

NISO Circulation Interchange Part 1: Protocol (NCIP)

Abstract: This Standard defines a protocol that is limited to the exchange of messages between and among computer-based applications to enable them to perform the functions necessary to lend and borrow items, to provide controlled access to electronic resources, and to facilitate co-operative management of these functions.

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Foreword

(This foreword is not part of the *NISO Circulation Interchange, Part 1: Protocol*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

About This Standard

The NCIP Standard's Development Process

The original NISO standard development committee, comprising individuals who represent libraries and other organizations that use circulation applications and providers that develop and sell those applications, began its work in January of 1999. At key stages throughout the process the committee reached out to the community for comment through announcements on key online discussion lists, through appearances at conferences, and by presentations to key standards groups like the Z39.50 Implementors Group (ZIG) and the ISO ILL Protocol Implementors Group (IPIG).

The committee also took up the task of developing and finalizing an Implementation Profile using XML for message encoding and a DTD to encapsulate the structure. In January 2001, NISO published the Standard (Protocol and Implementation Profile 1) as a Draft Standard for Trial Use. Several organizations undertook serious implementation efforts that guided changes to the Draft Standard and heightened the committee's awareness that application profiles were an absolute necessity. For most of 2001, the committee focused on developing a structure for these profiles and developing a series of profiles. The final two-part standard was approved and published in October 2002 along with several application profiles and a version 1.0 DTD and version 1.0 schema. A NCIP Implementers Group (NCIP-IG) was formed and a NCIP Maintenance Agency (MA) was appointed by NISO.

In 2007, when the standard was due for its five-year review, the NCIP-IG and MA proposed that the standard be revised. The Implementers Group working on version 2 started from a position of wanting to address the perceived hurdles hindering widespread adoption of NCIP. One of the major hurdles came from the self-service area, where assumptions basic to NCIP message construction were counter to the required workflow. Over the span of 2007-08, the group wrestled with both problems and solutions. It believes that the resulting version 2 meets the professed goals of simplification, streamlining, extensibility, and more attention to self-service needs.

Changes in Version 2

Version 2 includes radical changes to the protocol. It is not backward compatible with version 1, as it is based solely on an XML Schema. The version 2 changes build on changes made since original publication of NCIP and known collectively (if inaccurately) as version 1.01, the version several implementers are already using. There are a few other changes that also break backward compatibility. The most significant are in error handling and extensibility.

The NCIP-IG approached revision of NCIP with five primary motivations: correct reported defects, address issues reported by broker applications, address issues reported by self-service applications, provide new needed features, and streamline/simplify wherever possible. The following list summarizes the major changes in this revision, grouped under those five main headings.

1. Streamline/simplify
 - a) XML Schema is the sole definition for the initiation and response messages which comprise the NISO Circulation Interchange Protocol.
 - b) Removed "Visible User Id" and "Visible Item Id" and their associated child elements.
 - c) Removed the "User Transaction" element and promoted its child elements within "Lookup User Response".
 - d) The prefix "Unique" was removed from all such named elements.
 - e) The "Authenticate User" service was removed.

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- f) Converted all Enumerations from Scheme/Value pairs to strings with optional scheme attribute.
 - g) Removed "Unknown Service".
2. New Features
- a) The wrapper element "Ext" was added within outer level messages to provide extensibility.
 - b) Error handling was completely re-imagined as a Problem choice within NCIPMessage.
 - c) Added "Item Optional Fields" to "Request Item" and added "Number Of Pieces" to "Item Description".
 - d) Added a section giving a suggestion on optional compression.
 - e) Added new data element "Pickup Location" and added it everywhere "Pickup Expiry" occurs.
 - f) Added an XML namespace as an optional part of the message headers.
 - g) Added "From Agency Id" and "To Agency Id".
 - h) Added "Request Element Type".
3. Self-Service Issues
- a) The "Initiation Header" and "Response Header" are now optional wherever they appear.
 - b) Added new "Previous User Id" element as part of "User Optional Fields" within "Lookup User Response".
 - c) Added optional "Title" and "Medium Type" elements within "Loaned Item" and "Requested Item".
 - d) "Agency Id" becomes optional within "Item Id", "User Id", and "Request Id".
4. Broker Issues
- a) Two new services, "Delete Item" and "Delete User", were added.
 - b) Added an optional "Name Information" to "Routing Information".
 - c) Added new optional "Item Identifier Type", "Request Identifier Type", "User Identifier Type" to their associated parent elements.
 - d) Added a note about the need to translate "Agency Ids" among partners.
 - e) Added "Pickup Expiry" and (new) "Pickup Location" to "Accept Item".
5. Defects
- a) Corrected case in value "Cannot Guarantee Restrictions On Use".
 - b) Corrected erroneous exception statement in "Electronic Address" and "Physical Address" under "Agency Address Information".
 - c) Corrected service cited in "Electronic Resource Provided Flag" to be "Item Checked Out Service".
 - d) Added "Sensitive Data Flag" to Index.

A complete change list for version 2 (including the incorporated changes from version 1.01) is posted on the NCIP website: www.ncip.info.

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NISO Circulation Interchange

Part 1: Protocol (NCIP)

1 Purpose

The NISO Circulation Interchange Part 1: Protocol (NCIP) defines a set of messages and associated rules of syntax and semantics for use by applications to:

- Perform the functions necessary to lend and borrow items
- Provide controlled access to electronic resources
- Facilitate co-operative management of these functions

This Standard defines and specifies a set of objects, a set of services and the messages of which they are composed, a set of data elements used in the messages, and a pair of state tables governing the exchange of messages over a single connection. NCIP is a connection-oriented, sessionless protocol. This Standard specifically addresses conditions in which the application or applications that initiate the lending of items or control of access must acquire or transmit data about the user, agency, items, and/or access that is essential to successful conclusion of the function. This Standard also addresses the use of an agency's circulation application to manage access by a user to electronic resources such as electronic books, serials, and sound recordings.

While this Standard may be used in other applications, it specifically supports the following application areas.

- **Direct Consortial Borrowing** – Through direct consortial borrowing, users of one agency can request and borrow items from another agency within a consortium. NCIP facilitates the transfer of User and Item data between disparate circulation applications, thereby allowing an agency to manage traffic for non-local patrons and/or provide local control of items belonging to another agency.
- **Circulation/Interlibrary Loan Interaction** – NCIP facilitates the exchange of circulation data between interlibrary loan (ILL) applications and circulation applications, thereby permitting agencies to use circulation applications to track all loans to a user. Items belonging to the local collection and items borrowed for that User via interlibrary loan can be recorded together in the user's circulation record. Notifications for pickup, listing of charges, overdue notifications, etc., can be handled in the same way, whether items are owned locally or borrowed from another agency. Agencies may also expedite the tracking of items lent via interlibrary loan within their local circulation applications.
- **Self-Service Circulation** – Self-service circulation applications allow users to check out or check in desired items without assistance from agency staff. These applications may also support fine/fee transactions and supply user account data from the agency's circulation system.

2 Scope

This Standard describes a protocol (NCIP) that defines the exchange of messages between and among computer-based applications to enable them to perform the functions necessary to lend and borrow items, to provide controlled access to electronic resources, and to facilitate co-operative management of these functions. The Standard is not intended to define circulation, interlibrary loan, or other functions, but to facilitate communication of circulation data (e.g., Agency, User, Item)

between and among disparate applications. This communication may be based on agreements previously established by the cooperating agencies to govern that relationship. However, the standard also permits relationships to be established upon first interaction between two agencies, or to be established at each interaction on a case-by-case basis.

3 Normative References

This standard references the following documents. When cited in the text of the standard, the standard may be referred to by its number only. These standards are subject to revision; the most current version of these standards should be used.

IANA, *MIME Media Types* <<http://www.iana.org/assignments/media-types/>>

ISO 4217, *Codes for the representation of currencies and funds*

ISO 8601, *Data elements and interchange formats -- Information interchange -- Representation of dates and times*

4 Definitions

The following terms, as used in this standard, have the meanings indicated.

<u>Term</u>	<u>Definition</u>
Agency	An organization that lends items or provides other services to users. The relationship between agency and user and between agency and item is reflected in the fact that the identifiers for both item and user contain an agency identifier. Agencies have rules and policies that govern services.
Application	Computer software developed to: a) perform the functions necessary to lend and borrow items; b) provide controlled access to electronic resources; and, c) facilitate co-operative management of these functions. An application is a software/hardware agent that initiates an NCIP request or responds to such a request. It is somewhat analogous to a staff person who is employed by an agency in that it takes action on behalf of the agency in helping a user of the agency or in responding to a request made by the agency.
Item	A specific physical or electronic information resource belonging to an agency's collection(s).
NCIP	NISO Circulation Interchange Part 1: Protocol; the protocol specified in this Standard.
Object Class	The abstract essence of an object. This Standard defines three object classes: Agency Object, Item Object, and User Object.
Object Instance	A concrete instance of an object class. An object class may be instantiated with particular data, functionality, and relationships.
Profile	An agreed-upon document that identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or set of functions.

<u>Term</u>	<u>Definition</u>
Protocol	A set of formal rules governing the transmission of data across a network. Application level protocols deal with data formatting, including the syntax of messages, application to application dialogue, character sets, sequencing of messages, etc.
Service	A message pair consisting of an initiation and a response message that provides specific functionality with respect to the exchange of data related to circulation activities.
Standard	The formal documents (2) adopted by the voting members of NISO.
Standard Protocol	The protocol (NCIP) specified in this Standard, unless context indicates otherwise.
System	A computer running an application that is able to send or receive NCIP messages and has a unique network address. For example, TCP/IP address would include both the computer's network address and the port number.
User	The entity (person or organization) that will use an item (or service) provided by an agency.

4.1 Notational Convention

The key words "must", "must not", "required", "shall", "shall not", "should", "should not", "recommended", "may", and "optional" in this standard are to be interpreted as described in IETF RFC2119

5 Definition of NCIP Service Types, Services, and Messages

This Standard defines three types of services: Lookup, Update, and Notification. Each service type is composed of a number of services. NCIP services enable communicating applications to cooperate effectively in the delivery of specific services to users of agencies that wish to offer such services.

The protocol (NCIP) specified in this Standard is a confirmed-service protocol. It uses services to exchange data between applications concerning circulation and related activities. Each service consists of a pair of messages, an initiation message, and a response message. Each message and the current state of the connection (see Section 7) provide sufficient contextual data for the application receiving the message to process it successfully. Services are grouped, according to type, as follows:

- Lookup Service Type
- Update Service Type
- Notification Service Type

5.1 Object Classes and Object Definitions

This Standard specifies three primary object classes:

- Agency Object
- Item Object
- User Object

These objects are defined below in terms of the principal data elements of which they are composed. The data elements are further defined and specified in [Section 6](#).

The class name (Agency Object, Item Object, or User Object) is used for the object classes. The words Agency, Item, or User, when used alone (with initial capital letter), refer to an instance of the corresponding object class, that is, to data that is manipulated by an application. The words agency, item, or user (without initial capital letter) are used to refer to an actual physical instance in the external world. So, Item refers to a particular instance of the object class Item Object. This Item contains data about a particular item that is involved in a circulation activity.

5.1.1 Agency Object

The Agency Object represents a library or other organization that lends items from its collection(s) or provides related services to one or more classes of users. The Agency Object is composed of the following data elements:

- Agency Address Information
- Agency User Privilege Type
- Application Profile Supported Type
- Authentication Prompt
- Consortium Agreement
- Organization Name Information

5.1.2 Item Object

The Item Object represents a physical or logical (electronic) entity within an agency's collection(s) that may be lent or to which access may be provided to a User. The Item Object is composed of the following data elements:

- Bibliographic Description
- Circulation Status
- Electronic Resource
- Hold Queue Length
- Item Description
- Item Use Restriction Type
- Location
- Physical Condition
- Security Marker
- Sensitization Flag

5.1.3 User Object

The User Object represents a person or an organization that is or may become an authorized user of items owned by an agency. The User Object is composed of the following data elements:

- Authentication Input
- Block Or Trap
- Date Of Birth
- Name Information
- Previous User Id(s)
- User Address Information
- User Language
- User Privilege
- User Id

5.2 Summary of Service Types and Associated Services

The following table presents services (message pairs) in alphabetical order, grouped by the specific service types described in Section 5.

Sections 5.3-5.5 describe the services in terms of the following characteristics, with individual data elements defined in Section 6. In Sections 5.3 through 5.5:

- Names of the messages that compose each service are presented in ***Bold Italic***.
- Required and optional data elements used by each service are presented in alphabetical order.
- An “(R)” indicates that a data element is repeatable and the absence of this notation indicates that the data element is not repeatable.

Conditionally required data elements are enclosed in braces { }.

Table 1: Summary of Service Types and Associated Services

SECTION	SERVICE TYPE	SERVICE	
		INITIATION MESSAGE	RESPONSE MESSAGE
5.3	<i>LOOKUP</i>		
5.3.1		Lookup Agency	Lookup Agency Response
5.3.2		Lookup Item	Lookup Item Response
5.3.3		Lookup Request	Lookup Request Response
5.3.4		Lookup User	Lookup User Response
5.3.5		Lookup Version	Lookup Version Response
5.4	<i>UPDATE</i>		
5.4.1		Accept Item	Accept Item Response
5.4.10		Cancel Recall Item	Cancel Recall Item Response
5.4.15		Cancel Request Item	Cancel Request Item Response

SECTION	SERVICE TYPE	SERVICE	
		INITIATION MESSAGE	RESPONSE MESSAGE
5.4.2		Check In Item	Check In Item Response
5.4.3		Check Out Item	Check Out Item Response
5.4.5		Create Agency	Create Agency Response
5.4.6		Create Item	Create Item Response
5.4.7		Create User	Create User Response
5.4.8		Create User Fiscal Transaction	Create User Fiscal Transaction Response
5.4.9		Delete Item	Delete Item Response
5.4.10		Delete User	Delete User Response
5.4.11		Recall Item	Recall Item Response
5.4.12		Renew Item	Renew Item Response
5.4.13		Report Circulation Status Change	Report Circulation Status Change Response
5.4.14		Request Item	Request Item Response
5.4.16		Send User Notice	Send User Notice Response
5.4.4		Undo Check Out Item	Undo Check Out Item Response
5.4.17		Update Agency	Update Agency Response
5.4.18		Update Circulation Status	Update Circulation Status Response
5.4.19		Update Item	Update Item Response
5.4.20		Update Request Item	Update Request Item Response
5.4.21		Update User	Update User Response
5.5	NOTIFICATION		
5.5.1		Agency Created	Agency Created Response
5.5.2		Agency Updated	Agency Updated Response
5.5.3		Circulation Status Change Reported	Circulation Status Change Reported Response
5.5.4		Circulation Status Updated	Circulation Status Updated Response
5.5.5		Item Checked In	Item Checked In Response
5.5.6		Item Checked Out	Item Checked Out Response
5.5.7		Item Created	Item Created Response
5.5.8		Item Recall Cancelled	Item Recall Cancelled Response
5.5.9		Item Recalled	Item Recalled Response
5.5.10		Item Received	Item Received Response
5.5.11		Item Renewed	Item Renewed Response
5.5.12		Item Request Cancelled	Item Request Cancelled Response

SECTION	SERVICE TYPE	SERVICE	
		INITIATION MESSAGE	RESPONSE MESSAGE
5.5.13		Item Request Updated	Item Request Updated Response
5.5.14		Item Requested	Item Requested Response
5.5.15		Item Shipped	Item Shipped Response
5.5.16		Item Updated	Item Updated Response
5.5.17		User Created	User Created Response
5.5.18		User Fiscal Transaction Created	User Fiscal Transaction Created Response
5.5.19		User Notice Sent	User Notice Sent Response
5.5.20		User Updated	User Updated Response

5.3 Lookup Service Type

The Lookup Service Type includes services that permit an initiating application to ask a second (responding) application for data about an instance of an object. An initiating application may lookup data concerning instances of a User Object, an Item Object, or an Agency Object. The responding application must send a message to the initiating application in response to the lookup, either supplying the requested data or denying the lookup. In some instances, the responding application may not supply all of the data requested by the initiating application as, for example, when data are unavailable, or when policy or practice prohibits or restricts access. In all response messages, if the Problem element is returned, neither optional data nor requested data are returned. Note that all messages of the lookup service type consist of an optional header (see Section 8) as a minimum, except for messages of the Lookup Version Service.

The Lookup Services, as summarized in Table 1, are detailed below. The Agency Object and Item Object each have one Lookup Service and the User Object has two.

5.3.1 Lookup Agency Service

Usage:	This service requests data about a particular Agency known to the responding application. The initiating application provides the Id of the Agency and the list of elements for which data is requested.
Successful Result:	The responding application returns the requested data to the initiating application.
Messages and Data Elements:	
<i>Lookup Agency</i>	
Required data:	Agency Element Type (R) Agency Id
Optional data:	None

<i>Lookup Agency Response</i>	
Required data:	Problem, or Agency Id
Optional data:	None
If requested:	Agency Address Information (R) Agency User Privilege Type (R) Application Profile Supported Type (R) Authentication Prompt (R) Consortium Agreement (R) Organization Name Information (R)

5.3.2 Lookup Item Service

Usage:	This service requests data about a particular Item known to the responding application. The initiator provides the Id of the Item and a list of elements for which data is requested.
Successful Result:	The responding application returns the requested data to the initiating application.
Messages and Data Elements:	
<i>Lookup Item</i>	
Required data:	{Item Id, or Request Id}
Optional data:	Current Borrower Current Requesters Item Element Type (R)
<i>Lookup Item Response</i>	
Required data:	Problem, or {Item Id, or {Request Id and, optionally Item Id}}
Optional data:	None
If requested:	Date Recalled Hold Pickup Date Item Optional Fields Item Transaction

5.3.3 Lookup Request Service

Usage:	This service requests data about a particular Request known to the responding application. The initiator provides the Id of the Request and a list of elements for which data is requested.
---------------	---

Successful Result:	The responding application returns the requested data to the initiating application.
Messages and Data Elements:	
<i>Lookup Request</i>	
Required data:	{{Authentication Input (R), or User Id Request Type Item Id}, or Request Id
Optional data:	Request Element Type Item Element Type User Element Type
<i>Lookup Request Response</i>	
Required data:	{Item Id or Request Id} Problem
Optional data:	User Id Request Type Request Scope Type Request Status Type Hold Queue Position Shipping Information Earliest Date Needed Need Before Date Pickup Date Pickup Expiry Date Pickup Location Date of User Request Date Available Acknowledged Fee Amount Paid Fee Amount Item Optional Fields User Optional Fields

5.3.4 Lookup User Service

Usage:	This service requests data about a particular User known to the responding application. The initiator provides the Id of the User and a list of elements for which data is requested.
Successful Result:	The responding application returns the requested data to the initiating application.

Messages and Data Elements:	
<i>Lookup User</i>	
Optional data:	
Required data:	{Authentication Input (R), or User Id} Loaned Items
Optional data:	Requested Items User Element Type User Fiscal Account Desired
<i>Lookup User Response</i>	
Required data:	Problem, or User Id
Optional data:	None
If requested:	Loaned Items Count (R) Loaned Item (R) Previous User Id Requested Items Count (R) Requested Item (R) User Fiscal Account (R) User Optional Fields

5.3.5 Lookup Version Service

It is recognized that this Standard may be modified at some future date as the needs of organizations that employ circulation applications dictate. Such modification would yield a new version of this Standard. This, in turn, would very likely give rise to the possibility that not all implementers of the NCIP would be able to complete the necessary changes at the same time and this would mean that such implementers would be temporarily out of conformance with the new version of the Standard. As a consequence their implementations might be unable to communicate with those that have achieved conformance with the new version. Thus, a mechanism has been devised that will permit applications to communicate on a basic level when an initiation message references a different version of this Standard, as well as to inquire *a priori* of another application the version or versions it supports.

This mechanism involves one service, the Lookup Version Service, composed of the message pair Lookup Version and Lookup Version Response. It is expected that applications conforming to this Standard will support this special service to permit applications to determine what version or versions of this Standard other applications support. This service provides a version independent means of communication between the two applications.

When an application receives an NCIP message based on a version of the Standard it does not support, the application may respond with the Lookup Version Response message regardless of the nature of the initiation message, or the responding application may signal "Connection was closed while still processing an earlier message" (row 5 of the Responding Application Messaging State Table—see Section 7, [Table 7](#)) and enter the TERMINAL state.

An initiating application may invoke the Lookup Version Service in order to determine the version(s) of the Standard a responding application supports before attempting any further NCIP communication.

Usage:	This service requests data about the NCIP version(s) supported by the responding application.
Successful Result:	The responding application returns the requested data.
Messages and Data Elements:	
<i>Lookup Version</i>	
Required data:	From Agency Id To Agency Id
Optional data:	None
<i>Lookup Version Response</i>	
Required data:	From Agency Id To Agency Id Version Supported (R)
Optional data:	None

5.4 Update Service Type

The Update Service Type includes services that permit an initiating application to request that a second application create or modify (add or delete) data about an Agency, Item, or User maintained by the second application. These services also include transactions to create or modify a relationship between or among object instances. Deletes shall always be performed before adds. The responding application shall return a message either confirming or denying the request. In some instances, the responding application may not supply all the data requested by the initiating application, for example, when data are unavailable, or when policy or practice prohibits or restricts access. In all response messages, if Problem is returned, neither optional data nor requested data are returned. For all transactions, the response message may contain data about the transaction. Note that all update service type messages consist of an optional header (see Section 8) as a minimum.

Update Services are presented below in alphabetical order (except for cancel and undo services, which are grouped with the respective services they are intended to negate). These services are summarized in [Table 1](#).

5.4.1 Accept Item Service

Usage:	This service requests that the responding application accept an Item to be circulated to a User. The responding application may be a third party that has no prior knowledge of either the User or the Item. The initiation message identifies the action the responding agency is requested to take when it receives the item. The request may include a date by which the initiating application requires the Item to be returned, an indication that the user may apply to renew the loan of the Item, and financial data relating to the supply of the Item. If there is a possibility that the responding application has no prior knowledge of either the User or the Item, the request may optionally include data about the User and/or the Item.
Successful Result:	The responder accepts the Item for the action specified. It returns the Request Id. It may optionally provide an Item Id that the initiating application may use to reference the Item in subsequent messages.
Messages and Data Elements:	
<i>Accept Item</i>	
Required data:	Request Id Requested Action Type
Optional data:	{Date for Return, or Indeterminate Loan Period Flag, or Non Returnable Flag} Mandated Action Item Optional Fields Fiscal Transaction Information Pickup Expiry Date Pickup Location Renewal Not Permitted Item Id User Id User Optional Fields
<i>Accept Item Response</i>	
Required data:	Problem, or {Request Id and, optionally, Item Id}
Optional data:	Item Id

5.4.2 Check In Item Service

Usage:	This service requests that the responding application check in an Item. It also permits the initiating application to request data about the User and/or Item involved with this check in.
Successful Result:	The responder checks in the Item and returns any routing data, fine/fee data, and/or requested User or Item data.
Messages and Data Elements:	
<i>Check In Item</i>	
Required data:	Item Id
Optional data:	Item Element Type (R) Mandated Action User Element Type (R)
<i>Check In Item Response</i>	
Required data:	Problem, or Item Id
Optional data:	Fiscal Transaction Information Routing Information User Id
If requested:	Item Optional Fields User Optional Fields

5.4.3 Check Out Item Service

Usage:	This service requests that the responding application check out an Item to a User. It also permits the initiating application to acknowledge the fee amount (if any) associated with the check out. The initiating application may also request data about the User and/or Item involved with this check out.
Successful Result:	The responding application checks out the Item to the User until the date indicated in the response. It may also supply the data elements requested.
Messages and Data Elements:	
<i>Check Out Item</i>	
Required data:	{Authentication Input (R), or User Id} Item Id

Optional data:	Acknowledged Fee Amount Acknowledged Item Use Restriction Type (R) Desired Date Due Item Element Type (R) Mandated Action Paid Fee Amount Resource Desired Shipping Information Request Id User Element Type (R)
Check Out Item Response	
Required data:	{Problem, and, optionally {Required Fee Amount Required Item Use Restriction Type (R)}}, or {Date Due, or Non Returnable Flag, or Indeterminate Loan Period Flag} Item Id User Id}
Optional data:	Fiscal Transaction Information Renewal Count
If requested:	Electronic Resource Item Optional Fields User Optional Fields

5.4.4 Undo Check Out Item Service

Usage:	This service requests that the responding application undo the check out that immediately preceded this message. If the responder agrees to the request, processing continues as if the preceding check out had never occurred. This service is typically used by self-check applications.
Successful Result:	The immediately preceding check out is undone.
Messages and Data Elements:	
<i>Undo Check Out Item</i>	
Required data:	Item Id
Optional data:	{Authentication Input (R), or User Id} Mandated Action Request Id

<i>Undo Check Out Item Response</i>	
Required data:	Problem, or Item Id
Optional data:	Fiscal Transaction Information User Id

5.4.5 Create Agency Service

Usage:	This service requests that the responding application create a record for an agency. The initiating application supplies the data elements to be used to create the Agency. It may optionally supply a proposed Agency Id.
Successful Result:	The responding application creates a record for an agency and returns a Agency Id.
Messages and Data Elements:	
<i>Create Agency</i>	
Required data:	Organization Name Information (R)
Optional data:	Agency Address Information (R) Agency User Privilege Type (R) Application Profile Supported Type (R) Authentication Prompt (R) Consortium Agreement (R) Mandated Action Agency Id
<i>Create Agency Response</i>	
Required data:	Problem, or Agency Id

5.4.6 Create Item Service

Usage:	This service requests that the responding application create a record for an item. The initiating application supplies the data elements to be used to create the Item. It may optionally supply a proposed Item Id.
Successful Result:	The responding application creates a record for an item and returns a Item Id.
Messages and Data Elements:	
<i>Create Item</i>	
Required data:	Bibliographic Description

Optional data:	Circulation Status Item Description Item Use Restriction Type Location (R) Mandated Action Physical Condition Security Marker Sensitization Flag Item Id Request Id
Create Item Response	
Required data:	Problem, or Item Id

5.4.7 Create User Service

Usage:	This service requests that the responding application create a record for a user. The initiating application supplies the data elements to be used to create the User. It may optionally supply a proposed User Id.
Successful Result:	The responding application creates a record for a user and returns a User Id.
Messages and Data Elements:	
Create User	
Required data:	Name Information
Optional data:	{Authentication Input (R), or User Id} Block Or Trap (R) Date Of Birth Mandated Action User Address Information (R) User Language (R) User Privilege (R)
Create User Response	
Required data:	Problem, or User Id

5.4.8 Create User Fiscal Transaction Service

Usage:	This service requests that the responding application create a new fiscal transaction for a service provided to a User. The initiating application provides the type of update and fiscal details about the update it wants done.
Successful Result:	The responding application creates fiscal transaction data for the User.
Messages and Data Elements:	
<i>Create User Fiscal Transaction</i>	
Required data:	{Authentication Input (R), or User Id} Fiscal Transaction Information
Optional data:	Mandated Action
<i>Create User Fiscal Transaction Response</i>	
Required data:	Problem, or {Fiscal Transaction Reference Id User Id}

5.4.9 Delete Item Service

Usage:	This service asks that the responding application delete an item record. This may also result in deletion of the associated bibliographic record, depending on the rules of the responding application. The purpose of this service is to enable applications to remove unnecessary items in weeding and binding situations as well as cleaning up after creation of a temporary item. The initiating application provides an identifier and the responder is not required to return any data other than an acknowledgement or an error.
Successful Result:	The responding application deletes the item specified by the initiating application.
Messages and Data Elements:	
<i>Delete Item</i>	
Required data:	Item Id
Optional data:	Mandated Action
<i>Delete Item Response</i>	
Required data:	Problem, or Item Id
Optional data:	None

5.4.10 Delete User Service

Usage:	This service asks that the responding application delete a User. This service is intended to enable resource sharing systems and similar applications to remove temporary users created during request processes. The initiating application provides an identifier and the responder is not required to return any data other than an acknowledgement or an error.
Successful Result:	The responding application deletes the user record specified by the initiating application.
Messages and Data Elements:	
<i>Delete User</i>	
Required data:	Authentication Input (R), or User Id
Optional data:	Mandated Action
<i>Delete User Response</i>	
Required data:	Problem, or User Id
Optional data:	None

5.4.11 Recall Item Service

Usage:	This service requests that the responding application recall an Item from a User. The initiating application may propose a new date due for the Item. The initiating application may also request data about the User and/or Item involved with this recall.
Successful Result:	The responding application agrees to recall the Item and to take appropriate action. It may supply the new date on which the Item is now due. It may supply the data elements requested.
Messages and Data Elements:	
<i>Recall Item</i>	
Required data:	Item Id
Optional data:	Desired Date Due Item Element Type (R) Mandated Action Shipping Information User Element Type (R)

<i>Recall Item Response</i>	
Required data:	Problem, or Item Id
Optional data:	Date Due Fiscal Transaction Information User Id
If requested:	Item Optional Fields User Optional Fields

5.4.12 Cancel Recall Item Service

Usage:	This service requests that the responding application cancel the recall of an Item that it had previously been asked to recall. The initiating application may also request data about the User and/or Item involved with this recall cancellation.
Successful Result:	The responding application cancels the recall of the Item and takes appropriate fiscal actions. It may also supply the data elements requested.
Messages and Data Elements:	
<i>Cancel Recall Item</i>	
Required data:	Item Id
Optional data:	Item Element Type (R) Mandated Action User Element Type (R)
<i>Cancel Recall Item Response</i>	
Required data:	Problem, or Item Id
Optional data:	Fiscal Transaction Information User Id
If requested:	Item Optional Fields User Optional Fields

5.4.13 Renew Item Service

Usage:	This service requests that the responding application renew an Item for a User. The initiating application may include a suggested revision of the due date and an acknowledgement of fee amount. The initiating application may also request data about the User and/or Item involved with this renewal.
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Successful Result:	The responding application renews the Item to the User and provides a revised date on which the Item now is due. It may also supply the data elements requested.
Messages and Data Elements:	
<i>Renew Item</i>	
Required data:	{Authentication Input (R), or User Id} Item Id
Optional data:	Acknowledged Fee Amount Acknowledged Item Use Restriction Type (R) Desired Date Due Desired Date For Return Item Element Type (R) Mandated Action Paid Fee Amount User Element Type (R)
<i>Renew Item Response</i>	
Required data:	{Problem, and, optionally {Required Fee Amount Required Item Use Restriction Type (R)}}, or Pending, or Item Id
Optional data:	Date Due Date For Return Fiscal Transaction Information Renewal Count User Id
If requested:	Item Optional Fields User Optional Fields

5.4.14 Report Circulation Status Change Service

Usage:	This service requests that the responding application mark an Item as reported returned, missing, lost, or never borrowed. The initiating application may also request data about the User and/or Item involved with this status change.
Successful Result:	The responding application marks the Item as specified by the initiator. It may also supply the data elements requested.

Messages and Data Elements:	
<i>Report Circulation Status Change</i>	
Required data:	{Authentication Input (R), or User Id} {Item Reported Lost, or Item Reported Missing, or Item Reported Never Borrowed, or Item Reported Returned} Item Id
Optional data:	Item Element Type (R) Mandated Action User Element Type (R)
<i>Report Circulation Status Change Response</i>	
Required data:	Problem, or Item Id
Optional data:	User Id
If requested:	Item Optional Fields User Optional Field

5.4.15 Request Item Service

Usage:	This service requests that the responding application place a request on an Item for a User whether or not the Item is immediately available. The initiating application indicates the type of request being made. The initiating application may optionally provide an acknowledgement of the fee to be charged for the service. The initiating application may also request data about the User and/or Item involved with this request.
Successful Result:	The responding application places the request and provides data about where the Item may be picked up and the date it expects the Item to be available. It may also supply the data elements requested.
Messages and Data Elements:	
<i>Request Item</i>	
Required data:	{Authentication Input (R), or User Id} Request Scope Type Request Type {Bibliographic Id, or Item Id}

Optional data:	Acknowledged Fee Amount Acknowledged Item Use Restriction Type (R) Earliest Date Needed Item Element Type (R) Item Optional Fields Mandated Action Need Before Date Pickup Expiry Date Pickup Location Paid Fee Amount Shipping Information Request Id User Element Type (R)
<i>Request Item Response</i>	
Required data:	{Problem, and, optionally {Required Fee Amount Required Item Use Restriction Type (R)}}, or Request Scope Type Request Type {Item Id, or {Request Id, and, optionally Item Id}} User Id
Optional data:	Date Available Hold Pickup Date Fiscal Transaction Information Shipping Information
If requested:	Item Optional Fields User Optional Fields

5.4.16 Cancel Request Item Service

Usage:	This service requests that the responding application cancel a previous request for an Item. The initiating application may also request data about the User and/or Item involved with this request cancellation.
Successful Result:	The responding application cancels the request. It may provide updated fiscal data about the User. It may also supply the data elements requested.

Messages and Data Elements:	
<i>Cancel Request Item</i>	
Required data:	{Authentication Input (R), or User Id} Request Type {Item Id, or {Request Id, and, optionally Item Id}}
Optional data:	Acknowledged Fee Amount Item Element Type (R) Mandated Action Paid Fee Amount Request Scope Type User Element Type (R)
<i>Cancel Request Item Response</i>	
Required data:	Problem, or {Item Id, or {Request Id, and, optionally Item Id}} User Id
Optional data:	Fiscal Transaction Information
If requested:	Item Optional Fields User Optional Fields

5.4.17 Send User Notice Service

Usage:	This service requests that the responding application send a notice to a user. The initiating application provides the Id of the User and the type of notice to send. The initiating application may optionally provide a date on which it desires the notice be sent, and the content of the notice.
Successful Result:	The responding application agrees to send a notice and may provide either the date the notice was sent or the date on which it will send the notice.
Messages and Data Elements:	
<i>Send User Notice</i>	
Required data:	User Id User Notice Details
Optional data:	Date To Send Mandated Action

Send User Notice Response	
Required data:	Problem, or User Id
Optional data:	{Date Sent, or Date Will Send}

5.4.18 Update Agency Service

Usage:	This service requests that the responding application update data about an Agency. The initiating application provides elements to be deleted with the value for each element and/or elements to be added with the value for each element. If the initiating application is changing the value for an existing element it must include that element in both the delete and add sections of the message.
Successful Result:	The responding application updates data about the Agency as specified by the initiating application.
Messages and Data Elements:	
Update Agency	
Required data:	Agency Id
Optional data:	Add Agency Fields Delete Agency Fields Mandated Action
Update Agency Response	
Required data:	Problem, or Agency Id
Optional data:	None

5.4.19 Update Circulation Status Service

Usage:	This service requests that the responding application update the circulation status of an Item. The initiating application provides the Id of the item Id and the new circulation status.
Successful Result:	The responding application updates the circulation status as specified by the initiating application.
Messages and Data Elements:	
Update Circulation Status	
Required data:	Circulation Status Item Id

Optional data:	Mandated Action
<i>Update Circulation Status Response</i>	
Required data:	Problem, or Item Id
Optional data:	None

5.4.20 Update Item Service

Usage:	This service requests that the responding application update data about an Item. The initiating application provides elements to be deleted with the value for each element and/or elements to be added with the value for each element. If the initiating application is changing the value for an existing element it must include that element in both the delete and add sections of the message. This service cannot be used to change the circulation status of an Item.
Successful Result:	The responding application updates data about the Item as specified by the initiating application.
Messages and Data Elements:	
<i>Update Item</i>	
Required data:	Item Id
Optional data:	Add Item Fields Delete Item Fields Mandated Action
<i>Update Item Response</i>	
Required data:	Problem, or Item Id
Optional data:	None

5.4.21 Update Request Item Service

Usage:	This service asks that the responding application update data about a request for an Item made by a User. The initiating application provides elements to be deleted with the value for each element and/or elements to be added with the value for each element. If the initiating application is changing the value for an existing element it must include that element in both the delete and add sections of the message.
Successful Result:	The responding application updates the Item request as specified by the initiating application.

Messages and Data Elements:	
<i>Update Request Item</i>	
Required data:	{{Authentication Input (R), or User Id} Request Type Item Id}, or Request Id
Optional data:	Add Request Fields Delete Request Fields Item Element Type (R) Mandated Action User Element Type (R)
<i>Update Request Item Response</i>	
Required data:	{Problem, and, optionally Required Fee Amount}, or Request Scope Type Request Type Item Id User Id
Optional data:	Date Available Fiscal Transaction Information Hold Pickup Date Item Optional Fields User Optional Fields

5.4.22 Update User Service

Usage:	This service requests that the responding application update data about a User. The initiating application provides elements to be deleted with the value for each element and/or elements to be added with the value for each element. If the initiating application is changing the value for an existing element it must include that element in both the delete and add sections of the message.
Successful Result:	The responding application updates data about the User as specified by the initiating application.
Messages and Data Elements:	
<i>Update User</i>	
Required data:	{Authentication Input (R), or User Id}

Optional data:	Add User Fields Delete User Fields Mandated Action
<i>Update User Response</i>	
Required data:	Problem, or User Id
Optional data:	None

5.5 Notification Service Type

The Notification Service Type includes services that permit an initiating application to notify a second application that creation or modification of data about a User, an Item, or an Agency has occurred. These services also include notifications of transactions that have created or modified a relationship between or among object instances. The responding application shall send an acknowledgement message in response to the notification. Since this is a unilateral notification, the responder can only reply that it does or does not understand the message it has just received.

All notification messages shall include an optional header (see Section 8) as a minimum. Unless a problem is detected, response messages of the Notification Service Type consist only of an optional header. In the event, however, that the responder detects some sort of problem with the initiation message, the Problem data element specifying the nature of the problem is returned immediately following the Response Header.

The Notification Services, summarized in [Table 1](#), are presented below in alphabetical order.

5.5.1 Agency Created Service

Usage:	This service informs the responding application that a new Agency has been created. The initiating application provides the Agency Id and details about the Agency.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Agency Created</i>	
Required data:	Organization Name Information (R) Agency Id
Optional data:	Agency Address Information (R) Agency User Privilege Type (R) Application Profile Supported Type (R) Authentication Prompt (R) Consortium Agreement (R)
<i>Agency Created Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.2 Agency Updated Service

Usage:	This service informs the responding application that one or more data elements of an Agency have been updated. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Agency Updated</i>	
Required data:	Agency Id
Optional data:	Add Agency Fields Delete Agency Fields
<i>Agency Updated Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.3 Circulation Status Change Reported Service

Usage:	This service informs the responding application that an Item has been reported as returned, lost, missing, or never borrowed. The initiating application provides the Item Id and User Id, and may optionally provide other details associated with the circulation status change.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Circulation Status Change Reported</i>	
Required data:	{Item Reported Lost, or Item Reported Missing, or Item Reported Never Borrowed, or Item Reported Returned} Item Id User Id
Optional data:	Fiscal Transaction Information Item Optional Fields User Optional Fields

<i>Circulation Status Change Reported Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.4 Circulation Status Updated Service

Usage:	This service informs the responding application that the circulation status of an Item has been updated. The initiating application provides the unique Id of the item Id and the new circulation status. Only the following three values from Circulation Status are valid here: Renew Still Pending, Item Not Renewed, or Item Overdue. No other values of Circulation Status are permitted for this service.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Circulation Status Updated</i>	
Required data:	Circulation Status Item Id
Optional data:	None
<i>Circulation Status Updated Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.5 Item Checked In Service

Usage:	This service informs the responding application that an Item has been checked in. The initiating application provides the Unique Item Id and may optionally provide other details associated with the check in.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Checked In</i>	
Required data:	Item Id
Optional data:	Fiscal Transaction Information Item Optional Fields Routing Information User Id User Optional Fields

<i>Item Checked In Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.6 Item Checked Out Service

Usage:	This service informs the responding application that an Item has been checked out to a User. The initiating application provides the Item Id and User Id involved in the check out, and may optionally provide other details associated with the check out.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Checked Out</i>	
Required data:	{Date Due, or Non Returnable Flag, or Indeterminate Loan Period Flag} Item Id User Id
Optional data:	Electronic Resource Provided Flag Fiscal Transaction Information Item Optional Fields Renewal Count Shipping Information Request Id User Optional Fields
<i>Item Checked Out Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.7 Item Created Service

Usage:	This service informs the responding application that a new Item has been created. The initiating application provides the Item Id and details about the Item, and may optionally provide other details associated with the Item.
Successful Result:	The responding application replies that it understood the notification message.

Messages and Data Elements:	
<i>Item Created</i>	
Required data:	Bibliographic Description Item Id
Optional data:	Circulation Status Item Description Item Use Restriction Type Location (R) Physical Condition Security Marker Sensitization Flag Request Id
<i>Item Created Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.8 Item Recall Cancelled Service

Usage:	This service informs the responding application that a recall has been cancelled. The initiating application provides the Item Id, and may optionally provide the User Id and other data related to cancellation of the recall.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Recall Cancelled</i>	
Required data:	Item Id
Optional data:	Fiscal Transaction Information Item Optional Fields User Id User Optional Fields
<i>Item Recall Cancelled Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.9 Item Recalled Service

Usage:	This service informs the responding application that an Item has been recalled. The initiating application provides the Item Id of the recalled item and a new due date, and may optionally provide other details associated with the recall.
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Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Recalled</i>	
Required data:	Date Due Item Id
Optional data:	Item Optional Fields Shipping Information User Id User Optional Fields
<i>Item Recalled Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.10 Item Received Service

Usage:	This service informs the responding application that an agency has received an item. If the item has been received on behalf of a user, then data about that User should also be included in the message. The initiating application may optionally provide other details associated with the receipt of the Item.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Received</i>	
Required data:	Date Received Item Id
Optional data:	Item Optional Fields Request Id User Id User Optional Fields
<i>Item Received Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.11 Item Renewed Service

Usage:	This service informs the responding application that an Item has been renewed. The initiating application provides the Item Id and the new due date, and may optionally supply other details associated with the renewal.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Renewed</i>	
Required data:	Date Due Item Id
Optional data:	Fiscal Transaction Information Item Optional Fields Renewal Count User Id User Optional Fields
<i>Item Renewed Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.12 Item Request Cancelled Service

Usage:	This service informs the responding application that a request for an Item has been cancelled. The initiating application provides the Item Id and/or Request Id, and the User Id, and the type of the request being cancelled. It may optionally provide other details associated with the request being cancelled.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Request Cancelled</i>	
Required data:	Request Type {Item Id, or {Request Id, and, optionally Item Id}} User Id
Optional data:	Fiscal Transaction Information Item Optional Fields Request Scope Type User Optional Fields

<i>Item Request Cancelled Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.13 Item Request Updated Service

Usage:	This service informs the responding application that a request for an Item has been updated. The initiating application provides the Item Id and the User Id, or the Request Id. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message. Other data may also be provided.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Request Updated</i>	
Required data:	{Request Type Item Id User Id}, or Request Id
Optional data:	Add Request Fields Delete Request Fields Item Optional Fields User Optional Fields
<i>Item Request Updated Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.14 Item Requested Service

Usage:	This service informs the responding application that a request for an Item, which may not be immediately available, has been made. The initiating application provides the Item Id, or the Request Id and Bibliographic Id. It also provides the User Id and the type of request being made. It may also optionally provide other details related to the request.
Successful Result:	The responding application replies that it understood the notification message.

Messages and Data Elements:	
<i>Item Requested</i>	
Required data:	Request Scope Type Request Type {Item Id, or {Bibliographic Id Request Id}}
Optional data:	Date Available Date Of User Request Earliest Date Needed Item Optional Fields Need Before Date Pickup Expiry Date Pickup Location Shipping Information User Optional Fields
<i>Item Requested Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.15 Item Shipped Service

Usage:	This service informs the responding application that an Agency has shipped an Item. The date when the Item was shipped and the address to which it was shipped must be included in the message. When shipment supports a user request, User data should be supplied with the message. The initiating application may also provide other details associated with shipment of the Item.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Shipped</i>	
Required data:	Date Shipped Shipping Information {Unique Item Id, or {Request Id, and, optionally Item Id}}

Optional data:	Item Optional Fields User Id User Optional Fields
<i>Item Shipped Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.16 Item Updated Service

Usage:	This service informs the responding application that one or more data elements of an Item have been updated. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message. This service may not be used to report changes to circulation status.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>Item Updated</i>	
Required data:	Item Id
Optional data:	Add Item Fields Delete Item Fields
<i>Item Updated Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.17 User Created Service

Usage:	This service informs the responding application that a record for a user has been created. The initiating application provides Name Information and the User Id and may optionally provide additional data about the new User.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>User Created</i>	
Required data:	Name Information User Id

Optional data:	Block Or Trap (R) Date Of Birth User Address Information (R) User Language (R) User Privilege (R)
<i>User Created Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.18 User Fiscal Transaction Created Service

Usage:	This service informs the responding application that a new fiscal transaction has been applied to a User's fiscal account.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>User Fiscal Transaction Created</i>	
Required data:	Fiscal Transaction Information User Id
Optional data:	None
<i>User Fiscal Transaction Created Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.19 User Notice Sent Service

Usage:	This service informs the responding application that a notice has been sent to a User. The initiating application provides the User Id, the type of notice, and details about the notice.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>User Notice Sent</i>	
Required data:	Date Sent User Id User Notice Details
Optional data:	None
<i>User Notice Sent Response</i>	
Required data:	None
Optional data:	Problem (R)

5.5.20 User Updated Service

Usage:	This service informs the responding application that one or more data elements of a User have been updated. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message.
Successful Result:	The responding application replies that it understood the notification message.
Messages and Data Elements:	
<i>User Updated</i>	
Required data:	User Id
Optional data:	Add User Fields Delete User Fields
<i>User Updated Response</i>	
Required data:	None
Optional data:	Problem (R)

6 Data Dictionary

6.1 Introduction

This section includes a list of the data elements used in the messages defined in Section 5. Appendix G includes an index to all elements.

Complex data elements are presented together with a list of their component elements. Indentations in the lists of data elements indicate the hierarchical structure of the complex elements.

Simple data elements appear with definitions that indicate the nature and purpose of the data. Examples and notes are provided if available. If definitions are based on those in existing information standards, these sources are also noted. Complete citations for referenced standards are recorded in the [Bibliography](#).

Definitions for simple elements appear only once. If a simple element occurs in more than one complex element, the definition is included in the first occurrence of the element, and a reference is added from the second and subsequent occurrences of the elements to point to the location of the definition. If not specified, the definitions for the simple elements are found in the main alphabetical listing. All data elements that appear in the main alphabetical listing (i.e., headings) are shown in **bold face** type.

Information that applies generally to a class of data is given in a scope note. Headings for scope notes are in italics. See, for example, the scope note entry for *Note on Dates* (at "D" in the alphabetical list).

Implementers will use values selected from lists for many of the data elements following. Rather than using closed lists, enumerations, or scheme/value pairs, as was done in version 1, the current version encourages implementers to agree on lists of values to use for those elements as part of a configuration agreement outside of the protocol. Commonly used lists are posted at the Maintenance Agency web site for reference. Implementers who wish to reference an authority for a particular value can use the optional Scheme attribute to include the uri for that scheme. This allows optional validation of the value for those desiring to do validation.

6.2 Data Elements and their Definitions

Data elements used in this Standard are listed and defined in the following pages. An entry in the data dictionary has the following general structure (some parts may be absent from some entries either because they do not exist or are inapplicable).

Bibliographic Description		
	Bibliographic Level	Text string; identifies the level of the bibliographic description of the Item. Occurs 0 or 1 time. Examples: monograph, serial, or collection <i>Source:</i> MARC 21 NOTE: ISO 10161-1 uses the term "Item-type" to express this concept.
	Scheme	Text String; gives URI referring to an authoritative list of values to support validation of the value given above. Occurs 0 or 1 time

The precise nature of each data element's type, encoding, and other related specifications may be detailed further in an Implementation Profile (see Section 9).

6.2.1 Data Types

The following data types are used to characterize the data elements:

Date/time	Expresses a combination of a date and time of day to represent an instant of time.
Empty element	An element that contains no data and indicates, by its presence or absence, a predefined condition or situation. For example, the empty element Item Reported Lost, used in the Report Circulation Status Change, indicates that a User has reported that the Item is lost.
Integer	A decimal number with a positive, negative, or 0 value.
Positive integer	A decimal number with a minimum value of +1.
Non-negative integer	A decimal number with a minimum value of 0.
Text string	A string of letters, numbers, and punctuation, without any predefined properties for the processing of the data.

6.2.2 Required Usage

The data dictionary includes a statement of usage requirements for each simple element in relation to the complex data element of which it is a component. In the data dictionary, this information is carried

in the definition of the simple elements. Where more detailed explanations of the inter-dependencies of component elements are required, these are part of definitions of the relevant complex elements.

As well, the message definitions in Section 5 provide information on the usage requirements for the data elements used in each NCIP message. See Section [5.2](#) for an explanation of the terminology used there.

The following required usage notation is used in the data dictionary:

Occurs 1 and only 1 time	This data element must occur one and only one time within its parent element, i.e., it is mandatory and non-repeatable
Occurs 1 or more times	This data element may occur one or more times within its parent element, i.e., it is mandatory and repeatable.
Occurs 0 or 1 time	This data element may occur zero or one time within its parent element, i.e., it is optional and non-repeatable.
Occurs 0 or more times	This data element may occur zero or more times within its parent element, i.e., it is optional and repeatable.
xxx OR xxx	In this parent element, there is a choice of two (or three) elements, one and only one of which must be present.
xxx AND/OR xxx	In this parent element, there is a choice of two elements, at least one of which must be present; however both may be present.

6.3 The Data Dictionary

Data Element Name	Data Element Definition
Acknowledged Fee Amount	Monetary value in a specified currency (i.e., Amount), acknowledged by a User as the fee charged for a requested service. See Amount for the definition of this complex element.
Acknowledged Item Use Restriction Type	Text string; indicates that the User has acknowledged special rules and restrictions on the use of the Item. This acknowledgement is carried in messages for the request check out, or renewal of the Item. Has optional scheme attribute.
Scheme	Occurs 0 or 1 time.
Add Agency Fields	Complex element used to identify data elements that can be added as part of the Update Agency and Agency Updated services.
Agency Address Information	Occurs 0 or more times.
Agency User Privilege Type	Occurs 0 or more times.
Application Profile Supported Type	Occurs 0 or more times.
Authentication Prompt	Occurs 0 or more times.
Consortium Agreement	Occurs 0 or more times.
Organization Name Information	Occurs 0 or more times.

Data Element Name	Data Element Definition
Add Item Fields	Complex element used to identify data elements that can be added as part of the Update Item and Item Updated services.
	Bibliographic Description
	Item Description
	Item Use Restriction Type
	Location
	Physical Condition
	Security Marker
	Sensitization Flag
Add Request Fields	Complex element used to identify data elements that can be added as part of the Update Request Item and Item Request Updated services.
	Acknowledged Fee Amount
	Date Available
	Date Of User Request
	Earliest Date Needed
	Item Id
	Need Before Date
	Paid Fee Amount
	Pickup Expiry Date
	Pickup Location
	Request Scope Type
	Request Status Type
	Request Type
	Shipping Information
	User Id
Add User Fields	Complex element used to identify data elements that can be added as part of the Update User and User Updated services.
	Authentication Input
	Block Or Trap
	Date Of Birth
	Name Information
	User Address Information
	User Language
	User Privilege

Data Element Name	Data Element Definition
Agency Address Information	<p>Information about an Agency's physical or electronic address.</p> <p>Required Usage: Agency Address Information consists of Agency Address Role Type, a choice either of Physical Address OR Electronic Address, and optionally, Valid From Date AND/OR Valid To Date. None of these elements are repeatable.</p> <p>Source: Data structure adapted from preliminary draft of ISO/DIS 2146.</p>
	<p>Agency Address Role Type</p> <p>Text string; describes the purpose or role of the address associated with an Agency. An address may serve more than one purpose or role for an Agency. Has optional Scheme attribute.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples: billing, shipping, invoicing</p>
	<p>Scheme</p> <p>Occurs 0 or 1 time.</p>
	<p>Electronic Address</p> <p>Occurs 1 and only 1 time, but only if Physical Address is not present.</p>
	<p>Physical Address</p> <p>Occurs 1 and only 1 time, but only if Electronic Address is not present.</p>
	<p>Valid From Date</p> <p>Occurs 0 or 1 time.</p>
	<p>Valid To Date</p> <p>Occurs 0 or 1 time.</p>
Agency Element Type	<p>Text string; identifies the elements of the Agency Object on which queries (i.e., lookups) can be made. Has optional scheme attribute.</p> <p>Examples:</p> <ul style="list-style-type: none"> Agency Address Information Agency User Privilege Type Application Profile Supported Type Authentication Prompt Consortium Agreement Organization Name Information
	<p>Scheme</p> <p>Occurs 0 or 1 time.</p>
Agency Id	<p>Text string; identifies an Agency. Has optional scheme attribute.</p> <p>Examples: MARC Organization Code List maintained by the Library of Congress, Canadian Library Symbols</p>
	<p>Scheme</p> <p>Occurs 0 or 1 time.</p>
Agency User Privilege Type	<p>Text string; identifies the types of privileges that may be granted by a particular Agency or available to Users of a specific Agency. Has optional scheme attribute.</p> <p>Examples: undergraduate, graduate, faculty (for a university); adult, child, (for a public library)</p>
	<p>Scheme</p> <p>Occurs 0 or 1 time.</p>

Data Element Name	Data Element Definition
Amount	The amount of a fiscal charge or fee.
	<p>Currency Code</p> <p>Text string; indicates the type of currency of a particular sum of money; Has optional scheme attribute. Occurs 1 and only 1 time. Examples: Canadian dollar: CAD; Egyptian pound: EGP Although standard codes representing monetary currency for government entities are listed in ISO 4217, the designation of Currency Code as an open enumerated type permits libraries to develop additional schemes for library "pseudo-currencies," such as IFLA vouchers used for ILL.</p>
	Scheme
	<p>Monetary Value</p> <p>Integer expressed as positive, negative, or zero, multiplied by ten to the power M, where M is the value of the Minor unit for that currency as defined in ISO 4217, Section 6. Gives the Amount in terms of the value of Currency Code. Occurs 1 and only 1 time.</p>
Application Profile Supported Type	Text string; identifies the Application Profiles supported by an Agency. Has optional Scheme attribute.
	Scheme
Application Profile Type	Text string; identifies for each Circulation Interchange Protocol service the Application Profile under which the message is sent. Application Profiles define the context of the interchange between applications, for example, between circulation and self-service application; between circulation and ILL applications; or between disparate circulation applications within a consortium. Has optional Scheme attribute.
	Scheme
Authentication Data Format Type	Text string; identifies the format of the authentication data that an Agency requires. Has optional Scheme attribute. Examples: text, audio, image
	Scheme
Authentication Input	Information, such as a password, provided by a User when prompted; used to authenticate the User.
	Authentication Data Format Type
	<p>Authentication Input Data</p> <p>Text string input by a User in response to an authentication prompt. The nature of the data is specified by Authentication Data Format Type. Occurs 1 and only 1 time.</p>
	<p>Authentication Input Type</p> <p>Text string; identifies the nature of the data to be supplied to authenticate a User. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: Barcode Id, PIN, User Name</p>
	Scheme

Data Element Name		Data Element Definition
Authentication Prompt		Agency-specific data; used to prompt a User for entry of authentication data.
	Prompt Input	
	Authentication Data Format Type	Occurs 1 and only 1 time.
	Authentication Input Type	Occurs 1 and only 1 time.
	Sensitive Data Flag	Empty element; indicates whether or not authentication input should be treated as sensitive data. Occurs 0 or 1 time.
Prompt Output		
	Authentication Prompt Data	Text string(s) of the type specified by Authentication Prompt Type; representing prompts used by an Agency to request input of authentication data. Occurs 1 and only 1 time.
	Authentication Prompt Type	Text string; identifies the format of the authentication prompt. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: text, audio, image
	Scheme	Occurs 0 or 1 time.
Bibliographic Description		
	Author	Text string; gives the name of person or corporate body responsible for the intellectual or artistic content of an Item, including composers, creators, or originators of an Item. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1
	Author Of Component	Text string; gives the name of the author of a bibliographic item that is a component part of another item. Occurs 0 or 1 time. NOTE: ISO 10161-1 uses the term "author-of-article" to express this concept.
	Bibliographic Item Id	Occurs 0 or 1 time.
	Bibliographic Item Identifier	Text string; provides a resource identifier for the bibliographic item. Occurs 1 and only 1 time. Examples: Bibliographic Item Identifier Code = Report Number Bibliographic Item Identifier = NRCC-0020704

Data Element Name		Data Element Definition
	Bibliographic Item Identifier Code	Text string; identifies the source of resource identifier associated with the bibliographic item. Has optional Scheme attribute. Occurs 0 or 1 time. Examples: ISBN, ISSN, ISRC, ISMN, Legal Deposit Number, Government Publication Number, CODEN, and Report Number
	Scheme	Occurs 0 or 1 time.
	Bibliographic Level	Text string; identifies the level of the bibliographic description of the Item. Has optional Scheme attribute. Occurs 0 or 1 time. Examples: monograph, serial, or collection
	Scheme	Occurs 0 or 1 time.
	Bibliographic Record Id	Occurs 0 or 1 time. Bibliographic Record Id consists of Bibliographic Record Identifier and a choice of either Bibliographic Record Identifier Code OR Agency Id. None of these component elements are repeatable.
	Bibliographic Record Identifier	Text string; identifies the machine-readable record that describes a bibliographic item. Occurs 1 and only 1 time.
	Bibliographic Record Identifier Code	Text string; identifies the numbering scheme that uniquely identifies a bibliographic record. Code values are usually associated with national bibliographies or bibliographic utilities. Has optional Scheme attribute. Occurs 1 and only 1 time, but only if Agency Id is not present. Examples: ANBN (Australian National Bibliography Number), BNBN (British National Bibliography Number), LCCN (Library of Congress Control Number), RLIN
	Scheme	Occurs 0 or 1 time.
	Agency Id	In this context, identifies the Agency that is the source of the bibliographic record when that Agency is not listed explicitly as a value in the Bibliographic Record Identifier Code. Occurs 1 and only 1 time, but only if Bibliographic Record Identifier Code is not present.
	Component Id	Occurs 0 or 1 time.
	Component Identifier	Text string; identifies component part of another bibliographic item. Occurs 1 and only 1 time.
	Component Identifier Type	Text string; identifies a component part of a bibliographic item. Has optional Scheme attribute. Occurs 1 and only 1 time. For examples, see Bibliographic Item Identifier .
	Scheme	Occurs 0 or 1 time.

Data Element Name		Data Element Definition
	Edition	Text string; gives edition statement that identifies all the copies of an item produced from one master copy or substantially the same type image, having the same contents, and, in the case of non-book materials, issued by a particular publishing agency or group of such agencies. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1
	Electronic Data Format Type	Text string; identifies the format in which electronic data is available for access, download, etc. Has optional Scheme attribute. Occurs 0 or 1 time. Examples: rtf, tiff, mpeg
	Scheme	Occurs 0 or 1 time.
	Language	Occurs 0 or 1 time.
	Medium Type	Text string; identifies the medium on which the bibliographic item has been produced. Has optional Scheme attribute. Occurs 0 or 1 time. Examples: audio tape, book, machine-readable computer file
	Scheme	Occurs 0 or 1 time.
	Pagination	Text string; gives number of pages or leaves in an item or a component part of an item. Occurs 0 or 1 time.
	Place Of Publication	Text string; gives geographic location of the publisher, or failing this, of the printer, distributor, or manufacturer. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1
	Publication Date	Text string; gives date of issue of an item as designated by the publisher. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1
	Publication Date Of Component	Text string; gives publication date assigned by the publisher to the component of an item. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1
	Publisher	Text string; gives name of person(s) or organization(s) responsible for the publication of an item. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1

Data Element Name		Data Element Definition
	Series Title Number	Text string; gives name assigned to a group of separate publications related to one another by the fact that each bears a collective title applying to the group or subgroup as a whole as well as its own title, and the number within that series assigned to one of the pieces. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1
	Sponsoring Body	Text string; gives name of corporate body or organization that issued the item or is associated with its authorship. Occurs 0 or 1 time. <i>Source:</i> ISO 10161-1
	Title	Text string; gives name of an item (usually assigned by the author or publisher) usually consisting of a word or group of words intended to identify it. Occurs 0 or 1 time.
	Title Of Component	Text string; gives title of an item that is a component part of another Item, such as a chapter of a book or an article in an issue of a journal. Occurs 0 or 1 time. Note: ISO 10161-1 uses "title-of-article" to express this concept.
Bibliographic Id		Unique identification of a bibliographic item by either the Bibliographic Item Id or the Bibliographic Record Id. Required Usage: Bibliographic Id consists of a single occurrence of either Bibliographic Item Id OR Bibliographic Record Id.
	Bibliographic Item Id	See definition for this element under Bibliographic Description . Occurs 1 and 1 only time, but only if Bibliographic Record Id is not present.
	Bibliographic Record Id	See definition for this element under Bibliographic Description . Occurs 1 and 1 only time, but only if Bibliographic Item Id is not present.
Block Or Trap		Data specifying the nature of the block or trap.
	Agency Id	Occurs 1 and only 1 time.
	Block Or Trap Type	Text string; identifies the type of block or trap imposed by an Agency on a User. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: block check out, block hold, trap for lost card
	Scheme	Occurs 0 or 1 time.
	Valid From Date	Occurs 0 or 1 time.
	Valid To Date	Occurs 0 or 1 time.

Data Element Name	Data Element Definition
Circulation Status	Text string; indicates the current availability status of a bibliographic item. Has optional Scheme attribute. Examples: available on shelf, on loan, lost <i>Source:</i> ISO 10161-1
Scheme	Occurs 0 or 1 time.
Consortium Agreement	Text string; identifies a consortium agreement to which an Agency is a party. Has optional Scheme attribute.
Scheme	Occurs 0 or 1 time.
Current Borrower	Text string. identifies the User who currently has the Item on loan.
Current Borrower Desired	Empty element; indicates whether or not the requester desires information about the User who currently has the Item on loan.
Current Requesters Desired	Empty element; indicates that the requester desires information about all Users that have requested a specific Item.
Note on Dates	<i>All date data elements represent a single instant in time and are combinations of date and time of the day values, expressed in Coordinated Universal Time as specified in ISO 8601.</i> <i>Note: Where options for the expression of the representation of date (complete or truncated) and for the format (basic or extended) are allowed in ISO 8601, Implementation Profiles shall specify which options are to be used.</i>
Date Available	Date/time type; indicates when the requested Item is expected to be available to the User.
Date Due	Date/time type; indicates when the loan of an Item is scheduled to end.
Date Event Occurred	Date/time type; indicates the date and time that the initiating application took the mandated action.
Date For Return	Date/time type; indicates the date and time specified by the lending Agency for the return of an Item. Initiating applications provide this data when requesting that a responding application accept the Item for circulation to or pick-up by a User.
Date Of Birth	Date/time type; indicates a User's date of birth.
Date Of User Request	Date/time type; indicates when a User has issued a request for an Item.
Date Placed	Date/time type; indicates when a User placed a request for an Item.
Date Recalled	Date/time type; indicates when a recall for an Item was issued.
Date Received	Date/time type; indicates when an Agency received an Item.

Data Element Name	Data Element Definition
Date Reported Returned	Date/time type; indicates when the User purports to have returned the Item.
Date Sent	Date/time type; indicates when an Item or a notice was sent.
Date Shipped	Date/time type; indicates when an Agency shipped an Item.
Date To Send	Date/time type; indicates when an Item or a notice is to be sent.
Date Will Send	Date/time type; indicates when an Agency will send an Item or a notice.
Delete Agency Fields	Complex element used to identify data elements that can be deleted as part of the Update Agency and Agency Updated services.
	Agency Address Information
	Agency User Privilege Type
	Application Profile Supported Type
	Authentication Prompt
	Consortium Agreement
	Organization Name Information
Delete Item Fields	Complex element used to identify data elements that can be deleted as part of the Update Item and Item Updated services.
	Bibliographic Description
	Item Description
	Item Use Restriction Type
	Location
	Physical Condition
	Security Marker
	Sensitization Flag
Delete Request Fields	Complex element used to identify data elements that can be deleted as part of the Update Request Item and Item Request Updated services.
	Acknowledged Fee Amount
	Date Available
	Date Of User Request
	Earliest Date Needed
	Item Id
	Need Before Date
	Paid Fee Amount

Data Element Name		Data Element Definition
	Pickup Expiry Date	Occurs 0 or 1 time.
	Pickup Location	Occurs 0 or 1 time.
	Request Scope Type	Occurs 0 or 1 time.
	Request Status Type	Occurs 0 or 1 time.
	Request Type	Occurs 0 or 1 time.
	Shipping Information	Occurs 0 or 1 time.
	User Id	Occurs 0 or 1 time.
Delete User Fields		Complex element used to identify data elements that can be deleted as part of the Update User and User Updated services.
	Authentication Input	Occurs 0 or more times.
	Block Or Trap	Occurs 0 or more times.
	Date Of Birth	Occurs 0 or 1 time.
	Name Information	Occurs 0 or 1 time.
	User Address Information	Occurs 0 or more times.
	User Language	Occurs 0 or more times.
	User Privilege	Occurs 0 or more times.
Desired Date Due		Date/time type; indicates the date the User wishes the Item to be due. Initiating applications supply this data at the time that a request is issued for check out, renewal, or recall.
Desired Date For Return		Date/time type; indicates the date desired by the borrowing Agency for the return of an Item. This data is provided when requesting the renewal of an Item for which the circulation activity is being managed by an application other than that of the original lending Agency and the original lending Agency has specified a Date For Return.
Earliest Date Needed		Date/time type; indicates the earliest date at which the User has need of an Item. Implies that the requested Item is not required or desired prior to the date specified.
Electronic Address		
	Electronic Address Data	Text string; provides the electronic address. Occurs 1 and only 1 time.
	Electronic Address Type	Text string; identifies the type of address used to communicate electronically with an Agency or a User. Values are specified in the IANA Registry of Media Types. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: electronic mail address, IP address, telephone number
	Scheme	Occurs 0 or 1 time.

Data Element Name	Data Element Definition
Electronic Resource	
	Actual Resource Text string; gives the electronic resource entity, such as a computer file or the full text of the Item. Occurs 1 and only 1 time.
	Electronic Data Format Type Text string; identifies the data type of the electronic resource. Values are specified in the IANA Registry of Media Types. Has optional Scheme attribute. Occurs 1 and only 1 time.
	Scheme Occurs 0 or 1 time.
	Reference To Resource Text string; provides a pointer to the resource rather than providing the resource itself. Occurs 1 and only 1 time if Actual Resource and Electronic Data Format Type are absent.
Electronic Resource Provided Flag	Empty element; indicates whether or not the bibliographic item, in the form of an electronic resource, has been provided as part of the Item Checked Out Service.
Ext	Text string; identifies a new data element or value or message, depending on where in the schema it is used. Provides extensibility. Occurs 0 or more times.
Fiscal Action Type	Text string; identifies a fiscal action. Has optional Scheme attribute. Examples: assess, cancel, payment
	Scheme Occurs 0 or 1 time.
Fiscal Transaction Information	
	Amount Occurs 1 and only 1 time.
	Fiscal Action Type Occurs 1 and only 1 time.
	Fiscal Transaction Description Occurs 0 or 1 time.
	Fiscal Transaction Reference Id Occurs 0 or 1 time.
	Fiscal Transaction Type Occurs 1 and only 1 time.
	Item Details Occurs 0 or 1 time.
	Payment Method Type Occurs 0 or 1 time.
	Related Fiscal Transaction Reference Id Occurs 0 or more times.
	Request Id Occurs 0 or 1 time.
	Valid From Date Occurs 0 or 1 time.
	Valid To Date Occurs 0 or 1 time.

Data Element Name	Data Element Definition
Fiscal Transaction Description	Text string; gives supplementary details of the fiscal transaction.
Fiscal Transaction Reference Id	A number or string used to identify a specific financial transaction.
Agency Id	Occurs 1 and only 1 time.
Fiscal Transaction Identifier Value	Text string; gives value to be used to identify a fiscal transaction. Occurs 1 and only 1 time.
Fiscal Transaction Type	Text string; identifies the type of fiscal charge. Has optional Scheme attribute. Examples: catalog search, day pass, ILL fee
Scheme	Occurs 0 or 1 time.
From Agency Authentication	Text string; provides data to be used by recipient to authenticate the Agency initiating the message.
From Agency Id	Unique identification of the Agency (i.e., Agency Id) from which the message was sent. See Agency Id for a definition of this element.
From System Authentication	Text string; provides data to be used by recipient to authenticate the system from which the message was sent.
From System Id	Text string; identifies the system from which a message was sent. Has optional Scheme attribute.
Scheme	Occurs 0 or 1 time.
Hold Pickup Date	Date/time type; indicates when a hold expires for a given User.
Hold Queue Length	Non-negative integer; indicates the number of Users who currently have requested a hold on an Item.
Hold Queue Position	Positive integer; indicates the position in the hold queue of a request by a User for an Item, conditional on the value of Request Type of "hold."
Holdings Information	Required Usage: Holdings Information consists of a choice of one or more occurrences of Structured Holdings Data OR a single occurrence of Unstructured Holdings Data.
Structured Holdings Data	Occurs 1 or more times, but only if Unstructured Holdings Data is not present.
Unstructured Holdings Data	Occurs 1 and only 1 time, but only if Structured Holdings Data is not present.
Indeterminate Loan Period Flag	Empty element; indicates that the loan is for an indefinite period.
Initiation Header	
Application Profile Type	Occurs 0 or 1 time.
From Agency Authentication	Occurs 0 or 1 time.
From Agency Id	Occurs 1 and only 1 time.

Data Element Name		Data Element Definition
	From System Authentication	Occurs 0 or 1 time.
	From System Id	Occurs 0 or 1 time.
	On Behalf of Agency	Occurs 0 or 1 time.
	To Agency Id	Occurs 1 and only 1 time.
	To System Id	Occurs 0 or 1 time.
Item Description		Description of a specific physical or electronic Item belonging to an Agency's collection(s).
	Call Number	Text string; indicates permanent relative physical location assigned to a bibliographic item. Occurs 0 or 1 time.
	Copy Number	Text string; gives the copy number of an Item held by an Agency. Occurs 0 or 1 time. Examples: Copy 1, Copy 2
	Holdings Information	Occurs 0 or 1 time.
	Item Description Level	Text string; identifies the level at which the Item is described. Has optional Scheme attribute. Occurs 0 or 1 time. Examples: work, copy, piece
	Scheme	Occurs 0 or 1 time.
	Number of Pieces	Positive integer: gives the number of pieces that comprise this item. Occurs 0 or 1 times.
Item Details		Required Usage: Item Details consists of Item Id, Bibliographic Description, and optionally Date Checked Out, Date Renewed and Date Returned. In addition, there is an optional choice among three data elements, Date Due OR Indeterminate Loan Period Flag OR Non Returnable Flag. Only Date Renewed is repeatable.
	Bibliographic Description	Occurs 1 and only 1 time.
	Date Checked Out	Occurs 0 or 1 time.
	Date Due	Occurs 1 and 1 only time, but only if neither Indeterminate Loan Period Flag nor Non Returnable Flag is present.
	Date Renewed	Date/time type; indicates when an Item was renewed. Occurs 0 or more times.
	Date Returned	Date/time type; indicates when an Item was returned (not necessarily checked in, but no longer in the custody of a User or Agency). Occurs 0 or 1 time.
	Indeterminate Loan Period Flag	Occurs 1 and 1 only time, but only if neither Date Due nor Non Returnable Flag is present.

Data Element Name		Data Element Definition
	Item Id	Occurs 1 and only 1 time.
	Non Returnable Flag	Occurs 1 and 1 only time, but only if neither Date Due nor Indeterminate Loan Period Flag is present.
Item Element Type		Text string; identifies all the elements of the Item Object on which queries (i.e., lookups) can be made. Has optional Scheme attribute. Examples: <ul style="list-style-type: none"> - Bibliographic Description - Circulation Status - Electronic Resource - Hold Queue Length - Item Description - Item Use Restriction Type - Location - Physical Condition - Security Marker - Sensitization Flag
	Scheme	Occurs 0 or 1 time.
Item Id		
	Agency Id	Occurs 0 or 1 time.
	Item Identifier Type	Text string; specifies the type of identifier being used. Has optional Scheme attribute.
	Scheme	Occurs 0 or 1 time.
	Item Identifier Value	Text string; identifies, in context of a specific Agency, the Item involved in a circulation transaction. Identifier may take the form of a barcode, a record number, an accession number, etc. Occurs 1 and only 1 time.
Item Optional Fields		Complex element; used in update response messages. Carries data elements describing the Item Object specifically as in the initiation message of an update service. Also used in the initiation message of a notification service to describe the Item Object.
	Bibliographic Description	Occurs 0 or 1 time.
	Circulation Status	Occurs 0 or 1 time.
	Electronic Resource	Occurs 0 or 1 time.
	Hold Queue Length	Occurs 0 or 1 time.
	Item Description	Occurs 0 or 1 time.
	Item Use Restriction Type	Occurs 0 or more times.
	Location	Occurs 0 or more times.
	Physical Condition	Occurs 0 or 1 time.

Data Element Name	Data Element Definition
	Security Marker
	Occurs 0 or 1 time.
	Sensitization Flag
	Occurs 0 or 1 time.
Item Reported Lost	Empty element; indicates that a User or Agency has reported that the Item has been lost.
Item Reported Missing	Empty element; indicates that a User or Agency has reported that the Item is missing.
Item Reported Never Borrowed	Empty element; indicates that a User or Agency has reported that the Item was never borrowed.
Item Reported Returned	Complex element; indicates that a User or Agency has reported that the Item was returned on the date specified.
	Date Reported Returned
	Occurs 1 and only 1 time.
Item Transaction	
	Current Borrower
	Complex element; identifies the User that currently has Item on loan. See User Id for details of the structure of this complex element.
	Occurs 0 or 1 time.
	Current Requester
	Complex element; identifies a User that currently has an active request for an Item. See User Id for details of the structure of this complex element.
	Occurs 0 or more times.
Item Use Restriction Type	Text string; indicates the circulation usage rules and any special restrictions that apply to an Item at the time of a circulation transaction. Has optional Scheme attribute.
	Examples: in-library use only, renewals not permitted, term loan
	Scheme
	Occurs 0 or 1 time.
Language	Text string; identifies the language of the Item. Has optional Scheme attribute.
	Examples: eng (English), fre (French), ger (German)
	Scheme
	Occurs 0 or 1 time.
Loaned Item	Data describing an Item currently on loan to a User.
	Required Usage: Loaned Item consists of Item Id, Reminder Level, Amount, and a choice of either Date Due OR Indeterminate Loan Period Flag. None of these component elements are repeatable.
	Amount
	Occurs 1 and only 1 time.
	Date Due
	Occurs 1 and only 1 time, but only if Indeterminate Loan Period Flag is not present.
	Indeterminate Loan Period Flag
	Occurs 1 and only 1 time, but only if Date Due is not present.
	Item Id
	Occurs 1 and only 1 time.
	Medium Type
	Occurs 0 or 1 time.

Data Element Name		Data Element Definition
	Reminder Level	Occurs 1 and only 1 time.
	Title	Occurs 0 or 1 time.
Loaned Items Count		Required Usage: Loaned Items Count consists of Loaned Item Count Value and a choice of either Circulation Status OR Item Use Restriction Type. None of these component elements are repeatable.
	Circulation Status	Occurs 1 and only 1 time, but only if Item Use Restriction Type is not present.
	Item Use Restriction Type	Occurs 1 and only 1 time, but only if Circulation Status is not present.
	Loaned Item Count Value	Non-negative integer; specifies number of items that a User has on loan at any point in time for a given Circulation Status or Item Use Restriction Type. Occurs 1 and only 1 time. Examples: <ul style="list-style-type: none"> - Items with Item Use Restriction Type = normal loan period: 5 - Items with Item Use Restriction Type = overnight loan: 3 - Items with Item Use Restriction Type = in library use only: 1
Loaned Items Desired		Empty element; indicates that the requester desires information about Items loaned to a specific User.
Location		
	Location Name	Complex element, containing a sequence of Location Name Instances, which together express the location where an Item is housed at a particular point in time. Occurs 1 and only 1 time. Example: To provide the Location Name for an Item that is housed in locked cabinet #5 in the rare book room of the main library: <ul style="list-style-type: none"> Location Name Instance 1 <ul style="list-style-type: none"> - Location Name Level = 1 - Location Name Value = Main Location Name Instance 2 <ul style="list-style-type: none"> - Location Name Level = 2 - Location Name Value = Rare Book Room Location Name Instance 3 <ul style="list-style-type: none"> - Location Name Level = 3 - Location Name Value = Locked Cabinet #5
	Location Name Instance	Occurs 1 or more times.
	Location Name Level	Positive integer; indicates the level of the Location Name Instance in a sequence within Location Name. Occurs 1 and only 1 time.

Data Element Name		Data Element Definition
	Location Name Value	Text string; provides a value for the Location Name Instance; gives name of an Agency-specific location or sub-location where an Item is housed at a particular point in time. Occurs 1 and only 1 time.
	Location Type	Text string; identifies the nature of the location where an Item is at a particular point in time. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: Permanent, Temporary, Current
	Scheme	Occurs 0 or 1 time
	Valid From Date	Occurs 0 or 1 time.
	Valid To Date	Occurs 0 or 1 time.
Mandated Action		Complex element; indicates that the responding application shall honor the update request because the initiating application has already acted upon the update. For example, while in 'Offline Recovery' mode, a self-service unit inserts this element in each of the back-logged update messages to inform the circulation application that the requested action (e.g., Check Out Item) has already taken place during a period of time when the connection between the partner applications was broken.
	Date Event Occurred	Occurs 1 and only 1 time.
Name Information		
	Organization Name Information	Occurs 0 or more times, but 1 or more times if Personal Name Information is absent.
	Personal Name Information	Occurs 0 or 1 time, but 1 time if Organization Name Information is absent.
Need Before Date		Date/time type; indicates when the User needs the requested Item. Implies that the requested Item is no longer required if the Item cannot be supplied by the date specified.
Non Returnable Flag		Empty element; indicates that the Item is returnable.
Notice Content		Text string; provides the contents of the notice.
Notice Item		
	Amount	Occurs 0 or 1 time.
	Item Details	Occurs 1 and only 1 time.
Notice Type		Text string; identifies the type of notice to be sent or that has been sent to a User. Has optional Scheme attribute. Examples: account reminder, Item overdue, available for pickup
	Scheme	Occurs 0 or 1 time.

Data Element Name	Data Element Definition
Number of Pieces	Positive integer; gives the number of pieces comprising an item. Occurs 0 or 1 time.
On Behalf Of Agency	Unique identification of the Agency (i.e., Agency Id) on behalf of which the initiating message is sent. See Agency Id for a definition of this compound element.
Organization Name Information	
	<p>Organization Name</p> <p>Text string; represents the name of an organization. Occurs 1 and only 1 time. Examples: The Free Library of Philadelphia, Milton S. Eisenhower Library</p>
	<p>Organization Name Type</p> <p>Text string; identifies the type of Organization Name. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: official name, abbreviation or acronym, transliterated name <i>Source:</i> ISO 1046 draft</p>
	<p>Scheme</p> <p>Occurs 0 or 1 time.</p>
Paid Fee Amount	Monetary value in a specified currency (i.e., Amount), paid by a User as the fee charged for a requested item. See Amount for the definition of this complex element.
Pending	Information on status of a Renew Item request awaiting decision or settlement.
	<p>Date Of Expected Reply</p> <p>Date/time type; indicates when the sender expects to reply to a request to renew an Item. The sender does not guarantee that a reply will be made at the date/time specified. Occurs 0 or 1 time.</p>
Personal Name Information	
	<p>Structured Personal User Name</p> <p>Occurs 0 or 1 time if Structured Personal User Name is present; otherwise occurs 1 and only 1 time.</p>
	<p>Unstructured Personal User Name</p> <p>Occurs 0 or 1 time if Unstructured Personal User Name is present; otherwise occurs 1 and only 1 time.</p>
Physical Address	
<p>Designated geographical location recognized by a postal authority or other carrier, to which things may be delivered, as distinguished from Electronic Address.</p> <p>Required Usage: Physical Address consists of Physical Address Type and a choice of either Structured Address OR Unstructured Address. None of these component elements are repeatable.</p>	

Data Element Name		Data Element Definition
	Physical Address Type	Text string; indicates whether the physical address is a street address or a postal address. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: postal address, street address
	Scheme	Occurs 0 or 1 time.
	Structured Address	Occurs 1 and only 1 time, but only if Unstructured Address is not present.
	Unstructured Address	Occurs 1 and only 1 time but only if Structured Address is not present.
Physical Condition		
	Physical Condition Details	Text string; provides details of the physical condition of an item, identified by Physical Condition Type. Occurs 0 or 1 time.
	Physical Condition Type	Text string; identifies specific details of any unusual physical conditions of an Item. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: binding weak, color plates missing, water damage
	Scheme	Occurs 0 or 1 time.
Pickup Date		Date/time type; indicates when a requested Item is available for pickup as a result of fulfillment of a User request (e.g., a hold or a stack retrieval).
Pickup Expiry Date		Date/time type; indicates when the physical Item being held for a User is to be returned to a regular circulation status (e.g., available for loan), because the Item has not been picked up (i.e., checked out) by the User in the time allocated. This situation would arise as a result of fulfillment of a request such as a hold or a stack retrieval.
Pickup Location		Text string; identifies the location where an item can be picked up. Has optional Scheme attribute. Occurs 0 or 1 time.
	Scheme	Occurs 0 or 1 time.
Problem		Complex element; provides an indication either that an application cannot perform the service requested by the initiating application or that an application does not understand the initiation message. See Appendix A for existing sample lists of error messages and where they can be used.
	Problem Detail	Text string; identifies the problem in some detail. Occurs 0 or more times.
	Problem Element	Text string; identifies the data element in which the problem occurred. Occurs 0 or more times.

Data Element Name		Data Element Definition
	Problem Type	Text string; identifies type of problem encountered. Has optional Scheme attribute. Occurs 1 and only 1 time.
	Scheme	Occurs 1 and only 1 time.
	Problem Value	Text string; identifies the value in which the problem occurred. Occurs 0 or more times.
Related Fiscal Transaction Reference Id		A number or text string used to identify a related financial transaction. For example, the Related Fiscal Transaction Reference Id in the fiscal transaction to pay off the balance of an account is the Id of the fiscal transaction in which the balance owed is recorded.
	Agency Id	Occurs 1 and only 1 time.
	Fiscal Transaction Identifier Value	Text string; gives value to be used to identify a fiscal transaction. Occurs 1 and only 1 time.
Reminder Level		Positive integer; provides a count of the number of times a reminder has been sent to a User. Examples: 1, 3, 4
Renewal Count		Non-negative integer; indicates the number of times the Item identified has been renewed. The Renewal Count for an initial check out is "0".
Renewal Not Permitted		Empty element; indicates that the initiating Agency will accept requests to renew the Item.
Request Element Type		Text string; indicates the type of the request. Has optional Scheme attribute.
	Scheme	Occurs 0 or 1 time.
Request Id		
	Agency Id	Occurs 0 or 1 time.
	Request Identifier Type	Text string; specifies the type of identifier being used. Has optional Scheme attribute. Occurs 0 or 1 time.
	Scheme	Occurs 0 or 1 time.
	Request Identifier Value	Text string; provides the value of a specific request identifier. Occurs 1 and only 1 time.
Request Scope Type		Text string; indicates the level of the Item description being requested. Has optional Scheme attribute. Examples: bibliographic item (i.e., any item with the same bibliographic id), item (i.e., any item with the same bibliographic id and volume)
	Scheme	Occurs 0 or 1 time.

Data Element Name	Data Element Definition
Request Status Type	Text string; identifies the status of the request. Has optional Scheme attribute. Examples: in process, available for pickup, expired
Scheme	Occurs 0 or 1 time.
Request Type	Text string; identifies the nature of the request. Has optional Scheme attribute. Examples: hold, loan, stack retrieval
Scheme	Occurs 0 or 1 time.
Requested Action Type	Text string; identifies the action the responding Agency is requested to take on receipt of the Accept Item message. Has optional Scheme attribute... Examples: circulate, hold for pickup
Scheme	Occurs 0 or 1 time.
Requested Item	Data describing the Item requested by a User. Required Usage: Requested Item consists of Request Type, Request Status Type, Date Placed, a choice between Request Id AND/OR Item Id and optionally, Pickup Date, Pickup Expiry Date, Reminder Level, Hold Queue Position. None of these elements are repeatable.
Date Placed	Occurs 1 and only 1 time.
Hold Queue Position	Occurs 0 or 1 time.
Item Id	Occurs 0 or 1 time if Request Id is present; otherwise occurs 1 and only 1 time.
Medium Type	Occurs 0 or 1 time.
Pickup Date	Occurs 0 or 1 time.
Pickup Expiry Date	Occurs 0 or 1 time.
Pickup Location	Occurs 0 or 1 time.
Reminder Level	Occurs 0 or 1 time.
Request Id	Occurs 0 or 1 time if Item Id is present; otherwise occurs 1 and only 1 time.
Request Status Type	Occurs 1 and only 1 time.
Request Type	Occurs 1 and only 1 time.
Title	Occurs 0 or 1 time.
Requested Items Count	Required Usage: Requested Item Count consists of Requested Item Count Value and a choice among three elements, Circulation Status OR Item Use Restriction Type OR Request Type. None of these elements are repeatable.
Circulation Status	Occurs 1 and 1 only time, but only if neither Item Use Restriction Type nor Request Type is present.

Data Element Name		Data Element Definition
	Item Use Restriction Type	Occurs 1 and 1 only time, but only if neither Circulation Status nor Request Type is present.
	Request Type	Occurs 1 and 1 only time, but only if neither Circulation Status nor Item Use Restriction Type is present.
	Requested Item Count Value	Non-negative integer; indicates the number of holds, reserves, or pages a User has in effect at any point in time for a Circulation Status or Item Use Restriction Type. Occurs 1 and only 1 time. Example: A User may have on request 5 items on term loan, 3 items recalled, 1 item available on shelf.
Requested Items Desired		Empty element; indicates that the requester desires information about items requested by a specific User.
Required Fee Amount		Monetary value in a specified currency (i.e., Amount) that a User must pay for a requested service. See Amount for the definition of this complex element.
Required Item Use Restriction Type		Text string; indicates that the Agency must receive an acknowledgement from the User that special rules or restrictions apply to the use of the Item. This requirement is carried, if applicable, in messages responding to the request, check out, or renewal of the Item. Has optional Scheme attribute.
	Scheme	Occurs 0 or 1 time.
Resource Desired		Empty element; indicates that the requester desires an electronic resource be transmitted as part of a Check Out Item Response.
Response Header		
	From Agency Authentication	Occurs 0 or 1 time.
	From Agency Id	Occurs 1 and only 1 time.
	From System Authentication	Occurs 0 or 1 time.
	From System Id	Occurs 0 or 1 time.
	To Agency Id	Occurs 1 and only 1 time.
	To System Id	Occurs 0 or 1 time.
Routing Information		Information to aid in the routing of an Item following check in.
	Destination	Destination consists of either Bin Number AND/OR Location. Neither of these component elements is repeatable. Occurs 1 and only 1 time.
	Bin Number	Text string; identifies an Agency-specific destination to which a physical item is to be routed following check in. Occurs 0 or 1 time if Location is present; otherwise occurs 1 and only 1 time.

Data Element Name		Data Element Definition
	Location	Occurs 0 or 1 time if Bin Number is present; otherwise occurs 1 and only 1 time.
	Name Information	Occurs 0 or 1 time.
	Request Type	Occurs 0 or 1 time.
	Routing Instructions	Text string; provides instructions, such as special handling, for the routing of an Item within an Agency following check in. Occurs 1 and only 1 time.
	User Id	Occurs 0 or 1 time.
Security Marker		Text string; specifies the type of security marker protecting an Item, including encryption of electronic resources. Has optional Scheme attribute. Examples: 3M Tattle-Tape Security Strip, Checkpoint RFID, PGP
	Scheme	Text String; gives optional URI reference to an authoritative list of values to support validation of the value given above. Occurs 0 or 1 time.
Sensitization Flag		Empty element; indicates that an item should be desensitized and re-sensitized during the check out and check in procedures.
Shipping Information		Required Usage: Shipping Information consists of a choice of data elements, Physical Address OR Electronic Address, and, optionally, Shipping Instructions AND/OR Shipping Note.
	Electronic Address	Occurs 1 and only 1 time, but only if Physical Address is not present.
	Physical Address	Occurs 1 and only 1 time, but only if Electronic Address is not present.
	Shipping Instructions	Text string; provides human-readable data pertaining to the shipment of an Item, such as the preferred carrier, packaging requirements, etc. Occurs 0 or 1 time.
	Shipping Note	Text string; provides data additional to that provided in other data elements that comprise Shipping Information. Occurs 0 or 1 time.

Data Element Name	Data Element Definition
Structured Address	<p>Complex element; provides information about a physical address; structure permits parsing and allows for the component elements to be assembled in the order and format most suited to a given use.</p> <p>Required Usage: Within Structured Address, there is a choice of two sets of elements to express local address information. It can be expressed in a general way using Line 1, and, optionally, Line 2, or it can be expressed to a greater level of granularity, using the data elements Location Within Building, House Name, District, Post Office Box, and Street. If the second, more granular option is used, Structured Address must contain at least one out of Street, Post Office Box, and District, but could contain any two or all three. One or more of the data elements Care Of, Locality, Region, Country, and Postal Code optionally can be used with either set of "local" elements.</p>
Care Of	<p>Text string; gives name of a person, organization, or organizational unit to whose attention the addressed item is intended to be directed.</p> <p>Occurs 0 or 1 time.</p>
Country	<p>Text string; gives name of a country.</p> <p>Occurs 0 or 1 time.</p>
District	<p>Text string; gives name of a sub-entity within a country such as a parish, county, or district.</p> <p>Occurs 0 or 1 time.</p> <p>See Required Usage note in Structured Address for more details on the usage requirements for District.</p> <p>Source: ISO 8459-4</p>
House Name	<p>Text string; gives name of a house, building, or building complex.</p> <p>Occurs 0 or 1 time.</p>
Line 1	<p>Text string; gives one or more of Location Within Building, House Name, Street, Post Office Box, and/or District when a lower level of granularity is not needed.</p> <p>Occurs 0 or 1 time.</p> <p>See Required Usage note in Structured Address for more details on the usage requirements for Line 1.</p>
Line 2	<p>Text string; gives one or more of House Name, Street, Post Office Box, and/or District when Line 1 is not sufficient.</p> <p>Occurs 0 or 1 time.</p> <p>See Required Usage note in Structured Address for more details on the usage requirements for Line 2.</p>
Locality	<p>Text string; gives name of a city, suburb, or postal area.</p> <p>Occurs 0 or 1 time.</p> <p>Note: ISO 8459-4 uses term "City" for this concept.</p>

Data Element Name	Data Element Definition
Location Within Building	Text string; gives the name of a location within a building or building complex. Used to provide more detailed information when the Street element is not sufficient to identify a particular location. Occurs 0 or 1 time. Examples: Suite 42, Level 4 <i>Source:</i> ISO 8459-4
Post Office Box	Text string; gives the box number assigned by the postal authority. Occurs 0 or 1 time. See Required Usage note in Structured Address for more details on the usage requirements for Post Office Box. <i>Source:</i> ISO 8459-4
Postal Code	Text string; gives the code assigned by the postal authority of a country that uniquely identifies an address or groups of addresses. Occurs 0 or 1 time. Examples: - ZIP code (USA): 20814 - Postal code (Canada): K1A 0N4 <i>Source:</i> ISO 8459-4
Region	Text string; gives the name of an area within a country such as a state, province, department, or prefecture. Occurs 0 or 1 time. <i>Source:</i> ISO 8459-4
Street	Text string; gives the name of the location of a house, building or building complex within a city or district. Occurs 0 or 1 time. See Required Usage note in Structured Address for more details on the usage requirements for Street. <i>Source:</i> Variation on ISO 8459-4
Structured Holdings Data	Required Usage: Structured Holdings Data consists of Holdings Chronology AND/OR Holdings Enumeration. Neither of these component elements is repeatable.

Data Element Name		Data Element Definition
	Holdings Chronology	<p>Complex element; contains a sequence of Chronology Level Instances, which together express a time period covered by the Item as a specific part of a bibliographic item and shows the relationship of that Item to the entire bibliographic item.</p> <p>Occurs 0 or 1 time, but 1 and only 1 time if Holdings Enumeration is not present.</p> <p>Examples: To provide the Holdings Chronology for a newspaper issue with a publication date 1998/04/16:</p> <p>Chronology Level Instance 1</p> <ul style="list-style-type: none"> - Chronology Level = 1 - Chronology Caption = Year - Chronology Value = 1998 <p>Chronology Level Instance 2</p> <ul style="list-style-type: none"> - Chronology Level = 2 - Chronology Caption = Month - Chronology Value = 04 <p>Chronology Level Instance 3</p> <ul style="list-style-type: none"> - Chronology Level = 3 - Chronology Caption = Day - Chronology Value = 16
	Chronology Level Instance	<p>Complex element; provides structured information that describes the hierarchical relationship of the specific part held by an Agency to a whole Item, expressed in chronological terms.</p> <p>Occurs 1 or more times.</p> <p>Chronology Level Instance consists of Chronology Value and a choice of Chronology Caption AND/OR Chronology Level. None of these component elements are repeatable.</p>
	Chronology Caption	<p>Text string; provides a descriptive term identifying the Chronology Level Instance.</p> <p>Occurs 0 or 1 time if Chronology Level is present; otherwise occurs 1 and only 1 time.</p> <p><i>Source:</i> Z39.50 Holdings Attribute Set</p>
	Chronology Level	<p>Positive integer; indicates the level of a Chronology Level Instance in a sequence of Chronology Level Instances within Holdings Information.</p> <p>Occurs 0 or 1 time if Chronology Caption is present; otherwise occurs 1 and only 1 time.</p> <p><i>Source:</i> Z39.50 Holdings Attribute Set</p>
	Chronology Value	<p>Text string; provides the value for the Chronology Level Instance.</p> <p>Occurs 1 and only 1 time.</p> <p><i>Source:</i> Z39.50 Holdings Attribute Set</p>

Data Element Name	Data Element Definition
Holdings Enumeration	<p>Complex element, containing a sequence of Enumeration Level Instances, which together express a numeric or alphabetic designation of a specific part of a bibliographic item and show the relationship of that Item to the whole bibliographic item.</p> <p>Occurs 0 or 1 time, but 1 and only 1 time if Holdings Chronology is not present.</p> <p>Example: To provide the Holdings Enumeration for a serial issue numbered as Volume 235, Issue 13, Part 2:</p> <p>Enumeration Level Instance 1</p> <ul style="list-style-type: none"> - Enumeration Level = 1 - Enumeration Caption = Volume - Enumeration Value = 235 <p>Enumeration Level Instance 2</p> <ul style="list-style-type: none"> - Enumeration Level= 2 - Enumeration Caption = Issue - Enumeration Value = 13 <p>Enumeration Level Instance 3</p> <ul style="list-style-type: none"> - Enumeration Level = 3 - Enumeration Caption = Part - Enumeration Value = 2
	<p>Enumeration Level Instance</p> <p>Complex element; provides structured information that describes the hierarchical relationship of the specific part held by an Agency to an entire bibliographic item, expressed in numerative terms.</p> <p>Occurs 1 or more times.</p> <p>Enumeration Level Instance consists of Enumeration Value and a choice of Enumeration Caption AND/OR Enumeration Level. None of these component elements are repeatable.</p>
	<p>Enumeration Caption</p> <p>Text string; provides a descriptive name for the Enumeration Level Instance.</p> <p>Occurs 0 or 1 time if Enumeration Level is present, otherwise occurs 1 and only 1 time.</p> <p>Examples: volume, part, numéro</p> <p><i>Source:</i> Z39.50 Holdings Attribute Set</p>
	<p>Enumeration Level</p> <p>Positive integer; indicates the level of the Enumeration Level Instance in a sequence within Holdings Information.</p> <p>Occurs 0 or 1 time if Enumeration Caption is present; otherwise occurs 1 and only 1 time.</p> <p><i>Source:</i> Z39.50 Holdings Attribute Set</p>
	<p>Enumeration Value</p> <p>Text string; provides a value for the Enumeration Level Instance, which identifies the relationship of the piece to the whole bibliographic item.</p> <p>Occurs 1 and only 1 time.</p> <p><i>Source:</i> Z39.50 Holdings Attribute Set</p>

Data Element Name	Data Element Definition
Structured Personal User Name	Complex element; provides components of a personal name; structure permits parsing and allows for the component elements to be manipulated in the order and format most suited to a given use.
Given Name	Text string; gives simple, double, or compound name that distinguishes an individual within a family carrying a common name. Christian names and forenames are included as given names. Occurs 0 or 1 time. <i>Source:</i> ISO 8459-4
Initials	Text string; provides the initial letter or letters of the given name. Occurs 0 or 1 time.
Prefix	Text string; gives name element, placed before other personal name elements such as surname and given names that, in association with these elements, serves to identify an individual, but does not form an integral part of a name. Occurs 0 or 1 time. Examples: titles, epithets, indication of office, such as Mr., Hon., Dr. <i>Source:</i> ISO 8459-4
Suffix	Text string; denotes the family relationship, initials of an academic degree, or initials denoting membership in an organization that, in conjunction with a surname and a given name or names, serves to identify an individual, but does not form an integral part of a name. Occurs 0 or 1 time. Examples: <ul style="list-style-type: none"> - relative family relationship: Jr., Sr., III - initials of an academic degree: M.D., M.L.S., Ph.D. - initials denoting membership in an organization: F.R.S. <i>Source:</i> ISO 8459-4
Surname	Text string; gives surname or family name of the User. A surname may consist of a single word, or may be compound, that is, joined by a hyphen or contain more than one word. Occurs 1 and only 1 time. Examples: <ul style="list-style-type: none"> - single word: Stevens - compound: Bridges-Webb - multiple words: Van der Meer, Day Lewis <i>Source:</i> Variation of ISO 8459-4

Data Element Name	Data Element Definition
To Agency Id	Unique identification of the Agency (i.e., Agency Id) to which a message is sent. See Agency Id for a definition of this element.
To System Id	Open enumerated type; identifies the system to which a message is sent.
Unstructured Address	
	<p>Unstructured Address Data</p> <p>Text string; gives a complete physical address in a single string. String may contain simple processing information such as line breaks to be used when formatting information for output, such as a screen display or address label.</p> <p>Occurs 1 and only 1 time.</p>
	<p>Unstructured Address Type</p> <p>Text string; identifies the type of formatting present in Unstructured Address Data. Has optional Scheme attribute.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples: HTML, newline-delimited text</p>
	<p>Scheme</p> <p>Occurs 0 or 1 time.</p>
Unstructured Holdings Data	<p>Text string; gives holdings information in a string. This element could carry, for instance, the non-structured "volume-issue" data supplied by an ISO ILL Protocol-based request.</p> <p>Example: v.5, no. 7, Band 48, Tome 2</p>
Unstructured Personal User Name	Text string; gives the complete personal name of a User in a single string.
User Address Information	<p>Information about the place to which messages and Items destined for a User are directed.</p> <p>Required Usage: User Address Information consists of User Address Role Type, a choice of Physical Address OR Electronic Address, and, optionally, Valid From Date AND/OR Valid To Date. None of these elements are repeatable.</p> <p><i>Source:</i> Data structure adapted from preliminary draft of ISO/DIS 2146</p>
	<p>Electronic Address</p> <p>Occurs 1 and only 1 time, but only if Physical Address is not present.</p>
	<p>Physical Address</p> <p>Occurs 1 and only 1 time, but only if Electronic Address is not present.</p>
	<p>User Address Role Type</p> <p>Text string; describes a purpose or role of the address associated with a User. An address may have one or more purposes or roles for any one User. Has optional Scheme attribute.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples: bill to, home, work</p>
	<p>Scheme</p> <p>Occurs 0 or 1 time.</p>
	<p>Valid From Date</p> <p>Occurs 0 or 1 time.</p>

Data Element Name		Data Element Definition
	Valid To Date	Occurs 0 or 1 time.
User Element Type		Text string; identifies all the elements of the User Object on which queries (i.e., lookups) can be made. Has optional Scheme attribute. Examples: <ul style="list-style-type: none"> - Authentication Input - Block Or Trap - Date Of Birth - Name Information - User Address Information - User Language - User Privilege - User Id - Previous User Id
	Scheme	Occurs 0 or 1 time.
User Fiscal Account		Record of a User's fiscal obligations to or credit with an Agency.
	Account Balance	Monetary value in a specified currency (i.e., Amount) that is the balance in a User's account. See Amount for the definition of this complex element. Occurs 1 and only 1 time.
	Account Details	Details of a fiscal transaction affecting the User's account. Occurs 0 or more times.
	Accrual Date	Date/time type; indicates when the amount specified in Fiscal Transaction Information was accrued to the User's account. Occurs 1 and only 1 time.
	Fiscal Transaction Information	Occurs 1 and only 1 time.
User Fiscal Account Desired		Empty element; indicates that the requester desires information about the User's fiscal account.
User Id		
	Agency Id	Occurs 0 or 1 time.
	User Identifier Type	Text string; specifies type of identifier being used. Has optional Scheme attribute. Occurs 0 or 1 time.
	Scheme	Occurs 0 or 1 time.
	User Identifier Value	Text string; specifies a User within an Agency. Occurs 1 and only 1 time. Examples: patron bar code, patron record number, university identification number

Data Element Name	Data Element Definition
User Language	Text string; identifies one or more languages, in order of preference, in which the User wishes to receive written communication. Has optional Scheme attribute. Examples: eng (English), fra (French), deu (German)
Scheme	Occurs 0 or 1 time.
User Notice Details	A message to be displayed or otherwise sent to a User. Required Usage: User Notice Details consists of Notice Type, and optionally Notice Content. In addition, there is a choice among three data elements, Notice Item OR User Fiscal Account OR User Privilege.
Notice Content	Occurs 0 or 1 time.
Notice Type	Occurs 1 and only 1 time.
Notice Item	Occurs 1 or more times, but only if neither User Fiscal Account nor User Privilege are present.
User Fiscal Account	Occurs 1 and only 1 time, but only if neither Notice Item nor User Privilege are present.
User Privilege	Occurs 1 and only 1 time, but only if neither Notice Item nor User Fiscal Account are present.
User Optional Fields	Complex element; used in update response messages. Carries data elements describing the User Object as requested in the initiation message of an update service. Also used in the initiation message of a notification service to describe the User Object.
Block Or Trap	Occurs 0 or more times.
Date Of Birth	Occurs 0 or 1 time.
Name Information	Occurs 0 or 1 time.
Previous User Id	Occurs 0 or more times.
User Address Information	Occurs 0 or more times.
User Language	Occurs 0 or more times.
User Privilege	Occurs 0 or more times.
User Id	Occurs 0 or more times.
User Privilege	Complex element; contains details concerning a specified privilege accorded to a User by a specific Agency, such as fees charged for the privilege, the status of the privilege, or the dates during which the privilege is in force.
Agency User Privilege Type	Occurs 1 and only 1 time.
Agency Id	Occurs 1 and only 1 time.
User Privilege Description	Text string; describes a specific user privilege. Occurs 0 or 1 time.
User Privilege Fee	Occurs 0 or 1 time.
Amount	Occurs 1 and only 1 time.

Data Element Name		Data Element Definition
	Payment Method Type	Text string; indicates the method of payment (actual or proposed) for a specified user privilege fee. Has optional Scheme attribute. Occurs 0 or 1 time. Examples: cash, deposit account, direct debit
	Scheme	Occurs 0 or 1 time.
	User Privilege Status	Occurs 0 or 1 time.
	Date Of User Privilege Status	Date/time type; indicates when the current user privilege status came into effect. Occurs 0 or 1 time.
	User Privilege Status Type	Text string; indicates the current status of a user privilege. Has optional Scheme attribute. Occurs 1 and only 1 time. Examples: active, cancelled
	Scheme	Occurs 0 or 1 time.
	Valid From Date	Occurs 0 or 1 time.
	Valid To Date	Occurs 0 or 1 time.
	Valid From Date	Date/time type; indicates when data, such as an address, a user privilege, a block or a trap, became valid or will become valid. If this element is not provided, one may assume that the data is valid, unless otherwise specified in Valid To Date.
	Valid To Date	Date/time type; indicates when data, such as an address, a user privilege, a block or a trap, will no longer be valid or was no longer valid. If this element is not provided, one may assume that the data is valid, unless otherwise specified in Valid From Date.

6.4 Sample Lists of Values

Version 1 of the Protocol included Closed and Open Enumerated Types. This notion was not adequate for the needs of implementers. There are no enumerated types in version 2 of the protocol. Instead, there are text strings for values. Those values are likely to be drawn from lists of values. An optional scheme attribute on the data element can be used to reference an authoritative list of values. The lists of values formerly embedded within the protocol as closed enumerations have been retained in the protocol as examples and may be included in lists posted on the Maintenance Agency website as non-normative lists of example values. [Appendix A](#) contains a list of error message values indicating which message responses they are used in.

7 State Table Governing Messaging over a Single Connection

The Messaging State Tables define the behavior of the initiating ([Table 6](#)) and responding ([Table 7](#)) applications with regard to messaging over a single connection. Nothing in this standard is intended to prevent two applications from establishing multiple simultaneous connections for the exchange of

NCIP messages. These state tables do not govern the status of the circulation function being performed by either application. A blank cell in the tables represents the combination of an incoming event and a state that is not defined for NCIP. The terminal state for NCIP is not represented in the tables, as there is no “messaging state” immediately after transition to the terminal state.

The initiating application’s messaging may be in one of two states: *Idle* and *Waiting*. The responding application’s messaging may be in one of two states: *Idle* and *Processing*. The *Idle* state means that the connection exists but no response message is pending. The *Waiting* state means that the connection exists and a response message is pending. The *Processing* state means that the connection exists and the application is processing an initiation message.

The initiating and responding state machines enter the *Idle* state upon successful establishment of a connection.

Events are of two types, incoming, listed in [Table 2](#), and outgoing, listed in [Table 3](#).

Table 2: Incoming Events

Event	Description
INITreq	Application requests permission to send an initiation message.
RESPreq	Application requests permission to send a response message.
CLOSEreq	Application requests permission to close the connection
INITind	Application has received an initiation message.
RESPind	Application has received a response message
CLOSEind	The connection is no longer valid.
TIMER	The timer has expired.

Table 3: Outgoing Events

Event	Description
INIT	Application shall send initiation message.
RESP	Application shall send response message.
TIMEOUT	Application shall close the connection because its timer has expired.
CLOSE	Application shall close the connection.

There is one predicate ([Table 4](#)), which indicates whether the message identifier matches that of the immediately preceding message (p1) or not (^p1).

Table 4: Predicates

Predicate	Description
p1	Returns TRUE if the identifier of the message matches the MESSAGE.Id protocol variable or is a LookupVersionResponse.

The single variable ([Table 5](#)) contains the message identifier of the last message transmitted or received.

Table 5: Variables

Variables	Description
MESSAGE.Id	Has the value of the name of the NCIP service initiated by the last message transmitted (in the initiating role) or received (in the responding role).

Table 6: Initiating Application Messaging States

#	Event	IDLE	WAITING
1	INITreq	Set MESSAGE.Id var Set timer IN IT WAITING	
2	RESPind	p1 signal error #1 CLOSE TERMINAL	p1 clear timer IDLE
3	RESPind	^p1 signal error #1 CLOSE TERMINAL	^p1 signal error #2 CLOSE TERMINAL
4	INITind	signal error #4 CLOSE TERMINAL	signal error #4 CLOSE TERMINAL
5	CLOSEreq	CLOSE TERMINAL	signal error #3 CLOSE TERMINAL
6	CLOSEind	TERMINAL	signal error #3 TERMINAL
7	TIMER		TIMEOUT CLOSE TERMINAL

NOTE: Table rows 2 and 3 of the initiating application messaging state table differ in respect to the fact that the predicate (p1) is TRUE in row 2 and FALSE (^p1) in row 3.

ERROR # meanings:

1. Response message received while in IDLE state.
2. Response message received is not an appropriate response for immediately preceding initiation message.
3. Connection was closed while waiting for response message.
4. Initiation message received.

Table 7: Responding Application Messaging States

#	Event	IDLE	PROCESSING
1	INITind	set MESSAGE.Id var clear timer PROCESSING	signal error #1 CLOSE TERMINAL
2	RESPreq		p1 RESP set timer IDLE
3	RESPind	signal error #2 CLOSE TERMINAL	signal error #2 CLOSE TERMINAL
4	CLOSEreq	CLOSE TERMINAL	CLOSE TERMINAL
5	CLOSEind	CLOSE TERMINAL	signal error #3 TERMINAL
6	TIMER	TIMEOUT CLOSE TERMINAL	
<p>ERROR # meanings:</p> <ol style="list-style-type: none"> 1. Initiation message received while processing an earlier message. 2. Response message received. 3. Connection was closed while still processing an earlier message. 			

8 Standard Message Headers and Versioning

Message headers are related to message handling, rather than to message content or its processing. This standard specifies an optional Initiation Header and an optional Response Header. The structure and content of these headers are defined within the context of an Implementation Profile.

In addition every NCIP Message shall include a Version element that identifies the version of the Protocol to which the message conforms. With the exception noted in Section 5.3.5 Lookup Version Service, all response messages must be of the same Protocol version as the Initiation message to which they are a response.

9 Profiles

To support implementation of the protocol with specific practices and application environments, two types of profile documents support the protocol. The protocol combined with these profiles provides an extensible framework for applications. The two types of profiles are:

- **Implementation Profiles:** describe an implementation method that specifies how messages are exchanged. Specifications include messages, character, and data

encoding; required components and behavior; network transport; network security; scheme registration; and provision for extension (see template in [Appendix C](#)). The committee has developed a single Implementation Profile that uses current Web and XML technology. Note: This profile was originally called the Cross-Application Profile.

- **Application Profiles:** describe how the protocol is used to support a specific environment with a given set of practices and policies. This includes a description of services that must be supported, the required security environment etc. Each profile also provides an event table that maps specific external events and circumstances to the use of particular services specified in the protocol (see template in [Appendix D](#)). The committee has developed eight application profile documents that describe how the protocol might be used in three broad service areas: Self Service, Direct Consortial Borrowing, and Circulation/Interlibrary Loan Interaction (see [Appendix E](#)).

9.1 Rules for Profile Definition

A profile based on this standard shall meet the following constraints.

The profile shall not:

- Redefine data elements specified in this Standard
- Add messages not defined in this Standard
- Define new objects
- Add data elements to messages defined in this Standard
- Delete required data elements from messages defined in this Standard

These rules apply to any profiles that may be developed based on this Standard.

9.2 Implementation Profile

The Implementation Profile provides implementation-level details not specified in this Standard including:

- Message encoding and structure
- Character representation
- Representation of data types
- Specification of required components
 - Services
 - Message Prolog
 - Data Structures
 - Rules of behavior of implementations
- Transport mechanism(s)
- Security issues
- Standards referenced/used
- Optional scheme registration
- Provision for extension of the profile

Appendix A

(normative)

Definitions of Values for Use within the "Problem" Data Element

This appendix provides definitions for the values formerly defined for use in both the Messaging Error and Processing Error child elements (both obsolete in version 2) of Problem. Included in the definition is an indication of the now-optional scheme(s) in which the value is used.

These values are used in response messages in situations where the responding application encounters a problem upon receipt of a message.

Account Access Denied

- Access to the user account is not permitted.
- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme

Agency Access Denied

- Access to this Agency is not permitted.
- Used in: NCIP Lookup Agency Processing Error Scheme, NCIP Update Agency Processing Error Scheme

Agency Authentication Failed

- Attempt to authenticate the Agency was unsuccessful; the reason for the failure is unspecified.
- Used in: NCIP General Processing Error Scheme

Cannot Accept Item

- Responder cannot accept the Item under the conditions included in the message. The reason is unspecified.
- Used in: NCIP Accept Item Processing Error Scheme

Cannot Guarantee Restrictions On Use

- Responder cannot guarantee that the restrictions on the use of an Item will be enforced.
- Used in: NCIP Accept Item Processing Error Scheme

Duplicate Agency

- Agency already exists; acting on this update would create a duplicate Agency.
- Used in: NCIP Create Agency Processing Error Scheme

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Duplicate Fiscal Transaction

- Fiscal transaction record already exists; acting on this request would create a duplicate fiscal transaction.
- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme

Duplicate Item

- Item record already exists; acting on this update would create a duplicate Item.
- Used in: NCIP Create Item Processing Error Scheme

Duplicate Request

- Request for the Item already exists; acting on this update would create a duplicate request for the Item for the User.
- Used in: NCIP Request Item Processing Error Scheme

Duplicate User

- User record already exists; acting on this update would create a duplicate User.
- Used in: NCIP Create User Processing Error Scheme

Element Rule Violated

- Known and valid element contains a locally unacceptable value. For example, this error would be appropriate when a "date" type includes a value outside a range deemed valid by the responding application.
- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Create Agency Processing Error Scheme, NCIP Create Item Processing Error Scheme, NCIP Create User Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup Agency Processing Error Scheme, NCIP Lookup Item Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme, NCIP Update Agency Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

In valid Amount

- The requested action cannot proceed because the amount is not correct.
- Used in: NCIP General Processing Error Scheme

In valid Date

- Date/time is invalid because it is not a date, is an improperly formatted date/time, the date/time has passed, or is outside of the range of dates or times for which the service is provided.
- Used in: NCIP General Processing Error Scheme

In valid Message Syntax Error

- Message is not formed correctly, according to transfer syntax specifications in use by the partner applications (e.g., XML).
- Used in: NCIP Messaging Error Type Scheme

Item Access Denied

- Access to this Item is not permitted.
- Used in: NCIP Lookup Item Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme

Item Cannot Be Recalled

- Status of the Item or User Privilege prevents the Item from being recalled.
- Used in: NCIP Recall Item Processing Error Scheme

Item Does Not Circulate

- Request or check out of Item cannot proceed because the Item is non-circulating.
- Used in: NCIP Check Out Item Processing Error Scheme, NCIP Request Item Processing Error Scheme

Item Not Available By Need Before Date

- Item requested will not be available by the date/time the User needs the Item.
- Used in: NCIP Request Item Processing Error Scheme

Item Not Checked Out

- There is no record of the check out of the Item.
- Used in: NCIP Cancel Recall Item Processing Error Scheme, NCIP Check In Item Processing Error Scheme, NCIP Recall Item Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme

Item Not Checked Out To This User

- There is no record that the Item has been checked out to the User.
- Used in: NCIP Report Circulation Status Change Processing Error Scheme

Item Not Renewable

- Item may not be renewed.
- Used in: NCIP Renew Item Processing Error Scheme

Maximum Check Outs Exceeded

- Check out cannot proceed because the User already has the maximum number of items checked out.
- Used in: NCIP Check Out Item Processing Error Scheme

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Maximum Renewals Exceeded

- Renewal cannot proceed because the User has already renewed the Item the maximum number of times permitted.
- Used in: NCIP Renew Item Processing Error Scheme

Needed Data Missing

- Action requested by the initiator cannot be carried out because one or more optional data elements that are needed for processing are missing.
- Used in: NCIP General Processing Error Scheme

Non-Unique Item

- More than one Item matches lookup criteria.
- Used in: NCIP Lookup Item Processing Error Scheme

Non-Unique Request

- More than one request matches lookup criteria.
- Used in: NCIP Lookup Request Processing Error Scheme

Non-Unique User

- More than one User matches lookup criteria.
- Used in: NCIP Lookup User Processing Error Scheme

Protocol Error

- Transmission of the message violates the rules of the messaging state table. For example, this error would be encountered if a response were sent when there is no initiation message or if a second initiation message were sent on a single connection before the response message for the first service has been received.
- Used in: NCIP Messaging Error Type Scheme

Recall Cannot Be Cancelled At This Time

- Some unspecified condition exists that prevents the recall from being cancelled.
- Used in: NCIP Cancel Recall Item Processing Error Scheme

Renewal Not Allowed - Item Has Outstanding Requests

- Item may not be renewed because outstanding requests take precedence over the renewal request.
- Used in: NCIP Renew Item Processing Error Scheme

Request Already Processed

- Request cannot be cancelled because it has already been processed.
- Used in: NCIP Cancel Request Item Processing Error Scheme

Resource Cannot Be Provided

- Check out cannot proceed because the desired resource cannot be provided.
- Used in: NCIP Check Out Item Processing Error Scheme

System Authentication Failed

- Attempt to authenticate the system was unsuccessful; the reason for the failure is unspecified.
- Used in: NCIP General Processing Error Scheme

Temporary Processing Failure

- Temporary processing failure occurred.
- Used in: NCIP General Processing Error Scheme

Unable To Add Element

- Element cannot be added. This situation may occur, for example, if the element, defined as non-repeatable, already exists.
- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Update Agency Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

Unable To Delete Element

- Element cannot be deleted. This situation may occur, for example, because the requested element does not exist and thus cannot be deleted.
- Used in: NCIP Update Agency Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

Unauthorized Combination Of Element Values For Agency

- Agency is not authorized to use this combination of element values.
- Used in: NCIP General Processing Error Scheme

Unauthorized Combination Of Element Values For System

- System is not authorized to use this combination of element values.
- Used in: NCIP General Processing Error Scheme

Unauthorized Service For Agency

- Agency is not authorized to use this Service.
- Used in: NCIP General Processing Error Scheme

Unauthorized Service For System

- System is not authorized to use this Service.
- Used in: NCIP General Processing Error Scheme

Unknown Agency

- Agency is not known.
- Used in: NCIP General Processing Error Scheme (not specifically required for NCIP Lookup Agency Processing Error Scheme)

Unknown Element

- Element is not known.
- Used in: NCIP Messaging Error Type Scheme

Unknown Item

- Item is not known.
- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Recall Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Check In Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup Item Processing Error Scheme, NCIP Recall Item Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme, NCIP Undo Check Out Item Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme

Unknown Request

- Request is not known.
- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup Request Processing Error Scheme, NCIP Update Request Item Processing Error Scheme

Unknown Scheme

- Scheme is not known.
- Used in: NCIP Messaging Error Type Scheme

Unknown System

- System is not known.
- Used in: NCIP General Processing Error Scheme

Unknown User

- User is not known.
- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme, NCIP Undo Check Out Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

Unknown Value From Known Scheme

- Value is not known, although the scheme from which it is cited is known.
- Used in: NCIP Messaging Error Type Scheme

Unsupported Notice

- Notice type is not supported.
- Used in: NCIP Send User Notice Processing Error Scheme

Unsupported Service

- Service is not supported.
- Used in: NCIP General Processing Error Scheme

Unsupported Shipping Address Type

- The address type supplied in Shipping Information is not supported. The problem value may be either a Physical Address Type or an Electronic Address Type.
- Used in: NCIP Check Out Item Processing Error Scheme, NCIP Recall Item Processing Error Scheme

User Access Denied

- Access to the User is not permitted.
- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Update User Processing Error Scheme

User Authentication Failed

- Attempt to authenticate User was unsuccessful; the reason for the failure is unspecified.
- Used in: NCIP Cancel Request Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Undo Check Out Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

User Blocked

- Circulation service, such as check out, renew, or request, cannot proceed because User information indicates that the User is blocked from access to the specified service.
- Used in: NCIP Check Out Item Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Request Item Processing Error Scheme

User Ineligible To Check Out This Item

- Item Use Restriction Type, in conjunction with the User Privilege, prevents the Item from being checked out to the User.
- Used in: NCIP Accept Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme

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User Ineligible To Renew This Item

- Item Use Restriction Type, in conjunction with the User Privilege, prevents the Item from being renewed to the User.
- Used in: NCIP Renew Item Processing Error Scheme

User Ineligible To Request This Item

- Item Use Restriction Type, in conjunction with the User Privilege, prevents the Item from being requested by the User.
- Used in: NCIP Request Item Processing Error Scheme

Appendix B

(informative)

Lists of Values for Data Elements

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

This Standard provides a data structure that permits the formalizing of lists of values through an optional Scheme attribute on the affected data element. Sample lists of values are included in the data element lists. Many of these were formerly embedded within the protocol as closed enumeration types. More sample lists may be posted on the Maintenance Agency website.

Appendix C

(informative)

Implementation Profile Template

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

This appendix provides a sample template for the Implementation Profile, defined in Section 9.

C.1 Purpose

Describe the object to be attained through the development of this Implementation Profile.

C.2 Scope

Specify the scope of this Implementation Profile. Identify any issues to be addressed by the Profile.

C.3 Referenced Standards

Specify any national or international standards that are referenced in this Implementation Profile.

C.4 Definitions

List and define terms that have specific meaning within the context of this Implementation Profile.

C.5 Encoding

Specify the required behavior with regard to encoding, in the context of message structure, character representation, and representation of data types. Describe the structure required for each encoding aspect specified.

C.6 Required Components

List the components of the services and messages required for conformance to this Implementation Profile. Include the requirements for the data structures such as required services, message headers, or data structures. Describe the rules that define behavior for conformance.

C.7 Transport Protocol

Describe the transport protocol used to transfer the messages supported by this Implementation Profile. Include requirements for initiating applications and responding applications. Describe the required message header content and format.

C.8 Security

Describe the security requirements for this Implementation Profile.

C.9 Scheme /Profile Registration

Identify any registration requirements for schemes and implementers of this Implementation Profile.

C.10 Extension

Describe any extensibility mechanism allowed by this Implementation Profile.

Appendix D

(informative)

Application Profile Template

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

This appendix provides a sample template for the Application Profile, defined in Section 9.

D.1 Introduction

Specify the name of the Application Profile and state the Implementation Profile to which it relates.

An Application Profile specifies how a standard or group of standards can be implemented to support:

- An application such as circulation
- A function such as exchange of data about an event
- A community such as libraries
- An environment such as the Internet

An Application Profile identifies a set of base standards, together with appropriate options and parameters necessary to accomplish them, such as:

- Interoperability
- Methodology

An Application Profile specifies the selection of the options, subsets, and parameter values, where these choices are left open in the standard, depending on how the application(s) and functional processes within the Application Profile are structured.

D.1.1. Profile Constraints

The purpose of this template is to facilitate development and documentation of Application Profiles based on the NISO Circulation Interchange Part 1: Protocol and Circulation Interchange Part 2: Protocol Implementation Profile 1 (hereafter referred to as "this Standard"). An Application Profile based on this Standard shall meet the following constraints.

The Application Profile may not:

- Redefine data elements specified in this Standard
- Add messages not defined in this Standard
- Define new objects
- Add data elements to messages defined in this Standard
- Delete required data elements from messages defined in this Standard

D.2 Description of Application Area

Specify the application area to which this Application Profile relates. Describe the purpose of the application and unique features and functions that the application provides. Describe the high-level processing flow for the application and the transactions that are exchanged.

For example:

Self Service is a way to empower a user, by providing communication between the user's system and a circulation application to provide a service to the user. Services provided may include fee payment, check out, check in, etc. This Standard facilitates the transfer of requests from a Self-Service application to a Circulation application that performs the requested function. The Circulation application sends a response to each message received.

Self-Service applications are defined as user-initiated requests for service without intervention by library staff. This includes kiosk type applications and Web-based applications. Self Service applications need to communicate with the circulation system in order to process those requests.

Self-Service applications vary greatly in functionality. Functionality that may be provided by Self-Service applications includes check in, check out, renew, fee payment, view or update user record, and place or cancel holds.

Self-Service applications send requests to and receive responses from Circulation applications. The Self-Service application does not receive requests from Circulation applications; in this way, the Self-Service application is more like a client in a client-server environment. The Self-Service application acts only as an initiator, never as a responder.

D.3 Scope

Specify the scope of the Application Profile and minimal system requirements for all applications. Describe the purpose of the Application Profile. Specify any assumptions made. Describe application features and functions that are outside the scope of the Application Profile. If appropriate, describe the domain or intended community of the Application Profile.

D.4 Conformance

Specify the requirements for conformance with the Application Profile and define any levels of conformance.

D.5 References

List any national or international standards that relate to the Application Profile.

D.6 Definitions

List and define terms that have a unique meaning within the context of this Application Profile that will facilitate understanding of the Application Profile. For example:

Circulation Application	An application that receives requests and acts on those requests.
Self Service Application	An application that empowers a user, and provides functionality by requesting services from a Circulation application.

D.7 Profile Specification

D.7.1. Profile Description

Provide an overview of this Application Profile by defining the agencies and applications and their roles and responsibilities. Indicate whether the Application Profile supports synchrony between applications. Specify optional components of the Application Profile.

D.7.2. Participating Applications

List and describe the applications used in the Application Profile such as the Circulation Application, Self-Service Application, or Interlibrary Loan Application. Describe how each application interacts with the others, such as “The Circulation Application at the Item Agency exchanges data with the ILL Application at the Item Agency.” Identify which application(s) initiate services and which application(s) respond.

D.7.3. Business Rules

Describe how the business rules are applied. The description should identify the application that applies its business rules for the Agencies, Users, and Items.

For example, “The Circulation Application applies the business rules for circulation functions.” If more than one application controls which business rules are applied, specify which application applies which business rules in every circumstance addressed by the Application Profile. For example, “The business rules of the Item Agency’s Circulation Application are used to control the functions related to the Item when the User obtains the Item from the Item Agency.”

D.7.4. Management of User and Staff User Interaction

Specify the application(s) that provide the interface for the user and/or staff user that invoke NCIP services. For example, the Circulation Applications at both the Item Agency and the User Agency provide the capability for users to submit requests to the Circulation Applications at the respective Agencies.

D.7.5. Required Components

D.7.5.1. Required and Optional Services

List any required and optional services that this Application Profile supports.

D.7.5.2. Required and Conditionally Required Data Elements

List any optional data elements in this Standard or the Implementation Profile that are required or conditionally required in this Application Profile.

Message	Profile Required Elements	Conditions
List the message in which the elements are required	Specify optional data elements in NCIP or Implementation Profile that are required in this Application Profile	Describe conditions under which data elements are required.

D.7.6. Events

D.7.6.1. Events Table

Describe any events and related information as shown below.

Triggering Event and Event Location	Initiating Application	Service Initiated	Responding Application	Message Constraints
Describe the event that triggers the application to initiate a service and the location of the event in the application architecture.	Specify which application initiates the service that results from the triggering event.	List the service initiated.	Specify which application responds to the service.	Specify requirements for the initiation and response messages such as optional elements that must be included or are not permitted.
Example: Via the User Agency Patron Interface, User requests item to be placed on hold.	Example: User Agency's Circulation Application	Example: Request Item	Example: Item Agency's Circulation Application	Example: Request Type must be "Hold"

D.7.6.2. Suggested Triggering Events

Below is a list of triggering events that may help you develop a complete Application Profile. Delete any event(s) that do not relate to your Application Profile or insert additional events that you need.

Triggering Event and Event Location	Initiating Application	Service Initiated	Responding Application	Message Constraints
New Agency is added				
Information for an Agency is updated				
New Item is added				
Item is recalled				
Item recall is cancelled				
Item is shipped Item is received				
New User is created				
User information updated				

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Triggering Event and Event Location	Initiating Application	Service Initiated	Responding Application	Message Constraints
User requests an Item				
User cancels a request for an Item				
Notice is sent to a User				
User checks out Item				
User checks in Item				
User renews Item				
User acknowledges fee for check out				
User reports Item lost				
User pays a fine				
User pays a fee				
Suspicious activity during check out detected				
User requests an Item be placed on hold				
User requests an Item be retrieved from stacks				
User requests an Item be loaned				
User requests a copy of an Item for personal retention				
User changes request for an item				
User cancels a request for an item				

D.7.7. Lookup Service Table

In order to initiate some NCIP services, one application may need to obtain data from another application. The table below lists services that can be initiated in order to obtain needed data. The first column lists the application that provides the data. The second column lists the service executed. The third column lists the identifiers that are optional within NCIP, but required by this Application Profile. The fourth column lists the data returned.

Responding Application	Lookup Service	Required Ids	Required Response Data Elements
Item Agency	Lookup Item and Media Type	Item Id	Media Type

D.8 Transport Protocol

Specify the transport protocol(s) supported by this Application Profile for initiating and responding applications. Specify any restrictions on the use of specific transport protocols. For example:

The Self Service Application shall support at least one of the following transport protocols:

- HTTP
- HTTPS
- Direct Transmission over TCP/IP

The Circulation Application shall support all of the following transport protocols:

- HTTP
- HTTPS

Direct Transmission over TCP/IP The selection of the transport protocol by the initiator of a message shall govern the transport protocol used by the responder. The responder shall respond using the same connection, and therefore the same transport protocol, used to send the message.

D.9 Security and Privacy

Describe whether and how security is required by this Application Profile. Specify any security applications, authentication frameworks, trust models, encryption used, etc. Specify the application, if any, that authenticates the user. For example, "Authentication of the user is done by the Circulation Application." Also, specify whether user authentication is performed by an NCIP authentication mechanism.

D.10 Non-normative Guidelines

Specify any non-normative guidelines for the Application Profile.

Appendix E (informative)

Relationship between This Standard and Associated Profiles

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

The following diagram indicates the relationship between Circulation Interchange Part 1: Protocol (NCIP), Circulation Interchange Part 2: Protocol Implementation Profile 1, and various application profiles previously developed.

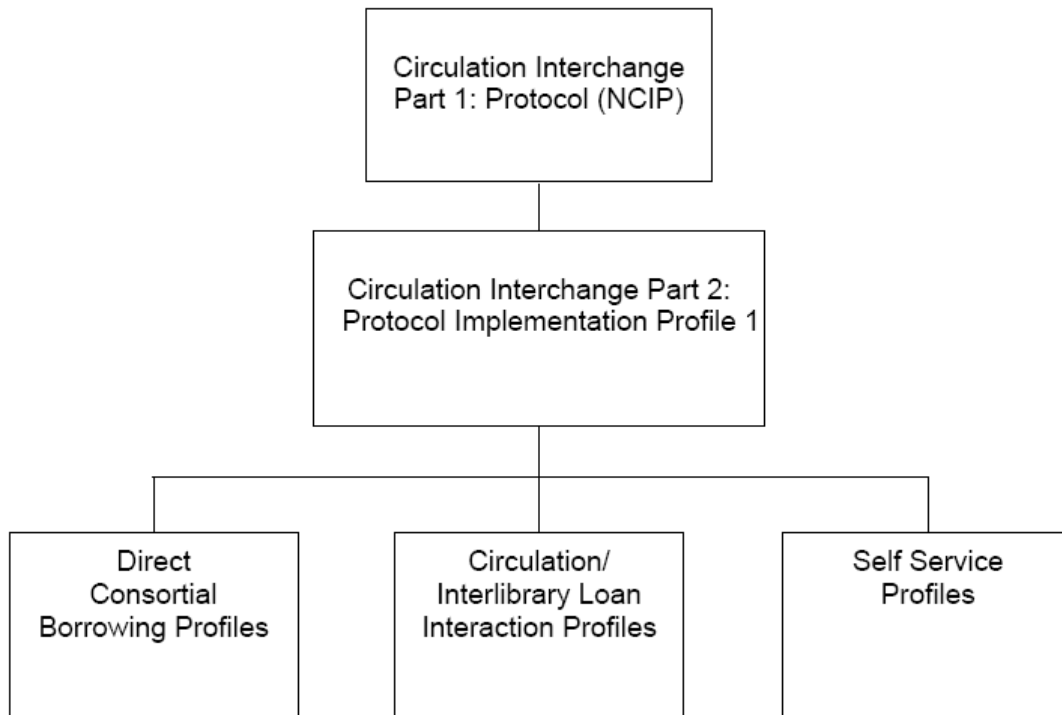


Figure 1: NCIP relationship to profiles

Eight Application Profiles were developed in conjunction with this Standard. Templates for developing Application Profiles are included in Appendix D. The eight Application Profiles are:

- **Self Service:**
 - Unmediated Online Circulation
 - Unmediated Online Circulation with Offline Recovery

- **Direct Consortial Borrowing:**
 - Item Agency Manages Transaction
 - User Agency Manages Transaction
 - Broker Application Manages Transaction
 - User Agency Manages Transaction with Proxy Check Out
- **Circulation/Interlibrary Loan Interaction:**
 - Borrowing Agency
 - Lending Agency

These application profiles will be further refined via an Implementors Group, and availability of the profiles will be announced by the group and/or the Maintenance Agency.

Appendix F

(informative)

Designation of Maintenance Agency and Registration Authority

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

NISO will appoint an agency to act as a Maintenance Agency and Registration Authority for the NCIP Standard. This appendix describes the responsibilities of that agency.

F.1 Maintenance Activities

F.1.1. Required Maintenance Activities

1. Responding to queries on interpretation of the NCIP and Implementation Profile.
2. Reviewing reports of defects.
3. Reviewing suggestions for improvement of the NCIP and Implementation Profiles.
4. Maintaining a current list of inquiries and responses that may be used for potential future enhancements of the NCIP and Implementation Profile.
5. Identifying an advisory group to review defect reports and suggestions, and approve changes.
6. Maintaining current versions of the NCIP and Implementation Profiles, as well as the current message encoding structures.
7. Maintaining current versions of the message structures (e.g. the XML Schema for Implementation Profile 1).
8. Maintaining a list of the latest version of all standards referenced in the Standard that are approved for use with NCIP.
9. Making documents available in appropriate machine-readable formats (e.g. http-accessible).
10. Encouraging coordinated development of application profiles and schemes intended for use with NCIP.
11. Coordinating activities with closely related standards groups such as Z39.50 and ISO ILL.

F.1.2. Desired Maintenance Activities

1. Provide a registration process that is easy for registrants.
2. Explore directory aspects of NCIP in conjunction with the Implementers Group.

F.2 Registration Activities

Registration activities include:

1. Registering agencies that have implemented the Standard.
2. Registering software providers that provide support for applications using the Protocol and who claim conformance with the Standard.
3. Reviewing and registering Application Profiles.
4. Providing support for the registration of scheme names where registration is required.
5. Providing support for the registration of values within schemes when required, including:
 - a) Registering authorities for specific schemes where appropriate
 - b) Registering values for schemes that require the maintenance of a single list of values.

Appendix G

(informative)

Alphabetical List of Data Elements and Their Location in the Data Dictionary (Section 6.3)

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

Account Balance	70	Bin Number.....	62
Account Details	70	Block Or Trap	41, 47, 50, 71
Accrual Date	70	Block Or Trap Type	47
Acknowledged Fee Amount	40, 41, 49	Call Number.....	53
Acknowledged Item Use Restriction Type.....	40	Care Of	64
Actual Resource.....	51	Chronology Caption.....	66
Add Agency Fields	40	Chronology Level.....	66
Add Item Fields	41	Chronology Level Instance	66
Add Request Fields.....	41	Chronology Value	66
Add User Fields.....	41	Circulation Status	48, 54, 56, 61
Address, Electronic	See Electronic Address	Component Date of Publication	
Address, Physical.....	See Physical Address	See Publication Date Of Component	
Address, Structured	See Structured Address	Component Id	45
Address, Unstructured	See Unstructured Address	Component Identifier	45
Agency Address Information	40, 42, 49	Component Identifier Type	45
Agency Address Role Type.....	42	Component Title	See Title Of Component
Agency Element Type	42	Consortium Agreement.....	40, 48, 49
Agency Id	42, 45, 47, 52, 54, 60, 70, 71	Copy Number	53
Agency User Privilege Type.....	40, 42, 49, 71	Country	64
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Any Application Profile Supported Type.....	40, 43, 49	Current Borrower	48, 55
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Authentication Input Data	43	Date Available	41, 48, 49
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Authentication Prompt Data	44	See Desired Date For Return	
Authentication Prompt Type.....	44	Date Due	48, 53, 55
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Author Of Component	44	Date Earliest Needed.....	See Earliest Date Needed
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Bibliographic Id.....	47	Date For Return	48
Bibliographic Item Id.....	44, 47	Date For Return Desired	
Bibliographic Item Identifier.....	44	See Desired Date For Return	
Bibliographic Item Identifier Code	45	Date Needed Before.....	See Need Before Date
Bibliographic Level	45	Date of Accrual	See Accrual Date
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Bibliographic Record Identifier Code.....	45	Date of Hold Pickup.....	See Hold Pickup Date

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Date Returned.....	53	Item Description Level	53
Date Sent	49	Item Details.....	51, 53, 57
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Date Valid From.....	See Valid From Date	Item Identifier Type.....	54
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Delete Item Fields	49	Item Reported Never Borrowed	55
Delete Request Fields	49	Item Reported Returned	55
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Bibliography

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2008. It is included for information only.)

The protocol specified in this Standard relates to a number of existing standards. Related standards include:

Circulation

3M Standard Interchange Protocol: Data Transfer Protocol Between Library Automation Devices and Automated Circulation Systems, Revision 2, 1997

ISO 8459-4:1997, *Information and documentation – Bibliographic data element directory – Part 4: Circulation applications* [Note: This standard is currently being revised and all of the parts are being combined into a single standard. Check the ISO website (www.iso.org) for the current status.]

Interlibrary Loan

ISO 8459-1:1988, *Information and documentation – Bibliographic data element directory – Part 1: Interloan applications* [Note: This standard is currently being revised and all of the parts are being combined into a single standard. Check the ISO website (www.iso.org) for the current status.]

ISO 10160:1997, *Information and documentation – Open Systems Interconnection Interlibrary Loan application service definition*

ISO 10161-1:1997, *Information and documentation – Open systems Interconnection Interlibrary Loan application protocol specification – Part 1: Protocol specification*

Other

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Z39.50 Holdings Schema, Version 1.4, November 2002.
<<http://lcweb.loc.gov/z3950/agency/defns/holdings.html>>