

**Twelfth Draft**  
**NISO Circulation Interchange Protocol Standard**  
(Draft Standard for Trial Use)

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# **NISO Circulation Interchange 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 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 American National Standard Circulation Interchange Protocol (NCIP), ANSI/NISO Z39.83-2001x. It is included for information only.)

### Draft Standard for Trial Use

Both the rapid evolution of Web-based library services and the growing number of resource-sharing arrangements among libraries require an open standard for the exchange of circulation information in the near term. Circulation is an area with many local practices and variations. This very fact has hindered standards development in this area. The committee<sup>1</sup> believes that only practical field implementations can identify the areas in which the protocol must be refined to support robust interchange of information among disparate systems.

NISO is therefore issuing Z39.83 as a *Draft Standard for Trial Use* in order to provide a standard in this critical area in a timely fashion. The trial period for the standard will be twelve to eighteen months. After that trial period, NISO expects to issue a version of the standard for ballot. The committee expects that the standard will continue to evolve during the trial period of twelve to eighteen months. The committee expects to issue revisions during the trial period. Changes in the fundamental architecture of the protocol are unlikely, but the committee does expect that some data structures may evolve. The committee also expects to add data elements and to refine further the definition of data elements during this period. The committee will widely publicize all revisions and NISO will make all revisions available on its web site.

NISO will provide support for an open implementers group during the trial period. This support will include support for an open listserve, maintenance of an open issues list, and support for a coordinator who will act as a liaison among implementers and between implementers and the committee. Participation in this group will allow implementers to influence the ongoing development of the standard.

### About This Standard

Circulation processes and services are evolving in directions that increasingly require disparate computer applications to exchange information about library users<sup>2</sup>, the items they wish to use, the owners of the items, and the relationships among these three entities.

In the absence of an agreed-upon standard for interchanging circulation information, interoperability among disparate applications has been *ad hoc* and proprietary. The cost of such solutions is high for individual agencies and in any case these solutions often provide for only a limited exchange of information because proprietary solutions limit the number of implementations that can participate in the exchange.

A widely implemented standard protocol for the interchange of circulation information between and among disparate circulation applications, between circulation applications and interlibrary loan (ILL), or other related applications can solve this problem.

The standard is intended to address the growing need for interoperability among disparate circulation, interlibrary loan, and related applications. Interoperability between self-service applications and circulation applications, between and among various circulation applications, between circulation and interlibrary loan applications, and between other related applications have been the principal focus of this standard.

The demand for self-service applications led to the development of the 3M Standard Interchange Protocol (SIP) which has become the *de facto* standard interface for self-service applications. The NCIP standard supports the deployment of self-service applications by building on experience obtained from the broad use of the 3M SIP.

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<sup>1</sup> The committee referred to is Committee AT of NISO, whose members may be found at [www.niso.org/commitat.htm](http://www.niso.org/commitat.htm).

<sup>2</sup> All key terms used in this standard are defined in Section 4 or Section 6.

This proposed standard has been developed within the context of a variety of existing standards, as well as through an awareness of existing applications. Wherever possible, existing terminology and definitions are used, duplication is avoided, and every effort has been made to permit developers to meld standards into a single application.

The NCIP standard defines and specifies a set of objects, a set of services and the messages of which they are comprised, 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 thus a connection-oriented, sessionless protocol.

In the development of this standard, a decision was made to specify one or more types of profiles in the standard, in order to permit flexibility and extensibility at the application level. Thus the standard provides general definitions and specifications, which are refined and further detailed in one or more profiles. The primary profile type, called a Cross-Application Profile (CAP), addresses a number of implementation issues, including message, character, and data encoding; required components and behavior; network transport; network security; scheme registration; and provision for extension. These issues are discussed in the Foreword to the CAP. Application profiles provide detailed information about how the standard would be implemented to support a particular kind of service or application within the construct of a particular CAP. The committee expects to produce a Cross-Application Profile and three or more application profiles as part of its work.



## 1. Purpose

The NISO Circulation Interchange Protocol (NCIP) defines a repertoire of messages and associated rules of syntax and semantics for use by applications to a) perform the functions necessary to lend items; b) provide controlled access to electronic resources; and, c) facilitate co-operative management of these functions. 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 information about the user, agency, items, and/or access that is essential to successful conclusion of the function. The protocol 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.

The protocol supports the following application areas. It is recognized that the standard may be used in other areas as well.

- **DIRECT CONSORTIAL BORROWING** – Through "Direct consortial borrowing", users of one agency can request and borrow items from another agency within a consortium. The protocol 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** – The protocol facilitates the exchange of circulation information between interlibrary loan 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 information from the agency's circulation system.
- **ACCESS TO ELECTRONIC RESOURCES** – This protocol permits the use of an agency's circulation system to manage access by a user to electronic resources such as electronic books, serials, and sound recordings.

## 2. Scope

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 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 information (e.g., agency, user, item) between and among disparate systems. This communication may be based upon agreements previously established by the cooperating agencies to govern that relationship. However, the standard also will permit relationships to be established upon first interaction between two agencies, or to be established at each interaction on a case-by-case basis.

## 3. Related Standards

A number of existing standards bear relationships with the protocol specified in this standard. These fall into two groups: standards to which reference was made during the development of the present standard; standards intended

for use in conjunction with the present standard. These two groups of standards are listed in the following subsections.

### 3.1 Referenced Standards

NCIP was developed with reference to the following standards.

#### *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

#### *Interlibrary Loan*

- ISO 10160, Information and Documentation - Open Systems Interconnection - Interlibrary Loan Application Service Definition (2nd edition, 1997)
- ISO 10161-1, Information and Documentation - Open Systems Interconnection - Interlibrary Loan Application Protocol Specification (2nd edition, 1997)
- ISO 8459-1:1988, Information and Documentation - Bibliographic Data Element Directory - Part 1: Interloan Applications

#### *Other*

- ANSI/NISO Z39.50-1995, Information Retrieval: Application Service Definition and Protocol Specification (ISO 23950)
- ANSI/NISO Z39.56-1996, Serial Item and Contribution Identifier (SICI)
- IANA Registry of Media Types; <http://www.isi.edu/in-notes/iana/assignments/media-types/media-types>
- IETF RFC2396, Uniform Resource Identifiers (URI): Generic Syntax <http://www.cis.ohio-state.edu/htbin/rfc/rfc2396.html>
- ISO 639-2:1998, Codes for the representation of names of languages -- Part 2: Alpha-3 code
- ISO 2108:1992, Information and Documentation -- International standard book numbering (ISBN)
- ISO/DIS 2146, Revised Data Model (working draft 1, 20000504)
- ISO 3166-1:1997, Codes for the representation of names of countries and their subdivisions -- Part 1: Country codes
- ISO 3166-2:1998, Codes for the representation of names of countries and their subdivisions -- Part 2: Country subdivision code
- ISO 3166-3:1999, Codes for the representation of names of countries and their subdivisions -- Part 3: Code for formerly used names of countries
- ISO 3297:1998, Information and Documentation -- International standard serial number (ISSN)
- ISO 3901:1986, Documentation -- International Standard Recording Code (ISRC)
- ISO 4217:1995, Codes for the representation of currencies and funds. The tables of codes for ISO 4217 are available from Maintenance Agency, BSI: <http://www.bsi.org.uk/bsi/products/standards/products/currency.xhtml>
- ISO 8601:1988, Data elements and interchange formats -- Information interchange -- Representation of dates and times.
- ISO 10957:1993, Information and documentation -- International standard music number (ISMN)
- ISO/DIS 17933, Generic Electronic Document Interchange (GEDI) (19981215)
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### 3.2 Standards for Use in Conjunction with NCIP

This standard is intended for use in conjunction with the following standards. When these standards are superseded by a revision approved by the issuing body, consult the revision.

- ANSI/NISO Z39.56-1996, Serial Item and Contribution Identifier (SICI)
- IANA Registry of Media Types <<http://www.isi.edu/in-notes/iana/assignments/media-types/media-types>>

- IETF RFC2396, Uniform Resource Identifiers (URI): Generic Syntax <http://www.cis.ohio-state.edu/htbin/rfc/rfc2396.html>
- ISO 639-2:1998, Codes for the representation of names of languages -- Part 2: Alpha-3 code
- ISO 2108:1992, Information and Documentation -- International standard book numbering (ISBN)
- ISO/DIS 2146, Revised Data Model (working draft 1, 20000504)
- ISO 3166-1:1997, Codes for the representation of names of countries and their subdivisions -- Part 1: Country codes
- ISO 3166-2:1998, Codes for the representation of names of countries and their subdivisions -- Part 2: Country subdivision code
- ISO 3166-3:1999, Codes for the representation of names of countries and their subdivisions -- Part 3: Code for formerly used names of countries
- ISO 3297:1998, Information and Documentation -- International standard serial number (ISSN)
- ISO 3901:1986, Documentation -- International Standard Recording Code (ISRC)
- ISO 4217:1995, Codes for the representation of currencies and funds. The tables of codes for ISO 4217 are available from Maintenance Agency, BSI: <http://www.bsi.org.uk/bsi/products/standards/products/currency.xhtml>
- ISO 8601:1988, Data elements and interchange formats -- Information interchange -- Representation of dates and times
- ISO 10957:1993, Information and documentation -- International standard music number (ISMN)

#### 4. Definitions

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

<b>Application</b>	Computer software developed a) to perform the functions necessary to lend items; b) to provide controlled access to electronic resources; and, c) to facilitate co-operative management of these functions.
<b>NCIP</b>	NISO Circulation Interchange Protocol; the protocol specified in this standard.
<b>Object Class</b>	The abstract essence of an object. This standard defines three object classes: Agency Object, Item Object, and User Object.
<b>Object Instance</b>	A concrete instance of an object class. An object class may be instantiated with particular data, functionality, and relationships.
<b>Profile</b>	An agreed-upon, harmonized document that identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or set of functions.
<b>Protocol</b>	A set of formal rules governing the transmission of data, especially across a network. Application level protocols deal with data formatting, including the syntax of messages, application/application dialogue, character sets, sequencing of messages, and so on.
<b>Service</b>	A service is an initiation/response message pair that provides specific functionality with respect to the exchange of data related to circulation and related activities.
<b>Standard</b>	The formal document adopted by the voting members of NISO.
<b>Standard Protocol</b>	The protocol specified in this standard, unless context indicates otherwise.

## 5. Definition of NCIP Service Types, Services, and Messages

This standard defines three types of services: Lookup, Update, and Notification. Each *service type* comprises 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 specified in this standard is a confirmed-service protocol. It employs 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 information 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 Definition

This standard specifies three object classes:

- Agency Object
- Item Object
- User Object

These objects are defined below in terms of the principal data elements of which they are comprised. The data elements are further defined and specified in Section 6.

#### 5.1.1 *Agency Object*

The Agency Object is comprised of the following data elements:

**Address Information**  
**Agency User Privilege Type**  
**Authentication Prompt**  
**CIP Roles Supported Type**  
**Consortium Agreement**  
**Organization Name Information**

#### 5.1.2 *Item Object*

The Item Object is comprised of the following data elements:

**Bibliographic Description**  
**Circulation Category Type**  
**Circulation Status**  
**Electronic Resource**  
**Item Description**  
**Location**  
**Physical Condition**  
**Security Marker**

#### 5.1.3 *User Object*

The User Object is comprised of the following data elements:

**Address Information**  
**Block Or Trap**  
**Date Of Birth**  
**Loaned Items Count**  
**Name Information**  
**Requested Items Count**  
**User Fiscal Account**  
**User Language**  
**User Privilege**

The class name (Agency Object, Item Object, or User Object) is used for object classes. The words Agency, Item, or User, when used alone (with initial capital letter), refer to an instance of the corresponding object class.

## 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 defined above. The services are more fully described in Sections 5.3-5.5. In these sections, services are presented in alphabetical order, and the names of the messages that comprise each service are indicated thus: **Authenticate User**. Data elements used by each service (required or optional) are indicated thus: **Unique User Id**, together with repeatability, designated (R) following the data element name (the absence of this notation indicates that the data element is not repeatable). Conditionally required data elements are enclosed in braces { }. Data elements are defined in Section 6.

Table 1. Summary of Service Types and Associated Services

SECTION	SERVICE TYPE	SERVICE	
		INITIATION MESSAGE	RESPONSE MESSAGE
<b>5.3</b>	<b><i>LOOKUP SERVICE TYPE</i></b>		
5.3.1		Authenticate User	Authenticate User Response
5.3.2		Lookup Agency	Lookup Agency Response
5.3.3		Lookup Item	Lookup Item Response
5.3.4		Lookup User	Lookup User Response
<b>5.4</b>	<b><i>UPDATE SERVICE TYPE</i></b>		
5.4.9		Cancel Recall Item	Cancel Recall Item Response
5.4.12		Cancel Request Item	Cancel Request Item Response
5.4.1		Check In Item	Check In Item Response
5.4.2		Check Out Item	Check Out Item Response
5.4.4		Claim Item Returned	Claim Item Returned Response
5.4.5		Create Agency	Create Agency Response
5.5.6		Create Item	Create Item Response
5.4.7		Create User	Create User Response
5.4.8		Recall Item	Recall Item Response
5.4.10		Renew Item	Renew Item Response
5.4.11		Request Item	Request Item Response
5.4.13		Send User Notice	Send User Notice Response
5.4.3		Undo Check Out Item	Undo Check Out Item Response
5.4.14		Update Agency	Update Agency Response
5.4.15		Update Item	Update Item Response
5.4.16		Update Request Item	Update Request Item Response
5.4.17		Update User	Update User Response

SECTION	SERVICE TYPE	SERVICE	
		INITIATION MESSAGE	RESPONSE MESSAGE
5.4.18		Update User Fiscal Account	Update User Fiscal Account Response
<b>5.5</b>	<b><i>NOTIFICATION SERVICE TYPE</i></b>		
5.5.1		Agency Created	Agency Created Response
5.5.2		Agency Updated	Agency Updated Response
5.5.3		Circulation Status Updated	Circulation Status Updated Response
5.5.4		Item Checked In	Item Checked In Response
5.5.5		Item Checked Out	Item Checked Out Response
5.5.6		Item Claimed Returned	Item Claimed Returned 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
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 Account Updated	User Fiscal Account Updated 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 comprises 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<sup>3</sup>. Note that all messages consist of a header (see Section 8) as a minimum.

Specific Lookup Services are detailed below. These services are summarized in Table 1 (pages 13-14). There is one Lookup Service each for the Agency Object and Item Object and two for the User Object.

#### 5.3.1 *Authenticate User Service*

**Usage:** This service requests authentication of a User known to an Agency. Authentication indicates only that the User is known by an Agency. It does not indicate that the responding application is authorizing services for that User.

The initiating application must determine the type of data the responding application requires for authentication<sup>4</sup>. If the responding application can authenticate this User, it must return the unique id of the User in the response.

**Successful Result:** The responding application authenticates the User and returns the unique id of the User in the response.

<sup>3</sup> In some instances, the responding application may not supply all of the data requested by the initiating application as, for example, when data is unavailable, or when policy or practice prohibits or restricts access.

<sup>4</sup> Such determination may, for example, be accomplished through use of the Lookup Agency Service.

**Messages and Data Elements:****Authenticate User**Required data: **Authentication Input** (R)

Optional data: none

**Authenticate User Response**Required data: **Problem**,<sup>5</sup>  
**Unique User Id**

Optional data: none

**5.3.2 Lookup Agency Service**

**Usage:** This service requests data about a particular Agency from the responding application. The initiating application provides the unique id of the Agency and the list of requested data elements.

**Successful Result:** The responding application returns the requested data to the initiating application.

**Messages and Data Elements:****Lookup Agency**Required data: **Agency Element Type** (R)  
**Unique Agency Id**

Optional data: none

**Lookup Agency Response**Required data: **Problem**, or  
**Unique Agency Id**

Optional data: none

If requested: **Address Information** (R)  
**Agency User Privilege Type** (R)  
**Authentication Prompt** (R)  
**CIP Roles Supported Type** (R)  
**Consortium Agreement** (R)  
**Organization Name Information** (R)**5.3.3 Lookup Item Service**

**Usage:** This service requests data about a particular Item known to the responding application. The initiator provides the unique id of the Item and the list of requested data elements.

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<sup>5</sup> In all response messages, if **Problem** is returned, neither optional data nor requested data are returned. For further discussion of the **Problem** element, see Appendix C.

**Successful Result:** The responding application returns the requested data to the initiating application.

**Messages and Data Elements:**

**Lookup Item**

Required data: **Item Element Type (R)**  
 { **Unique Item Id**, or  
**Unique Request Id** }

Optional data: **Current Borrower Desired**  
**Current Requesters Desired**

**Lookup Item Response**

Required data: **Problem**, or  
 { **Unique Item Id**, or  
 { **Unique Request Id** and, optionally  
**Unique Item Id** } }

Optional data: none

If requested: **Date Recalled**  
**Hold Pickup Date**  
**Item Optional Fields**  
**Item Transaction**

**5.3.4 Lookup User Service**

**Usage:** This service requests data about a particular User known to the responding application. The initiator provides the unique id of the User and the list of requested data elements.

**Successful Result:** The responding application returns the requested data to the initiating application.

**Messages and Data Elements:**

**Lookup User**

Required data: { **Authentication Input (R)**, or  
**Unique User Id** }  
**User Element Type (R)**

Optional data: **Loaned Items Desired**  
**Requested Items Desired**

**Lookup User Response**

Required data: **Problem**, or  
**Unique User Id**

Optional data: none



If requested:       **Loaned Items Count (R)**  
                           **Requested Items Count (R)**  
                           **User Fiscal Account (R)**  
                           **User Optional Fields**  
                           **User Transaction**

#### 5.4 Update Service Type

The Update Service Type comprises 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, or that it effect a transaction to create or modify a relationship between or among object instances. The second (responding) application must send a message to the initiating application in response to the request for an update, either confirming or denying the request<sup>6</sup>. For transactions, the response message may contain data about the transaction. Note that all messages consist of a header (see Section 8) as a minimum.

Update Services are presented 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 (pages 13-14).

##### 5.4.1 *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 the requested User or Item data.

##### **Messages and Data Elements:**

###### **Check In Item**

Required data:       **Unique Item Id**

Optional data:       **Item Element Type (R)**  
                           **User Element Type (R)**

###### **Check In Item Response**

Required data:       **Problem, or**  
                           **Unique Item Id**

Optional data:       **Fiscal Account Update Details**  
                           **Routing Information**  
                           **Unique User Id**

If requested:        **Item Optional Fields**  
                           **User Optional Fields**

---

<sup>6</sup> In some instances, the responding application may not supply all of the data requested by the initiating application as, for example, when data is unavailable, or when policy or practice prohibits or restricts access.

### 5.4.2 *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 request data about the Item and/or the User involved in this check out and to acknowledge the fee amount (if any) associated with this check out. The responder may provide an optional count of the successive number of times this item has been checked out to this User, if the check out message is used to handle renewals. If this is the initial check out, the value of **Renewal Count** should be set to zero.

**Successful Result:** The responding application checks out the Item to the User until the date indicated in the response and returns the requested Item and/or User data.

#### Messages and Data Elements:

##### Check Out Item

Required data: { **Authentication Input** (R), or  
**Unique User Id** }  
**Unique Item Id**

Optional data: **Acknowledged Fee Amount**  
**Date Due Desired**  
**Item Element Type** (R)  
**Resource Desired**  
**Shipping Information**  
**Unique Request Id**  
**User Element Type** (R)

##### Check Out Item Response

Required data: { **Problem**, and, optionally  
**Required Fee Amount** }, or  
{ **Date Due**, or  
**Non Returnable Flag**, or  
**Unlimited Loan Flag** }  
**Unique Item Id**  
**Unique User Id**

Optional data: **Fiscal Account Update Details**  
**Renewal Count**

If requested: **Electronic Resource**  
**Item Optional Fields**  
**User Optional Fields**

### 5.4.3 *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.

**Successful Result:** The immediately preceding check out is undone.

**Messages and Data Elements:****Undo Check Out Item**

Required data: **Unique Item Id**

Optional data: { **Authentication Input (R)**, or  
**Unique User Id** }  
**Unique Request Id**

**Undo Check Out Item Response**

Required data: **Problem**, or  
**Unique Item Id**

Optional data: **Fiscal Account Update Details**  
**Unique User Id**

**5.4.4 Claim Item Returned Service**

**Usage:** This service requests that the responding application mark an Item as claimed returned.

**Successful Result:** The responding application marks the Item as claimed returned.

**Messages and Data Elements:****Claim Item Returned**

Required data: { **Authentication Input (R)**, or  
**Unique User Id** }  
**Date Claimed Returned**  
**Unique Item Id**

Optional data: **Item Element Type (R)**  
**User Element Type (R)**

**Claim Item Returned Response**

Required data: **Problem**, or  
**Unique Item Id**

Optional data: **Unique User Id**

If requested: **Item Optional Fields**  
**User Optional Fields**

**5.4.5 Create Agency Service**

**Usage:** This service requests that the responding application create an Agency. The initiating application supplies the data elements to be used to create the Agency. Among the data elements that may optionally be supplied is a proposed unique id for the Agency.

**Successful Result:** An Agency is created with the data elements supplied by the initiating application, and its unique id is returned.

**Messages and Data Elements:**

**Create Agency**

Required data: **Organization Name Information (R)**

Optional data: **Address Information (R)**  
**Agency User Privilege Type (R)**  
**Authentication Prompt (R)**  
**CIP Roles Supported Type (R)**  
**Consortium Agreement (R)**  
**Unique Agency Id**

**Create Agency Response**

Required data: **Problem, or**  
**Unique Agency Id**

**5.4.6 Create Item Service**

**Usage:** This service requests that the responding application create an Item. The initiating application supplies the data elements to be used to create the Item. Among the optional data elements that may be supplied is a proposed unique identifier for the Item. The responding application returns the identifier that will be used.

**Successful Result:** An Item is created with the data elements supplied by the initiating application, and its unique id is returned.

**Messages and Data Elements:**

**Create Item**

Required data: **Bibliographic Description**

Optional data: **Circulation Category Type**  
**Circulation Status**  
**Item Description**  
**Location (R)**  
**Physical Condition**  
**Security Marker**  
**Unique Item Id**

**Create Item Response**

Required data: **Problem, or**  
**Unique Item Id**

#### 5.4.7 *Create User Service*

**Usage:** This service requests that the responding application create a User. The initiating application supplies the data elements to be used to create the User. Among the optional data elements that may be supplied is a proposed unique identifier for the User. The responding application returns the identifier that will be used.

**Successful Result:** A User is created with the data elements supplied by the initiating application, and its unique id is returned.

#### **Messages and Data Elements:**

##### **Create User**

Required data:     **Name Information**

Optional data:     **Address Information (R)**  
                       { **Authentication Input (R)**, or  
                       **Unique User Id** }  
                       **Block Or Trap (R)**  
                       **Date Of Birth**  
                       **User Language (R)**  
                       **User Privilege (R)**

##### **Create User Response**

Required data:     **Problem, or**  
                       **Unique User Id**

#### 5.4.8 *Recall Item Service*

**Usage:** This service requests that the responding application recall an Item from a User. The initiating application may also propose a new date due for the item, and may optionally request Item and/or User data elements it would like returned in the response.

**Successful Result:** The responding application agrees to recall the Item and takes whatever action is appropriate to do so. It may supply the new date on which the Item is now due, and may supply the User and Item data elements requested.

#### **Messages and Data Elements:**

##### **Recall Item**

Required data:     **Unique Item Id**

Optional data:     **Date Due Desired**  
                       **Item Element Type (R)**  
                       **Shipping Information**  
                       **User Element Type (R)**

##### **Recall Item Response**

Required data:     **Problem, or**

**Unique Item Id**

Optional data: **Date Due**  
**Fiscal Account Update Details**

If requested: **Item Optional Fields**  
**Unique User Id**  
**User Optional Fields**

**5.4.9 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 request may also optionally contain a list of Item and/or User data elements that should be returned in the response.

**Successful Result:** The responding application cancels the recall of the Item and takes whatever fiscal actions are appropriate. It may also supply the data elements requested.

**Messages and Data Elements:****Cancel Recall Item**

Required data: **Unique Item Id**

Optional data: **Item Element Type (R)**  
**User Element Type (R)**

**Cancel Recall Item Response**

Required data: **Problem, or**  
**Unique Item Id**

Optional data: **Fiscal Account Update Details**

If requested: **Item Optional Fields**  
**Unique User Id**  
**User Optional Fields**

**5.4.10 Renew Item Service**

**Usage:** This service requests that the responding application renew an Item for a User. The requester may optionally propose a new due date and may be required to acknowledge required fees for the renewal to take place. The request may also optionally contain a list of Item and/or User data elements that should be returned in the response

**Successful Result:** The responding application renews the Item to the User and provides the new date on which the item is now due. It may also supply the data elements requested.

**Messages and Data Elements:****Renew Item**

Required data: { **Authentication Input (R)**, or

Optional data: **Unique User Id**  
**Unique Item Id**  
**Acknowledged Fee Amount**  
**Date Due Desired**  
**Item Element Type (R)**  
**User Element Type (R)**

#### **Renew Item Response**

Required data: { **Problem**, and, optionally  
**Required Fee Amount** }, or  
**Pending**, or  
**Unique Item Id**

Optional data: **Date Due**  
**Fiscal Account Update Details**  
**Renewal Count**  
**Unique User Id**

If requested: **Item Optional Fields**  
**User Optional Fields**

#### **5.4.11 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, and may need to acknowledge any fees required. The request may also optionally contain a list of Item and/or User data elements that should be returned in the response.

**Successful Result:** The responding application places the request and provides information 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:**

##### **Request Item**

Required data: { { **Authentication Input (R)**, or  
**Unique User Id** }  
**Request Scope Type**  
**Request Type**  
{ **Unique Bibliographic Id**, or  
**Unique Item Id** }

Optional data: **Acknowledged Fee Amount**  
**Earliest Date Needed**  
**Item Element Type (R)**  
**Need Before Date**  
**Shipping Information**  
**Unique Request Id**  
**User Element Type (R)**

**Request Item Response**

Required data:	{ <b>Problem</b> , and, optionally <b>Required Fee Amount</b> }, or <b>Request Scope Type</b> <b>Request Type</b> { <b>Unique Item Id</b> and, optionally <b>Unique Request Id</b> }, or <b>Unique Request Id</b> <b>Unique User Id</b>
Optional data:	<b>Date Available</b> <b>Fiscal Account Update Details</b> <b>Hold Pickup Date</b>
If requested:	<b>Item Optional Fields</b> <b>Shipping Information</b> <b>User Optional Fields</b>

**5.4.12 Cancel Request Item Service**

**Usage:** This service requests that the responding application cancel a request for an Item that previously had been made. The request may also optionally contain a list of Item and User data elements that should be returned in the response.

**Successful Result:** The responding application cancels the request. It may also provide updated fiscal information about the User as a result of the request being cancelled, as well as data elements requested.

**Messages and Data Elements:****Cancel Request Item**

Required data:	{ <b>Authentication Input</b> (R), or <b>Unique User Id</b> <b>Request Type</b> { <b>Unique Item Id</b> and, optionally <b>Unique Request Id</b> }, or <b>Unique Request Id</b> }
Optional data:	<b>Item Element Type</b> (R) <b>Request Scope Type</b> <b>User Element Type</b> (R)

**Cancel Request Item Response**

Required data:	<b>Problem</b> , or { <b>Unique Item Id</b> and, optionally <b>Unique Request Id</b> }, or <b>Unique Request Id</b> <b>Unique User Id</b>
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Optional data:       **Fiscal Account Update Details**

If requested:       **Item Optional Fields**  
**User Optional Fields**

#### 5.4.13 *Send User Notice Service*

**Usage:** This service requests that the responding application send a notice to a User. The initiating application provides the unique id of the User and the type of notice to send. The initiator may optionally provide a date on which it desires the notice be sent, and the content to be used in 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:**

##### **Send User Notice**

Required data:       { **Authentication Input** (R), or  
**Unique User Id** }  
**User Notice Details**

Optional data:       **Date To Send**

##### **Send User Notice Response**

Required data:       **Problem**, or  
**Unique User Id**

Optional data:       { **Date Sent**, or  
**Date Will Send** }

#### 5.4.14 *Update Agency Service*

**Usage:** This service requests that the responding application update data about an Agency. The initiating application provides the data elements and the type of update (add or delete) it wants done<sup>7</sup>.

**Successful Result:** The responding application updates the Agency as specified by the initiating application.

#### **Messages and Data Elements:**

##### **Update Agency**

Required data:       **Unique Agency Id**

Optional data:       **Add Agency Fields**  
**Delete Agency Fields**

---

<sup>7</sup> Note that if the initiating application wishes to change existing data it must first delete the requisite fields and then add the new version of these fields. This rule applies to Update Agency, Update Item, Update Request Item, and Update User Services.

**Update Agency Response**

Required data: **Problem**, or  
**Unique Agency Id**

Optional data: none

**5.4.15 Update Item Service**

**Usage:** This service requests that the responding application update information about an Item. The initiating application provides the data elements and the type of update (add or delete) it wants done<sup>7</sup>. This service cannot be used to change the circulation status of an Item.

**Successful Result:** The responding application updates the Item as specified by the initiating application.

**Messages and Data Elements:****Update Item**

Required data: **Unique Item Id**

Optional data: **Add Item Fields**  
**Delete Item Fields**

**Update Item Response**

Required data: **Problem**, or  
**Unique Item Id**

Optional data: none

**5.4.16 Update Request Item Service**

**Usage:** This service asks that the responding application update data about a request made by a User for an Item. The initiating application provides the data elements and the type of update (add or delete) it wants done<sup>8</sup>.

**Successful Result:** The responding application updates the Item request as specified by the initiating application.

**Messages and Data Elements:****Update Request Item**

Required data: {{ **Authentication Input (R)**, or  
**Unique User Id** }  
**Request Type**  
**Unique Item Id** }, or  
**Unique Request Id**

Optional data: **Add Request Fields**  
**Delete Request Fields**

---

<sup>8</sup> Note that if the initiating application wishes to change existing data it must first delete the requisite fields and then add the new version of these fields. This rule applies to Update Agency, Update Item, Update Request Item, and Update User Services.

**Item Element Type (R)****User Element Type (R)****Update Request Item Response**

Required data: { **Problem**, and, optionally  
**Required Fee Amount** }, or  
**Request Scope Type**  
**Request Type**  
**Unique Item Id**  
**Unique User Id**

Optional data: **Date Available**  
**Fiscal Account Update Details**  
**Hold Pickup Date**  
**Item Optional Fields**  
**User Optional Fields**

*5.4.17 Update User Service*

**Usage:** This service requests that the responding application update data about a User. The initiating application provides the data elements and the type of update (add or delete) it wants done<sup>9</sup>.

**Successful Result:** The responding application updates the User as specified by the initiating application.

**Messages and Data Elements:****Update User**

Required data: { **Authentication Input (R)**, or  
**Unique User Id** }

Optional data: **Add User Fields**  
**Delete User Fields**

**Update User Response**

Required data: **Problem**, or  
**Unique User Id**

Optional data: none

*5.4.18 Update User Fiscal Account Service*

**Usage:** This service requests that the responding application update fiscal data about a User. The initiating application provides the type of update (specified via **Fiscal Action Type**) and fiscal details about the update it wants done.

**Successful Result:** The responding application updates the User fiscal data as specified by the initiating application.

---

<sup>9</sup> Note that if the initiating application wishes to change existing data it must first delete the requisite fields and then add the new version of these fields. This rule applies to Update Agency, Update Item, Update Request Item, and Update User Services.

**Messages and Data Elements:****Update User Fiscal Account**

Required data:     { **Authentication Input** (R), or  
                           **Unique User Id** }  
                           { **Existing Fiscal Transaction**, or  
                           **New Fiscal Transaction** }  
                           **Fiscal Action Type**

Optional data:     none

**Update User Fiscal Account Response**

Required data:     **Problem**, or  
                           { **Fiscal Transaction Reference Id**  
                           **Unique User Id** }

Optional data:     none

**5.5 Notification Service Type**

The Notification Service Type comprises 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 been effected, or that a notice has been sent. The second (responding) application must send an acknowledgement message in response to the notification. Note that all messages consist of a header (see Section 8) as a minimum. Unless a problem is detected, response messages of the Notification Service Type consist only of a header, which is not included in the service descriptions that follow. The services are presented in alphabetical order. They are summarized in Table 1 (pages 13-14).

**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 unique id of the Agency and some details about the Agency that has been created. Since this is a unilateral notification that an Agency has been created, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent<sup>10</sup>.

**Successful Result:** The responding application replies that it has understood the notification message.

**Messages and Data Elements:****Agency Created**

Required data:     **Organization Name Information** (R)  
                           **Unique Agency Id**

Optional data:     **Address Information** (R)  
                           **Agency User Privilege Type** (R)

<sup>10</sup> In the event that the responder detects some sort of problem with the initiation message, the **Messaging Error** data element is returned immediately following the Response Header, specifying the nature of the problem. This action applies to all response messages of Notification Service Type.

**Authentication Prompt** (R)  
**CIP Roles Supported Type** (R)  
**Consortium Agreement** (R)

### Agency Created Response

Required data: none

Optional data **Messaging Error** (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. It is assumed that the responding application has knowledge of the identified Agency. The initiating application provides the unique id of the Agency and details about the update that has been done. Since this is a unilateral notification that an Agency has been updated, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### Messages and Data Elements:

##### Agency Updated

Required data: **Unique Agency Id**

Optional data: **Add Agency Fields**  
**Delete Agency Fields**

##### Agency Updated Response

Required data: none

Optional data **Messaging Error** (R)

#### 5.5.3 Circulation Status Updated Service

**Usage:** This service informs the responding application that the circulation status of an Item has been updated. It is assumed that the responding application has knowledge of the identified Item. The initiating application provides the unique id of the Item, together with the new circulation status. One of the following three values from **Circulation Status** is valid here: Renew Still Pending, Item Not Renewed, or Item Overdue. No other values of **Circulation Status** are permitted for this service. Since this is a unilateral notification that an Item's circulation status has been updated, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### Messages and Data Elements:

##### Circulation Status Updated

Required data:     **Circulation Status**  
                           **Unique Item Id**

Optional data       none

#### **Circulation Status Updated Response**

Required data:       none

Optional data       **Messaging Error (R)**

#### **5.5.4 Item Checked In Service**

**Usage:** This service informs the responding application that an Item has been checked in. The initiating application provides the unique id of the Item, and may optionally supply some details related to the check in. Since this is a unilateral notification that an Item has been checked in, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### **Messages and Data Elements:**

##### **Item Checked In**

Required data:       **Unique Item Id**

Optional data:       **Fiscal Account Update Details**  
                           **Item Optional Fields**  
                           **Routing Information**  
                           **Unique User Id**  
                           **User Optional Fields**

##### **Item Checked In Response**

Required data:       none

Optional data       **Messaging Error (R)**

#### **5.5.5 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 unique id of the Item and, optionally, the User involved in the check out, and may optionally provide some other data related to the check out (such as the due date). An optional data element can be sent in the message to indicate the check out represents a renewal. If the message is sending a notification of the initial check out of the Item and this data element is sent, its value should be set to zero. Since this is a unilateral notification that an Item has been checked out, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### **Messages and Data Elements:**

**Item Checked Out**

Required data:	{ <b>Date Due</b> , or <b>Non Returnable Flag</b> , or <b>Unlimited Loan Flag</b> } <b>Unique Item Id</b> <b>Unique User Id</b>
Optional data:	<b>Electronic Resource Provided Flag</b> <b>Fiscal Account Update Details</b> <b>Item Optional Fields</b> <b>Renewal Count</b> <b>Shipping Information</b> <b>Unique Request Id</b> <b>User Optional Fields</b>

**Item Checked Out Response**

Required data:	none
Optional data	<b>Messaging Error (R)</b>

**5.5.6 Item Claimed Returned Service**

**Usage:** This service informs the responding application that a User has claimed to have returned an Item. The initiating application provides the unique id of the Item and of the User. Since this is a unilateral notification that an Item has been claimed returned, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

**Messages and Data Elements:****Item Claimed Returned**

Required data:	<b>Date Claimed Returned</b> <b>Unique Item Id</b> <b>Unique User Id</b>
Optional data:	<b>Fiscal Account Update Details</b> <b>Item Optional Fields</b> <b>User Optional Fields</b>

**Item Claimed Returned Response**

Required data:	none
Optional data	<b>Messaging Error (R)</b>

### 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 unique id of the Item and some details about the Item that has been created. Since this is a unilateral notification that an Item has been created, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### Messages and Data Elements:

##### Item Created

Required data: **Bibliographic Description**  
**Unique Item Id**

Optional data: **Circulation Category Type**  
**Circulation Status**  
**Item Description**  
**Location (R)**  
**Physical Condition**  
**Security Marker**

##### Item Created Response

Required data: none

Optional data **Messaging Error (R)**

### 5.5.8 *Item Recall Cancelled Service*

**Usage:** This service informs the receiver of the message that a recall that had previously been done on an Item has been cancelled. The initiating application provides the unique id of the Item, and may optionally provide the unique id of the User involved and other data related to cancellation of the recall. Since this is a unilateral notification that a recall of an Item has been cancelled, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### Messages and Data Elements:

##### Item Recall Cancelled

Required data: **Unique Item Id**

Optional data: **Fiscal Account Update Details**  
**Item Optional Fields**  
**Unique User Id**  
**User Optional Fields**



**Item Recall Cancelled Response**

Required data: none

Optional data **Messaging Error (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 unique id of the Item that has been recalled, and may optionally supply other details associated with the recall. Since this is a unilateral notification that an Item has been recalled, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

**Messages and Data Elements:****Item Recalled**

Required data: **Date Due**  
**Unique Item Id**

Optional data: **Item Optional Fields**  
**Shipping Information**  
**Unique User Id**  
**User Optional Fields**

**Item Recalled Response**

Required data: none

Optional data **Messaging Error (R)**

**5.5.10 Item Received Service**

**Usage:** This service informs the responding application that an Agency has received an Item. Whenever the Item has been received on behalf of a User, data about that User should be included in the message. Since this is a unilateral notification that an Item has been received, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

**Item Received**

Required data: **Date Received**  
**Unique Item Id**

Optional data: **Item Optional Fields**  
**Unique Request Id**  
**Unique User Id**

## User Optional Fields

### Item Received Response

Required data: none

Optional data: **Messaging Error (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 unique id of the Item, and may optionally supply other details associated with the renewal. Since this is a unilateral notification that an Item has been renewed, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### Messages and Data Elements:

##### Item Renewed

Required data: **Date Due**  
**Unique Item Id**

Optional data: **Fiscal Account Update Details**  
**Item Optional Fields**  
**Renewal Count**  
**Unique User Id**  
**User Optional Fields**

##### Item Renewed Response

Required data: none

Optional data: **Messaging Error (R)**

#### 5.5.12 Item Request Cancelled Service

**Usage:** This service informs the responding application that a request for an Item that had previously been made has been cancelled. The initiating application provides the unique ids of the Item and User, and the type of the request being cancelled. It may optionally provide other details about the cancellation. Since this is a unilateral notification that a request for an Item has been cancelled, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### Messages and Data Elements:

##### Item Request Cancelled

Required data: **Request Type**

{ { **Unique Item Id** and, optionally  
**Unique Request Id** }, or  
**Unique Request Id** }  
**Unique User Id**

Optional data: **Item Optional Fields**  
**Request Scope Type**  
**User Optional Fields**

### **Item Request Cancelled Response**

Required data: none

Optional data **Messaging Error (R)**

#### **5.5.13 Item Request Updated Service**

**Usage:** This service informs the responding application that a request for an Item, which may not be immediately available, has been updated. The initiating application provides the unique ids of the Item and User, and the type of request being made, or the unique id of the request. It may also optionally provide other details related to the request. Since this is a unilateral notification that an Item request has been updated, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### **Messages and Data Elements:**

### **Item Request Updated**

{ **Request Type**  
**Unique Item Id**  
**Unique User Id** }, or  
**Unique Request Id**

Optional data: **Add Request Fields**  
**Delete Request Fields**  
**Item Optional Fields**  
**User Optional Fields**

### **Item Request Updated Response**

Required data: none

Optional data **Messaging Error (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 unique ids of the Item and User, and the type of request being made. It may also optionally provide other details related to the request. Since this is a unilateral notification that an Item has been requested, the responder can only reply that it does or does not understand the mes-

sage it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### Messages and Data Elements:

##### Item Requested

Required data:	<b>Request Scope Type</b> <b>Request Type</b> <b>Unique Item Id</b> , or { <b>Unique Bibliographic Id</b> <b>Unique Request Id</b> } <b>Unique User Id</b>
Optional data:	<b>Acknowledged Fee Amount</b> <b>Date Available</b> <b>Date Of User Request</b> <b>Earliest Date Needed</b> <b>Item Optional Fields</b> <b>Need Before Date</b> <b>Shipping Information</b> <b>User Optional Fields</b>

##### Item Requested Response

Required data:	none
Optional data	<b>Messaging Error (R)</b>

#### 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. Other shipping information may also be included. When shipment supports a User request, User data should be supplied with the message. Since this is a unilateral notification that an Item has been shipped, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

##### Item Shipped

Required data:	<b>Date Shipped</b> <b>Shipping Address</b> <b>Unique Item ID</b>
Optional data:	<b>Item Optional Fields</b> <b>Shipping Instructions</b> <b>Shipping Note</b> <b>Unique Request Id</b>

**Unique User Id**  
**User Optional Fields**

**Item Shipped Response**

Required data: none  
 Optional data: **Messaging Error (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. It is assumed that the responding application has knowledge of the identified Item. This service may not be used to inform about a change of circulation status associated with any of the Update Service Type messages except Create Item. The initiating application provides the unique id of the Item and details about the update that has been done. Since this is a unilateral notification that an Item has been updated, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

**Messages and Data Elements:**

**Item Updated**

Required data: **Unique Item Id**  
 Optional data: **Add Item Fields**  
**Delete Item Fields**

**Item Updated Response**

Required data: none  
 Optional data: **Messaging Error (R)**

**5.5.17 User Created Service**

**Usage:** This service informs the responding application that a new User has been created. The initiating application provides the unique id of the User, and may provide additional data about the new User. Since this is a unilateral notification that a User has been created, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

**Messages and Data Elements:**

**User Created**

Required data: **Name Information**  
**Unique User Id**  
 Optional data: **Address Information (R)**

**Block Or Trap (R)**  
**Date Of Birth**  
**User Language (R)**  
**User Privilege (R)**

#### **User Created Response**

Required data: none

Optional data **Messaging Error (R)**

#### **5.5.18 User Fiscal Account Updated Service**

**Usage:** This service informs the responding application that an update has been made to a User fiscal account. It is assumed that the responding application has knowledge of the identified User. The initiating application provides the unique id of the User and details about the fiscal update that has been done. Since this is a unilateral notification that a User fiscal account has been updated, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### **Messages and Data Elements:**

##### **User Fiscal Account Updated**

Required data: **Fiscal Account Update Details**  
**Unique User Id**

Optional data none

##### **User Fiscal Account Updated Response**

Required data: none

Optional data **Messaging Error (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 unique id of the User, the type of notice that has been sent, and details about the notice. Since this is a unilateral notification that a notice has been sent to a User, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

#### **Messages and Data Elements:**

##### **User Notice Sent**

Required data: **Date Sent**  
**Unique User Id**

**User Notice Details**Optional data: **Notice Content****User Notice Sent Response**

Required data: none

Optional data **Messaging Error (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. It is assumed that the responding application has knowledge of the identified User. The initiating application provides the unique id of the User and details about the update that has been done. Since this is a unilateral notification that a User has been updated, the responder can only reply that it does or does not understand the message it has just received. Even though the message received was a unilateral notification of an action taken, the protocol state table (Section 7) requires that a response be sent.

**Successful Result:** The responding application replies that it has understood the notification message.

**Messages and Data Elements:****User Updated**Required data: **Unique User Id**Optional data: **Add User Fields**  
**Delete User Fields****User Updated Response**

Required data: none

Optional data **Messaging Error (R)****6. Data Dictionary**

Following is an alphabetically arranged list of the data elements used in the messages defined in Section 5 (for a full alphabetical listing, see Appendix B).

Complex data elements are defined in terms of a hierarchical listing of their component simple elements. Indentations in the lists of data elements indicate the hierarchical structure of these elements.

Simple data elements are defined by structured definitions that include information on the nature and purpose of the data. Examples and notes are provided if available. If definitions are based on those of existing information standards, this is also noted. Full citations for these standards are recorded in Section 3.2.

Definitions for simple elements appear only once. If a simple element is in more than one compound element, the definition is included in the first occurrence of the element, and a reference is added from the second and subsequent compound elements to point to the location of the definition. If not specified, the definitions for the simple elements are found in the alphabetical listing.

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 *Date*.

This Protocol allows for the definition of lists of values for the Enumeration data type outside the bounds of this standard. This extensibility permits implementers of the protocol to customize the enumerated lists to meet the requirements of the community using the protocol for the interchange of circulation information. Each data element defined as “Enumeration of values as specified in a scheme” consists of a pair of data elements, Scheme and Value. **Scheme** is a text string used to identify the authority determining the list of values for the enumeration. **Value** is a number, code, word or phrase from that authoritative list of values. The only relationship between or among the values of a list is that implied by their membership in the list. See Appendix A for more details on the use of enumerations.

### Enumerated Types

There are two classes of Enumeration Types:

- Closed Enumerated Type
- Open Enumerated Type

A cross-application profile can assign a restricted set of values required to support essential protocol messaging activities, and no other values are appropriate. These enumerated types, e.g., Item Element Type, and Failure Type, are defined as **Closed Enumerated Types**. Additional enumerated types that use external international standard lists of codes, e.g., Language Type, are also Closed. A Closed Enumerated Type possesses a scheme that **SHALL** be supported by applications conformant with a specified cross-application profile. No other schemes may be defined for closed enumerated types.

An **Open Enumerated Type** possesses a scheme that **SHALL** be supported by applications conformant with a specified cross-application profile. Note that the lists of values are not comprehensive and implementer groups may develop additional schemes for these enumerated types to cover their implementation requirements. Thus, an application may choose to support additional schemes for open enumerated types. Core lists of values that are to be supported by all implementations are defined for many open enumerated types, e.g., Address Role Type, Bibliographic Level. For other open enumerated types, such as Unique Agency Id and Currency Code, the lists of values should be derived from standard lists of codes or other registries, as identified.

In Section 5, data elements are shown to be required or optional, repeatable or not. The precise nature of each data element’s type, encoding, and other related specifications are given in a cross-application profile (see Section 9).

Data Element Name	Data Element Definition
<b>Acknowledged Fee Amount</b>	Monetary value in a specified currency (i.e., <b>Amount</b> ), acknowledged by a User as the fee charged for a requested service. See <b>Amount</b> for the definition of this compound element.
<b>Add Agency Fields</b>	
Organization Name Information	
Address Information	
Authentication Prompt	
CIP Roles Supported Type	
Consortium Agreement	
Agency User Privilege Type	



<b>Add Item Fields</b>	
Bibliographic Description	
Circulation Category Type	
Item Description	
Location	
Physical Condition	
Security Marker	
<b>Add Request Fields</b>	
Acknowledged Fee Amount	
Date Available	
Date Of User Request	
Earliest Date Needed	
Need Before Date	
Request Scope Type	
Request Type	
Shipping Information	
Unique Item Id	
Unique User Id	
<b>Add User Fields</b>	
Authentication Input	
Name Information	
Address Information	
User Language	
Date Of Birth	
User Privilege	
Block Or Trap	
<b>Address Information</b>	<p>Information on the name of the place to which messages are directed. Includes both physical and electronic address information, associated with both Users and Agencies.</p> <ul style="list-style-type: none"> <li>• Source: Data structure adapted from preliminary draft of ISO/DIS 2146.</li> </ul>
Unique User Id	
Unique Agency Id	

Address Role Type	<p>Enumeration of values as specified in a scheme; describes a purpose or role of the address associated with an Agency or a User. An address may have one or more purposes or roles for any one Agency or User.</p> <ul style="list-style-type: none"> <li>• Examples: bill to, ship to (for an agency), bill to, home, work (for a user)</li> <li>• <b>Address Role Type</b> is an open enumerated type.</li> </ul>
Valid From Date	
Valid To Date	
Physical Address	<p>Designated geographical location recognized by a postal authority or other carrier, to which things may be delivered, as distinguished from <b>Electronic Address</b>.</p>
Physical Address Type	<p>Enumeration of values as specified in a scheme; indicates whether this physical address is a street address or a postal address.</p> <ul style="list-style-type: none"> <li>• Examples: postal address, street address</li> <li>• <b>Physical Address Type</b> is an open enumerated type.</li> </ul>
Formatted Address	
Formatted Address Type	<p>Enumeration of values as specified in a scheme; identifies the type of formatting present in <b>Formatted Address Data</b>.</p> <ul style="list-style-type: none"> <li>• Examples: HTML, newline-delimited text</li> <li>• <b>Formatted Address Type</b> is an open enumerated type.</li> </ul>
Formatted Address Data	<p>Text string; provides 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 an address label.</p>
Structured Address	<p>Physical address information with components elements to permit parsing, allowing for the component elements to be assembled in the order and format most suited to a given use.</p>
Location Within Building	<p>Text string; gives 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.</p> <ul style="list-style-type: none"> <li>• Examples: Suite 42, Level 4.</li> <li>• Source: ISO 8459-4</li> </ul>
House Name	<p>Text string; gives name of a house, building or building complex.</p>
Street	<p>Text string; gives name of the location of a house, building or building complex within a city or district. .</p> <ul style="list-style-type: none"> <li>• Source: Variation on ISO 8459-4.</li> </ul>
Post Office Box	<p>Text string; gives box number assigned by the postal authority</p> <ul style="list-style-type: none"> <li>• Source: ISO 8459-4</li> </ul>
District	<p>Text string; gives name of a sub-entity within a country such as a parish, county or district.</p>

	<ul style="list-style-type: none"> <li>Source: ISO 8459-4</li> </ul>
Line 1	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.
Line 2	Text string; gives one or more of house-name, street, post office box and/or district when <b>Line 1</b> is not sufficient.
Locality	Text string; gives name of a city, suburb or postal area. <ul style="list-style-type: none"> <li>Note: ISO 8459-4 uses term “City” for this concept.</li> </ul>
Region	Text string; gives name of an area within a country such as a state, province, department or prefecture. <ul style="list-style-type: none"> <li>Source: ISO 8459-4.</li> </ul>
Country	Text string; gives name of a country.
Postal Code	Text string; gives code assigned by the postal authorities of a country that uniquely identifies an address or groups of addresses. <ul style="list-style-type: none"> <li>Examples: <p>ZIP code (USA): 20814</p> <p>Postal code (Canada): K1A 0N4</p> </li> <li>Source: ISO 8459-4</li> </ul>
Care Of	Text string; gives name of a person, organization, or organizational unit to whose attention the addressed Item is intended to be directed.
Electronic Address	
Electronic Address Type	Enumeration of values as specified in a scheme; identifies the type of address used to communication electronically with an Agency or a User. <ul style="list-style-type: none"> <li>Examples: electronic mail address, IP address, telephone number</li> <li><b>Electronic Address Type</b> is an open enumerated type.</li> </ul>
Electronic Address Data	Text string; provides the electronic address.
<b>Agency Element Type</b>	Enumeration of values as specified in a scheme; identifies the elements of the Agency Object on which queries (i.e., lookups) can be made. <ul style="list-style-type: none"> <li>Examples: Organization Name Information, Address Information, Agency User Privilege Type</li> <li><b>Agency Element Type</b> is a closed enumerated type.</li> </ul>
<b>Agency User Privilege Type</b>	Enumeration of values as specified in a scheme; identifies the types of privileges that may be granted by a particular Agency or available for Users of a specific consortium. <ul style="list-style-type: none"> <li>Examples: undergraduate, graduate, faculty (for a university); adult, juvenile, (for a public library)</li> <li>Note: <b>Agency User Privilege Type</b> is an open enumerated type.</li> </ul>
<b>Amount</b>	The amount of a fiscal charge or fee.

Currency Code	<p>Enumeration of valid currency code values as specified in ISO 4217; indicates the type of currency of a particular sum of money.</p> <ul style="list-style-type: none"> <li>• Examples: Canadian dollar: CAD; French franc: FRF; Egyptian pound: EGP.</li> <li>• <b>Currency Code</b> is an open enumerated type. 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.</li> </ul>
Monetary Value	<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 <b>Amount</b> in terms of the value of <b>Currency Code</b>.</p>
<b>Authentication Input</b>	<p>Information, such as passwords, provided by User when prompted, used in authentication of the User.</p>
Authentication Data Type	<p>Enumeration of values as specified in a scheme; identifies the format of the authentication data that an Agency requires.</p> <ul style="list-style-type: none"> <li>• Examples: Text, Audio, Image, Video.</li> <li>• <b>Authentication Data Type</b> is an open enumerated type.</li> </ul>
Authentication Input Type	<p>Enumeration of values as specified in a scheme; identifies the nature of the data to be supplied for the purpose of authenticating a User.</p> <ul style="list-style-type: none"> <li>• Examples: Barcode Id, PIN, User Name</li> <li>• <b>Authentication Input Type</b> is an open enumerated type.</li> </ul>
Authentication Input Data	<p>Text string input by a User <i>in response</i> to an authentication prompt. The nature of the data is specified by <b>Authentication Data Type</b>.</p>
<b>Authentication Prompt</b>	<p>Agency-specific data; used to prompt a User for entry of authentication data.</p>
Authentication Data Type	<p>See definition for this element under <b>Authentication Input</b>.</p>
Authentication Prompt Type	<p>Enumeration of values as specified in a scheme; identifies the nature of the authentication prompt.</p> <ul style="list-style-type: none"> <li>• Examples: Clear Text, Text With Hidden Response</li> <li>• <b>Authentication Data</b> is an open enumerated type.</li> </ul>
Authentication Prompt Data	<p>Text string(s) of the type specified by <b>Authentication Prompt Type</b>; representing prompts used by that Agency to request input of authentication data.</p> <ul style="list-style-type: none"> <li>• Examples: <i>Enter User number:</i> or <i>Enter PIN:</i> or <i>Place right index finger on pad:</i></li> </ul>
<b>Bibliographic Description</b>	
Author	<p>Text string; gives name of person or corporate body responsible for the intellectual or artistic content of an Item, including composers, creators or originators of an Item.</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Author Of Component	<p>Text string; gives name of author of a bibliographic item that is a component</p>

	<p>part of another item.</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1 uses “author-of-article” to express this concept.</li> </ul>
Bibliographic Item Id	
Bibliographic Item Identifier Code	<p>Enumeration of values as specified in a scheme; identifies a bibliographic item.</p> <ul style="list-style-type: none"> <li>• Examples: standard numbers such as ISBN, ISSN, ISRC, ISMN, Legal Deposit Number, Government Publication Number, CODEN, and Report Number.</li> <li>• <b>Bibliographic Item Identifier Code</b> is an open enumerated type.</li> </ul>
Bibliographic Item Identifier	<p>Text string of the type specified by <b>Bibliographic Item Identifier Code</b>; identifies bibliographic item.</p> <ul style="list-style-type: none"> <li>• Examples:</li> </ul> <p style="padding-left: 40px;">Bibliographic Item Identifier Code= ISSN</p> <p style="padding-left: 80px;">Bibliographic Item Identifier=1041-0031</p> <p style="padding-left: 40px;">Bibliographic Item Identifier Code= ISBN</p> <p style="padding-left: 80px;">Bibliographic Item Identifier= 0-7167-8180-8</p>
Bibliographic Record Id	
Bibliographic Record Identifier	Text string; identifies the machine-readable record that describes a bibliographic item.
Bibliographic Record Identifier Code	<p>Enumeration of values as specified in a scheme; identifies a bibliographic record</p> <ul style="list-style-type: none"> <li>• Examples: national bibliography numbers such as British National Bibliography Number, Library of Congress Control Number (LCCN), Australian National Bibliography Number, and system numbers such as OCLC, RLIN, or local system numbers.</li> <li>• Source: ISO 8459-4</li> <li>• <b>Bibliographic Record Identifier Code</b> is an open enumerated type.</li> </ul>
Component Id	
Component Identifier	Text string; identifies component part of another bibliographic item.
Component Identifier Type	<p>Enumeration of values as specified in a scheme; identifies a component part of a bibliographic item.</p> <ul style="list-style-type: none"> <li>• For examples, see <b>Bibliographic Item Identifier Code</b>.</li> <li>• <b>Component Identifier Type</b> is an open enumerated type.</li> </ul>
Edition	Text string; gives edition statement, that is a 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

	<ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Bibliographic Level	<p>Enumeration of values as specified in a scheme; identifies the level of the bibliographic description of the Item.</p> <ul style="list-style-type: none"> <li>• Examples: monograph, serial, or collection.</li> <li>• Source: MARC21, NOTE: ISO 10161-1 uses the term “Item-type” to express this concept.</li> <li>• <b>Bibliographic Level</b> is an open enumerated type.</li> </ul>
Pagination	Text string; gives number of pages or leaves in an Item or a component part of an Item.
Place Of Publication	<p>Text string; gives geographic location of the publisher, or failing this, of the printer, distributor or manufacturer</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Publication Date	<p>Text string; gives date of issue of a work as designated by the publisher of the work.</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Publication Date Of Component	<p>Text string; gives publication date assigned by the publisher to the components of a work.</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Publisher	<p>Text string; gives name of person(s) or organization(s) responsible for the publication of an Item.</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Series Title Number	<p>Text string; gives name and number 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 its number within that.</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Sponsoring Body	<p>Text string; gives name of corporate body or organization that issued the Item or that is associated with its authorship.</p> <ul style="list-style-type: none"> <li>• Source: ISO 10161-1</li> </ul>
Bibliographic Title	<p>Text string; gives name of an Item (usually assigned by the author or publisher) consisting (usually) of a word or group of words intended to identify it.</p> <ul style="list-style-type: none"> <li>• Note: ISO 10161-1 uses “title” to express this concept.</li> </ul>
Title Of Component	<p>Text string; gives title of an Item that is a component part, that is, a chapter, article, map, CD, or other component. of another Item.</p> <ul style="list-style-type: none"> <li>• Note: ISO 10161-1 uses “title-of-article” to express this concept.</li> </ul>
Volume-Issue	Text string; gives the number, letter or word identifying a unit of an Item, such as a serial or multi-volume monograph, the volumes of which are published in parts.
<b>Block Or Trap</b>	Data specifying the nature of the block or trap.

Block Or Trap Type	<p>Enumeration of values as specified in a scheme; identifies the type of block or trap imposed by an Agency on a User.</p> <ul style="list-style-type: none"> <li>• Examples: block checkout, block hold, block recall, block renewal, trap for lost card, trap for message, trap for pick-up.</li> <li>• <b>Block Or Trap Type</b> is an open enumerated type.</li> </ul>
Valid From Date	
Valid To Date	
Unique Agency Id	
<b>CIP Roles Supported Type</b>	<p>Enumeration of values as specified in a scheme; identifies the roles supported by each of the operational profiles defined for use with the Circulation Interchange Protocol.</p> <ul style="list-style-type: none"> <li>• Examples: circulation and self-service roles (for circulation to self-service interchange), circulation, ILL and broker roles (for circulation to ILL interchange) and borrower, lender and broker (for direct consortial borrowing interchange)</li> <li>• <b>CIP Roles Supported Type</b> is a closed enumerated type..</li> </ul>
<b>Circulation Category Type</b>	<p>Enumeration of values as specified in a scheme; indicates the circulation usage rules and any special restrictions that apply to an Item at the time of a circulation transaction.</p> <ul style="list-style-type: none"> <li>• Examples: in-library use only, renewals not permitted, term loan.</li> <li>• <b>Circulation Category Type</b> is an open enumerated type.</li> </ul>
<b>Circulation Status</b>	<p>Enumeration of values as specified in a scheme; indicates the current availability status of a bibliographic item for loan.</p> <ul style="list-style-type: none"> <li>• Examples: available on shelf, on loan, lost, missing.</li> <li>• Source: ISO 10161-1</li> <li>• <b>Circulation Status</b> is an open enumerated type..</li> </ul>
<b>Consortium Agreement</b>	<p>Enumeration of values as specified in a scheme; identifies a consortium agreement to which the Agency is a party.</p> <ul style="list-style-type: none"> <li>• <b>Consortium Agreement</b> is an open enumerated type.</li> </ul>
<b>Current Borrower Desired</b>	Boolean; indicates whether or not requester desires information about the User who has a specific Item on loan.
<b>Current Requesters Desired</b>	Boolean; indicates whether or not requester desires information about User s that have requested a specific Item.
<i>Date</i>	<p>NOTE: All <i>date</i> data elements represent a single instant in time (i.e., the XML data type, DateTime) and are combinations of date and time values. Dates are expressed in Coordinated Universal Time, as defined in ISO 8601, in the form. CCYYMMDDThhmmZ</p> <ul style="list-style-type: none"> <li>• Example:</li> </ul> <p style="padding-left: 40px;">DateTime representing 25 October 1985, 10:15:19851025T1015Z</p>
<b>Date Available</b>	Date and time when the requested Item is expected to be available to the

	User.
<b>Date Claimed Returned</b>	Date and time when the User purports to have returned the Item.
<b>Date Due</b>	Date and time when the loan of an Item is scheduled to end.
<b>Date Due Desired</b>	Date and time desired by a User as the date that the loan of a specified Item is to end. Initiating applications supply this information at the time that a request is issued for checkout, renewal or recall.
<b>Date Of Birth</b>	Date and time; personal user's date of birth (formatted according to ISO 8601). This element is associated with a personal user, but not with an organizational user.
<b>Date Of User Request</b>	Date and time when a User has issued a request to locate an Item.
<b>Date Recalled</b>	Date and time when a recall for the Item was issued.
<b>Date Received</b>	Date and time when an Agency received an Item.
<b>Date Sent</b>	Date and time when an Item or a notice was sent
<b>Date Shipped</b>	Date and time when an Agency shipped an Item.
<b>Date To Send</b>	Date and time when an Item or a notice is to be sent.
<b>Date Will Send</b>	Date and time when an Agency will send an Item or a notice.
<b>Delete Agency Fields</b>	
Organization Name Information	
Address Information	
Authentication Prompt	
CIP Roles Supported Type	
Consortium Agreement	
Agency User Privilege Type	
<b>Delete Item Fields</b>	
Bibliographic Description	
Circulation Category Type	
Item Description	
Location	
Physical Condition	
Security Marker	
<b>Delete Request Fields</b>	
Acknowledged Fee Amount	
Date Available	



Date Of User Request	
Earliest Date Needed	
Need Before Date	
Request Scope Type	
Request Type	
Shipping Information	
Unique Item Id	
Unique User Id	
<b>Delete User Fields</b>	
Authentication Input	
Name Information	
Address Information	
User Language	
Date Of Birth	
User Privilege	
Block Or Trap	
<b>Desensitization Flag</b>	<p>Boolean; indicates whether or not an Item should be desensitized during the check out procedure.</p> <ul style="list-style-type: none"> <li>• "True" indicates that the Item should be desensitized and can be removed from the library. "False" indicates that the Item should not be desensitized.</li> <li>• Example: "False" could be assigned to a non-circulating Item that may be checked out for in-library use, but cannot be removed from the library.</li> </ul>
<b>Earliest Date Needed</b>	Date and time of the earliest date at which the User has need of a requested Item. Implies that the requested item is not required prior to the date specified.
<b>Electronic Resource</b>	Text string; gives the actual electronic resource entity (for example, a computer file of the full text of the bibliographic item) that may be carried as part of a message.
<b>Electronic Resource Provided Flag</b>	Boolean; indicates whether or not the bibliographic item, in the form of an electronic resource, has been provided as part of the Checkout message.
<b>Existing Fiscal Transaction</b>	
Fiscal Transaction Reference Id	
Fiscal Transaction Type	<p>Enumeration of values as specified in a scheme; identifies the type of fiscal charge.</p> <ul style="list-style-type: none"> <li>• Examples: catalog search, day pass, use fee, reservation charge,</li> </ul>

	<p>service charge, etc.</p> <ul style="list-style-type: none"> <li>• <b>Fiscal Transaction Type</b> is an open enumerated type.</li> </ul>
Amount	
Valid From Date	
Valid To Date	
Fiscal Transaction Description	Text string; gives supplementary details on the fiscal transaction.
Unique Request Id	
Item Details	
Unique Item Id	
Bibliographic Description	
Date Due	
Date Renewed	Date and time when an Item was renewed.
Date Returned	Date and time when an Item was returned (not necessarily checked in, but no longer in the custody of a User).
<b>Fiscal Account Update Details</b>	
Fiscal Action Type	
Valid From Date	
Valid To Date	
New Fiscal Transaction	
Existing Fiscal Transaction	
<b>Fiscal Action Type</b>	<p>Enumeration of values as specified in a scheme; identifies a fiscal action.</p> <ul style="list-style-type: none"> <li>• Examples: assess, cancel, forgive, payment, penalty, waive, write-off.</li> </ul> <p><b>Fiscal Action Type</b> is an open enumerated type..</p>
<b>Fiscal Transaction Reference Id</b>	A number or string used to identify a specific financial transaction.
Unique Agency Id	
Fiscal Transaction Identifier Value	Text string; gives value to be used to identify a fiscal transaction.
<b>From Agency Authentication</b>	Text string; provides data to be used by recipient to authenticate the Agency initiating message.
<b>From Agency Id</b>	Unique identification of the Agency (i.e., <b>Unique Agency Id</b> ) from which message was sent. See <b>Unique Agency Id</b> for a definition of this compound element.
<b>From System Authentication</b>	Text string; provides data to be used by recipient to authenticate the System from which the message was sent.

<b>From System Id</b>	Enumeration of values as specified in a scheme; identifies the system from which a message was sent. <ul style="list-style-type: none"> <li>• <b>From System Id</b> is an open enumerated type.</li> </ul>
<b>Hold Pickup Date</b>	Date and time when a hold expires for a given User.
<b>Hold Queue Length</b>	Non-negative integer; indicates the number of Users who currently have requested a hold on a specified Item.
<b>Hold Queue Position</b>	Positive integer; indicates the position in the hold queue of a request by a specific User for an identified Item, conditional on the value of "Request Type" being "hold."
<b>Item Description</b>	Description of a specific physical or electronic item belonging to an Agency's collection(s).
Bibliographic Description Level	Enumeration of values as specified in a scheme; identifies the level at which the Item is described. <ul style="list-style-type: none"> <li>• Examples: bibliographic title, volume, issue, copy.</li> <li>• <b>Bibliographic Description Level</b> is an open enumerated type.</li> </ul>
Call Number	Text string; indicates permanent relative physical location assigned to a bibliographic item.
Copy Number	Text string; gives the designation of a specific copy of an Item held by an Agency. <ul style="list-style-type: none"> <li>• Examples: Copy 1, Copy 2</li> </ul>
Electronic Data Format Type	Enumeration of values as specified in the IANA Registry of Media Types; identifies the format in which electronic data is available for access, download, etc. <ul style="list-style-type: none"> <li>• Examples: rtf, tiff, mpeg.</li> <li>• <b>Electronic Data Format Type</b> is an open enumerated type.</li> </ul>
Medium Type	Enumeration of values as specified in a scheme; identifies the medium on which the bibliographic item has been produced. <ul style="list-style-type: none"> <li>• Examples: audio tape, book, machine-readable computer file.</li> <li>• <b>Medium Type</b> is an open enumerated type..</li> </ul>
Serial Holdings	Text string, summarizes details identifying the parts of a serial held by a given Agency.
Language	Enumeration of values from the list of Alpha-3 Bibliographic Codes as specified in <i>ISO 639-2/B</i> ; identifies the language of the item. <ul style="list-style-type: none"> <li>• Example: eng (English), fre (French), ger (German)</li> <li>• <b>Language</b> is a closed enumerated type.</li> </ul>
Visible Item Id	
Visible Item Identifier	Text string; gives a barcode or another eye-readable identifier that is affixed to or accompanies a physical Item. The value of this identifier may be identical to the <b>Item Identifier Value</b> used in the <b>Unique Item Id</b> .

Visible Item Identifier Type	Enumeration of values as specified in a scheme; identifies the type of <b>Visible Item Identifier</b> used. <ul style="list-style-type: none"> <li>• Examples: barcodes, accession number</li> <li>• <b>Visible Item Type</b> is an open enumerated type.</li> </ul>
<b>Item Element Type</b>	Enumeration of values as specified in a scheme; identifies all the elements of the Item Object on which queries (i.e., lookups) can be made. <ul style="list-style-type: none"> <li>• <b>Item Element Type</b> is a closed enumerated type.</li> </ul>
<b>Item Optional Fields</b>	
Bibliographic Description	
Circulation Category Type	
Circulation Status	
Desensitization Flag	
Hold Queue Length	
Item Description	
Location	
Physical Condition	
Security Marker	
<b>Item Transaction</b>	
Current Borrower	Compound element; identifies User that currently has Item on loan. See <b>Unique User Id</b> for details of the structure of this compound element
Current Requester	Compound element; identifies User that currently has an active request for an Item. See <b>Unique User Id</b> for details of the structure of this compound element.
<b>Loaned Items Count</b>	
Circulation Status	
Circulation Category Type	
Loaned Item Count Value	Non-negative integer; specifies number of Items User has on loan at any point in time for given "Circulation Status" or "Circulation Category Type": <ul style="list-style-type: none"> <li>• Example: <p>Items with Circulation Status = normal loan period: 5</p> <p>Items with Circulation Status = overnight loan: 3</p> <p>Items with Circulation Status = in library use only: 1</p> </li> </ul>
<b>Loaned Items Desired</b>	Boolean; indicates whether or not requester desires information about Items loaned to a specific User.
<b>Location</b>	

Location Name	Text string; gives name of an Agency-specific location where an Item is housed at a particular point in time <ul style="list-style-type: none"> <li>• Examples: Current Periodicals, Hold Shelves, Storage.</li> </ul>
Location Type	Enumeration of values as specified in a scheme; identifies the location where an Item is at a particular point in time. <ul style="list-style-type: none"> <li>• Examples: permanent, temporary, and current.</li> <li>• <b>Location Type</b> is an open enumerated type.</li> </ul>
Valid From Date	
Valid To Date	
<b>Messaging Error</b>	Compound element; indicates that the responding application does not understand the initiation message. Element includes identification of location and nature of any messaging errors in an initiation message.
Error Type	Enumeration of values as specified in a scheme; indicates the reason for the error. <ul style="list-style-type: none"> <li>• Examples: Invalid Message (XML), Protocol Error, Unknown Service</li> <li>• <b>Error Type</b> is a closed enumerated type.</li> </ul>
Error Element	Recursive structure used in a response message to identify the element of an initiation message that is the subject of the error. It must fully specify the path from (but not including) the root node of the initiation message to the element that is the subject of the error.  <b>Error Element</b> contains either another <b>Error Element</b> or <b>Error Value</b> or neither (i.e., just <b>Value</b> ). Thus, if the presence or absence of an element (rather than the value of an element) is the error, then the recursive Error Element structure ends with an Error Element containing only <b>Value</b> .
Value	Text string; provides name of data element in which error is located.
Error Element	See definition for this element above.
Error Value	Text string; contains data element value that was in error.
<b>Name Information</b>	
Organization Name Information	
Personal Name Information	
<b>Need Before Date</b>	Date and time when the User needs the requested item. Infers that the requested item is no longer required if the Item cannot be supplied by the date specified.
<b>New Fiscal Transaction</b>	
Fiscal Transaction Reference Id	
Fiscal Transaction Type	See definition for this element under <b>Existing Fiscal Transaction</b> .
Amount	

Valid From Date	
Valid To Date	
Fiscal Transaction Description	See definition for this element under <b>Existing Fiscal Transaction</b> .
Unique Request Id	
Item Details	See definition for this element under <b>Existing Fiscal Transaction</b> .
<b>Non-returnable Flag</b>	Boolean; indicates whether or not the Item is returnable. <ul style="list-style-type: none"> <li>• “True” indicates that the Item does not need to be returned and a Date Due is not supplied.</li> </ul>
<b>Notice Content</b>	Text string; provides the contents of the notice.
<b>Notice Type</b>	Enumeration of values as specified in a scheme; identifies the type of notice to be sent or that has been sent to a User. <ul style="list-style-type: none"> <li>• Example: account reminder, Item overdue, Item recall, Item to collect, subscription, warnings.</li> <li>• <b>Notice Type</b> is an open enumerated type.</li> </ul>
<b>Organization Name Information</b>	
Organization Name Type	Enumeration of values as specified in a scheme; identifies the name type of <b>Organization Name</b> . <ul style="list-style-type: none"> <li>• Examples: official name, abbreviation or acronym, alternative name, converted name, distinguished name, transcribed name, translated name, and transliterated name.</li> <li>• Source: from ISO 1046 draft.</li> <li>• <b>Organization Name Type</b> is an open enumerated type.</li> </ul>
Organization Name	Text string; representing a name of an organization. <ul style="list-style-type: none"> <li>• Examples: The Free Library of Philadelphia, Milton S. Eisenhower Library.</li> </ul>
<b>Overdue Item</b>	
Item Details	See definition for this element under <b>Existing Fiscal Transaction</b> .
Amount	
<b>Pending</b>	Request to renew an Item awaiting decision or settlement that has not yet been undecided satisfied.
Date Of Expected Reply	Date and time 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 and time specified.
<b>Personal Name Information</b>	
Personal User Name Structured	Describes a person who is identified as a User.  This structured name element permits manipulation of the defined components of a personal name.

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 <ul style="list-style-type: none"> <li>• Source: ISO 8459-4.</li> </ul>
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 separate word <ul style="list-style-type: none"> <li>• Examples: single word: Stevens compound: Bridges-Webb multiple words: Van der Meer, Day Lewis</li> <li>• Source: Variation of ISO 8459-4.</li> </ul>
Initials	Text string; provides the initial letters of the given name.
Prefix	Text string; gives name element, placed before other personal name elements such as surname and a given and given names that, in association with these elements, serves to identify an individual, but does not form an integral part of a name. <ul style="list-style-type: none"> <li>• Examples: titles, epithets and indication of office, such as Mr., Hon., Dr.</li> <li>• Source: ISO 8459-4</li> </ul>
Suffix	Text string; gives name element that follow a surname in normal address denoting relative 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. <ul style="list-style-type: none"> <li>• Examples: 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.</li> <li>• Source: ISO 8459-4</li> </ul>
Personal User Common Name	Text string; gives complete name in a single string that identifies a person who is a User.
<b>Physical Condition</b>	
Physical Condition Type	Enumeration of values as specified in a scheme; identifies specific details of an exceptional physical condition of an Item. <ul style="list-style-type: none"> <li>• Examples: binding weak, color plates missing, markings, pages missing, special binding, water damage.</li> <li>• <b>Physical Condition Type</b> is an open enumerated type.</li> </ul>
Physical Condition Details	Text string; provides details of the physical condition, identified by <b>Physical Condition Type</b> .

<b>Problem</b>	
Messaging Error	
Processing Failure	
<b>Processing Failure</b>	Compound element; indicates that the responding application cannot perform the service requested by the initiating application. This element is structured to enable a responding application to specify the location and nature of any processing failures in an initiation message.
Failure Type	Enumeration of values as specified in a scheme; indicates the reason for the processing failure. <ul style="list-style-type: none"> <li>• Examples: Agency Access Denied, Unknown Item, Duplicate User, User Blocked</li> <li>• <b>Failure Type</b> is a closed enumerated type.</li> </ul>
Failure Element	Recursive structure used in a response message to identify the element of an initiation message that is the subject of the failure. It must fully specify the path from (but not including) the root node of the initiation message to the element that is the subject of the failure.  <b>Failure Element</b> contains either another <b>Failure Element</b> or <b>Failure Value</b> or neither (i.e., just <b>Value</b> ). Thus, if the presence or absence of an element (rather than the value of an element) is the error, then the recursive <b>Failure Element</b> structure ends with a <b>Failure Element</b> containing only <b>Value</b> .
Value	Text string; provides name of data element in which processing failure is located.
Failure Element	See definition for this element above
Failure Value	Text string; contains data element value that caused processing failure.
<b>Renewal Count</b>	Non-negative integer; indicates the number of times the Item identified has been renewed. The Renewal Count for an initial checkout is "0".
<b>Request Scope Type</b>	Enumeration of values as specified in a scheme; indicates the scope or level of the Item being requested. <ul style="list-style-type: none"> <li>• Examples: any item with the same unique bibliographic id, any item with the same bibliographic Id and volume.</li> <li>• <b>Request Scope Type</b> is an open enumerated type.</li> </ul>
<b>Request Type</b>	Enumeration of values as specified in a scheme; identifies the nature of the request. <ul style="list-style-type: none"> <li>• Examples: hold, page, reserve, patron-initiated loan request, patron-initiated request for a copy</li> <li>• <b>Request Type</b> is an open enumerated type.</li> </ul>
<b>Requested Items Count</b>	
Circulation Status	
Circulation Category Type	
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 "Circula-



	<p>tion Category Type”.</p> <ul style="list-style-type: none"> <li>• Example: A User may have on request 5 Items on loan, 3 Items recalled, 1 Item available on shelf.</li> </ul>
<b>Requested Items Desired</b>	Boolean; indicates whether or not requester desires information about Items requested by a specific User.
<b>Required Fee Amount</b>	Monetary value in a specified currency (i.e., <b>Amount</b> ) that a User must pay for a requested service. See <b>Amount</b> for the definition of this compound element
<b>Resource Desired</b>	Boolean; indicates whether or not requester desires that an electronic resource be transmitted as part of a check out.
<b>Routing Information</b>	Information to aid in the routing of an Item following check-in.
Destination	
Bin Number	Text string; identifies an Agency-specific destination to which a physical item is to be routed following a check-in transaction.
Location	
Routing Instructions	Text string; provides instructions (e.g., special handling) for the routing of an Item within an Agency following check-in.
<b>Security Marker</b>	<p>Enumeration of values as specified in a scheme; specifies the type of security marker protecting an Item, including encryption of electronic resources.</p> <ul style="list-style-type: none"> <li>• Examples: 3M Tattle-Tape Security Strip, 3M Whisper Tape, PGP.</li> <li>• <b>Security Marker</b> is an open enumerated type.</li> </ul>
<b>Shipping Address</b>	Information on the physical or electronic address (i.e., <b>Address Information</b> ) to which the Item is to be shipped. See <b>Address Information</b> for the definition of this compound element
<b>Shipping Information</b>	
Shipping Address	.
Shipping Instructions	
Shipping Note	
<b>Shipping Instructions</b>	Text string; provides human-readable data pertaining to the shipment of an Item, such as the preferred carrier, packaging requirements, etc.
<b>Shipping Note</b>	Text string; provides data additional to that provided in other data elements that comprise "Shipping Information".
<b>To Agency Id</b>	Unique identification of Agency (i.e., <b>Unique Agency Id</b> ) to which message is being sent. See <b>Unique Agency Id</b> for a definition of this compound element.
<b>To System Id</b>	<p>Enumeration of values as specified in a scheme; identifies the system to which a message is sent.</p> <ul style="list-style-type: none"> <li>• <b>To System Id</b> is an open enumerated type.</li> </ul>
<b>Unique Agency Id</b>	Enumeration of values as specified in a scheme; identifies an Agency.

	<ul style="list-style-type: none"> <li>Examples: MARC Organization Code List maintained by the Library of Congress, Canadian Library Symbols.</li> <li><b>Unique Agency Id</b> is an open enumerated type.</li> </ul>
<b>Unique Bibliographic Id</b>	Unique identification of a bibliographic item by either of the two following data elements.
Bibliographic Item Id	See definition for this element under <b>Bibliographic Description</b> .
Bibliographic Record Id	See definition for this element under <b>Bibliographic Description</b> .
<b>Unique Item Id</b>	
Unique Agency Id	
Item Identifier Value	Text string; identifies, in context of specific Agency, the Item involved in a circulation transaction. Identifier may take the form of an Item barcode, an Item record number, or an Item accession number, for example.
<b>Unique Request Id</b>	Text string; identifies an Agency's request for an Item.
Request Identifier Value	Text string; identifies a given Agency's Item request.
Unique Agency Id	
<b>Unique User Id</b>	
Unique Agency Id	
User Identifier Value	Text string; identifies a User within an Agency. <ul style="list-style-type: none"> <li>Examples: patron bar code, patron record number, social security number.</li> </ul>
<b>Unlimited Loan Flag</b>	Boolean; indicates whether or not a loan is for an indefinite period. <ul style="list-style-type: none"> <li>"True" indicates that the loan is for an indefinite period and a Date Due is not supplied.</li> </ul>
<b>User Element Type</b>	Enumeration of values as specified in a scheme; identifies all the elements of the User Object on which queries (i.e., lookups) can be made. <ul style="list-style-type: none"> <li><b>User Element Type</b> is a closed enumerated type.</li> </ul>
<b>User Fiscal Account</b>	Record of a User's fiscal obligations to or credit with an Agency
Account Balance	Monetary value in a specified currency (i.e., <b>Amount</b> ) that is the balance in a User's account. See <b>Amount</b> for the definition of this compound element.
Account Details	Details of a fiscal transaction affecting the User's account.
Fiscal Transaction Reference Id	
Fiscal Transaction Type	See definition for this element under <b>Existing Fiscal Transaction</b> .
Valid From Date	
Valid To Date	
Amount Accrued	Monetary value in a specified currency (i.e., <b>Amount</b> ) incurred by the User or paid by the User as the result of a specified type of fee or charge. See

	<b>Amount</b> for the definition of this compound element
Accrual Date	Date and time when the amount specified by <b>Amount Accrued</b> was accrued to the User's account.
Unique Item Id	
Date Due	
Unlimited Loan Flag	
Non-Returnable Flag	
Date Checked Out	Date and time when an Item is placed in the custody of a User.
Date Due	
Date Renewed	See definition for this element under <b>Existing Fiscal Transaction. Item Details</b> .
Date Checked In	Date and time when an Item has been rendered available for check out by a User.
<b>User Language</b>	Enumeration of values from the list of Alpha-3 Terminology Codes as specified in <i>ISO 639-2/T</i> ; identifies one or more languages, in order of preference, in which the User wishes to receive written communication. <ul style="list-style-type: none"> <li>• Example: eng (English), fra (French), deu (German)</li> <li>• <b>User Language Type</b> is a closed enumerated type.</li> </ul>
<b>User Notice Details</b>	A message to be displayed or otherwise sent to a User.
Notice Type	
Notice Content	
Overdue Item	
User Fiscal Account	
User Privilege	
<b>User Optional Fields</b>	
Name Information	
Address Information	
Date Of Birth	
User Language	
User Privilege	
Block Or Trap	
<b>User Privilege</b>	Privileges accorded to a User by an Agency (i.e., a subset of "Agency User Privilege Type").
Unique Agency Id	

Agency User Privilege Type	
Valid From Date	
Valid To Date	
User Privilege Fee	
Amount	
Payment Method Type	<p>Enumeration of values as specified in a scheme; indicates the method of payment (actual or proposed) for a specified User privilege fee.</p> <ul style="list-style-type: none"> <li>• Examples: cash, direct debit.</li> <li>• <b>Payment Method Type</b> is an open enumerated type.</li> </ul>
User Privilege Status	
User Privilege Status Type	<p>Enumeration of values as specified in a scheme; indicates the current status of a User privilege.</p> <ul style="list-style-type: none"> <li>• Examples: active, cancelled.</li> <li>• <b>User Privilege Status Type</b> is an open enumerated type.</li> </ul>
Date Of User Privilege Status	Date and time when the latest user privilege status came into effect.
User Privilege Description	Text string; describes a specific User privilege.
<b>User Transaction</b>	Information concerning a User's loan or request transactions; identifies Item(s) that a User has on loan or on request, together with the Agency to which the Items belong.
Loaned Item	Data describing an Item currently on loan to a User.
Unique Item Id	
Reminder Level	<p>Positive integer; provides a count of the number of times a reminder has been sent to a User.</p> <p>Examples: 1, 2, 3, 4, 5.</p>
Date Due	
Unlimited Loan Flag	
Amount	
Requested Item	Data describing the Item on which a User has caused a hold, reserve, or page to be placed.
Unique Item Id	
Unique Request Id	
Reminder Level	
Date Placed	Date and time when a User placed a request (hold, page, or reserve) for an Item.
Hold Queue Position	

<b>Valid From Date</b>	Date and time when information, such as an address, a user privilege, a block or a trap, became valid or will become valid. If no data is provided for this element, it should be assumed that the information is valid, unless otherwise specified in <b>Valid To Date</b> .
<b>Valid To Date</b>	Date and time when information, such as an address, a user privilege, a block or a trap, will no longer be valid or is no longer valid. If no data is provided for this element, it should be assumed that the information is valid, unless otherwise specified in <b>Valid From Date</b> .

## 7. State Table Governing Messaging over a Single Connection

The Messaging State Tables define the behavior of the initiating and responding applications with regard to the messaging over a single connection<sup>11</sup>. 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 the protocol. The terminal state for this protocol 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 and outgoing. These events are identified below.

### Incoming events:

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.

### Outgoing events:

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, which indicates whether the message identifier matches that of the immediately preceding message (p1) or not (^p1).

### Predicates:

p1	Returns true if the identifier of the message matches the MESSAGE.Id protocol variable.
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The single variable contains the message identifier of the last message transmitted or received.

### Variables:

MESSAGE.Id	Has the value of the identifier of the last message transmitted (in the initiating role) or received (in the responding role).
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<sup>11</sup> Nothing in this protocol is intended to prevent two applications from establishing multiple simultaneous connections for the exchange of NCIP messages.

Table 2. Initiating Application Messaging State Table

	<b>Event</b>	<b>IDLE</b>	<b>WAITING</b>
1	INITreq	set MESSAGE.Id var set timer INIT WAITING	
2 12	RESPind	p1 signal error #1 TERMINAL	p1 clear timer IDLE
3	RESPind	^p1 signal error #1 TERMINAL	^p1 signal error #2 TERMINAL
4	INITind	Signal error #4 TERMINAL	signal error #4 TERMINAL
5	CLOSEreq	CLOSE TERMINAL	
6	CLOSEind	TERMINAL	signal error #3 TERMINAL
7	TIMER		TIMEOUT TERMINAL

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 3. Responding Application Messaging State Table

	<b>Event</b>	<b>IDLE</b>	<b>PROCESSING</b>
1	INITind	Set MESSAGE.Id var Clear timer PROCESSING	Signal error #1 TERMINAL
2	RESPreq		p1 RESP Set timer IDLE
3	RESPind	Signal error #2 TERMINAL	Signal error #2 TERMINAL
4	CLOSEreq	CLOSE TERMINAL	
5	CLOSEind	CLOSE TERMINAL	Signal error #3 TERMINAL
6	TIMER	TIMEOUT TERMINAL	

ERROR # meanings:

- 1: Initiation message received while processing an earlier message.
- 2: Response message received.
- 3: Connection was closed while still processing an earlier message.

<sup>12</sup> Note that 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.

## 8. Standard Message Headers

Message headers are related to message handling, rather than to message content or its processing. This standard specifies an Initiation Message Header and a Response Message Header. The structure and content of these headers may be found in the Cross-Application Profile (see Section 9).

## 9. Profiles

A profile specifies the use of a particular standard, or group of standards, to support a particular application (e.g., circulation, interlibrary loan), function, community (e.g., the library community), or environment (e.g., the Internet). A profile identifies a set of base standards, together with appropriate options and parameters necessary to accomplish identified functions for purposes including: (a) interoperability, and (b) methodology for referencing the various uses of the base standards, meaningful both to users and suppliers. A profile thus establishes options, subsets, and values of parameters, where these choices are left open in the standard.

This standard calls for a Cross-Application Profile and possibly one or more Application Profiles. These profiles are defined and described in separate documents, but are required to adhere to specific rules as set out below (tentative).

### 9.1 Rules for Profile Definition

A profile that is based on this standard SHALL meet the following constraints.

The 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

These rules apply to profiles discussed in Sections 9.3 and 9.4, below, and to any other profiles that may be developed with this standard as a base.

### 9.2 Rules for Data Element Definition in Profiles

As noted earlier, a profile may define data elements additional to those defined in this standard, or may delete data elements defined herein, but may not redefine data elements specified in this standard. Data elements defined in profiles must have one definition consistent across all applications in which the data element is used; must be named in a manner consistent with that employed in this standard; must specify the data type consistent with this standard and with the Cross-Application Profile (see below).

### 9.3 Cross-Application Profile

The Cross-Application Profile contemplated by this standard is intended to provide implementation-level details not specified in this standard. This will enable the standard to have a longer useful life within the ever-changing technology arena. The Cross-Application Profile is expected to address the following matters, as a minimum:

- Message encoding and structure
- Character representation
- Representation of data types
- Specification of required components

- Services
- XML Prolog
- Data Structures
- Enumerated data types
- Rules of behavior of implementations
- Transport mechanism(s)
- Security issues
- Standards referenced/used
- Scheme registration (for enumerated data types)
- Provision for extension of the profile

#### **9.4 Application Profiles**

One or more application-specific profiles is contemplated by this standard, with the expectation that three Application Profiles may be developed:

- Direct consortial borrowing (DCB)
- Self-service (SS)
- Circulation/ILL interaction (Circ-ILL)

These profiles (and/or others) must be developed under the rules of Sections 9.1 and 9.2, above.



## Appendix A. Enumerated Data Types

(This appendix is not part of the American National Standard Circulation Interchange Protocol (NCIP), ANSI/NISO Z39.83-2001x. It is included for information only.)

This standard provides a data structure that permits the definition of lists of values for enumerated data types outside the scope of this standard. The data structure consists of a pair of data elements, Scheme and Value, for each enumerated type. **Scheme** is a string used to identify the authority determining the list of values for the enumerated type, and **Value** is a number, code, word, or phrase from that authoritative list of values. The only relationship between or among the values of a list is that implied by their membership in the list.

Certain enumerated data types are defined by a cross-application profile to provide input to specific processes. Other enumerated data types may be based on existing authoritative lists of codes (such as the list of Alpha-3 Bibliographic Codes for Language specified in ISO 639-2 and the list of Currency Codes in ISO 4217). In addition, to support operational requirements for which no standard authoritative list exists, groups of implementers may establish authoritative lists of values based on their common business rules and operational requirements.

An application may have knowledge of zero or more named schemes and the associated values. If an application receives an NCIP message that identifies a Scheme of which the application has no knowledge, an error response is sent to the initiating application.

For example, the values used by an group of academic libraries for **Agency User Privilege Type** may be based on academic status (such as Faculty, Postdoctoral, Graduate, Undergraduate, Staff, Administration), while a public library consortium may base their list of values on age (such as Adult, Child, Youth, Senior). The following example illustrates in greater detail how enumerated data types are formulated. In the example, five (6) Schemes have been identified: two NISO Privilege Schemes, a SSHE Scheme, State Government Scheme, Military Scheme, and Marin County Scheme. Each named scheme is an enumerated list whose values are given following the name of the scheme. It is presumed that each named scheme is maintained by some organization.

In the example the indentations represent:

Type	Scheme	Value
------	--------	-------

### ILLUSTRATIVE EXAMPLE

Agency User Privilege Type

NCIP Agency User Privilege Type Academic Scheme

Administration

Faculty

Graduate

Postdoctoral

Staff

Undergraduate

NCIP Agency User Privilege Type Public Scheme

Administration

Adult

Juvenile

Senior

Staff

Young Adult

Youth

SSHEScheme

Administration  
Faculty  
Graduate  
Postdoctoral  
Staff  
Undergraduate

StateGovernmentScheme  
Agency Head  
Deputy Secretary  
Governor  
Lt. Governor  
Representative  
Secretary  
Senator  
Staff

MilitaryScheme  
Admiral  
Captain  
Colonel  
Commander  
General  
Lieutenant  
Major  
Non-Com  
Petty Officer

MarinCountyScheme  
Adult  
Child  
Hearing Impaired  
Home Bound  
Physically Handicapped  
Senior  
Staff  
Vision Impaired  
Youth

[end of example]

## Appendix B. Alphabetical List of Data Elements and Their Location in Section 6 (non-normative)

(This appendix is not part of the American National Standard Circulation Interchange Protocol (NCIP), ANSI/NISO Z39.83-2001x. It is included for information only.)

Data Element Name	Page in Section 6
Account Balance	58
Account Details	58
Accrual Date	59
<b>Acknowledged Fee Amount</b>	40
Acknowledged Fee Amount	41
Acknowledged Fee Amount	48
<b>Add Agency Fields</b>	40
<b>Add Item Fields</b>	40
<b>Add Request Fields</b>	41
<b>Add User Fields</b>	41
Address Information	40
Address Information	41
<b>Address Information</b>	41
Address Information	48
Address Information	49
Address Information	59
Address Role Type	41
<b>Agency Element Type</b>	43
Agency User Privilege Type	40
<b>Agency User Privilege Type</b>	43
Agency User Privilege Type	48
Agency User Privilege Type	60
<b>Amount</b>	43
Amount	50
Amount	53

Amount	54
Amount	60
Amount	60
Amount Accrued	58
Authentication Data Type	44
Authentication Data Type	44
Authentication Input	41
<b>Authentication Input</b>	44
Authentication Input	49
Authentication Input Data	44
Authentication Input Type	44
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<b>Authentication Prompt</b>	44
Authentication Prompt	48
Authentication Prompt Data	44
Authentication Prompt Type	44
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Author Of Component	44
Bibliographic Description	41
<b>Bibliographic Description</b>	44
Bibliographic Description	48
Bibliographic Description	50
Bibliographic Description	52
Bibliographic Description Level	51
Bibliographic Item Id	45
Bibliographic Item Id	58

Bibliographic Item Identifier	45
Bibliographic Item Identifier Code	45
Bibliographic Level	46
Bibliographic Record Id	45
Bibliographic Record Id	58
Bibliographic Record Identifier	45
Bibliographic Record Identifier Code	45
Bibliographic Title	46
Bin Number	57
Block Or Trap	41
<b>Block Or Trap</b>	46
Block Or Trap	49
Block Or Trap	59
Block Or Trap Type	47
Call Number	51
Care Of	43
CIP Roles Supported Type	40
<b>CIP Roles Supported Type</b>	47
CIP Roles Supported Type	48
Circulation Category Type	41
<b>Circulation Category Type</b>	47
Circulation Category Type	48
Circulation Category Type	52
Circulation Category Type	52
Circulation Category Type	56
<b>Circulation Status</b>	47
Circulation Status	52
Circulation Status	52
Circulation Status	56
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Component Identifier	45

Component Identifier Type	45
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<b>Consortium Agreement</b>	47
Consortium Agreement	48
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Country	43
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Current Borrower	52
<b>Current Borrower Desired</b>	47
Current Requester	52
<b>Current Requesters Desired</b>	47
<i>Date</i>	47
Date Available	41
<b>Date Available</b>	47
Date Available	48
Date Checked In	59
Date Checked Out	59
<b>Date Claimed Returned</b>	48
<b>Date Due</b>	48
Date Due	50
Date Due	59
Date Due	59
Date Due	60
<b>Date Due Desired</b>	48
Date Of Birth	41
<b>Date Of Birth</b>	48
Date Of Birth	49
Date Of Birth	59
Date Of Expected Reply	54
Date Of User Privilege Status	60
Date Of User Request	41

<b>Date Of User Request</b>	48
Date Of User Request	49
Date Placed	60
<b>Date Recalled</b>	48
<b>Date Received</b>	48
Date Renewed	50
Date Renewed	59
Date Returned	50
<b>Date Sent</b>	48
<b>Date Shipped</b>	48
<b>Date To Send</b>	48
<b>Date Will Send</b>	48
<b>Delete Agency Fields</b>	48
<b>Delete Item Fields</b>	48
<b>Delete Request Fields</b>	48
<b>Delete User Fields</b>	49
<b>Desensitization Flag</b>	49
Desensitization Flag	52
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District	42
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Earliest Date Needed	49
<b>Earliest Date Needed</b>	49
Edition	45
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Electronic Address Data	43
Electronic Address Type	43
Electronic Data Format Type	51
<b>Electronic Resource</b>	49
<b>Electronic Resource Provided Flag</b>	49
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Error Element	53
Error Type	53
Error Value	53
<b>Existing Fiscal Transaction</b>	49
Existing Fiscal Transaction	50
Failure Element	56
Failure Element	56
Failure Type	56
Failure Value	56
<b>Fiscal Account Update Details</b>	50
Fiscal Action Type	50
<b>Fiscal Action Type</b>	50
Fiscal Transaction Description	50
Fiscal Transaction Description	54
Fiscal Transaction Identifier Value	50
Fiscal Transaction Reference Id	49
<b>Fiscal Transaction Reference Id</b>	50
Fiscal Transaction Reference Id	53
Fiscal Transaction Reference Id	58
Fiscal Transaction Type	49
Fiscal Transaction Type	53
Fiscal Transaction Type	58
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Formatted Address Data	42
Formatted Address Type	42
<b>From Agency Authentication</b>	50
<b>From Agency Id</b>	50
<b>From System Authentication</b>	50
<b>From System Id</b>	51
Given Name	55
<b>Hold Pickup Date</b>	51

<b>Hold Queue Length</b>	51
Hold Queue Length	52
<b>Hold Queue Position</b>	51
Hold Queue Position	60
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Item Description	48
<b>Item Description</b>	51
Item Description	52
Item Details	50
Item Details	54
Item Details	54
<b>Item Element Type</b>	52
Item Identifier Value	58
<b>Item Optional Fields</b>	52
<b>Item Transaction</b>	52
Language	51
Line 1	43
Line 2	43
Loaned Item	60
Loaned Item Count Value	52
<b>Loaned Items Count</b>	52
<b>Loaned Items Desired</b>	52
Locality	43
Location	41
Location	48
Location	52
<b>Location</b>	52
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Location Within Building	42
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Name Information	41
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<b>Name Information</b>	53
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Need Before Date	41
Need Before Date	49
<b>Need Before Date</b>	53
New Fiscal Transaction	50
<b>New Fiscal Transaction</b>	53
<b>Non-returnable Flag</b>	54
Non-Returnable Flag	59
<b>Notice Content</b>	54
Notice Content	59
<b>Notice Type</b>	54
Notice Type	59
Organization Name	54
Organization Name Information	40
Organization Name Information	48
Organization Name Information	53
<b>Organization Name Information</b>	54
Organization Name Type	54
<b>Overdue Item</b>	54
Overdue Item	59
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Payment Method Type	60

<b>Pending</b>	54
Personal Name Information	53
<b>Personal Name Information</b>	54
Personal User Common Name	55
Personal User Name Structured	54
Physical Address	42
Physical Address Type	42
Physical Condition	41
Physical Condition	48
Physical Condition	52
<b>Physical Condition</b>	55
Physical Condition Details	55
Physical Condition Type	55
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<b>Processing Failure</b>	56
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Reminder Level	60
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Request Identifier Value	58
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<b>Request Type</b>	56
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Requested Item Count Value	56
<b>Requested Items Count</b>	56
<b>Requested Items Desired</b>	57
<b>Required Fee Amount</b>	57
<b>Resource Desired</b>	57
<b>Routing Information</b>	57
Routing Instructions	57
Security Marker	41
Security Marker	48
Security Marker	52
<b>Security Marker</b>	57
Serial Holdings	51
Series Title Number	46
<b>Shipping Address</b>	57
Shipping Address	57
Shipping Information	41
Shipping Information	49
<b>Shipping Information</b>	57
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<b>Shipping Instructions</b>	57
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<b>Shipping Note</b>	57
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<b>To System Id</b>	57
Unique Agency Id	41
Unique Agency Id	47
Unique Agency Id	50
<b>Unique Agency Id</b>	57
Unique Agency Id	58
Unique Agency Id	58
Unique Agency Id	58
Unique Agency Id	59
<b>Unique Bibliographic Id</b>	58
Unique Item Id	41
Unique Item Id	49
Unique Item Id	50
<b>Unique Item Id</b>	58
Unique Item Id	59
Unique Item Id	60
Unique Item Id	60
Unique Request Id	50
Unique Request Id	54
<b>Unique Request Id</b>	58
Unique Request Id	60
Unique User Id	41
Unique User Id	49
<b>Unique User Id</b>	58
Unique User Id	41
<b>Unlimited Loan Flag</b>	58
Unlimited Loan Flag	59
Unlimited Loan Flag	60
<b>User Element Type</b>	58

<b>User Fiscal Account</b>	58
User Fiscal Account	59
User Identifier Value	58
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<b>User Language</b>	59
User Language	59
<b>User Notice Details</b>	59
<b>User Optional Fields</b>	59
User Privilege	41
User Privilege	49
User Privilege	59
User Privilege	59
<b>User Privilege</b>	59
User Privilege Description	60
User Privilege Fee	60
User Privilege Status	60
User Privilege Status Type	60
<b>User Transaction</b>	60
Valid From Date	42
Valid From Date	47
Valid From Date	50
Valid From Date	50
Valid From Date	53
Valid From Date	54
Valid From Date	58
Valid From Date	60
<b>Valid From Date</b>	61
Valid To Date	42
Valid To Date	47
Valid To Date	50



Valid To Date	50
Valid To Date	53
Valid To Date	54
Valid To Date	58
Valid To Date	60
<b>Valid To Date</b>	61
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## Appendix C. Structure of the Data Element “Problem” and Illustrations of Its Use (non-normative)

(This appendix is not part of the American National Standard Circulation Interchange Protocol (NCIP), ANSI/NISO Z39.83-2001x. It is included for information only.)

The data element named “**Problem**” has the following structure (as defined in Section 6):

### Problem

#### Messaging Error (R)

##### Error Type

##### Scheme

##### Uvalue

#### Error Element

##### Uvalue

{ **Error Element** or **Error Uvalue** } (optional, not repeatable)

or

#### Processing Failure (R)

##### Failure Type

##### Scheme

##### Uvalue

#### Failure Element

##### Uvalue

{ **Failure Element** or **Failure Uvalue** } (optional, not repeatable)

**Messaging Error** is a repeatable element that is used by a responding application to indicate that it does not understand the initiation message. *This is the only error element that notification response messages may return.*

**Processing Failure** is a repeatable element that is used by a responding application to indicate that it cannot perform the services requested by the initiating application.

- For **Messaging Error**,

**Error Type** refers to a Scheme (an enumerated list) that is used to indicate the reason for the error.

Examples: Invalid Message (XML)  
Non-conformant Message  
Protocol Error  
etc.

**Error Element** is a recursive structure used in a response message to identify the element of the initiation message that is the subject of the error. It must fully describe the path from (but not including) the root node of the initiation message to the element that is the subject of the error.

**Uvalue** provides the name of the data element in which the error is located.

**Error Uvalue** contains the data element value that was in error.

**Error Element** contains either another **Error Element** or **Error Value** or neither (i.e., just **Value**). Thus, if the presence or absence of an element (rather than the value of an element) is the error, then the recursive **Error Element** structure ends with an **Error Element** containing only **Value**.

- For **Processing Failure**,

**Failure Type** refers to a Scheme (an enumerated list) that is used to indicate the reason for the processing failure.

Examples:       Item Not Checked Out  
                   Unknown Agency  
                   Unknown Item  
                   Unknown User  
                   User Delinquent/Blocked  
                   User Access Denied  
                   etc.

**Failure Element** is a recursive structure used to identify the element of the initiation message that is the subject of the error. It must fully describe the path from (but not including) the root node of the initiation message to the element that is the subject of the error.

**Value** provides the name of the data element in which the processing failure is located.

**Failure Value** contains the data element value that caused the processing failure.

**Failure Element** contains either another **Failure Element** or **Failure Value** or neither (i.e., just **Value**). Thus, if the presence or absence of an element (rather than the value of an element) is the error, then the **Failure Element** structure ends with a **Failure Element** containing only **Value**.

#### Illustrative Examples:

- 1) A "Create User" initiation message may contain an "Agency User Privilege Type" element, which should contain a "Scheme" and an "Value" element, that is:

```
Agency User Privilege Type
  Scheme
  Value
```

If an application receives a "Create User" initiation message that has an "Value" element with the value of graduate from the "Scheme" *Public Libraries*; and the *Public Libraries* scheme does not have a graduate value, then the "Problem" element of the "Create User Response" message would be as follows:

```
<Problem>
  <Messaging Error>
    <Error Type>                                     # This indicates the type of error.
      <Scheme>NCIP Error Type Scheme</Scheme>
      <Value>Unknown Value From Known Scheme</Value>
    </Error Type>
  <Error Element>                                     # This indicates the outermost element
                                                    # that contained the error.
    <Value>AgencyUserPrivilegeType</Value>          # This indicates the name of the outermost
                                                    # element.
  </Error Element>                                     # This indicates the next-inner element
                                                    # that contained the error.
```

```

    <Value>Value</Value> # This indicates the name of the next-
    <Error Value>graduate</Failure Value> # This indicates the value that the
    </Error Element> # This indicates the value that the
    </Error Element> # This indicates the value that the
    </Messaging Failure> # This indicates the value that the
  </Problem> # This indicates the value that the

```

- 2) An "Update Item" message is sent which contains an element "Unique User Id" which is an invalid element in such a message. If an application receives such an element in a Update Item initiation message, the "Problem" element of the "Update Item Response" message would be as follows:

```

<Problem>
  <Messaging Error>
    <Error Type> # This indicates the type of error.
    <Scheme>NCIP Error Type Scheme</Scheme>
    <Value>Unknown Element</Value>
    </Error Type>
    <Error Element> # This indicates the outermost ele-
    <Value>Add Item Fields</Value> # This indicates the name of the out-
    <Error Element> # This indicates the next-inner ele-
    <Value>Unique User Id</Value> # This indicates the name of the next-
    </Error Element> # This indicates the next-inner element.
  </Error Element>
  </Messaging Failure>
</Problem>

```

Notice that there is no "Failure Value" element at the innermost level because it is the element, not its value, that is the error.

- 3) A "Create User" message is sent which the responding application recognizes as a duplicate. In this case, the "Problem" element of the "Create User Response" message would be as follows:

```

<Problem>
  <Processing Failure>
    <Failure Type> # This indicates the type of error.
    <Scheme>NCIP Failure Type Scheme</Scheme>
    <Value>User Already Exists</Value>
    </Failure Type>
    <Failure Element> # This indicates the outermost ele-
    <Value>Unique User Id</Value> # This indicates the name of the out-
    <Failure Element> # This indicates the name of the next-
    <Value>User Identifier Value</Value> # This indicates the name of the next-
    <Failure Value>2012400044567x</Failure Value> # This indicates the value that the
    </Failure Element> # This indicates the value that the
  </Failure Element> # This indicates the value that the
</Processing Failure>

```

</Problem>

- 4) A "Create User" message MUST contain a From System Id in the Initiation Header. If that element is missing in a Create User initiation message, the "Problem" element of the "Create User Response" message would be as follows (note that because the Initiation Header was malformed, this is an error concerning the message, not the data within the message. Compare example #2 above):

<Problem>

<Messaging Error>

<Error Type>

<Scheme>NCIP Error Type Scheme</Scheme>

<Value>Required Data Missing</Value>

</Error Type>

<Error Element>

<Value>InitiationHeader</Value>

<Error Element>

<Value>FromSystemId</Value>

</Error Element>

</Error Element>

</Messaging Error>

</Problem>

# This indicates the type of error.

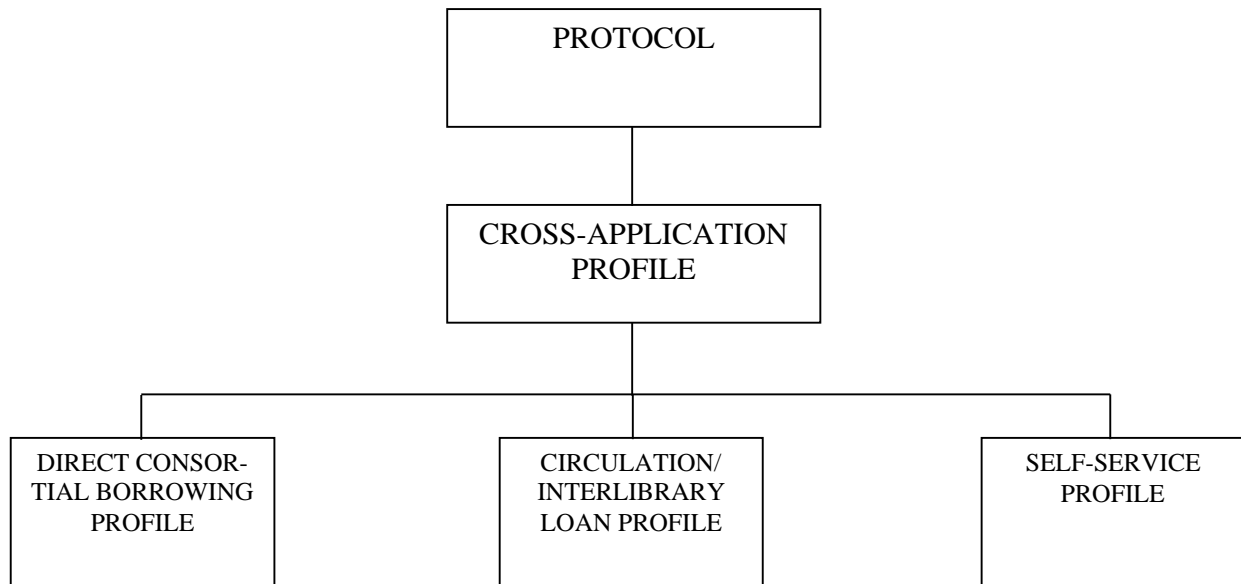
# This indicates the outermost element that contained the error.

# This indicates the name of the outermost element.

# This indicates the name of the element in error

**Appendix D. Relationship between This Standard and Associated Profiles (non-normative)**

(This appendix is not part of the American National Standard Circulation Interchange Protocol (NCIP), ANSI/NISO Z39.83-2001x. It is included for information only.)



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