one for articles, in which case the data is used, and one for journals, in which case the date is ignored. There is a different template per source.

Type of Link	Source	Note
OpenURL_ servicetext	---	
Link to Holdings	\$\$Taleph_holdings	
Link to Request	---	
Link to Review	---	
Link to Price	---	
Additional links	---	
Link to Holdings_ Available	---	
Link to Holdings_ Unavailable	---	
Link to Holdings_ Doesnotexist	---	
Link to UC	---	
Link to Finding Aid	---	
Link to Excerpt	---	

# Search

## Search Section

Index	Source tag	Notes
Creator/ Contributor	100 ## - 196 ## \$\$a (every 4th tag) 101 ## - 197 ## \$\$a (every 4th tag) 800 ## \$\$a, 801 ## \$\$a 806 ## \$\$a, 808 ## \$\$a 812 ## \$\$a, 813 ## \$\$a 818 ## \$\$a, 819 ## \$\$a 824 ## \$\$a, 825 ## \$\$a 200 ## - 296 ## \$\$a (every 4th tag) 201 ## - 297 ## \$\$a (every 4th tag) 802 ## \$\$a, 803 ## \$\$a 808 ## \$\$a, 809 ## \$\$a 814 ## \$\$a, 815 ## \$\$a 820 ## \$\$a, 821 ## \$\$a 826 ## \$\$a, 827 ## \$\$a	Mapping rule 2. The headings form of persons (not the cross references) are considered twice: Copy as is Transformation routine "Normalize author" is used to take the last name + the initial character from the first name
Title	089 #1 \$\$a 304 ## \$\$a 310 ## \$\$a 331 ## \$\$a 333 ## \$\$a 335 ## \$\$a 360 ## \$\$a	Mapping rule 2.
Description	517 #1 \$\$a 524 #1 \$\$a 750 #1 \$\$a 753 #1 \$\$a 756 #1 \$\$a	Mapping rule 1.
Subject	902## \$\$a - 947## \$a (every 5th tag) Take any subfield except \$\$1 and \$\$9	Mapping rule 2.

Index	Source tag	Notes
	710 ## \$\$a 711 ## \$\$a, \$\$v 720 ## \$\$# 740 ## \$\$#	
Full Text	---	
General	400 ## \$\$a 403 ## \$\$a 407 ## \$\$a 410 ## \$\$a 412 ## \$\$a 415 ## \$\$a 417 ## \$\$a 418 ## \$\$a 519 ## \$\$a	Mapping rule 4.
Source ID	From PNX: control/sourceid	
Record ID	From PNX: control/recordid	
ISBN	540 ## \$\$a	Mapping rule 4.
ISSN	541 ## \$\$a	Mapping rule 4.
TOC	---	
Resource type	From PNX: display/type	

Index	Source tag	Notes
Format	---	
Creation date	<p>425 a1 \$\$a OR 425p1 \$\$a OR</p> <p>425 b1 \$\$a OR 425c1 \$\$a OR</p> <p>425 #1 \$\$a OR 595_1 \$\$a OR</p> <p>425a 2 \$\$a OR 425p2 \$\$a OR</p> <p>425 b2 \$\$a OR 425c2 \$\$a OR</p> <p>425 #2 \$\$a OR 595_2 \$\$a OR</p> <p>089 #1 \$\$a</p> <p>ADD</p> <p>619 a1 \$\$a OR 619 b1 \$\$a OR</p> <p>619 #1 \$\$a</p> <p>ADD</p> <p>674 #1 \$\$a</p>	Mapping rule 3.
Record type	---	
Additional Title	<p>340 #1 \$\$a - 355 #1 \$\$a</p> <p>361 #1 \$\$a</p> <p>365 #1 \$\$a</p> <p>370 #1 \$\$a</p> <p>376 #1 \$\$a</p> <p>451 #1 \$\$a - 491 #1 \$\$a (every 10th tag)</p> <p>454 #1 \$\$a - 494 #1 \$\$a (every 10th tag)</p> <p>621 #1 \$\$a, 624 #1 \$\$a, 627 #1 \$\$a, 630 #1 \$\$a</p> <p>670 #1 \$\$a</p> <p>675 #1 \$\$a</p> <p>804 #1 \$\$a, 805 #1 \$\$a</p> <p>810 #1 \$\$a, 811 #1 \$\$a</p> <p>816 #1 \$\$a, 817 #1 \$\$a</p> <p>822 #1 \$\$a, 823 #1 \$\$a</p> <p>828 #1 \$\$a, 829 #1 \$\$a</p>	Mapping Rule 1.

Index	Source tag	Notes
Additional resource record ID	From PNX: control/addsrcrecordid	
Search Scope	From PNX: delivery/institution control/sourceid (for example the data source is added as a scope)	
Restricted Search Scope	---	
Scope	Copies from the Search scope and Restricted search scope from the sections above	
Syndetics full text	---	
Syndetics TOC	---	
Alternative title	---	

## Sort

### Sort Section

Sort type	Source/Content	Note
Creation date	425 a1 \$\$a OR 425 p1 \$\$a OR  425 b1 \$\$a OR 425 c1 \$\$a OR  425 #1 \$\$a OR 595 #1 \$\$a OR  425 a2 \$\$a OR 425 p2 \$\$a OR  425 b2 \$\$a OR 425 c2 \$\$a OR	Mapping rule 1.  Analyze the content of the field and use just the four numeric characters. If this shouldn't be possible (because of the content of the field) or if a source year field is missing use "0000" as default year.

Sort type	Source/Content	Note
	425 #2 \$\$a OR 595 #2 \$\$a OR  089 #1 \$\$a	

## Facets

### Facet Section

Facet	Source	Note
Language	037 b# \$\$a  OR  037 a# \$\$a  OR  037 c# \$\$a	Mapping rule 3.
Creation date	425 a1 \$\$a OR 425 p1 \$\$a OR 425 b1 \$\$a OR 425 c1 \$\$a OR 425 #1 \$\$a OR 595 #1 \$\$a OR 425 a2 \$\$a OR 425 p2 \$\$a OR 425 b2 \$\$a OR 425 c2 \$\$a OR 425 #2 \$\$a OR 595 #2 \$\$a OR 089 #1 \$\$a ADD 619 a1 \$\$a OR 619 b1 \$\$a OR 619 #1 \$\$a ADD 674 #1 \$\$a	Mapping rule 1.  Analyze the content of the field and use just the four numeric characters. If this shouldn't be possible (because of the content of the field) or if a source year field is missing use "0000" as default year.
Topic	902 ## - 947 ## \$\$\$ (every 5th tag) Any subfields except \$\$1 and \$\$9 710 ## \$\$a 711 ## \$\$a 740 ## \$\$a	Mapping rule 2.  All subfields of 902## are considered as one topic (the same for 907### - 947##). Subfields are merged with "_/_".  For example, 902#1\$\$p_/_\$\$t

Facet	Source	Note
Collection	AVA \$\$b	Mapping table "ILS library codes" is used.
Top-level	334 #1 \$\$a OR 655 #1 \$\$u or \$\$g OR 552 #1 \$\$a OR 051 Pos. 0 OR 052 Pos. 0 OR Constant=Book	The following mapping tables are used: "toplevel_334" "type_051_0" "type_052_0" ELSE: Constant "Book"
Pre-filter	Based on the field Type of the display section a 1:1 mapping should be done: Book -> Books Journal -> Journals Article -> Articles Text Resource -> Books Audio -> Audio-Video Video -> Audio-Video Image -> Images Map -> Maps Score -> Scores	
Resource type	Create this based on the Resource type field from display section as follows. Book ' books Journal ' journals Article ' articles Text Resource ' books	In some cases, two values should be created, each as separate field.

Facet	Source	Note
	Audio ' audio-video Video ' audio-video Image ' images Map ' maps Score ' scores Other ' other	
Creator/ Contributor	100 ## \$\$a - 196 ## \$\$a (every 4th tag) 800 ## \$\$a - 824 ## \$\$a (every 6th tag) 200 ## \$\$a - 296 ## \$\$a (every 4th tag) 802 ## \$\$a - 826 ## \$\$a (every 6th tag)	Mapping rule 2. Transformation routine "Normalize author" is used.
Physical format	---	
File size	---	
Related record	331 #2 \$\$a 451 #1 \$\$a 461 #1 \$\$a 471 #1 \$\$a 481 #1 \$\$a 491 #1 \$\$a	451 - 491: Transformation routine "Take until first occurrence of" is used to take only characters until the first semicolon appears in the fields.
Genre	---	
Language	037 b# \$\$a OR 037 a# \$\$a OR 037 c# \$\$a	Mapping rule 3.

Facet	Source	Note
Creation date	425 a1 \$\$a OR 425p1 \$\$a OR 425 b1 \$\$a OR 425c1 \$\$a OR 425 #1 \$\$a OR 595_1 \$\$a OR 425 a2 \$\$a OR 425p2 \$\$a OR 425 b2 \$\$a OR 425c2 \$\$a OR 425 #2 \$\$a OR 595_2 \$\$a OR 089 #1 \$\$a ADD 619 a1 \$\$a OR 619 b1 \$\$a OR 619 #1 \$\$a ADD 674 #1 \$\$a	Mapping rule 1.  Analyze the content of the field and use just the four numeric characters. If this shouldn't be possible (because of the content of the field) or if a source year field is missing use "0000" as default year.
Topic	902 ## - 947 ## \$\$# (every 5th tag) Any subfields except \$\$1 and \$\$9 710 ## \$\$a 711 ## \$\$a 740 ## \$\$a	Mapping rule 2.  All subfields of 902## are considered as one topic (the same for 907### - 947##). Subfields are merged with "_/_" .  For example, 902#1\$\$p_/_\$\$t
Collection	AVA \$\$b	Mapping table "ILS library codes" is used.
Top-level	334 #1 \$\$a OR 655 #1 \$\$u or \$\$g OR 552 #1 \$\$a OR 051 Pos. 0 OR 052 Pos. 0 OR Constant=Book	The following mapping tables are used: "toplevel_334" "type_051_0" "type_052_0" ELSE: Constant "Book"

Facet	Source	Note
Pre-filter	<p>Based on the field Type of the display section a 1:1 mapping should be done:</p> <p>Book -&gt; Books</p> <p>Journal -&gt; Journals</p> <p>Article -&gt; Articles</p> <p>Text Resource -&gt; Books</p> <p>Audio -&gt; Audio-Video</p> <p>Video -&gt; Audio-Video</p> <p>Image -&gt; Images</p> <p>Map -&gt; Maps</p> <p>Score -&gt; Scores</p>	
Resource type	<p>Create this based on the Resource type field from display section as follows:</p> <p>Book -&gt; books</p> <p>Journal -&gt; journals</p> <p>Article -&gt; articles</p> <p>Text Resource -&gt; books</p> <p>Audio -&gt; audio-video</p> <p>Video -&gt; audio-video</p> <p>Image -&gt; images</p> <p>Map -&gt; maps</p> <p>Score -&gt; scores</p> <p>Other -&gt; other</p>	<p>In some cases, two values should be created, each as separate field.</p>
Creator/ Contributor	<p>100 ## \$\$a - 196 ## \$\$a (every 4th tag)</p> <p>800 ## \$\$a - 824 ## \$\$a (every 6th tag)</p> <p>200 ## \$\$a - 296 ## \$\$a (every 4th tag)</p> <p>802 ## \$\$a - 826 ## \$\$a (every 6th tag)</p>	<p>Mapping rule 2.</p> <p>Transformation routine "Normalize author" is used.</p>

Facet	Source	Note
Physical format	---	
File size	---	
Related record	331 #2 \$\$a 451 #1 \$\$a 461 #1 \$\$a 471 #1 \$\$a 481 #1 \$\$a 491 #1 \$\$a	451 - 491: Transformation routine "Take until first occurrence of" is used to take only characters until the first semicolon appears in the fields.
Genre	---	

## Duplicate Record Detection Vector

Currently, two types of record matching vectors exist:

- T1 – for non-serials
- T2 – for serials

### Vector for T1 - "non-serials"

Vector for T1

Field ID	Nature of field	Content of Field/ Source Tag + Subfield	Note
T	Type	FMT 052 #1	Mapping rule 1. The type value "T" will be determined based on tag FMT and tag 052: If tag FMT is "MH" ADD tag 052 is present then the type is T2 All other records with tag FMT "MH" are type T1 (for example, tag 052 is missing) Records with tag FMT "MU" are not part of the duplication detection.

The following fields are for the candidate selection:

Field ID	Nature of field	Content of Field/ Source Tag + Subfield	Note
C1	UnivID, NBN, Univ_ID_Invalid	574 #1	Mapping rule 1.
C2	ISXN, ISXN_invalid	540 #1 \$\$a (any indicator except z) 541 #1 \$\$a 543 #1 \$\$a 634 #1 \$\$a (any indicator except z)	Mapping rule 1. Transformation routine "Drop string" is used to remove hyphen. Multiple occurrences are merged and delimited by " _;_".
C3	Short title+author	331 #1 \$\$a ADD 100 #1 \$\$a OR 200 #1 \$\$a	Mapping rule 1. Transformation routine "Take string" is used to normalize only the first 25 characters of title. Transformation routine "Take string" is used to normalize only the first 10 characters of title.
C4	Year	425 a1 \$\$a OR 425 p1 \$\$a OR 425 #1 \$\$a OR 595 #1 \$\$a	Mapping rule 1. Only the four numeric characters are used. If it's not possible to identify the year (because of the content of the field) or if a year source field is missing, "0000" is used as the default year.
C5 - C10	---	---	
The following fields are for the matching program:			
F1	UnivID NBN	Use C1	

Field ID	Nature of field	Content of Field/ Source Tag + Subfield	Note
F2	Univ_Invalid	---	
F3	ISXN	540 a1 \$\$a 541 a1 \$\$a 543 a1 \$\$a 634 a1 \$\$a	Mapping rule 1. Multiple occurrences are delimited by a semicolon. Transformation routine "Drop string" is used to remove the hyphen.
F4	ISXN_Invalid	540 #1 \$\$a (only indicator blank and b) 541 #1 \$\$a 543 #1 \$\$a 634 #1 \$\$a (only indicator blank and b)	Mapping rule 1. Multiple occurrences are delimited by a semicolon. Transformation routine "Drop string" is used to remove the hyphen.
F5	Short title+author	C3 of the candidate section	
F6	Year	C4 of the candidate section	
F7	Full title	331 #1 \$\$a	Mapping rule 1.
F8	Place of publication	410 #1 \$\$a	Mapping rule 1. Transformation routine "Take string" is used to normalize only the first 5 normalized characters of the field.
F9	Pagination	433 #1 \$\$a	Mapping rule 1.
F10	Publisher	412 #1 \$\$a	Mapping rule 1. Transformation routine "Take string" is used to normalize only the first 5 normalized characters of the field.

Field ID	Nature of field	Content of Field/ Source Tag + Subfield	Note
F11	Main entry (author, corporate body, meeting)	100 #1 \$\$a OR 200 #1 \$\$a OR 100 #1 \$\$a	Mapping rule 1.
F12	Physical format	334 #1 \$\$a	
	Mapping rule 1.		
F13	Edition	403 #1 OR 400 #1	Mapping rule 1.  Transformation routine "Take string" is used to normalize only the first 5 normalized characters of the field.

## Vector for T2 - "serials"

### Vector for T2

Field ID	Nature of field	Content of Field/ Source Tag + Subfield	Note
T	Type	FMT 052 #1	Mapping rule 1  The type value T2 will be determined based on tag FMT and tag 052:  If tag FMT is "MH" AND tag 052 is present then the type is T2  All other records with tag FMT "MH" are type T1 (i.e. tag 052 is missing)  Records with tag FMT "MU" are not part of the duplication detection.
The following fields are for the candidate selection:			
C1	Univ_ID, ZDB-ID, UnivID_invalid	025 z1 (= ZDB ID)	Mapping rule 1.  Rule for the contents of the field:  If the field contains only alphabetic characters ignore the content for the field UnivID.

Field ID	Nature of field	Content of Field/ Source Tag + Subfield	Note
C2	ISSN, ISSN_ invalid, ISSN_ Cancelled	542 #1 \$\$a (any indicator except z) 635 #1 \$\$a	Mapping rule 1. Transformation routine "Drop string" is used to remove hyphen. Multiple occurrences are merged and delimited by "_:_".
C3	Short Title + corporate body	310 #1 \$\$a OR 331 #1 \$\$a ADD 200 #1 \$\$a	Mapping rule 1. Transformation routine "Take string" is used to normalize only the first 25 characters of title. Transformation routine "Take string" is used to normalize only the first 10 characters of title.
C4	Place of publication	410 #1 \$\$a	Mapping rule 1. Transformation routine "Take string" is used to normalize only the first 5 characters.
C5 - C10	---	---	Not in use.
The following fields are for the matching program:			
F1	ZDB-ID	Use C1	
F2	Univ_invalid	---	
F3	ISSN	542 a1 \$\$a 635 a1 \$\$a	Mapping rule 1. Multiple occurrences are delimited by semicolon. Transformation routine "Drop string" is used to remove hyphen.
F4	ISSN_Invalid	542 #1 \$\$a (R) 635 #1 \$\$a (R)	Mapping rule 1. Multiple occurrences are delimited by semicolon. Transformation routine "Drop string" is used to remove hyphen.
F5	ISSN cancelled	-	

Field ID	Nature of field	Content of Field/ Source Tag + Subfield	Note
F6	Year of first volume	425 b1	Mapping rule 1.  Analyze the content of the field and use just the four numeric characters. If this shouldn't be possible (because of the content of the field) or if a year source field is missing use "0000" as default year.
F7	Full title	310 #1 OR 331 #1	Mapping rule 1.
F8	Short title + corporate body	take C3 of the candidate section	
F9	Country of publication	---	
F10	Place of publication	410 #1 \$\$a	Mapping rule 1.  Transformation routine "Take string" is used to take only the first 5 normalized characters of the field.
F11	Main entry (corporate body, meeting)	200 #1 \$\$a	Mapping rule 1.
F12	Physical format	334 #1 \$\$a	Mapping rule 1.
F13	Publisher	412 #1 \$\$a	Mapping rule 1.  Transformation routine "Take string" is used to take only the first 5 normalized characters of the field.

## FRBRization

### FRBRization

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
T	Always 1		

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
K1	100 #1 \$\$a OR 200 #1 \$\$a OR 800 ## \$\$a OR 200 ## \$\$a	A	<p>Following transformation routines are used:</p> <p>"Delete characters", parameter:  []'</p> <p>"Replace characters", parameter: ;\$~^%*^/?@.::;&lt;&gt;{}- ()!;_@^</p> <p>"Character conversion" using the NACO_diacritics character conversion table.</p> <p>"Lower case"</p>
K2	304 #1 \$\$a	TO	<p>Following transformation routines are used:</p> <p>"Delete characters", parameter:  []'</p> <p>"Replace characters", parameter: ;\$~^%*^/?@.::;&lt;&gt;{}- ()!;_@^</p> <p>"Character conversion" using the NACO_diacritics character conversion table.</p> <p>"Lower case"</p>
K3	From PNX: display/title	T	
K4 - K10	---	---	

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution	AVA \$\$a OR Constant "MAB"	Mapping rule 1. Mapping table "ILS Institution Codes" is used.
Delivery category	334 #1 \$\$a 655 #1 \$\$u, \$\$g	Mapping rule 4. The following mapping tables are uses: 334 : "delcategory_334"

Delivery Field	Source	Additional Normalization Notes
	522 b1 \$\$a 050 Pos. 3	050 : "delcategory_050_3"  If no value can be assigned according to the 4 fields, the constant "Physical item" should be used.
Restricted delivery scope	---	Customer specific; if needed to be defined during implementation phase.

## Ranking

Local mapping required as relevant.

### Ranking Section

Booster Field	Source	Additional Normalization Notes
booster1	1 or as added by enrichment program	
booster2		Not in use.

## Enrichment

Local mapping required as relevant.

### Enrichment Section

Enrichment Field	Source	Additional Normalization Notes
Classification LCC [classificationlcc]	---	
Classification DDC [classificationddc]	---	
Classification UDC	---	
Classification RVK	700 g# \$\$a (= RVK classification code as source for the enrichment process)	Mapping rule 2. Multiple occurrences are not concatenated.

Enrichment Field	Source	Additional Normalization Notes
Fulltext	---	
TOC	---	
Abstract	---	
Review	---	
Rank parent/child	FMT	IF FMT= "MU" then set constant "mab-u"
Rank number of copies	---	
Rank date first copy	---	
Rank number of loans	---	
Availability	---	

## Additional Data

This includes multiple occurrences in separate fields.

Additional Data

Additional Data Field	Source	Additional Normalization Notes
Author Last Name	100 ## \$\$a - 196 ## \$\$a (every 4th tag) 101 ## \$\$a - 197 ## \$\$a (every 4th tag)	Mapping rule 2. Transformation routine "Get author last name" is used.
Author First Name	100 ## \$\$a - 196 ## \$\$a (every 4th tag) 101 ## \$\$a - 197 ## \$\$a (every 4th tag)	Mapping rule 2. Transformation routine "Get author first name" is used.
Author Initial	---	

Additional Data Field	Source	Additional Normalization Notes
Author Initial 1 (first initial)	---	
Author Initial Middle	---	
Author suffix	---	
Author	100 ## \$\$a - 196 ## \$\$a (every 4th tag) 101 ## \$\$a - 197 ## \$\$a (every 4th tag)	Mapping rule 2.
Corporate author	200 ## \$\$a - 296 ## \$\$a (every 4th tag) 201 ## \$\$a - 297 ## \$\$a (every 4th tag) 802 ## \$\$a - 82 6## \$\$a (every 6th tag) 803 ## \$\$a - 827 ## \$\$a (every 6th tag)	Mapping rule 2.
Additional author	800 ## \$\$a - 824 ## \$\$a (every 6th tag) 801 ## \$\$a - 825 ## \$\$a (every 6th tag)	Mapping rule 2.
Series author	---	
Book title	From PNX: display/title	Only if PNX: display/type not article OR journal
Article title	From PNX: display/title	Only if PNX: display/type = article
Journal title	From PNX: display/title	Only if PNX: display/type = journal
Short title	331 ## \$\$a 335 ## \$\$a 360 ## \$\$a	Mapping rule 2.  Transformation routine "Take substring / 0@@@25" is used to normalize only the first 25 characters.

Additional Data Field	Source	Additional Normalization Notes
	089 #1 \$\$a	
Additional title	340 ## \$\$a - 355 ## \$\$a 361 ## \$\$a 365 ## \$\$a 370 ## \$\$a 376 ## \$\$a 451 ## \$\$a - 491 ## \$\$a (every 10th tag) 454 ## \$\$a - 494 ## \$\$a (every 10th tag) 503 ## \$\$a 621 ## \$\$a, 624 ## \$\$a, 627 ## \$\$a, 630 ## \$\$a 670 ## \$\$a 675 ## \$\$a 804 ## \$\$a - 828 ## \$\$a (every 6th tag) 805 ## \$\$a - 829 ## \$\$a (every 6th tag)	Mapping Rule 2.
Series title	---	
Date	425 a1 \$\$a OR 425 p1 \$\$a OR 425 b1 \$\$a OR 425 c1 \$\$a OR 425 #1 \$\$a OR 595 #1 \$\$a OR 425 a2 \$\$a OR 425 p2 \$\$a OR 425 b2 \$\$a OR 425 c2 \$\$a OR 425 #2 \$\$a OR 595 #2 \$\$a OR 089 #1 \$\$a ADD 619 a1 \$\$a OR 61 9b1 \$\$a OR 619 #1 \$\$a ADD 674 #1 \$\$a (R)	Mapping rule 4.

Additional Data Field	Source	Additional Normalization Notes
RISDate	---	
Additional date	---	
Volume	---	
Issue	---	
Part	---	
Season	---	
Quarter	---	
Start page	---	
End page	---	
Pages	---	
Article number	553 #1 \$\$a	Mapping rule 1.
ISSN	542 #1 \$\$a	Mapping rule 1.
eISSN		
ISBN	540 #1 \$\$a	Mapping rule 1.
CODEN	376 b1 \$\$a	Mapping rule 1.

Additional Data Field	Source	Additional Normalization Notes
SICI	---	
Metadata format	<p>IF 519 exists -&gt; <b>dissertation</b></p> <p>Else based on Resource type from display:</p> <ul style="list-style-type: none"> <li>• book -&gt; <b>book</b></li> <li>• journal -&gt; <b>journal</b></li> <li>• article -&gt; <b>journal</b></li> <li>• conference_proceeding &amp; record has ISSN -&gt; <b>journal</b></li> </ul> <p>Else -&gt; <b>book</b></p>	Mapping table "Metadata format" is used.
Genre	The Genre mapping table maps the resource type from the display section of the PNx to the genre that is required by the OpenURL.	Use Genre mapping table.
RIS Type	---	
Notes	<p>519 #1 \$\$a</p> <p>517 #1 \$\$p, \$\$a</p>	<p>Mapping rule 1.</p> <p>Subfields \$\$p and \$\$a of fields 5XX#1 are merged like this:</p> <p>\$\$p + suffix ":_ " is the prefix for \$\$a</p>
Abstract	<p>750 #1 \$\$a</p> <p>753 #1 \$\$a</p> <p>756 #1 \$\$a</p>	Mapping rule 1.
City of Publication	<p>410 ## \$\$a</p> <p>415 ## \$\$a</p>	Mapping rule 4.
Publisher	<p>412 ## \$\$a</p> <p>417 ## \$\$a</p>	Mapping rule 4.
Miscellaneous 1	---	

Additional Data Field	Source	Additional Normalization Notes
Miscellaneous 2	---	
Miscellaneous 3	---	
OCLC ID	---	
DOI	552 #1 \$\$a	Mapping rule 1.
URL	655 #1 \$\$u 655 #1 \$\$g 552 #1 \$\$a	Mapping rule 1.

## Browse

The system can create multiple occurrences in separate fields.

### Browse

Browse field	Source	Additional normalization notes
Institution	PNX: delivery/institution	
Author	100 #1 \$\$a 104 a1 \$\$a 108 a1 \$\$a (every 4th tag, until 136_1) 200 #1 \$\$a 204 a1 \$\$a 208 a1 \$\$a	\$\$D (display form) and \$\$E (normalized form) are created.
Title	331 ## \$\$a 335 ## \$\$a 360 ## \$\$a	Fields are merged in the following way for \$\$D (display form): 331#2 : 335#2 331#2. 089#1

Browse field	Source	Additional normalization notes
	089 #1 \$\$a 304 #1 \$\$a 310 #1 \$\$a 340 #1 \$\$a - 352#1 \$\$a (every 4th tag) 341 #1 \$\$a - 353#1 \$\$a (every 4th tag)	331#1 : 335#1 Fields are merged in the following way for \$\$E (normalized form): 331#2 335#2 331#2 089#1 331#1 335#1
Subject	902 ## (Take any subfields except \$\$1 and \$\$9) 907 ## (Take any subfields except \$\$1,\$\$9,\$\$a) 912 #1 (every 5th tag until 947; take any subfields except \$\$1,\$\$9,\$\$a) 710 ## \$\$a 711 ## \$\$a 740 ## \$\$a	\$\$D (display form) and \$\$E (normalized form) are created.
Call number	AVA \$\$d (for call number) AVA \$\$a (for institution)	\$\$D (display form) and \$\$E (normalized form) are created.

## Generic danMARC2

[Return to menu](#)

### Control Section

Control Section

Normalized Record Field	Source/Content	Note
Source ID	From data source definitions	
Record ID	Source ID + Source Record-ID	
Original source ID	From data source definitions	
Additional Record-ID	---	
Source Format	From data source definitions	
Source System	From data source definitions	
Source ID	From data source definitions	
Record ID	Source ID + Source Record-ID	

### Display Section

Display Section

Display Element	Source	Note
Resource Type	FMT	008 \$\$t: mapping table "rsrctype_008_t" is used.
	OR	009 \$\$a: mapping table "rsrctype_009_a" is used.
	008 \$\$t	009 \$\$g: mapping table "rsrctype_009_g" is used.
	OR	008 \$\$h: mapping table "rsrctype_008_h" is used.

Display Element	Source	Note
	009 \$\$a OR 009 \$\$g OR 008 \$\$h ELSE: "other"	
Title	245 \$\$a, \$\$b, \$\$c, \$\$e	Merge subfields in the following syntax: \$\$a: \$\$b : \$\$c / \$\$e
Creator	100 \$\$a, \$\$h, \$\$c OR 110 \$\$a, \$\$c	100: merge subfields with blank between: \$\$a, \$\$h \$\$c 110: merge subfields with blank between: \$\$a \$\$c
Contributor	700 \$\$a, \$\$e, \$\$h 710 \$\$a, \$\$c	700: merge subfields with blank between: \$\$a, \$\$h \$\$e 710: merge subfields with blank between: \$\$a \$\$c
Edition	250 \$\$a	
Publisher	260 \$\$a, \$\$b	Take only the first subfields \$\$a and \$\$b. Merge subfields by using the following syntax: \$\$a : \$\$b
Creation date	008 \$\$a OR 260 \$\$c	
Physical format	300 \$\$a, \$\$b, \$\$c, \$\$n \$\$n, \$\$a : \$\$b : \$\$c	Merge subfields by using the following syntax:
Is Part Of	557 \$\$a, \$\$b, \$\$e, \$\$v, \$\$k, \$\$u, \$\$z \$\$a / \$\$e : \$\$v , \$\$k . \$\$z . \$\$u	Merge subfields by using the following syntax:

Display Element	Source	Note
Identifier	021 \$\$a 022 \$\$a 024 \$\$a 027 \$\$a 028 \$\$a 032 \$\$a	Add to beginning of string : 021 : \$\$CISBN\$\$V 022 : \$\$CISN\$\$V 024 : \$\$CISBN\$\$V 027 : \$\$CISRN\$\$V 028 : \$\$CISMN\$\$V
Subject	600 \$\$a, \$\$h 630 \$\$a 631 \$\$a	Subfields are delimited by semicolon.
Description	504 \$\$a 530 \$\$a	
Language	008 \$\$l	The language is stored in ISO 639-2 (3-letter code).
Relation	440 \$\$a, \$\$e, \$\$v 860 \$\$i, \$\$t 816 \$\$i, \$\$t	Merge subfields: 440 \$\$a / \$\$e ; \$\$v 860 \$\$i : \$\$t 861 \$\$i : \$\$t
Source	From PNX: control/sourceid	
Coverage	---	
Rights		
	---	
Vernacular title	---	

Display Element	Source	Note
Uniform title	240 \$\$a	

## Links

### Links Section

Type of Link	Source	Note
OpenURL	Based on resource type from display: If type=article then: \$\$Topenurl_article Otherwise: \$\$Topenurl_journal	SFX has two sources for Primo: one for articles in which case the data is used and one for journals in which case the date is ignored. There is a different template per source.
Link to Resource	856 \$\$u IF 856 \$\$3 not "table of contents" OR 856 \$\$u IF 856 \$\$3 not "book review" OR 856 \$\$u IF 856 \$\$3 not "sample text" OR 856 \$\$u IF 856 \$\$3 not "publisher description"	Add display text (\$\$D) from \$\$y + \$\$3 + \$\$z. If not available then use code: "Online version"
Thumbnail	\$\$Tamazon_thumb \$\$Tsyndetics_thumb (disabled) \$\$Tgoogle_thumb	For Amazon and Syndetics, this field requires an ISBN. For Google, this field requires an OCLC and LCCN.
Link to TOC	856 \$\$u IF \$\$3 or \$\$z are "Table of contents" 530 \$\$u, \$\$y	Add display text (\$\$D) from \$\$y. -"-

Type of Link	Source	Note
Link to Abstract	\$\$Tsyndetics_abstract (based on 021\$\$a, ISBN)	
OpenURL_fulltext	Based on resource type from display:  If type=article then: \$\$Topenurl_article  Otherwise: \$\$Topenurl_journal	SFX has two sources for Primo: one for articles in which case the data is used and one for journals in which case the date is ignored. There is a different template per source.
OpenURL_servicetext	---	
Link to Request	---	
Link to Review	856 \$\$u IF \$\$3 is "Book review"  529 \$\$u	Add display text (\$\$D) from \$\$y.  -"-
Link to Price	---	
Additional links	856 \$\$u IF \$\$3 is "Publisher description" or "Sample text"  523 \$\$u  526 \$\$u  529 \$\$u  865 \$\$u  866 \$\$u  867 \$\$u  868 \$\$u  870 \$\$u  871 \$\$u  873 \$\$u  874 \$\$u	Add display text (\$\$D) from \$\$y. -"- -"- -"-  Add display text "Edition on other media".  Add display text "Edition in original language".  Add display text "Main edition on other language".  Add display text "Editions in other language".  Add display text "Parent record entry related to supplement".  Add display text "Supplement to main publication".  Add display text "Main series added entry".  Add display text "Subseries added entry".  Add display text "Nonspecific relationship".

Type of Link	Source	Note
	879 \$\$u	
Link to Holdings_ Available	---	
Link to Holdings_ Unavailable	---	
Link to Holdings_ Doesnotexist	---	
Link to UC	---	
Link to Finding Aid	---	
Link to Excerpt	---	

## Search

### Search Section

Index	Source tag	Notes
Creator/Contributor	091 \$\$ahkefcsij	
	100 \$\$ahkefc	
	110 \$\$aecsikj	
	239 \$\$aecsikj	
	700 \$\$ahkefc	
	710 \$\$aecsikj	
	739 \$\$aecsikj	
	770 \$\$acefhk	
	780 \$\$aecsikj	

Index	Source tag	Notes
	900 \$\$acefhk 910 \$\$aceghijks	
Title	245 \$\$abce	
Description	504 \$\$a 530 \$\$a	
Subject	All 6XX fields	
Full Text	---	
General	260 \$\$b 506 all subfields 512 all subfields 517 all subfields 520 all subfields 538 all subfields 559 all subfields 024 \$\$a, \$\$x 027 all subfields 028 all subfields	
Source ID	From PNX: control/sourceid	
Record ID	From PNX: control/recordid	
ISBN	021 \$\$axw	Remove hyphen within the ISBN.

Index	Source tag	Notes
ISSN	022 \$\$axw	Remove hyphen within the ISBN.
TOC	530 \$\$a	
Resource type	From PNX: display/type	
Format	---	
Creation date	008 \$\$a	
OR		
260 \$\$c		
Record type	---	
Additional Title	092 \$\$abcgnopqrsuxy 222 \$\$ab 239 \$\$tuv  247 \$\$acgnopsvx 248 \$\$acgnopsvx 249 \$\$a 440 \$\$acnopqrsv  512 \$\$tx 520 \$\$tx 526 \$\$tx 530 \$\$tx 534 \$\$tx 557 \$\$abv 558 \$\$a 739 \$\$tuv	Mapping Rule 1.

Index	Source tag	Notes
	740 \$\$adefghjks 745 \$\$abno  795 \$\$abcpqrsuv  840 \$\$anov  945 \$\$anov	
Additional resource record ID	From PNX: control/addsrcrecordid	
Search Scope	From PNX: delivery/institution control/sourceid (for example the data source is added as a scope)	
Restricted Search Scope	---	
Scope	Copies from the Search scope and Restricted search scope from the sections above	
Syndetics full text	---	
Syndetics TOC	---	
Alternative title	210 \$\$abcgnopqrsuxy 240 \$\$adefghjks 241 \$\$ano	

## Sort

### Sort Section

Sort type	Source/Content	Note
Creation Date	008 \$\$a OR	

Sort type	Source/Content	Note
	260 \$\$c	
title	245 \$\$abce	
author	100 \$\$ahc OR 110 \$\$ac	

## Facets

### Facet Section

Facet	Source	Note
Language	008 \$\$l OR 041 \$\$ade	The language is stored in ISO 639-2.
Creation date	008 \$\$a OR 260 \$\$c	
Topic	600 \$\$v, \$\$x, \$\$y, \$\$z 610 \$\$v, \$\$x, \$\$y, \$\$z 630 \$\$v, \$\$x, \$\$y, \$\$z 631 \$\$v, \$\$x, \$\$y, \$\$z 650 \$\$v, \$\$x, \$\$y, \$\$z 651 \$\$v, \$\$x, \$\$y, \$\$z	
Collection		
Top-level	Online Resource facet: PNX: [delivery/category] IF "Online Resource" PNX: [delivery/category] IF "SFX Resource"	The availability top level facets should be added per ILS system.

Facet	Source	Note
	PNX: [delivery/category] IF "Metalib Resource"	
Pre-filter	<p>Based on the field Type of the display section a 1:1 mapping should be done:</p> <p>Book -&gt; Books</p> <p>Journal -&gt; Journals</p> <p>Article -&gt; Articles</p> <p>Text Resource -&gt; Books</p> <p>Audio -&gt; Audio-Video</p> <p>Video -&gt; Audio-Video</p> <p>Image -&gt; Images</p> <p>Map -&gt; Maps</p> <p>Score -&gt; Scores</p>	
Resource type	From PNX: display/type	Use mapping table "format_mean"
Creator/ Contributor	<p>100 \$\$a, \$\$h</p> <p>110 \$\$a, \$\$c</p> <p>700 \$\$a, \$\$h</p> <p>710 \$\$a, \$\$c</p>	100 and 700: merge subfields with comma; \$\$h: take only first character (substring 0@@1)
Physical format	---	
File size	---	
Related record	---	
Genre	008 \$\$d, \$\$e, \$\$g, \$\$h, \$\$j, \$\$k	<p>Mapping tables are consulted:</p> <p>"genre_008_d"</p> <p>"genre_008_e"</p> <p>"genre_008_g"</p>

Facet	Source	Note
		"genre_008_h" "genre_008_j" "genre_008_k"

## Duplicate Record Detection Vector

Currently two types of record matching vectors exist:

- T1 – for non-serials
- T2 – for serials

### Vector for T1 - "non-serials"

Vector for T1

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
T	Type	008 \$\$t	If 008 \$\$t is not p write constant 1. If 008 \$\$t is p write constant 2.
The following fields are for the candidate selection:			
C1	UnivID, NBN, Univ_ID_Invalid	001 \$\$a	
C2	ISXN, ISXN_invalid	021 \$\$a, \$\$x 022 \$\$a, \$\$x, \$\$z	Remove hyphen within the ISXNs and normalize X to x
C3	Short title	245 \$\$a, \$\$b, \$\$n, \$\$p	Take 20 characters from the beginning and 10 from the end.
C4	Year	008 \$\$a OR 260 \$\$a OR	If the item is not a journal, uses 008 \$\$a. If the item is a journal, uses 260 \$\$a.
C5 - C10	---	---	Not used.

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
The following fields are for the matching program:			
F1	UnivID NBN	001 \$\$a	
F2	Univ_Invalid	---	
F3	ISXN	021 \$\$a 022 \$\$a	
F4	ISXN_Invalid	021 \$\$x 022 \$\$x	
F5	Short title	245 \$\$a, \$\$b, \$\$n, \$\$p	Like C3
F6	Year	008 \$\$a OR 260 \$\$c	
F7	Full title	245 \$\$a, \$\$b, \$\$c, \$\$n, \$\$p	
F8	Country of publication	008 \$\$b	
F9	Pagination	300 \$\$a	
F10	Publisher	260 \$\$b	
F11	Main entry (author, corporate body, meeting)	100 \$\$h, \$\$a OR 110 \$\$a, \$\$c	

## Vector for T2 - "serials"

### Vector for T2

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
T	Type	FMT	Created if the format is SE.
The following fields are for the candidate selection:			
C1	Univ_ID, ZDB-ID, UnivID_invalid	001 \$\$a	
C2	ISSN, ISSN_invalid, ISSN_Cancelled	022 \$\$a, \$\$x, \$\$z	Remove hyphen within the ISSNs and normalize X to x.
C3	Short Title	245 \$\$a, \$\$b, \$\$n, \$\$p	
C4	Year	008 \$\$a OR 260 \$\$c	
The following fields are for the matching program:			
F1	UnivID NBN	001 \$\$a	
F2	Univ_invalid	---	
F3	ISSN	022 \$\$a	Remove hyphen within the ISSNs and normalize X to x.
F4	ISSN_Invalid	022 \$\$x	Remove hyphen within the ISSNs and normalize X to x.
F5	ISSN cancelled	022 \$\$z	Remove hyphen within the ISSNs and normalize X to x.
F6	Year	008 \$\$a	

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
		OR 260 \$\$c	
F7	Full title	245 \$\$a, \$\$b, \$\$c, \$\$n, \$\$p	
F8	Truncated title	245 \$\$a	
F9	Country of publication	008 \$\$b	
F10	Place of publication	260 \$\$a	
F11	Main entry ( corporate body, meeting)	110 \$\$a, \$\$c, \$\$i, \$\$k, \$\$j	

## FRBRization

### FRBRization

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
T	Always 1		
K1	100 or 110 or 700 and 710	A	Single occurrence of 100 and 110. Multiple occurrences of 700, 710, 100, 110. Take subfields a, b, c, d, q, h
K2	240	TO	Subfield a, o, s, q, u
K3	If format is not p: 240 ADD, 245 OR, 242 OR, 246 OR, 247 OR, 740 OR, 245 subfield k  If format is p: 240 ADD, 245 OR, 242 OR, 246 OR, 247 OR, 740 OR, 245 subfield k	T	240 - Subfields a, d, m, n,p,r, s 245 - a, b, e, f, g, n, p 242 - a, b, f, g, n, p 246 - a, b, f, g, n, p 247 - a, b, f, g, n, p

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
			<p>740 -a, n, p</p> <p>Do not generate a part key from 240 if it starts with any of the following: selections, laws, treaties, bills, statutes, acts, or rules.</p> <hr/> <p><b>Note</b></p> <p>If the format is not a publication (FMT=p), then the title part keys will be generated from both 240 and 245.</p> <hr/>

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution		
Delivery category	035 \$\$a 009 \$\$g 856 \$\$u	<p>IF 035 \$\$a contains "SFX" THEN SFX Resource.</p> <p>IF 009 \$\$g IS "xe" THEN Online resource.</p> <p>IF 009 \$\$g IS "xa" THEN Microform.</p> <p>IF 856 \$\$3 is</p> <p>NOT "Table of contents" OR</p> <p>NOT "Book review"</p> <p>OR</p> <p>NOT "Sample text"</p> <p>OR</p> <p>NOT "Publisher description"</p> <p>THEN "Online Resource"</p> <p>Anything else: Physical item.</p>
Restricted delivery scope		

## Ranking

Local mapping required as relevant.

Ranking Section

Booster Field	Source	Additional Normalization Notes
booster1	1 or as added by enrichment program	
booster2		Not in use.

## Enrichment

Local mapping required as relevant.

Enrichment Section

Enrichment Field	Source	Additional Normalization Notes
classification.lcc	050 \$\$a	

## Additional Data

Additional Data

Additional Data Field	Source	Additional Normalization Notes
Author Last Name	100 \$\$a OR 700 \$\$a	
Author First Name	100 \$\$h OR 700 \$\$h	
Author Initial	---	
Author Initial 1 (first initial)	---	
Author Initial Middle	---	

Additional Data Field	Source	Additional Normalization Notes
Author suffix	---	
Author	100 \$\$a, \$\$h, \$\$k, \$\$e, \$\$f, \$\$c	
Corporate author	110 \$\$a, \$\$c 710 \$\$a, \$\$i, \$\$j, \$\$k	
Additional author	700 \$\$a, \$\$h, \$\$k, \$\$e, \$\$f, \$\$c 710 \$\$a, \$\$h, \$\$k, \$\$e, \$\$f, \$\$c 711 \$\$a, \$\$b, \$\$c, \$\$d, \$\$n	
Series author	800 \$\$a, \$\$b, \$\$c, \$\$d, \$\$e	
Book title	From PNX: display/title	Only IF [display/type] NOT "Article" or "Journal"
Article title	From PNX: display/title	Only IF [display/type] EQUALS "Article"
Journal title	From PNX: display/title	Only IF [display/type] EQUALS "Journal"
Short title	210 \$\$a	
Additional title	246 \$\$a, \$\$b, \$\$n, \$\$p	
Series title	440 all subfields except for "z" 490 all subfields except for "z"	
Date	008 \$\$a OR 260 \$\$c	

Additional Data Field	Source	Additional Normalization Notes
RISDate	260 \$\$c OR 008 \$\$a	
Additional date	---	
Volume	---	
Issue	---	
Part	---	
Season	---	
Quarter	---	
Start page	---	
End page	---	
Pages	---	
Article number		
ISSN	022 \$\$a	
eISSN	776 \$\$z	
ISBN	021 \$\$a	
CODEN	030 \$\$a	

Additional Data Field	Source	Additional Normalization Notes
SICI	---	
Metadata format	<p>IF 506 exists -&gt; <b>dissertation</b></p> <p>Else based on Resource type from display:</p> <ul style="list-style-type: none"> <li>• book -&gt; <b>book</b></li> <li>• journal -&gt; <b>journal</b></li> <li>• article -&gt; <b>journal</b></li> <li>• conference_proceeding &amp; record has ISSN -&gt; <b>journal</b></li> </ul> <p>Else -&gt; <b>book</b></p>	Use mapping table "Metadata format".
Genre	The Genre mapping table maps the resource type from the display section of the PNx to the genre that is required by the OpenURL.	Use Genre mapping table.
RIS type	<p>IF 506 \$\$a EXISTS THEN "THES"</p> <p>ELSE based on Resource type from display.</p>	Use mapping table "RIS type".
Notes	<p>506 \$\$a</p> <p>520 \$\$a</p>	Merge fields with ; between.
Abstract	530 \$\$a	
City of Publication	260 \$\$a	
Publisher	260 \$\$b	
Miscellaneous 1	---	
Miscellaneous 2	---	
Miscellaneous 3	---	

Additional Data Field	Source	Additional Normalization Notes
OCLC ID	035 \$\$a	Check that string exists "OCoLC".
DOI	---	
URL	---	
Local fields 1-25	---	

## Browse

The system can create multiple occurrences in separate fields.

### Browse Section

Browse field	Source	Additional normalization notes
Institution	PNX: delivery/institution	
Author	100 \$\$ahefc, 110 \$\$aecikj, 110 \$\$secikj, 239 \$\$ahefc, 540 \$\$a, 700 \$\$ahefc, 710 \$\$aecikj, 710 \$\$secikj, 720 \$\$ah, 720 \$\$k, 739 \$\$ahefc, 770 \$\$ahefc, 780 \$\$aecikj, 780 \$\$secikj, 900 \$\$ahefc, 910 \$\$ahgecikj, 910 \$\$secikj	\$\$D (display form) and \$\$E (normalized form) are created.
Title	210 \$\$abc, 222 \$\$ab, 239 \$\$tuv, 239 \$\$u, 239 \$\$v, 240 \$\$adefghnos, 240 \$\$s, 241 \$\$aon, 242 \$\$acno, 245 \$\$abcnoy, 245 \$\$pqrs, 245 \$\$u, 245 \$\$x, 247 \$\$ac, 247 \$\$p, 247 \$\$son, 247 \$\$x, 248 \$\$ac, 248 \$\$p, 248 \$\$son, 248 \$\$x, 440 \$\$acon, 440 \$\$psrq, 512 \$\$t, 512 \$\$x, 520 \$\$t, 520 \$\$x, 526 \$\$t, 526 \$\$x, 530 \$\$t, 530 \$\$x, 534 \$\$t, 534 \$\$x, 700 \$\$t, 710 \$\$t, 739 \$\$tuv, 739 \$\$u, 739 \$\$v, 740 \$\$afgsdehno, 740 \$\$s, 745 \$\$abon, 795 \$\$abcuv, 795 \$\$u, 795 \$\$v, 795 \$\$pqrs, 840 \$\$aon, 945 \$\$aon	\$\$D (display form) and \$\$E (normalized form) are created.
Subject	600 \$\$ahefc, 610 \$\$aecikj, 610 \$\$secikj, 620 \$\$a, 621 \$\$abefj, 630 \$\$au, 630 \$\$bu, 630 \$\$fu, 630 \$\$gu, 630 \$\$su, 630 \$\$tu, 630 \$\$a, 630 \$\$b, 630 \$\$f, 630 \$\$g, 630 \$\$s, 630 \$\$t, 631 \$\$a, 631 \$\$b, 631 \$\$f, 631 \$\$g, 631 \$\$s, 631 \$\$t, 633 \$\$au, 633 \$\$a, 634 \$\$a, 634 \$\$au, 634 \$\$avxyz, 634 \$\$b, 634 \$\$bu, 634 \$\$bvxyz, 634 \$\$cd, 634 \$\$cdu, 634 \$\$cdvxyz, 634 \$\$u, 645 \$\$au, 645 \$\$avxyz, 645 \$\$bu, 645 \$\$bvxyz, 645 \$\$cu, 645 \$\$cvxyz, 650 \$\$abcdevxyz, 651 \$\$aevxyz, 652 \$\$ahefc, 652 \$\$b, 652 \$\$t, 654 \$\$ahefc, 654 \$\$b, 654 \$\$t, 655 \$\$ahefc, 655 \$\$b, 655 \$\$t, 660 \$\$abcdevxyz, 661 \$\$a, 661 \$\$b, 661 \$\$c, 661 \$\$d, 662 \$\$a, 662 \$\$b, 662 \$\$c, 666 \$\$e, 666 \$\$f, 666 \$\$i, 666 \$\$l, 666 \$\$m, 666 \$\$n, 666 \$\$o, 666 \$\$p, 666 \$\$q, 666 \$\$r, 666 \$\$s, 666 \$\$t, 666 \$\$u, 667 \$\$e, 667 \$\$f, 667 \$\$i, 667 \$\$l, 667 \$\$m, 667 \$\$n, 667 \$\$o, 667 \$\$p, 667 \$\$q, 667 \$\$r, 667 \$\$s, 667 \$\$t, 667 \$\$u, 668 \$\$abc, 670 \$\$abcdevxyz, 690 \$\$ad, 690 \$\$bd, 900 \$\$acefn, 910 \$\$ahgecikj,	\$\$D (display form) and \$\$E (normalized form) are created.

Browse field	Source	Additional normalization notes
	910 \$\$secikj, 930 \$\$au, 930 \$\$fu, 930 \$\$su, 930 \$\$a, 930 \$\$f, 930 \$\$s, 933 \$\$au, 933 \$\$a, 934 \$\$au, 934 \$\$bu, 934 \$\$cdu, 934 \$\$a, 934 \$\$b, 934 \$\$cd, 952 \$\$a, 966 \$\$e, 966 \$\$f, 966 \$\$i, 966 \$\$l, 966 \$\$m, 966 \$\$n, 966 \$\$o, 966 \$\$p, 966 \$\$q, 966 \$\$r, 966 \$\$s, 966 \$\$t, 966 \$\$u, 968 \$\$a	
Call number	Rules not added.	

## Aleph danMARC2

[Return to menu](#)

In most aspects, the Aleph danMARC2 mapping is the same as the Generic danMARC2 mapping. Only the exceptions are listed in this section.

## Control Section

Control Section

Normalized Record Field	Source/Content	Note
ILS API ID	Created from the PNX control/sourceid merged with control/sourcerecordid	Required for OPAC via Primo.

## Display Section

Display Section

Display Element	Source	Note
Library level availability	AVA	<p>The Availability subfields are created as follows:</p> <p>\$\$I Institution – based on institution look-up table based on AVA\$\$a</p> <p>\$\$L Library – based on library look-up table based on AVA\$\$b</p> <p>\$\$1 Sublocation – from AVA\$\$c</p> <p>\$\$2 Call number – from AVA\$\$d</p> <p>\$\$S Availability status – based on AVA\$\$e</p> <p>\$\$3 No. of items – from AVA\$\$f</p> <p>\$\$4 No. of unavailable items – from AVA\$\$g</p> <p>\$\$5 multi-volume flag – from AVA\$\$h</p> <p>\$\$6 number of loans – from AVA\$\$i</p> <p>\$\$9 – For more information, refer to section <a href="#">Adding \$\$9ONLINE to Library Level Availability</a>.</p> <p>\$\$P location priority – from AVA \$\$p</p> <p>\$\$X source institution code (Aleph ADM) – from AVA \$\$a</p> <p>\$\$Y source library code (Aleph sublibrary) – from AVA \$\$b</p> <p>\$\$Z source sub-location code (Aleph collection) – from AVA \$\$j</p>

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## Links

Links Section

Type of Link	Source	Note
Backlink	\$\$Taleph_backlink	For example, for a backlink to an Aleph source (OPAC): Func=direct&l_base=<original_source_id> &doc_number=<source-record-id/></original_source_id>
Link to Holdings	\$\$Taleph_holdings	

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## Search

Search Section

Index	Source tag	Notes
Creator/Contributor	In addition to the generic mapping also AUT (cross-references)	
Subject	In addition to the generic mapping also SUB (cross-references)	

---

## Facets

Facet Section

Facet	Source	Note
Collection	AVA \$\$b	Use mapping table "ILS library codes."
Top-level	Generic mapping and: Available facet: AVA \$\$e IF "available" or "check_holdings"	

---

## Delivery and Scoping

Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution	AVA \$\$a or AVA \$\$b	Use mapping table ILS Institution.

---

## Browse

The system can create multiple occurrences in separate fields.

Browse Section

Browse field	Source	Additional normalization notes
Call number	AVA \$\$d (for call number) AVA \$\$a (for institution)	\$\$D (display form), \$\$E (normalized form), and \$\$I (institution) are created.

## Generic UNIMARC

[Return to menu](#)

### Control Section

Control Section

Normalized Record Field	Source/Content	Note
Source ID	From data source definitions	
Original Source ID	From data source definitions	
Source Record-ID	From header of source file	
Record ID	Source ID + Source Record-ID	
Additional Record-ID		
Source Type		Not in use.
Source Format	From data source definitions	
SourceSystem		

### Display Section

#### General Notes

- String multiple occurrences with a semicolon unless indicated otherwise. If the source data has a period at the end and it is not the final occurrence, remove the

#### Notes Regarding Subfields And Indicators

- If no subfields are listed explicitly, data from all non-numeric subfields will be displayed.

- If a field or a subfield is repeated, all instances should be displayed.
- Subfields are listed in alphabetical order for the sake of clarity, but should be displayed in the order they are recorded in the source record.
- If all the subfields or specified non-numeric subfields are taken, numeric subfields are not considered.
- If a numeric subfield is specifically included, no other numeric subfield will be included.
- If a numeric subfield is excluded, the mapping will take other numeric subfields.
- If no indicators are defined, all indicators will be taken.

Display Section

Display Element	Source	Note
Source	Source from the data source definition	
Resource Type	See mapping below	
Title	200 acdehi	<p>Punctuation :</p> <p>If several a, the second and following are preceded by ,^</p> <p>chi preceded by .^</p> <p>e preceded by ^:^</p> <p>d preceded by ^=^</p>
Uniform title	<p>500 abhiklmqrsu</p> <p>OR</p> <p>501 abejkmrsuwxyz</p> <p>OR</p> <p>503 abdefijkmn</p>	<p>500</p> <p>b preceded by ^[ followed by ]^</p> <p>hiklqrsu preceded by .^</p> <p>m preceded by ^( followed by )^</p> <p>501</p> <p>bejkmrsuw preceded by .^</p> <p>xyz preceded by ^:^</p> <p>503</p> <p>bdeijkmn preceded by .^</p> <p>f preceded by ,^</p>
Vernacular title		

Display Element	Source	Note
Creator	700 abcdfg 7100 abcghp 720 af 730 a 7101 a	700 b preceded by ,^ f preceded by ^( followed by )^ other subfields preceded by .^ 7100 All subfields preceded by .^ except a 720 f preceded by ^( followed by )^
Contributor	702 abcdfg 7120 abcghp 722 af 716 acf 701 abcdfg 722 af 7111 a 7110 a 7121 a	702 b preceded by ,^ f preceded by ^( followed by )^ other subfields preceded by .^ 7120 All subfields preceded by .^ except a 722 f preceded by ^( followed by )^ 716 f preceded by ^( followed by )^ c preceded by .^
Description	328 b 330 a 327 abcdefghi	Every field is a separate occurrence. 327 every subfield is a title
Edition	205 a	
Publisher	210 ac	c preceded by ^:^ if several a, followed a are preceded by ^;^

Display Element	Source	Note
Subject	<p>Strip all numeric subfields.</p> <p>600 abcdjtxyz</p> <p>601 abcdefghjtxyz</p> <p>602 afjtxyz</p> <p>604 atjxyz</p> <p>605 ahijkmnxyz</p> <p>606 ajxyz</p> <p>607 ajxyz</p> <p>608 ajxyz</p> <p>610 a</p> <p>615 axyz</p> <p>616 acfjx</p>	<p>Strip all numeric subfields.</p> <p>600</p> <p>b preceded by , ^</p> <p>f preceded by ( and followed by )</p> <p>xyz preceded by ^: ^</p> <p>other subfields preceded by . ^</p> <p>601</p> <p>xyz preceded by ^: ^</p> <p>other subfields preceded by . ^</p> <p>602</p> <p>f preceded by ( and followed by )</p> <p>xyz preceded by ^: ^</p> <p>other subfields preceded by . ^</p> <p>604</p> <p>xyz preceded by ^: ^</p> <p>other subfields preceded by . ^</p> <p>605</p> <p>nm preceded by ( and followed by )</p> <p>xyz preceded by ^: ^</p> <p>other subfields preceded by . ^</p> <p>606 - 607 - 608 - 615</p> <p>jxyz preceded by ^: ^</p> <p>610</p> <p>If several a, second and following preceded by ^: ^</p> <p>616</p> <p>f preceded by ( and followed by )</p> <p>jxy preceded by ^: ^</p> <p>c preceded by . ^</p>
Language	101 a	Validate code against list of ISO 639-2 codes, section B. If the code cannot be translated, leave it as is.

Display Element	Source	Note
Physical Format	337 a 215 acde	Punctuation = a : c ; d + e.
Identifier	010 \$\$a – prefix the value with ISBN 011 \$\$a – prefix the value with ISSN 013 \$\$a – prefix the value with ISMN	This mapping is disabled in the out-of-the-box template since the identifiers by default do not display in the Front End.
Relation	410, 411: Prefix the value with Series 430, 431, 432, 433, 434, 435, 436, 437: Prefix the value with Earlier Title 440, 441, 442, 443, 444, 445, 446, 447, 448: Prefix the value with Later Title	Every field should be a separate occurrence. The prefix should be added to \$\$C and the value to \$\$V. Display constant codes are used: series earlier_title later_title
Is Part Of	422 tfghi	f preceded by ^/ g preceded by ^; hi preceded by .^
Creation Date	210 \$d OR 100 \$a/09-12	For a date created from 008, create a date only if it starts with a digit that is not zero and replace missing digits with a question mark. For example: 19-- > 19?? 19uu > 19??

## Mapping to Resource Type

The mapping is based on the format type derived either from LDR positions 6 and 7 or tag and position. Use the following tables to determine the mapping.

LDR Positions

Leader pos. 6/7	Record type	Format
a Language material + pos.7= m	Books	BK
a Language material + pos.7= s	Continuing Resources	SE

Leader pos. 6/7	Record type	Format
c Notated music	Music	MU
d Manuscript notated music	Music	MU
e Cartographic material	Maps	MP
f Manuscript cartographic material	Maps	MP
g Projected medium	Visual materials	VM
i Nonmusical sound recording	Audio materials	AM
j Musical sound recording	Audio materials	AM
k Two-dimensional non-projectable graphic	Visual materials	VM
l Electronic Resource	Electronic resource	CF
m Mixed material	Mixed materials	MX
r Three-dimensional artifact or naturally occurring object	Visual materials	VM
b Manuscript language material	Books	BK
Default		BK

Record Type Derived from Tag and Position

Format	Based on (tag and position)	TYPE	Note
Any	328 a,b,c,d,e,t,z – is present or 105 a pos.4, 5, 6,7 = m or v	dissertation	

Format	Based on (tag and position)	TYPE	Note
BK	LDR pos.7 = a	article	
BK		book	The catch-all for BK if no further information is available is Book
CF	110 \$a pos.0 = f	database	
CF	LDR pos.7 = s	electronic journal	
CF		other	
MP		Map	
AM		audio	
MU	LDR 06 = c or d	Score	
SE	110 \$a pos.0 = b	serial	
SE	110 \$a pos.0 = a or c or e or z	journal	
VM	LDR pos.6 = k	image	
VM	LDR pos.6 = g	video	
VM		other	
MX		other	

# Links

## Links Section

Type of Link	Source	Note
OpenURL	Based on resource type from display:  If type = article, then: \$\$Topenurl_article  Else: \$\$Topenurl_journal	SFX has two sources for Primo: one for articles in which case the data is used and one for journals in which case the date is ignored. There is a different template per source.
OpenURL_ fulltext	Based on resource type from display:  If type = article, then: \$\$Topenurifull_article  Else: \$\$Topenurifull_journal	SFX has two sources for Primo: one for articles in which case the data is used and one for journals in which case the date is ignored. There is a different template per source.
OpenURL_ servicetext		
Backlink		
LinktoHoldings		
Linkto Holdings_ available		
Linkto Holdings_ unavailable		
Linkto Holdings_ doesnotexist		
LinktoRequest		
LinktoResource	8564 \$u  Add display text (\$\$D) from \$2 + \$z. If not available then use code: "Online version"  856 1#	

Type of Link	Source	Note
	Add display text (\$\$D) from \$2 + \$z. If not available then use code: "Online version Validate that the link is to the resource by checking the content of subfield 3.	
Additional links	316 u \$\$Dlink to extract 317 u \$\$Dlink to extract 320 u \$\$D Link to bibliographical or index information 321 u \$\$D Link to extract 334 u \$\$D Link to awards information 337 u \$\$D Link to system details 345 u \$\$D Link to acquisition information	
Thumbnail	010 a: \$\$Tamazon_thumb \$\$Tsyndetics_thumb \$\$Tgoogle_thumb	
LinktoTOC	327 u \$\$U \$\$DTable of Contents 010 a \$\$Tsyndetics_toc\$\$DTable of Contents	Create Amazon and Syndetic links only if there is an ISBN.
LinktoAbstract	010 a \$\$Tsyndetics_abstract\$\$D Abstract	
LinktoExcerpt	010 a \$\$Tsyndetics_excerpt\$\$D Excerpt from item	
LinktoReview		
LinktoFindingAid		
LinktoPrice		
Linktouc	\$\$Tamazon_uc – add if there is ISBN \$\$Tworldcat_isbn – add if there is ISBN ELSE add	

Type of Link	Source	Note
	\$\$Tworldcat_oclc – if there is OCLC number	

## Search

### Search Section

Index	Source tag	Notes
Creator/contributor	200 f 700 abcdfg 701 abcdfg 702 abcdfg 7100 abcghp 7120 abcghp 716 acf 700 1 or 2 ab 722 af 730 a 711 abcdef 712 abcdef	
Title	200 acehi	
Additional title	410 t, 411 t, 423 t, 225 aei, 410 aei, 421 ae, 422 ae, 423 ae, 430 ae, 432 ae, 433 ae, 434 ae, 435 ae, 436 ae, 437 ae, 440 ae, 441 ae, 442 ae, 443 ae, 444 ae, 445 ae, 446 ae, 447 ae, 448 ae, 451 ae, 452 ae, 453 ae, 454 ae, 455 ae, 456 ae, 470 ae, 481 ae, 482 ae, 488 ae, 501 a, 510 ae, 512 ae, 517 ae, 518 ae, 531 ae, 532 ae, 545 ae,	
Alternative Title	200 d 454 thio 503 abdefijkmn	

Index	Source tag	Notes
	500 abhikl 510 aehi 512 aehi 513 aehij 514 aehij 515 aehij 516 aehij 517 aehij 530 a 531 a 532 a 540 aehi 541 aehi 545 a 7101 abcdefghp	
Description	330 a 327 abcdefghi	
Subject	Strip all numeric subfields. 600 abcdftxyz 601 abcdefghjtxyz 602 afjtxyz 604 atjxyz 605 ahijkmnxyz 606 ajxyz 607 ajxyz 608 ajxyz 610 a 615 axyz 616 acfjx 675 a 676 a	

Index	Source tag	Notes
ISBN	010 az	
ISSN	011 ayz	
Resource type	Resource type from display	
Creation date	100 \$a/09-12 and 100 \$a/13-16 are digits and not 9999 210 \$d	
Full Text		
TOC	327 abcdefghi	
RecordSource	Source ID from the control section	Note: Required to filter out certain sources.
RecordID	Record ID from the control section	Note: Required to retrieve record based on system number.
General	101 a 210 c 322 a 323 a 326 a 328 abcdetz 333 a 334 abcd	
Search scope	From PNX: delivery/institution control/sourceid (for example the data source is added as a scope)	
Restricted search scope		

Index	Source tag	Notes
Scope	Copies from the Search scope and Restricted search scope from the sections above	

## Sort

### Sort Section

Sort type	DC field
Creation Date	100 \$a/09-12 OR 210 \$d
author	Single sort key created from (subfields same as display/author): 700 710 720 730
title	Single sort key created from (subfields same as display/title): 200
Popularity	

## Facets

### Facet Section

Facet	Source	Note
Resource type	Create this based on the Resource type field from display section as follows: Book -> books Journal -> journals Article -> articles Text Resource -> books Image -> images Audio -> media Video -> media	In some cases, two values should be created, each as a separate field.

Facet	Source	Note
	Score -> Scores Map -> Maps Other -> other	
Language	101 subfields a, d, h.	If the language is not a valid ISO 639 code it should not be created.
Creator/ Contributor_	700 abcdf 701 abcdf 702 abcdf 710 abcd 711 abcd 712 abcd 720 af 721 af 722 af 730 a 710 1# a 711 1# a 712 1# a	Punctuation 700, 701 and 702 b preceded by ,^ f preceded by ^( followed by )^ other subfields preceded by .^ 7100, 7110 and 7120 All subfields preceded by .^ except a 720, 721 and 722 f preceded by ^( followed by )^
Topic	600 abcdfjtxyz 601 abcdefghjtxyz 602 afjtxyz 604 atjxyz 605 ahijkmnxyz 606 ajxyz 607 ajxyz 610 a 616 acfjxy First facet level is all data up to the first occurrence of subfield \$\$j, x, y or z. Each subfield division (j, x, y or z) constitutes the next level.	Strip all numeric subfields. 600 b preceded by ,^ f preceded by ( and followed by ) other subfields preceded by .^ 601 other subfields preceded by .^ 602 f preceded by ( and followed by ) other subfields preceded by .^ 604 other subfields preceded by .^

Facet	Source	Note
	<p>Note: The first facet level might have multiple occurrences in one record. These multiple occurrences should be de-duplicated.</p>	<p>605 nm preceded by ( and followed by ) other subfields preceded by .^</p> <p>610 If several a, second and following preceded by ^:^</p> <p>616 f preceded by ( and followed by ) c preceded by .^</p>
Genre	<p>608 \$a 600 \$j 601 \$j 602 \$j 604 \$j 605 \$j 606 \$j 607 \$j</p>	
classification.lcc	<p>Added by enrichment 680 \$a</p>	
Creation Date	<p>100 \$a /09-12 OR 210 \$d</p>	<p>Truncate 210 \$d so that it has only 4 digits. If the date cannot be normalized to 4 digits, do not create the facet.</p>
File size	<p>Not in use</p>	
Collection		
Physical format	<p>Not in use</p>	<p>Not in use.</p>
Top-level	<p>online_resources -- assign if the delivery category is Online Resource, SFX Resource, or MetaLib Resource. new -- as tagged before load.</p>	

Facet	Source	Note
	Available in Library map is based on the availability information in the source record.	
Pre-filter	Based on Resource Type from the display section: Book -> books Journal -> journals Article -> articles Text Resource -> books Image -> images Video -> audio_video Audio -> audio_video Maps -> maps Score -> scores	
Related record		

## Duplicate Record Detection Vector

Currently two types of record matching vectors exist:

- T1 – for non-serials
- T2 – for serials

The mapping of record to T1 or T2 is based on the format type. The format type is based on the extraction procedure that creates the format (FMT) field from pos. 6 and 7 in the leader.

- T1 – All formats except for SE
- T2 – E

## Vector for T1 - "non-serials"

Vector for T1

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
T	Type	1	Created if the format is not SE.

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
The following fields are for the candidate selection:			
C1	UnivID, UnivID_invalid	020 \$b \$z	Take prefix and number and remove any suffixes. Multiple occurrences are delimited by a semicolon.
C2	ISBN, Invalid_ISBN	010 \$a \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
C3	Short title	200 \$aehi Use normalization routine #1 Exact match on first 20 and last 10 characters.	The result is a single string of 30 characters.
C4	Year	100 \$a 09-12	
The following fields are for the matching program:			
F1	UnivID	020 \$a	Take prefix and number and remove any suffixes
F2	UnivID_Invalid	020 \$z	Take prefix and number and remove any suffixes Multiple occurrences are delimited by a semicolon.
F3	ISBN	010 \$a	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F4	ISBN_Invalid	010 \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F5	Short title	200 \$aehi	Same as C3.
F6	Year	100 \$a 09-12	

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
F7	Full title	200 \$acdehi Use routine #2 from	
F8	Country of publication	102 a	
F9	Pagination	215 \$\$a	
F10	Publisher	210 \$\$c Use filing routine #3 to normalize	Take only first occurrence of 260 tag and first occurrence of subfield c.
F11	Main entry (author, corporate body, meeting)	700 \$abf OR 710 0# \$abcghp OR 710 1# \$abcdefgghp Use normalization routine #3 to normalize	

## Vector for T2 - "serials"

### Vector for T2

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
T	Type	2	Created if the format is SE.
The following fields are for the candidate selection:			
C1	UnivID, UnivID_invalid	020 \$a \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
C2	ISSN, Invalid_ISSN, cancelled_ISSN	011 \$a \$y \$z	Use data until a blank character or the end of subfield.

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
			Multiple occurrences are delimited by a semicolon.
C3	Short title	200 \$aehi Use filing procedure #1 Exact match on first 25 char.	The result is a single string of 25 characters.
C4	Place of publication	210 \$\$a normalized using routine 75 After applying routine #3 then take only the first string (up to first blank).	Take only first occurrence of 210 and first occurrence of subfield a.
The following fields are for the matching program:			
F1	UnivID	020 \$a	Use data until a blank character or the end of subfield.
F2	UnivID_Invalid	020 \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F3	ISSN	011 \$a	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F4	ISSN_Invalid	011 \$y	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F5	ISSN_Cancelled	011 \$z	Use data until a blank character or the end of subfield. Multiple occurrences are delimited by a semicolon.
F6	Year	100 \$a 09-12	

Field ID	Nature of field	Content of Field/Source Tag + Subfield	Note
F7	Full title	200 \$aehi Use filing routine #2	
F8	Truncated title	200 \$a Use normalization routine #2	
F9	Country of publication	102 a	
F10	Place of publication	210 \$\$a normalized using routine #3 After applying routine, take only the first string (up to first blank).	Take only first occurrence of 210 and first occurrence of subfield a.
F11	Main entry (author, corporate body, meeting)	7100 \$abcghp OR 7101 \$abcdefghp Use filing routine #3	

## FRBRization

Refer to [Normalization Routines for Duplicate Record Detection](#) for the normalization routines for the author and title parts.

The key field has two subfields:

- \$\$K key part
- \$\$A key part type that determines the algorithm

FRBRization

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
T	Always 1		MARC 21 algorithm
K1	700, or 710, or 720, or 701, and 711, and 721	A	Single occurrence of 700, 710, 720 ; Multiple occurrences of 701, 711, 721, 730. 70X Take subfields a, b, f 71X Take subfields abc

Field ID	Source (value of \$\$K for K fields)	Key part type (value of \$\$A for K fields)	Note
			72X Take subfields af 730 take subfield a
K2			Not defined. Unimarc does not have equivalent for title only key.
Kn	<p>If format is not SE:</p> <p>500, and 200, or 540, or 515, or 518, or 545, or 503</p> <p>If format is SE:</p> <p>200, and 520, or 530, or 531, or 532, or 545</p>	T	<p>200 – Subfields aedhi 500 – ahik 540 – aehi 515 – a 518 – a 545 – a 503 – abefijm 520 – aehi 530 – a 531 – a 532 – a</p>

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution		
Delivery category		Based on algorithm in <a href="#">Defining the Delivery Category Algorithm</a> .
Restricted delivery scope		

---

## Ranking

Local mapping required as relevant.

Ranking Section

Booster Field	Source	Additional Normalization Notes
booster1	1 or as added by enrichment program	
booster2		Not in use.

---

## Enrichment

Local mapping required as relevant.

Enrichment Section

Enrichment Field	Source	Additional Normalization Notes
classification.lcc	680 a	All occurrences added to separate fields.
fulltext		
TOC		
Abstract		
Review		
Rank-parent-child		
Rank-Number of copies		
Rank-Date first copy		
Rank-Number of loans		

## Additional Data

This includes multiple occurrences in separate fields.

Additional Data

Additional Data Field	Source	Additional Normalization Notes
Author Last	70X#1 a	
Author First	70X#1 b	
Author initials		
Author first initial		
Author middle initial		
Author suffix		
Author	abcdf abcdf	
Corporate Author	7100 abcgh 7110 abcgh	
Additional author	702 abcdf 712 abcgh 730 a 7121 adef	
Series author	225 f	
Book Title	If resource type is not an article or a journal: 200 aehi	

Additional Data Field	Source	Additional Normalization Notes
Article title	200 aehi	
Journal title	If resource type is Journal: 200 aehi	
Short title	231 a	
Additional title	5XX	Strip numeric subfields
Series title	225 410 411	Strip subfield x and numeric subfields
Date	100 \$a 09-12 or 210 \$d	Normalize to 4 characters.
RISDate	210 \$d or 100 \$a/09-12	
Additional Date		
Volume		
Issue		
Part		
Season		
Quarter		
Start page		
End page		

Additional Data Field	Source	Additional Normalization Notes
Pages		
Article number		
ISSN	011 a	Use data up to a blank character or end of subfield.
eISSN	452 x	Use data up to a blank character or end of subfield.
ISBN	010 a	Use data up to a blank character or end of subfield.
CODEN	040 a	Use data up to a blank character or end of subfield.
SICI		
Metadata Format	<p>If there is a 328 -&gt; <b>dissertation</b></p> <p>Else based on Resource type from display:</p> <ul style="list-style-type: none"> <li>• book -&gt; <b>book</b></li> <li>• journal -&gt; <b>journal</b></li> <li>• article -&gt; <b>journal</b></li> <li>• conference_proceeding &amp; record has ISSN -&gt; <b>journal</b></li> </ul> <p>Else -&gt; <b>book</b></p>	
Genre	The Genre mapping table maps the resource type from the display section of the PNX to the genre that is required by the OpenURL.	Use Genre mapping table.
RISType	<p>Based on Resource type from display:</p> <p>If there is a 328 then -&gt; THES</p> <p>book -&gt; BOOK</p> <p>journal -&gt; JOUR</p> <p>map -&gt; MAP</p>	

Additional Data Field	Source	Additional Normalization Notes
	video -> VIDEO audio -> SOUND music -> MUSIC article -> JOUR Else -> GEN	
City of Publication	210 a	
Publisher	210 c	
Abstract	330 a	
Miscellaneous1		
Miscellaneous2		
Miscellaneous3		
OCLC ID	035 \$\$a - if text (OCoLC) is present in 035.	Take all digits following the text OCLC and until space. Example: 035 \$\$a(OCoLC)814782
LCCN	020 \$\$a	Take prefix and number.
DOI		
URL		
Local fields 1-25		

---

## Normalization Routines for Duplicate Record Detection

---

### Note

Certain characters are translated in XML:

---

Normalization Routines for Dedup Record Detection

Special Character	Special Meaning	Entity Encoding
>	Begins a tag.	>
<	Ends a tag.	<
Quotation mark.	"	
	'Apostrophe.	'
&	Ampersand.	&

The publishing platform removes all leading and trailing spaces and packs double spaces.

---

### Normalization Routine #1

1. Remove non-filing characters

Remove all text that appears within <<>> or within the Unicode characters 0088 and 0089.

2. Delete the following characters: '
  3. Change the following characters to blank: !@#\$%^&\*()\_+={}|:~<>?/,./~`
  4. Convert characters using the FILING-KEY-01 character conversion table.
  5. Change characters to lower case.
  6. Remove all spaces.
  7. Take first 10 and last 10 characters.
- 

### Normalization Routine #2

1. No non-filing characters in Unimarc.
2. Remove all text that appears within <<>> or within the Unicode characters 0088 and 0089. For example:

```
<datafield ind1="1" ind2="0" tag="200"> <subfield code="a"/></datafield>

<datafield tag="200" ind1="1" ind2="0"> <subfield code="a">
<<The>> book : its history in England in the middle ages!
</subfield>
</datafield>
```

Should become:

```
book: its history in England in the middle ages
```

3. Delete the following characters: '
4. Change the following characters to blank: !@#\$%^&\*()\_+={}|:~<>?.,/~`
5. Convert characters using the FILING-KEY-01 character conversion table.
6. Change characters to lower case.

---

## Normalization Routine #3

1. Delete the following characters: '
2. Change the following characters to blank: !@#\$%^&\*()\_+={}|:~<>?.,/~`
3. Convert characters using the FILING-KEY-01 character conversion table.
4. Change characters to lower case.

---

## Normalization Routines for FRBR

### Note

The publishing platform will delete leading and trailing blanks and remove double spaces.

---

---

## Author Part Normalization

1. Delete characters: | [ ]'
2. Change characters to space: \$~'^%\*\^?@.:;<>{}-()!¿□
3. Convert characters using the NACO\_diacritics character conversion table.
4. Change characters to lower case.

---

## Title Part Normalization

1. Remove non-filing characters.
2. Remove all text that appears within <<>> or within the Unicode characters 0088 and 0089.
3. Delete characters: | [ ] '
4. Change characters to space: \$~'^%\*^/?@.::;<>{}-()!;!;□
5. Convert characters using the NACO\_diacritics character conversion table.
6. Change characters to lower case.

---

## Defining the Delivery Category Algorithm

The following "out of the box" algorithm will be used for UNIMARC. It should be possible to distinguish between the following resource types:

- Physical items (except for microform)
- Microform
- SFX resources
- Online resources

The algorithm is read from top to bottom. Once a record is assigned a category the algorithm stops.

When there are several definitions for the same category the priority is given to the "safest" option.

In the algorithm priority has been given to online resources based on the assumption that users most often prefer this option. Primo will include a display of the location and availability status of physical items.

The format is based on the definitions used for each resource type. For more information on these definitions, see [LDR Positions](#).

Defining the Delivery Category Algorithm

Condition	Delivery Category	Note
If 035=SFX	SFX Resources	
LDR pos.6 = I		
or 106 \$a pos.0 = s	Online Resource	
If there is a 8564-	Online Resource	

Condition	Delivery Category	Note
If 106 \$a pos.0 = t	Microform	
If 200 \$\$b includes the string micro	Microform	
If not any of the above	Physical Item	

## Aleph UNIMARC

[Return to menu](#)

In most aspects the Aleph UNIMARC mapping is the same as the Generic UNIMARC mapping (see [Generic UNIMARC](#)). Only the exceptions are listed below. For the Aleph-specific fields described below, refer to the Aleph MARC mapping (see [Aleph MARC 21](#))

## Control Section

Control Section

Normalized Record Field	Source/Content	Notes
ILS API ID	See <a href="#">Aleph MARC 21</a> .	

## Display Section

Display Section

Display Element	Source	Notes
Library Level Availability	See <a href="#">Aleph MARC 21</a> .	
Local Display Fields	Ids30, Ids31, and Ids32 are defined in parallel with local search fields Isr30, Isr31, and Isr32.	Contains rules for the display lateral links based on the use of UP/DOWN/PAR type links in the PLK field. The rules are disabled out of the box. These fields can be used if you have linked records from Aleph with PLK data in which subfields m and n are used. Note that the <b>Use local fields 30-39 as lateral links</b> parameter on the General Configuration > Installation subsystem page must be defined as Y. This is the default value. In hosted environments, the parameter is enabled.

## Links

Links Section

Type of Link	Source	Notes
Backlink	See <a href="#">Aleph MARC 21</a> .	
LinktoHoldings	See <a href="#">Aleph MARC 21</a> .	

## Search

### Search Section

Index	Source tag	Notes
Local Search Fields	Isr30, Isr31, and Isr32 are defined in parallel with local display fields Ids30, Ids31, and Ids32.	Contains rules for the display lateral links based on the use of UP/DOWN/PAR type links in the PLK field. The rules are disabled out of the box. These fields can be used if you have linked records from Aleph with PLK data in which subfields m and n are used. Note that the <b>Use local fields 30-39 as lateral links</b> parameter on the General Configuration > Installation subsystem page must be defined as Y. This is the default value. In hosted environments, the parameter is enabled.

## Sort

### Sort Section

Sort type	DC field
Popularity	See <a href="#">Aleph MARC 21</a> .

## Facets

### Facets Section

Facet	Source	Notes
Collection	See <a href="#">Aleph MARC 21</a> .	
Top-level	See <a href="#">Aleph MARC 21</a> .	

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Institution	See <a href="#">Aleph MARC 21</a> .	

## XML and Complex XML

[Return to menu](#)

The XML and Complex XML Templates are actually empty templates that can be used for any non-standard XML file. The Complex XML template lets you use the **Complex XML** source type, which enables you to use the full X-path to define the source. Because the format is unknown, only rules for the mandatory fields (title, resource type, and delivery category) are included in both templates to provide default values. You can modify the following sections as needed for your XML source.

### Control

Control Section

Control field	Source/Content	Additional Normalization Rules
Source ID	From configuration file.	Required field.
Record ID	Source ID + Source Record-ID	Required field.
Source system	From configuration file	

### Display

Display Section

Display Field	Source/Content	Additional Normalization Rules
Title	Constant – "Title"	
	Should be modified	
Type	Constant – "Book"	Modify as relevant

### Links

No Link fields are predefined.

---

## Search

No Search fields are predefined.

---

## Sort

Sort Section

Sort	Source/Content	Additional Normalization Rules
title	Copied from PNX display/title	
author	Copied from PNX display/creator	

---

## Facets

No Facet fields are predefined.

---

## Duplicate Record Detection

No dedup vectors are predefined.

---

## FRBR

No FRBR vectors are predefined.

---

## Delivery and Scoping

Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Delivery category	Online Resource	Modify as relevant

---

## Ranking

No Ranking fields are predefined.

---

---

## Enrichment

No enrichment fields are predefined.

---

## Additional Data

No additional data fields are predefined.

## WARC

[Return to menu](#)

The WARC template is based on the standard metadata elements that are parsed to the XML file created by the WARC file splitter. The following format is usually used as the path: `metadata/<tag>`.

## Control

Control Section

Control field	Source/Content	Additional Normalization Rules
Source ID	From configuration file.	Required field.
Record ID	Source ID + Source Record-ID	Required field.
Source system	From configuration file.	

## Display

Display Section

Display Field	Source/Content	Additional Normalization Rules
Type	Constant – “website”	
title	metadata/title	
OR if not present the URI is taken:		
warc-target-uri		
creator	metadata/author	
contributor	metadata/producer	

Display Field	Source/Content	Additional Normalization Rules
creation date	metadata/created	
format	metadata/content-type and metadata/resource-type	The two fields are merged
subject	metadata/keywords	
description	metadata/description	
language	metadata/language	
rights	metadata/rights	

## Links

### Links Section

Link	Source/Content	Additional Normalization Rules
link to resource	warc_record/warc-target-uri	

## Search

### Search Section

Search Field	Source/Content	Additional Normalization Rules
creatorcontrib	metadata/author	
metadata/producer		
title	metadata/title	
OR if not present the URI is taken:		
warc-target-uri		

Search Field	Source/Content	Additional Normalization Rules
description	metadata/description	
subject	metadata/keywords	
fulltext	content	This tag includes the content of the harvested web page.
recordid	from PNX control/recordid	
resource type	from PNX display/type	
creation date	metadata/created	
format	metadata/content-type and metadata/resource-type	The two fields are merged

## Sort

### Sort Section

Sort	Source/Content	Additional Normalization Rules
title	Copied from PNX display/title	
author	Copied from PNX display/creator	

## Facets

### Facets Section

Facet	Source/Content	Additional Normalization Rules
language	metadata/language	
topic	metadata/keywords	

Facet	Source/Content	Additional Normalization Rules
toplevel	Constant: online_resources	
prefilter	from PNX display/type	
resource type	from PNX display/type	

---

## Duplicate Record Detection

No dedup vectors are predefined.

---

## FRBR

No FRBR vectors are predefined.

---

## Delivery and Scoping

### Delivery and Scoping Section

Delivery Field	Source	Additional Normalization Notes
Delivery category	Online Resource	Modify as relevant

---

## Ranking

No Ranking fields are predefined.

---

## Enrichment

No enrichment fields are predefined.

---

## Additional Data

No additional data fields are predefined.

## Adding \$\$9ONLINE to Library Level Availability

[Return to menu](#)

A record that is available online may also have physical items. If the record contains both types, Primo allows you to assign a “virtual” delivery category of Physical Items so that the record can display two GetIt 1 links: one for the Online delivery category and another for the Physical Item delivery category.

Primo determines that an online resource is also physical if the PNX record includes locations in the display/availlibrary field. Because libraries frequently create holdings and item records for online resources (which creates display/availlibrary fields in the PNX), Primo cannot determine if these holdings and item records actually represent a physical item. For these records, you can indicate that the record is only an online resource by adding \$\$9ONLINE to the availlibrary field. If this is done, Primo will display only the delivery option for the online material in the View online tab and not display the physical material (which is displayed in the Request tab).

In most cases, the system can determine whether a resource is only online by examining the location code or call number. Because this information depends on local data, these rules must be added locally.

The following example shows how to set up the normalization rules using the Aleph AVA source field, but any field can be used.

The screenshot shows the Normalization Rules Editor interface. The rule group is named "display\_availlibrary". The source is set to "MARC" and the field is "AVA". The conditions logic is set to "True". The condition 1 logic is "True". The condition 1 source is "MARC", field is "AVA", and the success if is "Match Current". The condition 1 routine is "Check that string exists" with the parameter "internet". The transformation is "Write constant" with the parameter "\$\$9ONLINE". The action is "MERGE".

Rule group	Type	Field	Ind1	Ind2	Subfield	Enabled
display_availlibrary	MARC	AVA			Include	<input checked="" type="checkbox"/>

Conditions logic: True

Condition 1 - Logic: True

Condition 1 - Source	Type	Field	Ind1	Ind2	Subfield	Success if
MARC	AVA			Include	j	Match Current

Condition 1 - Routines

Routine	Parameter
Check that string exists	internet

Transformations

Transformation	Parameter
Write constant	\$\$9ONLINE

Action: MERGE

### Adding \$\$9ONLINE in Normalization Rules Editor

---

## Virtual Delivery Category

[Return to menu](#)

Primo will create a virtual delivery category of Physical Items and offer delivery for both if the following conditions are met:

1. The **Always check if also Physical Item** parameter is set to **Y** on the Advanced Configuration > General Configuration > Delivery page.
2. The delivery category of the record itself is either **Online Resource**, **SFX Resource**, **MetaLib Resource**, **Alma-E**, or **Alma-D**. For deduped records, the system uses existing logic to determine the delivery category, taking the user's institution into account.
3. The record contains at least one display/availlibrary field that does not have subfield 9 set to **ONLINE** (which indicates that there is at least one location that represents physical items).
4. The user's institution matches an institution in a display/availlibrary field that does not have subfield 9 set to **ONLINE**.

or

The **Shared user database field** is set to **Y** on the [Primo Home > Advanced Configuration > General Configuration > Delivery](#) subsystem page. The **Shared user database** field was added for OPAC via Primo and indicates that all institutions within the Primo installation have a shared user database. The system uses it to prevent users from getting a request option for a record that belongs to an institution in which users are not authorized to make requests. For more information on OPAC via Primo, refer to the *Primo Interoperability Guide*.

or

The **Shared user database field** is set to **P** on the [Primo Home > Advanced Configuration > General Configuration > Delivery](#) subsystem page, the **SHARED\_USER\_DB** flag is set to **Y** for the user's institution, and an institution in the display/availlibrary field that does not have subfield 9 set to **ONLINE** is part of a shared group.

---

## MetaLib and Primo Restrictions

It is possible to create restricted delivery and search scopes in Primo based on restrictions in MetaLib.

---

## Restricted Search and Delivery Scopes

In MetaLib, a switch determines two modes of authorization or working with restricted resources:

- All resources can be searched but are locked. The user cannot use the resource.
- The resources cannot be searched—for example, only authorized users will locate the resource.

In Primo if the site opted for the first option, Primo should create restricted delivery scopes. If the site opted for the second option, Primo should create restricted search scopes.

---

## How to Create Restrictions

MetaLib has the following restrictions:

- Free/Subscription - only Subscription resources are restricted (549 tag)
- Affiliation based on institution - sign-in or based on IP (AF1 tag)
- User group (AF3 tag)
- IP group (AIP tag)

---

## Free/Subscription (in 594 Tag)

If the value is set to **FREE**, the resource can be used by anybody. In Primo there is no need to create a restricted search/delivery scope. If the value is set to **SUBSCRIPTION**, the resource is restricted. In principle, a restricted search/delivery scope should be created. The following sections are relevant only if the resource value is set to **SUBSCRIPTION**.

---

## Institutional Affiliation (in AF1 Tag)

This field contains the institution to which it belongs. If the resource is set to **SUBSCRIPTION** and this is the only restriction (there is no AF3 or AIP), the resource is available only to affiliated users, either by sign-in or IP range.

The default MetaLib KB-PNX mapping creates a restricted search or restricted delivery scope from the Primo institution code. A site should enable the relevant rule.

In addition, the scope must be defined in the Primo Back Office.

---

## User Group Affiliation (in AF3 Tag)

There is no default rule to create restricted search/delivery scopes based on user group. However, a rule can be added creating a special scope based on the existence of AF3 and this scope can be restricted to a specific user group.

---

## IP Group (in AIP Tag)

There is no default rule to create restricted search/delivery scopes based on user group. However, you can add a rule to create a special scope based on the existence of AIP.

---

### **Note**

In Primo it is not possible to define restrictions at the level of IP ranges and such a scope can be the basis for defining "additional restrictions" (this option is available only for restricted delivery scopes).

---

In Primo you can map this to additional restrictions, but only for restricted delivery.

## Files Used by the Dedup Algorithm

The Dedup algorithm uses the files listed in this section to determine duplicate records. These files are located in the following directory, where <r> indicates the release in which Primo was initially installed and <c> indicates the Primo copy:

```
/exlibris/primo/p<r><c>/ng/primo/home/profile/publish/publish/production/conf
```

### CDLMatchingProfile.xml

This file configures the Dedup algorithm for non-serial records.

```
<?xml version="1.0" encoding="UTF-8"?>
<MatchingProfile
  xmlns="http://www.exlibrisgroup.com/xsd/primo/platform"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.exlibrisgroup.com/xsd/primo/platform
  ../../../../../../primo_publishing/publish/src/main/com/exlibris/publish/xsd/
  matchingProfile_v1.0.xsd ">
<handlers>
  <handler id="SINGLE_MATCH">
    <fieldID>f20</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
  <arguments>
    <argument name="match">800</argument>
    <argument name="mismatch">0</argument>
  </arguments>
</handler>
<handler id="CDLDate">
  <fieldID>f6</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupNumericComparator</name>
  <arguments>
    <argument name="match">+200</argument>
    <argument name="within" param="2">-25</argument>
    <argument name="mismatch">-250</argument>
  </arguments>
</handler>

<handler id="CDLID">
  <fieldID>f1,f2,f3,f4</fieldID>
  <name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLIDComparator</name>
  <arguments>
    <argument name="recID_match">+200</argument>
    <argument name="recID_recIDInvalid_match">+100</argument>
    <argument name="recIDInvalid_match">+50</argument>
```

```

        <argument name="recID_mismatch">-470</argument>
        <argument name="recID_recIDInvalid_mismatch">-50</argument>
        <argument name="ISBN_match">+85</argument>
        <argument name="ISBN_ISSN_match">+30</argument>
        <argument name="ISSN_ISSN_match">+10</argument>
        <argument name="ISSN_ISBN_mismatch">-225</argument>
    </arguments>
</handler>
<handler id="CDLShortTitle">
    <fieldID>f5</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
    <arguments>
        <argument name="match">+450</argument>
    </arguments>
</handler>
<handler id="CDLSubShortTitle">
    <fieldID>f5</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
    <arguments>
        <argument name="match">-450</argument>
    </arguments>
</handler>
<handler id="CDLLongTitle">
    <fieldID>f7</fieldID>
    <name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLTitleComparator</name>
    <arguments>
        <argument name="match">600</argument>
        <argument name="within">350</argument>
        <argument name="keywords_weight_factor">450</argument>
        <argument name="keywords_order_base_weight">50</argument>
        <argument name="mismatch">-600</argument>
    </arguments>
</handler>
<handler id="CDLCountryOfPub">
    <fieldID>f8</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
    <arguments>
        <argument name="match">40</argument>
        <argument name="mismatch">-205</argument>
    </arguments>
</handler>
<handler id="CDLPagination">
    <fieldID>f9</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLPageHandlerComparator</name>
    <arguments>

```

```

        <argument name="matchgt">100</argument>
        <argument name="matchlt">50</argument>
        <argument name="withingt">50</argument>
        <argument name="withinlt">20</argument>
        <argument name="mismatch">-225</argument>
    </arguments>
</handler>
<handler id="CDLPublisher">
    <fieldID>f10</fieldID>
</handler>
<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
    <arguments>
        <argument name="match">+100</argument>
        <argument name="within">+100</argument>
        <argument name="mismatch">-25</argument>
    </arguments>
</handler>
<handler id="CDLMainEntry">
    <fieldID>f11</fieldID>
</handler>
<name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLMainEntryComparator</name>
    <arguments>
        <argument name="match">+125</argument>
        <argument name="both_missing">+75</argument>
        <argument name="one_missing">+25</argument>
        <argument name="keywords_weight_factor" param="49">80</argument>
        <argument name="keywords_order_base_weight" param="49">10</argument>
        <argument name="mismatch">-200</argument>
    </arguments>
</handler>
</handlers>
<thresholds>
    <threshold id="tr1">
        <upper_threshold>+850</upper_threshold>
        <lower_threshold>0</lower_threshold>
    </threshold>
    <threshold id="tr2">
        <upper_threshold>+875</upper_threshold>
    </threshold>
    <threshold id="tr3">
        <upper_threshold>+800</upper_threshold>
    </threshold>
</thresholds>
<steps>
    <step type="handler">SINGLE_MATCH</step>
    <step type="threshold">tr3</step>
    <step type="handler">CDLID</step>
    <step type="handler">CDLShortTitle</step>
    <step type="handler">CDLDate</step>
    <step type="threshold">tr1</step>

```

```

    <step type="handler">CDLSubShortTitle</step>
    <step type="handler">CDLLongTitle</step>
    <step type="handler">CDLCountryOfPub</step>
    <step type="handler">CDLPagination</step>
    <step type="handler">CDLPublisher</step>
    <step type="handler">CDLMainEntry</step>
    <step type="threshold">tr2</step>
</steps>
</MatchingProfile>

```

#### CDLMatchingProfile.xml File

## CDLSeMatchingProfile.xml

This file configures the Dedup algorithm for serial records.

```

<MatchingProfile
  xmlns="http://www.exlibrisgroup.com/xsd/primo/platform"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.exlibrisgroup.com/xsd/primo/platform
  ../../../../../../primo_publishing/publish/src/main/com/exlibris/publish/xsd/
  matchingProfile_v1.0.xsd ">
<handlers>
  <handler id="SINGLE_MATCH">
    <fieldID>f20</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
  <arguments>
    <argument name="match">800</argument>
    <argument name="mismatch">0</argument>
  </arguments>
</handler>
<handler id="CDLID">
  <fieldID>f1,f2,f3,f4,f5</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLIDSerialComparator</name>
  <arguments>
    <argument name="recID_match">+200</argument>
    <argument name="recID_recIDInvalid_match">+100</argument>
    <argument name="recIDInvalid_match">+50</argument>
    <argument name="recID_mismatch">-470</argument>
    <argument name="recID_recIDInvalid_mismatch">-50</argument>
    <argument name="ISSN_match">+200</argument>
    <argument name="ISSNInvalid_match">+50</argument>
    <argument name="ISSNCanceled_match">+10</argument>
    <argument name="ISSN_ISSNInvalid_match">+100</argument>
    <argument name="ISSN_ISSNCanceled_match">+50</argument>
    <argument name="ISSNInvalid_ISSNCanceled_match">+30</argument>

```

```

        <argument name="ISSN_ISSN_mismatch">-250</argument>
    </arguments>
</handler>
<handler id="CDLLongTitle">
    <fieldID>f7,f8</fieldID>
</name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLTitleSerialComparator</name>
    <arguments>
        <argument name="full_common_match">135</argument>
        <argument name="full_match">600</argument>
        <argument name="full_truncated_common_match">135</argument>
        <argument name="full_truncated_match">175</argument>
        <argument name="keywords_weight_factor">75</argument>
        <argument name="keywords_order_base_weight">50</argument>
        <argument name="mismatch">-600</argument>
    </arguments>
</handler>
<handler id="CDLDate">
    <fieldID>f6</fieldID>
</name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLDateSerialComparator</name>
    <arguments>
        <argument name="match">225</argument>
        <argument name="within1">50</argument>
        <argument name="within2">25</argument>
        <argument name="last_digit_zero">20</argument>
        <argument name="mismatch">-150</argument>
    </arguments>
</handler>
<handler id="CDLCountryOfPub">
    <fieldID>f9</fieldID>
</name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
    <arguments>
        <argument name="match">40</argument>
        <argument name="mismatch">-20</argument>
    </arguments>
</handler>
<handler id="CDLPlaceOfPub">
    <fieldID>f10</fieldID>
</name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
    <arguments>
        <argument name="match">200</argument>
        <argument name="mismatch">-100</argument>
    </arguments>
</handler>
<handler id="CDLMainEntry_se">
    <fieldID>f11</fieldID>

```

```

<name>com.exlibris.primo.publish.platform.dedup.cdlimpl.CDLMainEntrySerialComparator</name>
  <arguments>
    <argument name="match">+200</argument>

    <argument name="keywords_weight_factor" param="59">75</argument>
    <argument name="keywords_order_base_weight" param="59">25</argument>
    <argument name="mismatch">-250</argument>
  </arguments>
</handler>
</handlers>
<thresholds>
  <threshold id="tr1">
    <upper_threshold>+800</upper_threshold>
    <lower_threshold>0</lower_threshold>
  </threshold>
  <threshold id="tr2">
    <upper_threshold>+800</upper_threshold>
  </threshold>
  <threshold id="tr3">
    <upper_threshold>+800</upper_threshold>
  </threshold>
</thresholds>
<steps>
  <step type="handler">SINGLE_MATCH</step>
  <step type="threshold">tr3</step>
  <step type="handler">CDLID</step>
  <step type="handler">CDLLongTitle</step>
  <step type="threshold">tr1</step>
  <step type="handler">CDLDate</step>
  <step type="handler">CDLCountryOfPub</step>
  <step type="handler">CDLPlaceOfPub</step>
  <step type="handler">CDLMainEntry_se</step>
  <step type="threshold">tr2</step>
</steps>
<common_title_list>
  <file_name>CDLSeCommonTitleList.txt</file_name>
</common_title_list>
</MatchingProfile>

```

#### CDLSeMatchingProfile.xml File

## CDLArticlesMatchingProfile.xml

This file configures the Dedup algorithm for articles.

```

<?xml version="1.0" encoding="UTF-8"?>
<MatchingProfile
  xmlns="http://www.exlibrisgroup.com/xsd/primo/platform"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.exlibrisgroup.com/xsd/primo/platform
  ../../../../primo_publishing/publish/src/main/com/exlibris/publish/xsd/
  matchingProfile_v1.0.xsd ">
<handlers>
  <handler id="CDLArtTitle">
    <fieldID>f1</fieldID>

<name>com.exlibris.primo.publish.platform.dedup.comparator.DedupStringComparator</name>
  <arguments>
    <argument name="match">100</argument>
    <argument name="mismatch">-100</argument>
  </arguments>
</handler>
</handlers>
<thresholds>
  <threshold id="tr1">
    <upper_threshold>+100</upper_threshold>
    <lower_threshold>+100</lower_threshold>
  </threshold>
</thresholds>
<steps>
  <step type="handler">CDLArtTitle</step>
  <step type="threshold">tr1</step>
</steps>
</MatchingProfile>

```

**CDLArticlesMatchingProfile.xml File**

## CDLSeCommonTitleList.txt

This file contains a list of common words that the Dedup algorithm uses for title matching.

For information on configuring local titles, see [ClientCommonTitles.txt](#).

```

ADVERTISER
ANALES
ANNUAL BUDGET
ANNUAL FINANCIAL REPORT
ANNUAL REPORT
ANNUAL REPORTS
ANNUAL REPORT FOR
ANNUAL REPORT FOR THE FISCAL YEAR ENDED MARCH \265\265\265\265\265\265\267
BIENNIAL REPORT

```

BOLETIN  
BUDGET  
BULLETIN  
CALENDAR  
CATALOGUE  
CIRCULAR  
COMPREHENSIVE ANNUAL FINANCIAL REPORT  
!COMPILATION OF SELECTED ACTS  
COMPILATION OF SELECTED ACTS WITHIN THE JURISDICTION OF THE COMMITTEE ON COMMERCE  
CONFERENCE PROCEEDINGS  
CONFERENCE RECORD  
DIRECTORY  
FACT SHEET  
FINAL BUDGET  
FINANCIAL REPORT  
GENERAL CATALOG  
JAHRESBERICHT  
JOURNAL  
LANGUAGE SCIENCES  
  
LAWS ETC  
LEGISLATIVE CALENDAR  
LEGISLATIVE SUMMARY  
MEMBERSHIP DIRECTORY  
MEMOIRES  
MEMORIA  
MINUTES  
MITTEILUNGEN  
MONOGRAPH  
MONTHLY BULLETIN  
NEWS RELEASE  
NEWSLETTER  
OCCASIONAL PAPER  
OCCASIONAL PAPERS  
PROCEEDINGS  
PROCEEDINGS OF THE ANNUAL MEETING  
PROGRESS REPORT  
PROPOSED BUDGET  
PUBLICACIONES  
PUBLICATION  
PUBLICATIONS  
RAPPORT  
RAPPORT ANNUEL  
REPORT  
REPORT AND ACCOUNTS  
RESEARCH REPORT  
REVISTA  
SEMI ANNUAL REPORT TO THE CONGRESS  
SEMIANNUAL REPORT TO THE CONGRESS

```
SESSION LAWS
STATISTICAL REPORT
TECHNICAL BULLETIN
TECHNICAL REPORT
TRANSACTIONS
TRAVAUX
TRUDY
UPDATE
VEROEFFENTLICHUNGEN
VEROFFENTLICHUNGEN
WORKS
YEAR BOOK
YEARBOOK
TELEPHONE DIRECTORY
```

**CDLSeCommonTitleList.xml File**

---

## ClientCommonTitles.txt

The `ClientCommonTitles.txt` file allows you to add local titles, which are not included in the `CDLSeCommonTitleList.txt` file. These files are used by the algorithm to determine matches. Note that the `ClientCommonTitles.txt` file will not be overridden during an SP update.

## Out-of-the-Box Latin Normalization for Indexing and Searching

The table below summarizes the out-of-the-box normalizations for Latin characters, including the standard hard-coded normalizations provided with Lucene and the normalizations defined in the following file:

`non_cjk_unicode_normalization.txt`

For more information, see [Normalization of Characters in Primo](#).

### Note

The system changes all characters to lowercase after the normalization (if not already lowercase).

Out-of-the-Box Normalization

Original Character	Normalized Character	Description
0000	0020	# <control> ( ' ' to ' ' )
0001	0020	# <control> ( " to ' ' )
0002	0020	# <control> ( " to ' ' )
0003	0020	# <control> ( ' ' to ' ' )
0004	0020	# <control> ( ' ' to ' ' )
0005	0020	# <control> ( " to ' ' )
0006	0020	# <control> ( " to ' ' )
0007	0020	# <control> ( " to ' ' )
0008	0020	# <control> ( " to ' ' )
0009	0020	# <control> ( " to ' ' )

Original Character	Normalized Character	Description
000A	0020	# <control> ( " to ' ' )
000B	0020	# <control> ( " to ' ' )
000C	0020	# <control> ( " to ' ' )
000D	0020	# <control> ( " to ' ' )
000E	0020	# <control> ( " to ' ' )
000F	0020	# <control> ( " to ' ' )
0010	0020	# <control> ( " to ' ' )
0011	0020	# <control> ( " to ' ' )
0012	0020	# <control> ( " to ' ' )
0013	0020	# <control> ( " to ' ' )
0014	0020	# <control> ( " to ' ' )
0015	0020	# <control> ( " to ' ' )
0016	0020	# <control> ( " to ' ' )
0017	0020	# <control> ( " to ' ' )
0018	0020	# <control> ( " to ' ' )
0019	0020	# <control> ( " to ' ' )

Original Character	Normalized Character	Description
001A	0020	# <control> ( " to ' ' )
001B	0020	# <control> ( " to ' ' )
001C	0020	# <control> ( " to ' ' )
001D	0020	# <control> ( " to ' ' )
001E	0020	# <control> ( ' ' to ' ' )
001F	0020	# <control> ( " to ' ' )
0041	0061	# LATIN CAPITAL LETTER A ( 'A' to 'a' )
0042	0062	# LATIN CAPITAL LETTER B ( 'B' to 'b' )
0043	0063	# LATIN CAPITAL LETTER C ( 'C' to 'c' )
0044	0064	# LATIN CAPITAL LETTER D ( 'D' to 'd' )
0045	0065	# LATIN CAPITAL LETTER E ( 'E' to 'e' )
0046	0066	# LATIN CAPITAL LETTER F ( 'F' to 'f' )
0047	0067	# LATIN CAPITAL LETTER G ( 'G' to 'g' )
0048	0068	# LATIN CAPITAL LETTER H ( 'H' to 'h' )
0049	0069	# LATIN CAPITAL LETTER I ( 'I' to 'i' )
004A	006A	# LATIN CAPITAL LETTER J ( 'J' to 'j' )

Original Character	Normalized Character	Description
004B	006B	# LATIN CAPITAL LETTER K ( 'K' to 'k' )
004C	006C	# LATIN CAPITAL LETTER L ( 'L' to 'l' )
004D	006D	# LATIN CAPITAL LETTER M ( 'M' to 'm' )
004E	006E	# LATIN CAPITAL LETTER N ( 'N' to 'n' )
004F	006F	# LATIN CAPITAL LETTER O ( 'O' to 'o' )
0050	0070	# LATIN CAPITAL LETTER P ( 'P' to 'p' )
0051	0071	# LATIN CAPITAL LETTER Q ( 'Q' to 'q' )
0052	0072	# LATIN CAPITAL LETTER R ( 'R' to 'r' )
0053	0073	# LATIN CAPITAL LETTER S ( 'S' to 's' )
0054	0074	# LATIN CAPITAL LETTER T ( 'T' to 't' )
0055	0075	# LATIN CAPITAL LETTER U ( 'U' to 'u' )
0056	0076	# LATIN CAPITAL LETTER V ( 'V' to 'v' )
0057	0077	# LATIN CAPITAL LETTER W ( 'W' to 'w' )
0058	0078	# LATIN CAPITAL LETTER X ( 'X' to 'x' )
0059	0079	# LATIN CAPITAL LETTER Y ( 'Y' to 'y' )
005A	007A	# LATIN CAPITAL LETTER Z ( 'Z' to 'z' )

Original Character	Normalized Character	Description
00A0	0020	# NO-BREAK SPACE ( ' ' to ' ' )
00A1	0020	# INVERTED EXCLAMATION MARK ( '¡' to ' ' )
00A2	0043	#CENT SIGN ( ¢ to C )
00A6	0020	# BROKEN BAR ( '¦' to ' ' )
00A8	0020	# DIAERESIS ( '¨' to ' ' )
00AA	0020	# FEMININE ORDINAL INDICATOR ( 'ª' to ' ' )
00AB	0020	# LEFT-POINTING DOUBLE ANGLE QUOTATION MARK ( '«' to ' ' )
00AC	0020	# NOT SIGN ( '¬' to ' ' )
00AD	0020	# SOFT HYPHEN ( '­' to ' ' )
00AF	0000	# MACRON ( '¯' to ' ' )
00B0	0020	# DEGREE SIGN ( '°' to ' ' )
00B1	0020	# PLUS-MINUS SIGN ( '±' to ' ' )
00B2	0032	# SUPERSCRIPT TWO ( '²' to '2' )
00B3	0033	# SUPERSCRIPT THREE ( '³' to '3' )
00B4	0000	# ACUTE ACCENT ( '´' to ' ' )
00B6	0020	# PILCROW SIGN ( '¶' to ' ' )

Original Character	Normalized Character	Description
00B7	0000	# MIDDLE DOT ( '.' to '' )
00B8	0000	# CEDILLA ( '¸' to '' )
00B9	0031	# SUPERSCRIPT ONE ( '¹' to '1' )
00BA	0000	# MASCULINE ORDINAL INDICATOR ( 'º' to '' )
00BB	0020	# RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK ( '»' to '' )
00BC	0034	# VULGAR FRACTION ONE QUARTER ( '¼' to '4' )
00BD	0032	# VULGAR FRACTION ONE HALF ( '½' to '2' )
00BE	0034	# VULGAR FRACTION THREE QUARTERS ( '¾' to '4' )
00BF	0020	# INVERTED QUESTION MARK ( '¿' to '' )
00C0	0061	# LATIN CAPITAL LETTER A WITH GRAVE ( 'À' to 'a' )
00C1	0061	# LATIN CAPITAL LETTER A WITH ACUTE ( 'Á' to 'a' )
00C2	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX ( 'Â' to 'a' )
00C3	0061	# LATIN CAPITAL LETTER A WITH TILDE ( 'Ã' to 'a' )
00C4	If locale is <b>ger</b> : 0041 All others: 0041+0045	# LATIN CAPITAL LETTER A WITH DIAERESIS If locale is <b>ger</b> , then Ä' to A. Otherwise, Ä' to AE.
00C5	0041+0041	# LATIN CAPITAL LETTER A WITH RING ABOVE ( 'Ä' to 'AA' )

Original Character	Normalized Character	Description
00C6	0041+0045	# LATIN CAPITAL LETTER AE ( 'Æ' to 'AE' )
00C7	0063	# LATIN CAPITAL LETTER C WITH CEDILLA ( 'Ç' to 'c' )
00C8	0065	# LATIN CAPITAL LETTER E WITH GRAVE ( 'È' to 'e' )
00C9	0065	# LATIN CAPITAL LETTER E WITH ACUTE ( 'É' to 'e' )
00CA	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX ( 'Ê' to 'e' )
00CB	0065	# LATIN CAPITAL LETTER E WITH DIAERESIS ( 'Ë' to 'e' )
00CC	0069	# LATIN CAPITAL LETTER I WITH GRAVE ( 'Ì' to 'i' )
00CD	0069	# LATIN CAPITAL LETTER I WITH ACUTE ( 'Í' to 'i' )
00CE	0069	# LATIN CAPITAL LETTER I WITH CIRCUMFLEX ( 'Î' to 'i' )
00CF	0069	# LATIN CAPITAL LETTER I WITH DIAERESIS ( 'Ï' to 'i' )
00D0	0044	# LATIN CAPITAL LETTER ETH ( 'Ð' to 'D' )
00D1	006E	# LATIN CAPITAL LETTER N WITH TILDE ( 'Ñ' to 'n' )
00D2	006F	# LATIN CAPITAL LETTER O WITH GRAVE ( 'Ò' to 'o' )
00D3	006F	# LATIN CAPITAL LETTER O WITH ACUTE ( 'Ó' to 'o' )
00D4	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX ( 'Ô' to 'o' )
00D5	006F	# LATIN CAPITAL LETTER O WITH TILDE ( 'Õ' to 'o' )

Original Character	Normalized Character	Description
00D6	If locale is <b>ger</b> : 004F All others: 004F+0045	# If locale is <b>ger</b> , then LATIN CAPITAL LETTER O WITH DIAERESIS ( 'Ö' to "O"). Otherwise, LATIN CAPITAL LETTER O WITH DIAERESIS ( 'Ö' to "OE")
00D8	004F+0045	# LATIN CAPITAL LETTER O WITH STROKE ( 'Ø' to 'OE' )
00D9	0075	# LATIN CAPITAL LETTER U WITH GRAVE ( 'Û' to 'u' )
00DA	0075	# LATIN CAPITAL LETTER U WITH ACUTE ( 'Ú' to 'u' )
00DB	0075	# LATIN CAPITAL LETTER U WITH CIRCUMFLEX ( 'Û' to 'u' )
00DC	If locale is <b>ger</b> : 0055 All others: 0055+0045	# If locale is <b>ger</b> , LATIN CAPITAL LETTER U WITH DIAERESIS ( 'Ü' to 'U' ). Otherwise, ( 'Ú' to 'UE' ).
00DD	0079	# LATIN CAPITAL LETTER Y WITH ACUTE ( 'Ÿ' to 'y' )
00DE	0054+0048	# LATIN CAPITAL LETTER THORN ( 'Þ' to 'TH' )
00DF	0073+0073	# LATIN SMALL LETTER SHARP S ( 'ß' to 'ss' )
00E0	0061	# LATIN SMALL LETTER A WITH GRAVE ( 'à' to 'a' )
00E1	0061	# LATIN SMALL LETTER A WITH ACUTE ( 'á' to 'a' )
00E2	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX ( 'â' to 'a' )
00E3	0061	# LATIN SMALL LETTER A WITH TILDE ( 'ã' to 'a' )

Original Character	Normalized Character	Description
00E4	If locale is <b>ger</b> : 0061 All others: 0061+0056	# If locale is <b>ger</b> , then LATIN SMALL LETTER A WITH DIAERESIS ( 'ä' to 'a' ). Otherwise, ( 'ä' to 'ae' ).
00E5	0061+0061	# LATIN SMALL LETTER A WITH RING ABOVE ( 'å' to 'aa' )
00E6	0061+0065	# LATIN SMALL LETTER AE ( 'æ' to 'ae' )
00E7	0063	# LATIN SMALL LETTER C WITH CEDILLA ( 'ç' to 'c' )
00E8	0065	# LATIN SMALL LETTER E WITH GRAVE ( 'è' to 'e' )
00E9	0065	# LATIN SMALL LETTER E WITH ACUTE ( 'é' to 'e' )
00EA	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX ( 'ê' to 'e' )
00EB	0065	# LATIN SMALL LETTER E WITH DIAERESIS ( 'ë' to 'e' )
00EC	0069	# LATIN SMALL LETTER I WITH GRAVE ( 'ì' to 'i' )
00ED	0069	# LATIN SMALL LETTER I WITH ACUTE ( 'í' to 'i' )
00EE	0069	# LATIN SMALL LETTER I WITH CIRCUMFLEX ( 'î' to 'i' )
00EF	0069	# LATIN SMALL LETTER I WITH DIAERESIS ( 'ï' to 'i' )
00F0	0064	#LATIN SMALL LETTER ETH
00F1	006E	# LATIN SMALL LETTER N WITH TILDE ( 'ñ' to 'n' )
00F2	006F	# LATIN SMALL LETTER O WITH GRAVE ( 'ò' to 'o' )

Original Character	Normalized Character	Description
00F3	006F	# LATIN SMALL LETTER O WITH ACUTE ( 'ó' to 'o' )
00F4	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX ( 'ô' to 'o' )
00F5	006F	# LATIN SMALL LETTER O WITH TILDE ( 'õ' to 'o' )
00F6	If locale is <b>ger</b> : 006F All others: 006F+0065	# If locale is <b>ger</b> , then LATIN SMALL LETTER O WITH DIAERESIS ( 'ö' to 'o' ). Otherwise, ( 'ö' to 'oe' ).
00F8	006F+0065	# LATIN SMALL LETTER O WITH STROKE ( 'ø' to 'oe' )
00F9	0075	# LATIN SMALL LETTER U WITH GRAVE ( 'ù' to 'u' )
00FA	0075	# LATIN SMALL LETTER U WITH ACUTE ( 'ú' to 'u' )
00FB	0075	# LATIN SMALL LETTER U WITH CIRCUMFLEX ( 'û' to 'u' )
00FC	If locale is <b>ger</b> : 0075 All others: 0075+0065	# If locale is <b>ger</b> , then LATIN SMALL LETTER U WITH DIAERESIS ( 'ü' to 'u' ). Otherwise, ( 'ü' to 'ue' ).
00FD	0079	# LATIN SMALL LETTER Y WITH ACUTE ( 'ý' to 'y' )
00FE	0074+0068	# LATIN SMALL LETTER THORN ( 'þ' to 'th' )
00FF	0079	# LATIN SMALL LETTER Y WITH DIAERESIS ( 'ÿ' to 'y' )
0100	0061	# LATIN CAPITAL LETTER A WITH MACRON ( 'Ā' to 'a' )
0101	0061	# LATIN SMALL LETTER A WITH MACRON ( 'ā' to 'a' )

Original Character	Normalized Character	Description
0102	0061	# LATIN CAPITAL LETTER A WITH BREVE ( 'Ă' to 'a' )
0103	0061	# LATIN SMALL LETTER A WITH BREVE ( 'ă' to 'a' )
0104	0061	# LATIN CAPITAL LETTER A WITH OGONEK ( 'Ą' to 'a' )
0105	0061	# LATIN SMALL LETTER A WITH OGONEK ( 'ą' to 'a' )
0106	0063	# LATIN CAPITAL LETTER C WITH ACUTE ( 'Ć' to 'c' )
0107	0063	# LATIN SMALL LETTER C WITH ACUTE ( 'ć' to 'c' )
0108	0063	# LATIN CAPITAL LETTER C WITH CIRCUMFLEX ( 'Ĉ' to 'c' )
0109	0063	# LATIN SMALL LETTER C WITH CIRCUMFLEX ( 'ĉ' to 'c' )
010A	0063	# LATIN CAPITAL LETTER C WITH DOT ABOVE ( 'Ċ' to 'c' )
010B	0063	# LATIN SMALL LETTER C WITH DOT ABOVE ( 'ċ' to 'c' )
010C	0043+0048	# LATIN CAPITAL LETTER C WITH CARON ( 'Č' to 'CH' )
010D	0063+0068	# LATIN SMALL LETTER C WITH CARON ( 'č' to 'ch' )
010E	0064	# LATIN CAPITAL LETTER D WITH CARON ( 'Ď' to 'd' )
010F	0064	# LATIN SMALL LETTER D WITH CARON ( 'ď' to 'd' )
0110	0064	# LATIN CAPITAL LETTER D WITH STROKE ( 'Ð' to 'd' )
0111	0064	# LATIN SMALL LETTER D WITH STROKE ( 'ð' to 'd' )

Original Character	Normalized Character	Description
0112	0065	# LATIN CAPITAL LETTER E WITH MACRON ( 'Ē' to 'e' )
0113	0065	# LATIN SMALL LETTER E WITH MACRON ( 'ē' to 'e' )
0114	0065	# LATIN CAPITAL LETTER E WITH BREVE ( 'Ĕ' to 'e' )
0115	0065	# LATIN SMALL LETTER E WITH BREVE ( 'ĕ' to 'e' )
0116	0065	# LATIN CAPITAL LETTER E WITH DOT ABOVE ( 'Ė' to 'e' )
0117	0065	# LATIN SMALL LETTER E WITH DOT ABOVE ( 'ė' to 'e' )
0118	0065	# LATIN CAPITAL LETTER E WITH OGONEK ( 'Ę' to 'e' )
0119	0065	# LATIN SMALL LETTER E WITH OGONEK ( 'ę' to 'e' )
011A	0059+0045	# LATIN CAPITAL LETTER E WITH CARON ( 'Ě' to 'YE' )
011B	0079+0065	# LATIN SMALL LETTER E WITH CARON ( 'ě' to 'ye' )
011C	0067	# LATIN CAPITAL LETTER G WITH CIRCUMFLEX ( 'Ĝ' to 'g' )
011D	0067	# LATIN SMALL LETTER G WITH CIRCUMFLEX ( 'ĝ' to 'g' )
011E	0067	# LATIN CAPITAL LETTER G WITH BREVE ( 'Ģ' to 'g' )
011F	0067	# LATIN SMALL LETTER G WITH BREVE ( 'ģ' to 'g' )
0120	0067	# LATIN CAPITAL LETTER G WITH DOT ABOVE ( 'Ġ' to 'g' )
0121	0067	# LATIN SMALL LETTER G WITH DOT ABOVE ( 'ġ' to 'g' )

Original Character	Normalized Character	Description
0122	0067	# LATIN CAPITAL LETTER G WITH CEDILLA ( 'Ġ' to 'g' )
0123	0067	# LATIN SMALL LETTER G WITH CEDILLA ( 'ġ' to 'g' )
0124	0068	# LATIN CAPITAL LETTER H WITH CIRCUMFLEX ( 'Ĥ' to 'h' )
0125	0068	# LATIN SMALL LETTER H WITH CIRCUMFLEX ( 'ĥ' to 'h' )
0126	0068	# LATIN CAPITAL LETTER H WITH STROKE ( 'Ħ' to 'h' )
0127	0068	# LATIN SMALL LETTER H WITH STROKE ( 'ħ' to 'h' )
0128	0069	# LATIN CAPITAL LETTER I WITH TILDE ( 'İ' to 'i' )
0129	0069	# LATIN SMALL LETTER I WITH TILDE ( 'ı' to 'i' )
012A	0069	# LATIN CAPITAL LETTER I WITH MACRON ( 'Ī' to 'i' )
012B	0069	# LATIN SMALL LETTER I WITH MACRON ( 'ī' to 'i' )
012C	0069	# LATIN CAPITAL LETTER I WITH BREVE ( 'İ̆' to 'i' )
012D	0069	# LATIN SMALL LETTER I WITH BREVE ( 'ĭ' to 'i' )
012E	0069	# LATIN CAPITAL LETTER I WITH OGONEK ( 'Į' to 'i' )
012F	0069	# LATIN SMALL LETTER I WITH OGONEK ( 'į' to 'i' )
0130	0069	# LATIN CAPITAL LETTER I WITH DOT ABOVE ( 'İ̇' to 'i' )
0131	0069	# LATIN SMALL LETTER DOTLESS I ( 'i' to 'i' )

Original Character	Normalized Character	Description
0132	006A	# LATIN CAPITAL LIGATURE IJ ( 'IJ' to 'j' )
0133	006A	# LATIN SMALL LIGATURE IJ ( 'ij' to 'j' )
0134	006A	# LATIN CAPITAL LETTER J WITH CIRCUMFLEX ( 'Ĵ' to 'j' )
0135	006A	# LATIN SMALL LETTER J WITH CIRCUMFLEX ( 'ĵ' to 'j' )
0136	004B	# LATIN CAPITAL LETTER K WITH CEDILLA ( 'Ķ' to 'K' )
0137	006B	# LATIN SMALL LETTER K WITH CEDILLA ( 'ķ' to 'k' )
0139	006C	# LATIN CAPITAL LETTER L WITH ACUTE ( 'Ĺ' to 'l' )
013A	006C	# LATIN SMALL LETTER L WITH ACUTE ( 'ĺ' to 'l' )
013B	006C	# LATIN CAPITAL LETTER L WITH CEDILLA ( 'Ľ' to 'l' )
013C	006C	# LATIN SMALL LETTER L WITH CEDILLA ( 'ĺ' to 'l' )
013D	006C	# LATIN CAPITAL LETTER L WITH CARON ( 'Ľ' to 'l' )
013E	006C	# LATIN SMALL LETTER L WITH CARON ( 'ľ' to 'l' )
013F	006C	# LATIN CAPITAL LETTER L WITH MIDDLE DOT ( 'Ĺ' to 'l' )
0140	006C	# LATIN SMALL LETTER L WITH MIDDLE DOT ( 'ĺ' to 'l' )
0141	006C	# LATIN CAPITAL LETTER L WITH STROKE ( 'Ł' to 'l' )
0142	006C	# LATIN SMALL LETTER L WITH STROKE ( 'ł' to 'l' )

Original Character	Normalized Character	Description
0143	006E	# LATIN CAPITAL LETTER N WITH ACUTE ( 'Ñ' to 'n' )
0144	006E	# LATIN SMALL LETTER N WITH ACUTE ( 'ñ' to 'n' )
0145	006E	# LATIN CAPITAL LETTER N WITH CEDILLA ( 'Ñ' to 'n' )
0146	006E	# LATIN SMALL LETTER N WITH CEDILLA ( 'ñ' to 'n' )
0147	006E	# LATIN CAPITAL LETTER N WITH CARON ( 'Ň' to 'n' )
0148	006E	# LATIN SMALL LETTER N WITH CARON ( 'ň' to 'n' )
0149	006E	# LATIN SMALL LETTER N PRECEDED BY APOSTROPHE ( 'n' to 'n' )
014A	006E	# LATIN CAPITAL LETTER ENG ( 'Ŋ' to 'n' )
014B	006E	# LATIN SMALL LETTER ENG ( 'ŋ' to 'n' )
014C	006F	# LATIN CAPITAL LETTER O WITH MACRON ( 'Ō' to 'o' )
014D	006F	# LATIN SMALL LETTER O WITH MACRON ( 'ō' to 'o' )
014E	006F	# LATIN CAPITAL LETTER O WITH BREVE ( 'Ŏ' to 'o' )
014F	006F	# LATIN SMALL LETTER O WITH BREVE ( 'ö' to 'o' )
0150	006F	# LATIN CAPITAL LETTER O WITH DOUBLE ACUTE ( 'Ő' to 'o' )
0151	006F	# LATIN SMALL LETTER O WITH DOUBLE ACUTE ( 'ő' to 'o' )
0152	004F+0045	# LATIN CAPITAL LIGATURE OE ( 'Œ' to 'OE' )

Original Character	Normalized Character	Description
0153	006F+0065	# LATIN SMALL LIGATURE OE ( 'œ' to 'oe' )
0154	0072	# LATIN CAPITAL LETTER R WITH ACUTE ( 'Ŕ' to 'r' )
0155	0072	# LATIN SMALL LETTER R WITH ACUTE ( 'ŕ' to 'r' )
0156	0072	# LATIN CAPITAL LETTER R WITH CEDILLA ( 'Ŗ' to 'r' )
0157	0072	# LATIN SMALL LETTER R WITH CEDILLA ( 'ŗ' to 'r' )
0158	0072	# LATIN CAPITAL LETTER R WITH CARON ( 'Ř' to 'r' )
0159	0072	# LATIN SMALL LETTER R WITH CARON ( 'ř' to 'r' )
015A	0073	# LATIN CAPITAL LETTER S WITH ACUTE ( 'Ś' to 's' )
015B	0073	# LATIN SMALL LETTER S WITH ACUTE ( 'ś' to 's' )
015C	0073	# LATIN CAPITAL LETTER S WITH CIRCUMFLEX ( 'Ŝ' to 's' )
015D	0073	# LATIN SMALL LETTER S WITH CIRCUMFLEX ( 'ŝ' to 's' )
015E	0073	# LATIN CAPITAL LETTER S WITH CEDILLA ( 'Ş' to 's' )
015F	0073	# LATIN SMALL LETTER S WITH CEDILLA ( 'ş' to 's' )
0160	0053+0048	# LATIN CAPITAL LETTER S WITH CARON ( 'Š' to 'SH' )
0161	0073+0068	# LATIN SMALL LETTER S WITH CARON ( 'š' to 'sh' )
0162	0074	# LATIN CAPITAL LETTER T WITH CEDILLA ( 'Ṭ' to 't' )

Original Character	Normalized Character	Description
0163	0074	# LATIN SMALL LETTER T WITH CEDILLA ( 'ț' to 't' )
0164	0074	# LATIN CAPITAL LETTER T WITH CARON ( 'ř' to 't' )
0165	0074	# LATIN SMALL LETTER T WITH CARON ( 'ř' to 't' )
0166	0074	# LATIN CAPITAL LETTER T WITH STROKE ( 'Ŧ' to 't' )
0167	0074	# LATIN SMALL LETTER T WITH STROKE ( 'ŧ' to 't' )
0168	0075	# LATIN CAPITAL LETTER U WITH TILDE ( 'Ū' to 'u' )
0169	0075	# LATIN SMALL LETTER U WITH TILDE ( 'ū' to 'u' )
016A	0075	# LATIN CAPITAL LETTER U WITH MACRON ( 'Ū' to 'u' )
016B	0075	# LATIN SMALL LETTER U WITH MACRON ( 'ū' to 'u' )
016C	0075	# LATIN CAPITAL LETTER U WITH BREVE ( 'Ů' to 'u' )
016D	0075	# LATIN SMALL LETTER U WITH BREVE ( 'ů' to 'u' )
016E	004F+004F	# LATIN CAPITAL LETTER U WITH RING ABOVE ( 'Ů' to 'OO' )
016F	006F+006F	# LATIN SMALL LETTER U WITH RING ABOVE ( 'ů' to 'oo' )
0170	0075	# LATIN CAPITAL LETTER U WITH DOUBLE ACUTE ( 'Ů' to 'u' )
0171	0075	# LATIN SMALL LETTER U WITH DOUBLE ACUTE ( 'ů' to 'u' )
0172	0075	# LATIN CAPITAL LETTER U WITH OGONEK ( 'Ų' to 'u' )

Original Character	Normalized Character	Description
0173	0075	# LATIN SMALL LETTER U WITH OGONEK ( 'u' to 'u' )
0174	0077	# LATIN CAPITAL LETTER W WITH CIRCUMFLEX ( 'W' to 'w' )
0175	0077	# LATIN SMALL LETTER W WITH CIRCUMFLEX ( 'w' to 'w' )
0176	0079	# LATIN CAPITAL LETTER Y WITH CIRCUMFLEX ( 'Y' to 'y' )
0177	0079	# LATIN SMALL LETTER Y WITH CIRCUMFLEX ( 'y' to 'y' )
0178	0079	# LATIN CAPITAL LETTER Y WITH DIAERESIS ( 'Y' to 'y' )
0179	007A	# LATIN CAPITAL LETTER Z WITH ACUTE ( 'Z' to 'z' )
017A	007A	# LATIN SMALL LETTER Z WITH ACUTE ( 'z' to 'z' )
017B	007A	# LATIN CAPITAL LETTER Z WITH DOT ABOVE ( 'Z' to 'z' )
017C	0078+0068	# LATIN SMALL LETTER Z WITH DOT ABOVE ( 'z' to 'zh' )
017D	007A	# LATIN CAPITAL LETTER Z WITH CARON ( 'Z' to 'z' )
017E	007A+0068	# LATIN SMALL LETTER Z WITH CARON ( 'z' to 'zh' )
017F	0073	# LATIN SMALL LETTER LONG S ( 'f' to 's' )
0180	0062	# LATIN SMALL LETTER B WITH STROKE ( 'b' to 'b' )
0181	0062	# LATIN CAPITAL LETTER B WITH HOOK ( 'B' to 'b' )
0182	0062	# LATIN CAPITAL LETTER B WITH TOPBAR ( 'B' to 'b' )

Original Character	Normalized Character	Description
0183	0062	# LATIN SMALL LETTER B WITH TOPBAR ( 'b̄' to 'b' )
0184	0185	# LATIN CAPITAL LETTER TONE SIX ( 'b̄' to '?' )
0186	006F	# LATIN CAPITAL LETTER OPEN O ( 'b̄' to 'o' )
0187	0063	# LATIN CAPITAL LETTER C WITH HOOK ( 'C̄' to 'c' )
0188	0063	# LATIN SMALL LETTER C WITH HOOK ( 'c̄' to 'c' )
0189	0064	# LATIN CAPITAL LETTER AFRICAN D ( 'D̄' to 'd' )
018A	0064	# LATIN CAPITAL LETTER D WITH HOOK ( 'D̄' to 'd' )
018C	0040	# LATIN SMALL LETTER D WITH TOPBAR ( 'd̄' to '@' )
018D	0040	# LATIN SMALL LETTER TURNED DELTA ( 'q̄' to '@' )
018E	0065	# LATIN CAPITAL LETTER REVERSED E ( 'Ē' to 'e' )
0190	0065	# LATIN CAPITAL LETTER OPEN E ( 'Ē' to 'e' )
0191	0066	# LATIN CAPITAL LETTER F WITH HOOK ( 'F̄' to 'f' )
0192	0066	# LATIN SMALL LETTER F WITH HOOK ( 'f̄' to 'f' )
0193	0067	# LATIN CAPITAL LETTER G WITH HOOK ( 'Ḡ' to 'g' )
0194	0067	# LATIN CAPITAL LETTER GAMMA ( 'Ȳ' to 'g' )
0197	0069	# LATIN CAPITAL LETTER I WITH STROKE ( 'Ī' to 'i' )

Original Character	Normalized Character	Description
0198	006B	# LATIN CAPITAL LETTER K WITH HOOK ( 'K' to 'k' )
0199	006B	# LATIN SMALL LETTER K WITH HOOK ( 'k' to 'k' )
019A	006C	# LATIN SMALL LETTER L WITH BAR ( 'l' to 'l' )
019B	006C	# LATIN SMALL LETTER LAMBDA WITH STROKE ( 'λ' to 'l' )
019D	006E	# LATIN CAPITAL LETTER N WITH LEFT HOOK ( 'N' to 'n' )
019F	006F	# LATIN CAPITAL LETTER O WITH MIDDLE TILDE ( 'Ø' to 'o' )
01A0	006F	# LATIN CAPITAL LETTER O WITH HORN ( 'ø' to 'o' )
01A1	006F	# LATIN SMALL LETTER O WITH HORN ( 'Ø' to 'o' )
01A4	0070	# LATIN CAPITAL LETTER P WITH HOOK ( 'P' to 'p' )
01A5	0070	# LATIN SMALL LETTER P WITH HOOK ( 'p' to 'p' )
01A7	01A8	# LATIN CAPITAL LETTER TONE TWO ( 'Z' to '?' )
01AB	0074	# LATIN SMALL LETTER T WITH PALATAL HOOK ( 't̃' to 't' )
01AC	0074	# LATIN CAPITAL LETTER T WITH HOOK ( 'T' to 't' )
01AD	0074	# LATIN SMALL LETTER T WITH HOOK ( 't' to 't' )
01AE	0074	# LATIN CAPITAL LETTER T WITH RETROFLEX HOOK ( 'Ṭ' to 't' )
01AF	0075	# LATIN CAPITAL LETTER U WITH HORN ( 'U' to 'u' )

Original Character	Normalized Character	Description
01B0	0075	# LATIN SMALL LETTER U WITH HORN ( 'u' to 'u' )
01B2	0076	# LATIN CAPITAL LETTER V WITH HOOK ( 'V' to 'v' )
01B3	0079	# LATIN CAPITAL LETTER Y WITH HOOK ( 'Y' to 'y' )
01B4	0079	# LATIN SMALL LETTER Y WITH HOOK ( 'y' to 'y' )
01B5	007A	# LATIN CAPITAL LETTER Z WITH STROKE ( 'Z' to 'z' )
01B6	007A	# LATIN SMALL LETTER Z WITH STROKE ( 'z' to 'z' )
01B8	01B9	# LATIN CAPITAL LETTER EZH REVERSED ( 'Ʒ' to '?' )
01BC	01BD	# LATIN CAPITAL LETTER TONE FIVE ( '5' to '?' )
01C4	0044+005A	# LATIN CAPITAL LETTER DZ WITH CARON
01C6	0064+007A	# LATIN SMALL LETTER DZ WITH CARON
01C7	004C+004A	# LATIN CAPITAL LETTER LJ (LJ to LJ)
01C9	006C+00CA	# LATIN SMALL LETTER lj (lk to lj)
01CA	004E+004A	# LATIN CAPITAL LETTER LJ ('NJ' to 'NJ')
01CC	006E+006A	#LATIN SMALL LETTER nj ('nj' to 'nj')
01CD	0061	# LATIN CAPITAL LETTER A WITH CARON ( 'Ā' to 'a' )
01CE	0061	# LATIN SMALL LETTER A WITH CARON ( 'ā' to 'a' )

Original Character	Normalized Character	Description
01CF	0069	# LATIN CAPITAL LETTER I WITH CARON ( 'Ī' to 'i' )
01D0	0069	# LATIN SMALL LETTER I WITH CARON ( 'ī' to 'i' )
01D1	006F	# LATIN CAPITAL LETTER O WITH CARON ( 'Ŏ' to 'o' )
01D2	006F	# LATIN SMALL LETTER O WITH CARON ( 'ö' to 'o' )
01D3	0075	# LATIN CAPITAL LETTER U WITH CARON ( 'Ů' to 'u' )
01D4	0075	# LATIN SMALL LETTER U WITH CARON ( 'ů' to 'u' )
01D5	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND MACRON ( 'Û' to 'u' )
01D6	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND MACRON ( 'ü' to 'u' )
01D7	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND ACUTE ( 'Û' to 'u' )
01D8	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND ACUTE ( 'ú' to 'u' )
01D9	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND CARON ( 'Û' to 'u' )
01DA	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND CARON ( 'ü' to 'u' )
01DB	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND GRAVE ( 'Û' to 'u' )
01DC	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND GRAVE ( 'ə' to 'u' )
01DE	0061	# LATIN CAPITAL LETTER A WITH DIAERESIS AND MACRON ( 'Ā' to 'a' )
01DF	0061	# LATIN SMALL LETTER A WITH DIAERESIS AND MACRON ( 'ā' to 'a' )

Original Character	Normalized Character	Description
01E0	0061	# LATIN CAPITAL LETTER A WITH DOT ABOVE AND MACRON ( 'Ā' to 'a' )
01E1	0061	# LATIN SMALL LETTER A WITH DOT ABOVE AND MACRON ( 'ā' to 'a' )
01E2	0065	# LATIN CAPITAL LETTER AE WITH MACRON ( 'Ā̄' to 'e' )
01E3	0065	# LATIN SMALL LETTER AE WITH MACRON ( 'ā̄' to 'e' )
01E4	0067	# LATIN CAPITAL LETTER G WITH STROKE ( 'Ĝ' to 'g' )
01E5	0067	# LATIN SMALL LETTER G WITH STROKE ( 'ĝ' to 'g' )
01E6	0067	# LATIN CAPITAL LETTER G WITH CARON ( 'Ě' to 'g' )
01E7	0067	# LATIN SMALL LETTER G WITH CARON ( 'ě' to 'g' )
01E8	006B	# LATIN CAPITAL LETTER K WITH CARON ( 'Ě' to 'k' )
01E9	006B	# LATIN SMALL LETTER K WITH CARON ( 'ě' to 'k' )
01EA	006F	# LATIN CAPITAL LETTER O WITH OGONEK ( 'Ų' to 'o' )
01EB	006F	# LATIN SMALL LETTER O WITH OGONEK ( 'ų' to 'o' )
01EC	006F	# LATIN CAPITAL LETTER O WITH OGONEK AND MACRON ( 'Ų̄' to 'o' )
01ED	006F	# LATIN SMALL LETTER O WITH OGONEK AND MACRON ( 'ų̄' to 'o' )
01F0	006A	# LATIN SMALL LETTER J WITH CARON ( 'Ĵ' to 'j' )
01F4	0067	# LATIN CAPITAL LETTER G WITH ACUTE ( 'Ĝ' to 'g' )

Original Character	Normalized Character	Description
01F5	0067	# LATIN SMALL LETTER G WITH ACUTE ( 'g' to 'g' )
01FA	0061	# LATIN CAPITAL LETTER A WITH RING ABOVE AND ACUTE ( 'Á' to 'a' )
01FB	0061	# LATIN SMALL LETTER A WITH RING ABOVE AND ACUTE ( 'á' to 'a' )
01FC	0065	# LATIN CAPITAL LETTER AE WITH ACUTE ( 'Æ' to 'e' )
01FD	0065	# LATIN SMALL LETTER AE WITH ACUTE ( 'æ' to 'e' )
01FE	006F	# LATIN CAPITAL LETTER O WITH STROKE AND ACUTE ( 'Ø' to 'o' )
01FF	006F	# LATIN SMALL LETTER O WITH STROKE AND ACUTE ( 'ø' to 'o' )
0200	0061	# LATIN CAPITAL LETTER A WITH DOUBLE GRAVE ( 'Ä' to 'a' )
0201	0061	# LATIN SMALL LETTER A WITH DOUBLE GRAVE ( 'ä' to 'a' )
0202	0061	# LATIN CAPITAL LETTER A WITH INVERTED BREVE ( 'À' to 'a' )
0203	0061	# LATIN SMALL LETTER A WITH INVERTED BREVE ( 'à' to 'a' )
0204	0065	# LATIN CAPITAL LETTER E WITH DOUBLE GRAVE ( 'Ë' to 'e' )
0205	0065	# LATIN SMALL LETTER E WITH DOUBLE GRAVE ( 'ë' to 'e' )
0206	0065	# LATIN CAPITAL LETTER E WITH INVERTED BREVE ( 'Ê' to 'e' )
0207	0065	# LATIN SMALL LETTER E WITH INVERTED BREVE ( 'ê' to 'e' )
0208	0069	# LATIN CAPITAL LETTER I WITH DOUBLE GRAVE ( 'Ï' to 'i' )

Original Character	Normalized Character	Description
0209	0069	# LATIN SMALL LETTER I WITH DOUBLE GRAVE ( '?' to 'i' )
020A	0069	# LATIN CAPITAL LETTER I WITH INVERTED BREVE ( '?' to 'i' )
020B	0069	# LATIN SMALL LETTER I WITH INVERTED BREVE ( '?' to 'i' )
020C	006F	# LATIN CAPITAL LETTER O WITH DOUBLE GRAVE ( '?' to 'o' )
020D	006F	# LATIN SMALL LETTER O WITH DOUBLE GRAVE ( '?' to 'o' )
020E	006F	# LATIN CAPITAL LETTER O WITH INVERTED BREVE ( '?' to 'o' )
020F	006F	# LATIN SMALL LETTER O WITH INVERTED BREVE ( '?' to 'o' )
0210	0072	# LATIN CAPITAL LETTER R WITH DOUBLE GRAVE ( '?' to 'r' )
0211	0072	# LATIN SMALL LETTER R WITH DOUBLE GRAVE ( '?' to 'r' )
0212	0072	# LATIN CAPITAL LETTER R WITH INVERTED BREVE ( '?' to 'r' )
0213	0072	# LATIN SMALL LETTER R WITH INVERTED BREVE ( '?' to 'r' )
0214	0075	# LATIN CAPITAL LETTER U WITH DOUBLE GRAVE ( '?' to 'u' )
0215	0075	# LATIN SMALL LETTER U WITH DOUBLE GRAVE ( '?' to 'u' )
0216	0075	# LATIN CAPITAL LETTER U WITH INVERTED BREVE ( '?' to 'u' )
0217	0075	# LATIN SMALL LETTER U WITH INVERTED BREVE ( '?' to 'u' )
0250	0061	# LATIN SMALL LETTER TURNED A ( '?' to 'a' )

Original Character	Normalized Character	Description
0251	0061	# LATIN SMALL LETTER ALPHA ( '?' to 'a' )
0252	0061	# LATIN SMALL LETTER TURNED ALPHA ( '?' to 'a' )
0253	0062	# LATIN SMALL LETTER B WITH HOOK ( '?' to 'b' )
0254	006F	# LATIN SMALL LETTER OPEN O ( '?' to 'o' )
0255	0063	# LATIN SMALL LETTER C WITH CURL ( '?' to 'c' )
0256	0064	# LATIN SMALL LETTER D WITH TAIL ( '?' to 'd' )
0257	0064	# LATIN SMALL LETTER D WITH HOOK ( '?' to 'd' )
0258	0065	# LATIN SMALL LETTER REVERSED E ( '?' to 'e' )
0259	0279	# LATIN SMALL LETTER SCHWA ( '?' to '?' )
025A	027A	# LATIN SMALL LETTER SCHWA WITH HOOK ( '?' to '?' )
025B	0065	# LATIN SMALL LETTER OPEN E ( '?' to 'e' )
025F	006A	# LATIN SMALL LETTER DOTLESS J WITH STROKE ( '?' to 'j' )
0260	0067	# LATIN SMALL LETTER G WITH HOOK ( '?' to 'g' )
0261	0067	# LATIN SMALL LETTER SCRIPT G ( '?' to 'g' )
0262	0067	# LATIN LETTER SMALL CAPITAL G ( '?' to 'g' )
0263	0067	# LATIN SMALL LETTER GAMMA ( '?' to 'g' )

Original Character	Normalized Character	Description
0266	0068	# LATIN SMALL LETTER H WITH HOOK ( '?' to 'h' )
0268	0069	# LATIN SMALL LETTER I WITH STROKE ( '?' to 'i' )
026A	0069	# LATIN LETTER SMALL CAPITAL I ( '?' to 'i' )
026B	006C	# LATIN SMALL LETTER L WITH MIDDLE TILDE ( '?' to 'l' )
026C	006C	# LATIN SMALL LETTER L WITH BELT ( '?' to 'l' )
026D	006C	# LATIN SMALL LETTER L WITH RETROFLEX HOOK ( '?' to 'l' )
0271	006D	# LATIN SMALL LETTER M WITH HOOK ( '?' to 'm' )
0272	006E	# LATIN SMALL LETTER N WITH LEFT HOOK ( '?' to 'n' )
0273	006E	# LATIN SMALL LETTER N WITH RETROFLEX HOOK ( '?' to 'n' )
0274	006E	# LATIN LETTER SMALL CAPITAL N ( '?' to 'n' )
0275	006F	# LATIN SMALL LETTER BARRED O ( '?' to 'o' )
0276	0065	# LATIN LETTER SMALL CAPITAL OE ( '?' to 'e' )
027C	0072	# LATIN SMALL LETTER R WITH LONG LEG ( '?' to 'r' )
027D	0072	# LATIN SMALL LETTER R WITH TAIL ( '?' to 'r' )
0280	0072	# LATIN LETTER SMALL CAPITAL R ( '?' to 'r' )
0282	0073	# LATIN SMALL LETTER S WITH HOOK ( '?' to 's' )

Original Character	Normalized Character	Description
028F	0079	# LATIN LETTER SMALL CAPITAL Y ( '?' to 'y' )
0299	0062	# LATIN LETTER SMALL CAPITAL B ( '?' to 'b' )
029C	0068	# LATIN LETTER SMALL CAPITAL H ( '?' to 'h' )
029F	006C	# LATIN LETTER SMALL CAPITAL L ( '?' to 'l' )
1E00	0061	# LATIN CAPITAL LETTER A WITH RING BELOW ( '?' to 'a' )
1E01	0061	# LATIN SMALL LETTER A WITH RING BELOW ( '?' to 'a' )
1E02	0062	# LATIN CAPITAL LETTER B WITH DOT ABOVE ( '?' to 'b' )
1E03	0062	# LATIN SMALL LETTER B WITH DOT ABOVE ( '?' to 'b' )
1E04	0062	# LATIN CAPITAL LETTER B WITH DOT BELOW ( '?' to 'b' )
1E05	0062	# LATIN SMALL LETTER B WITH DOT BELOW ( '?' to 'b' )
1E06	0062	# LATIN CAPITAL LETTER B WITH LINE BELOW ( '?' to 'b' )
1E07	0062	# LATIN SMALL LETTER B WITH LINE BELOW ( '?' to 'b' )
1E08	0063	# LATIN CAPITAL LETTER C WITH CEDILLA AND ACUTE ( '?' to 'c' )
1E09	0063	# LATIN SMALL LETTER C WITH CEDILLA AND ACUTE ( '?' to 'c' )
1E0A	0064	# LATIN CAPITAL LETTER D WITH DOT ABOVE ( '?' to 'd' )
1E0B	0064	# LATIN SMALL LETTER D WITH DOT ABOVE ( '?' to 'd' )

Original Character	Normalized Character	Description
1E0C	0064	# LATIN CAPITAL LETTER D WITH DOT BELOW ( '?' to 'd' )
1E0D	0064	# LATIN SMALL LETTER D WITH DOT BELOW ( '?' to 'd' )
1E0E	0064	# LATIN CAPITAL LETTER D WITH LINE BELOW ( '?' to 'd' )
1E0F	0064	# LATIN SMALL LETTER D WITH LINE BELOW ( '?' to 'd' )
1E10	0064	# LATIN CAPITAL LETTER D WITH CEDILLA ( '?' to 'd' )
1E11	0064	# LATIN SMALL LETTER D WITH CEDILLA ( '?' to 'd' )
1E12	0064	# LATIN CAPITAL LETTER D WITH CIRCUMFLEX BELOW ( '?' to 'd' )
1E13	0064	# LATIN SMALL LETTER D WITH CIRCUMFLEX BELOW ( '?' to 'd' )
1E14	0065	# LATIN CAPITAL LETTER E WITH MACRON AND GRAVE ( '?' to 'e' )
1E15	0065	# LATIN SMALL LETTER E WITH MACRON AND GRAVE ( '?' to 'e' )
1E16	0065	# LATIN CAPITAL LETTER E WITH MACRON AND ACUTE ( '?' to 'e' )
1E17	0065	# LATIN SMALL LETTER E WITH MACRON AND ACUTE ( '?' to 'e' )
1E18	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX BELOW ( '?' to 'e' )
1E19	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX BELOW ( '?' to 'e' )
1E1A	0065	# LATIN CAPITAL LETTER E WITH TILDE BELOW ( '?' to 'e' )
1E1B	0065	# LATIN SMALL LETTER E WITH TILDE BELOW ( '?' to 'e' )

Original Character	Normalized Character	Description
1E1C	0065	# LATIN CAPITAL LETTER E WITH CEDILLA AND BREVE ( '?' to 'e' )
1E1D	0065	# LATIN SMALL LETTER E WITH CEDILLA AND BREVE ( '?' to 'e' )
1E1E	0066	# LATIN CAPITAL LETTER F WITH DOT ABOVE ( '?' to 'f' )
1E1F	0066	# LATIN SMALL LETTER F WITH DOT ABOVE ( '?' to 'f' )
1E20	0067	# LATIN CAPITAL LETTER G WITH MACRON ( '?' to 'g' )
1E21	0067	# LATIN SMALL LETTER G WITH MACRON ( '?' to 'g' )
1E22	0068	# LATIN CAPITAL LETTER H WITH DOT ABOVE ( '?' to 'h' )
1E23	0068	# LATIN SMALL LETTER H WITH DOT ABOVE ( '?' to 'h' )
1E24	0068	# LATIN CAPITAL LETTER H WITH DOT BELOW ( '?' to 'h' )
1E25	0068	# LATIN SMALL LETTER H WITH DOT BELOW ( '?' to 'h' )
1E26	0068	# LATIN CAPITAL LETTER H WITH DIAERESIS ( '?' to 'h' )
1E27	0068	# LATIN SMALL LETTER H WITH DIAERESIS ( '?' to 'h' )
1E28	0068	# LATIN CAPITAL LETTER H WITH CEDILLA ( '?' to 'h' )
1E29	0068	# LATIN SMALL LETTER H WITH CEDILLA ( '?' to 'h' )
1E2A	0068	# LATIN CAPITAL LETTER H WITH BREVE BELOW ( '?' to 'h' )
1E2B	0068	# LATIN SMALL LETTER H WITH BREVE BELOW ( '?' to 'h' )

Original Character	Normalized Character	Description
1E2C	0069	# LATIN CAPITAL LETTER I WITH TILDE BELOW ( '?' to 'i' )
1E2D	0069	# LATIN SMALL LETTER I WITH TILDE BELOW ( '?' to 'i' )
1E2E	0069	# LATIN CAPITAL LETTER I WITH DIAERESIS AND ACUTE ( '?' to 'i' )
1E2F	0069	# LATIN SMALL LETTER I WITH DIAERESIS AND ACUTE ( '?' to 'i' )
1E30	006B	# LATIN CAPITAL LETTER K WITH ACUTE ( '?' to 'k' )
1E31	006B	# LATIN SMALL LETTER K WITH ACUTE ( '?' to 'k' )
1E32	006B	# LATIN CAPITAL LETTER K WITH DOT BELOW ( '?' to 'k' )
1E33	006B	# LATIN SMALL LETTER K WITH DOT BELOW ( '?' to 'k' )
1E34	006B	# LATIN CAPITAL LETTER K WITH LINE BELOW ( '?' to 'k' )
1E35	006B	# LATIN SMALL LETTER K WITH LINE BELOW ( '?' to 'k' )
1E36	006C	# LATIN CAPITAL LETTER L WITH DOT BELOW ( '?' to 'l' )
1E37	006C	# LATIN SMALL LETTER L WITH DOT BELOW ( '?' to 'l' )
1E38	006C	# LATIN CAPITAL LETTER L WITH DOT BELOW AND MACRON ( '?' to 'l' )
1E39	006C	# LATIN SMALL LETTER L WITH DOT BELOW AND MACRON ( '?' to 'l' )
1E3A	006C	# LATIN CAPITAL LETTER L WITH LINE BELOW ( '?' to 'l' )
1E3B	006C	# LATIN SMALL LETTER L WITH LINE BELOW ( '?' to 'l' )

Original Character	Normalized Character	Description
1E3C	006C	# LATIN CAPITAL LETTER L WITH CIRCUMFLEX BELOW ( '?' to 'l' )
1E3D	006C	# LATIN SMALL LETTER L WITH CIRCUMFLEX BELOW ( '?' to 'l' )
1E3E	006D	# LATIN CAPITAL LETTER M WITH ACUTE ( '?' to 'm' )
1E3F	006D	# LATIN SMALL LETTER M WITH ACUTE ( '?' to 'm' )
1E40	006D	# LATIN CAPITAL LETTER M WITH DOT ABOVE ( '?' to 'm' )
1E41	006D	# LATIN SMALL LETTER M WITH DOT ABOVE ( '?' to 'm' )
1E42	006D	# LATIN CAPITAL LETTER M WITH DOT BELOW ( '?' to 'm' )
1E43	006D	# LATIN SMALL LETTER M WITH DOT BELOW ( '?' to 'm' )
1E44	006E	# LATIN CAPITAL LETTER N WITH DOT ABOVE ( '?' to 'n' )
1E45	006E	# LATIN SMALL LETTER N WITH DOT ABOVE ( '?' to 'n' )
1E46	006E	# LATIN CAPITAL LETTER N WITH DOT BELOW ( '?' to 'n' )
1E47	006E	# LATIN SMALL LETTER N WITH DOT BELOW ( '?' to 'n' )
1E48	006E	# LATIN CAPITAL LETTER N WITH LINE BELOW ( '?' to 'n' )
1E49	006E	# LATIN SMALL LETTER N WITH LINE BELOW ( '?' to 'n' )
1E4A	006E	# LATIN CAPITAL LETTER N WITH CIRCUMFLEX BELOW ( '?' to 'n' )
1E4B	006E	# LATIN SMALL LETTER N WITH CIRCUMFLEX BELOW ( '?' to 'n' )

Original Character	Normalized Character	Description
1E4C	006F	# LATIN CAPITAL LETTER O WITH TILDE AND ACUTE ( '?' to 'o' )
1E4D	006F	# LATIN SMALL LETTER O WITH TILDE AND ACUTE ( '?' to 'o' )
1E4E	006F	# LATIN CAPITAL LETTER O WITH TILDE AND DIAERESIS ( '?' to 'o' )
1E4F	006F	# LATIN SMALL LETTER O WITH TILDE AND DIAERESIS ( '?' to 'o' )
1E50	006F	# LATIN CAPITAL LETTER O WITH MACRON AND GRAVE ( '?' to 'o' )
1E51	006F	# LATIN SMALL LETTER O WITH MACRON AND GRAVE ( '?' to 'o' )
1E52	006F	# LATIN CAPITAL LETTER O WITH MACRON AND ACUTE ( '?' to 'o' )
1E53	006F	# LATIN SMALL LETTER O WITH MACRON AND ACUTE ( '?' to 'o' )
1E54	0070	# LATIN CAPITAL LETTER P WITH ACUTE ( '?' to 'p' )
1E55	0070	# LATIN SMALL LETTER P WITH ACUTE ( '?' to 'p' )
1E56	0070	# LATIN CAPITAL LETTER P WITH DOT ABOVE ( '?' to 'p' )
1E57	0070	# LATIN SMALL LETTER P WITH DOT ABOVE ( '?' to 'p' )
1E58	0072	# LATIN CAPITAL LETTER R WITH DOT ABOVE ( '?' to 'r' )
1E59	0072	# LATIN SMALL LETTER R WITH DOT ABOVE ( '?' to 'r' )
1E5A	0072	# LATIN CAPITAL LETTER R WITH DOT BELOW ( '?' to 'r' )
1E5B	0072	# LATIN SMALL LETTER R WITH DOT BELOW ( '?' to 'r' )

Original Character	Normalized Character	Description
1E5C	0072	# LATIN CAPITAL LETTER R WITH DOT BELOW AND MACRON ( '?' to 'r' )
1E5D	0072	# LATIN SMALL LETTER R WITH DOT BELOW AND MACRON ( '?' to 'r' )
1E5E	0072	# LATIN CAPITAL LETTER R WITH LINE BELOW ( '?' to 'r' )
1E5F	0072	# LATIN SMALL LETTER R WITH LINE BELOW ( '?' to 'r' )
1E60	0073	# LATIN CAPITAL LETTER S WITH DOT ABOVE ( '?' to 's' )
1E61	0073	# LATIN SMALL LETTER S WITH DOT ABOVE ( '?' to 's' )
1E62	0073	# LATIN CAPITAL LETTER S WITH DOT BELOW ( '?' to 's' )
1E63	0073	# LATIN SMALL LETTER S WITH DOT BELOW ( '?' to 's' )
1E64	0073	# LATIN CAPITAL LETTER S WITH ACUTE AND DOT ABOVE ( '?' to 's' )
1E65	0073	# LATIN SMALL LETTER S WITH ACUTE AND DOT ABOVE ( '?' to 's' )
1E66	0073	# LATIN CAPITAL LETTER S WITH CARON AND DOT ABOVE ( '?' to 's' )
1E67	0073	# LATIN SMALL LETTER S WITH CARON AND DOT ABOVE ( '?' to 's' )
1E68	0073	# LATIN CAPITAL LETTER S WITH DOT BELOW AND DOT ABOVE ( '?' to 's' )
1E69	0073	# LATIN SMALL LETTER S WITH DOT BELOW AND DOT ABOVE ( '?' to 's' )
1E6A	0074	# LATIN CAPITAL LETTER T WITH DOT ABOVE ( '?' to 't' )
1E6B	0074	# LATIN SMALL LETTER T WITH DOT ABOVE ( '?' to 't' )

Original Character	Normalized Character	Description
1E6C	0074	# LATIN CAPITAL LETTER T WITH DOT BELOW ( '?' to 't' )
1E6D	0074	# LATIN SMALL LETTER T WITH DOT BELOW ( '?' to 't' )
1E6E	0074	# LATIN CAPITAL LETTER T WITH LINE BELOW ( '?' to 't' )
1E6F	0074	# LATIN SMALL LETTER T WITH LINE BELOW ( '?' to 't' )
1E70	0074	# LATIN CAPITAL LETTER T WITH CIRCUMFLEX BELOW ( '?' to 't' )
1E71	0074	# LATIN SMALL LETTER T WITH CIRCUMFLEX BELOW ( '?' to 't' )
1E72	0074	# LATIN CAPITAL LETTER U WITH DIAERESIS BELOW ( '?' to 't' )
1E73	0075	# LATIN SMALL LETTER U WITH DIAERESIS BELOW ( '?' to 'u' )
1E74	0075	# LATIN CAPITAL LETTER U WITH TILDE BELOW ( '?' to 'u' )
1E75	0075	# LATIN SMALL LETTER U WITH TILDE BELOW ( '?' to 'u' )
1E76	0075	# LATIN CAPITAL LETTER U WITH CIRCUMFLEX BELOW ( '?' to 'u' )
1E77	0075	# LATIN SMALL LETTER U WITH CIRCUMFLEX BELOW ( '?' to 'u' )
1E78	0075	# LATIN CAPITAL LETTER U WITH TILDE AND ACUTE ( '?' to 'u' )
1E79	0075	# LATIN SMALL LETTER U WITH TILDE AND ACUTE ( '?' to 'u' )
1E7A	0075	# LATIN CAPITAL LETTER U WITH MACRON AND DIAERESIS ( '?' to 'u' )
1E7B	0075	# LATIN SMALL LETTER U WITH MACRON AND DIAERESIS ( '?' to 'u' )

Original Character	Normalized Character	Description
1E7C	0076	# LATIN CAPITAL LETTER V WITH TILDE ( '?' to 'v' )
1E7D	0076	# LATIN SMALL LETTER V WITH TILDE ( '?' to 'v' )
1E7E	0076	# LATIN CAPITAL LETTER V WITH DOT BELOW ( '?' to 'v' )
1E7F	0076	# LATIN SMALL LETTER V WITH DOT BELOW ( '?' to 'v' )
1E80	0077	# LATIN CAPITAL LETTER W WITH GRAVE ( '?' to 'w' )
1E81	0077	# LATIN SMALL LETTER W WITH GRAVE ( '?' to 'w' )
1E82	0077	# LATIN CAPITAL LETTER W WITH ACUTE ( '?' to 'w' )
1E83	0077	# LATIN SMALL LETTER W WITH ACUTE ( '?' to 'w' )
1E84	0077	# LATIN CAPITAL LETTER W WITH DIAERESIS ( '?' to 'w' )
1E85	0077	# LATIN SMALL LETTER W WITH DIAERESIS ( '?' to 'w' )
1E86	0077	# LATIN CAPITAL LETTER W WITH DOT ABOVE ( '?' to 'w' )
1E87	0077	# LATIN SMALL LETTER W WITH DOT ABOVE ( '?' to 'w' )
1E88	0077	# LATIN CAPITAL LETTER W WITH DOT BELOW ( '?' to 'w' )
1E89	0077	# LATIN SMALL LETTER W WITH DOT BELOW ( '?' to 'w' )
1E8A	0078	# LATIN CAPITAL LETTER X WITH DOT ABOVE ( '?' to 'x' )
1E8B	0078	# LATIN SMALL LETTER X WITH DOT ABOVE ( '?' to 'x' )

Original Character	Normalized Character	Description
1E8C	0078	# LATIN CAPITAL LETTER X WITH DIAERESIS ( '?' to 'x' )
1E8D	0078	# LATIN SMALL LETTER X WITH DIAERESIS ( '?' to 'x' )
1E8E	0079	# LATIN CAPITAL LETTER Y WITH DOT ABOVE ( '?' to 'y' )
1E8F	0079	# LATIN SMALL LETTER Y WITH DOT ABOVE ( '?' to 'y' )
1E90	007A	# LATIN CAPITAL LETTER Z WITH CIRCUMFLEX ( '?' to 'z' )
1E91	007A	# LATIN SMALL LETTER Z WITH CIRCUMFLEX ( '?' to 'z' )
1E92	007A	# LATIN CAPITAL LETTER Z WITH DOT BELOW ( '?' to 'z' )
1E93	007A	# LATIN SMALL LETTER Z WITH DOT BELOW ( '?' to 'z' )
1E94	007A	# LATIN CAPITAL LETTER Z WITH LINE BELOW ( '?' to 'z' )
1E95	007A	# LATIN SMALL LETTER Z WITH LINE BELOW ( '?' to 'z' )
1E96	0068	# LATIN SMALL LETTER H WITH LINE BELOW ( '?' to 'h' )
1E97	0074	# LATIN SMALL LETTER T WITH DIAERESIS ( '?' to 't' )
1E98	0077	# LATIN SMALL LETTER W WITH RING ABOVE ( '?' to 'w' )
1E99	0079	# LATIN SMALL LETTER Y WITH RING ABOVE ( '?' to 'y' )
1E9A	0061	# LATIN SMALL LETTER A WITH RIGHT HALF RING ( '?' to 'a' )
1E9B	0073	# LATIN SMALL LETTER LONG S WITH DOT ABOVE ( '?' to 's' )

Original Character	Normalized Character	Description
1EA0	0061	# LATIN CAPITAL LETTER A WITH DOT BELOW ( '?' to 'a' )
1EA1	0061	# LATIN SMALL LETTER A WITH DOT BELOW ( '?' to 'a' )
1EA2	0061	# LATIN CAPITAL LETTER A WITH HOOK ABOVE ( '?' to 'a' )
1EA3	0061	# LATIN SMALL LETTER A WITH HOOK ABOVE ( '?' to 'a' )
1EA4	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND ACUTE ( '?' to 'a' )
1EA5	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND ACUTE ( '?' to 'a' )
1EA6	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND GRAVE ( '?' to 'a' )
1EA7	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND GRAVE ( '?' to 'a' )
1EA8	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'a' )
1EA9	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'a' )
1EAA	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND TILDE ( '?' to 'a' )
1EAB	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND TILDE ( '?' to 'a' )
1EAC	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'a' )
1EAD	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'a' )
1EAE	0061	# LATIN CAPITAL LETTER A WITH BREVE AND ACUTE ( '?' to 'a' )
1EAF	0061	# LATIN SMALL LETTER A WITH BREVE AND ACUTE ( '?' to 'a' )

Original Character	Normalized Character	Description
1EB0	0061	# LATIN CAPITAL LETTER A WITH BREVE AND GRAVE ( '?' to 'a' )
1EB1	0061	# LATIN SMALL LETTER A WITH BREVE AND GRAVE ( '?' to 'a' )
1EB2	0061	# LATIN CAPITAL LETTER A WITH BREVE AND HOOK ABOVE ( '?' to 'a' )
1EB3	0061	# LATIN SMALL LETTER A WITH BREVE AND HOOK ABOVE ( '?' to 'a' )
1EB4	0061	# LATIN CAPITAL LETTER A WITH BREVE AND TILDE ( '?' to 'a' )
1EB5	0061	# LATIN SMALL LETTER A WITH BREVE AND TILDE ( '?' to 'a' )
1EB6	0061	# LATIN CAPITAL LETTER A WITH BREVE AND DOT BELOW ( '?' to 'a' )
1EB7	0061	# LATIN SMALL LETTER A WITH BREVE AND DOT BELOW ( '?' to 'a' )
1EB8	0065	# LATIN CAPITAL LETTER E WITH DOT BELOW ( '?' to 'e' )
1EB9	0065	# LATIN SMALL LETTER E WITH DOT BELOW ( '?' to 'e' )
1EBA	0065	# LATIN CAPITAL LETTER E WITH HOOK ABOVE ( '?' to 'e' )
1EBB	0065	# LATIN SMALL LETTER E WITH HOOK ABOVE ( '?' to 'e' )
1EBC	0065	# LATIN CAPITAL LETTER E WITH TILDE ( '?' to 'e' )
1EBD	0065	# LATIN SMALL LETTER E WITH TILDE ( '?' to 'e' )
1EBE	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND ACUTE ( '?' to 'e' )
1EBF	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND ACUTE ( '?' to 'e' )

Original Character	Normalized Character	Description
1EC0	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND GRAVE ( '?' to 'e' )
1EC1	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND GRAVE ( '?' to 'e' )
1EC2	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'e' )
1EC3	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'e' )
1EC4	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND TILDE ( '?' to 'e' )
1EC5	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND TILDE ( '?' to 'e' )
1EC6	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'e' )
1EC7	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'e' )
1EC8	0069	# LATIN CAPITAL LETTER I WITH HOOK ABOVE ( '?' to 'i' )
1EC9	0069	# LATIN SMALL LETTER I WITH HOOK ABOVE ( '?' to 'i' )
1ECA	0069	# LATIN CAPITAL LETTER I WITH DOT BELOW ( '?' to 'i' )
1ECB	0069	# LATIN SMALL LETTER I WITH DOT BELOW ( '?' to 'i' )
1ECC	006F	# LATIN CAPITAL LETTER O WITH DOT BELOW ( '?' to 'o' )
1ECD	006F	# LATIN SMALL LETTER O WITH DOT BELOW ( '?' to 'o' )
1ECE	006F	# LATIN CAPITAL LETTER O WITH HOOK ABOVE ( '?' to 'o' )
1ECF	006F	# LATIN SMALL LETTER O WITH HOOK ABOVE ( '?' to 'o' )

Original Character	Normalized Character	Description
1ED0	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND ACUTE ( '?' to 'o' )
1ED1	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND ACUTE ( '?' to 'o' )
1ED2	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND GRAVE ( '?' to 'o' )
1ED3	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND GRAVE ( '?' to 'o' )
1ED4	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'o' )
1ED5	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'o' )
1ED6	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND TILDE ( '?' to 'o' )
1ED7	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND TILDE ( '?' to 'o' )
1ED8	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'o' )
1ED9	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'o' )
1EDA	006F	# LATIN CAPITAL LETTER O WITH HORN AND ACUTE ( '?' to 'o' )
1EDB	006F	# LATIN SMALL LETTER O WITH HORN AND ACUTE ( '?' to 'o' )
1EDC	006F	# LATIN CAPITAL LETTER O WITH HORN AND GRAVE ( '?' to 'o' )
1EDD	006F	# LATIN SMALL LETTER O WITH HORN AND GRAVE ( '?' to 'o' )
1EDE	006F	# LATIN CAPITAL LETTER O WITH HORN AND HOOK ABOVE ( '?' to 'o' )
1EDF	006F	# LATIN SMALL LETTER O WITH HORN AND HOOK ABOVE ( '?' to 'o' )

Original Character	Normalized Character	Description
1EE0	006F	# LATIN CAPITAL LETTER O WITH HORN AND TILDE ( '?' to 'o' )
1EE1	006F	# LATIN SMALL LETTER O WITH HORN AND TILDE ( '?' to 'o' )
1EE2	006F	# LATIN CAPITAL LETTER O WITH HORN AND DOT BELOW ( '?' to 'o' )
1EE3	006F	# LATIN SMALL LETTER O WITH HORN AND DOT BELOW ( '?' to 'o' )
1EE4	0075	# LATIN CAPITAL LETTER U WITH DOT BELOW ( '?' to 'u' )
1EE5	0075	# LATIN SMALL LETTER U WITH DOT BELOW ( '?' to 'u' )
1EE6	0075	# LATIN CAPITAL LETTER U WITH HOOK ABOVE ( '?' to 'u' )
1EE7	0075	# LATIN SMALL LETTER U WITH HOOK ABOVE ( '?' to 'u' )
1EE8	0075	# LATIN CAPITAL LETTER U WITH HORN AND ACUTE ( '?' to 'u' )
1EE9	0075	# LATIN SMALL LETTER U WITH HORN AND ACUTE ( '?' to 'u' )
1EEA	0075	# LATIN CAPITAL LETTER U WITH HORN AND GRAVE ( '?' to 'u' )
1EEB	0075	# LATIN SMALL LETTER U WITH HORN AND GRAVE ( '?' to 'u' )
1EEC	0075	# LATIN CAPITAL LETTER U WITH HORN AND HOOK ABOVE ( '?' to 'u' )
1EED	0075	# LATIN SMALL LETTER U WITH HORN AND HOOK ABOVE ( '?' to 'u' )
1EEE	0075	# LATIN CAPITAL LETTER U WITH HORN AND TILDE ( '?' to 'u' )
1EEF	0075	# LATIN SMALL LETTER U WITH HORN AND TILDE ( '?' to 'u' )

Original Character	Normalized Character	Description
1EF0	0075	# LATIN CAPITAL LETTER U WITH HORN AND DOT BELOW ( '?' to 'u' )
1EF1	0075	# LATIN SMALL LETTER U WITH HORN AND DOT BELOW ( '?' to 'u' )
1EF2	0079	# LATIN CAPITAL LETTER Y WITH GRAVE ( '?' to 'y' )
1EF3	0079	# LATIN SMALL LETTER Y WITH GRAVE ( '?' to 'y' )
1EF4	0079	# LATIN CAPITAL LETTER Y WITH DOT BELOW ( '?' to 'y' )
1EF5	0079	# LATIN SMALL LETTER Y WITH DOT BELOW ( '?' to 'y' )
1EF6	0079	# LATIN CAPITAL LETTER Y WITH HOOK ABOVE ( '?' to 'y' )
1EF7	0079	# LATIN SMALL LETTER Y WITH HOOK ABOVE ( '?' to 'y' )
1EF8	0079	# LATIN CAPITAL LETTER Y WITH TILDE ( '?' to 'y' )
1EF9	0079	# LATIN SMALL LETTER Y WITH TILDE ( '?' to 'y' )
2010	002D	# HYPHEN NORMALIZATION
2011	002D	# HYPHEN NORMALIZATION
2070	0030	# SUPERSCRIPT ZERO ( '?' to '0' )
2071	0031	# SUPERSCRIPT LATIN SMALL LETTER I ( '?' to '1' )
2072	0032	
2073	0033	

Original Character	Normalized Character	Description
2074	0034	# SUPERSCRIPT FOUR ( '?' to '4' )
2075	0035	# SUPERSCRIPT FIVE ( '?' to '5' )
2076	0036	# SUPERSCRIPT SIX ( '?' to '6' )
2077	0037	# SUPERSCRIPT SEVEN ( '?' to '7' )
2078	0038	# SUPERSCRIPT EIGHT ( '?' to '8' )
2079	0039	# SUPERSCRIPT NINE ( '?' to '9' )
207A	002B	# SUPERSCRIPT PLUS SIGN ( '?' to '+' )
207B	0020	# SUPERSCRIPT MINUS ( '?' to '-' )
207C	003D	# SUPERSCRIPT EQUALS SIGN ( '?' to '=' )
207D	0028	# SUPERSCRIPT LEFT PARENTHESIS ( '?' to '(' )
207E	0029	# SUPERSCRIPT RIGHT PARENTHESIS ( '?' to ')' )
2080	0030	# SUBSCRIPT ZERO ( '?' to '0' )
2081	0031	# SUBSCRIPT ONE ( '?' to '1' )
2082	0032	# SUBSCRIPT TWO ( '?' to '2' )
2083	0033	# SUBSCRIPT THREE ( '?' to '3' )
2084	0034	# SUBSCRIPT FOUR ( '?' to '4' )

Original Character	Normalized Character	Description
2085	0035	# SUBSCRIPT FIVE ( '?' to '5' )
2086	0036	# SUBSCRIPT SIX ( '?' to '6' )
2087	0037	# SUBSCRIPT SEVEN ( '?' to '7' )
2088	0038	# SUBSCRIPT EIGHT ( '?' to '8' )
2089	0039	# SUBSCRIPT NINE ( '?' to '9' )
208A	002B	# SUBSCRIPT PLUS SIGN ( '?' to '+' )
208B	0020	# SUBSCRIPT MINUS ( '?' to '-' )
208C	003D	# SUBSCRIPT EQUALS SIGN ( '?' to '=' )
208D	0028	# SUBSCRIPT LEFT PARENTHESIS ( '?' to '(' )
208E	0029	# SUBSCRIPT RIGHT PARENTHESIS ( '?' to ')' )
2113	006C	# SCRIPT SMALL L ( '?' to 'l' )

## Character Conversion Transformation - Normalization Table

The following table lists the out-of-the-box transformations used to normalize Latin characters. The table contains the following columns:

1. The original character
2. The normalized character
3. The description of the original character

From	To	Description
0000	0020	# <control> ( ' to ' ' )
0001	0020	# <control> ( " to ' ' )
0002	0020	# <control> ( " to ' ' )
0003	0020	# <control> ( " to ' ' )
0004	0020	# <control> ( " to ' ' )
0005	0020	# <control> ( " to ' ' )
0006	0020	# <control> ( " to ' ' )
0007	0020	# <control> ( " to ' ' )
0008	0020	# <control> ( " to ' ' )
0009	0020	# <control> ( " to ' ' )
000A	0020	# <control> ( " to ' ' )
000B	0020	# <control> ( " to ' ' )

From	To	Description
000C	0020	# <control> ( " to ' ' )
000D	0020	# <control> ( " to ' ' )
000E	0020	# <control> ( " to ' ' )
000F	0020	# <control> ( " to ' ' )
0010	0020	# <control> ( ' ' to ' ' )
0011	0020	# <control> ( ' ' to ' ' )
0012	0020	# <control> ( '?' to ' ' )
0013	0020	# <control> ( ' ' to ' ' )
0014	0020	# <control> ( ' ' to ' ' )
0015	0020	# <control> ( '-' to ' ' )
0016	0020	# <control> ( " to ' ' )
0017	0020	# <control> ( " to ' ' )
0018	0020	# <control> ( " to ' ' )
0019	0020	# <control> ( " to ' ' )
001A	0020	# <control> ( " to ' ' )
001B	0020	# <control> ( '?' to ' ' )

From	To	Description
001C	0020	# <control> ( '?' to ' ' )
001D	0020	# <control> ( " to ' ' )
001E	0020	# <control> ( " to ' ' )
001F	0020	# <control> ( " to ' ' ) <
!!!002D-->0020 # HYPHEN-MINUS ( '-' to ' ' ) commented out, we now want to keep the hyphen in some cases		
0041	0061	# LATIN CAPITAL LETTER A ( 'A' to 'a' )
0042	0062	# LATIN CAPITAL LETTER B ( 'B' to 'b' )
0043	0063	# LATIN CAPITAL LETTER C ( 'C' to 'c' )
0044	0064	# LATIN CAPITAL LETTER D ( 'D' to 'd' )
0045	0065	# LATIN CAPITAL LETTER E ( 'E' to 'e' )
0046	0066	# LATIN CAPITAL LETTER F ( 'F' to 'f' )
0047	0067	# LATIN CAPITAL LETTER G ( 'G' to 'g' )
0048	0068	# LATIN CAPITAL LETTER H ( 'H' to 'h' )
0049	0069	# LATIN CAPITAL LETTER I ( 'I' to 'i' )
004A	006A	# LATIN CAPITAL LETTER J ( 'J' to 'j' )
004B	006B	# LATIN CAPITAL LETTER K ( 'K' to 'k' )

From	To	Description
004C	006C	# LATIN CAPITAL LETTER L ( 'L' to 'l' )
004D	006D	# LATIN CAPITAL LETTER M ( 'M' to 'm' )
004E	006E	# LATIN CAPITAL LETTER N ( 'N' to 'n' )
004F	006F	# LATIN CAPITAL LETTER O ( 'O' to 'o' )
0050	0070	# LATIN CAPITAL LETTER P ( 'P' to 'p' )
0051	0071	# LATIN CAPITAL LETTER Q ( 'Q' to 'q' )
0052	0072	# LATIN CAPITAL LETTER R ( 'R' to 'r' )
0053	0073	# LATIN CAPITAL LETTER S ( 'S' to 's' )
0054	0074	# LATIN CAPITAL LETTER T ( 'T' to 't' )
0055	0075	# LATIN CAPITAL LETTER U ( 'U' to 'u' )
0056	0076	# LATIN CAPITAL LETTER V ( 'V' to 'v' )
0057	0077	# LATIN CAPITAL LETTER W ( 'W' to 'w' )
0058	0078	# LATIN CAPITAL LETTER X ( 'X' to 'x' )
0059	0079	# LATIN CAPITAL LETTER Y ( 'Y' to 'y' )
005A	007A	# LATIN CAPITAL LETTER Z ( 'Z' to 'z' )
0080	0043	

From	To	Description
00A0	0020	# NO-BREAK SPACE ( ' ' to ' ' )
00A1	0020	# INVERTED EXCLAMATION MARK ( '¡' to ' ' )
00A2	0063	
00A6	0020	# BROKEN BAR ( '¦' to ' ' )
00A8	0020	# DIAERESIS ( '¨' to ' ' )
00AA	0020	# FEMININE ORDINAL INDICATOR ( 'ª' to ' ' )
00AB	0020	# LEFT-POINTING DOUBLE ANGLE QUOTATION MARK ( '«' to ' ' )
00AC	0020	# NOT SIGN ( '¬' to ' ' )
00AD	0020	# SOFT HYPHEN ( '­' to ' ' )
00AF	0000	# MACRON ( '¯' to ' ' )
00B0	0020	# DEGREE SIGN ( '°' to ' ' )
00B1	0020	# PLUS-MINUS SIGN ( '±' to ' ' )
00B2	0032	# SUPERSCRIPT TWO ( '²' to '2' )
00B3	0033	# SUPERSCRIPT THREE ( '³' to '3' )
00B4	0000	# ACUTE ACCENT ( '´' to ' ' )
00B6	0020	# PILCROW SIGN ( '¶' to ' ' )

From	To	Description
00B7	0000	# MIDDLE DOT ( '·' to '·' )
00B8	0000	# CEDILLA ( '¸' to '¸' )
00B9	0031	# SUPERSCRIPT ONE ( '¹' to '¹' )
00BA	0000	# MASCULINE ORDINAL INDICATOR ( 'º' to 'º' )
00BB	0020	# RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK ( '»' to '»' )
00BC	0034	# VULGAR FRACTION ONE QUARTER ( '¼' to '¼' )
00BD	0032	# VULGAR FRACTION ONE HALF ( '½' to '½' )
00BE	0034	# VULGAR FRACTION THREE QUARTERS ( '¾' to '¾' )
00BF	0020	# INVERTED QUESTION MARK ( '¿' to '¿' )
00C0	0061	# LATIN CAPITAL LETTER A WITH GRAVE ( 'À' to 'a' )
00C1	0061	# LATIN CAPITAL LETTER A WITH ACUTE ( 'Á' to 'a' )
00C2	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX ( 'Â' to 'a' )
00C3	0061	# LATIN CAPITAL LETTER A WITH TILDE ( 'Ã' to 'a' )
00C4	0061	# LATIN CAPITAL LETTER A WITH DIAERESIS ( 'Ä' to 'a' )
00C5	0061	# LATIN CAPITAL LETTER A WITH RING ABOVE ( 'Å' to 'a' )
00C6	0061 0065	# LATIN CAPITAL LETTER AE ( 'Æ' to 'e' )

From	To	Description
00C7	0063	# LATIN CAPITAL LETTER C WITH CEDILLA ( 'Ç' to 'c' )
00C8	0065	# LATIN CAPITAL LETTER E WITH GRAVE ( 'È' to 'e' )
00C9	0065	# LATIN CAPITAL LETTER E WITH ACUTE ( 'É' to 'e' )
00CA	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX ( 'Ê' to 'e' )
00CB	0065	# LATIN CAPITAL LETTER E WITH DIAERESIS ( 'Ë' to 'e' )
00CC	0069	# LATIN CAPITAL LETTER I WITH GRAVE ( 'Ì' to 'i' )
00CD	0069	# LATIN CAPITAL LETTER I WITH ACUTE ( 'Í' to 'i' )
00CE	0069	# LATIN CAPITAL LETTER I WITH CIRCUMFLEX ( 'Î' to 'i' )
00CF	0069	# LATIN CAPITAL LETTER I WITH DIAERESIS ( 'Ï' to 'i' )
00D0	0064	# LATIN CAPITAL LETTER ETH ( 'Ð' to 'd' )
00D1	006E	# LATIN CAPITAL LETTER N WITH TILDE ( 'Ñ' to 'n' )
00D2	006F	# LATIN CAPITAL LETTER O WITH GRAVE ( 'Ò' to 'o' )
00D3	006F	# LATIN CAPITAL LETTER O WITH ACUTE ( 'Ó' to 'o' )
00D4	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX ( 'Ô' to 'o' )
00D5	006F	# LATIN CAPITAL LETTER O WITH TILDE ( 'Õ' to 'o' )
00D6	006F	# LATIN CAPITAL LETTER O WITH DIAERESIS ( 'Ö' to 'o' )

From	To	Description
00D8	006F	# LATIN CAPITAL LETTER O WITH STROKE ( 'Ø' to 'o' )
00D9	0075	# LATIN CAPITAL LETTER U WITH GRAVE ( 'Û' to 'u' )
00DA	0075	# LATIN CAPITAL LETTER U WITH ACUTE ( 'Ú' to 'u' )
00DB	0075	# LATIN CAPITAL LETTER U WITH CIRCUMFLEX ( 'Û' to 'u' )
00DC	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS ( 'Ü' to 'u' )
00DD	0079	# LATIN CAPITAL LETTER Y WITH ACUTE ( 'Ý' to 'y' )
00DE	0074 0068	# LATIN CAPITAL LETTER THORN ( 'Þ' to 'h' )
00DF	0073 0073	# LATIN SMALL LETTER SHARP S ( 'ß' to 's' )
00E0	0061	# LATIN SMALL LETTER A WITH GRAVE ( 'à' to 'a' )
00E1	0061	# LATIN SMALL LETTER A WITH ACUTE ( 'á' to 'a' )
00E2	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX ( 'â' to 'a' )
00E3	0061	# LATIN SMALL LETTER A WITH TILDE ( 'ã' to 'a' )
00E4	0061	# LATIN SMALL LETTER A WITH DIAERESIS ( 'ä' to 'a' )
00E5	0061	# LATIN SMALL LETTER A WITH RING ABOVE ( 'å' to 'a' )
00E6	0061 0065	# LATIN SMALL LETTER AE ( 'æ' to 'e' )

From	To	Description
00E7	0063	# LATIN SMALL LETTER C WITH CEDILLA ( 'ç' to 'c' )
00E8	0065	# LATIN SMALL LETTER E WITH GRAVE ( 'è' to 'e' )
00E9	0065	# LATIN SMALL LETTER E WITH ACUTE ( 'é' to 'e' )
00EA	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX ( 'ê' to 'e' )
00EB	0065	# LATIN SMALL LETTER E WITH DIAERESIS ( 'ë' to 'e' )
00EC	0069	# LATIN SMALL LETTER I WITH GRAVE ( 'ì' to 'i' )
00ED	0069	# LATIN SMALL LETTER I WITH ACUTE ( 'í' to 'i' )
00EE	0069	# LATIN SMALL LETTER I WITH CIRCUMFLEX ( 'î' to 'i' )
00EF	0069	# LATIN SMALL LETTER I WITH DIAERESIS ( 'ï' to 'i' )
00F0	0064	# LATIN SMALL LETTER ETH ( 'ð' to 'd' )
00F1	006E	# LATIN SMALL LETTER N WITH TILDE ( 'ñ' to 'n' )
00F2	006F	# LATIN SMALL LETTER O WITH GRAVE ( 'ò' to 'o' )
00F3	006F	# LATIN SMALL LETTER O WITH ACUTE ( 'ó' to 'o' )
00F4	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX ( 'ô' to 'o' )
00F5	006F	# LATIN SMALL LETTER O WITH TILDE ( 'õ' to 'o' )
00F6	006F	# LATIN SMALL LETTER O WITH DIAERESIS ( 'ö' to 'o' )

From	To	Description
00F8	006F	# LATIN SMALL LETTER O WITH STROKE ( 'ø' to 'o' )
00F9	0075	# LATIN SMALL LETTER U WITH GRAVE ( 'ù' to 'u' )
00FA	0075	# LATIN SMALL LETTER U WITH ACUTE ( 'ú' to 'u' )
00FB	0075	# LATIN SMALL LETTER U WITH CIRCUMFLEX ( 'û' to 'u' )
00FC	0075	# LATIN SMALL LETTER U WITH DIAERESIS ( 'ü' to 'u' )
00FD	0079	# LATIN SMALL LETTER Y WITH ACUTE ( 'ý' to 'y' )
00FE	0074 0068	# LATIN SMALL LETTER THORN ( 'þ' to 'h' )
00FF	0079	# LATIN SMALL LETTER Y WITH DIAERESIS ( 'ÿ' to 'y' )
0100	0061	# LATIN CAPITAL LETTER A WITH MACRON ( 'Ā' to 'a' )
0101	0061	# LATIN SMALL LETTER A WITH MACRON ( 'ā' to 'a' )
0102	0061	# LATIN CAPITAL LETTER A WITH BREVE ( 'Ă' to 'a' )
0103	0061	# LATIN SMALL LETTER A WITH BREVE ( 'ă' to 'a' )
0104	0061	# LATIN CAPITAL LETTER A WITH OGONEK ( 'Ą' to 'a' )
0105	0061	# LATIN SMALL LETTER A WITH OGONEK ( 'ą' to 'a' )
0106	0063	# LATIN CAPITAL LETTER C WITH ACUTE ( 'Ć' to 'c' )
0107	0063	# LATIN SMALL LETTER C WITH ACUTE ( 'ć' to 'c' )

From	To	Description
0108	0063	# LATIN CAPITAL LETTER C WITH CIRCUMFLEX ( 'C' to 'c' )
0109	0063	# LATIN SMALL LETTER C WITH CIRCUMFLEX ( 'c' to 'c' )
010A	0063	# LATIN CAPITAL LETTER C WITH DOT ABOVE ( 'C' to 'c' )
010B	0063	# LATIN SMALL LETTER C WITH DOT ABOVE ( 'c' to 'c' )
010C	0063	# LATIN CAPITAL LETTER C WITH CARON ( 'C' to 'c' )
010D	0063	# LATIN SMALL LETTER C WITH CARON ( 'c' to 'c' )
010E	0064	# LATIN CAPITAL LETTER D WITH CARON ( 'D' to 'd' )
010F	0064	# LATIN SMALL LETTER D WITH CARON ( 'd' to 'd' )
0110	0064	# LATIN CAPITAL LETTER D WITH STROKE ( 'Đ' to 'd' )
0111	0064	# LATIN SMALL LETTER D WITH STROKE ( 'd' to 'd' )
0112	0065	# LATIN CAPITAL LETTER E WITH MACRON ( 'E' to 'e' )
0113	0065	# LATIN SMALL LETTER E WITH MACRON ( 'e' to 'e' )
0114	0065	# LATIN CAPITAL LETTER E WITH BREVE ( 'E' to 'e' )
0115	0065	# LATIN SMALL LETTER E WITH BREVE ( 'e' to 'e' )
0116	0065	# LATIN CAPITAL LETTER E WITH DOT ABOVE ( 'E' to 'e' )
0117	0065	# LATIN SMALL LETTER E WITH DOT ABOVE ( 'e' to 'e' )

From	To	Description
0118	0065	# LATIN CAPITAL LETTER E WITH OGONEK ( 'E' to 'e' )
0119	0065	# LATIN SMALL LETTER E WITH OGONEK ( 'e' to 'e' )
011A	0065	# LATIN CAPITAL LETTER E WITH CARON ( 'E' to 'e' )
01CA	006E	006A
01CB	006E	006A
01CC	006E	006A
01C4	0044	005A
011B	0065	# LATIN SMALL LETTER E WITH CARON ( 'e' to 'e' )
01C7	006C	006A
01C8	006C	006A
01C9	006C	006A
01C6	0064	007A
011C	0067	# LATIN CAPITAL LETTER G WITH CIRCUMFLEX ( 'G' to 'g' )
011D	0067	# LATIN SMALL LETTER G WITH CIRCUMFLEX ( 'g' to 'g' )
011E	0067	# LATIN CAPITAL LETTER G WITH BREVE ( 'G' to 'g' )
011F	0067	# LATIN SMALL LETTER G WITH BREVE ( 'g' to 'g' )

From	To	Description
0120	0067	# LATIN CAPITAL LETTER G WITH DOT ABOVE ( 'G' to 'g' )
0121	0067	# LATIN SMALL LETTER G WITH DOT ABOVE ( 'g' to 'g' )
0122	0067	# LATIN CAPITAL LETTER G WITH CEDILLA ( 'G' to 'g' )
0123	0067	# LATIN SMALL LETTER G WITH CEDILLA ( 'g' to 'g' )
0124	0068	# LATIN CAPITAL LETTER H WITH CIRCUMFLEX ( 'H' to 'h' )
0125	0068	# LATIN SMALL LETTER H WITH CIRCUMFLEX ( 'h' to 'h' )
0126	0068	# LATIN CAPITAL LETTER H WITH STROKE ( 'H' to 'h' )
0127	0068	# LATIN SMALL LETTER H WITH STROKE ( 'h' to 'h' )
0128	0069	# LATIN CAPITAL LETTER I WITH TILDE ( 'I' to 'i' )
0129	0069	# LATIN SMALL LETTER I WITH TILDE ( 'i' to 'i' )
012A	0069	# LATIN CAPITAL LETTER I WITH MACRON ( 'I' to 'i' )
012B	0069	# LATIN SMALL LETTER I WITH MACRON ( 'i' to 'i' )
012C	0069	# LATIN CAPITAL LETTER I WITH BREVE ( 'I' to 'i' )
012D	0069	# LATIN SMALL LETTER I WITH BREVE ( 'i' to 'i' )
012E	0069	# LATIN CAPITAL LETTER I WITH OGONEK ( 'I' to 'i' )
012F	0069	# LATIN SMALL LETTER I WITH OGONEK ( 'i' to 'i' )

From	To	Description
0130	0069	# LATIN CAPITAL LETTER I WITH DOT ABOVE ( 'I' to 'i' )
0131	0069	# LATIN SMALL LETTER DOTLESS I ( 'i' to 'i' )
0132	0069 006A	# LATIN CAPITAL LIGATURE IJ ( '?' to 'j' )
0133	0069 006A	# LATIN SMALL LIGATURE IJ ( '?' to 'j' )
0134	006A	# LATIN CAPITAL LETTER J WITH CIRCUMFLEX ( 'J' to 'j' )
0135	006A	# LATIN SMALL LETTER J WITH CIRCUMFLEX ( 'j' to 'j' )
0136	0068	# LATIN CAPITAL LETTER K WITH CEDILLA ( 'K' to 'h' )
0137	0068	# LATIN SMALL LETTER K WITH CEDILLA ( 'k' to 'h' )
0139	006C	# LATIN CAPITAL LETTER L WITH ACUTE ( 'L' to 'l' )
013A	006C	# LATIN SMALL LETTER L WITH ACUTE ( 'l' to 'l' )
013B	006C	# LATIN CAPITAL LETTER L WITH CEDILLA ( 'L' to 'l' )
013C	006C	# LATIN SMALL LETTER L WITH CEDILLA ( 'l' to 'l' )
013D	006C	# LATIN CAPITAL LETTER L WITH CARON ( 'L' to 'l' )
013E	006C	# LATIN SMALL LETTER L WITH CARON ( 'l' to 'l' )
013F	006C	# LATIN CAPITAL LETTER L WITH MIDDLE DOT ( '?' to 'l' )
0140	006C	# LATIN SMALL LETTER L WITH MIDDLE DOT ( '?' to 'l' )

From	To	Description
0141	006C	# LATIN CAPITAL LETTER L WITH STROKE ( 'L' to 'l' )
0142	006C	# LATIN SMALL LETTER L WITH STROKE ( 'l' to 'l' )
0143	006E	# LATIN CAPITAL LETTER N WITH ACUTE ( 'N' to 'n' )
0144	006E	# LATIN SMALL LETTER N WITH ACUTE ( 'n' to 'n' )
0145	006E	# LATIN CAPITAL LETTER N WITH CEDILLA ( 'N' to 'n' )
0146	006E	# LATIN SMALL LETTER N WITH CEDILLA ( 'n' to 'n' )
0147	006E	# LATIN CAPITAL LETTER N WITH CARON ( 'N' to 'n' )
0148	006E	# LATIN SMALL LETTER N WITH CARON ( 'n' to 'n' )
0149	006E	# LATIN SMALL LETTER N PRECEDED BY APOSTROPHE ( '?' to 'n' )
014A	006E	# LATIN CAPITAL LETTER ENG ( '?' to 'n' )
014B	006E	# LATIN SMALL LETTER ENG ( '?' to 'n' )
014C	006F	# LATIN CAPITAL LETTER O WITH MACRON ( 'O' to 'o' )
014D	006F	# LATIN SMALL LETTER O WITH MACRON ( 'o' to 'o' )
014E	006F	# LATIN CAPITAL LETTER O WITH BREVE ( 'O' to 'o' )
014F	006F	# LATIN SMALL LETTER O WITH BREVE ( 'o' to 'o' )
0150	006F	# LATIN CAPITAL LETTER O WITH DOUBLE ACUTE ( 'O' to 'o' )

From	To	Description
0151	006F	# LATIN SMALL LETTER O WITH DOUBLE ACUTE ( 'o' to 'o' )
0152	006F 0065	# LATIN CAPITAL LIGATURE OE ( 'Œ' to 'e' )
0153	006F 0065	# LATIN SMALL LIGATURE OE ( 'œ' to 'e' )
0154	0072	# LATIN CAPITAL LETTER R WITH ACUTE ( 'R' to 'r' )
0155	0072	# LATIN SMALL LETTER R WITH ACUTE ( 'r' to 'r' )
0156	0072	# LATIN CAPITAL LETTER R WITH CEDILLA ( 'R' to 'r' )
0157	0072	# LATIN SMALL LETTER R WITH CEDILLA ( 'r' to 'r' )
0158	0072	# LATIN CAPITAL LETTER R WITH CARON ( 'R' to 'r' )
0159	0072	# LATIN SMALL LETTER R WITH CARON ( 'r' to 'r' )
015A	0073	# LATIN CAPITAL LETTER S WITH ACUTE ( 'S' to 's' )
015B	0073	# LATIN SMALL LETTER S WITH ACUTE ( 's' to 's' )
015C	0073	# LATIN CAPITAL LETTER S WITH CIRCUMFLEX ( 'S' to 's' )
015D	0073	# LATIN SMALL LETTER S WITH CIRCUMFLEX ( 's' to 's' )
015E	0073	# LATIN CAPITAL LETTER S WITH CEDILLA ( 'S' to 's' )
015F	0073	# LATIN SMALL LETTER S WITH CEDILLA ( 's' to 's' )
0160	0073	# LATIN CAPITAL LETTER S WITH CARON ( 'Š' to 's' )

From	To	Description
0161	0073	# LATIN SMALL LETTER S WITH CARON ( 'š' to 's' )
0162	0074	# LATIN CAPITAL LETTER T WITH CEDILLA ( 'T' to 't' )
0163	0074	# LATIN SMALL LETTER T WITH CEDILLA ( 't' to 't' )
0164	0074	# LATIN CAPITAL LETTER T WITH CARON ( 'T' to 't' )
0165	0074	# LATIN SMALL LETTER T WITH CARON ( 't' to 't' )
0166	0074	# LATIN CAPITAL LETTER T WITH STROKE ( 'T' to 't' )
0167	0074	# LATIN SMALL LETTER T WITH STROKE ( 't' to 't' )
0168	0075	# LATIN CAPITAL LETTER U WITH TILDE ( 'U' to 'u' )
0169	0075	# LATIN SMALL LETTER U WITH TILDE ( 'u' to 'u' )
016A	0075	# LATIN CAPITAL LETTER U WITH MACRON ( 'U' to 'u' )
016B	0075	# LATIN SMALL LETTER U WITH MACRON ( 'u' to 'u' )
016C	0075	# LATIN CAPITAL LETTER U WITH BREVE ( 'U' to 'u' )
016D	0075	# LATIN SMALL LETTER U WITH BREVE ( 'u' to 'u' )
016E	0075	# LATIN CAPITAL LETTER U WITH RING ABOVE ( 'U' to 'u' )
016F	0075	# LATIN SMALL LETTER U WITH RING ABOVE ( 'u' to 'u' )
0170	0075	# LATIN CAPITAL LETTER U WITH DOUBLE ACUTE ( 'U' to 'u' )

From	To	Description
0171	0075	# LATIN SMALL LETTER U WITH DOUBLE ACUTE ( 'u' to 'u' )
0172	0075	# LATIN CAPITAL LETTER U WITH OGONEK ( 'U' to 'u' )
0173	0075	# LATIN SMALL LETTER U WITH OGONEK ( 'u' to 'u' )
0174	0077	# LATIN CAPITAL LETTER W WITH CIRCUMFLEX ( 'W' to 'w' )
0175	0077	# LATIN SMALL LETTER W WITH CIRCUMFLEX ( 'w' to 'w' )
0176	0079	# LATIN CAPITAL LETTER Y WITH CIRCUMFLEX ( 'Y' to 'y' )
0177	0079	# LATIN SMALL LETTER Y WITH CIRCUMFLEX ( 'y' to 'y' )
0178	0079	# LATIN CAPITAL LETTER Y WITH DIAERESIS ( 'ÿ' to 'y' )
0179	007A	# LATIN CAPITAL LETTER Z WITH ACUTE ( 'Z' to 'z' )
017A	007A	# LATIN SMALL LETTER Z WITH ACUTE ( 'z' to 'z' )
017B	007A	# LATIN CAPITAL LETTER Z WITH DOT ABOVE ( 'Z' to 'z' )
017C	007A	# LATIN SMALL LETTER Z WITH DOT ABOVE ( 'z' to 'z' )
017D	007A	# LATIN CAPITAL LETTER Z WITH CARON ( 'Ž' to 'z' )
017E	007A	# LATIN SMALL LETTER Z WITH CARON ( 'ž' to 'z' )
017F	0073	# LATIN SMALL LETTER LONG S ( 'ſ' to 's' )
0180	0062	# LATIN SMALL LETTER B WITH STROKE ( 'b' to 'b' )

From	To	Description
0181	0062	# LATIN CAPITAL LETTER B WITH HOOK ( '?' to 'b' )
0182	0062	# LATIN CAPITAL LETTER B WITH TOPBAR ( '?' to 'b' )
0183	0062	# LATIN SMALL LETTER B WITH TOPBAR ( '?' to 'b' )
0184	0185	# LATIN CAPITAL LETTER TONE SIX ( '?' to '?' )
0186	006F	# LATIN CAPITAL LETTER OPEN O ( '?' to 'o' )
0187	0063	# LATIN CAPITAL LETTER C WITH HOOK ( '?' to 'c' )
0188	0063	# LATIN SMALL LETTER C WITH HOOK ( '?' to 'c' )
0189	0064	# LATIN CAPITAL LETTER AFRICAN D ( 'Đ' to 'd' )
018A	0064	# LATIN CAPITAL LETTER D WITH HOOK ( '?' to 'd' )
018C	0040	# LATIN SMALL LETTER D WITH TOPBAR ( '?' to '@' )
018D	0040	# LATIN SMALL LETTER TURNED DELTA ( '?' to '@' )
018E	0065	# LATIN CAPITAL LETTER REVERSED E ( '?' to 'e' )
0190	0065	# LATIN CAPITAL LETTER OPEN E ( '?' to 'e' )
0191	0066	# LATIN CAPITAL LETTER F WITH HOOK ( 'f' to 'f' )
0192	0066	# LATIN SMALL LETTER F WITH HOOK ( 'f' to 'f' )
0193	0067	# LATIN CAPITAL LETTER G WITH HOOK ( '?' to 'g' )

From	To	Description
0194	0067	# LATIN CAPITAL LETTER GAMMA ( '?' to 'g' )
0197	0069	# LATIN CAPITAL LETTER I WITH STROKE ( 'I' to 'i' )
0198	006B	# LATIN CAPITAL LETTER K WITH HOOK ( '?' to 'k' )
0199	006B	# LATIN SMALL LETTER K WITH HOOK ( '?' to 'k' )
019A	006C	# LATIN SMALL LETTER L WITH BAR ( 'l' to 'l' )
019B	006C	# LATIN SMALL LETTER LAMBDA WITH STROKE ( '?' to 'l' )
019D	006E	# LATIN CAPITAL LETTER N WITH LEFT HOOK ( '?' to 'n' )
019F	006F	# LATIN CAPITAL LETTER O WITH MIDDLE TILDE ( 'O' to 'o' )
01A0	006F	# LATIN CAPITAL LETTER O WITH HORN ( 'O' to 'o' )
01A1	006F	# LATIN SMALL LETTER O WITH HORN ( 'o' to 'o' )
01A4	0070	# LATIN CAPITAL LETTER P WITH HOOK ( '?' to 'p' )
01A5	0070	# LATIN SMALL LETTER P WITH HOOK ( '?' to 'p' )
01A7	01A8	# LATIN CAPITAL LETTER TONE TWO ( '?' to '?' )
01AB	0074	# LATIN SMALL LETTER T WITH PALATAL HOOK ( 't' to 't' )
01AC	0074	# LATIN CAPITAL LETTER T WITH HOOK ( '?' to 't' )
01AD	0074	# LATIN SMALL LETTER T WITH HOOK ( '?' to 't' )

From	To	Description
01AE	0074	# LATIN CAPITAL LETTER T WITH RETROFLEX HOOK ( 'T' to 't' )
01AF	0075	# LATIN CAPITAL LETTER U WITH HORN ( 'U' to 'u' )
01B0	0075	# LATIN SMALL LETTER U WITH HORN ( 'u' to 'u' )
01B2	0076	# LATIN CAPITAL LETTER V WITH HOOK ( '?' to 'v' )
01B3	0079	# LATIN CAPITAL LETTER Y WITH HOOK ( '?' to 'y' )
01B4	0079	# LATIN SMALL LETTER Y WITH HOOK ( '?' to 'y' )
01B5	007A	# LATIN CAPITAL LETTER Z WITH STROKE ( '?' to 'z' )
01B6	007A	# LATIN SMALL LETTER Z WITH STROKE ( 'z' to 'z' )
01B8	01B9	# LATIN CAPITAL LETTER EZH REVERSED ( '?' to '?' )
01BC	01BD	# LATIN CAPITAL LETTER TONE FIVE ( '?' to '?' )
01CD	0061	# LATIN CAPITAL LETTER A WITH CARON ( 'A' to 'a' )
01CE	0061	# LATIN SMALL LETTER A WITH CARON ( 'a' to 'a' )
01CF	0069	# LATIN CAPITAL LETTER I WITH CARON ( 'I' to 'i' )
01D0	0069	# LATIN SMALL LETTER I WITH CARON ( 'i' to 'i' )
01D1	006F	# LATIN CAPITAL LETTER O WITH CARON ( 'O' to 'o' )
01D2	006F	# LATIN SMALL LETTER O WITH CARON ( 'o' to 'o' )

From	To	Description
01D3	0075	# LATIN CAPITAL LETTER U WITH CARON ( 'U' to 'u' )
01D4	0075	# LATIN SMALL LETTER U WITH CARON ( 'u' to 'u' )
01D5	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND MACRON ( 'U' to 'u' )
01D6	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND MACRON ( 'u' to 'u' )
01D7	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND ACUTE ( 'U' to 'u' )
01D8	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND ACUTE ( 'u' to 'u' )
01D9	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND CARON ( 'U' to 'u' )
01DA	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND CARON ( 'u' to 'u' )
01DB	0075	# LATIN CAPITAL LETTER U WITH DIAERESIS AND GRAVE ( 'U' to 'u' )
01DC	0075	# LATIN SMALL LETTER U WITH DIAERESIS AND GRAVE ( 'u' to 'u' )
01DE	0061	# LATIN CAPITAL LETTER A WITH DIAERESIS AND MACRON ( 'A' to 'a' )
01DF	0061	# LATIN SMALL LETTER A WITH DIAERESIS AND MACRON ( 'a' to 'a' )
01E0	0061	# LATIN CAPITAL LETTER A WITH DOT ABOVE AND MACRON ( '?' to 'a' )
01E1	0061	# LATIN SMALL LETTER A WITH DOT ABOVE AND MACRON ( '?' to 'a' )
01E2	0061 0065	# LATIN CAPITAL LETTER AE WITH MACRON ( '?' to 'e' )
01E3	0061 0065	# LATIN SMALL LETTER AE WITH MACRON ( '?' to 'e' )

From	To	Description
01E4	0067	# LATIN CAPITAL LETTER G WITH STROKE ( 'G' to 'g' )
01E5	0067	# LATIN SMALL LETTER G WITH STROKE ( 'g' to 'g' )
01E6	0067	# LATIN CAPITAL LETTER G WITH CARON ( 'G' to 'g' )
01E7	0067	# LATIN SMALL LETTER G WITH CARON ( 'g' to 'g' )
01E8	006B	# LATIN CAPITAL LETTER K WITH CARON ( 'K' to 'k' )
01E9	006B	# LATIN SMALL LETTER K WITH CARON ( 'k' to 'k' )
01EA	006F	# LATIN CAPITAL LETTER O WITH OGONEK ( 'O' to 'o' )
01EB	006F	# LATIN SMALL LETTER O WITH OGONEK ( 'o' to 'o' )
01EC	006F	# LATIN CAPITAL LETTER O WITH OGONEK AND MACRON ( 'O' to 'o' )
01ED	006F	# LATIN SMALL LETTER O WITH OGONEK AND MACRON ( 'o' to 'o' )
01F0	006A	# LATIN SMALL LETTER J WITH CARON ( 'j' to 'j' )
01F4	0067	# LATIN CAPITAL LETTER G WITH ACUTE ( '?' to 'g' )
01F5	0067	# LATIN SMALL LETTER G WITH ACUTE ( '?' to 'g' )
01FA	0061	# LATIN CAPITAL LETTER A WITH RING ABOVE AND ACUTE ( '?' to 'a' )
01FB	0061	# LATIN SMALL LETTER A WITH RING ABOVE AND ACUTE ( '?' to 'a' )
01FC	0061 0065	# LATIN CAPITAL LETTER AE WITH ACUTE ( '?' to 'e' )

From	To	Description
01FD	0061 0065	# LATIN SMALL LETTER AE WITH ACUTE ( '?' to 'e' )
01FE	006F	# LATIN CAPITAL LETTER O WITH STROKE AND ACUTE ( '?' to 'o' )
01FF	006F	# LATIN SMALL LETTER O WITH STROKE AND ACUTE ( '?' to 'o' )
0200	0061	# LATIN CAPITAL LETTER A WITH DOUBLE GRAVE ( '?' to 'a' )
0201	0061	# LATIN SMALL LETTER A WITH DOUBLE GRAVE ( '?' to 'a' )
0202	0061	# LATIN CAPITAL LETTER A WITH INVERTED BREVE ( '?' to 'a' )
0203	0061	# LATIN SMALL LETTER A WITH INVERTED BREVE ( '?' to 'a' )
0204	0065	# LATIN CAPITAL LETTER E WITH DOUBLE GRAVE ( '?' to 'e' )
0205	0065	# LATIN SMALL LETTER E WITH DOUBLE GRAVE ( '?' to 'e' )
0206	0065	# LATIN CAPITAL LETTER E WITH INVERTED BREVE ( '?' to 'e' )
0207	0065	# LATIN SMALL LETTER E WITH INVERTED BREVE ( '?' to 'e' )
0208	0069	# LATIN CAPITAL LETTER I WITH DOUBLE GRAVE ( '?' to 'i' )
0209	0069	# LATIN SMALL LETTER I WITH DOUBLE GRAVE ( '?' to 'i' )
020A	0069	# LATIN CAPITAL LETTER I WITH INVERTED BREVE ( '?' to 'i' )
020B	0069	# LATIN SMALL LETTER I WITH INVERTED BREVE ( '?' to 'i' )
020C	006F	# LATIN CAPITAL LETTER O WITH DOUBLE GRAVE ( '?' to 'o' )

From	To	Description
020D	006F	# LATIN SMALL LETTER O WITH DOUBLE GRAVE ( '?' to 'o' )
020E	006F	# LATIN CAPITAL LETTER O WITH INVERTED BREVE ( '?' to 'o' )
020F	006F	# LATIN SMALL LETTER O WITH INVERTED BREVE ( '?' to 'o' )
0210	0072	# LATIN CAPITAL LETTER R WITH DOUBLE GRAVE ( '?' to 'r' )
0211	0072	# LATIN SMALL LETTER R WITH DOUBLE GRAVE ( '?' to 'r' )
0212	0072	# LATIN CAPITAL LETTER R WITH INVERTED BREVE ( '?' to 'r' )
0213	0072	# LATIN SMALL LETTER R WITH INVERTED BREVE ( '?' to 'r' )
0214	0075	# LATIN CAPITAL LETTER U WITH DOUBLE GRAVE ( '?' to 'u' )
0215	0075	# LATIN SMALL LETTER U WITH DOUBLE GRAVE ( '?' to 'u' )
0216	0075	# LATIN CAPITAL LETTER U WITH INVERTED BREVE ( '?' to 'u' )
0217	0075	# LATIN SMALL LETTER U WITH INVERTED BREVE ( '?' to 'u' )
0250	0061	# LATIN SMALL LETTER TURNED A ( '?' to 'a' )
0251	0061	# LATIN SMALL LETTER ALPHA ( '?' to 'a' )
0252	0061	# LATIN SMALL LETTER TURNED ALPHA ( '?' to 'a' )
0253	0062	# LATIN SMALL LETTER B WITH HOOK ( '?' to 'b' )
0254	006F	# LATIN SMALL LETTER OPEN O ( '?' to 'o' )

From	To	Description
0255	0063	# LATIN SMALL LETTER C WITH CURL ( '?' to 'c' )
0256	0064	# LATIN SMALL LETTER D WITH TAIL ( '?' to 'd' )
0257	0064	# LATIN SMALL LETTER D WITH HOOK ( '?' to 'd' )
0258	0065	# LATIN SMALL LETTER REVERSED E ( '?' to 'e' )
0259	0279	# LATIN SMALL LETTER SCHWA ( '?' to '?' )
025A	027A	# LATIN SMALL LETTER SCHWA WITH HOOK ( '?' to '?' )
025B	0065	# LATIN SMALL LETTER OPEN E ( '?' to 'e' )
025F	006A	# LATIN SMALL LETTER DOTLESS J WITH STROKE ( '?' to 'j' )
0260	0067	# LATIN SMALL LETTER G WITH HOOK ( '?' to 'g' )
0261	0067	# LATIN SMALL LETTER SCRIPT G ( 'g' to 'g' )
0262	0067	# LATIN LETTER SMALL CAPITAL G ( '?' to 'g' )
0263	0067	# LATIN SMALL LETTER GAMMA ( '?' to 'g' )
0266	0068	# LATIN SMALL LETTER H WITH HOOK ( '?' to 'h' )
0268	0069	# LATIN SMALL LETTER I WITH STROKE ( '?' to 'i' )
026A	0069	# LATIN LETTER SMALL CAPITAL I ( '?' to 'i' )
026B	006C	# LATIN SMALL LETTER L WITH MIDDLE TILDE ( '?' to 'l' )

From	To	Description
026C	006C	# LATIN SMALL LETTER L WITH BELT ( '?' to 'l' )
026D	006C	# LATIN SMALL LETTER L WITH RETROFLEX HOOK ( '?' to 'l' )
0271	006D	# LATIN SMALL LETTER M WITH HOOK ( '?' to 'm' )
0272	006E	# LATIN SMALL LETTER N WITH LEFT HOOK ( '?' to 'n' )
0273	006E	# LATIN SMALL LETTER N WITH RETROFLEX HOOK ( '?' to 'n' )
0274	006E	# LATIN LETTER SMALL CAPITAL N ( '?' to 'n' )
0275	006F	# LATIN SMALL LETTER BARRED O ( '?' to 'o' )
0276	0065	# LATIN LETTER SMALL CAPITAL OE ( '?' to 'e' )
027C	0072	# LATIN SMALL LETTER R WITH LONG LEG ( '?' to 'r' )
027D	0072	# LATIN SMALL LETTER R WITH TAIL ( '?' to 'r' )
0280	0072	# LATIN LETTER SMALL CAPITAL R ( '?' to 'r' )
0282	0073	# LATIN SMALL LETTER S WITH HOOK ( '?' to 's' )
028F	0079	# LATIN LETTER SMALL CAPITAL Y ( '?' to 'y' )
0299	0062	# LATIN LETTER SMALL CAPITAL B ( '?' to 'b' )
029C	0068	# LATIN LETTER SMALL CAPITAL H ( '?' to 'h' )
029F	006C	# LATIN LETTER SMALL CAPITAL L ( '?' to 'l' )

From	To	Description
02B0	0068	# MODIFIER LETTER SMALL H ( '?' to 'h' )
02B1	0068	# MODIFIER LETTER SMALL H WITH HOOK ( '?' to 'h' )
02B2	006A	# MODIFIER LETTER SMALL J ( '?' to 'j' )
02B3	0072	# MODIFIER LETTER SMALL R ( '?' to 'r' )
02B4	0000	
02B5	0000	
02B6	0000	
02B7	0077	# MODIFIER LETTER SMALL W ( '?' to 'w' )
02B8	0079	# MODIFIER LETTER SMALL Y ( '?' to 'y' )
02B9	0000	# MODIFIER LETTER PRIME ( "" to '' )
02BA	0000	# MODIFIER LETTER DOUBLE PRIME ( "" to '' )
02BB	0000	# MODIFIER LETTER TURNED COMMA ( '?' to '' )
02BC	0000	# MODIFIER LETTER APOSTROPHE ( "" to '' )
02BD	0000	# MODIFIER LETTER REVERSED COMMA ( '?' to '' )
02BE	0000	# MODIFIER LETTER RIGHT HALF RING ( '?' to '' )
02BF	0000	# MODIFIER LETTER LEFT HALF RING ( '?' to '' )

From	To	Description
02C0	0000	# MODIFIER LETTER GLOTTAL STOP ( '?' to '' )
02C1	0000	# MODIFIER LETTER REVERSED GLOTTAL STOP ( '?' to '' )
02C2	0000	# MODIFIER LETTER LEFT ARROWHEAD ( '?' to '' )
02C3	0000	# MODIFIER LETTER RIGHT ARROWHEAD ( '?' to '' )
02C4	0000	# MODIFIER LETTER UP ARROWHEAD ( '^' to '' )
02C5	0000	# MODIFIER LETTER DOWN ARROWHEAD ( '?' to '' )
02C6	0000	# MODIFIER LETTER CIRCUMFLEX ACCENT ( '^' to '' )
02C7	0000	# CARON ( '?' to '' )
02C8	0000	# MODIFIER LETTER VERTICAL LINE ( ' ' to '' )
02C9	0000	# MODIFIER LETTER MACRON ( '̄' to '' )
02CA	0000	# MODIFIER LETTER ACUTE ACCENT ( '´' to '' )
02CB	0000	# MODIFIER LETTER GRAVE ACCENT ( '`' to '' )
02CC	0000	# MODIFIER LETTER LOW VERTICAL LINE ( '?' to '' )
02CD	0000	# MODIFIER LETTER LOW MACRON ( '̆' to '' )
02CE	0000	# MODIFIER LETTER LOW GRAVE ACCENT ( '?' to '' )
02CF	0000	# MODIFIER LETTER LOW ACUTE ACCENT ( '?' to '' )

From	To	Description
02D0	0000	# MODIFIER LETTER TRIANGULAR COLON ( '?' to '' )
02D1	0000	# MODIFIER LETTER HALF TRIANGULAR COLON ( '?' to '' )
02D2	0000	# MODIFIER LETTER CENTRED RIGHT HALF RING ( '?' to '' )
02D3	0000	# MODIFIER LETTER CENTRED LEFT HALF RING ( '?' to '' )
02D4	0000	# MODIFIER LETTER UP TACK ( '?' to '' )
02D5	0000	# MODIFIER LETTER DOWN TACK ( '?' to '' )
02D6	0000	# MODIFIER LETTER PLUS SIGN ( '?' to '' )
02D7	0000	# MODIFIER LETTER MINUS SIGN ( '?' to '' )
02D8	0000	# BREVE ( '?' to '' )
02D9	0000	# DOT ABOVE ( '?' to '' )
02DA	0000	# RING ABOVE ( '°' to '' )
02DB	0000	# OGONEK ( '?' to '' )
02DC	0000	# SMALL TILDE ( 'ˇ' to '' )
02DD	0000	# DOUBLE ACUTE ACCENT ( '?' to '' )
02DE	0000	# MODIFIER LETTER RHOTIC HOOK ( '?' to '' )
02DF	0000	

From	To	Description
02E0	0000	# MODIFIER LETTER SMALL GAMMA ( '?' to '' )
02E1	006C	# MODIFIER LETTER SMALL L ( '?' to 'l' )
02E2	0073	# MODIFIER LETTER SMALL S ( '?' to 's' )
02E3	0078	# MODIFIER LETTER SMALL X ( '?' to 'x' )
02E4	0000	# MODIFIER LETTER SMALL REVERSED GLOTTAL STOP ( '?' to '' )
02E5	0000	# MODIFIER LETTER EXTRA-HIGH TONE BAR ( '?' to '' )
02E6	0000	# MODIFIER LETTER HIGH TONE BAR ( '?' to '' )
02E7	0000	# MODIFIER LETTER MID TONE BAR ( '?' to '' )
02E8	0000	# MODIFIER LETTER LOW TONE BAR ( '?' to '' )
02E9	0000	# MODIFIER LETTER EXTRA-LOW TONE BAR ( '?' to '' )
02EA	0000	
02EB	0000	
02EC	0000	
02ED	0000	
02EE	0000	
02EF	0000	

From	To	Description
02F0	0000	
02F1	0000	
02F2	0000	
02F3	0000	
02F4	0000	
02F5	0000	
02F6	0000	
02F7	0000	
02F8	0000	
02F9	0000	
02FA	0000	
02FB	0000	
02FC	0000	
02FE	0000	
02FF	0000	
0300	0000	# COMBINING GRAVE ACCENT ( ' ' to ' ' )

From	To	Description
0301	0000	# COMBINING ACUTE ACCENT ( '´ to ' ' )
0302	0000	# COMBINING CIRCUMFLEX ACCENT ( '¨ to ' ' )
0303	0000	# COMBINING TILDE ( '~ to ' ' )
0304	0000	# COMBINING MACRON ( '¯ to ' ' )
0305	0000	# COMBINING OVERLINE ( '¯ to ' ' )
0306	0000	# COMBINING BREVE ( '˘ to ' ' )
0307	0000	# COMBINING DOT ABOVE ( '· to ' ' )
0308	0000	# COMBINING DIAERESIS ( '¨ to ' ' )
0309	0000	# COMBINING HOOK ABOVE ( 'ˆ to ' ' )
030A	0000	# COMBINING RING ABOVE ( '° to ' ' )
030B	0000	# COMBINING DOUBLE ACUTE ACCENT ( 'ˆ to ' ' )
030C	0000	# COMBINING CARON ( 'ˇ to ' ' )
030D	0000	# COMBINING VERTICAL LINE ABOVE ( '¸ to ' ' )
030E	0000	# COMBINING DOUBLE VERTICAL LINE ABOVE ( 'ˆ to ' ' )
030F	0000	# COMBINING DOUBLE GRAVE ACCENT ( '˘ to ' ' )
0310	0000	# COMBINING CANDRABINDU ( '̣ to ' ' )

From	To	Description
0311	0000	# COMBINING INVERTED BREVE ( '?' to '' )
0312	0000	# COMBINING TURNED COMMA ABOVE ( '?' to '' )
0313	0000	# COMBINING COMMA ABOVE ( '?' to '' )
0314	0000	# COMBINING REVERSED COMMA ABOVE ( '?' to '' )
0315	0000	# COMBINING COMMA ABOVE RIGHT ( '?' to '' )
0316	0000	# COMBINING GRAVE ACCENT BELOW ( '?' to '' )
0317	0000	# COMBINING ACUTE ACCENT BELOW ( '?' to '' )
0318	0000	# COMBINING LEFT TACK BELOW ( '?' to '' )
0319	0000	# COMBINING RIGHT TACK BELOW ( '?' to '' )
031A	0000	# COMBINING LEFT ANGLE ABOVE ( '?' to '' )
031B	0000	# COMBINING HORN ( '?' to '' )
031C	0000	# COMBINING LEFT HALF RING BELOW ( '?' to '' )
031D	0000	# COMBINING UP TACK BELOW ( '?' to '' )
031E	0000	# COMBINING DOWN TACK BELOW ( '?' to '' )
031F	0000	# COMBINING PLUS SIGN BELOW ( '?' to '' )
0320	0000	# COMBINING MINUS SIGN BELOW ( '?' to '' )

From	To	Description
0321	0000	# COMBINING PALATALIZED HOOK BELOW ( '?' to '' )
0322	0000	# COMBINING RETROFLEX HOOK BELOW ( '?' to '' )
0323	0000	# COMBINING DOT BELOW ( '?' to '' )
0324	0000	# COMBINING DIAERESIS BELOW ( '?' to '' )
0325	0000	# COMBINING RING BELOW ( '?' to '' )
0326	0000	# COMBINING COMMA BELOW ( '?' to '' )
0327	0000	# COMBINING CEDILLA ( '?' to '' )
0328	0000	# COMBINING OGONEK ( '?' to '' )
0329	0000	# COMBINING VERTICAL LINE BELOW ( '?' to '' )
032A	0000	# COMBINING BRIDGE BELOW ( '?' to '' )
032B	0000	# COMBINING INVERTED DOUBLE ARCH BELOW ( '?' to '' )
032C	0000	# COMBINING CARON BELOW ( '?' to '' )
032D	0000	# COMBINING CIRCUMFLEX ACCENT BELOW ( '?' to '' )
032E	0000	# COMBINING BREVE BELOW ( '?' to '' )
032F	0000	# COMBINING INVERTED BREVE BELOW ( '?' to '' )
0330	0000	# COMBINING TILDE BELOW ( '?' to '' )

From	To	Description
0331	0000	# COMBINING MACRON BELOW ( ' _ ' to ' ' )
0332	0000	# COMBINING LOW LINE ( ' _ ' to ' ' )
0333	0000	# COMBINING DOUBLE LOW LINE ( ' ? ' to ' ' )
0334	0000	# COMBINING TILDE OVERLAY ( ' ? ' to ' ' )
0335	0000	# COMBINING SHORT STROKE OVERLAY ( ' ? ' to ' ' )
0336	0000	# COMBINING LONG STROKE OVERLAY ( ' ? ' to ' ' )
0337	0000	# COMBINING SHORT SOLIDUS OVERLAY ( ' ? ' to ' ' )
0338	0000	# COMBINING LONG SOLIDUS OVERLAY ( ' ? ' to ' ' )
0339	0000	# COMBINING RIGHT HALF RING BELOW ( ' ? ' to ' ' )
033A	0000	# COMBINING INVERTED BRIDGE BELOW ( ' ? ' to ' ' )
033B	0000	# COMBINING SQUARE BELOW ( ' ? ' to ' ' )
033C	0000	# COMBINING SEAGULL BELOW ( ' ? ' to ' ' )
033D	0000	# COMBINING X ABOVE ( ' ? ' to ' ' )
033E	0000	# COMBINING VERTICAL TILDE ( ' ? ' to ' ' )
033F	0000	# COMBINING DOUBLE OVERLINE ( ' ? ' to ' ' )
0340	0000	# COMBINING GRAVE TONE MARK ( ' ? ' to ' ' )

From	To	Description
0341	0000	# COMBINING ACUTE TONE MARK ( '?' to '' )
0342	0000	# COMBINING GREEK PERISPOMENI ( '?' to '' )
0343	0000	# COMBINING GREEK KORONIS ( '?' to '' )
0344	0000	# COMBINING GREEK DIALYTIKA TONOS ( '?' to '' )
0345	0000	# COMBINING GREEK YPOGEGRAMMENI ( '?' to '' )
0346	0000	
0347	0000	
0348	0000	
0349	0000	
034A	0000	
034B	0000	
034C	0000	
034D	0000	
034E	0000	
034F	0000	
0350	0000	

From	To	Description
0351	0000	
0352	0000	
0353	0000	
0354	0000	
0355	0000	
0356	0000	
0357	0000	
0358	0000	
0359	0000	
035A	0000	
035B	0000	
035C	0000	
035D	0000	
035E	0000	
035F	0000	
0362	0000	

From	To	Description
0363	0000	
0364	0000	
0365	0000	
0366	0000	
0367	0000	
0368	0000	
0369	0000	
036A	0000	
036B	0000	
036C	0000	
036D	0000	
036E	0000	
036F	0000	
0360	0000	# COMBINING DOUBLE TILDE ( '?' to '' )
0361	0000	# COMBINING DOUBLE INVERTED BREVE ( '?' to '' )
0374	0375	# GREEK NUMERAL SIGN ( '?' to '?' )

From	To	Description
0386	0391	# GREEK CAPITAL LETTER ALPHA WITH TONOS ( '?' to '?' )
0388	0395	# GREEK CAPITAL LETTER EPSILON WITH TONOS ( '?' to '?' )
0389	0397	# GREEK CAPITAL LETTER ETA WITH TONOS ( '?' to '?' )
038A	0399	# GREEK CAPITAL LETTER IOTA WITH TONOS ( '?' to '?' )
038C	039F	# GREEK CAPITAL LETTER OMICRON WITH TONOS ( '?' to '?' )
038E	03A5	# GREEK CAPITAL LETTER UPSILON WITH TONOS ( '?' to '?' )
038F	03A9	# GREEK CAPITAL LETTER OMEGA WITH TONOS ( '?' to 'O' )
0390	0399	# GREEK SMALL LETTER IOTA WITH DIALYTIKA AND TONOS ( '?' to '?' )
03AA	0399	# GREEK CAPITAL LETTER IOTA WITH DIALYTIKA ( '?' to '?' )
03AB	03A5	# GREEK CAPITAL LETTER UPSILON WITH DIALYTIKA ( '?' to '?' )
03AC	0391	# GREEK SMALL LETTER ALPHA WITH TONOS ( '?' to '?' )
03AD	0395	# GREEK SMALL LETTER EPSILON WITH TONOS ( '?' to '?' )
03AE	0397	# GREEK SMALL LETTER ETA WITH TONOS ( '?' to '?' )
03AF	0399	# GREEK SMALL LETTER IOTA WITH TONOS ( '?' to '?' )
03B0	03A5	# GREEK SMALL LETTER UPSILON WITH DIALYTIKA AND TONOS ( '?' to '?' )
03B1	0391	# GREEK SMALL LETTER ALPHA ( 'a' to '?' )

From	To	Description
03B2	0392	# GREEK SMALL LETTER BETA ( 'β' to '?' )
03B3	0393	# GREEK SMALL LETTER GAMMA ( '?' to 'Γ' )
03B4	0394	# GREEK SMALL LETTER DELTA ( 'δ' to '?' )
03B5	0395	# GREEK SMALL LETTER EPSILON ( 'ε' to '?' )
03B6	0396	# GREEK SMALL LETTER ZETA ( '?' to 'Ζ' )
03B7	0397	# GREEK SMALL LETTER ETA ( '?' to '?' )
03B8	0398	# GREEK SMALL LETTER THETA ( '?' to 'Τ' )
03B9	0399	# GREEK SMALL LETTER IOTA ( '?' to '?' )
03BA	039A	# GREEK SMALL LETTER KAPPA ( '?' to '?' )
03BB	039B	# GREEK SMALL LETTER LAMDA ( '?' to '?' )
03BC	039C	# GREEK SMALL LETTER MU ( 'μ' to '?' )
03BD	039D	# GREEK SMALL LETTER NU ( '?' to '?' )
03BE	039E	# GREEK SMALL LETTER XI ( '?' to '?' )
03BF	039F	# GREEK SMALL LETTER OMICRON ( '?' to '?' )
03C0	03A0	# GREEK SMALL LETTER PI ( 'π' to '?' )
03C1	03A1	# GREEK SMALL LETTER RHO ( '?' to '?' )

From	To	Description
03C2	03A3	# GREEK SMALL LETTER FINAL SIGMA ( '?' to 'S' )
03C3	03A3	# GREEK SMALL LETTER SIGMA ( 's' to 'S' )
03C4	03A4	# GREEK SMALL LETTER TAU ( 't' to '?' )
03C5	03A5	# GREEK SMALL LETTER UPSILON ( '?' to '?' )
03C6	03A6	# GREEK SMALL LETTER PHI ( 'f' to 'F' )
03C7	03A7	# GREEK SMALL LETTER CHI ( '?' to '?' )
03C8	03A8	# GREEK SMALL LETTER PSI ( '?' to '?' )
03C9	03A9	# GREEK SMALL LETTER OMEGA ( '?' to 'O' )
03CA	0399	# GREEK SMALL LETTER IOTA WITH DIALYTIKA ( '?' to '?' )
03CB	03A5	# GREEK SMALL LETTER UPSILON WITH DIALYTIKA ( '?' to '?' )
03CC	039F	# GREEK SMALL LETTER OMICRON WITH TONOS ( '?' to '?' )
03CD	03A5	# GREEK SMALL LETTER UPSILON WITH TONOS ( '?' to '?' )
03CE	03A9	# GREEK SMALL LETTER OMEGA WITH TONOS ( '?' to 'O' )
0401	0415	# CYRILLIC CAPITAL LETTER IO ( '?' to '?' )
0402	0414	# CYRILLIC CAPITAL LETTER DJE ( '?' to '?' )
0403	0413	# CYRILLIC CAPITAL LETTER GJE ( '?' to '?' )

From	To	Description
0404	042D	# CYRILLIC CAPITAL LETTER UKRAINIAN IE ( '?' to '?' )
0405	0417	# CYRILLIC CAPITAL LETTER DZE ( '?' to '?' )
0406	0418	# CYRILLIC CAPITAL LETTER BYELORUSSIAN-UKRAINIAN I ( '?' to '?' )
0407	0418	# CYRILLIC CAPITAL LETTER YI ( '?' to '?' )
0408	0419	# CYRILLIC CAPITAL LETTER JE ( '?' to '?' )
0409	041B	# CYRILLIC CAPITAL LETTER LJE ( '?' to '?' )
040A	041D	# CYRILLIC CAPITAL LETTER NJE ( '?' to '?' )
040B	0422	# CYRILLIC CAPITAL LETTER TSHE ( '?' to '?' )
040C	041A	# CYRILLIC CAPITAL LETTER KJE ( '?' to '?' )
040D	0418	# CYRILLIC CAPITAL LETTER I WITH GRAVE ( '?' to '?' )
040E	0423	# CYRILLIC CAPITAL LETTER SHORT U ( '?' to '?' )
040F	0426	# CYRILLIC CAPITAL LETTER DZHE ( '?' to '?' )
0430	0410	# CYRILLIC SMALL LETTER A ( '?' to '?' )
0431	0411	# CYRILLIC SMALL LETTER BE ( '?' to '?' )
0432	0412	# CYRILLIC SMALL LETTER VE ( '?' to '?' )
0433	0413	# CYRILLIC SMALL LETTER GHE ( '?' to '?' )

From	To	Description
0434	0414	# CYRILLIC SMALL LETTER DE ( '?' to '?' )
0435	0415	# CYRILLIC SMALL LETTER IE ( '?' to '?' )
0436	0416	# CYRILLIC SMALL LETTER ZHE ( '?' to '?' )
0437	0417	# CYRILLIC SMALL LETTER ZE ( '?' to '?' )
0438	0418	# CYRILLIC SMALL LETTER I ( '?' to '?' )
0439	0419	# CYRILLIC SMALL LETTER SHORT I ( '?' to '?' )
043A	041A	# CYRILLIC SMALL LETTER KA ( '?' to '?' )
043B	041B	# CYRILLIC SMALL LETTER EL ( '?' to '?' )
043C	041C	# CYRILLIC SMALL LETTER EM ( '?' to '?' )
043D	041D	# CYRILLIC SMALL LETTER EN ( '?' to '?' )
043E	041E	# CYRILLIC SMALL LETTER O ( '?' to '?' )
043F	041F	# CYRILLIC SMALL LETTER PE ( '?' to '?' )
0440	0420	# CYRILLIC SMALL LETTER ER ( '?' to '?' )
0441	0421	# CYRILLIC SMALL LETTER ES ( '?' to '?' )
0442	0422	# CYRILLIC SMALL LETTER TE ( '?' to '?' )
0443	0423	# CYRILLIC SMALL LETTER U ( '?' to '?' )

From	To	Description
0444	0424	# CYRILLIC SMALL LETTER EF ( '?' to '?' )
0445	0425	# CYRILLIC SMALL LETTER HA ( '?' to '?' )
0446	0426	# CYRILLIC SMALL LETTER TSE ( '?' to '?' )
0447	0427	# CYRILLIC SMALL LETTER CHE ( '?' to '?' )
0448	0428	# CYRILLIC SMALL LETTER SHA ( '?' to '?' )
0449	0429	# CYRILLIC SMALL LETTER SHCHA ( '?' to '?' )
044A	042A	# CYRILLIC SMALL LETTER HARD SIGN ( '?' to '?' )
044B	042B	# CYRILLIC SMALL LETTER YERU ( '?' to '?' )
044C	042C	# CYRILLIC SMALL LETTER SOFT SIGN ( '?' to '?' )
044D	042D	# CYRILLIC SMALL LETTER E ( '?' to '?' )
044E	042E	# CYRILLIC SMALL LETTER YU ( '?' to '?' )
044F	042F	# CYRILLIC SMALL LETTER YA ( '?' to '?' )
0451	0415	# CYRILLIC SMALL LETTER IO ( '?' to '?' )
0452	0414	# CYRILLIC SMALL LETTER DJE ( '?' to '?' )
0453	0413	# CYRILLIC SMALL LETTER GJE ( '?' to '?' )
0454	042D	# CYRILLIC SMALL LETTER UKRAINIAN IE ( '?' to '?' )

From	To	Description
0455	0417	# CYRILLIC SMALL LETTER DZE ( '?' to '?' )
0456	0418	# CYRILLIC SMALL LETTER BYELORUSSIAN-UKRAINIAN I ( '?' to '?' )
0457	0418	# CYRILLIC SMALL LETTER YI ( '?' to '?' )
0458	0419	# CYRILLIC SMALL LETTER JE ( '?' to '?' )
0459	041B	# CYRILLIC SMALL LETTER LJE ( '?' to '?' )
045A	041D	# CYRILLIC SMALL LETTER NJE ( '?' to '?' )
045B	0422	# CYRILLIC SMALL LETTER TSHE ( '?' to '?' )
045C	041A	# CYRILLIC SMALL LETTER KJE ( '?' to '?' )
045D	0418	# CYRILLIC SMALL LETTER I WITH GRAVE ( '?' to '?' )
045E	0423	# CYRILLIC SMALL LETTER SHORT U ( '?' to '?' )
045F	0426	# CYRILLIC SMALL LETTER DZHE ( '?' to '?' )
0460	0425	# CYRILLIC CAPITAL LETTER OMEGA ( '?' to '?' )
0461	0425	# CYRILLIC SMALL LETTER OMEGA ( '?' to '?' )
0462	0415	# CYRILLIC CAPITAL LETTER YAT ( '?' to '?' )
0463	0415	# CYRILLIC SMALL LETTER YAT ( '?' to '?' )
0465	0464	# CYRILLIC SMALL LETTER IOTIFIED E ( '?' to '?' )

From	To	Description
0467	0466	# CYRILLIC SMALL LETTER LITTLE YUS ( '?' to '?' )
0469	0468	# CYRILLIC SMALL LETTER IOTIFIED LITTLE YUS ( '?' to '?' )
046B	046A	# CYRILLIC SMALL LETTER BIG YUS ( '?' to '?' )
046D	046C	# CYRILLIC SMALL LETTER IOTIFIED BIG YUS ( '?' to '?' )
046F	046E	# CYRILLIC SMALL LETTER KSI ( '?' to '?' )
0471	0470	# CYRILLIC SMALL LETTER PSI ( '?' to '?' )
0472	0424	# CYRILLIC CAPITAL LETTER FITA ( '?' to '?' )
0473	0424	# CYRILLIC SMALL LETTER FITA ( '?' to '?' )
0474	0418	# CYRILLIC CAPITAL LETTER IZHITSA ( '?' to '?' )
0475	0418	# CYRILLIC SMALL LETTER IZHITSA ( '?' to '?' )
0476	0418	# CYRILLIC CAPITAL LETTER IZHITSA WITH DOUBLE GRAVE ACCENT ( '?' to '?' ) - changed from 00AF from here till 047F, see defect 9982
0477	0418	# CYRILLIC SMALL LETTER IZHITSA WITH DOUBLE GRAVE ACCENT ( '?' to '?' ) - changed from 00AF from here till 047F, see defect 9982
0478	0423	# CYRILLIC CAPITAL LETTER UK ( '?' to '?' )
0479	0423	# CYRILLIC SMALL LETTER UK ( '?' to '?' )
047A	0425	# CYRILLIC CAPITAL LETTER ROUND OMEGA ( '?' to '?' ) - changed from 00AF from here till 047F, see defect 9982
047B	0425	# CYRILLIC SMALL LETTER ROUND OMEGA ( '?' to '?' )

From	To	Description
047C	0425	# CYRILLIC CAPITAL LETTER OMEGA WITH TITLO ( '?' to '?' )
047D	0425	# CYRILLIC SMALL LETTER OMEGA WITH TITLO ( '?' to '?' )
047E	0425	# CYRILLIC CAPITAL LETTER OT ( '?' to '?' )
047F	0425	# CYRILLIC SMALL LETTER OT ( '?' to '?' )
0481	0480	# CYRILLIC SMALL LETTER KOPPA ( '?' to '?' )
048C	042C	# CYRILLIC CAPITAL LETTER SEMISOFT SIGN ( '?' to '?' )
048D	042C	# CYRILLIC SMALL LETTER SEMISOFT SIGN ( '?' to '?' )
048E	0420	# CYRILLIC CAPITAL LETTER ER WITH TICK ( '?' to '?' )
048F	0420	# CYRILLIC SMALL LETTER ER WITH TICK ( '?' to '?' )
0490	0413	# CYRILLIC CAPITAL LETTER GHE WITH UPTURN ( '?' to '?' )
0491	0413	# CYRILLIC SMALL LETTER GHE WITH UPTURN ( '?' to '?' )
0492	0413	# CYRILLIC CAPITAL LETTER GHE WITH STROKE ( '?' to '?' )
0493	0413	# CYRILLIC SMALL LETTER GHE WITH STROKE ( '?' to '?' )
0494	0413	# CYRILLIC CAPITAL LETTER GHE WITH MIDDLE HOOK ( '?' to '?' )
0495	0413	# CYRILLIC SMALL LETTER GHE WITH MIDDLE HOOK ( '?' to '?' )
0496	0416	# CYRILLIC CAPITAL LETTER ZHE WITH DESCENDER ( '?' to '?' )

From	To	Description
0497	0416	# CYRILLIC SMALL LETTER ZHE WITH DESCENDER ( '?' to '?' )
0498	0417	# CYRILLIC CAPITAL LETTER ZE WITH DESCENDER ( '?' to '?' )
0499	0417	# CYRILLIC SMALL LETTER ZE WITH DESCENDER ( '?' to '?' )
049A	041A	# CYRILLIC CAPITAL LETTER KA WITH DESCENDER ( '?' to '?' )
049B	041A	# CYRILLIC SMALL LETTER KA WITH DESCENDER ( '?' to '?' )
049C	041A	# CYRILLIC CAPITAL LETTER KA WITH VERTICAL STROKE ( '?' to '?' )
049D	041A	# CYRILLIC SMALL LETTER KA WITH VERTICAL STROKE ( '?' to '?' )
049E	041A	# CYRILLIC CAPITAL LETTER KA WITH STROKE ( '?' to '?' )
049F	041A	# CYRILLIC SMALL LETTER KA WITH STROKE ( '?' to '?' )
04A0	041A	# CYRILLIC CAPITAL LETTER BASHKIR KA ( '?' to '?' )
04A1	041A	# CYRILLIC SMALL LETTER BASHKIR KA ( '?' to '?' )
04A2	041D	# CYRILLIC CAPITAL LETTER EN WITH DESCENDER ( '?' to '?' )
04A3	041D	# CYRILLIC SMALL LETTER EN WITH DESCENDER ( '?' to '?' )
04A4	041D	# CYRILLIC CAPITAL LIGATURE EN GHE ( '?' to '?' )
04A5	041D	# CYRILLIC SMALL LIGATURE EN GHE ( '?' to '?' )
04A6	041F	# CYRILLIC CAPITAL LETTER PE WITH MIDDLE HOOK ( '?' to '?' )

From	To	Description
04A7	041F	# CYRILLIC SMALL LETTER PE WITH MIDDLE HOOK ( '?' to '?' )
04A8	041E	# CYRILLIC CAPITAL LETTER ABKHASIAN HA ( '?' to '?' )
04A9	041E	# CYRILLIC SMALL LETTER ABKHASIAN HA ( '?' to '?' )
04AA	0421	# CYRILLIC CAPITAL LETTER ES WITH DESCENDER ( '?' to '?' )
04AB	0421	# CYRILLIC SMALL LETTER ES WITH DESCENDER ( '?' to '?' )
04AC	0422	# CYRILLIC CAPITAL LETTER TE WITH DESCENDER ( '?' to '?' )
04AD	0422	# CYRILLIC SMALL LETTER TE WITH DESCENDER ( '?' to '?' )
04AE	0423	# CYRILLIC CAPITAL LETTER STRAIGHT U ( '?' to '?' )
04AF	0423	# CYRILLIC SMALL LETTER STRAIGHT U ( '?' to '?' )
04B0	0423	# CYRILLIC CAPITAL LETTER STRAIGHT U WITH STROKE ( '?' to '?' )
04B1	0423	# CYRILLIC SMALL LETTER STRAIGHT U WITH STROKE ( '?' to '?' )
04B2	0425	# CYRILLIC CAPITAL LETTER HA WITH DESCENDER ( '?' to '?' )
04B3	0425	# CYRILLIC SMALL LETTER HA WITH DESCENDER ( '?' to '?' )
04B4	0422	# CYRILLIC CAPITAL LIGATURE TE TSE ( '?' to '?' )
04B5	0422	# CYRILLIC SMALL LIGATURE TE TSE ( '?' to '?' )
04B6	0427	# CYRILLIC CAPITAL LETTER CHE WITH DESCENDER ( '?' to '?' )

From	To	Description
04B7	0427	# CYRILLIC SMALL LETTER CHE WITH DESCENDER ( '?' to '?' )
04B8	0427	# CYRILLIC CAPITAL LETTER CHE WITH VERTICAL STROKE ( '?' to '?' )
04B9	0427	# CYRILLIC SMALL LETTER CHE WITH VERTICAL STROKE ( '?' to '?' )
04BA	0425	# CYRILLIC CAPITAL LETTER SHHA ( '?' to '?' )
04BB	0425	# CYRILLIC SMALL LETTER SHHA ( 'h' to '?' )
04BC	0415	# CYRILLIC CAPITAL LETTER ABKHASIAN CHE ( '?' to '?' )
04BD	0415	# CYRILLIC SMALL LETTER ABKHASIAN CHE ( '?' to '?' )
04BE	0415	# CYRILLIC CAPITAL LETTER ABKHASIAN CHE WITH DESCENDER ( '?' to '?' )
04BF	0415	# CYRILLIC SMALL LETTER ABKHASIAN CHE WITH DESCENDER ( '?' to '?' )
04C0	042B	# CYRILLIC LETTER PALOCHKA ( '?' to '?' )
04C1	0416	# CYRILLIC CAPITAL LETTER ZHE WITH BREVE ( '?' to '?' )
04C2	0416	# CYRILLIC SMALL LETTER ZHE WITH BREVE ( '?' to '?' )
04C3	041A	# CYRILLIC CAPITAL LETTER KA WITH HOOK ( '?' to '?' )
04C4	041A	# CYRILLIC SMALL LETTER KA WITH HOOK ( '?' to '?' )
04C7	041D	# CYRILLIC CAPITAL LETTER EN WITH HOOK ( '?' to '?' )
04C8	041D	# CYRILLIC SMALL LETTER EN WITH HOOK ( '?' to '?' )

From	To	Description
04C9	0425	# CYRILLIC CAPITAL LETTER EN WITH TAIL ( '?' to '?' )
04CA	0425	# CYRILLIC SMALL LETTER EN WITH TAIL ( '?' to '?' )
04CB	0427	# CYRILLIC CAPITAL LETTER KHAKASSIAN CHE ( '?' to '?' )
04CC	0427	# CYRILLIC SMALL LETTER KHAKASSIAN CHE ( '?' to '?' )
04D0	0410	# CYRILLIC CAPITAL LETTER A WITH BREVE ( '?' to '?' )
04D1	0410	# CYRILLIC SMALL LETTER A WITH BREVE ( '?' to '?' )
04D2	0410	# CYRILLIC CAPITAL LETTER A WITH DIAERESIS ( '?' to '?' )
04D3	0410	# CYRILLIC SMALL LETTER A WITH DIAERESIS ( '?' to '?' )
04D4	0410	# CYRILLIC CAPITAL LIGATURE A IE ( '?' to '?' )
04D5	0410	# CYRILLIC SMALL LIGATURE A IE ( '?' to '?' )
04D6	0415	# CYRILLIC CAPITAL LETTER IE WITH BREVE ( '?' to '?' )
04D7	0415	# CYRILLIC SMALL LETTER IE WITH BREVE ( '?' to '?' )
04D8	0415	# CYRILLIC CAPITAL LETTER SCHWA ( '?' to '?' )
04D9	0415	# CYRILLIC SMALL LETTER SCHWA ( '?' to '?' )
04DA	0415	# CYRILLIC CAPITAL LETTER SCHWA WITH DIAERESIS ( '?' to '?' )
04DB	0415	# CYRILLIC SMALL LETTER SCHWA WITH DIAERESIS ( '?' to '?' )

From	To	Description
04DC	0416	# CYRILLIC CAPITAL LETTER ZHE WITH DIAERESIS ( '?' to '?' )
04DD	0416	# CYRILLIC SMALL LETTER ZHE WITH DIAERESIS ( '?' to '?' )
04DE	0417	# CYRILLIC CAPITAL LETTER ZE WITH DIAERESIS ( '?' to '?' )
04DF	0417	# CYRILLIC SMALL LETTER ZE WITH DIAERESIS ( '?' to '?' )
04E0	0417	# CYRILLIC CAPITAL LETTER ABKHASIAN DZE ( '?' to '?' )
04E1	0417	# CYRILLIC SMALL LETTER ABKHASIAN DZE ( '?' to '?' )
04E2	0418	# CYRILLIC CAPITAL LETTER I WITH MACRON ( '?' to '?' )
04E3	0418	# CYRILLIC SMALL LETTER I WITH MACRON ( '?' to '?' )
04E4	0418	# CYRILLIC CAPITAL LETTER I WITH DIAERESIS ( '?' to '?' )
04E5	0418	# CYRILLIC SMALL LETTER I WITH DIAERESIS ( '?' to '?' )
04E6	041E	# CYRILLIC CAPITAL LETTER O WITH DIAERESIS ( '?' to '?' )
04E7	041E	# CYRILLIC SMALL LETTER O WITH DIAERESIS ( '?' to '?' )
04E8	041E	# CYRILLIC CAPITAL LETTER BARRED O ( '?' to '?' )
04E9	041E	# CYRILLIC SMALL LETTER BARRED O ( '?' to '?' )
04EA	041E	# CYRILLIC CAPITAL LETTER BARRED O WITH DIAERESIS ( '?' to '?' )
04EB	041E	# CYRILLIC SMALL LETTER BARRED O WITH DIAERESIS ( '?' to '?' )

From	To	Description
04EC	042D	# CYRILLIC CAPITAL LETTER E WITH DIAERESIS ( '?' to '?' )
04ED	042D	# CYRILLIC SMALL LETTER E WITH DIAERESIS ( '?' to '?' )
04EE	0423	# CYRILLIC CAPITAL LETTER U WITH MACRON ( '?' to '?' )
04EF	0423	# CYRILLIC SMALL LETTER U WITH MACRON ( '?' to '?' )
04F0	0423	# CYRILLIC CAPITAL LETTER U WITH DIAERESIS ( '?' to '?' )
04F1	0423	# CYRILLIC SMALL LETTER U WITH DIAERESIS ( '?' to '?' )
04F2	0423	# CYRILLIC CAPITAL LETTER U WITH DOUBLE ACUTE ( '?' to '?' )
04F3	0423	# CYRILLIC SMALL LETTER U WITH DOUBLE ACUTE ( '?' to '?' )
04F4	0427	# CYRILLIC CAPITAL LETTER CHE WITH DIAERESIS ( '?' to '?' )
04F5	0427	# CYRILLIC SMALL LETTER CHE WITH DIAERESIS ( '?' to '?' )
04F8	042B	# CYRILLIC CAPITAL LETTER YERU WITH DIAERESIS ( '?' to '?' )
04F9	042B	# CYRILLIC SMALL LETTER YERU WITH DIAERESIS ( '?' to '?' )
0591	0000	# HEBREW ACCENT ETNAHTA ( '?' to '' )
0592	0000	# HEBREW ACCENT SEGOL ( '?' to '' )
0593	0000	# HEBREW ACCENT SHALSHELET ( '?' to '' )
0594	0000	# HEBREW ACCENT ZAQEF QATAN ( '?' to '' )

From	To	Description
0595	0000	# HEBREW ACCENT ZAQEF GADOL ( '?' to '' )
0596	0000	# HEBREW ACCENT TIPEHA ( '?' to '' )
0597	0000	# HEBREW ACCENT REVIA ( '?' to '' )
0598	0000	# HEBREW ACCENT ZARQA ( '?' to '' )
0599	0000	# HEBREW ACCENT PASHTA ( '?' to '' )
059A	0000	# HEBREW ACCENT YETIV ( '?' to '' )
059B	0000	# HEBREW ACCENT TEVIR ( '?' to '' )
059C	0000	# HEBREW ACCENT GERESH ( '?' to '' )
059D	0000	# HEBREW ACCENT GERESH MUQDAM ( '?' to '' )
059E	0000	# HEBREW ACCENT GERSHAYIM ( '?' to '' )
059F	0000	# HEBREW ACCENT QARNEY PARA ( '?' to '' )
05A0	0000	# HEBREW ACCENT TELISHA GEDOLA ( '?' to '' )
05A1	0000	# HEBREW ACCENT PAZER ( '?' to '' )
05A3	0000	# HEBREW ACCENT MUNAH ( '?' to '' )
05A4	0000	# HEBREW ACCENT MAHAPAKH ( '?' to '' )
05A5	0000	# HEBREW ACCENT MERKHA ( '?' to '' )

From	To	Description
05A6	0000	# HEBREW ACCENT MERKHA KEFULA ( '?' to '' )
05A7	0000	# HEBREW ACCENT DARGA ( '?' to '' )
05A8	0000	# HEBREW ACCENT QADMA ( '?' to '' )
05A9	0000	# HEBREW ACCENT TELISHA QETANA ( '?' to '' )
05AA	0000	# HEBREW ACCENT YERAH BEN YOMO ( '?' to '' )
05AB	0000	# HEBREW ACCENT OLE ( '?' to '' )
05AC	0000	# HEBREW ACCENT ILUY ( '?' to '' )
05AD	0000	# HEBREW ACCENT DEHI ( '?' to '' )
05AE	0000	# HEBREW ACCENT ZINOR ( '?' to '' )
05AF	0000	# HEBREW MARK MASORA CIRCLE ( '?' to '' )
05B0	0000	# HEBREW POINT SHEVA ( '?' to '' )
05B1	0000	# HEBREW POINT HATAF SEGOL ( '?' to '' )
05B2	0000	# HEBREW POINT HATAF PATAH ( '?' to '' )
05B3	0000	# HEBREW POINT HATAF QAMATS ( '?' to '' )
05B4	0000	# HEBREW POINT HIRIQ ( '?' to '' )
05B5	0000	# HEBREW POINT TSERE ( '?' to '' )

From	To	Description
05B6	0000	# HEBREW POINT SEGOL ( '?' to '' )
05B7	0000	# HEBREW POINT PATAH ( '?' to '' )
05B8	0000	# HEBREW POINT QAMATS ( '?' to '' )
05B9	0000	# HEBREW POINT HOLAM ( '?' to '' )
05BB	0000	# HEBREW POINT QUBUTS ( '?' to '' )
05BC	0000	# HEBREW POINT DAGESH OR MAPIQ ( '?' to '' )
05BD	0000	# HEBREW POINT METEG ( '?' to '' )
05BE	002D	# HEBREW PUNCTUATION MAQAF ( '?' to '-' )
05BF	0000	# HEBREW POINT RAFE ( '?' to '' )
05C0	0000	# HEBREW PUNCTUATION PASEQ ( '?' to '' )
05C1	0000	# HEBREW POINT SHIN DOT ( '?' to '' )
05C2	0000	# HEBREW POINT SIN DOT ( '?' to '' )
05C3	0000	# HEBREW PUNCTUATION SOF PASUQ ( '?' to '' )
05C4	0000	# HEBREW MARK UPPER DOT ( '?' to '' )
05F0	05D5	# HEBREW LIGATURE YIDDISH DOUBLE VAV ( '?' to '?' )
05F1	05D9	# HEBREW LIGATURE YIDDISH VAV YOD ( '?' to '?' )

From	To	Description
05F2	05D9 05D9	# HEBREW LIGATURE YIDDISH DOUBLE YOD ( '?' to '?' )
05F3	0000	# HEBREW PUNCTUATION GERESH ( '?' to '' )
05F4	0000	# HEBREW PUNCTUATION GERSHAYIM ( '?' to '' )
1DC0	0000	# 1DC0 - 1DFF are Combining Diacritical Marks Supplement
1DC1	0000	
1DC2	0000	
1DC3	0000	
1DC4	0000	
1DC5	0000	
1DC6	0000	
1DC7	0000	
1DC8	0000	
1DC9	0000	
1DCA	0000	
1DCB	0000	
1DCC	0000	

From	To	Description
1DCD	0000	
1DCE	0000	
1DCF	0000	
1DD0	0000	
1DD1	0000	
1DD2	0000	
1DD3	0000	
1DD4	0000	
1DD5	0000	
1DD6	0000	
1DD7	0000	
1DD8	0000	
1DD9	0000	
1DDA	0000	
1DDB	0000	
1DDC	0000	

From	To	Description
1DDD	0000	
1DDE	0000	
1DDF	0000	
1DE0	0000	
1DE1	0000	
1DE2	0000	
1DE3	0000	
1DE4	0000	
1DE5	0000	
1DE6	0000	
1DFC	0000	
1DFD	0000	
1DFE	0000	
1DFF	0000	
1E00	0061	# LATIN CAPITAL LETTER A WITH RING BELOW ( 'ä' to 'å' )
1E01	0061	# LATIN SMALL LETTER A WITH RING BELOW ( 'ä' to 'å' )

From	To	Description
1E02	0062	# LATIN CAPITAL LETTER B WITH DOT ABOVE ( '?' to 'b' )
1E03	0062	# LATIN SMALL LETTER B WITH DOT ABOVE ( '?' to 'b' )
1E04	0062	# LATIN CAPITAL LETTER B WITH DOT BELOW ( '?' to 'b' )
1E05	0062	# LATIN SMALL LETTER B WITH DOT BELOW ( '?' to 'b' )
1E06	0062	# LATIN CAPITAL LETTER B WITH LINE BELOW ( '?' to 'b' )
1E07	0062	# LATIN SMALL LETTER B WITH LINE BELOW ( '?' to 'b' )
1E08	0063	# LATIN CAPITAL LETTER C WITH CEDILLA AND ACUTE ( '?' to 'c' )
1E09	0063	# LATIN SMALL LETTER C WITH CEDILLA AND ACUTE ( '?' to 'c' )
1E0A	0064	# LATIN CAPITAL LETTER D WITH DOT ABOVE ( '?' to 'd' )
1E0B	0064	# LATIN SMALL LETTER D WITH DOT ABOVE ( '?' to 'd' )
1E0C	0064	# LATIN CAPITAL LETTER D WITH DOT BELOW ( '?' to 'd' )
1E0D	0064	# LATIN SMALL LETTER D WITH DOT BELOW ( '?' to 'd' )
1E0E	0064	# LATIN CAPITAL LETTER D WITH LINE BELOW ( '?' to 'd' )
1E0F	0064	# LATIN SMALL LETTER D WITH LINE BELOW ( '?' to 'd' )
1E10	0064	# LATIN CAPITAL LETTER D WITH CEDILLA ( '?' to 'd' )
1E11	0064	# LATIN SMALL LETTER D WITH CEDILLA ( '?' to 'd' )

From	To	Description
1E12	0064	# LATIN CAPITAL LETTER D WITH CIRCUMFLEX BELOW ( '?' to 'd' )
1E13	0064	# LATIN SMALL LETTER D WITH CIRCUMFLEX BELOW ( '?' to 'd' )
1E14	0065	# LATIN CAPITAL LETTER E WITH MACRON AND GRAVE ( '?' to 'e' )
1E15	0065	# LATIN SMALL LETTER E WITH MACRON AND GRAVE ( '?' to 'e' )
1E16	0065	# LATIN CAPITAL LETTER E WITH MACRON AND ACUTE ( '?' to 'e' )
1E17	0065	# LATIN SMALL LETTER E WITH MACRON AND ACUTE ( '?' to 'e' )
1E18	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX BELOW ( '?' to 'e' )
1E19	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX BELOW ( '?' to 'e' )
1E1A	0065	# LATIN CAPITAL LETTER E WITH TILDE BELOW ( '?' to 'e' )
1E1B	0065	# LATIN SMALL LETTER E WITH TILDE BELOW ( '?' to 'e' )
1E1C	0065	# LATIN CAPITAL LETTER E WITH CEDILLA AND BREVE ( '?' to 'e' )
1E1D	0065	# LATIN SMALL LETTER E WITH CEDILLA AND BREVE ( '?' to 'e' )
1E1E	0066	# LATIN CAPITAL LETTER F WITH DOT ABOVE ( '?' to 'f' )
1E1F	0066	# LATIN SMALL LETTER F WITH DOT ABOVE ( '?' to 'f' )
1E20	0067	# LATIN CAPITAL LETTER G WITH MACRON ( '?' to 'g' )
1E21	0067	# LATIN SMALL LETTER G WITH MACRON ( '?' to 'g' )

From	To	Description
1E22	0068	# LATIN CAPITAL LETTER H WITH DOT ABOVE ( '?' to 'h' )
1E23	0068	# LATIN SMALL LETTER H WITH DOT ABOVE ( '?' to 'h' )
1E24	0068	# LATIN CAPITAL LETTER H WITH DOT BELOW ( '?' to 'h' )
1E25	0068	# LATIN SMALL LETTER H WITH DOT BELOW ( '?' to 'h' )
1E26	0068	# LATIN CAPITAL LETTER H WITH DIAERESIS ( '?' to 'h' )
1E27	0068	# LATIN SMALL LETTER H WITH DIAERESIS ( '?' to 'h' )
1E28	0068	# LATIN CAPITAL LETTER H WITH CEDILLA ( '?' to 'h' )
1E29	0068	# LATIN SMALL LETTER H WITH CEDILLA ( '?' to 'h' )
1E2A	0068	# LATIN CAPITAL LETTER H WITH BREVE BELOW ( '?' to 'h' )
1E2B	0068	# LATIN SMALL LETTER H WITH BREVE BELOW ( '?' to 'h' )
1E2C	0069	# LATIN CAPITAL LETTER I WITH TILDE BELOW ( '?' to 'i' )
1E2D	0069	# LATIN SMALL LETTER I WITH TILDE BELOW ( '?' to 'i' )
1E2E	0069	# LATIN CAPITAL LETTER I WITH DIAERESIS AND ACUTE ( '?' to 'i' )
1E2F	0069	# LATIN SMALL LETTER I WITH DIAERESIS AND ACUTE ( '?' to 'i' )
1E30	006B	# LATIN CAPITAL LETTER K WITH ACUTE ( '?' to 'k' )
1E31	006B	# LATIN SMALL LETTER K WITH ACUTE ( '?' to 'k' )

From	To	Description
1E32	006B	# LATIN CAPITAL LETTER K WITH DOT BELOW ( '?' to 'k' )
1E33	006B	# LATIN SMALL LETTER K WITH DOT BELOW ( '?' to 'k' )
1E34	006B	# LATIN CAPITAL LETTER K WITH LINE BELOW ( '?' to 'k' )
1E35	006B	# LATIN SMALL LETTER K WITH LINE BELOW ( '?' to 'k' )
1E36	006C	# LATIN CAPITAL LETTER L WITH DOT BELOW ( '?' to 'l' )
1E37	006C	# LATIN SMALL LETTER L WITH DOT BELOW ( '?' to 'l' )
1E38	006C	# LATIN CAPITAL LETTER L WITH DOT BELOW AND MACRON ( '?' to 'l' )
1E39	006C	# LATIN SMALL LETTER L WITH DOT BELOW AND MACRON ( '?' to 'l' )
1E3A	006C	# LATIN CAPITAL LETTER L WITH LINE BELOW ( '?' to 'l' )
1E3B	006C	# LATIN SMALL LETTER L WITH LINE BELOW ( '?' to 'l' )
1E3C	006C	# LATIN CAPITAL LETTER L WITH CIRCUMFLEX BELOW ( '?' to 'l' )
1E3D	006C	# LATIN SMALL LETTER L WITH CIRCUMFLEX BELOW ( '?' to 'l' )
1E3E	006D	# LATIN CAPITAL LETTER M WITH ACUTE ( '?' to 'm' )
1E3F	006D	# LATIN SMALL LETTER M WITH ACUTE ( '?' to 'm' )
1E40	006D	# LATIN CAPITAL LETTER M WITH DOT ABOVE ( '?' to 'm' )
1E41	006D	# LATIN SMALL LETTER M WITH DOT ABOVE ( '?' to 'm' )

From	To	Description
1E42	006D	# LATIN CAPITAL LETTER M WITH DOT BELOW ( '?' to 'm' )
1E43	006D	# LATIN SMALL LETTER M WITH DOT BELOW ( '?' to 'm' )
1E44	006E	# LATIN CAPITAL LETTER N WITH DOT ABOVE ( '?' to 'n' )
1E45	006E	# LATIN SMALL LETTER N WITH DOT ABOVE ( '?' to 'n' )
1E46	006E	# LATIN CAPITAL LETTER N WITH DOT BELOW ( '?' to 'n' )
1E47	006E	# LATIN SMALL LETTER N WITH DOT BELOW ( '?' to 'n' )
1E48	006E	# LATIN CAPITAL LETTER N WITH LINE BELOW ( '?' to 'n' )
1E49	006E	# LATIN SMALL LETTER N WITH LINE BELOW ( '?' to 'n' )
1E4A	006E	# LATIN CAPITAL LETTER N WITH CIRCUMFLEX BELOW ( '?' to 'n' )
1E4B	006E	# LATIN SMALL LETTER N WITH CIRCUMFLEX BELOW ( '?' to 'n' )
1E4C	006F	# LATIN CAPITAL LETTER O WITH TILDE AND ACUTE ( '?' to 'o' )
1E4D	006F	# LATIN SMALL LETTER O WITH TILDE AND ACUTE ( '?' to 'o' )
1E4E	006F	# LATIN CAPITAL LETTER O WITH TILDE AND DIAERESIS ( '?' to 'o' )
1E4F	006F	# LATIN SMALL LETTER O WITH TILDE AND DIAERESIS ( '?' to 'o' )
1E50	006F	# LATIN CAPITAL LETTER O WITH MACRON AND GRAVE ( '?' to 'o' )
1E51	006F	# LATIN SMALL LETTER O WITH MACRON AND GRAVE ( '?' to 'o' )

From	To	Description
1E52	006F	# LATIN CAPITAL LETTER O WITH MACRON AND ACUTE ( '?' to 'o' )
1E53	006F	# LATIN SMALL LETTER O WITH MACRON AND ACUTE ( '?' to 'o' )
1E54	0070	# LATIN CAPITAL LETTER P WITH ACUTE ( '?' to 'p' )
1E55	0070	# LATIN SMALL LETTER P WITH ACUTE ( '?' to 'p' )
1E56	0070	# LATIN CAPITAL LETTER P WITH DOT ABOVE ( '?' to 'p' )
1E57	0070	# LATIN SMALL LETTER P WITH DOT ABOVE ( '?' to 'p' )
1E58	0072	# LATIN CAPITAL LETTER R WITH DOT ABOVE ( '?' to 'r' )
1E59	0072	# LATIN SMALL LETTER R WITH DOT ABOVE ( '?' to 'r' )
1E5A	0072	# LATIN CAPITAL LETTER R WITH DOT BELOW ( '?' to 'r' )
1E5B	0072	# LATIN SMALL LETTER R WITH DOT BELOW ( '?' to 'r' )
1E5C	0072	# LATIN CAPITAL LETTER R WITH DOT BELOW AND MACRON ( '?' to 'r' )
1E5D	0072	# LATIN SMALL LETTER R WITH DOT BELOW AND MACRON ( '?' to 'r' )
1E5E	0072	# LATIN CAPITAL LETTER R WITH LINE BELOW ( '?' to 'r' )
1E5F	0072	# LATIN SMALL LETTER R WITH LINE BELOW ( '?' to 'r' )
1E60	0073	# LATIN CAPITAL LETTER S WITH DOT ABOVE ( '?' to 's' )
1E61	0073	# LATIN SMALL LETTER S WITH DOT ABOVE ( '?' to 's' )

From	To	Description
1E62	0073	# LATIN CAPITAL LETTER S WITH DOT BELOW ( '?' to 's' )
1E63	0073	# LATIN SMALL LETTER S WITH DOT BELOW ( '?' to 's' )
1E64	0073	# LATIN CAPITAL LETTER S WITH ACUTE AND DOT ABOVE ( '?' to 's' )
1E65	0073	# LATIN SMALL LETTER S WITH ACUTE AND DOT ABOVE ( '?' to 's' )
1E66	0073	# LATIN CAPITAL LETTER S WITH CARON AND DOT ABOVE ( '?' to 's' )
1E67	0073	# LATIN SMALL LETTER S WITH CARON AND DOT ABOVE ( '?' to 's' )
1E68	0073	# LATIN CAPITAL LETTER S WITH DOT BELOW AND DOT ABOVE ( '?' to 's' )
1E69	0073	# LATIN SMALL LETTER S WITH DOT BELOW AND DOT ABOVE ( '?' to 's' )
1E6A	0074	# LATIN CAPITAL LETTER T WITH DOT ABOVE ( '?' to 't' )
1E6B	0074	# LATIN SMALL LETTER T WITH DOT ABOVE ( '?' to 't' )
1E6C	0074	# LATIN CAPITAL LETTER T WITH DOT BELOW ( '?' to 't' )
1E6D	0074	# LATIN SMALL LETTER T WITH DOT BELOW ( '?' to 't' )
1E6E	0074	# LATIN CAPITAL LETTER T WITH LINE BELOW ( '?' to 't' )
1E6F	0074	# LATIN SMALL LETTER T WITH LINE BELOW ( '?' to 't' )
1E70	0074	# LATIN CAPITAL LETTER T WITH CIRCUMFLEX BELOW ( '?' to 't' )
1E71	0074	# LATIN SMALL LETTER T WITH CIRCUMFLEX BELOW ( '?' to 't' )

From	To	Description
1E72	0074	# LATIN CAPITAL LETTER U WITH DIAERESIS BELOW ( '?' to 't' )
1E73	0075	# LATIN SMALL LETTER U WITH DIAERESIS BELOW ( '?' to 'u' )
1E74	0075	# LATIN CAPITAL LETTER U WITH TILDE BELOW ( '?' to 'u' )
1E75	0075	# LATIN SMALL LETTER U WITH TILDE BELOW ( '?' to 'u' )
1E76	0075	# LATIN CAPITAL LETTER U WITH CIRCUMFLEX BELOW ( '?' to 'u' )
1E77	0075	# LATIN SMALL LETTER U WITH CIRCUMFLEX BELOW ( '?' to 'u' )
1E78	0075	# LATIN CAPITAL LETTER U WITH TILDE AND ACUTE ( '?' to 'u' )
1E79	0075	# LATIN SMALL LETTER U WITH TILDE AND ACUTE ( '?' to 'u' )
1E7A	0075	# LATIN CAPITAL LETTER U WITH MACRON AND DIAERESIS ( '?' to 'u' )
1E7B	0075	# LATIN SMALL LETTER U WITH MACRON AND DIAERESIS ( '?' to 'u' )
1E7C	0076	# LATIN CAPITAL LETTER V WITH TILDE ( '?' to 'v' )
1E7D	0076	# LATIN SMALL LETTER V WITH TILDE ( '?' to 'v' )
1E7E	0076	# LATIN CAPITAL LETTER V WITH DOT BELOW ( '?' to 'v' )
1E7F	0076	# LATIN SMALL LETTER V WITH DOT BELOW ( '?' to 'v' )
1E80	0077	# LATIN CAPITAL LETTER W WITH GRAVE ( '?' to 'w' )
1E81	0077	# LATIN SMALL LETTER W WITH GRAVE ( '?' to 'w' )

From	To	Description
1E82	0077	# LATIN CAPITAL LETTER W WITH ACUTE ( '?' to 'w' )
1E83	0077	# LATIN SMALL LETTER W WITH ACUTE ( '?' to 'w' )
1E84	0077	# LATIN CAPITAL LETTER W WITH DIAERESIS ( '?' to 'w' )
1E85	0077	# LATIN SMALL LETTER W WITH DIAERESIS ( '?' to 'w' )
1E86	0077	# LATIN CAPITAL LETTER W WITH DOT ABOVE ( '?' to 'w' )
1E87	0077	# LATIN SMALL LETTER W WITH DOT ABOVE ( '?' to 'w' )
1E88	0077	# LATIN CAPITAL LETTER W WITH DOT BELOW ( '?' to 'w' )
1E89	0077	# LATIN SMALL LETTER W WITH DOT BELOW ( '?' to 'w' )
1E8A	0078	# LATIN CAPITAL LETTER X WITH DOT ABOVE ( '?' to 'x' )
1E8B	0078	# LATIN SMALL LETTER X WITH DOT ABOVE ( '?' to 'x' )
1E8C	0078	# LATIN CAPITAL LETTER X WITH DIAERESIS ( '?' to 'x' )
1E8D	0078	# LATIN SMALL LETTER X WITH DIAERESIS ( '?' to 'x' )
1E8E	0079	# LATIN CAPITAL LETTER Y WITH DOT ABOVE ( '?' to 'y' )
1E8F	0079	# LATIN SMALL LETTER Y WITH DOT ABOVE ( '?' to 'y' )
1E90	007A	# LATIN CAPITAL LETTER Z WITH CIRCUMFLEX ( '?' to 'z' )
1E91	007A	# LATIN SMALL LETTER Z WITH CIRCUMFLEX ( '?' to 'z' )

From	To	Description
1E92	007A	# LATIN CAPITAL LETTER Z WITH DOT BELOW ( '?' to 'z' )
1E93	007A	# LATIN SMALL LETTER Z WITH DOT BELOW ( '?' to 'z' )
1E94	007A	# LATIN CAPITAL LETTER Z WITH LINE BELOW ( '?' to 'z' )
1E95	007A	# LATIN SMALL LETTER Z WITH LINE BELOW ( '?' to 'z' )
1E96	0068	# LATIN SMALL LETTER H WITH LINE BELOW ( '?' to 'h' )
1E97	0074	# LATIN SMALL LETTER T WITH DIAERESIS ( '?' to 't' )
1E98	0077	# LATIN SMALL LETTER W WITH RING ABOVE ( '?' to 'w' )
1E99	0079	# LATIN SMALL LETTER Y WITH RING ABOVE ( '?' to 'y' )
1EA9A	0061	# LATIN SMALL LETTER A WITH RIGHT HALF RING ( '?' to 'a' )
1E9B	0073	# LATIN SMALL LETTER LONG S WITH DOT ABOVE ( '?' to 's' )
1EA0	0061	# LATIN CAPITAL LETTER A WITH DOT BELOW ( '?' to 'a' )
1EA1	0061	# LATIN SMALL LETTER A WITH DOT BELOW ( '?' to 'a' )
1EA2	0061	# LATIN CAPITAL LETTER A WITH HOOK ABOVE ( '?' to 'a' )
1EA3	0061	# LATIN SMALL LETTER A WITH HOOK ABOVE ( '?' to 'a' )
1EA4	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND ACUTE ( '?' to 'a' )
1EA5	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND ACUTE ( '?' to 'a' )

From	To	Description
1EA6	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND GRAVE ( '?' to 'a' )
1EA7	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND GRAVE ( '?' to 'a' )
1EA8	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'a' )
1EA9	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'a' )
1EAA	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND TILDE ( '?' to 'a' )
1EAB	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND TILDE ( '?' to 'a' )
1EAC	0061	# LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'a' )
1EAD	0061	# LATIN SMALL LETTER A WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'a' )
1EAE	0061	# LATIN CAPITAL LETTER A WITH BREVE AND ACUTE ( '?' to 'a' )
1EAF	0061	# LATIN SMALL LETTER A WITH BREVE AND ACUTE ( '?' to 'a' )
1EB0	0061	# LATIN CAPITAL LETTER A WITH BREVE AND GRAVE ( '?' to 'a' )
1EB1	0061	# LATIN SMALL LETTER A WITH BREVE AND GRAVE ( '?' to 'a' )
1EB2	0061	# LATIN CAPITAL LETTER A WITH BREVE AND HOOK ABOVE ( '?' to 'a' )
1EB3	0061	# LATIN SMALL LETTER A WITH BREVE AND HOOK ABOVE ( '?' to 'a' )
1EB4	0061	# LATIN CAPITAL LETTER A WITH BREVE AND TILDE ( '?' to 'a' )
1EB5	0061	# LATIN SMALL LETTER A WITH BREVE AND TILDE ( '?' to 'a' )

From	To	Description
1EB6	0061	# LATIN CAPITAL LETTER A WITH BREVE AND DOT BELOW ( '?' to 'a' )
1EB7	0061	# LATIN SMALL LETTER A WITH BREVE AND DOT BELOW ( '?' to 'a' )
1EB8	0065	# LATIN CAPITAL LETTER E WITH DOT BELOW ( '?' to 'e' )
1EB9	0065	# LATIN SMALL LETTER E WITH DOT BELOW ( '?' to 'e' )
1EBA	0065	# LATIN CAPITAL LETTER E WITH HOOK ABOVE ( '?' to 'e' )
1EBB	0065	# LATIN SMALL LETTER E WITH HOOK ABOVE ( '?' to 'e' )
1EBC	0065	# LATIN CAPITAL LETTER E WITH TILDE ( '?' to 'e' )
1EBD	0065	# LATIN SMALL LETTER E WITH TILDE ( '?' to 'e' )
1EBE	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND ACUTE ( '?' to 'e' )
1EBF	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND ACUTE ( '?' to 'e' )
1EC0	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND GRAVE ( '?' to 'e' )
1EC1	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND GRAVE ( '?' to 'e' )
1EC2	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'e' )
1EC3	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'e' )
1EC4	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND TILDE ( '?' to 'e' )
1EC5	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND TILDE ( '?' to 'e' )

From	To	Description
1EC6	0065	# LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'e' )
1EC7	0065	# LATIN SMALL LETTER E WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'e' )
1EC8	0069	# LATIN CAPITAL LETTER I WITH HOOK ABOVE ( '?' to 'i' )
1EC9	0069	# LATIN SMALL LETTER I WITH HOOK ABOVE ( '?' to 'i' )
1ECA	0069	# LATIN CAPITAL LETTER I WITH DOT BELOW ( '?' to 'i' )
1ECB	0069	# LATIN SMALL LETTER I WITH DOT BELOW ( '?' to 'i' )
1ECC	006F	# LATIN CAPITAL LETTER O WITH DOT BELOW ( '?' to 'o' )
1ECD	006F	# LATIN SMALL LETTER O WITH DOT BELOW ( '?' to 'o' )
1ECE	006F	# LATIN CAPITAL LETTER O WITH HOOK ABOVE ( '?' to 'o' )
1ECF	006F	# LATIN SMALL LETTER O WITH HOOK ABOVE ( '?' to 'o' )
1ED0	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND ACUTE ( '?' to 'o' )
1ED1	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND ACUTE ( '?' to 'o' )
1ED2	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND GRAVE ( '?' to 'o' )
1ED3	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND GRAVE ( '?' to 'o' )
1ED4	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'o' )
1ED5	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND HOOK ABOVE ( '?' to 'o' )

From	To	Description
1ED6	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND TILDE ( '?' to 'o' )
1ED7	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND TILDE ( '?' to 'o' )
1ED8	006F	# LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'o' )
1ED9	006F	# LATIN SMALL LETTER O WITH CIRCUMFLEX AND DOT BELOW ( '?' to 'o' )
1EDA	006F	# LATIN CAPITAL LETTER O WITH HORN AND ACUTE ( '?' to 'o' )
1EDB	006F	# LATIN SMALL LETTER O WITH HORN AND ACUTE ( '?' to 'o' )
1EDC	006F	# LATIN CAPITAL LETTER O WITH HORN AND GRAVE ( '?' to 'o' )
1EDD	006F	# LATIN SMALL LETTER O WITH HORN AND GRAVE ( '?' to 'o' )
1EDE	006F	# LATIN CAPITAL LETTER O WITH HORN AND HOOK ABOVE ( '?' to 'o' )
1EDF	006F	# LATIN SMALL LETTER O WITH HORN AND HOOK ABOVE ( '?' to 'o' )
1EE0	006F	# LATIN CAPITAL LETTER O WITH HORN AND TILDE ( '?' to 'o' )
1EE1	006F	# LATIN SMALL LETTER O WITH HORN AND TILDE ( '?' to 'o' )
1EE2	006F	# LATIN CAPITAL LETTER O WITH HORN AND DOT BELOW ( '?' to 'o' )
1EE3	006F	# LATIN SMALL LETTER O WITH HORN AND DOT BELOW ( '?' to 'o' )
1EE4	0075	# LATIN CAPITAL LETTER U WITH DOT BELOW ( '?' to 'u' )
1EE5	0075	# LATIN SMALL LETTER U WITH DOT BELOW ( '?' to 'u' )

From	To	Description
1EE6	0075	# LATIN CAPITAL LETTER U WITH HOOK ABOVE ( '?' to 'u' )
1EE7	0075	# LATIN SMALL LETTER U WITH HOOK ABOVE ( '?' to 'u' )
1EE8	0075	# LATIN CAPITAL LETTER U WITH HORN AND ACUTE ( '?' to 'u' )
1EE9	0075	# LATIN SMALL LETTER U WITH HORN AND ACUTE ( '?' to 'u' )
1EEA	0075	# LATIN CAPITAL LETTER U WITH HORN AND GRAVE ( '?' to 'u' )
1EEB	0075	# LATIN SMALL LETTER U WITH HORN AND GRAVE ( '?' to 'u' )
1EEC	0075	# LATIN CAPITAL LETTER U WITH HORN AND HOOK ABOVE ( '?' to 'u' )
1EED	0075	# LATIN SMALL LETTER U WITH HORN AND HOOK ABOVE ( '?' to 'u' )
1EEE	0075	# LATIN CAPITAL LETTER U WITH HORN AND TILDE ( '?' to 'u' )
1EEF	0075	# LATIN SMALL LETTER U WITH HORN AND TILDE ( '?' to 'u' )
1EF0	0075	# LATIN CAPITAL LETTER U WITH HORN AND DOT BELOW ( '?' to 'u' )
1EF1	0075	# LATIN SMALL LETTER U WITH HORN AND DOT BELOW ( '?' to 'u' )
1EF2	0079	# LATIN CAPITAL LETTER Y WITH GRAVE ( '?' to 'y' )
1EF3	0079	# LATIN SMALL LETTER Y WITH GRAVE ( '?' to 'y' )
1EF4	0079	# LATIN CAPITAL LETTER Y WITH DOT BELOW ( '?' to 'y' )
1EF5	0079	# LATIN SMALL LETTER Y WITH DOT BELOW ( '?' to 'y' )

From	To	Description
1EF6	0079	# LATIN CAPITAL LETTER Y WITH HOOK ABOVE ( '?' to 'y' )
1EF7	0079	# LATIN SMALL LETTER Y WITH HOOK ABOVE ( '?' to 'y' )
1EF8	0079	# LATIN CAPITAL LETTER Y WITH TILDE ( '?' to 'y' )
1EF9	0079	# LATIN SMALL LETTER Y WITH TILDE ( '?' to 'y' )
2010	002D	# HYPHEN NORMALIZATION
2011	002D	# HYPHEN NORMALIZATION
2070	0030	# SUPERSCRIPT ZERO ( '°' to '0' )
2071	0031	# SUPERSCRIPT LATIN SMALL LETTER I ( '?' to '1' )
2072	0032	
2073	0033	
2074	0034	# SUPERSCRIPT FOUR ( '4' to '4' )
2075	0035	# SUPERSCRIPT FIVE ( '5' to '5' )
2076	0036	# SUPERSCRIPT SIX ( '6' to '6' )
2077	0037	# SUPERSCRIPT SEVEN ( '7' to '7' )
2078	0038	# SUPERSCRIPT EIGHT ( '8' to '8' )
2079	0039	# SUPERSCRIPT NINE ( '?' to '9' )

From	To	Description
207A	002B	# SUPERSCRIPT PLUS SIGN ( '?' to '+' )
207B	0020	# SUPERSCRIPT MINUS ( '?' to '-' ) - changed from 002D, see defect 9982
207C	003D	# SUPERSCRIPT EQUALS SIGN ( '?' to '=' )
207D	0028	# SUPERSCRIPT LEFT PARENTHESIS ( '?' to '(' )
207E	0029	# SUPERSCRIPT RIGHT PARENTHESIS ( '?' to ')' )
2080	0030	# SUBSCRIPT ZERO ( '0' to '0' )
2081	0031	# SUBSCRIPT ONE ( '1' to '1' )
2082	0032	# SUBSCRIPT TWO ( '2' to '2' )
2083	0033	# SUBSCRIPT THREE ( '3' to '3' )
2084	0034	# SUBSCRIPT FOUR ( '4' to '4' )
2085	0035	# SUBSCRIPT FIVE ( '5' to '5' )
2086	0036	# SUBSCRIPT SIX ( '6' to '6' )
2087	0037	# SUBSCRIPT SEVEN ( '7' to '7' )
2088	0038	# SUBSCRIPT EIGHT ( '8' to '8' )
2089	0039	# SUBSCRIPT NINE ( '9' to '9' )
208A	002B	# SUBSCRIPT PLUS SIGN ( '?' to '+' )

From	To	Description
208B	0020	# SUBSCRIPT MINUS ( '?' to ' ' ) - changed from 002D, see defect 9982
208C	003D	# SUBSCRIPT EQUALS SIGN ( '?' to '=' )
208D	0028	# SUBSCRIPT LEFT PARENTHESIS ( '?' to '(' )
208E	0029	# SUBSCRIPT RIGHT PARENTHESIS ( '?' to ')' )
2113	006C	# SCRIPT SMALL L ( 'l' to 'l' )
20D0	0000	# 20D0 - 20FF ARE Combining Marks for Symbols
20D1	0000	
20D2	0000	
20D3	0000	
20D4	0000	
20D5	0000	
20D6	0000	
20D7	0000	
20D8	0000	
20D9	0000	
20DA	0000	

From	To	Description
20DB	0000	
20DC	0000	
20DD	0000	
20DE	0000	
20DF	0000	
20E0	0000	
20E1	0000	
20E2	0000	
20E3	0000	
20E4	0000	
20E5	0000	
20E6	0000	
20E7	0000	
20E8	0000	
20E9	0000	
20EA	0000	

From	To	Description
20EB	0000	
20EC	0000	
20ED	0000	
20EE	0000	
20EF	0000	
20F0	0000	
A700	0000	
A701	0000	
A702	0000	
A703	0000	
A704	0000	
A705	0000	
A706	0000	
A707	0000	
A708	0000	
A709	0000	

From	To	Description
A70A	0000	
A70B	0000	
A70C	0000	
A70D	0000	
A70E	0000	
A70F	0000	
A710	0000	
A711	0000	
A712	0000	
A713	0000	
A714	0000	
A715	0000	
A716	0000	
A717	0000	
A718	0000	
A719	0000	

From	To	Description
A71A	0000	
A71B	0000	
A71C	0000	
A71D	0000	
A71E	0000	
A71F	0000	
FE20	0000	# COMBINING LIGATURE LEFT HALF ( '?' to '' )
FE21	0000	# COMBINING LIGATURE RIGHT HALF ( '?' to '' )
FE22	0000	# COMBINING DOUBLE TILDE LEFT HALF ( '?' to '' )
FE23	0000	# COMBINING DOUBLE TILDE RIGHT HALF ( '?' to '' )
FE24	0000	# COMBINING MACRON LEFT HALF
FE25	0000	# COMBINING MACRON RIGHT HALF
FE26	0000	# COMBINING CONJOINING MACRON
0060	0000	
0027	0000	
2018	0000	#LEFT SINGLE QUOTATION MARK

From	To	Description
2019	0000	#RIGHT SINGLE QUOTATION MARK
201B	0000	#SINGLE HIGH-REVERSED-9 QUOTATION MARK
<pre> !!!!!!!!!!!!!!! !!!Except if in B0--&gt;Search Engine Configurations--&gt;Language Recognition--&gt; Locale !!!!German language is set !!!! 00C4 0041+0045 # LATIN CAPITAL LETTER A WITH DIAERESIS ('Ä' to 'AE') !!!! 00E4 0061+0065 # LATIN SMALL LETTER A WITH DIAERESIS ('ä' to 'ae') !!!! 00D6 004F+0045 # LATIN CAPITAL LETTER O WITH DIAERESIS ('Ö' to 'OE') !!!! 00F6 006F+0065 # LATIN SMALL LETTER O WITH DIAERESIS ('ö' to 'oe') !!!! 00DC 0055+0045 # LATIN CAPITAL LETTER U WITH DIAERESIS ('Ü' to 'UE') !!!! 00FC 0075+0065 # LATIN SMALL LETTER U WITH DIAERESIS ('ü' to 'ue') </pre>		