# NISO Circulation Interchange
# Part 1: Protocol (NCIP)

Version 2.02

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

An American National Standard

Developed by the

National Information Standards Organization

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by the

American National Standards Institute

# About NISO Standards

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# Contents

# Foreword

(This foreword is not part of the *NISO Circulation Interchange, Part 1: Protocol*, ANSI/NISO Z39.83-1-2012. It is included for information only.)

## *About This Standard*

### The NCIP Standard's Development Process

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

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

In 2007, when the standard was due for its five-year review, the NCIP-IG and MA proposed that the standard be revised. The Implementers Group working on Version 2.00 started from a position of wanting to address the perceived hurdles hindering widespread adoption of NCIP. One of the major hurdles came from the self-service area, where assumptions basic to NCIP message construction were counter to the required workflow. Over the span of 2007-08, the group wrestled with both problems and solutions. The group believes that the resulting Version 2.00 meets the professed goals of simplification, streamlining, extensibility, and more attention to self-service needs.

### The Move to Continuous Maintenance

In 2009, the NCIP Standing Committee replaced the NCIP Implementers Group (NCIP-IG). At their request, NISO petitioned ANSI to place NCIP under continuous maintenance. Under continuous maintenance, a process is put in place for submittal and review of proposed changes on a published schedule. Requests for change must be submitted to the NCIP-SC prior to its semiannual in-person meetings. At each meeting, the group will review all of the change requests and decide to accept the change for inclusion in the next revision, accept the change for further study and additional discussion at a future meeting, or reject the change. The complete procedure for the continuous maintenance is available at the NISO website (www.niso.org/workrooms/ncip/continuous).

When a sufficient number of changes have been accepted by the NCIP-SC—or one or more changes is deemed to be to significant enough—the NCIP-SC will prepare a revision for ballot and approval by a NISO voting pool of interested NISO voting members.

The NCIP-SC believes that Continuous Maintenance will permit the NCIP standard to adapt more quickly to the ever-changing needs in the implementer community. The group is, however, sensitive to the tension that exists between frequent changes, interoperability, and backwards compatibility. Therefore, the NCIP-SC is committed to maintaining backwards compatibility in minor revisions and reserving more significant structural changes for major revisions. For example, Version 2.00 and 2.01 will be compatible, but there is no guarantee that Version 2.01 and Version 3.0 will be. Of course, a Version 2.0 implementation exchanging with a Version 2.01 implementation will not understand any changes introduced in Version 2.01. It should be noted, too, that the effective version used in any specific transaction is governed by the Initiator.

**ANSI/NISO Z39.83-1-2012**
**Version 2.02**

**Instructions for Submittal of Proposed Change to ANSI/NISO Z39.83 Under Continuous Maintenance**

If a provision of the standard is proposed to be added, deleted, or modified, the text of the provision must be submitted in writing. Comments or proposals for revisions to any part of the standard may be submitted to NISO any time. Submissions must be accompanied by the submitter's name, affiliation, telephone number, and e-mail address.

Written comments are to be sent to:

> National Information Standards Organization (NISO)
> Attn: NCIP Standing Committee
> 3600 Clipper Mill Road, Suite 302
> Baltimore, MD 21211
> Tel.: 301-654-2512 (main)
>     866-957-1593 (toll-free)
> Fax: 410-685-5278
> E-mail: nisohq@niso.org

Comments may also be submitted to NISO online at www.niso.org/contact. In addition, the following person may be contacted by those interested in submitting changes:

> Robert Walsh
> ANSI/NISO Z39.83 Maintenance Agency Representative,
> EnvisionWare
> E-mail: rwalsh@envisionware.com

**Change History**

*Version 2.02 [2012]*

Version 2.02 attempts to incorporate real-world feedback and experience into the standard with changes that improve the usefulness and practicality of the various services. An optional, repeatable *Bibliographic Id* has been added to the *Loaned Item* and *Requested Item* elements. An optional *Date Due* has been added to *Item Optional Fields*. "UPC" and "GTIN" have been added to the *Bibliographic Item Identifier Code* scheme, and "DVD" and "Blu-Ray" have been added to the *Medium Type* scheme.

One of the larger changes in 2.02 is the addition of a *Lookup Item Set* service. This new service allows an initiator to query a set of items that may share some kind of relationship with a single request. The specifics of the relationship shared by the items is left undefined in order to maximize flexibility and provisions have been put in place to limit the scope of the response so as to not overload the responder.

In Section 6, the structure of the *Problem* element was corrected to match the schema with respect to the repeatability of its sub-elements. The description for the *Non-Returnable Flag* empty element was changed to accurately reflect that its presence indicates the item is not returnable. *Amount* and *Reminder Level* have been made optional when used within *Loaned Item*, and an explanation of the intended use for the *Amount* element in this context has been added. Appendix G, the alphabetical index of data elements, was removed because, in the opinion of the NCIP Standing Committee, it is easier to search the text of the standard to find occurrences of various elements than it was to use this partial index. Finally, the various URIs/URLs for the NCIP schema have been normalized to point to the same location.

*Version 2.01 [interim revision, not officially approved as a standard]*

Version 2.01 is aimed primarily at correcting defects identified in the 2008 standard and ensuring that the standard and the NCIP schema agree with one another. Further, some structural changes were made in the standard to improve the presentation of the information and make it more usable for implementers. For example, much of Section 5 was rearranged so that it is presented in the same order that the elements appear in the NCIP schema. Additionally, the generic pattern for error responses is now described in the overview portion of Section 5, and specific details for error

responses are given in the context of the individual services only when they diverge from the general pattern.

Two substantive changes were made. First, *Bibliographic Record Id* was made repeatable within *Bibliographic Description*. This makes it possible, for example, for an initiator to send an *Accept Item* message passing both an OCLC number and a Library of Congress Catalog Number. Second, *Request Item* has been changed so that it now accepts both *Bibliographic Record Id* and *Item Id*, and both elements are now repeatable. In earlier versions, *Request Item* accepted either a single *Bibliographic Record Id* or a single *Item Id*.

There were two known issues with version 2.01. First, there was a disagreement between the standard and the NCIP schema regarding whether *Problem Detail*, *Problem Element*, and *Problem Value* elements are repeatable. According to the 2.01 standard, these elements may repeat. However, according to the schema, each is optional but may occur only once if present. The schema, which falls outside of the standard, was revised for version 2.02 to resolve this discrepancy. Second, Part 2 of version 2.01 of the standard refers to Section 5.4 of the ISO 8601 standard for date and time format, which was included in the 2000 version of that standard (ISO 8601:2000, *Data elements and interchange formats – Information interchange – Representation of dates and times*). Section 5.4 of the ISO standard was removed in the 2004 revision of that standard so the reference was removed in 2.02.

### Version 2.00 [2008]

Version 2.00 included radical changes to the protocol. It is not backward compatible with Version 1.00, as it is based solely on an XML schema. The Version 2.00 changes build on changes made since original publication of NCIP—known collectively (if inaccurately) as Version 1.01; several implementers were using this unofficial version. There are a few other changes that also break backward compatibility. The most significant are in error handling and extensibility.

The NCIP-IG approached the version 2.00 revision of NCIP with five primary motivations: correct reported defects, address issues reported by broker applications, address issues reported by self-service applications, provide new needed features, and streamline/simplify wherever possible. The following list summarizes the major changes in the 2.00 revision, grouped under those five main headings.

1. Streamline/simplify

    a) XML Schema is the sole definition for the initiation and response messages that comprise the NISO Circulation Interchange Protocol.

    b) Removed *Visible User Id* and *Visible Item Id* and their associated child elements.

    c) Removed the *User Transaction* element and promoted its child elements within *Lookup User Response*.

    d) The prefix *Unique* was removed from all such named elements.

    e) The *Authenticate User* service was removed.

    f) Converted all *Enumerations* from Scheme/Value pairs to strings with optional scheme attribute.

    g) Removed *Unknown Service*.

2. New Features

    a) The wrapper element *Ext* was added within outer level messages to provide extensibility.

    b) Error handling was completely re-imagined as a Problem choice within *NCIPMessage*.

    c) Added Item *Optional Fields* to *Request Item* and added *Number Of Piece*s to *Item Description*.

    d) Added a section giving a suggestion on optional compression.

e)   Added new data element *Pickup Location* and added it everywhere *Pickup Expiry* occurs.

f)   Added an XML namespace as an optional part of the message headers.

g)   Added *From Agency Id* and *To Agency Id*.

h)   Added *Request Element Type*.

3.   Self-Service Issues

a)   The *Initiation Header* and *Response Header* are now optional wherever they appear.

b)   Added new *Previous User Id* element as part of *User Optional Fields* within *Lookup User Response*.

c)   Added optional Title and Medium Type elements within Loaned Item and *Requested Item*.

d)   *Agency Id* becomes optional within *Item Id*, *User Id*, and *Request Id*.

4.   Broker Issues

a)   Two new services, *Delete Item* and *Delete User*, were added.

b)   Added an optional *Name Information* to *Routing Information*.

c)   Added new optional *Item Identifier Type*, *Request Identifier Type*, *User Identifier Type* to their associated parent elements.

d)   Added a note about the need to translate *Agency Ids* among partners.

e)   Added *Pickup Expiry* and (new) *Pickup Location* to *Accept Item*.

5.   Defects

a)   Corrected case in value *Cannot Guarantee Restrictions On Use.*

b)   Corrected erroneous exception statement in *Electronic Address* and *Physical Address* under *Agency Address Information*.

c)   Corrected service cited in Electronic Resource Provided Flag to be *Item Checked Out Service*.

d)   Added *Sensitive Data Flag* to *Index*.

A complete change list for Version 2.00 (including the incorporated changes from Version 1.01) is posted on the NISO website at: www.niso.org/standards/z39-83-1-2008/.

## Trademarks, Service Marks

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## NISO Voting Members

The following NISO members were in the voting pool that approved this standard.

**American Society for Information Science & Technology (ASIS&T)**
Mark Needleman

**Association of Research Libraries (ARL)**
Julia Blixrud

**College Center for Library Automation (CCLA)**
David Brightbill

**EnvisionWare Inc.**
Robert Walsh

**Ex Libris Inc.**
Mike Dicus

**Innovative Interfaces Inc.**
Betsy Graham

**John Wiley & Sons Ltd.**
Keith Webster

**Library of Congress**
John Zagas

**Los Alamos National Laboratory**
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**National Security Agency**
Kate Dolan

**Polaris Library Systems**
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**Ringgold Inc.**
Donald Chvatal

**The Library Corporation (TLC)**
Juli Marsh

## NISO Discovery to Delivery Topic Committee Members

This standard is part of the portfolio of the NISO Discovery to Delivery Topic Committee. At the time the Topic Committee approved this standard for ballot, the following individuals were members.

**Pascal Calarco**
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**Lucy Harrison**
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**Peter Murray**
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## NCIP-SC Members

The NCIP Standing Committee (NCIP-SC) provides support for the NCIP standard, including voting on and preparing changes according to the continuous maintenance procedures for this standard. The following individuals were members of the NCIP-SC at the time that version 2.02 (2012) was approved.

**John Barr**
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**John Bodfish**
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**Dhaval Kotecha**
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# NISO Circulation Interchange
# Part 1: Protocol (NCIP)

## 1  Purpose

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

- Perform the functions necessary to lend and borrow items

- Provide controlled access to electronic resources

- Facilitate co-operative management of these functions

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

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

- **Direct Consortial Borrowing –** Through direct consortial borrowing, users of one agency can request and borrow items from another agency within a consortium. NCIP facilitates the transfer of User and Item data between disparate circulation applications, thereby allowing an agency to manage traffic for non-local patrons and/or provide local control of items belonging to another agency.

- **Circulation/Interlibrary Loan Interaction –** NCIP facilitates the exchange of circulation data between interlibrary loan (ILL) applications and circulation applications, thereby permitting agencies to use circulation applications to track all loans to a user. Items belonging to the local collection and items borrowed for that User via interlibrary loan can be recorded together in the user's circulation record. Notifications for pickup, listing of charges, overdue notifications, etc., can be handled in the same way, whether items are owned locally or borrowed from another agency. Agencies may also expedite the tracking of items lent via interlibrary loan within their local circulation applications.

- **Self-Service Circulation –** Self-service circulation applications allow users to check out or check in desired items without assistance from agency staff. These applications may also support fine/fee transactions and supply user account data from the agency's circulation system.

## 2  Scope

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

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

# 3   Normative References

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

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

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

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

# 4   Definitions and Conventions

## 4.1   Definitions

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

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

| Term | Definition |
|---|---|
| **Protocol** | A set of formal rules governing the transmission of data across a network. Application level protocols deal with data formatting, including the syntax of messages, application to application dialogue, character sets, sequencing of messages, etc. |
| **Service** | A message pair consisting of an initiation and a response message that provides specific functionality with respect to the exchange of data related to circulation activities. |
| **Standard** | The two parts of ANSI/NISO Z39.83-2012 approved as an American National Standard. |
| **Standard Protocol** | The protocol (NCIP) specified in this standard, unless context indicates otherwise. |
| **System** | A computer running an application that is able to send or receive NCIP messages and has a unique network address. For example, a TCP/IP address would include both the computer's network address and the port number. |
| **User** | The entity (person or organization) that will use an item (or service) provided by an agency. |

## 4.2 Notational Conventions

The key words "must", "must not", "required", "shall", "shall not", "should", "should not", "recommended", "may", and "optional" in this standard are to be interpreted as described in IETF RFC 2119.

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

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

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

- Lookup Service Type

- Update Service Type

- Notification Service Type

## 5.1  Object Classes and Object Definitions

This standard specifies three primary object classes:

- Agency Object
- Item Object
- User Object

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

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

### 5.1.1  Agency Object

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

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

### 5.1.2  Item Object

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

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

### 5.1.3   User Object

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

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

## 5.2   Summary of Service Types and Associated Services

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

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

- Names of the messages that compose each service are presented in ***Bold Italic.***
- Required and optional data elements used by each service are presented in the order in which they appear in the schema.
- An "(R)" indicates that a data element is repeatable and the absence of this notation indicates that the data element is not repeatable.
- Conditionally required data elements are enclosed in braces { }.

For Lookup and Update services, the responses generally adhere to the following pattern:

- Response Header – optional
- Problem (R) – required unless one or more data elements is present
- Data Elements – required unless the problem element is present
- Ext – optional

In the remainder of this section, services which adhere to the pattern will not list the Problem element in the description of the appropriate responses. Some Lookup and Update services, though, permit the Problem element to be accompanied by additional data elements that further explain the problem. For these services that do not adhere to the general pattern, the allowable structure for the Problem element will be outlined separate from the standard response.

For Notification services, the responses always adhere to the following pattern:

- Response Header – optional
- Problem (R) – optional
- Ext – optional

Therefore, the responses will not be described in conjunction with each individual Notification service.

**Table 1: Summary of Service Types and Associated Services**

| SECTION | SERVICE TYPE | SERVICE | |
|---|---|---|---|
| | | INITIATION MESSAGE | RESPONSE MESSAGE |
| *5.3* | *LOOKUP* | | |
| 5.3.1 | | Lookup Agency | Lookup Agency Response |
| 5.3.2 | | Lookup Item | Lookup Item Response |
| 5.3.3 | | Lookup Request | Lookup Request Response |
| 5.3.4 | | Lookup User | Lookup User Response |
| 5.3.5 | | Lookup Version | Lookup Version Response |
| 5.3.6 | | Lookup Item Set | Lookup Item Set Response |
| *5.4* | *UPDATE* | | |
| 5.4.1 | | Accept Item | Accept Item Response |
| 5.4.2 | | Check In Item | Check In Item Response |
| 5.4.3 | | Check Out Item | Check Out Item Response |
| 5.4.4 | | Undo Check Out Item | Undo Check Out Item Response |
| 5.4.5 | | Create Agency | Create Agency Response |
| 5.4.6 | | Create Item | Create Item Response |
| 5.4.7 | | Create User | Create User Response |
| 5.4.8 | | Create User Fiscal Transaction | Create User Fiscal Transaction Response |
| 5.4.9 | | Delete Item | Delete Item Response |
| 5.4.10 | | Delete User | Delete User Response |
| 5.4.11 | | Recall Item | Recall Item Response |
| 5.4.12 | | Cancel Recall Item | Cancel Recall Item Response |
| 5.4.13 | | Renew Item | Renew Item Response |
| 5.4.14 | | Report Circulation Status Change | Report Circulation Status Change Response |
| 5.4.15 | | Request Item | Request Item Response |
| 5.4.16 | | Cancel Request Item | Cancel Request Item Response |
| 5.4.17 | | Send User Notice | Send User Notice Response |
| 5.4.18 | | Update Agency | Update Agency Response |
| 5.4.19 | | Update Circulation Status | Update Circulation Status Response |
| 5.4.20 | | Update Item | Update Item Response |
| 5.4.21 | | Update Request Item | Update Request Item Response |
| 5.4.22 | | Update User | Update User Response |

| SECTION | SERVICE TYPE | SERVICE | |
|---|---|---|---|
| | | INITIATION MESSAGE | RESPONSE MESSAGE |
| *5.5* | *NOTIFICATION* | | |
| 5.5.1 | | Agency Created | Agency Created Response |
| 5.5.2 | | Agency Updated | Agency Updated Response |
| 5.5.3 | | Circulation Status Change Reported | Circulation Status Change Reported Response |
| 5.5.4 | | Circulation Status Updated | Circulation Status Updated Response |
| 5.5.5 | | Item Checked In | Item Checked In Response |
| 5.5.6 | | Item Checked Out | Item Checked Out Response |
| 5.5.7 | | Item Created | Item Created Response |
| 5.5.8 | | Item Recall Cancelled | Item Recall Cancelled Response |
| 5.5.9 | | Item Recalled | Item Recalled Response |
| 5.5.10 | | Item Received | Item Received Response |
| 5.5.11 | | Item Renewed | Item Renewed Response |
| 5.5.12 | | Item Request Cancelled | Item Request Cancelled Response |
| 5.5.13 | | Item Request Updated | Item Request Updated Response |
| 5.5.14 | | Item Requested | Item Requested Response |
| 5.5.15 | | Item Shipped | Item Shipped Response |
| 5.5.16 | | Item Updated | Item Updated Response |
| 5.5.17 | | User Created | User Created Response |
| 5.5.18 | | User Fiscal Transaction Created | User Fiscal Transaction Created Response |
| 5.5.19 | | User Notice Sent | User Notice Sent Response |
| 5.5.20 | | User Updated | User Updated Response |

## 5.3 Lookup Service Type

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

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

### 5.3.1    Lookup Agency Service

| | |
|---|---|
| **Usage:** | This service requests data about a particular Agency known to the responding application. The initiating application provides the Id of the Agency and the list of elements for which data is requested. |
| **Successful Result:** | The responding application returns the requested data to the initiating application. |
| **Messages and Data Elements:** | |
| *Lookup Agency* | |
| **Required data:** | Agency Element Type (R) <br> Agency Id |
| **Optional data:** | Initiation Header <br> Ext |
| *Lookup Agency Response* | |
| **Required data:** | Agency Id |
| **Optional data:** | Response Header <br> Ext |
| **If requested:** | Agency Address Information (R) <br> Agency User Privilege Type (R) <br> Application Profile Supported Type (R) <br> Authentication Prompt (R) <br> Consortium Agreement (R) <br> Organization Name Information (R) |

### 5.3.2    Lookup Item Service

| | |
|---|---|
| **Usage:** | This service requests data about a particular Item known to the responding application. The initiator provides the Id of the Item and a list of elements for which data is requested. |
| **Successful Result:** | The responding application returns the requested data to the initiating application. |
| **Messages and Data Elements:** | |
| *Lookup Item* | |
| **Required data:** | {Item Id or <br> Request Id} |
| **Optional data:** | Initiation Header <br> Item Element Type (R) <br> Current Borrower Desired <br> Current Requesters Desired <br> Ext |

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| *Lookup Item Response* | |
|---|---|
| **Required data:** | {Item Id and/or<br>Request Id} |
| **Optional data:** | Response Header<br>Ext |
| **If requested:** | Hold Pickup Date<br>Date Recalled<br>Item Transaction<br>Item Optional Fields |

### 5.3.3   Lookup Request Service

| **Usage:** | This service requests data about a particular Request known to the responding application. The initiator provides the Id of the Request and a list of elements for which data is requested. |
|---|---|
| **Successful Result:** | The responding application returns the requested data to the initiating application. |
| **Messages and Data Elements:** | |
| *Lookup Request* | |
| **Required data:** | {{Authentication Input (R) or<br>User Id}<br>Item Id<br>Request Type}, or<br>Request Id |
| **Optional data:** | Initiation Header<br>Request Element Type (R)<br>Item Element Type (R)<br>User Element Type (R)<br>Ext |
| *Lookup Request Response* | |
| **Required data:** | {Item Id, and/or<br>Request Id} |
| **Optional data:** | Response Header<br>User Id<br>Request Type<br>Request Scope Type<br>Request Status Type<br>Hold Queue Position<br>Shipping Information<br>Earliest Date Needed<br>Need Before Date |

| | Pickup Date |
|---|---|
| | Pickup Location |
| | Pickup Expiry Date |
| | Date of User Request |
| | Date Available |
| | Acknowledged Fee Amount |
| | Paid Fee Amount |
| | Item Optional Fields |
| | User Optional Fields |
| | Ext |

### 5.3.4   Lookup User Service

| Usage: | This service requests data about a particular User known to the responding application. The initiator provides the Id of the User and a list of elements for which data is requested. |
|---|---|
| **Successful Result:** | The responding application returns the requested data to the initiating application. |
| **Messages and Data Elements:** | |
| *Lookup User* | |
| **Required data:** | {User Id or<br>Authentication Input (R)} |
| **Optional data:** | Initiation Header<br>User Element Type (R)<br>Loaned Items Desired<br>Requested Items Desired<br>User Fiscal Account Desired<br>Ext |
| *Lookup User Response* | |
| **Required data:** | User Id |
| **Optional data:** | Response Header<br>Ext |
| **If requested:** | User Fiscal Account (R)<br>Loaned Items Count (R)<br>Loaned Item (R)<br>Requested Items Count (R)<br>Requested Item (R)<br>User Optional Fields |

### 5.3.5   Lookup Version Service

It is recognized that this standard may be modified at some future date as the needs of organizations that employ circulation applications dictate. Such modification would yield a new version of this

standard. This, in turn, would very likely give rise to the possibility that not all implementers of the NCIP would be able to complete the necessary changes at the same time and that such implementers would be temporarily out of conformance with the new version of the standard. As a consequence their implementations might be unable to communicate with those that have achieved conformance with the new version. Thus, a mechanism has been devised that will permit applications to communicate on a basic level when an initiation message references a different version of this standard, as well as to inquire *a priori* of another application the version or versions it supports.

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

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

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

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

### 5.3.6   Lookup Item Set Service

Many libraries today are implementing new discovery interfaces (e.g., the eXtensible Catalog, VuFind, WorldCat Local, Blacklight, Summon, Primo) that integrate the library's collection with other resources and offer features not available in their ILS's OPAC, such as faceted browsing. Often these discovery interfaces use indexes built from an extract of their catalog's bibliographic information. With this architecture there is a requirement to retrieve real-time circulation status, location, and other item data from the ILS, as defined by the "GetAvailability" service in the ILS-DI specifications (www.diglib.org/architectures/ilsdi/DLF_ILS_Discovery_1.1.pdf#page=26).

NCIP's Lookup Item is limited to one item per service but doing that would be inefficient, and in some cases impossible to retrieve all of the items for a search result list that displayed, for example, 20 titles. This service is intended to overcome that limitation.

| Usage: | This service requests data about a set of Items known to the responding application. The initiator provides a set of identifiers for the Items and a list of elements for which data is requested. |
|---|---|
| **Successful Result:** | The responding application returns the requested data to the initiating application. |
| **Messages and Data Elements:** | |
| *Lookup Item Set* | |
| **Required data:** | {Bibliographic Id, or<br><br>Holdings Set Id, or<br><br>Item Id} |
| **Optional data:** | Item Element Type<br>Current Borrower Desired<br>Current Requesters Desired<br>Maximum Items Count<br>Next Item Token |
| *Lookup Item Set Response* | |
| **Required data:** | Problem, or<br><br>Bib Information |
| **Optional data:** | Next Item Token |
| **If requested:** | Current Borrower (inside Item Information)<br>Current Requester (inside Bib Information) |

### 5.3.6.1  Using Maximum Items Count and Next Item Token

In lookup services such as Lookup Item Set, where it is possible for the response message size to become so large as to be unparseable or otherwise unuseable by the initiator, the initiation message provides a Maximum Items Count element that limits the maximum number of items that the responder may return in the response message. There is still a potential for the response message size to vary greatly due to the amount of data associated with each item, and initiators are expected to account for this possibility when they set its value.

If a responder determines that the number of items matching the identifiers in the initiation message would exceed the Maximum Items Count, it should limit the number that are actually returned to less than or equal to the Maximum Items Count and also return a Next Item Token in the response message. When there are no further items to be returned, the Next Item Token must be omitted from the response.

The exact nature of the string value of a Next Item Token is not defined by this standard, but the following guidelines are suggested:

1. The token's size should be small relative to the rest of the response message so as not to defeat its purpose.

2. Some examples of what the token might be are: a key to temporary storage such as a web server's session object, a row number in a result set, or the address of an object in memory.

3. The token is intended to be opaque to the initiator, i.e., the initiator should not expect its value to be meaningful.

4. As the examples in #2 suggest, the intent is that the responder could, if it gets this token back in a subsequent message, identify the remaining item records to return in that response.

This standard does not define the length of time over which a Next Item Token will be valid; consequently initiators may encounter situations where a subsequent service invocation fails because the Next Item Token is no longer valid. Implementers of responders are encouraged to make this a tuneable parameter as the "right" duration will probably vary by application workflow and resources made available to the NCIP responder.

The only valid usage of the Next Item Token is in an invocation of the same service, where "same service" is defined here as a service that is invoked with the same content as a prior service except with the addition of a Next Item Token. This allows a responder to assume that the identifiers of the set of items are provided in the same order and that the Maximum Items Count has the same value.

What follows are two examples of the use of Next Item Token. These examples are intended only to highlight the diversity of approaches that might be taken by a responder in using the Next Item Token. (For both examples, assume a Maximum Items Count of 10 and that 24 items match the identifiers in the initiation message.)

In the first example, the responder uses a SQL database to store item information. The Next Item Token is a *count* of the number of previous invocations of the service. Notice that the responder does not have to hold the SQL result set over the interval between the invocations.

**Example 1: Use of Next Item Token for count of previous invocations**

| Invocation | Initiation message's Next Item Token | Process in the responder | Response message's Next Item Token |
|---|---|---|---|
| First | (not present) | Build SQL query; return items from row #s 1-10. | 1 |
| Second | 1 | Re-build SQL query; return items from row #s 11-20. | 2 |
| Third | 2 | Re-build SQL query; return items from rows #s 21-24. | (not present) |

In the second example the responder retrieves all of the item data on the first invocation, composes every response message needed to return the entire set of items, and stores them in an in-memory stack. The Next Item Token is the *memory address* of the stack.

**Example 2: Use of Next Item Token for memory address**

| Invocation | Initiation message's Next Item Token | Process in the responder | Response message's Next Item Token |
|---|---|---|---|
| First | (not present) | Retrieve all items, compose all three response messages, store the 2nd and 3rd in an in-memory stack, and return the first message. | 0x09d198f1ea429 |

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| Second | 0x09d198f1ea429 | Remove the 2nd message from the in-memory stack and return it. | 0x09d198f1ea429 |
|--------|-----------------|----------------------------------------------------------------|-----------------|
| Third | 0x09d198f1ea429 | Remove the 3rd message from the in-memory stack and return it. | (not present) |

Notice that in the first illustration the responder retains absolutely no state about the service, while in the second illustration the responder maintains a significant amount of state. Yet in neither case is that aspect of the responders design exposed to the initiator, which should allow the broadest range of applications to interoperate without prior agreement on such details.

## 5.4   Update Service Type

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

Update Services are presented below in alphabetical order (except for cancel and undo services, which are grouped with the respective services they are intended to negate). However, the data elements are presented in the order in which they appear in the schema. The update services are summarized in Table 1.

### 5.4.1   Accept Item Service

| **Usage:** | This service requests that the responding application accept an Item to be circulated to a User. The responding application may be a third party that has no prior knowledge of either the User or the Item. The initiation message identifies the action the responding agency is requested to take when it receives the item. The request may include a date by which the initiating application requires the Item to be returned, an indication that the user may apply to renew the loan of the Item, and financial data relating to the supply of the Item. If there is a possibility that the responding application has no prior knowledge of either the User or the Item, the request may optionally include data about the User and/or the Item. |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

| Successful Result: | The responder accepts the Item for the action specified. It returns the Request Id. It may optionally provide an Item Id that the initiating application may use to reference the Item in subsequent messages. |
|---|---|
| **Messages and Data Elements:** | |
| *Accept Item* | |
| **Required data:** | Request Id<br>Requested Action Type |
| **Optional data:** | Initiation Header<br>Mandated Action<br>User Id<br>Item Id<br>{Date for Return or<br>Indeterminate Loan Period Flag or<br>Non Returnable Flag}<br>Renewal Not Permitted<br>Fiscal Transaction Information<br>Item Optional Fields<br>User Optional Fields<br>Pickup Location<br>Pickup Expiry Date<br>Ext |
| *Accept Item Response* | |
| **Required data:** | Request Id |
| **Optional data:** | Response Header<br>Item Id<br>Ext |

### 5.4.2   Check In Item Service

| Usage: | This service requests that the responding application check in an Item. It also permits the initiating application to request data about the User and/or Item involved with this check in. |
|---|---|
| Successful Result: | The responder checks in the Item and returns any routing data, fine/fee data, and/or requested User or Item data. |
| **Messages and Data Elements:** | |
| *Check In Item* | |
| **Required data:** | Item Id |
| **Optional data:** | Initiation Header |

|  | Mandated Action |
|---|---|
|  | Item Element Type (R) |
|  | User Element Type (R) |
|  | Ext |
| *Check In Item Response* | |
| **Required data:** | Item Id |
| **Optional data:** | Response Header |
|  | User Id |
|  | Routing Information |
|  | Fiscal Transaction Information |
|  | Ext |
| **If requested:** | Item Optional Fields |
|  | User Optional Fields |

### 5.4.3 Check Out Item Service

| **Usage:** | This service requests that the responding application check out an Item to a User. It also permits the initiating application to acknowledge the fee amount (if any) associated with the check out. The initiating application may also request data about the User and/or Item involved with this check out. |
|---|---|
| **Successful Result:** | The responding application checks out the Item to the User until the date indicated in the response. It may also supply the data elements requested. |
| **Messages and Data Elements:** | |
| *Check Out Item* | |
| **Required data:** | {User Id or |
|  | Authentication Input (R)} |
|  | Item Id |
| **Optional data:** | Initiation Header |
|  | Mandated Action |
|  | Request Id |
|  | Acknowledged Fee Amount |
|  | Paid Fee Amount |
|  | Acknowledged Item Use Restriction Type (R) |
|  | Shipping Information |
|  | Resource Desired |
|  | Desired Date Due |
|  | Item Element Type (R) |
|  | User Element Type (R) |
|  | Ext |

| *Check Out Item Response* | |
|---|---|
| **Required data:** | {Item Id<br>User Id<br>{Date Due or<br>Indeterminate Loan Period Flag or<br>Non Returnable Flag}} |
| **Optional data:** | Response Header<br>Renewal Count<br>Fiscal Transaction Information<br>Ext |
| **If requested:** | Electronic Resource<br>Item Optional Fields<br>User Optional Fields |
| **Problem response:** | Response Header (optional)<br>Problem (R, required) and<br>Required Fee Amount (optional) and<br>Required Item Use Restriction Type (R, optional)<br>Ext (optional) |

### 5.4.4 Undo Check Out Item Service

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

| Optional data: | Response Header |
| --- | --- |
| | User Id |
| | Fiscal Transaction Information |
| | Ext |

### 5.4.5 Create Agency Service

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

### 5.4.6 Create Item Service

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

| Optional data: | Initiation Header |
| --- | --- |
| | Mandated Action |
| | Item Id |
| | Request Id |
| | Item Use Restriction Type (R) |
| | Circulation Status |
| | Item Description |
| | Location (R) |
| | Physical Condition |
| | Security Marker |
| | Sensitization Flag |
| | Ext |
| *Create Item Response* | |
| Required data: | Item Id |
| Optional data: | Response Header |
| | Ext |

### 5.4.7 Create User Service

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

| Optional data: | Response Header |
| --- | --- |
| | Ext |

### 5.4.8 Create User Fiscal Transaction Service

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

### 5.4.9 Delete Item Service

| Usage: | This service asks that the responding application delete an item record. This may also result in deletion of the associated bibliographic record, depending on the rules of the responding application. The purpose of this service is to enable applications to remove unnecessary items in weeding and binding situations as well as cleaning up after creation of a temporary item. The initiating application provides an identifier and the responder is not required to return any data other than an acknowledgement or an error. |
| --- | --- |
| **Successful Result:** | The responding application deletes the item specified by the initiating application. |
| **Messages and Data Elements:** | |
| *Delete Item* | |
| **Required data:** | Item Id |

| Optional data: | Initiation Header<br>Mandated Action<br>Ext |
|---|---|
| *Delete Item Response* | |
| Required data: | Item Id |
| Optional data: | Response Header<br>Ext |

### 5.4.10  Delete User Service

| Usage: | This service asks that the responding application delete a User. This service is intended to enable resource sharing systems and similar applications to remove temporary users created during request processes. The initiating application provides an identifier and the responder is not required to return any data other than an acknowledgement or an error. |
|---|---|
| Successful Result: | The responding application deletes the user record specified by the initiating application. |
| **Messages and Data Elements:** | |
| *Delete User* | |
| Required data: | User Id or<br>Authentication Input (R) |
| Optional data: | Initiation Header<br>Mandated Action<br>Ext |
| *Delete User Response* | |
| Required data: | User Id |
| Optional data: | Response Header<br>Ext |

### 5.4.11  Recall Item Service

| Usage: | This service requests that the responding application recall an Item from a User. The initiating application may propose a new date due for the Item. The initiating application may also request data about the User and/or Item involved with this recall. |
|---|---|
| Successful Result: | The responding application agrees to recall the Item and to take appropriate action. It may supply the new date on which the Item is now due. It may supply the data elements requested. |

| Messages and Data Elements: | |
|---|---|
| *Recall Item* | |
| **Required data:** | Item Id |
| **Optional data:** | Initiation Header<br>Mandated Action<br>Desired Date Due<br>Shipping Information<br>Item Element Type (R)<br>User Element Type (R)<br>Ext |
| *Recall Item Response* | |
| **Required data:** | Item Id |
| **Optional data:** | Response Header<br>User Id<br>Date Due<br>Fiscal Transaction Information<br>Ext |
| **If requested:** | Item Optional Fields<br>User Optional Fields |

### 5.4.12  Cancel Recall Item Service

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

| **Optional data:** | Response Header |
| | User Id |
| | Fiscal Transaction Information |
| | Ext |
| **If requested:** | Item Optional Fields |
| | User Optional Fields |

### 5.4.13  Renew Item Service

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

| Optional data: | Response Header |
| --- | --- |
| | User Id |
| | Date Due |
| | Date For Return |
| | Renewal Count |
| | Fiscal Transaction Information |
| | Ext |
| **If requested:** | Item Optional Fields |
| | User Optional Fields |
| **Problem response:** | Response Header (optional) |
| | Problem (R, required) and |
| | Required Fee Amount (optional) |
| | Required Item Use Restriction Type (R, optional) |
| | Ext (optional) |

### 5.4.14  Report Circulation Status Change Service

| Usage: | This service requests that the responding application mark an Item as reported returned, missing, lost, or never borrowed. The initiating application may also request data about the User and/or Item involved with this status change. |
| --- | --- |
| **Successful Result:** | The responding application marks the Item as specified by the initiator. It may also supply the data elements requested. |
| **Messages and Data Elements:** | |
| *Report Circulation Status Change* | |
| **Required data:** | Item Id |
| | {User Id or |
| | Authentication Input (R)} |
| | {Item Reported Returned or |
| | Item Reported Never Borrowed or |
| | Item Reported Lost or |
| | Item Reported Missing} |
| **Optional data:** | Initiation Header |
| | Mandated Action |
| | Item Element Type (R) |
| | User Element Type (R) |
| | Ext |
| *Report Circulation Status Change Response* | |
| **Required data:** | Item Id |

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| Optional data: | Response Header |
| --- | --- |
| | User Id |
| | Ext |
| **If requested:** | Item Optional Fields |
| | User Optional Field |

### 5.4.15 Request Item Service

| Usage: | This service requests that the responding application place a request on an Item for a User whether or not the Item is immediately available. The initiating application indicates the type of request being made. The initiating application may optionally provide an acknowledgement of the fee to be charged for the service. The initiating application may also request data about the User and/or Item involved with this request. |
| --- | --- |
| **Successful Result:** | The responding application places the request and provides data about where the Item may be picked up and the date it expects the Item to be available. It may also supply the data elements requested. |
| **Messages and Data Elements:** | |
| *Request Item* | |
| **Required data:** | {User Id or |
| | Authentication Input (R)} |
| | {Item Id (R) and/or |
| | Bibliographic Id (R)} |
| | Request Type |
| | Request Scope Type |
| **Optional data:** | Initiation Header |
| | Mandated Action |
| | Request Id |
| | Item Optional Fields |
| | Shipping Information |
| | Earliest Date Needed |
| | Need Before Date |
| | Pickup Location |
| | Pickup Expiry Date |
| | Acknowledged Fee Amount |
| | Paid Fee Amount |
| | Acknowledged Item Use Restriction Type (R) |
| | Item Element Type (R) |
| | User Element Type (R) |
| | Ext |

| *Request Item Response* | |
|---|---|
| **Required data:** | {Item Id and/or<br>Request Id}<br>User Id<br>Request Type<br>Request Scope Type} |
| **Optional data:** | Response Header<br>Shipping Information<br>Date Available<br>Hold Pickup Date<br>Fiscal Transaction Information<br>Ext |
| **If requested:** | Item Optional Fields<br>User Optional Fields |
| **Problem response:** | Response Header (optional)<br>Problem (R, required) and<br>Required Fee Amount (optional)<br>Required Item Use Restriction Type (R, optional)<br>Ext (optional) |

### 5.4.16 Cancel Request Item Service

| **Usage:** | This service requests that the responding application cancel a previous request for an Item. The initiating application may also request data about the User and/or Item involved with this request cancellation. |
|---|---|
| **Successful Result:** | The responding application cancels the request. It may provide updated fiscal data about the User. It may also supply the data elements requested. |
| **Messages and Data Elements:** | |
| *Cancel Request Item* | |
| **Required data:** | {User Id or<br>Authentication Input (R)}<br>{Item Id and/or<br>Request Id}<br>Request Type |

| Optional data: | Initiation Header |
| --- | --- |
| | Mandated Action |
| | Request Scope Type |
| | Acknowledged Fee Amount |
| | Paid Fee Amount |
| | Item Element Type (R) |
| | User Element Type (R) |
| | Ext |
| ***Cancel Request Item Response*** | |
| Required data: | {Item Id and/or |
| | Request Id} |
| | User Id |
| Optional data: | Response Header |
| | Fiscal Transaction Information |
| | Ext |
| If requested: | Item Optional Fields |
| | User Optional Fields |

### 5.4.17 Send User Notice Service

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

| Optional data: | Response Header |
| --- | --- |
| | {Date Sent or |
| | Date Will Send} |
| | Ext |

### 5.4.18 Update Agency Service

| Usage: | This service requests that the responding application update data about an Agency. The initiating application provides elements to be deleted with the value for each element and/or elements to be added with the value for each element. If the initiating application is changing the value for an existing element, it must include that element in both the delete and add sections of the message. |
| --- | --- |
| Successful Result: | The responding application updates data about the Agency as specified by the initiating application. |
| **Messages and Data Elements:** | |
| *Update Agency* | |
| Required data: | Agency Id |
| Optional data: | Initiation Header |
| | Mandated Action |
| | Delete Agency Fields |
| | Add Agency Fields |
| | Ext |
| *Update Agency Response* | |
| Required data: | Agency Id |
| Optional data: | Response Header |
| | Ext |

### 5.4.19 Update Circulation Status Service

| Usage: | This service requests that the responding application update the circulation status of an Item. The initiating application provides the Id of the item Id and the new circulation status. |
| --- | --- |
| Successful Result: | The responding application updates the circulation status as specified by the initiating application. |

| Messages and Data Elements: | |
|---|---|
| *Update Circulation Status* | |
| **Required data:** | Item Id<br>Circulation Status |
| **Optional data:** | Initiation Header<br>Mandated Action<br>Ext |
| *Update Circulation Status Response* | |
| **Required data:** | Item Id |
| **Optional data:** | Response Header<br>Ext |

### 5.4.20  Update Item Service

| Usage: | This service requests that the responding application update data about an Item. The initiating application provides elements to be deleted with the value for each element and/or elements to be added with the value for each element. If the initiating application is changing the value for an existing element, it must include that element in both the delete and add sections of the message. This service cannot be used to change the circulation status of an Item. |
|---|---|
| **Successful Result:** | The responding application updates data about the Item as specified by the initiating application. |
| **Messages and Data Elements:** | |
| *Update Item* | |
| **Required data:** | Item Id |
| **Optional data:** | Initiation Header<br>Mandated Action<br>Delete Item Fields<br>Add Item Fields<br>Ext |
| *Update Item Response* | |
| **Required data:** | Item Id |
| **Optional data:** | Response Header<br>Ext |

### 5.4.21  Update Request Item Service

| | |
|---|---|
| **Usage:** | This service asks that the responding application update data about a request for an Item made by a User. The initiating application provides elements to be deleted with the value for each element and/or elements to be added with the value for each element. If the initiating application is changing the value for an existing element, it must include that element in both the delete and add sections of the message. |
| **Successful Result:** | The responding application updates the Item request as specified by the initiating application. |
| **Messages and Data Elements:** | |
| *Update Request Item* | |
| **Required data:** | {{User Id, or<br>Authentication Input (R)}<br>Item Id<br>Request Type} or<br>Request Id |
| **Optional data:** | Initiation Header<br>Mandated Action<br>Delete Request Fields<br>Add Request Fields<br>Item Element Type (R)<br>User Element Type (R)<br>Ext |
| *Update Request Item Response* | |
| **Required data:** | Item Id<br>User Id<br>Request Type<br>Request Scope Type |
| **Optional data:** | Response Header<br>Date Available<br>Hold Pickup Date<br>Fiscal Transaction Information<br>Item Optional Fields<br>User Optional Fields<br>Ext |
| **Problem response:** | Response Header (optional)<br>Problem (R, required) and<br>Required Fee Amount (optional)<br>Required Item Use Restriction Type (R, optional)<br>Ext (optional) |

**5.4.22  Update User Service**

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

## 5.5   Notification Service Type

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

As was stated in the introductory matter for Section 5.2, the notification service responses always adhere to the following pattern:

- Response Header – optional

- Problem (R) – optional

- Ext – optional

Therefore, the responses will not be described in conjunction with each individual Notification service.

The Notification Services, summarized in Table 1, are presented below in alphabetical order. However, the data elements are presented in the order in which they appear in the schema.

### 5.5.1 Agency Created Service

| Usage: | This service informs the responding application that a new Agency has been created. The initiating application provides the Agency Id and details about the Agency. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Agency Created* | |
| **Required data:** | Agency Id<br>Organization Name Information (R) |
| **Optional data:** | Initiation Header<br>Agency Address Information (R)<br>Authentication Prompt (R)<br>Application Profile Supported Type (R)<br>Consortium Agreement (R)<br>Agency User Privilege Type (R)<br>Ext |

### 5.5.2 Agency Updated Service

| Usage: | This service informs the responding application that one or more data elements of an Agency have been updated. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Agency Updated* | |
| **Required data:** | Agency Id |
| **Optional data:** | Initiation Header<br>Delete Agency Fields<br>Add Agency Fields<br>Ext |

### 5.5.3   Circulation Status Change Reported Service

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

### 5.5.4   Circulation Status Updated Service

| Usage: | This service informs the responding application that the circulation status of an Item has been updated. The initiating application provides the unique Id of the item Id and the new circulation status. Only the following three values from Circulation Status are valid here: Renew Still Pending, Item Not Renewed, or Item Overdue. No other values of Circulation Status are permitted for this service. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Circulation Status Updated* | |
| **Required data:** | Item Id<br>Circulation Status |
| **Optional data:** | Initiation Header<br>Ext |

### 5.5.5   Item Checked In Service

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

### 5.5.6   Item Checked Out Service

| Usage: | This service informs the responding application that an Item has been checked out to a User. The initiating application provides the Item Id and User Id involved in the check out, and may optionally provide other details associated with the check out. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Item Checked Out* | |
| **Required data:** | User Id |
| | Item Id |
| | {Date Due, or |
| | Indeterminate Loan Period Flag |
| | Non Returnable Flag} |

| **Optional data:** | Initiation Header |
|---|---|
| | Request Id |
| | Electronic Resource Provided Flag |
| | Renewal Count |
| | Fiscal Transaction Information |
| | Shipping Information |
| | Item Optional Fields |
| | User Optional Fields |
| | Ext |

### 5.5.7  Item Created Service

| **Usage:** | This service informs the responding application that a new Item has been created. The initiating application provides the Item Id and details about the Item, and may optionally provide other details associated with the Item. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Item Created* | |
| **Required data:** | Item Id |
| | Bibliographic Description |
| **Optional data:** | Initiation Header |
| | Request Id |
| | Item Use Restriction Type (R) |
| | Circulation Status |
| | Item Description |
| | Location (R) |
| | Physical Condition |
| | Security Marker |
| | Sensitization Flag |
| | Ext |

### 5.5.8  Item Recall Cancelled Service

| **Usage:** | This service informs the responding application that a recall has been cancelled. The initiating application provides the Item Id, and may optionally provide the User Id and other data related to cancellation of the recall. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |

| Messages and Data Elements: | |
|---|---|
| *Item Recall Cancelled* | |
| **Required data:** | Item Id |
| **Optional data:** | Initiation Header<br>User Id<br>Fiscal Transaction Information<br>Item Optional Fields<br>User Optional Fields<br>Ext |

### 5.5.9 Item Recalled Service

| Usage: | This service informs the responding application that an Item has been recalled. The initiating application provides the Item Id of the recalled item and a new due date, and may optionally provide other details associated with the recall. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Item Recalled* | |
| **Required data:** | Item Id<br>Date Due |
| **Optional data:** | Initiation Header<br>User Id<br>Shipping Information<br>Item Optional Fields<br>User Optional Fields<br>Ext |

### 5.5.10 Item Received Service

| Usage: | This service informs the responding application that an agency has received an item. If the item has been received on behalf of a user, then data about that User should also be included in the message. The initiating application may optionally provide other details associated with the receipt of the Item. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |

| **Messages and Data Elements:** | |
| --- | --- |
| *Item Received* | |
| **Required data:** | Item Id<br>Date Received |
| **Optional data:** | Initiation Header<br>User Id<br>Request Id<br>Item Optional Fields<br>User Optional Fields<br>Ext |

### 5.5.11  Item Renewed Service

| **Usage:** | This service informs the responding application that an Item has been renewed. The initiating application provides the Item Id and the new due date, and may optionally supply other details associated with the renewal. |
| --- | --- |
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Item Renewed* | |
| **Required data:** | Item Id<br>Date Due |
| **Optional data:** | Initiation Header<br>User Id<br>Renewal Count<br>Fiscal Transaction Information<br>Item Optional Fields<br>User Optional Fields<br>Ext |

### 5.5.12  Item Request Cancelled Service

| **Usage:** | This service informs the responding application that a request for an Item has been cancelled. The initiating application provides the Item Id and/or Request Id, and the User Id, and the type of the request being cancelled. It may optionally provide other details associated with the request being cancelled. |
| --- | --- |
| **Successful Result:** | The responding application replies that it understood the notification message. |

| Messages and Data Elements: | |
|---|---|
| *Item Request Cancelled* | |
| **Required data:** | User Id<br>{Item Id, or<br>{Request Id, and, optionally<br>Item Id}}<br>Request Type |
| **Optional data:** | Initiation Header<br>Request Scope Type<br>Fiscal Transaction Information<br>Item Optional Fields<br>User Optional Fields<br>Ext |

**5.5.13 Item Request Updated Service**

| | |
|---|---|
| **Usage:** | This service informs the responding application that a request for an Item has been updated. The initiating application provides the Item Id and the User Id, or the Request Id. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message. Other data may also be provided. |
| **Successful Result:** | The responding application replies that it understood the notification message. |
| Messages and Data Elements: | |
| *Item Request Updated* | |
| **Required data:** | {User Id<br>Item Id<br>Request Type}, or<br>Request Id |
| **Optional data:** | Initiation Header<br>Delete Request Fields<br>Add Request Fields<br>Item Optional Fields<br>User Optional Fields<br>Ext |

#### 5.5.14  Item Requested Service

| Usage: | This service informs the responding application that a request for an Item, which may not be immediately available, has been made. The initiating application provides the Item Id, or the Request Id and Bibliographic Id. It also provides the User Id and the type of request being made. It may also optionally provide other details related to the request. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Item Requested* | |
| **Required data:** | User Id<br>{Item Id, or<br>{Bibliographic Id<br>Request Id}}<br>Request Type<br>Request Scope Type |
| **Optional data:** | Initiation Header<br>Shipping Information<br>Earliest Date Needed<br>Need Before Date<br>Pickup Location<br>Pickup Expiry Date<br>Date Of User Request<br>Date Available<br>Item Optional Fields<br>User Optional Fields<br>Ext |

#### 5.5.15  Item Shipped Service

| Usage: | This service informs the responding application that an Agency has shipped an Item. The date when the Item was shipped and the address to which it was shipped must be included in the message. When shipment supports a user request, User data should be supplied with the message. The initiating application may also provide other details associated with shipment of the Item. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |

| **Messages and Data Elements:** | |
|---|---|
| *Item Shipped* | |
| **Required data:** | {Item Id, or <br> {Request Id, and, optionally <br> Item Id}} <br> Date Shipped <br> Shipping Information |
| **Optional data:** | Initiation Header <br> User Id <br> Item Optional Fields <br> User Optional Fields <br> Ext |

### 5.5.16  Item Updated Service

| **Usage:** | This service informs the responding application that one or more data elements of an Item have been updated. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message. This service may not be used to report changes to circulation status. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *Item Updated* | |
| **Required data:** | Item Id |
| **Optional data:** | Initiation Header <br> Delete Item Fields <br> Add Item Fields <br> Ext |

### 5.5.17  User Created Service

| **Usage:** | This service informs the responding application that a record for a user has been created. The initiating application provides Name Information and the User Id and may optionally provide additional data about the new User. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |

| **Messages and Data Elements:** | |
|---|---|
| *User Created* | |
| **Required data:** | User Id |
| | Name Information |
| **Optional data:** | Initiation Header |
| | User Address Information (R) |
| | Date Of Birth |
| | User Language (R) |
| | User Privilege (R) |
| | Block Or Trap (R) |
| | Ext |

### 5.5.18 User Fiscal Transaction Created Service

| **Usage:** | This service informs the responding application that a new fiscal transaction has been applied to a User's fiscal account. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *User Fiscal Transaction Created* | |
| **Required data:** | User Id |
| | Fiscal Transaction Information |
| **Optional data:** | Initiation Header |
| | Ext |

### 5.5.19 User Notice Sent Service

| **Usage:** | This service informs the responding application that a notice has been sent to a User. The initiating application provides the User Id, the type of notice, and details about the notice. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *User Notice Sent* | |
| **Required data:** | User Id |
| | Date Sent |
| | User Notice Details |
| **Optional data:** | Initiation Header |
| | Ext |

### 5.5.20  User Updated Service

| Usage: | This service informs the responding application that one or more data elements of a User have been updated. The initiating application provides elements that have been deleted with the value for each element and/or elements that have been added with the value for each element. If the value for an existing element has changed, the message must include that element in both the delete and add sections of the message. |
|---|---|
| **Successful Result:** | The responding application replies that it understood the notification message. |
| **Messages and Data Elements:** | |
| *User Updated* | |
| **Required data:** | User Id |
| **Optional data:** | Initiation Header<br>Delete User Fields<br>Add User Fields<br>Ext |

# 6   Data Dictionary

## 6.1   Introduction

This section includes a list of the data elements used in the messages defined in Section 5.

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

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

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

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

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

can use the optional Scheme attribute to include the URI for that scheme. This allows optional validation of the value for those desiring to do validation.

## 6.2 Data Elements and their Definitions

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

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

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

### 6.2.1 Data Types

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

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

### 6.2.2 Required Usage

The data dictionary includes a statement of usage requirements for each simple element in relation to the complex data element of which it is a component. In the data dictionary, this information is carried in the definition of the simple elements. Where more detailed explanations of the inter-dependencies of component elements are required, these are part of definitions of the relevant complex elements.

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

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

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

## 6.3   The Data Dictionary

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

| Data Element Name | Data Element Definition |
|---|---|
| Item Description | Occurs 0 or 1 time. |
| Location | Occurs 0 or more times. |
| Physical Condition | Occurs 0 or 1 time. |
| Security Marker | Occurs 0 or 1 time. |
| Sensitization Flag | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Add Request Fields** | Complex element used to identify data elements that can be added as part of the Update Request Item and Item Request Updated services. |
| User Id | Occurs 0 or 1 time. |
| Item Id | Occurs 0 or 1 time. |
| Request Type | Occurs 0 or 1 time. |
| Request Scope Type | Occurs 0 or 1 time. |
| Request Status Type | Occurs 0 or 1 time. |
| Shipping Information | Occurs 0 or 1 time. |
| Earliest Date Needed | Occurs 0 or 1 time. |
| Need Before Date | Occurs 0 or 1 time. |
| Pickup Location | Occurs 0 or 1 time. |
| Pickup Expiry Date | Occurs 0 or 1 time. |
| Date Of User Request | Occurs 0 or 1 time. |
| Date Available | Occurs 0 or 1 time. |
| Acknowledged Fee Amount | Occurs 0 or 1 time. |
| Paid Fee Amount | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Add User Fields** | Complex element used to identify data elements that can be added as part of the Update User and User Updated services. |
| Authentication Input | Occurs 0 or more times. |
| Name Information | Occurs 0 or 1 time. |
| User Address Information | Occurs 0 or more times. |
| Date Of Birth | Occurs 0 or 1 time. |
| User Language | Occurs 0 or more times. |
| User Privilege | Occurs 0 or more times. |
| Block Or Trap | Occurs 0 or more times. |
| Ext | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| **Agency Address Information** | Information about an Agency's physical or electronic address.<br>*Source*: Data structure adapted from preliminary draft of ISO 2146. |
|     Agency Address Role Type | Text string; describes the purpose or role of the address associated with an Agency. An address may serve more than one purpose or role for an Agency.<br>Occurs 1 and only 1 time.<br>Examples: billing, shipping, invoicing |
|         Scheme | Occurs 0 or 1 time. |
|     Valid From Date | Occurs 0 or 1 time. |
|     Valid To Date | Occurs 0 or 1 time. |
|     Physical Address | Occurs 1 and only 1 time, but only if Electronic Address is not present. |
|     Electronic Address | Occurs 1 and only 1 time, but only if Physical Address is not present. |
|     Ext | Occurs 0 or 1 time. |
| **Agency Element Type** | Text string; identifies the elements of the Agency Object on which queries (i.e., lookups) can be made. Examples:<br>Agency Address Information<br>Agency User Privilege Type<br>Application Profile Supported Type<br>Authentication Prompt<br>Consortium Agreement<br>Organization Name Information |
|     Scheme | Occurs 0 or 1 time. |
| **Agency Id** | Text string; identifies an Agency.<br>Examples: MARC Organization Code List maintained by the Library of Congress, Canadian Library Symbols |
|     Scheme | Occurs 0 or 1 time. |
| **Agency User Privilege Type** | Text string; identifies the types of privileges that may be granted by a particular Agency or available to Users of a specific Agency.<br>Examples: undergraduate, graduate, faculty (for a university); adult, child (for a public library) |
|     Scheme | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| **Amount** | The amount of a fiscal charge or fee. |
|    Currency Code | Text string; indicates the type of currency of a particular sum of money.<br><br>Occurs 1 and only 1 time.<br><br>Examples: Canadian dollar: CAD; Egyptian pound: EGP<br><br>Note: Although standard codes representing monetary currency for government entities are listed in ISO 4217, the designation of Currency Code as an open enumerated type permits libraries to develop additional schemes for library "pseudo-currencies," such as IFLA vouchers used for ILL. |
|       Scheme | Occurs 0 or 1 time. |
|    Monetary Value | Integer expressed as positive, negative, or zero, multiplied by ten to the power M, where M is the value of the Minor unit for that currency as defined in ISO 4217, Section 6. Gives the Amount in terms of the value of Currency Code.<br><br>Occurs 1 and only 1 time. |
|    Ext | Occurs 0 or 1 time. |
| **Application Profile Supported Type** | Text string; identifies the Application Profiles supported by an Agency. |
|    Scheme | Occurs 0 or 1 time. |
| **Application Profile Type** | Text string; identifies for each Circulation Interchange Protocol service the Application Profile under which the message is sent. Application Profiles define the context of the interchange between applications, for example, between circulation and self-service application; between circulation and ILL applications; or between disparate circulation applications within a consortium. |
|    Scheme | Occurs 0 or 1 time. |
| **Authentication Data Format Type** | Text string; identifies the format of the authentication data that an Agency requires.<br><br>Examples: text, audio, image |
|    Scheme | Occurs 0 or 1 time. |
| **Authentication Input** | Information, such as a password, provided by a User when prompted; used to authenticate the User. |
|    Authentication Input Data | Text string input by a User in response to an authentication prompt. The nature of the data is specified by Authentication Data Format Type.<br><br>Occurs 1 and only 1 time. |
|    Authentication Data Format Type | Occurs 1 and only 1 time. |
|    Authentication Input Type | Text string; identifies the nature of the data to be supplied to authenticate a User.<br><br>Occurs 1 and only 1 time.<br><br>Examples: Barcode Id, PIN, User Name |

| Data Element Name | | | Data Element Definition |
|---|---|---|---|
| | | Scheme | Occurs 0 or 1 time. |
| | Ext | | Occurs 0 or 1 time. |
| **Authentication Prompt** | | | Agency-specific data; used to prompt a User for entry of authentication data. |
| | Prompt Output | | |
| | | Authentication Prompt Data | Text string(s) of the type specified by Authentication Prompt Type; representing prompts used by an Agency to request input of authentication data. Occurs 1 and only 1 time. |
| | | Authentication Prompt Type | Text string; identifies the format of the authentication prompt. Occurs 1 and only 1 time. Examples: text, audio, image |
| | | Scheme | Occurs 0 or 1 time. |
| | | Ext | Occurs 0 or 1 time. |
| | Prompt Input | | |
| | | Authentication Input Type | Occurs 1 and only 1 time. |
| | | Authentication Data Format Type | Occurs 1 and only 1 time. |
| | | Sensitive Data Flag | Empty element; indicates whether or not authentication input should be treated as sensitive data. Occurs 0 or 1 time. |
| | | Ext | Occurs 0 or 1 time. |
| | Ext | | Occurs 0 or 1 time. |
| **Bib Information** | | | A wrapper for bibliographic and holdings information useful when describing a set of Items sharing common bibliographic or holdings data. |
| | Bibliographic Id | | Occurs 0 or 1 time. |
| | Bibliographic Description | | Occurs 0 or 1 time but only if Problem is not present in the same Bib Information. |
| | Title Hold Queue Length | | Non-negative integer; indicates the number of holds, reserves, or pages for any or all Items associated with a bibliographic entity. Occurs 0 or 1 time but only if Problem is not present in the same Bib Information. |
| | Current Requester | | Occurs 0 or more times but only if Problem is not present in the same Bib Information. |
| | Holdings Set | | Occurs 1 or more times but only if Problem is not present in the same Bib Information. |
| | Problem | | Occurs 1 or more time but only if Bibliographic Description, Title Hold Queue Length, Current Requester, and Holdings Set are not present in the same Bib Information. |

| Data Element Name | Data Element Definition |
|---|---|
| **Bibliographic Description** | |
| Author | Text string; gives the name of person or corporate body responsible for the intellectual or artistic content of an Item, including composers, creators, or originators of an Item. Occurs 0 or 1 time. *Source*: ISO 10161-1 |
| Author Of Component | Text string; gives the name of the author of a bibliographic item that is a component part of another item. Occurs 0 or 1 time. Note: ISO 10161-1 uses the term "author-of-article" to express this concept. |
| Bibliographic Item Id | Occurs 0 or 1 time. |
| Bibliographic Item Identifier | Text string; provides a resource identifier for the bibliographic item. Occurs 1 and only 1 time. Examples: Bibliographic Item Identifier Code = Report Number Bibliographic Item Identifier = NRCC-0020704 |
| Bibliographic Item Identifier Code | Text string; identifies the source of resource identifier associated with the bibliographic item. Occurs 0 or 1 time. Examples: ISBN, ISSN, ISRC, ISMN, UPC, GTIN, Legal Deposit Number, Government Publication Number, CODEN, and Report Number |
| Scheme | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| Bibliographic Record Id | Bibliographic Record Id consists of Bibliographic Record Identifier and a choice of either Bibliographic Record Identifier Code OR Agency Id. Occurs 0 or more times. None of these component elements are repeatable. |
| Bibliographic Record Identifier | Text string; identifies the machine-readable record that describes a bibliographic item. Occurs 1 and only 1 time. |
| Agency Id | In this context, identifies the Agency that is the source of the bibliographic record when that Agency is not listed explicitly as a value in the Bibliographic Record Identifier Code. Occurs 1 and only 1 time, but only if Bibliographic Record Identifier Code is not present. |
| Scheme | Occurs 0 or 1 time. |

| Data Element Name | | | Data Element Definition |
|---|---|---|---|
| | | Bibliographic Record Identifier Code | Text string; identifies the numbering scheme that uniquely identifies a bibliographic record. Code values are usually associated with national bibliographies or bibliographic utilities. <br><br> Occurs 1 and only 1 time, but only if Agency Id is not present. <br><br> Examples: ANBN (Australian National Bibliography Number), BNBN (British National Bibliography Number), LCCN (Library of Congress Control Number), RLIN |
| | | Scheme | Occurs 0 or 1 time. |
| | Ext | | Occurs 0 or 1 time. |
| Component Id | | | Occurs 0 or 1 time. |
| | | Component Identifier Type | Text string; identifies a component part of a bibliographic item. <br><br> Occurs 1 and only 1 time. <br><br> For examples, see Bibliographic Item Identifier. |
| | | Scheme | Occurs 0 or 1 time. |
| | | Component Identifier | Text string; identifies component part of another bibliographic item. <br><br> Occurs 1 and only 1 time. |
| | Ext | | Occurs 0 or 1 time. |
| Edition | | | Text string; gives edition statement that identifies all the copies of an item produced from one master copy or substantially the same type image, having the same contents, and, in the case of non-book materials, issued by a particular publishing agency or group of such agencies. <br><br> Occurs 0 or 1 time. <br> *Source*: ISO 10161-1 |
| Pagination | | | Text string; gives number of pages or leaves in an item or a component part of an item. <br><br> Occurs 0 or 1 time. |
| Place Of Publication | | | Text string; gives geographic location of the publisher, or failing this, of the printer, distributor, or manufacturer. <br><br> Occurs 0 or 1 time. <br> *Source:* ISO 10161-1 |
| Publication Date | | | Text string; gives date of issue of an item as designated by the publisher. <br><br> Occurs 0 or 1 time. <br> *Source:* ISO 10161-1 |
| Publication Date Of Component | | | Text string; gives publication date assigned by the publisher to the component of an item. <br><br> Occurs 0 or 1 time. <br> *Source:* ISO 10161-1 |

| Data Element Name | | Data Element Definition |
|---|---|---|
| Publisher | | Text string; gives name of person(s) or organization(s) responsible for the publication of an item. Occurs 0 or 1 time. *Source:* ISO 10161-1 |
| Series Title Number | | Text string; gives name assigned to a group of separate publications related to one another by the fact that each bears a collective title applying to the group or subgroup as a whole as well as its own title, and the number within that series assigned to one of the pieces. Occurs 0 or 1 time. *Source:* ISO 10161-1 |
| Title | | Text string; gives name of an item (usually assigned by the author or publisher) usually consisting of a word or group of words intended to identify it. Occurs 0 or 1 time. |
| Title Of Component | | Text string; gives title of an item that is a component part of another Item, such as a chapter of a book or an article in an issue of a journal. Occurs 0 or 1 time. Note: ISO 10161-1 uses "title-of-article" to express this concept. |
| Bibliographic Level | | Text string; identifies the level of the bibliographic description of the Item. Occurs 0 or 1 time. Examples: monograph, serial, or collection |
| | Scheme | Occurs 0 or 1 time. |
| Sponsoring Body | | Text string; gives name of corporate body or organization that issued the item or is associated with its authorship. Occurs 0 or 1 time. *Source:* ISO 10161-1 |
| Electronic Data Format Type | | Text string; identifies the format in which electronic data is available for access, download, etc. Occurs 0 or 1 time. Examples: rtf, tiff, mpeg |
| | Scheme | Occurs 0 or 1 time. |
| Language | | Occurs 0 or 1 time. |
| | Scheme | Occurs 0 or 1 time. |
| Medium Type | | Text string; identifies the medium on which the bibliographic item has been produced. Occurs 0 or 1 time. Examples: audio tape, book, machine-readable computer file |
| | Scheme | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| Ext | Occurs 0 or 1 time. |
| **Bibliographic Id** | Unique identification of a bibliographic item by either the Bibliographic Item Id or the Bibliographic Record Id. |
| Bibliographic Item Id | See definition for this element under Bibliographic Description.<br>Occurs 1 and 1 only time, but only if Bibliographic Record Id is not present. |
| Bibliographic Record Id | See definition for this element under Bibliographic Description.<br>Occurs 1 and 1 only time, but only if Bibliographic Item Id is not present. |
| Ext | Occurs 0 or 1 time. |
| **Block Or Trap** | Data specifying the nature of the block or trap. |
| Agency Id | Occurs 1 and only 1 time. |
| Scheme | Occurs 0 or 1 time. |
| Block Or Trap Type | Text string; identifies the type of block or trap imposed by an Agency on a User.<br>Occurs 1 and only 1 time.<br>Examples: block check out, block hold, trap for lost card |
| Scheme | Occurs 0 or 1 time. |
| Valid From Date | Occurs 0 or 1 time. |
| Valid To Date | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Circulation Status** | Text string; indicates the current availability status of a bibliographic item.<br>Examples: available on shelf, on loan, lost<br>*Source*: ISO 10161-1 |
| Scheme | Occurs 0 or 1 time. |
| **Consortium Agreement** | Text string; identifies a consortium agreement to which an Agency is a party. |
| Scheme | Occurs 0 or 1 time. |
| **Current Borrower** | Data specifying the user to whom the item is currently charged. |
| User Id | Occurs 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Current Borrower Desired** | Empty element; indicates whether or not the requester desires information about the User who currently has the Item on loan. |
| **Current Requesters Desired** | Empty element; indicates that the requester desires information about all Users that have requested a specific Item. |

| Data Element Name | Data Element Definition |
|---|---|
| *Note on Dates* | *All date data elements represent a single instant in time and are combinations of date and time of the day values, expressed in Coordinated Universal Time as specified in ISO 8601.* |
| | *Note: Where options for the expression of the representation of date (complete or truncated) and for the format (basic or extended) are allowed in ISO 8601, Implementation Profiles shall specify which options are to be used.* |
| **Date Available** | Date/time type; indicates when the requested Item is expected to be available to the User. |
| **Date Due** | Date/time type; indicates when the loan of an Item is scheduled to end. |
| **Date Event Occurred** | Date/time type; indicates the date and time that the initiating application took the mandated action. |
| **Date For Return** | Date/time type; indicates the date and time specified by the lending Agency for the return of an Item. Initiating applications provide this data when requesting that a responding application accept the Item for circulation to or pick-up by a User. |
| **Date Of Birth** | Date/time type; indicates a User's date of birth. |
| **Date Of User Request** | Date/time type; indicates when a User has issued a request for an Item. |
| **Date Placed** | Date/time type; indicates when a User has placed a request for an Item. |
| **Date Recalled** | Date/time type; indicates when a recall for an Item was issued. |
| **Date Received** | Date/time type; indicates when an Agency received an Item. |
| **Date Reported Returned** | Date/time type; indicates when the User purports to have returned the Item. |
| **Date Sent** | Date/time type; indicates when an Item or a notice was sent. |
| **Date Shipped** | Date/time type; indicates when an Agency shipped an Item. |
| **Date To Send** | Date/time type; indicates when an Item or a notice is to be sent. |
| **Date Will Send** | Date/time type; indicates when an Agency will send an Item or a notice. |
| **Delete Agency Fields** | Complex element used to identify data elements that can be deleted as part of the Update Agency and Agency Updated services. |
| Organization Name Information | Occurs 0 or more times. |
| Agency Address Information | Occurs 0 or more times. |
| Authentication Prompt | Occurs 0 or more times. |

| Data Element Name | Data Element Definition |
|---|---|
|     Application Profile Supported Type | Occurs 0 or more times. |
|     Consortium Agreement | Occurs 0 or more times. |
|     Agency User Privilege Type | Occurs 0 or more times. |
|     Ext | Occurs 0 or 1 time. |
| **Delete Item Fields** | Complex element used to identify data elements that can be deleted as part of the Update Item and Item Updated services. |
|     Bibliographic Description | Occurs 0 or 1 time. |
|     Item Use Restriction Type | Occurs 0 or more times. |
|     Item Description | Occurs 0 or 1 time. |
|     Location | Occurs 0 or more times. |
|     Physical Condition | Occurs 0 or 1 time. |
|     Security Marker | Occurs 0 or 1 time. |
|     Sensitization Flag | Occurs 0 or 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **Delete Request Fields** | Complex element used to identify data elements that can be deleted as part of the Update Request Item and Item Request Updated services. |
|     User Id | Occurs 0 or 1 time. |
|     Item Id | Occurs 0 or 1 time. |
|     Request Type | Occurs 0 or 1 time. |
|     Request Scope Type | Occurs 0 or 1 time. |
|     Request Status Type | Occurs 0 or 1 time. |
|     Shipping Information | Occurs 0 or 1 time. |
|     Earliest Date Needed | Occurs 0 or 1 time. |
|     Need Before Date | Occurs 0 or 1 time. |
|     Pickup Location | Occurs 0 or 1 time. |
|     Pickup Expiry Date | Occurs 0 or 1 time. |
|     Date Of User Request | Occurs 0 or 1 time. |
|     Date Available | Occurs 0 or 1 time. |
|     Acknowledged Fee Amount | Occurs 0 or 1 time. |
|     Paid Fee Amount | Occurs 0 or 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **Delete User Fields** | Complex element used to identify data elements that can be deleted as part of the Update User and User Updated services. |
|     Authentication Input | Occurs 0 or more times. |

| Data Element Name | Data Element Definition |
|---|---|
| Name Information | Occurs 0 or 1 time. |
| User Address Information | Occurs 0 or more times. |
| Date Of Birth | Occurs 0 or 1 time. |
| User Language | Occurs 0 or more times. |
| User Privilege | Occurs 0 or more times. |
| Block Or Trap | Occurs 0 or more times. |
| Ext | Occurs 0 or 1 time. |
| **Desired Date Due** | Date/time type; indicates the date the User wishes the Item to be due. Initiating applications supply this data at the time that a request is issued for check out, renewal, or recall. |
| **Desired Date For Return** | Date/time type; indicates the date desired by the borrowing Agency for the return of an Item. This data is provided when requesting the renewal of an Item for which the circulation activity is being managed by an application other than that of the original lending Agency and the original lending Agency has specified a Date For Return. |
| **Earliest Date Needed** | Date/time type; indicates the earliest date at which the User has need of an Item. Implies that the requested Item is not required or desired prior to the date specified. |
| **Electronic Address** | |
| Electronic Address Type | Text string; identifies the type of address used to communicate electronically with an Agency or a User. Values are specified in the IANA Registry of Media Types. Occurs 1 and only 1 time. Examples: electronic mail address, IP address, telephone number |
| Scheme | Occurs 0 or 1 time. |
| Electronic Address Data | Text string; provides the electronic address. Occurs 1 and only 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Electronic Resource** | |
| Electronic Data Format Type | Text string; identifies the data type of the electronic resource. Values are specified in the IANA Registry of Media Types. Occurs 1 and only 1 time. |
| Scheme | Occurs 0 or 1 time. |
| Actual Resource | Text string; gives the electronic resource entity, such as a computer file or the full text of the Item. Occurs 1 and only 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| Reference To Resource | Text string; provides a pointer to the resource rather than providing the resource itself.<br><br>Occurs 1 and only 1 time if Actual Resource and Electronic Data Format Type are absent. |
| Ext | Occurs 0 or 1 time. |
| **Electronic Resource Provided Flag** | Empty element; indicates whether or not the bibliographic item, in the form of an electronic resource, has been provided as part of the Item Checked Out Service. |
| **Ext** | Complex element; identifies a new data element or value or message, depending on where in the schema it is used.<br><br>Provides extensibility. |
| any | Special element that may contain any content.<br><br>Occurs 0 or more times. |
| **Fiscal Action Type** | Text string; identifies a fiscal action.<br><br>Examples: assess, cancel, payment |
| Scheme | Occurs 0 or 1 time. |
| **Fiscal Transaction Information** | |
| Fiscal Action Type | Occurs 1 and only 1 time. |
| Fiscal Transaction Reference Id | Occurs 0 or 1 time. |
| Related Fiscal Transaction Reference Id | Occurs 0 or more times. |
| Fiscal Transaction Type | Occurs 1 and only 1 time. |
| Valid From Date | Occurs 0 or 1 time. |
| Valid To Date | Occurs 0 or 1 time. |
| Amount | Occurs 1 and only 1 time. |
| Payment Method Type | Occurs 0 or 1 time. |
| Fiscal Transaction Description | Occurs 0 or 1 time. |
| Request Id | Occurs 0 or 1 time. |
| Item Details | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Fiscal Transaction Description** | Text string; gives supplementary details of the fiscal transaction. |
| **Fiscal Transaction Reference Id** | A number or string used to identify a specific financial transaction. |
| Agency Id | Occurs 1 and only 1 time. |
| Fiscal Transaction Identifier Value | Text string; gives value to be used to identify a fiscal transaction.<br><br>Occurs 1 and only 1 time. |
| Ext | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| **Fiscal Transaction Type** | Text string; identifies the type of fiscal charge. Examples: catalog search, day pass, ILL fee |
| Scheme | Occurs 0 or 1 time. |
| **From Agency Authentication** | Text string; provides data to be used by recipient to authenticate the Agency initiating the message. |
| **From Agency Id** | Unique identification of the Agency (i.e., Agency Id) from which the message was sent. See Agency Id for a definition of this element. |
| Agency Id | Occurs 1 and only 1 time. |
| Ext | Occurs 0 or 1 time. |
| **From System Authentication** | Text string; provides data to be used by recipient to authenticate the system from which the message was sent. |
| **From System Id** | Text string; identifies the system from which a message was sent. |
| Scheme | Occurs 0 or 1 time. |
| **Hold Pickup Date** | Date/time type; indicates when a hold expires for a given User. |
| **Hold Queue Length** | Non-negative integer; indicates the number of Users who currently have requested a hold on an Item. |
| **Hold Queue Position** | Positive integer; indicates the position in the hold queue of a request by a User for an Item, conditional on the value of Request Type of "hold." |
| **Holdings Information** | |
| Structured Holdings Data | Occurs 1 or more times, but only if Unstructured Holdings Data is not present. |
| Unstructured Holdings Data | Occurs 1 and only 1 time, but only if Structured Holdings Data is not present. |
| Ext | Occurs 0 or 1 time. |
| **Holdings Set** | A wrapper for holdings and Item information useful when describing a set of Items sharing common holdings data. Note: For systems that do not have a "holdings" entity (i.e., items are "attached" directly with bibs), some of these elements would be omitted (e.g., the Holdings Set Id) and the contained Item Information element would contain all of the Items associated with the bib described by the parent Bib Information element. |
| Holdings Set Id | Text string; provides a resource identifier for the set of holdings. Occurs 0 or 1 time but only if Problem is not present in the same Holdings Set. |

| Data Element Name | Data Element Definition |
|---|---|
| Location | Represents the Location data that is shared by some of the Items in the contained Item Information element.<br><br>Occurs 0 or 1 time but only if Problem is not present in the same Holdings Set. |
| Call Number | Represents the Call Number data that is shared by some of the Items contained in the Item Information element.<br><br>Occurs 0 or 1 time but only if Problem is not present in the same Holdings Set. |
| Summary Holdings Information | Occurs 0 or 1 time but only if Problem is not present in the same Holdings Set. |
| Electronic Resource | Occurs 0 or 1 time but only if Problem is not present in the same Holdings Set. |
| Item Information | Occurs 0 or 1 time but only if Problem is not present in the same Holdings Set. |
| Problem | Occurs 0 or more times but only if Holdings Set Id, Location, Call Number, Summary Holdings Information, Electronic Resource, and Item Information are not present in the same Holdings Set. |
| **Indeterminate Loan Period Flag** | Empty element; indicates that the loan is for an indefinite period. |
| **Initiation Header** | |
| From System Id | Occurs 0 or 1 time. |
| From System Authentication | Occurs 0 or 1 time. |
| From Agency Id | Occurs 1 and only 1 time. |
| From Agency Authentication | Occurs 0 or 1 time. |
| On Behalf of Agency | Occurs 0 or 1 time. |
| To System Id | Occurs 0 or 1 time. |
| To Agency Id | Occurs 1 and only 1 time. |
| Application Profile Type | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Item Description** | Description of a specific physical or electronic Item belonging to an Agency's collection(s). |
| Call Number | Text string; indicates permanent relative physical location assigned to a bibliographic item.<br><br>Occurs 0 or 1 time. |
| Copy Number | Text string; gives the copy number of an Item held by an Agency.<br><br>Occurs 0 or 1 time.<br><br>Examples: Copy 1, Copy 2 |

| Data Element Name | Data Element Definition |
|---|---|
|    Item Description Level | Text string; identifies the level at which the Item is described.<br>Occurs 0 or 1 time.<br>Examples: work, copy, piece |
|       Scheme | Occurs 0 or 1 time. |
|    Holdings Information | Occurs 0 or 1 time. |
|    Number of Pieces | Positive integer: gives the number of pieces that comprise this item.<br>Occurs 0 or 1 time. |
|    Ext | Occurs 0 or 1 time. |
| **Item Details** | |
|    Item Id | Occurs 1 and only 1 time. |
|    Bibliographic Description | Occurs 1 and only 1 time. |
|    Date Checked Out | Occurs 0 or 1 time. |
|    Date Renewed | Date/time type; indicates when an Item was renewed.<br>Occurs 0 or more times. |
|    Date Due | Occurs 1 and 1 only time, but only if neither Indeterminate Loan Period Flag nor Non Returnable Flag is present. |
|    Indeterminate Loan Period Flag | Occurs 1 and 1 only time, but only if neither Date Due nor Non Returnable Flag is present. |
|    Non Returnable Flag | Occurs 1 and 1 only time, but only if neither Date Due nor Indeterminate Loan Period Flag is present. |
|    Date Returned | Date/time type; indicates when an Item was returned (not necessarily checked in, but no longer in the custody of a User or Agency).<br>Occurs 0 or 1 time. |
|    Ext | Occurs 0 or 1 time. |
| **Item Element Type** | Text string; identifies all the elements of the Item Object on which queries (i.e., lookups) can be made.<br>Examples:<br>   - Bibliographic Description<br>   - Circulation Status<br>   - Electronic Resource<br>   - Hold Queue Length<br>   - Date Due<br>   - Item Description<br>   - Item Use Restriction Type<br>   - Location<br>   - Physical Condition<br>   - Security Marker<br>   - Sensitization Flag |

| Data Element Name | Data Element Definition |
|---|---|
|     Scheme | Occurs 0 or 1 time. |
| **Item Id** | |
|     Agency Id | Occurs 0 or 1 time. |
|     Item Identifier Type | Text string: specifies the type of identifier being used. |
|         Scheme | Occurs 0 or 1 time. |
|     Item Identifier Value | Text string; identifies, in context of a specific Agency, the Item involved in a circulation transaction. Identifier may take the form of a barcode, a record number, an accession number, etc. <br> Occurs 1 and only 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **Item Information** | A wrapper for data elements related to a single Item. |
|     Item Id | Occurs 0 or 1 time. |
|     Request Id | Occurs 0 or more times but only if Problem is not present in the same Item Information. |
|     Current Borrower | Occurs 0 or 1 time but only if Problem is not present in the same Item Information. |
|     Date Due | Occurs 0 or 1 time but only if Problem is not present in the same Item Information. |
|     Date Recalled | Occurs 0 or 1 time but only if Problem is not present in the same Item Information. |
|     Hold Pickup Date | Occurs 0 or 1 time but only if Problem is not present in the same Item Information. |
|     Item Transaction | Occurs 0 or 1 time but only if Problem is not present in the same Item Information. |
|     Item Optional Fields | If the Location data for this item differs from that in the parent Holdings Set, include the Location in this element. <br> Occurs 0 or 1 time but only if Problem is not present in the same Item Information. |
|     Item Note | Text string; provides data additional to that provide in other data elements that comprise Item Information. <br> Occurs 0 or 1 time but only if Problem is not present in the same Item Information. |
|     Problem | Occurs 0 or more times but only if Request Id, Current Borrower, Current Requester, Date Due, Date Recalled, Hold Pickup Date, Item Transaction, Item Optional Fields, and Item Note are not present in the same Item Information element. |
| **Item Optional Fields** | Complex element; used in update response messages. Carries data elements describing the Item Object specifically as in the initiation message of an update service. Also used in the initiation message of a notification service to describe the Item Object. |

| Data Element Name | Data Element Definition |
|---|---|
| Bibliographic Description | Occurs 0 or 1 time. |
| Item Use Restriction Type | Occurs 0 or more times. |
| Circulation Status | Occurs 0 or 1 time. |
| Hold Queue Length | Occurs 0 or 1 time. |
| Date Due | Occurs 0 or 1 time. |
| Item Description | Occurs 0 or 1 time. |
| Location | Occurs 0 or more times. |
| Physical Condition | Occurs 0 or 1 time. |
| Electronic Resource | Occurs 0 or 1 time. |
| Security Marker | Occurs 0 or 1 time. |
| Sensitization Flag | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Item Reported Lost** | Empty element; indicates that a User or Agency has reported that the Item has been lost. |
| **Item Reported Missing** | Empty element; indicates that a User or Agency has reported that the Item is missing. |
| **Item Reported Never Borrowed** | Empty element; indicates that a User or Agency has reported that the Item was never borrowed. |
| **Item Reported Returned** | Complex element; indicates that a User or Agency has reported that the Item was returned on the date specified. |
| Date Reported Returned | Occurs 1 and only 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Item Transaction** | |
| Current Borrower | Complex element; identifies the User that currently has Item on loan. See User Id for details of the structure of this complex element. Occurs 0 or 1 time. |
| Current Requester | Complex element; identifies a User that currently has an active request for an Item. See User Id for details of the structure of this complex element. Occurs 0 or more times. |
| **Item Use Restriction Type** | Text string; indicates the circulation usage rules and any special restrictions that apply to an Item at the time of a circulation transaction. Examples: in-library use only, renewals not permitted, term loan |
| Scheme | Occurs 0 or 1 time. |
| **Language** | Text string; identifies the language of the Item. Examples: eng (English), fre (French), ger (German) |
| Scheme | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| **Loaned Item** | Data describing an Item currently on loan to a User. |
|     Item Id | Occurs 1 and only 1 time. |
|     Reminder Level | Occurs 0 or 1 time. |
|     Date Due | Occurs 1 and only 1 time, but only if Indeterminate Loan Period Flag is not present. |
|     Indeterminate Loan Period Flag | Occurs 1 and only 1 time, but only if Date Due is not present. |
|     Amount | When used inside the Loaned Item element, Amount is intended to convey the not-yet-final amount of accrued fines associated with a charged item.<br>Occurs 0 or 1 time. |
|     Bibliographic Id | Occurs 0 or more times. |
|     Title | Occurs 0 or 1 time. |
|     Medium Type | Occurs 0 or 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **Loaned Items Count** | |
|     Circulation Status | Occurs 1 and only 1 time, but only if Item Use Restriction Type is not present. |
|     Item Use Restriction Type | Occurs 1 and only 1 time, but only if Circulation Status is not present. |
|     Loaned Item Count Value | Non-negative integer; specifies number of items that a User has on loan at any point in time for a given Circulation Status or Item Use Restriction Type.<br>Occurs 1 and only 1 time.<br>Examples:<br>  - Items with Item Use Restriction Type = normal loan period: 5<br>  - Items with Item Use Restriction Type = overnight loan: 3<br>  - Items with Item Use Restriction Type = in library use only: 1 |
|     Ext | Occurs 0 or 1 time. |
| **Loaned Items Desired** | Empty element; indicates that the requester desires information about Items loaned to a specific User. |
| **Location** | |
|     Location Type | Text string; identifies the nature of the location where an Item is at a particular point in time.<br>Occurs 1 and only 1 time.<br>Examples: Permanent, Temporary, Current |
|       Scheme | Occurs 0 or 1 time. |

| Data Element Name | | | | Data Element Definition |
|---|---|---|---|---|
| | Location Name | | | Complex element, containing a sequence of Location Name Instances, which together express the location where an Item is housed at a particular point in time. |
| | | | | Occurs 1 and only 1 time. |
| | | | | Example: To provide the Location Name for an Item that is housed in locked cabinet #5 in the rare book room of the main library: |
| | | | |     Location Name Instance 1 |
| | | | |     -   Location Name Level = 1 |
| | | | |     -   Location Name Value = Main |
| | | | |     Location Name Instance 2 |
| | | | |     -   Location Name Level = 2 |
| | | | |     -   Location Name Value = Rare Book Room |
| | | | |     Location Name Instance 3 |
| | | | |     -   Location Name Level = 3 |
| | | | |     -   Location Name Value = Locked Cabinet #5 |
| | | Location Name Instance | | Occurs 1 or more times. |
| | | | Location Name Level | Positive integer; indicates the level of the Location Name Instance in a sequence within Location Name. |
| | | | | Occurs 1 and only 1 time. |
| | | | Location Name Value | Text string; provides a value for the Location Name Instance; gives name of an Agency-specific location or sub-location where an Item is housed at a particular point in time. |
| | | | | Occurs 1 and only 1 time. |
| | | | Ext | Occurs 0 or 1 time. |
| | Valid From Date | | | Occurs 0 or 1 time. |
| | Valid To Date | | | Occurs 0 or 1 time. |
| **Mandated Action** | | | | Complex element; indicates that the responding application shall honor the update request because the initiating application has already acted upon the update. For example, while in "Offline Recovery" mode, a self-service unit inserts this element in each of the back-logged update messages to inform the circulation application that the requested action (e.g., Check Out Item) has already taken place during a period of time when the connection between the partner applications was broken. |
| | Date Event Occurred | | | Occurs 1 and only 1 time. |
| | Ext | | | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| **Maximum Items Count** | Positive integer; included in an initiation message, it indicates the maximum number of items that the responder should include in its response; further items can be obtained by invoking the same service but including the Next Item Token that was returned in the prior response. See Section 5.3.6.1, "Using Maximum Items Count and Next Item Token." Occurs 0 or 1 time. |
| **Name Information** | |
| Personal Name Information | Occurs 0 or 1 time, but 1 time if Organization Name Information is absent. |
| Organization Name Information | Occurs 0 or more times, but 1 or more times if Personal Name Information is absent. |
| Ext | Occurs 0 or 1 time. |
| **Need Before Date** | Date/time type; indicates when the User needs the requested Item. Implies that the requested Item is no longer required if the Item cannot be supplied by the date specified. |
| **Next Item Token** | Text string; an identifier that is returned by the responder, and which enables the responder to identify the next items to include in a subsequent response if the same service is invoked subsequently. The descriptive phrase "same service" means the same NCIP service with the same identifiers, e.g., the same list of Item Ids in a Lookup Item Set initiation message. See Section 5.3.6.1, "Using Maximum Items Count and Next Item Token." Occurs 0 or 1 time. |
| **Non Returnable Flag** | Empty element; indicates that the Item is not returnable. |
| **Notice Content** | Text string; provides the contents of the notice. |
| **Notice Item** | |
| Item Details | Occurs 1 and only 1 time. |
| Amount | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Notice Type** | Text string; identifies the type of notice to be sent or that has been sent to a User. Examples: account reminder, item overdue, available for pickup |
| Scheme | Occurs 0 or 1 time. |
| **Number of Pieces** | Positive integer; gives the number of pieces comprising an item. Occurs 0 or 1 time. |
| **On Behalf Of Agency** | Unique identification of the Agency (i.e., Agency Id) on behalf of which the initiating message is sent. See Agency Id for a definition of this compound element. |

| Data Element Name | Data Element Definition |
|---|---|
|     Agency Id | Occurs 1 and only 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **Organization Name Information** | |
|     Organization Name Type | Text string; identifies the type of Organization Name. Occurs 1 and only 1 time. <br><br> Examples: official name, abbreviation or acronym, transliterated name <br> *Source*: ISO 1046 draft |
|         Scheme | Occurs 0 or 1 time. |
|     Organization Name | Text string; represents the name of an organization. <br> Occurs 1 and only 1 time. <br> Examples: The Free Library of Philadelphia, Milton S. Eisenhower Library |
|     Ext | Occurs 0 or 1 time. |
| **Paid Fee Amount** | Monetary value in a specified currency (i.e., Amount), paid by a User as the fee charged for a requested item. See Amount for the definition of this complex element. |
| **Pending** | Information on status of a Renew Item request awaiting decision or settlement. |
|     Date Of Expected Reply | Date/time type; indicates when the sender expects to reply to a request to renew an Item. The sender does not guarantee that a reply will be made at the date/time specified. <br> Occurs 0 or 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **Personal Name Information** | |
|     Unstructured Personal User Name | Occurs 0 or 1 time if Structured Personal User Name is present; otherwise occurs 1 and only 1 time. |
|     Structured Personal User Name | Occurs 0 or 1 time if Unstructured Personal User Name is present; otherwise occurs 1 and only 1 time. |
| **Physical Address** | Designated geographical location recognized by a postal authority or other carrier, to which things may be delivered, as distinguished from Electronic Address. |
|     Structured Address | Occurs 1 and only 1 time, but only if Unstructured Address is not present. |
|     Unstructured Address | Occurs 1 and only 1 time but only if Structured Address is not present. |
|     Physical Address Type | Text string; indicates whether the physical address is a street address or a postal address. <br> Occurs 1 and only 1 time. <br> Examples: postal address, street address |
|         Scheme | Occurs 0 or 1 time. |

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

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

| Data Element Name | Data Element Definition |
|---|---|
| **Requested Action Type** | Text string; identifies the action the responding Agency is requested to take on receipt of the Accept Item message. Examples: circulate, hold for pickup |
|     Scheme | Occurs 0 or 1 time. |
| **Requested Item** | Complex element; Data describing the Item requested by a User. |
|     Item Id | Occurs 0 or 1 time if Request Id is present; otherwise occurs 1 and only 1 time. |
|     Request Id | Occurs 0 or 1 time if Item Id is present; otherwise occurs 1 and only 1 time. |
|     Request Type | Occurs 1 and only 1 time. |
|     Request Status Type | Occurs 1 and only 1 time. |
|     Date Placed | Occurs 1 and only 1 time. |
|     Pickup Date | Occurs 0 or 1 time. |
|     Pickup Location | Occurs 0 or 1 time. |
|     Pickup Expiry Date | Occurs 0 or 1 time. |
|     Reminder Level | Occurs 0 or 1 time. |
|     Hold Queue Position | Occurs 0 or 1 time. |
|     Bibliographic Id | Occurs 0 or more times. |
|     Title | Occurs 0 or 1 time. |
|     Medium Type | Occurs 0 or 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **Requested Items Count** | |
|     Request Type | Occurs 1 and 1 only time, but only if neither Circulation Status nor Item Use Restriction Type is present. |
|     Circulation Status | Occurs 1 and 1 only time, but only if neither Item Use Restriction Type nor Request Type is present. |
|     Item Use Restriction Type | Occurs 1 and 1 only time, but only if neither Circulation Status nor Request Type is present. |
|     Requested Item Count Value | Non-negative integer; indicates the number of holds, reserves, or pages a User has in effect at any point in time for a Circulation Status or Item Use Restriction Type. Occurs 1 and only 1 time. Example: A User may have on request 5 items on term loan, 3 items recalled, 1 item available on shelf. |
|     Ext | Occurs 0 or 1 time. |
| **Requested Items Desired** | Empty element; indicates that the requester desires information about items requested by a specific User. |

| Data Element Name | Data Element Definition |
|---|---|
| **Required Fee Amount** | Monetary value in a specified currency (i.e., Amount) that a User must pay for a requested service. See Amount for the definition of this complex element. |
| **Required Item Use Restriction Type** | Text string; indicates that the Agency must receive an acknowledgement from the User that special rules or restrictions apply to the use of the Item. This requirement is carried, if applicable, in messages responding to the request, check out, or renewal of the Item. |
| Scheme | Occurs 0 or 1 time. |
| **Resource Desired** | Empty element; indicates that the requester desires an electronic resource be transmitted as part of a Check Out Item Response. |
| **Response Header** | |
| From System Id | Occurs 0 or 1 time. |
| From System Authentication | Occurs 0 or 1 time. |
| From Agency Id | Occurs 1 and only 1 time. |
| From Agency Authentication | Occurs 0 or 1 time. |
| To System Id | Occurs 0 or 1 time. |
| To Agency Id | Occurs 1 and only 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Routing Information** | Information to aid in the routing of an Item following check in. |
| Routing Instructions | Text string; provides instructions, such as special handling, for the routing of an Item within an Agency following check in. Occurs 1 and only 1 time. |
| Destination | Complex element; Occurs 1 and only 1 time. |
| Bin Number | Text string; identifies an Agency-specific destination to which a physical item is to be routed following check in. Occurs 0 or 1 time if Location is present; otherwise occurs 1 and only 1 time. |
| Location | Occurs 0 or 1 time if Bin Number is present; otherwise occurs 1 and only 1 time. |
| Request Type | Occurs 0 or 1 time. |
| User Id | Occurs 0 or 1 time. |
| Name Information | Occurs 0 or 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Security Marker** | Text string; specifies the type of security marker protecting an Item, including encryption of electronic resources. Examples: Electromagnetic Security Strip, RFID, PGP |

| Data Element Name | Data Element Definition |
|---|---|
|    Scheme | Text String; gives optional URI reference to an authoritative list of values to support validation of the value given above.<br><br>Occurs 0 or 1 time. |
| **Sensitization Flag** | Empty element; indicates that an item should be desensitized and re-sensitized during the check out and check in procedures. |
| **Shipping Information** | |
|    Shipping Instructions | Text string; provides human-readable data pertaining to the shipment of an Item, such as the preferred carrier, packaging requirements, etc.<br><br>Occurs 0 or 1 time. |
|    Shipping Note | Text string; provides data additional to that provided in other data elements that comprise Shipping Information.<br><br>Occurs 0 or 1 time. |
|    Physical Address | Occurs 1 and only 1 time, but only if Electronic Address is not present. |
|    Electronic Address | Occurs 1 and only 1 time, but only if Physical Address is not present. |
|    Ext | Occurs 0 or 1 time. |
| **Structured Address** | Complex element; provides information about a physical address; structure permits parsing and allows for the component elements to be assembled in the order and format most suited to a given use.<br><br>Usage Notes: Within Structured Address, there is a choice of two sets of elements to express local address information. It can be expressed in a general way using Line 1, and, optionally, Line 2, or it can be expressed to a greater level of granularity, using the data elements Location Within Building, House Name, District, Post Office Box, and Street. If the second, more granular, option is used, Structured Address must contain at least one of Street, Post Office Box, and District, but could contain any two or all three. One or more of the data elements Care Of, Locality, Region, Country, and Postal Code optionally can be used with either set of "local" elements. |
|    Location Within Building | Text string; gives the name of a location within a building or building complex. Used to provide more detailed information when the Street element is not sufficient to identify a particular location.<br><br>Occurs 0 or 1 time.<br><br>See Usage Notes in Structured Address for more details on the usage requirements for Location Within Building.<br><br>Examples: Suite 42, Level 4<br><br>*Source:* ISO 8459-4 |

| Data Element Name | Data Element Definition |
|---|---|
| House Name | Text string; gives name of a house, building, or building complex. <br> Occurs 0 or 1 time. <br> See Usage Notes in Structured Address for more details on the usage requirements for House Name. |
| District | Text string; gives name of a sub-entity within a country such as a parish, county, or district. <br> Occurs 0 or 1 time. <br> See Usage Notes in Structured Address for more details on the usage requirements for District. <br> *Source*: ISO 8459-4 |
| Post Office Box | Text string; gives the box number assigned by the postal authority. <br> Occurs 0 or 1 time. <br> See Usage Notes in Structured Address for more details on the usage requirements for Post Office Box. <br> *Source:* ISO 8459-4 |
| Street | Text string; gives the name of the location of a house, building or building complex within a city or district. <br> Occurs 0 or 1 time. <br> See Usage Notes in Structured Address for more details on the usage requirements for Street. <br> *Source*: Variation on ISO 8459-4 |
| 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. <br> Occurs 0 or 1 time. <br> See Usage Notes in Structured Address for more details on the usage requirements for Line 1. |
| Line 2 | Text string; gives one or more of House Name, Street, Post Office Box, and/or District when Line 1 is not sufficient. <br> Occurs 0 or 1 time. <br> See Usage Notes in Structured Address for more details on the usage requirements for Line 2. |
| Locality | Text string; gives name of a city, suburb, or postal area. <br> Occurs 0 or 1 time. <br> Note: ISO 8459-4 uses term "City" for this concept. |
| Region | Text string; gives the name of an area within a country such as a state, province, department, or prefecture. <br> Occurs 0 or 1 time. <br> *Source*: ISO 8459-4 |
| Country | Text string; gives name of a country. <br> Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
|    Postal Code | Text string; gives the code assigned by the postal authority of a country that uniquely identifies an address or groups of addresses.<br><br>Occurs 0 or 1 time.<br><br>Examples:<br>   -   ZIP code (USA): 20814<br>   -   Postal code (Canada): K1A 0N4<br>*Source*: ISO 8459-4 |
|    Care Of | Text string; gives name of a person, organization, or organizational unit to whose attention the addressed item is intended to be directed.<br><br>Occurs 0 or 1 time. |
|    Ext | Occurs 0 or 1 time. |
| **Structured Holdings Data** | Complex element |
|    Holdings Chronology | Complex element; contains a sequence of Chronology Level Instances, which together express a time period covered by the Item as a specific part of a bibliographic item and shows the relationship of that Item to the entire bibliographic item.<br><br>Occurs 0 or 1 time, but 1 and only 1 time if Holdings Enumeration is not present.<br><br>Examples: To provide the Holdings Chronology for a newspaper issue with a publication date 1998/04/1 6:<br>   Chronology Level Instance 1<br>      -   Chronology Level = 1<br>      -   Chronology Caption = Year<br>      -   Chronology Value = 1998<br>   Chronology Level Instance 2<br>      -   Chronology Level= 2<br>      -   Chronology Caption = Month<br>      -   Chronology Value = 04<br>   Chronology Level Instance 3<br>      -   Chronology Level = 3<br>      -   Chronology Caption = Day<br>      -   Chronology Value = 16 |
|       Chronology Level Instance | Complex element; provides structured information that describes the hierarchical relationship of the specific part held by an Agency to a whole Item, expressed in chronological terms.<br><br>Occurs 1 or more times. |

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

| Data Element Name | | | | Data Element Definition |
|---|---|---|---|---|
| | | | Enumeration Caption | Text string; provides a descriptive name for the Enumeration Level Instance. Occurs 0 or 1 time if Enumeration Level is present, otherwise occurs 1 and only 1 time. Examples: volume, part, numéro *Source:* Z39.50 Holdings Attribute Set |
| | | | Enumeration Level | Positive integer; indicates the level of the Enumeration Level Instance in a sequence within Holdings Information. Occurs 0 or 1 time if Enumeration Caption is present; otherwise occurs 1 and only 1 time. *Source*: Z39.50 Holdings Attribute Set |
| | | | Enumeration Value | Text string; provides a value for the Enumeration Level Instance, which identifies the relationship of the piece to the whole bibliographic item. Occurs 1 and only 1 time. *Source*: Z39.50 Holdings Attribute Set |
| | | | Ext | Occurs 0 or 1 time. |
| **Structured Personal User Name** | | | | Complex element; provides components of a personal name; structure permits parsing and allows for the component elements to be manipulated in the order and format most suited to a given use. |
| | Prefix | | | Text string; gives name element—placed before other personal name elements such as surname and given names—that, in association with these elements, serves to identify an individual, but does not form an integral part of a name. Occurs 0 or 1 time. Examples: titles, epithets, indication of office, such as Mr., Hon., Dr. *Source*: ISO 8459-4 |
| | Given Name | | | Text string; gives simple, double, or compound name that distinguishes an individual within a family carrying a common name. Christian names and forenames are included as given names. Occurs 0 or 1 time. *Source*: ISO 8459-4 |
| | Initials | | | Text string; provides the initial letter or letters of the given name. Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| Surname | Text string; gives surname or family name of the User. A surname may consist of a single word, or may be compound, that is, joined by a hyphen or contain more than one word. Occurs 1 and only 1 time. Examples: - single word: Stevens - compound: Bridges-Webb - multiple words: Van der Meer, Day Lewis *Source:* Variation of ISO 8459-4 |
| Suffix | Text string; denotes the family relationship, initials of an academic degree, or initials denoting membership in an organization that, in conjunction with a surname and a given name or names, serves to identify an individual, but does not form an integral part of a name. Occurs 0 or 1 time. Examples: - 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. *Source:* ISO 8459-4 |
| Ext | Occurs 0 or 1 time. |
| **Summary Holdings Information** | Complex element. Contains a summary statement of the holdings in a Holdings Set. |
| Structured Holdings Data | Occurs 0 or more times. |
| Unstructured Holdings Data | Occurs 1 and only 1 time. |
| **To Agency Id** | Unique identification of the Agency (i.e., Agency Id) to which a message is sent. |
| Agency Id | Occurs 1 and only 1 time. |
| Ext | Occurs 0 or 1 time. |
| **To System Id** | Open enumerated type; identifies the system to which a message is sent. |
| Scheme | Text String; gives optional URI reference to an authoritative list of values to support validation of the value given above. Occurs 0 or 1 time. |
| **Unstructured Address** | |
| Unstructured Address Type | Text string; identifies the type of formatting present in Unstructured Address Data. Occurs 1 and only 1 time. Examples: HTML, newline-delimited text |
| Scheme | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| Unstructured Address Data | Text string; gives a complete physical address in a single string. String may contain simple processing information such as line breaks to be used when formatting information for output, such as a screen display or address label. Occurs 1 and only 1 time. |
| Ext | Occurs 0 or 1 time. |
| **Unstructured Holdings Data** | Text string; gives holdings information in a string. This element could carry, for instance, the non-structured "volume-issue" data supplied by an ISO ILL Protocol-based request. Example: v.5, no. 7, Band 48, Tome 2 |
| **Unstructured Personal User Name** | Text string; gives the complete personal name of a User in a single string. |
| **User Address Information** | Information about the place to which messages and Items destined for a User are directed. *Source*: Data structure adapted from ISO 2146 |
| User Address Role Type | Text string; describes a purpose or role of the address associated with a User. An address may have one or more purposes or roles for any one User. Occurs 1 and only 1 time. Examples: bill to, home, work |
| Scheme | Occurs 0 or 1 time. |
| Valid From Date | Occurs 0 or 1 time. |
| Valid To Date | Occurs 0 or 1 time. |
| Physical Address | Occurs 1 and only 1 time, but only if Electronic Address is not present. |
| Electronic Address | Occurs 1 and only 1 time, but only if Physical Address is not present. |
| Ext | Occurs 0 or 1 time. |
| **User Element Type** | Text string; identifies all the elements of the User Object on which queries (i.e., lookups) can be made. Examples: <br> - Authentication Input <br> - Block Or Trap <br> - Date Of Birth <br> - Name Information <br> - User Address Information <br> - User Language <br> - User Privilege <br> - User Id <br> - Previous User Id |
| Scheme | Occurs 0 or 1 time. |

| Data Element Name | Data Element Definition |
|---|---|
| **User Fiscal Account** | Record of a User's fiscal obligations to or credit with an Agency. |
|     Account Balance | Monetary value in a specified currency (i.e., Amount) that is the balance in a User's account. See Amount for the definition of this complex element.<br><br>Occurs 1 and only 1 time. |
|     Account Details | Details of a fiscal transaction affecting the User's account.<br><br>Occurs 0 or more times. |
|         Accrual Date | Date/time type; indicates when the amount specified in Fiscal Transaction Information was accrued to the User's account.<br><br>Occurs 1 and only 1 time. |
|         Fiscal Transaction Information | Occurs 1 and only 1 time. |
|         Ext | Occurs 0 or 1 time. |
|     Ext | Occurs 0 or 1 time. |
| **User Fiscal Account Desired** | Empty element; indicates that the requester desires information about the User's fiscal account. |
| **User Id** | |
|     Agency Id | Occurs 0 or 1 time. |
|     User Identifier Type | Text string: specifies type of identifier being used.<br>Occurs 0 or 1 time. |
|         Scheme | Occurs 0 or 1 time. |
|     User Identifier Value | Text string; specifies a User within an Agency.<br>Occurs 1 and only 1 time.<br>Examples: patron bar code, patron record number, university identification number |
|     Ext | Occurs 0 or 1 time. |
| **User Language** | Text string; identifies one or more languages, in order of preference, in which the User wishes to receive written communication.<br>Examples: eng (English), fra (French), deu (German) |
|     Scheme | Occurs 0 or 1 time. |
| **User Notice Details** | A message to be displayed or otherwise sent to a User. |
|     Notice Type | Occurs 1 and only 1 time. |
|         Scheme | Occurs 0 or 1 time. |
|     Notice Content | Occurs 0 or 1 time. |
|     Notice Item | Occurs 1 or more times, but only if neither User Fiscal Account nor User Privilege are present. |
|     User Fiscal Account | Occurs 1 and only 1 time, but only if neither Notice Item nor User Privilege are present. |

| Data Element Name | | | | Data Element Definition |
|---|---|---|---|---|
| | User Privilege | | | Occurs 1 and only 1 time, but only if neither Notice Item nor User Fiscal Account are present. |
| | Ext | | | Occurs 0 or 1 time. |
| **User Optional Fields** | | | | Complex element; used in update response messages. Carries data elements describing the User Object as requested in the initiation message of an update service. Also used in the initiation message of a notification service to describe the User Object. |
| | Name Information | | | Occurs 0 or 1 time. |
| | User Address Information | | | Occurs 0 or more times. |
| | Date Of Birth | | | Occurs 0 or 1 time. |
| | User Language | | | Occurs 0 or more times. |
| | User Privilege | | | Occurs 0 or more times. |
| | Block Or Trap | | | Occurs 0 or more times. |
| | User Id | | | Occurs 0 or more times. |
| | Previous User Id | | | Occurs 0 or more times. |
| | Ext | | | Occurs 0 or 1 time. |
| **User Privilege** | | | | Complex element; contains details concerning a specified privilege accorded to a User by a specific Agency, such as fees charged for the privilege, the status of the privilege, or the dates during which the privilege is in force. |
| | Agency Id | | | Occurs 1 and only 1 time. |
| | Agency User Privilege Type | | | Occurs 1 and only 1 time. |
| | Valid From Date | | | Occurs 0 or 1 time. |
| | Valid To Date | | | Occurs 0 or 1 time. |
| | User Privilege Fee | | | Occurs 0 or 1 time. |
| | | Amount | | Occurs 1 and only 1 time. |
| | | Payment Method Type | | Text string; indicates the method of payment (actual or proposed) for a specified user privilege fee. Occurs 0 or 1 time. Examples: cash, deposit account, direct debit |
| | | | Scheme | Occurs 0 or 1 time. |
| | | Ext | | Occurs 0 or 1 time. |
| | User Privilege Status | | | Occurs 0 or 1 time. |
| | | User Privilege Status Type | | Text string; indicates the current status of a user privilege. Occurs 1 and only 1 time. Examples: active, cancelled |
| | | | Scheme | Occurs 0 or 1 time. |

| Data Element Name | | | Data Element Definition |
|---|---|---|---|
| | | Date Of User Privilege Status | Date/time type; indicates when the current user privilege status came into effect.<br>Occurs 0 or 1 time. |
| | | Ext | Occurs 0 or 1 time. |
| | User Privilege Description | | Text string; describes a specific user privilege.<br>Occurs 0 or 1 time. |
| | Ext | | Occurs 0 or 1 time. |
| **Valid From Date** | | | Date/time type; indicates when data, such as an address, a user privilege, a block or a trap, became valid or will become valid. If this element is not provided, one may assume that the data is valid, unless otherwise specified in Valid To Date. |
| **Valid To Date** | | | Date/time type; indicates when data, such as an address, a user privilege, a block or a trap, will no longer be valid or was no longer valid. If this element is not provided, one may assume that the data is valid, unless otherwise specified in Valid From Date. |

## 6.4   Sample Lists of Values

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

# 7   State Table Governing Messaging over a Single Connection

The Messaging State Tables define the behavior of the initiating (Table 6) and responding (Table 7) applications with regard to messaging over a single connection. Nothing in this standard is intended to prevent two applications from establishing multiple simultaneous connections for the exchange of NCIP messages. These state tables do not govern the status of the circulation function being performed by either application. A blank cell in the tables represents the combination of an incoming event and a state that is not defined for NCIP. The terminal state for NCIP is not represented in the tables, as there is no "messaging state" immediately after transition to the terminal state.

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

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

Events are of two types, incoming, listed in Table 2, and outgoing, listed in Table 3.

**Table 2: Incoming Events**

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

**Table 3: Outgoing Events**

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

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

**Table 4: Predicates**

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

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

**Table 5: Variables**

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

**Table 6: Initiating Application Messaging States**

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

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

**ERROR # meanings:**

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

**Table 7: Responding Application Messaging States**

| # | Event | IDLE | PROCESSING |
|---|-------|------|------------|
| 1 | INITind | set MESSAGE.Id var<br>clear timer<br>PROCESSING | signal error #1<br>CLOSE<br>TERMINAL |

| # | Event | IDLE | PROCESSING |
|---|-------|------|------------|
| 2 | RESPreq | | p1<br>RESP<br>set timer<br>IDLE |
| 3 | RESPind | signal error #2<br>CLOSE<br>TERMINAL | signal error #2<br>CLOSE<br>TERMINAL |
| 4 | CLOSEreq | CLOSE<br>TERMINAL | CLOSE<br>TERMINAL |
| 5 | CLOSEind | CLOSE<br>TERMINAL | signal error #3<br>TERMINAL |
| 6 | TIMER | TIMEOUT<br>CLOSE<br>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.

# 8   Standard Message Headers and Versioning

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

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

# 9   Profiles

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

*   **Implementation Profiles** – Describe an implementation method that specifies how messages are exchanged. Specifications include messages, character, and data encoding; required components and behavior; network transport; network security; scheme registration; and provision for extension (see template in Appendix C). The committee has developed a single Implementation Profile that uses current Web and XML technology. Note: This profile was originally called the Cross-Application Profile.

*   **Application Profiles** – Describe how the protocol is used to support a specific environment with a given set of practices and policies. This includes a description of services that must be

supported, the required security environment etc. Each profile also provides an event table that maps specific external events and circumstances to the use of particular services specified in the protocol (see template in Appendix D). The committee has developed eight application profile documents that describe how the protocol might be used in three broad service areas: Self Service, Direct Consortial Borrowing, and Circulation/Interlibrary Loan Interaction (see Appendix E).

## 9.1   Rules for Profile Definition

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

The profile shall not:

- Redefine data elements specified in this standard

- Add messages not defined in this standard

- Define new objects

- Add data elements to messages defined in this standard

- Delete required data elements from messages defined in this standard

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

## 9.2   Implementation Profile

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

- Message encoding and structure

- Character representation

- Representation of data types

- Specification of required components

  - Services

  - Message Prolog

  - Data Structures

  - Rules of behavior of implementations

- Transport mechanism(s)

- Security issues

- Standards referenced/used

- Optional scheme registration

- Provision for extension of the profile

# Appendix A
(normative)
# Definitions of Values for Use within the "Problem" Data Element

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

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

### Account Access Denied

- Access to the user account is not permitted.

- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme

### Agency Access Denied

- Access to this Agency is not permitted.

- Used in: NCIP Lookup Agency Processing Error Scheme, NCIP Update Agency Processing Error Scheme

### Agency Authentication Failed

- Attempt to authenticate the Agency was unsuccessful; the reason for the failure is unspecified.

- Used in: NCIP General Processing Error Scheme

### Cannot Accept Item

- Responder cannot accept the Item under the conditions included in the message. The reason is unspecified.

- Used in: NCIP Accept Item Processing Error Scheme

### Cannot Guarantee Restrictions On Use

- Responder cannot guarantee that the restrictions on the use of an Item will be enforced.

- Used in: NCIP Accept Item Processing Error Scheme

### Duplicate Agency

- Agency already exists; acting on this update would create a duplicate Agency.

- Used in: NCIP Create Agency Processing Error Scheme

***Duplicate Fiscal Transaction***

- Fiscal transaction record already exists; acting on this request would create a duplicate fiscal transaction.

- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme

***Duplicate Item***

- Item record already exists; acting on this update would create a duplicate Item.

- Used in: NCIP Create Item Processing Error Scheme

***Duplicate Request***

- Request for the Item already exists; acting on this update would create a duplicate request for the Item for the User.

- Used in: NCIP Request Item Processing Error Scheme

***Duplicate User***

- User record already exists; acting on this update would create a duplicate User.

- Used in: NCIP Create User Processing Error Scheme

***Element Rule Violated***

- Known and valid element contains a locally unacceptable value. For example, this error would be appropriate when a "date" type includes a value outside a range deemed valid by the responding application.

- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Create Agency Processing Error Scheme, NCIP Create Item Processing Error Scheme, NCIP Create User Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup Agency Processing Error Scheme, NCIP Lookup Item Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme, NCIP Update Agency Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

***Invalid Amount***

- The requested action cannot proceed because the amount is not correct.

- Used in: NCIP General Processing Error Scheme

***Invalid Date***

- Date/time is invalid because it is not a date, is an improperly formatted date/time, the date/time has passed, or is outside of the range of dates or times for which the service is provided.

- Used in: NCIP General Processing Error Scheme

*Invalid Message Syntax Error*

- Message is not formed correctly, according to transfer syntax specifications in use by the partner applications (e.g., XML).

- Used in: NCIP Messaging Error Type Scheme

*Item Access Denied*

- Access to this Item is not permitted.

- Used in: NCIP Lookup Item Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme

*Item Cannot Be Recalled*

- Status of the Item or User Privilege prevents the Item from being recalled.

- Used in: NCIP Recall Item Processing Error Scheme

*Item Does Not Circulate*

- Request or check out of Item cannot proceed because the Item is non-circulating.

- Used in: NCIP Check Out Item Processing Error Scheme, NCIP Request Item Processing Error Scheme

*Item Not Available By Need Before Date*

- Item requested will not be available by the date/time the User needs the Item.

- Used in: NCIP Request Item Processing Error Scheme

*Item Not Checked Out*

- There is no record of the check out of the Item.

- Used in: NCIP Cancel Recall Item Processing Error Scheme, NCIP Check In Item Processing Error Scheme, NCIP Recall Item Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme

*Item Not Checked Out To This User*

- There is no record that the Item has been checked out to the User.

- Used in: NCIP Report Circulation Status Change Processing Error Scheme

*Item Not Renewable*

- Item may not be renewed.

- Used in: NCIP Renew Item Processing Error Scheme

*Maximum Check Outs Exceeded*

- Check out cannot proceed because the User already has the maximum number of items checked out.

- Used in: NCIP Check Out Item Processing Error Scheme

### Maximum Renewals Exceeded

- Renewal cannot proceed because the User has already renewed the Item the maximum number of times permitted.

- Used in: NCIP Renew Item Processing Error Scheme

### Needed Data Missing

- Action requested by the initiator cannot be carried out because one or more optional data elements that are needed for processing are missing.

- Used in: NCIP General Processing Error Scheme

### Non-Unique Item

- More than one Item matches lookup criteria.

- Used in: NCIP Lookup Item Processing Error Scheme

### Non-Unique Request

- More than one request matches lookup criteria.

- Used in: NCIP Lookup Request Processing Error Scheme

### Non-Unique User

- More than one User matches lookup criteria.

- Used in: NCIP Lookup User Processing Error Scheme

### Protocol Error

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

- Used in: NCIP Messaging Error Type Scheme

### Recall Cannot Be Cancelled At This Time

- Some unspecified condition exists that prevents the recall from being cancelled.

- Used in: NCIP Cancel Recall Item Processing Error Scheme

### Renewal Not Allowed – Item Has Outstanding Requests

- Item may not be renewed because outstanding requests take precedence over the renewal request.

- Used in: NCIP Renew Item Processing Error Scheme

### Request Already Processed

- Request cannot be cancelled because it has already been processed.

- Used in: NCIP Cancel Request Item Processing Error Scheme

### Resource Cannot Be Provided

- Check out cannot proceed because the desired resource cannot be provided.

- Used in: NCIP Check Out Item Processing Error Scheme

### System Authentication Failed

- Attempt to authenticate the system was unsuccessful; the reason for the failure is unspecified.

- Used in: NCIP General Processing Error Scheme

### Temporary Processing Failure

- Temporary processing failure occurred.

- Used in: NCIP General Processing Error Scheme

### Unable To Add Element

- Element cannot be added. This situation may occur, for example, if the element, defined as non-repeatable, already exists.

- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Update Agency Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

### Unable To Delete Element

- Element cannot be deleted. This situation may occur, for example, because the requested element does not exist and thus cannot be deleted.

- Used in: NCIP Update Agency Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

### Unauthorized Combination Of Element Values For Agency

- Agency is not authorized to use this combination of element values.

- Used in: NCIP General Processing Error Scheme

### Unauthorized Combination Of Element Values For System

- System is not authorized to use this combination of element values.

- Used in: NCIP General Processing Error Scheme

### Unauthorized Service For Agency

- Agency is not authorized to use this Service.

- Used in: NCIP General Processing Error Scheme

### Unauthorized Service For System

- System is not authorized to use this Service.

- Used in: NCIP General Processing Error Scheme

### Unknown Agency

- Agency is not known.

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

### Unknown Element

- Element is not known.

- Used in: NCIP Messaging Error Type Scheme

### Unknown Item

- Item is not known.

- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Recall Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Check In Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup Item Processing Error Scheme, NCIP Recall Item Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme, NCIP Undo Check Out Item Processing Error Scheme, NCIP Update Circulation Status Processing Error Scheme, NCIP Update Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme

### Unknown Request

- Request is not known.

- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup Request Processing Error Scheme, NCIP Update Request Item Processing Error Scheme

### Unknown Scheme

- Scheme is not known.

- Used in: NCIP Messaging Error Type Scheme

### Unknown System

- System is not known.

- Used in: NCIP General Processing Error Scheme

### Unknown User

- User is not known.

- Used in: NCIP Accept Item Processing Error Scheme, NCIP Cancel Request Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Send User Notice Processing Error Scheme, NCIP Undo Check Out Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

*Unknown Value From Known Scheme*

- Value is not known, although the scheme from which it is cited is known.

- Used in: NCIP Messaging Error Type Scheme

*Unsupported Notice*

- Notice type is not supported.

- Used in: NCIP Send User Notice Processing Error Scheme

*Unsupported Service*

- Service is not supported.

- Used in: NCIP General Processing Error Scheme

*Unsupported Shipping Address Type*

- The address type supplied in Shipping Information is not supported. The problem value may be either a Physical Address Type or an Electronic Address Type.

- Used in: NCIP Check Out Item Processing Error Scheme, NCIP Recall Item Processing Error Scheme

*User Access Denied*

- Access to the User is not permitted.

- Used in: NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Update User Processing Error Scheme

*User Authentication Failed*

- Attempt to authenticate User was unsuccessful; the reason for the failure is unspecified.

- Used in: NCIP Cancel Request Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme, NCIP Create User Processing Error Scheme, NCIP Create User Fiscal Transaction Processing Error Scheme, NCIP Lookup User Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Report Circulation Status Change Processing Error Scheme, NCIP Request Item Processing Error Scheme, NCIP Undo Check Out Item Processing Error Scheme, NCIP Update Request Item Processing Error Scheme, NCIP Update User Processing Error Scheme

*User Blocked*

- Circulation service, such as check out, renew, or request, cannot proceed because User information indicates that the User is blocked from access to the specified service.

- Used in: NCIP Check Out Item Processing Error Scheme, NCIP Renew Item Processing Error Scheme, NCIP Request Item Processing Error Scheme

*User Ineligible To Check Out This Item*

- Item Use Restriction Type, in conjunction with the User Privilege, prevents the Item from being checked out to the User.

- Used in: NCIP Accept Item Processing Error Scheme, NCIP Check Out Item Processing Error Scheme

### *User Ineligible To Renew This Item*

- Item Use Restriction Type, in conjunction with the User Privilege, prevents the Item from being renewed to the User.

- Used in: NCIP Renew Item Processing Error Scheme

### *User Ineligible To Request This Item*

- Item Use Restriction Type, in conjunction with the User Privilege, prevents the Item from being requested by the User.

- Used in: NCIP Request Item Processing Error Scheme

# Appendix B
(informative)
# Lists of Values for Data Elements

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2012. It is included for information only.)

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

# Appendix C
(informative)
# Implementation Profile Template

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2012. It is included for information only.)

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

## C.1 Purpose

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

## C.2 Scope

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

## C.3 Referenced Standards

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

## C.4 Definitions

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

## C.5 Encoding

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

## C.6 Required Components

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

## C.7 Transport Protocol

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

## C.8 Security

Describe the security requirements for this Implementation Profile.

## C.9 Scheme /Profile Registration

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

## C.10   Extension

Describe any extensibility mechanism allowed by this Implementation Profile.

# Appendix D

(informative)

# Application Profile Template

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2012. It is included for information only.)

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

## D.1 Introduction

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

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

- An application such as circulation

- A function such as exchange of data about an event

- A community such as libraries

- An environment such as the Internet

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

- Interoperability

- Methodology

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

### D.1.1. Profile Constraints

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

The Application Profile may not:

- Redefine data elements specified in this standard

- Add messages not defined in this standard

- Define new objects

- Add data elements to messages defined in this standard

- Delete required data elements from messages defined in this standard

## D.2 Description of Application Area

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

For example:

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

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

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

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

## D.3 Scope

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

## D.4 Conformance

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

## D.5 References

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

## D.6 Definitions

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

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

## D.7 Profile Specification

### D.7.1. Profile Description

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

### D.7.2. Participating Applications

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

### D.7.3. Business Rules

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

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

### D.7.4. Management of User and Staff User Interaction

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

### D.7.5. Required Components

#### D.7.5.1. Required and Optional Services

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

#### D.7.5.2. Required and Conditionally Required Data Elements

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

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

### D.7.6. Events

### D.7.6.1. Events Table

Describe any events and related information as shown below.

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

### D.7.6.2. Suggested Triggering Events

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

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

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

### D.7.7. Lookup Service Table

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

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

## D.8 Transport Protocol

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

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

- HTTP

- HTTPS

- Direct Transmission over TCP/IP

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

- HTTP

- HTTPS

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

## D.9 Security and Privacy

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

## D.10   Non-normative Guidelines

Specify any non-normative guidelines for the Application Profile.

# Appendix E

(informative)

# Relationship between This Standard
# and Associated Profiles

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2012. It is included for information only.)

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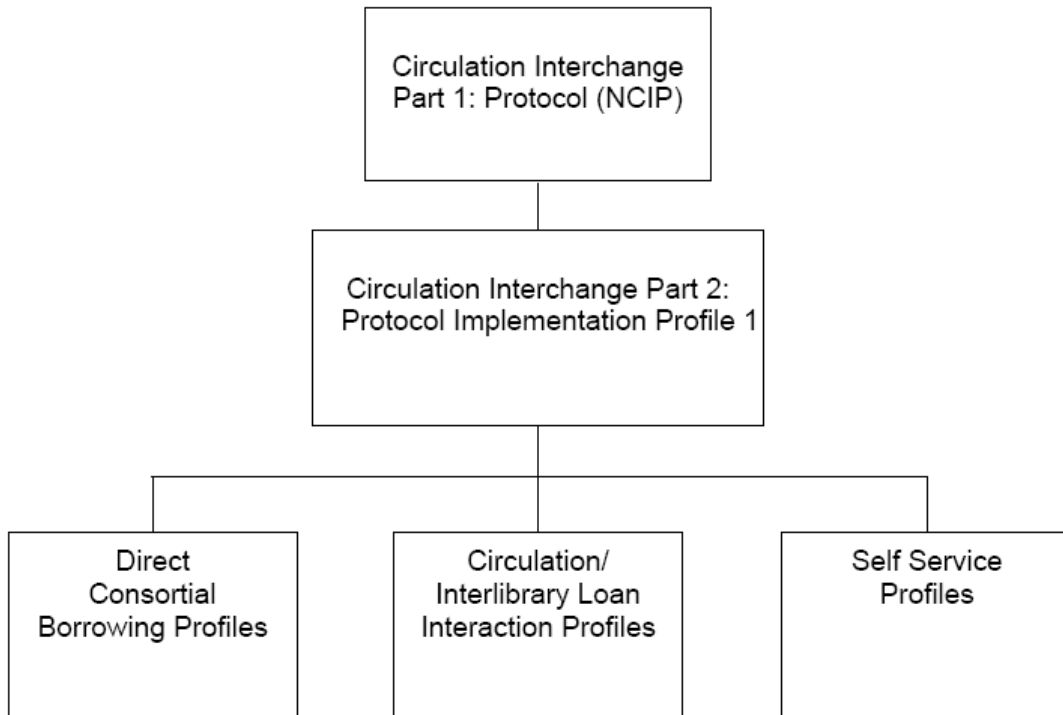


**Figure 1: NCIP relationship to profiles**

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

- **Self Service:**
    - Unmediated Online Circulation
    - Unmediated Online Circulation with Offline Recovery
- **Direct Consortial Borrowing:**
    - Item Agency Manages Transaction

–   User Agency Manages Transaction

–   Broker Application Manages Transaction

–   User Agency Manages Transaction with Proxy Check Out

- **Circulation/Interlibrary Loan Interaction:**

–   Borrowing Agency

–   Lending Agency

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

# Appendix F
(informative)
# Designation of Maintenance Agency and Registration Authority

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2012. It is included for information only.)

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

## F.1 Maintenance Activities

### F.1.1. Required Maintenance Activities

1. Responding to queries on interpretation of the NCIP and Implementation Profile.

2. Reviewing reports of defects.

3. Reviewing suggestions for improvement of the NCIP and Implementation Profiles.

4. Maintaining a current list of inquiries and responses that may be used for potential future enhancements of the NCIP and Implementation Profile.

5. Identifying an advisory group to review defect reports and suggestions, and approve changes.

6. Maintaining current versions of the NCIP and Implementation Profiles, as well as the current message encoding structures.

7. Maintaining current versions of the message structures (e.g., the XML Schema for Implementation Profile 1).

8. Maintaining a list of the latest version of all standards referenced in the standard that are approved for use with NCIP.

9. Making documents available in appropriate machine-readable formats (e.g., http-accessible).

10. Encouraging coordinated development of application profiles and schemes intended for use with NCIP.

11. Coordinating activities with closely related standards groups such as Z39.50 and ISO ILL.

### F.1.2. Desired Maintenance Activities

1. Provide a registration process that is easy for registrants.

2. Explore directory aspects of NCIP in conjunction with the Implementers Group.

## F.2 Registration Activities

Registration activities include:

1. Registering agencies that have implemented the standard.

2. Registering software providers that provide support for applications using the Protocol and who claim conformance with the standard.

3. Reviewing and registering Application Profiles.

4. Providing support for the registration of scheme names where registration is required.

5. Providing support for the registration of values within schemes when required, including:

   a) Registering authorities for specific schemes where appropriate

   b) Registering values for schemes that require the maintenance of a single list of values.

# Bibliography

(This appendix is not part of the *NISO Circulation Interchange Part 1: Protocol (NCIP)*, ANSI/NISO Z39.83-1-2012. It is included for information only.)

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

**Circulation**

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

ISO 8459-4:1997, *Information and documentation – Bibliographic data element directory – Part 4: Circulation applications* [Note: This standard has been revised and all of the parts have been combined into a single standard. See ISO 8459:2009, *Information and documentation – Bibliographic data element directory for use in data exchange and enquiry* at http://www.iso.org/iso/catalogue_detail.htm?csnumber=44937.]

**Interlibrary Loan**

ISO 8459-1:1988, *Information and documentation – Bibliographic data element directory – Part 1: Interloan applications* [Note: This standard has been revised and all of the parts have been combined into a single standard. See ISO 8459:2009, *Information and documentation – Bibliographic data element directory for use in data exchange and enquiry* at http://www.iso.org/iso/catalogue_detail.htm?csnumber=44937.]

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

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

**Other**

ANSI/NISO Z39.50-2003 (R2009), *Information Retrieval: Application Service Definition & Protocol Specification* <http://www.niso.org/standards/z39-50-2003/>

ANSI/NISO Z39.56-1996 (R2002), *Serial Item and Contribution Identifier (SICI)* <http://www.niso.org/standards/z39-56-1996r2002/>

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

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*Z39.50 Holdings Attribute Set*, Version 1.0, April 2000; prepared by Janifer Gatenby & Pieter Van Lierop, GEAC Computers.<http://lcweb.loc.gov/z3950/agency/defns/holdattr.html>

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