

Circulation Interchange Part 1: Protocol (NCIP)

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

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Foreword

(This foreword is not part of the American National Standard for Circulation Interchange Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. It is included for information only.)

Acknowledgements

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About This Standard

Both the rapid evolution of Web-based library services and the growing number of resource-sharing arrangements among libraries require an open standard for the exchange of circulation data. These applications must exchange data about library users, the items they wish to use, the owners of the items, and the relationships among these three entities.

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

This Standard is intended to address the growing need for interoperability among disparate circulation, interlibrary loan, and related applications. Interoperability between self-service applications and circulation applications, between and among various circulation applications, between circulation and interlibrary loan applications, and between other related applications, has been the principal focus of this Standard. All key terms used in this Standard are defined in Section 4 or Section 6.

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

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

The Protocol

The protocol specified in this Standard (NCIP) defines and specifies a set of objects, a set of services, messages that support those services, 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.

- **Connection-oriented** - Circulation processes happen in real time, often with the user present and awaiting service. A connection-oriented protocol facilitates a timely interaction between applications and allows the application requesting a service to know with confidence that a message was received by the partner application.
- **Sessionless** - The lifecycle of a particular circulation activity provided by an agency to a user is often extended over days, weeks, or months. It is impractical to maintain sessions between two applications. This environment is unlike information retrieval where a single service involves related exchanges within a brief period of time.
- **State of the message** - The protocol does provide a simple state table that governs the exchange of messages within a connection. This table does not govern the order of messages across the lifecycle of any particular circulation exchange between a user and agency or agencies.

Extensibility

NCIP is intended to support multiple applications and to evolve with technology and library practice. This requires an extensible framework that includes the protocol and two types of profiles.

- **The Standard** - This Standard describes the services, data objects and data elements at an abstract level. The protocol defined herein may be deployed using different encoding and transport implementation methods.
- **Implementation Profiles** - Each implementation method is described in a separate Implementation Profile that specifies how messages are exchanged. Specifications include message, character, and data encoding; required components and behavior; network transport; network security; scheme registration; and provision for extension. Note: Implementation profiles were originally called Cross-Application Profiles.
- **Application Profiles** - Application Profiles describe how the protocol would be used to support a specific application with a given set of practices and policies. An Application Profile includes a description of services that must be supported. Each profile also provides an event table that maps specific external events and circumstances to the use of particular services specified in the protocol.

This total framework will provide the stability required for longevity of use along with the flexibility necessary for NCIP to adapt to changing usage and technology. It will also allow it to be used across multiple applications.

- **Evolving technology and usage** - Separating services and data objects from actual implementation details will allow the NCIP to be implemented with new technology without needing to redefine services or data objects.
- **Multiple applications** - Practical implementation of the NCIP will vary among and even within broad application areas. If each application were to follow its own rules, interoperability would inevitably suffer. The application profiles allow for detailed specification of the use of the NCIP within a particular application area. Two implementors exchanging messages have a common set of rules to determine what

messages must be sent in a particular circumstance.

Of equal importance in thinking about extensibility is balancing the requirement for supporting the wide variation in local circulation practices and policies with support for interoperability among libraries and other organizations. Investigation showed that much of local practice and policy data is encapsulated in enumerated lists that capture descriptive elements for both items and users. The values in those lists vary from library to library, even among libraries of the same type.

As a solution to the need to support variation in local library practice, the NCIP uses a scheme-value pair instead of a single primitive data element for all such enumerated lists. The scheme name identifies the specific enumerated list that is being used. The value element provides a specific entry from this list. Each scheme is identified by a URI to guarantee a unique name for the scheme.

The Committee, its Membership, and Process

Committee AT began its work in January of 1999. NISO formed the committee so that it was broadly representative of organizations active in this area. It included individuals who represent libraries and other organizations that use circulation applications and providers that develop and sell those applications.

This committee has worked from the beginning to develop a protocol that would be of the greatest benefit to the entire community. The inclusive nature of the committee was helpful in achieving this goal. It was also necessary to operate in a very open fashion. Meeting attendees from outside the committee were invited to participate in discussions; several were asked to join the committee. At key stages throughout the process the committee has reached out to the community for comment through announcements on key online discussion lists, through appearances at conferences, and by presentations to key standards groups like the Z39.50 Implementors Group (ZIG) and the ISO ILL Protocol Implementors Group (IPIG). This has brought in invaluable comment and discussion.

The committee began its work by developing a set of goals for the NCIP that was published on the NISO Web site in November of 1999. The committee responded to all comments and revised the document as appropriate.

The committee then set to work on writing the NCIP itself. The first task was to define the data objects and the message structure. Once the basic outline of objects and services was complete, the committee undertook the complex task of assuring that the NCIP as defined would support the intended applications.

In order to accomplish this efficiently, the committee organized itself into teams around the three broad application areas. Each application team included experts from that application area. These teams reviewed the message structure from the perspective of their application and suggested changes. Through this process, the committee discovered the need for several new messages and for additional data elements.

During this time, the committee also took up the task of developing and finalizing an Implementation Profile. The committee had agreed early in 2000 that it would use XML for message encoding and that it would use a DTD to encapsulate the structure. By August of that year, the committee had settled on the transport mechanisms. With this completed, the committee had taken the NCIP to the point that it could be implemented.

As a result, in 2000 December, the committee reached consensus that the protocol and the Implementation Profile were ready for initial testing. To encourage this testing, NISO published the Standard (Protocol and Implementation Profile 1) as a Draft Standard for Trial Use in 2001 January. The committee took this step because it felt that only practical field implementations could identify the areas in which the Standard would need to be refined to support robust interchange of data among disparate systems. As hoped, several organizations undertook serious implementation efforts and these efforts guided changes to the Draft Standard.

These implementations also 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 committee anticipates that these profiles will be modified through use and that additional profiles will be created.

Trademarks, Service Marks

Wherever used in this Standard, all terms that are trademarks or service marks are and remain the property of their respective owners.

This Standard was processed and approved for submittal to ANSI by the National Information Standards Organization. It was balloted by the NISO Voting Members 2002 May 24 - 2002 July 8. It will next be reviewed in 2007. Suggestions for improving this Standard are welcome. They should be sent to the National Information Standards Organization, 4733 Bethesda Avenue, Suite 300, Bethesda, MD 20814. NISO approval of this Standard does not necessarily imply that all Voting Members voted for its approval. At the time it approved this Standard, NISO had the following members:

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Circulation Interchange Part 1: Protocol (NCIP)

1. Purpose

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

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

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

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

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

2. Scope

This Standard describes a protocol (NCIP) that defines the exchange of messages between and among computer-based applications to enable them to perform the functions necessary to lend and borrow items, to provide controlled access to electronic resources, and to facilitate co-operative

management of these functions. The Standard is not intended to define circulation, interlibrary loan, or other functions, but to facilitate communication of circulation data (e.g., Agency, User, Item) between and among disparate applications. This communication may be based on agreements previously established by the cooperating agencies to govern that relationship. However, the standard also permits relationships to be established upon first interaction between two agencies, or to be established at each interaction on a case-by-case basis.

3. Related Standards

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.

Interlibrary Loan

- ISO 8459-1:1988, Information and documentation — Bibliographic data element directory — Part 1: Interloan applications.
- 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.

Other

- ANSI/NISO Z39.50-1995, Information Retrieval: Application Service Definition and Protocol Specification. Also available from ISO as ISO 23950.
- ANSI/NISO Z39.56-1996, Serial Item and Contribution Identifier (SICI).
- IANA Registry of Media Types.
Retrieved 2002 August 15 from <<http://www.iana.org/assignments/media-types>>
- IETF RFC2119, Key words for use in RFCs to Indicate Requirement Levels; 1997 March.
Retrieved 2002 August 15, from <<http://www.ietf.org/rfc/rfc2119.txt>>
- IETF RFC2396, Uniform Resource Identifiers (URI): Generic Syntax; 2002 August.
Retrieved 2002 August 15, from <<http://www.ietf.org/rfc/rfc2396.txt>>
- ISO 639-2:1998, Codes for the representation of names of languages — Part 2: Alpha-3 code.
- ISO 2108:1992, Information and documentation — International standard book numbering (ISBN).
- ISO/DIS 2146, Documentation — Directories of libraries, archives, information and documentation centres, and their databases. Revised data model. (Working draft, 2000 May 4).

- ISO 3166-1:1997, Codes for the representation of names of countries and their subdivisions — Part 1: Country codes.
- ISO 3166-2:1998, Codes for the representation of names of countries and their subdivisions — Part 2: Country subdivision codes.
- ISO 3166-3:1999, Codes for the representation of names of countries and their subdivisions — Part 3: Codes for formerly used names of countries.
- ISO 3297:1998, Information and documentation — International standard serial number (ISSN).
- ISO 3901:1986, Documentation — International standard recording code (ISRC).
- ISO 4217:1995, Codes for the representation of currencies and funds.
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Retrieved 2002 August 15, from
<<http://lcweb.loc.gov/z3950/agency/defns/holdings.html>>

4. Definitions

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

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

4.1 Notational Convention

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

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

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

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

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

5.1 Object Classes and Object Definitions

This Standard specifies three primary object classes:

- Agency Object
- Item Object
- User Object

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

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

5.1.1 Agency Object

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

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

5.1.2 Item Object

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

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

5.1.3 User Object

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

- Authentication Input
- Block Or Trap
- Date Of Birth
- Name Information
- User Address Information
- User Language
- User Privilege
- Visible User Id

5.2 Summary of Service Types and Associated Services

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

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

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

Table 1. Summary of Service Types and Associated Services

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

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

5.3 Lookup Service Type

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

Usage:

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

The initiating application must determine the type of data the responding application requires for authentication. If the responding application can authenticate the User, it must return the unique Id of the User in the response.

Successful Result: The responding application authenticates the User and returns the unique Id of the User.

Messages and Data Elements:

Authenticate User

Required data: Authentication Input (R)

Optional data: None

Authenticate User Response

Required data: Problem, or
Unique User Id

Optional data: None

5.3.2 Lookup Agency Service

Usage: This service requests data about a particular Agency known to the responding application. The initiating application provides the unique 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)
Unique Agency Id

Optional data: None

Lookup Agency Response

Required data: Problem, or
Unique Agency Id

Optional data: None

If requested: Agency Address Information (R)
Agency User Privilege Type (R)
Application Profile Supported Type (R)
Authentication Prompt (R)
Consortium Agreement (R)
Organization Name Information (R)

5.3.3 Lookup Item Service

Usage: This service requests data about a particular Item known to the responding application. The initiator provides the unique Id of the Item and 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 Element Type (R)
{Unique Item Id, or
Unique Request Id, or
Visible Item Id}

Optional data: Current Borrower Desired
Current Requesters Desired

Lookup Item Response

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

Optional data: None

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

5.3.4 Lookup User Service

Usage: This service requests data about a particular User known to the responding application. The initiator provides the unique Id of the User and 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: {Authentication Input (R), or
Unique User Id, or
Visible User Id}
User Element Type (R)

Optional data: Loaned Items Desired
Requested Items Desired
User Fiscal Account Desired

Lookup User Response

Required data:	Problem, or Unique User Id
Optional data:	None
If requested:	Loaned Items Count (R) Requested Items Count (R) User Fiscal Account (R) User Optional Fields User Transaction

5.3.5 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 implementors of the NCIP would be able to complete the necessary changes at the same time and this would mean that such implementors 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 3) 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 To Agency Id
Optional data:	None

Lookup Version Response

Required data:	From Agency Id To Agency Id Version Supported (R)
Optional data:	None

5.4 Update Service Type

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

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

5.4.1 Accept Item Service

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

Successful Result: The responder accepts the Item for the action specified. It returns the Unique Request Id. It may optionally provide a Unique Item Id that the initiating application may use to reference the Item in subsequent messages.

Messages and Data Elements:

Accept Item

Required data:	Unique Request Id Requested Action Type
-----------------------	--

Optional data: {Date for Return, or Indeterminate Loan Period Flag, or Non Returnable Flag}
Mandated Action
Item Optional Fields
Fiscal Transaction Information
Renewal Not Permitted
Unique Item Id
Unique User Id
User Optional Fields

Accept Item Response

Required data: Problem, or
Unique Request Id

Optional data: Unique Item Id

5.4.2 Check In Item Service

Usage: This service requests that the responding application check in an Item. It also permits the initiating application to request data about the User and/or Item involved with this check in.

Successful Result: The responder checks in the Item and returns any routing data, fine/fee data, and/or requested User or Item data.

Messages and Data Elements:

Check In Item

Required data: Unique Item Id

Optional data: Item Element Type (R)
Mandated Action
User Element Type (R)

Check In Item Response

Required data: Problem, or
Unique Item Id

Optional data: Fiscal Transaction Information
Routing Information
Unique User Id

If requested: Item Optional Fields
User Optional Fields

5.4.3 Check Out Item Service

Usage: This service requests that the responding application check out an Item to a User. It also permits the initiating application to acknowledge the fee amount (if any) associated with the check out. The initiating application may also request data about the User and/or Item involved with this check out.

Successful Result: The responding application checks out the Item to the User until the date indicated in the response. It may also supply

the data elements requested.

Messages and Data Elements:

Check Out Item

Required data:	{Authentication Input (R), or Unique User Id} Unique Item Id
Optional data:	Acknowledged Fee Amount Acknowledged Item Use Restriction Type (R) Desired Date Due Item Element Type (R) Mandated Action Resource Desired Shipping Information Unique Request Id User Element Type (R)

Check Out Item Response

Required data:	{Problem, and, optionally {Required Fee Amount Required Item Use Restriction Type (R)}}, or {Date Due, or Non Returnable Flag, or Indeterminate Loan Period Flag} Unique Item Id Unique User Id}
Optional data:	Fiscal Transaction Information Renewal Count
If requested:	Electronic Resource Item Optional Fields User Optional Fields

5.4.4 Undo Check Out Item Service

Usage: This service requests that the responding application undo the check out that immediately preceded this message. If the responder agrees to the request, processing continues as if the preceding check out had never occurred. This service is typically used by self-check applications.

Successful Result: The immediately preceding check out is undone.

Messages and Data Elements:

Undo Check Out Item

Required data:	Unique Item Id
Optional data:	{Authentication Input (R), or Unique User Id} Mandated Action Unique Request Id

Undo Check Out Item Response

Required data:	Problem, or Unique Item Id
Optional data:	Fiscal Transaction Information Unique User Id

5.4.5 Create Agency Service

Usage:	This service requests that the responding application create a record for an agency. The initiating application supplies the data elements to be used to create the Agency. It may optionally supply a proposed Unique Agency Id.
Successful Result:	The responding application creates a record for an agency and returns a Unique Agency Id.

Messages and Data Elements:***Create Agency***

Required data:	Organization Name Information (R)
Optional data:	Agency Address Information (R) Agency User Privilege Type (R) Application Profile Supported Type (R) Authentication Prompt (R) Consortium Agreement (R) Mandated Action Unique Agency Id

Create Agency Response

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

5.4.6 Create Item Service

Usage:	This service requests that the responding application create 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 Unique Item Id.
Successful Result:	The responding application creates a record for an item and returns a Unique Item Id.

Messages and Data Elements:***Create Item***

Required data:	Bibliographic Description
Optional data:	Circulation Status Item Description Item Use Restriction Type Location (R) Mandated Action Physical Condition

Security Marker
Sensitization Flag
Unique Item Id
Unique Request Id

Create Item Response

Required data: Problem, or
Unique Item Id

5.4.7 Create User Service

Usage: This service requests that the responding application create a record for a user. The initiating application supplies the data elements to be used to create the User. It may optionally supply a proposed Unique User Id.

Successful Result: The responding application creates a record for a user and returns a Unique User Id.

Messages and Data Elements:

Create User

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

Create User Response

Required data: Problem, or
Unique User Id

5.4.8 Create User Fiscal Transaction Service

Usage: This service requests that the responding application create a new fiscal transaction for a service provided to a User. The initiating application provides the type of update and fiscal details about the update it wants done.

Successful Result: The responding application creates fiscal transaction data for the User.

Messages and Data Elements:

Create User Fiscal Transaction

Required data: {Authentication Input (R), or
Unique User Id}
Fiscal Transaction Information

Optional data: Mandated Action

Create User Fiscal Transaction Response

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

Optional data: None

5.4.9 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: Unique Item Id

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

Recall Item Response

Required data: Problem, or
Unique Item Id

Optional data: Date Due
Fiscal Transaction Information
Unique User Id

If requested: Item Optional Fields
User Optional Fields

5.4.10 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: Unique Item Id

Optional data: Item Element Type (R)
Mandated Action
User Element Type (R)

Cancel Recall Item Response

Required data: Problem, or
Unique Item Id

Optional data: Fiscal Transaction Information
Unique User Id

If requested: Item Optional Fields
User Optional Fields

5.4.11 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: {Authentication Input (R), or
Unique User Id}
Unique Item Id

Optional data: Acknowledged Fee Amount
Acknowledged Item Use Restriction Type (R)
Desired Date Due
Desired Date For Return
Item Element Type (R)
Mandated Action
User Element Type (R)

Renew Item Response

Required data: {Problem, and, optionally
{Required Fee Amount
Required Item Use Restriction Type (R)}}, or
Pending, or
Unique Item Id

Optional data: Date Due
Date For Return
Fiscal Transaction Information

Renewal Count
 Unique User Id
If requested: Item Optional Fields
 User Optional Fields

5.4.12 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: {Authentication Input (R), or Unique User Id}
 {Item Reported Lost, or Item Reported Missing, or Item Reported Never Borrowed, or Item Reported Returned}
 Unique Item Id

Optional data: Item Element Type (R)
 Mandated Action
 User Element Type (R)

Report Circulation Status Change Response

Required data: Problem, or Unique Item Id

Optional data: Unique User Id

If requested: Item Optional Fields
 User Optional Fields

5.4.13 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:	{Authentication Input (R), or Unique User Id Request Scope Type Request Type {Unique Bibliographic Id, or Unique Item Id}
Optional data:	Acknowledged Fee Amount Acknowledged Item Use Restriction Type (R) Earliest Date Needed Item Element Type (R) Mandated Action Need Before Date Pickup Expiry Date Shipping Information Unique Request Id User Element Type (R)

Request Item Response

Required data:	{Problem, and, optionally {Required Fee Amount Required Item Use Restriction Type (R)}}, or Request Scope Type Request Type {Unique Item Id, or {Unique Request Id, and, optionally Unique Item Id}} Unique User Id
Optional data:	Date Available Hold Pickup Date Fiscal Transaction Information Required Item Use Restriction Type (R) Shipping Information
If requested:	Item Optional Fields User Optional Fields

5.4.14 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:	{Authentication Input (R), or Unique User Id Request Type {Unique Item Id, or {Unique Request Id, and, optionally Unique Item Id}}
Optional data:	Item Element Type (R) Mandated Action Request Scope Type User Element Type (R)

Cancel Request Item Response

Required data:	Problem, or {Unique Item Id, or {Unique Request Id, and, optionally Unique Item Id}} Unique User Id
Optional data:	Fiscal Transaction Information
If requested:	Item Optional Fields User Optional Fields

5.4.15 Send User Notice Service

Usage:	This service requests that the responding application send a notice to a user. The initiating application provides the unique Id of the User and the type of notice to send. The 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:	Unique User Id User Notice Details
Optional data:	Date To Send Mandated Action

Send User Notice Response

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

5.4.16 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: Unique Agency Id
Optional data: Add Agency Fields
Delete Agency Fields
Mandated Action

Update Agency Response

Required data: Problem, or
Unique Agency Id
Optional data: None

5.4.17 Update Circulation Status Service

Usage: This service requests that the responding application update the circulation status of an Item. The initiating application provides the unique Id of the item Id and the new circulation status.

Successful Result: The responding application updates the circulation status as specified by the initiating application.

Messages and Data Elements:

Update Circulation Status

Required data: Circulation Status
Unique Item Id
Optional data: Mandated Action

Update Circulation Status Response

Required data: Problem, or
Unique Item Id
Optional data: None

5.4.18 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: Unique Item Id
Optional data: Add Item Fields
Delete Item Fields
Mandated Action

Update Item Response

Required data: Problem, or
Unique Item Id
Optional data: None

5.4.19 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: {{Authentication Input (R), or
Unique User Id}
Request Type
Unique Item Id}, or
Unique Request Id
Optional data: Add Request Fields
Delete Request Fields
Item Element Type (R)
Mandated Action
User Element Type (R)

Update Request Item Response

Required data:	{Problem, and, optionally Required Fee Amount}, or Request Scope Type Request Type Unique Item Id Unique User Id
Optional data:	Date Available Fiscal Transaction Information Hold Pickup Date Item Optional Fields User Optional Fields

5.4.20 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:	{Authentication Input (R), or Unique User Id}
Optional data:	Add User Fields Delete User Fields Mandated Action

Update User Response

Required data:	Problem, or Unique User Id
Optional data:	None

5.5 Notification Service Type

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

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

The Notification Services, summarized in Table 1, are presented below in alphabetical order.

5.5.1 Agency Created Service

Usage: This service informs the responding application that a new Agency has been created. The initiating application provides the Unique 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: Organization Name Information (R)
Unique Agency Id

Optional data: Agency Address Information (R)
Agency User Privilege Type (R)
Application Profile Supported Type (R)
Authentication Prompt (R)
Consortium Agreement (R)

Agency Created Response

Required data: None

Optional data: Messaging Error (R)

5.5.2 Agency Updated Service

Usage: This service informs the responding application that one or more data elements of an Agency have been updated. 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: Unique Agency Id

Optional data: Add Agency Fields
Delete Agency Fields

Agency Updated Response

Required data: None
Optional Data: Messaging Error (R)

5.5.3 Circulation Status 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 Unique Item Id and Unique 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 Reported Lost, or
Item Reported Missing, or
Item Reported Never Borrowed, or
Item Reported Returned}
Unique Item Id
Unique User Id

Optional data: Fiscal Transaction Information
Item Optional Fields
User Optional Fields

Circulation Status Change Reported Response

Required data: None
Optional data: Messaging Error (R)

5.5.4 Circulation Status Updated Service

Usage: This service informs the responding application that the circulation status of an Item has been updated. The initiating application provides the unique Id of the item Id and the new circulation status. Only the following three values from Circulation Status are valid here: Renew Still Pending, Item Not Renewed, or Item Overdue. No other values of Circulation Status are permitted for this service.

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

Messages and Data Elements:

Circulation Status Updated

Required data: Circulation Status
Unique Item Id

Optional data: None

Circulation Status Updated Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.5 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:	Unique Item Id
Optional data:	Fiscal Transaction Information Item Optional Fields Routing Information Unique User Id User Optional Fields

Item Checked In Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.6 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 Unique Item Id and Unique 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:	{Date Due, or Non Returnable Flag, or Indeterminate Loan Period Flag} Unique Item Id Unique User Id
Optional data:	Electronic Resource Provided Flag Fiscal Transaction Information Item Optional Fields Renewal Count Shipping Information

Unique Request Id
User Optional Fields

Item Checked Out Response

Required data: None
Optional data: Messaging Error (R)

5.5.7 Item Created Service

Usage: This service informs the responding application that a new Item has been created. The initiating application provides the Unique 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: Bibliographic Description
Unique Item Id
Optional data: Circulation Status
Item Description
Item Use Restriction Type
Location (R)
Physical Condition
Security Marker
Sensitization Flag
Unique Request Id

Item Created Response

Required data: None
Optional data: Messaging Error (R)

5.5.8 Item Recall Cancelled Service

Usage: This service informs the responding application that a recall has been cancelled. The initiating application provides the Unique Item Id, and may optionally provide the Unique 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: Unique Item Id
Optional data: Fiscal Transaction Information
Item Optional Fields
Unique User Id

User Optional Fields

Item Recall Cancelled Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.9 Item Recalled Service

Usage: This service informs the responding application that an Item has been recalled. The initiating application provides the Unique 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:	Date Due Unique Item Id
Optional data:	Item Optional Fields Shipping Information Unique User Id User Optional Fields

Item Recalled Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.10 Item Received Service

Usage: This service informs the responding application that an agency has received an item. 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:	Date Received Unique Item Id
Optional data:	Item Optional Fields Unique Request Id Unique User Id User Optional Fields

Item Received Response

Required data: None

Optional data: Messaging Error (R)

5.5.11 Item Renewed Service

Usage: This service informs the responding application that an Item has been renewed. The initiating application provides the Unique 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: Date Due
Unique Item Id

Optional data: Fiscal Transaction Information
Item Optional Fields
Renewal Count
Unique User Id
User Optional Fields

Item Renewed Response

Required data: None

Optional data: Messaging Error (R)

5.5.12 Item Request Cancelled Service

Usage: This service informs the responding application that a request for an Item has been cancelled. The initiating application provides the Unique Item Id and/or Unique Request Id, and the Unique 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: Request Type
{Unique Item Id, or
{Unique Request Id, and, optionally
Unique Item Id}}
Unique User Id

Optional data: Fiscal Transaction Information
Item Optional Fields
Request Scope Type

User Optional Fields

Item Request Cancelled Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.13 Item Request Updated Service

Usage: This service informs the responding application that a request for an Item has been updated. The initiating application provides the Unique Item Id and the Unique User Id, or the Unique 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:	{Request Type Unique Item Id Unique User Id}, or Unique Request Id
Optional data:	Add Request Fields Delete Request Fields Item Optional Fields User Optional Fields

Item Request Updated Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.14 Item Requested Service

Usage: This service informs the responding application that a request for an Item, which may not be immediately available, has been made. The initiating application provides the Unique Item Id, or the Unique Request Id and Unique Bibliographic ID. It also provides the Unique 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:	Request Scope Type Request Type {Unique Item Id, or {Unique Bibliographic Id Unique Request Id}}
	Unique User Id
Optional data:	Date Available Date Of User Request Earliest Date Needed Item Optional Fields Need Before Date Pickup Expiry Date Shipping Information User Optional Fields

Item Requested Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.15 Item Shipped Service

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

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

Messages and Data Elements:***Item Shipped***

Required data:	Date Shipped Shipping Information {Unique Item Id, or {Unique Request Id, and, optionally Unique Item Id}}
Optional data:	Item Optional Fields Unique User Id User Optional Fields

Item Shipped Response

Required data:	None
Optional data:	Messaging Error (R)

5.5.16 Item Updated Service

Usage: This service informs the responding application that one or more data elements of an Item have been updated. 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: Unique Item Id

Optional data: Add Item Fields
Delete Item Fields

Item Updated Response

Required data: None

Optional data: Messaging Error (R)

5.5.17 User Created Service

Usage: This service informs the responding application that a record for a user has been created. The initiating application provides Name Information and the Unique 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: Name Information
Unique User Id

Optional data: Block Or Trap (R)
Date Of Birth
User Address Information (R)
User Language (R)
User Privilege (R)
Visible User Id (R)

User Created Response

Required data: None

Optional data: Messaging Error (R)

5.5.18 User Fiscal Transaction Created Service

Usage: This service informs the responding application that a new fiscal transaction has been applied to a User's fiscal account.

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

Messages and Data Elements:

User Fiscal Transaction Created

Required data: Fiscal Transaction Information
Unique User Id

Optional data: None

User Fiscal Transaction Created Response

Required data: None

Optional data: Messaging Error (R)

5.5.19 User Notice Sent Service

Usage: This service informs the responding application that a notice has been sent to a User. The initiating application provides the Unique 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: Date Sent
Unique User Id
User Notice Details

Optional data: None

User Notice Sent Response

Required data: None

Optional data: Messaging Error (R)

5.5.20 User Updated Service

Usage: This service informs the responding application that one or more data elements of a User have been updated. 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: Unique User Id
Optional data: Add User Fields
Delete User Fields

User Updated Response

Required data: None
Optional data: Messaging Error (R)

6. Data Dictionary

6.1 Introduction

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

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

Simple data elements appear with definitions that indicate the nature and purpose of the data. Examples and notes are provided if available. If definitions are based on those in existing information standards, these sources are also noted. Complete citations for referenced standards are recorded in Section 3.

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).

This Standard allows for the development of additional lists of values for an Enumerated Data Type; these lists are not included in this standard. This extensibility permits implementors of NCIP to customize the enumerated lists to meet the requirements of a community using NCIP. Each data element defined as an Open Enumerated Type or a Closed Enumerated Type consists of a pair of data elements, Scheme and Value. Scheme is a text string used to identify the authority determining the list of values for the enumeration and Value is a number, code, word, or phrase from that scheme. The only relationship between or among the values of a list is that implied by their membership in the scheme. See Appendix C for more details on the use of enumerations.

6.2 Enumerated Types

There are two classes of Enumerated Type:

- Closed Enumerated Type
- Open Enumerated Type

This Standard establishes a set of restricted enumerated types required to support NCIP messaging. Such data elements, e.g., Item Element Type and Processing Error Type, are defined in Section 6.4 Closed Enumerated Types. The values for each of these Closed Enumerated Types are prescribed by this Standard and no other values are permitted. Closed Enumerated Types may also use external international standard lists of codes, e.g., Language Type. Closed Enumerated Types possess a scheme that shall be supported by applications conformant with this Standard. No other schemes may be defined for Closed Enumerated Types.

An Open Enumerated Type possesses a scheme that shall be supported by applications conformant with a specified Implementation Profile. The lists of values are not comprehensive and implementor groups may develop additional schemes for these enumerated types to cover their implementation requirements. Thus, an application may choose to support additional schemes for one or more Open Enumerated Types. Core lists of values to be supported by all implementations are defined for many Open Enumerated Types, e.g., Address Role Type or Bibliographic Level. For other Open Enumerated Types, such as Unique Agency Id and Consortium Agreement, the lists of values may be derived from standard lists of codes or other registries.

6.3 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).

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).

Bibliographic Description	
...	
Bibliographic Level	<p>Open enumerated type; identifies the level of the bibliographic description of the Item.</p> <p>Occurs 0 or 1 time.</p> <p>Examples: monograph, serial, or collection</p> <p>Source: MARC21</p> <p>NOTE: ISO 10161-1 uses the term "Item-type" to express this concept.</p>

6.3.1 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.

6.3.2 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.

Data Element Name	Data Element Definition
Acknowledged Fee Amount	Monetary value in a specified currency (i.e., Amount), acknowledged by a User as the fee charged for a requested service. See Amount for the definition of this complex element.
Acknowledged Item Use Restriction Type	Open enumerated type; 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.
Add Agency Fields	Complex element used to identify data elements that can be added as part of the Update Agency and Agency Updated services.
Agency Address Information	Occurs 0 or more times.
Agency User Privilege Type	Occurs 0 or more times.
Application Profile Supported Type	Occurs 0 or more times.
Authentication Prompt	Occurs 0 or more times.
Consortium Agreement	Occurs 0 or more times.
Organization Name Information	Occurs 0 or more times.
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 Description	Occurs 0 or 1 time.
Item Use Restriction Type	Occurs 0 or more times.
Location	Occurs 0 or more times.
Physical Condition	Occurs 0 or 1 time.
Security Marker	Occurs 0 or 1 time.
Sensitization Flag	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.
Acknowledged Fee Amount	Occurs 0 or 1 time.
Date Available	Occurs 0 or 1 time.
Date Of User Request	Occurs 0 or 1 time.
Earliest Date Needed	Occurs 0 or 1 time.
Need Before Date	Occurs 0 or 1 time.
Pickup Expiry Date	Occurs 0 or 1 time.
Request Scope Type	Occurs 0 or 1 time.
Request Status Type	Occurs 0 or 1 time.
Request Type	Occurs 0 or 1 time.
Shipping Information	Occurs 0 or 1 time.
Unique Item Id	Occurs 0 or 1 time.
Unique User Id	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.

Data Element Name	Data Element Definition
Authentication Input	Occurs 0 or more times.
Block Or Trap	Occurs 0 or more times.
Date Of Birth	Occurs 0 or 1 time.
Name Information	Occurs 0 or 1 time.
User Address Information	Occurs 0 or more times.
User Language	Occurs 0 or more times.
User Privilege	Occurs 0 or more times.
Visible User Id	Occurs 0 or more times.
Agency Address Information	<p>Information about an Agency's physical or electronic address.</p> <p>Required Usage: Agency Address Information consists of Agency Address Role Type, a choice either of Physical Address OR Electronic Address, and optionally, Valid From Date AND/OR Valid To Date. None of these elements are repeatable.</p> <p>Source: Data structure adapted from preliminary draft of ISO/DIS 2146.</p>
Agency Address Role Type	<p>Open enumerated type; 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.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples: billing, shipping, invoicing</p>
Electronic Address	Occurs 1 and only 1 time, but only if Electronic Address is not present.
Physical Address	Occurs 1 and only 1 time, but only if Physical Address is not present.
Valid From Date	Occurs 0 or 1 time.
Valid To Date	Occurs 0 or 1 time.
Agency Element Type	<p>Closed enumerated type; identifies the elements of the Agency Object on which queries (i.e., lookups) can be made.</p> <p>Scheme: http://www.niso.org/ncip/v1_0/schemes/agencyelementtype/agencyelementtype.scm</p> <p>Common name: NCIP Agency Element Type Scheme</p> <p>Values:</p> <ul style="list-style-type: none"> - Agency Address Information - Agency User Privilege Type - Application Profile Supported Type - Authentication Prompt - Consortium Agreement - Organization Name Information
Agency User Privilege Type	<p>Open enumerated type; identifies the types of privileges that may be granted by a particular Agency or available to Users of a specific Agency.</p> <p>Examples: undergraduate, graduate, faculty (for a university); adult, child, (for a public library)</p>
Amount	The amount of a fiscal charge or fee.

Data Element Name	Data Element Definition
Currency Code	<p>Open enumerated type; indicates the type of currency of a particular sum of money; values are currency codes specified in ISO 4217.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples: Canadian dollar: CAD; Egyptian pound: EGP</p> <p>Although standard codes representing monetary currency for government entities are listed in ISO 4217, the designation of Currency Code as an open enumerated type permits libraries to develop additional schemes for library "pseudo-currencies", such as IFLA vouchers used for ILL.</p>
Monetary Value	<p>Integer expressed as positive, negative, or zero, multiplied by ten to the power M, where M is the value of the Minor unit for that currency as defined in ISO 4217, Section 6. Gives the Amount in terms of the value of Currency Code.</p> <p>Occurs 1 and only 1 time.</p>
Application Profile Supported Type	<p>Open enumerated type; identifies the Application Profiles supported by an Agency.</p>
Application Profile Type	<p>Open enumerated type; 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.</p>
Authentication Data Format Type	<p>Open enumerated type; identifies the format of the authentication data that an Agency requires.</p> <p>Examples: text, audio, image</p>
Authentication Input	<p>Information, such as a password, provided by a User when prompted; used to authenticate the User.</p>
Authentication Data Format Type	<p>Occurs 1 and only 1 time.</p>
Authentication Input Data	<p>Text string input by a User in response to an authentication prompt. The nature of the data is specified by Authentication Data Format Type.</p> <p>Occurs 1 and only 1 time.</p>
Authentication Input Type	<p>Open enumerated type; identifies the nature of the data to be supplied to authenticate a User.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples: Barcode Id, PIN, User Name</p>
Authentication Prompt	<p>Agency-specific data; used to prompt a User for entry of authentication data.</p>
Prompt Input	
Authentication Data Format Type	<p>Occurs 1 and only 1 time.</p>
Authentication Input Type	<p>Occurs 1 and only 1 time.</p>
Sensitive Data Flag	<p>Empty element; indicates whether or not authentication input should be treated as sensitive data.</p> <p>Occurs 0 or 1 time.</p>
Prompt Output	

Data Element Name	Data Element Definition
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	Open enumerated type; identifies the format of the authentication prompt. Occurs 1 and only 1 time. Examples: text, audio, image
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 Code	Open enumerated type; identifies the source of resource identifier associated with the bibliographic item. Occurs 0 or 1 time. Examples: ISBN, ISSN, ISRC, ISMN, Legal Deposit Number, Government Publication Number, CODEN, and Report Number
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 Level	Open enumerated type; identifies the level of the bibliographic description of the Item. Occurs 0 or 1 time. Examples: monograph, serial, or collection Source: MARC21 NOTE: ISO 10161-1 uses the term "Item-type" to express this concept.
Bibliographic Record Id	Occurs 0 or 1 time. Bibliographic Record Id consists of Bibliographic Record Identifier and a choice of either Bibliographic Record Identifier Code OR Unique Agency Id. None of these component elements are repeatable.
Bibliographic Record Identifier	Text string; identifies the machine-readable record that describes a bibliographic item. Occurs 1 and only 1 time.
Bibliographic Record Identifier Code	Open enumerated type; identifies the numbering scheme that

Data Element Name	Data Element Definition
	<p>uniquely identifies a bibliographic record. Code values are usually associated with national bibliographies or bibliographic utilities.</p> <p>Occurs 1 and only 1 time, but only if Unique Agency Id is not present.</p> <p>Examples:</p> <ul style="list-style-type: none"> – ANBN (Australian National Bibliography Number), BNBN (British National Bibliography Number), LCCN (Library of Congress Control Number), RLIN
Unique Agency Id	<p>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.</p> <p>Occurs 1 and only 1 time, but only if Bibliographic Record Identifier Code is not present.</p>
Component Id	Occurs 0 or 1 time.
Component Identifier	<p>Text string; identifies component part of another bibliographic item.</p> <p>Occurs 1 and only 1 time.</p>
Component Identifier Type	<p>Open enumerated type; identifies a component part of a bibliographic item.</p> <p>Occurs 1 and only 1 time.</p> <p>For examples, see Bibliographic Item Identifier.</p>
Edition	<p>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.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 10161-1</p>
Electronic Data Format Type	<p>Open enumerated type; identifies the format in which electronic data is available for access, download, etc.</p> <p>Occurs 0 or 1 time.</p> <p>Values are specified in the IANA Registry of Media Types</p> <p>Examples: rtf, tiff, mpeg</p>
Language	Occurs 0 or 1 time.
Medium Type	<p>Open enumerated type; identifies the medium on which the bibliographic item has been produced.</p> <p>Occurs 0 or 1 time.</p> <p>Examples: audio tape, book, machine-readable computer file</p>
Pagination	<p>Text string; gives number of pages or leaves in an item or a component part of an item.</p> <p>Occurs 0 or 1 time.</p>
Place Of Publication	<p>Text string; gives geographic location of the publisher, or failing this, of the printer, distributor, or manufacturer.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 10161-1</p>
Publication Date	Text string; gives date of issue of an item as designated by the

Data Element Name	Data Element Definition
	<p>publisher.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 10161-1</p>
Publication Date Of Component	<p>Text string; gives publication date assigned by the publisher to the component of a item.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 10161-1</p>
Publisher	<p>Text string; gives name of person(s) or organization(s) responsible for the publication of an item.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 10161-1</p>
Series Title Number	<p>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.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 10161-1</p>
Sponsoring Body	<p>Text string; gives name of corporate body or organization that issued the item or is associated with its authorship.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 10161-1</p>
Title	<p>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.</p> <p>Occurs 0 or 1 time.</p>
Title Of Component	<p>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 a issue of a journal.</p> <p>Occurs 0 or 1 time.</p> <p>Note: ISO 10161-1 uses "title-of-article" to express this concept.</p>
Block Or Trap	Data specifying the nature of the block or trap.
Block Or Trap Type	<p>Open enumerated type; identifies the type of block or trap imposed by an Agency on a User.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples: block check out, block hold, trap for lost card</p>
Unique Agency Id	Occurs 1 and only 1 time.
Valid From Date	Occurs 0 or 1 time.
Valid To Date	Occurs 0 or 1 time.
Circulation Status	<p>Open enumerated type; indicates the current availability status of a bibliographic item.</p> <p>Examples: available on shelf, on loan, lost</p> <p>Source: ISO 10161-1</p>
Consortium Agreement	<p>Open enumerated type; identifies a consortium agreement to which an Agency is a party.</p>

Data Element Name	Data Element Definition
Current Borrower Desired	Empty element; indicates whether or not 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.
<i>Note on Dates</i>	<p>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.</p> <p>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.</p>
Date Available	Date/time type; indicates when the requested Item is expected to be available to the User.
Date Due	Date/time type; indicates when the loan of an Item is scheduled to end.
Date Event Occurred	Date/time type; indicates the date and time that the initiating application took the mandated action.
Date For Return	Date/time type; indicates the date and time specified by the lending Agency for the return of an Item. Initiating applications provide this data when requesting that a responding application accept the Item for circulation to or pick-up by a User.
Date Of Birth	Date/time type; indicates a User's date of birth.
Date Of User Request	Date/time type; indicates when a User has issued a request for an Item.
Date Placed	Date/time type; indicates when a User placed a request for an Item.
Date Recalled	Date/time type; indicates when a recall for an Item was issued.
Date Received	Date/time type; indicates when an Agency received an Item.
Date Reported Returned	Date/time type; indicates when the User purports to have returned the Item.
Date Sent	Date/time type; indicates when an Item or a notice was sent.
Date Shipped	Date/time type; indicates when an Agency shipped an Item.
Date To Send	Date/time type; indicates when an Item or a notice is to be sent.
Date Will Send	Date/time type; indicates when an Agency will send an Item or a notice.
Delete Agency Fields	Complex element used to identify data elements that can be deleted as part of the Update Agency and Agency Updated services.
Agency Address Information	Occurs 0 or more times.
Agency User Privilege Type	Occurs 0 or more times.
Application Profile Supported Type	Occurs 0 or more times.
Authentication Prompt	Occurs 0 or more times.
Consortium Agreement	Occurs 0 or more times.
Organization Name Information	Occurs 0 or more times.
Delete Item Fields	Complex element used to identify data elements that can be deleted as part of the Update Item and Item Updated services.

Data Element Name	Data Element Definition
Bibliographic Description	Occurs 0 or 1 time.
Item Description	Occurs 0 or 1 time.
Item Use Restriction Type	Occurs 0 or more times.
Location	Occurs 0 or more times.
Physical Condition	Occurs 0 or 1 time.
Security Marker	Occurs 0 or 1 time.
Sensitization Flag	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.
Acknowledged Fee Amount	Occurs 0 or 1 time.
Date Available	Occurs 0 or 1 time.
Date Of User Request	Occurs 0 or 1 time.
Earliest Date Needed	Occurs 0 or 1 time.
Need Before Date	Occurs 0 or 1 time.
Pickup Expiry Date	Occurs 0 or 1 time.
Request Scope Type	Occurs 0 or 1 time.
Request Status Type	Occurs 0 or 1 time.
Request Type	Occurs 0 or 1 time.
Shipping Information	Occurs 0 or 1 time.
Unique Item Id	Occurs 0 or 1 time.
Unique User Id	Occurs 0 or 1 time.
Delete User Fields	Complex element used to identify data elements that can be deleted as part of the Update User and User Updated services.
Authentication Input	Occurs 0 or more times.
Block Or Trap	Occurs 0 or more times.
Date Of Birth	Occurs 0 or 1 time.
Name Information	Occurs 0 or 1 time.
User Address Information	Occurs 0 or more times.
User Language	Occurs 0 or more times.
User Privilege	Occurs 0 or more times.
Visible User Id	Occurs 0 or more times.
Desired Date Due	Date/time type; indicates the date the User wishes the Item to be due. Initiating applications supply this data at the time that a request is issued for check out, renewal, or recall.
Desired Date For Return	Date/time type; indicates the date desired by the borrowing Agency for the return of an Item. This data is provided when requesting the renewal of an Item for which the circulation activity is being managed by an application other than that of the original lending Agency and the original lending Agency has specified a Date For Return.
Earliest Date Needed	Date/time type; indicates the earliest date at which the User has need of an Item. Implies that the requested Item is not required or

Data Element Name	Data Element Definition
	desired prior to the date specified.
Electronic Address	
Electronic Address Type	Open enumerated type; 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
Electronic Address Data	Text string; provides the electronic address. Occurs 1 and only 1 time.
Electronic Resource	
Actual Resource	Text string; gives the electronic resource entity, such as a computer file or the full text of the Item. Occurs 1 and only 1 time.
Electronic Data Format Type	Open enumerated type; identifies the data type of the electronic resource. Values are specified in the IANA Registry of Media Types. Occurs 1 and only 1 time.
Reference To Resource	Text string; provides a pointer to the resource rather than providing the resource itself. Occurs 1 and only 1 time if Actual Resource and Electronic Data Format Type are absent.
Electronic Resource Provided Flag	Empty element; indicates whether or not the bibliographic item, in the form of an electronic resource, has been provided as part of the Check Out Item Service.
Fiscal Transaction Information	
Amount	Occurs 1 and only 1 time.
Fiscal Action Type	Occurs 1 and only 1 time.
Fiscal Transaction Description	Occurs 0 or 1 time.
Fiscal Transaction Reference Id	Occurs 0 or 1 time.
Fiscal Transaction Type	Occurs 1 and only 1 time.
Item Details	Occurs 0 or 1 time.
Payment Method Type	Occurs 0 or 1 time.
Related Fiscal Transaction Reference Id	Occurs 0 or more times.
Unique Request Id	Occurs 0 or 1 time.
Valid From Date	Occurs 0 or 1 time.
Valid To Date	Occurs 0 or 1 time.
Fiscal Action Type	Open enumerated type; identifies a fiscal action. Examples: assess, cancel, payment
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.
Fiscal Transaction Identifier Value	Text string; gives value to be used to identify a fiscal transaction. Occurs 1 and only 1 time.
Unique Agency Id	Occurs 1 and only 1 time.

Data Element Name	Data Element Definition
Fiscal Transaction Type	Open enumerated type; identifies the type of fiscal charge. Examples: catalog search, day pass, ILL fee
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., Unique Agency Id) from which the message was sent. See Unique Agency Id for a definition of this element.
From System Authentication	Text string; provides data to be used by recipient to authenticate the system from which the message was sent.
From System Id	Open enumerated type; identifies the system from which a message was sent.
Hold Pickup Date	Date/time type; indicates when a hold expires for a given User.
Hold Queue Length	Non-negative integer; indicates the number of Users who currently have requested a hold on an Item.
Hold Queue Position	Positive integer; indicates the position in the hold queue of a request by a User for an Item, conditional on the value of Request Type of "hold."
Holdings Information	Required Usage: Holdings Information consists of a choice of one or more occurrences of Structured Holdings Data OR a single occurrence of Unstructured Holdings Data.
Structured Holdings Data	Occurs 1 or more times, but only if Unstructured Holdings Data is not present.
Unstructured Holdings Data	Occurs 1 and only 1 time, but only if Structured Holdings Data is not present.
Indeterminate Loan Period Flag	Empty element; indicates that the loan is for an indefinite period.
Initiation Header	
Application Profile Type	Occurs 0 or 1 time.
From Agency Authentication	Occurs 0 or 1 time.
From Agency Id	Occurs 1 and only 1 time.
From System Authentication	Occurs 0 or 1 time.
From System Id	Occurs 0 or 1 time.
On Behalf of Agency	Occurs 0 or 1 time.
To Agency Id	Occurs 1 and only 1 time.
To System Id	Occurs 0 or 1 time.
Item Description	Description of a specific physical or electronic Item belonging to an Agency's collection(s).
Call Number	Text string; indicates permanent relative physical location assigned to a bibliographic item. Occurs 0 or 1 time.
Copy Number	Text string; gives the copy number of an Item held by an Agency. Occurs 0 or 1 time. Examples: Copy 1, Copy 2
Holdings Information	Occurs 0 or 1 time.
Item Description Level	Open enumerated type; identifies the level at which the Item is

Data Element Name	Data Element Definition
	described. Occurs 0 or 1 time. Examples: work, copy, piece
Visible Item Id	Occurs 0 or 1 time.
Visible Item Identifier	Text string; gives a barcode or another eye-readable identifier that is affixed to or accompanies a physical Item. The value of this identifier may be identical to the Item Identifier Value used in the Unique Item Id. Occurs 1 and only 1 time.
Visible Item Identifier Type	Open enumerated type; identifies the type of Visible Item Identifier used. Occurs 1 and only 1 time. Examples: barcode, accession number
Item Details	Required Usage: Item Details consists of Unique Item Id, Bibliographic Description, and optionally Date Checked Out, Date Renewed and Date Returned. In addition, there is an optional choice among three data elements, Date Due OR Indeterminate Loan Period Flag OR Non Returnable Flag. Only Date Renewed is repeatable.
Bibliographic Description	Occurs 1 and only 1 time.
Date Checked Out	Occurs 0 or 1 time.
Date Due	Occurs 1 and 1 only time, but only if neither Indeterminate Loan Period Flag nor Non Returnable Flag is present.
Date Renewed	Date/time type; indicates when an Item was renewed. Occurs 0 or more times.
Date Returned	Date/time type; indicates when an Item was returned (not necessarily checked in, but no longer in the custody of a User or Agency) Occurs 0 or 1 time.
Indeterminate Loan Period Flag	Occurs 1 and 1 only time, but only if neither Date Due nor Non Returnable Flag is present.
Non Returnable Flag	Occurs 1 and 1 only time, but only if neither Date Due nor Indeterminate Loan Period Flag is present.
Unique Item Id	Occurs 1 and only 1 time.
Item Element Type	Closed enumerated type; identifies all the elements of the Item Object on which queries (i.e., lookups) can be made. Scheme: http://www.niso.org/ncip/v1_0/schemes/itemelementtype/itemelementtype.scm Common name: NCIP Item Element Type Scheme Values: <ul style="list-style-type: none"> - Bibliographic Description - Circulation Status - Electronic Resource - Hold Queue Length - Item Description

Data Element Name	Data Element Definition
	<ul style="list-style-type: none"> - Item Use Restriction Type - Location - Physical Condition - Security Marker - Sensitization Flag
Item Optional Fields	Complex element; used in update response messages. Carries data elements describing the Item Object specifically as in the initiation message of an update service. Also used in the initiation message of a notification service to describe the Item Object.
Bibliographic Description	Occurs 0 or 1 time.
Circulation Status	Occurs 0 or 1 time.
Electronic Resource	Occurs 0 or 1 time.
Hold Queue Length	Occurs 0 or 1 time.
Item Description	Occurs 0 or 1 time.
Item Use Restriction Type	Occurs 0 or more times.
Location	Occurs 0 or more times.
Physical Condition	Occurs 0 or 1 time.
Security Marker	Occurs 0 or 1 time.
Sensitization Flag	Occurs 0 or 1 time.
Item Reported Lost	Empty element; indicates that a User or Agency has reported that the Item has been lost.
Item Reported Missing	Empty element; indicates that a User or Agency has reported that the Item is missing.
Item Reported Never Borrowed	Empty element; indicates that a User or Agency has reported that the Item was never borrowed.
Item Reported Returned	Complex element; indicates that a User or Agency has reported that the Item was returned on the date specified.
Date Reported Returned	Occurs 1 and only 1 time.
Item Transaction	
Current Borrower	Complex element; identifies the User that currently has Item on loan. See Unique 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 Unique User Id for details of the structure of this complex element. Occurs 0 or more times.
Item Use Restriction Type	Open enumerated type; 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
Language	Closed enumerated type; identifies the language of the Item. Values are from the list of Alpha-3 Bibliographic Codes as specified in <i>ISO 639-2/B</i> .

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

Data Element Name	Data Element Definition
	<ul style="list-style-type: none"> - Location Name Level = 3 - Location Name Value = Locked Cabinet #5
Location Name Instance	Occurs 1 or more times.
Location Name Level	Positive integer; indicates the level of the Location Name Instance in a sequence within Location Name. Occurs 1 and only 1 time.
Location Name Value	Text string; provides a value for the Location Name Instance; gives name of an Agency-specific location or sub-location where an Item is housed at a particular point in time. Occurs 1 and only 1 time.
Location Type	Open enumerated type; identifies the nature of the location where an Item is at a particular point in time. Occurs 1 and only 1 time. Examples: Permanent, Temporary, Current
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.
Messaging Error	Complex element; indicates that the responding application does not understand the initiation message. Includes identification of location and nature of any messaging errors in an initiation message. See Appendix B for additional detail.
Messaging Error Type	Closed enumerated type; indicates the reason for the messaging error. Occurs 1 and only 1 time. These reasons are enumerated in the NCIP Messaging Error Type Scheme, as follows: Scheme: http://www.niso.org/ncip/v1_0/schemes/messagingerrortype/messagingerrortype.scm Common Name: NCIP Messaging Error Type Scheme Values: <ul style="list-style-type: none"> - Invalid Message Syntax Error - Protocol Error - Unknown Element - Unknown Scheme - Unknown Service - Unknown Value From Known Scheme See Appendix A for definitions of these values.

Data Element Name	Data Element Definition
Messaging Error Element	<p>Recursive structure used in a response message to identify the element of an initiation message that is the subject of the error. It must fully specify the path from (but not including) the root node of the initiation message to the element that is the subject of the error.</p> <p>Occurs 1 and only 1 time. Messaging Error Element consists of Element Name, and, optionally, either Messaging Error Value OR another occurrence of Messaging Error Element.</p> <p>Messaging Error Element contains either another Messaging Error Element or Messaging Error Value or neither (i.e., just Element Name). Thus, if the presence or absence of an element (rather than the value of an element) is the error, then the recursive Messaging Error Element structure ends with a Messaging Error Element containing only Element Name.</p>
Element Name	Text string; provides name of data element in which error is located. Occurs 1 and only 1 time.
Messaging Error Element	Occurs 0 or 1 times, but 0 times if Messaging Error Value is present.
Messaging Error Value	Text string; contains the data element value that was in error. Occurs 0 or 1 times, but 0 times if Messaging Error Element is present.
Name Information	
Organization Name Information	Occurs 0 or more times, but 1 or more times if Personal Name Information is absent.
Personal Name Information	Occurs 0 or 1 time, but 1 time if Organization Name Information is absent.
Need Before Date	Date/time type; indicates when the User needs the requested Item. Implies that the requested Item is no longer required if the Item cannot be supplied by the date specified.
Non Returnable Flag	Empty element; indicates that the Item is returnable.
Notice Content	Text string; provides the contents of the notice.
Notice Item	
Amount	Occurs 0 or 1 time.
Item Details	Occurs 1 and only 1 time.
Notice Type	Open enumerated type; identifies the type of notice to be sent or that has been sent to a User. Examples: account reminder, Item overdue, available for pickup
On Behalf Of Agency	Unique identification of the Agency (i.e., Unique Agency Id) on behalf of which the initiating message is sent. See Unique Agency Id for a definition of this compound element.
Organization Name Information	
Organization Name	Text string; represents the name of an organization. Occurs 1 and only 1 time. Examples: The Free Library of Philadelphia, Milton S. Eisenhower Library
Organization Name Type	Open enumerated type; identifies the type of Organization Name.

Data Element Name	Data Element Definition
	Occurs 1 and only 1 time. Examples: official name, abbreviation or acronym, transliterated name Source: ISO 1046 draft
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. Occurs 0 or 1 time.
Personal Name Information	Required Usage: Personal Address Information consists of Structured Personal User Name AND/OR Unstructured Personal User Name. Neither of these component elements is repeatable.
Structured Personal User Name	Occurs 0 or 1 time if Structured Personal User Name is present, otherwise occurs 1 and only 1 time.
Unstructured 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. Required Usage: Physical Address consists of Physical Address Type and a choice of either Structured Address OR Unstructured Address. None of these component elements are repeatable.
Physical Address Type	Open enumerated type; indicates whether the physical address is a street address or a postal address. Occurs 1 and only 1 time. Examples: postal address, street 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 Condition	
Physical Condition Details	Text string; provides details of the physical condition of an item, identified by Physical Condition Type. Occurs 0 or 1 time.
Physical Condition Type	Open enumerated type; 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
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

Data Element Name	Data Element Definition
	a result of fulfillment of a request such as a hold or a stack retrieval.
Problem	Complex element; provides an indication either that an application cannot perform the service requested by the initiating application (i.e., 1 or more Processing Errors) or that an application does not understand the initiation message (i.e., 1 or more Messaging Errors). See Appendix B for additional detail.
Messaging Error	Occurs 1 or more times, but only if Processing Error is not present.
Processing Error	Occurs 1 or more times, but only if Messaging Error is not present.
Processing Error	Complex element; indicates that the responding application cannot perform the service requested by the initiating application. This element is structured to enable a responding application to specify the location and nature of any processing errors in an initiation message.
Processing Error Type	<p>Closed enumerated type; indicates the reason for the processing error.</p> <p>Occurs 1 and only 1 time.</p> <p>The reasons common to all lookup and update services are defined in the NCIP General Processing Error Scheme, as follows:</p> <p>Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/generalprocessingerror.scm</p> <p>Common Name: NCIP General Processing Error Scheme</p> <p>Values:</p> <ul style="list-style-type: none"> - Agency Authentication Failed - Invalid Amount - Invalid Date - Needed Data Missing - System Authentication Failed - Temporary Processing Failure - Unauthorized Combination of Element Values for Agency - Unauthorized Combination of Element Values for System - Unauthorized Service for Agency - Unauthorized Service for System - Unknown Agency - Unknown System - Unsupported Service <p>See Appendix A for definitions of these values.</p> <p>See also Section 6.4 and Appendix A for the closed enumerated types for the processing errors that apply to specific lookup and update services.</p>
Processing Error Element	Recursive structure used in a response message to identify the element of an initiation message that is the subject of the processing error. It must fully specify the path from (but not including) the root node of the initiation message to the element that

Data Element Name	Data Element Definition
	<p>is the subject of the processing error.</p> <p>Processing Error Element contains either another Processing Error Element or Processing Error Value or neither (i.e., just Element Name). Thus, if the presence or absence of an element (rather than the value of an element) is the error, then the recursive Processing Error Element structure ends with a Processing Error Element containing only Element Name.</p> <p>Occurs 1 and only 1 time. Processing Error Element consists of Element Name, and, optionally, either Processing Error Value OR another occurrence of Processing Error Element.</p>
Element Name	<p>Text string; provides name of data element in which processing error is located.</p> <p>Occurs 1 and only 1 time.</p>
Processing Error Element	Occurs 0 or 1 time, but 0 times if Processing Error Value is present.
Processing Error Value	<p>Text string; contains data element value that caused the processing error.</p> <p>Occurs 0 or 1 time, but 0 times if Processing Error Element is present.</p>
Related Fiscal Transaction Reference Id	<p>A number or text string used to identify a related financial transaction.</p> <p>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.</p>
Unique Agency Id	Occurs 1 and only 1 time.
Fiscal Transaction Identifier Value	<p>Text string; gives value to be used to identify a fiscal transaction.</p> <p>Occurs 1 and only 1 time.</p>
Reminder Level	<p>Positive integer; provides a count of the number of times a reminder has been sent to a User.</p> <p>Examples: 1, 3, 4</p>
Renewal Count	<p>Non-negative integer; indicates the number of times the Item identified has been renewed. The Renewal Count for an initial check out is "0".</p>
Renewal Not Permitted	<p>Empty element; indicates that the initiating Agency will accept requests to renew the Item.</p>
Request Scope Type	<p>Open enumerated type; indicates the level of the Item description being requested.</p> <p>Examples: bibliographic item (i.e., any item with the same unique bibliographic id), item (i.e., any item with the same bibliographic id and volume)</p>
Request Status Type	<p>Open enumerated type; identifies the status of the request.</p> <p>Examples: in process, available for pickup, expired</p>
Request Type	<p>Open enumerated type; identifies the nature of the request.</p> <p>Examples: hold, loan, stack retrieval</p>
Requested Action Type	<p>Open enumerated type; identifies the action the responding Agency is requested to take on receipt of the Accept Item message.</p>

Data Element Name	Data Element Definition
	Examples: circulate, hold for pickup
Requested Item	Data describing the Item requested by a User. Required Usage: Requested Item consists of Request Type, Request Status Type, Date Placed, a choice between Unique Request Id AND/OR Unique Item Id and optionally, Pickup Date, Pickup Expiry Date, Reminder Level, Hold Queue Position. None of these elements are repeatable.
Date Placed	Occurs 1 and only 1 time.
Hold Queue Position	Occurs 0 or 1 time.
Pickup Date	Occurs 0 or 1 time.
Pickup Expiry Date	Occurs 0 or 1 time.
Reminder Level	Occurs 0 or 1 time.
Request Status Type	Occurs 1 and only 1 time.
Request Type	Occurs 1 and only 1 time.
Unique Item Id	Occurs 0 or 1 time if Unique Request Id is present, otherwise occurs 1 and only 1 time.
Unique Request Id	Occurs 0 or 1 time if Unique Item Id is present, otherwise occurs 1 and only 1 time.
Requested Items Count	Required Usage: Requested Item Count consists of Requested Item Count Value and a choice among three elements, Circulation Status OR Item Use Restriction Type OR Request Type. None of these elements are repeatable.
Circulation Status	Occurs 1 and 1 only time, but only if neither Item Use Restriction Type nor Request Type is present.
Item Use Restriction Type	Occurs 1 and 1 only time, but only if neither Circulation Status nor Request Type is present.
Request Type	Occurs 1 and 1 only time, but only if neither Circulation Status nor Item Use Restriction Type is present.
Requested Item Count Value	Non-negative integer; indicates the number of holds, reserves, or pages a User has in effect at any point in time for a Circulation Status or Item Use Restriction Type. Occurs 1 and only 1 time. Example: A User may have on request 5 items on term loan, 3 items recalled, 1 item available on shelf.
Requested Items Desired	Empty element; indicates that the requester desires information about items requested by a specific User.
Required Fee Amount	Monetary value in a specified currency (i.e., Amount) that a User must pay for a requested service. See Amount for the definition of this complex element.
Required Item Use Restriction Type	Open enumerated type; 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.
Resource Desired	Empty element; indicates that the requester desires an electronic resource be transmitted as part of a Check Out Item Response.

Data Element Name	Data Element Definition
Response Header	
From Agency Authentication	Occurs 0 or 1 time.
From Agency Id	Occurs 1 and only 1 time.
From System Authentication	Occurs 0 or 1 time
From System Id	Occurs 0 or 1 time
To Agency Id	Occurs 1 and only 1 time.
To System Id	Occurs 0 or 1 time
Routing Information	
Information to aid in the routing of an Item following check in.	
Destination	Occurs 1 and only 1 time. Destination consists of either Bin Number AND/OR Location. Neither of these component elements is repeatable.
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.
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.
Unique User Id	Occurs 0 or 1 time.
Security Marker	
Open enumerated type; specifies the type of security marker protecting an Item, including encryption of electronic resources. Examples: 3M Tattle-Tape Security Strip, Checkpoint RFID, PGP	
Sensitization Flag	
Empty element; indicates that an item should be desensitized and re-sensitized during the check out and check in procedures.	
Shipping Information	
Required Usage: Shipping Information consists of a choice of data elements, Physical Address OR Electronic Address, and, optionally, Shipping Instructions AND/OR Shipping Note.	
Electronic Address	Occurs 1 and only 1 time, but only if Physical Address is not present.
Physical Address	Occurs 1 and only 1 time, but only if Electronic Address is not present.
Shipping Instructions	Text string; provides human-readable data pertaining to the shipment of an Item, such as the preferred carrier, packaging requirements, etc. Occurs 0 or 1 time.
Shipping Note	Text string; provides data additional to that provided in other data elements that comprise Shipping Information. Occurs 0 or 1 time.
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. Required Usage: Within Structured Address, there is a choice of	

Data Element Name	Data Element Definition
	<p>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.</p> <p>If the second, more granular option is used, Structured Address must contain at least one out of Street, Post Office Box, and District, but could contain any two or all three.</p> <p>One or more of the data elements Care Of, Locality, Region, Country, and Postal Code optionally can be used with either set of "local" elements.</p>
Care Of	<p>Text string; gives name of a person, organization, or organizational unit to whose attention the addressed item is intended to be directed.</p> <p>Occurs 0 or 1 time.</p>
Country	<p>Text string; gives name of a country.</p> <p>Occurs 0 or 1 time.</p>
District	<p>Text string; gives name of a sub-entity within a country such as a parish, county, or district.</p> <p>Occurs 0 or 1 time. See Required Usage note in Structured Address for more details on the usage requirements for District.</p> <p>Source: ISO 8459-4</p>
House Name	<p>Text string; gives name of a house, building, or building complex.</p> <p>Occurs 0 or 1 time.</p>
Line 1	<p>Text string; gives one or more of Location Within Building, House Name, Street, Post Office Box, and/or District when a lower level of granularity is not needed.</p> <p>Occurs 0 or 1 time. See Required Usage note in Structured Address for more details on the usage requirements for Line 1.</p>
Line 2	<p>Text string; gives one or more of House Name, Street, Post Office Box, and/or District when Line 1 is not sufficient.</p> <p>Occurs 0 or 1 time. See Required Usage note in Structured Address for more details on the usage requirements for Line 2.</p>
Locality	<p>Text string; gives name of a city, suburb, or postal area.</p> <p>Occurs 0 or 1 time.</p> <p>Note: ISO 8459-4 uses term "City" for this concept.</p>
Location Within Building	<p>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.</p> <p>Occurs 0 or 1 time.</p> <p>Examples: Suite 42, Level 4</p> <p>Source: ISO 8459-4</p>
Post Office Box	<p>Text string; gives the box number assigned by the postal authority.</p> <p>Occurs 0 or 1 time. See Required Usage note in Structured</p>

Data Element Name	Data Element Definition
	<p>Address for more details on the usage requirements for Post Office Box.</p> <p>Source: ISO 8459-4</p>
Postal Code	<p>Text string; gives the code assigned by the postal authority of a country that uniquely identifies an address or groups of addresses.</p> <p>Occurs 0 or 1 time.</p> <p>Examples:</p> <ul style="list-style-type: none"> - ZIP code (USA): 20814 - Postal code (Canada): K1A 0N4 <p>Source: ISO 8459-4</p>
Region	<p>Text string; gives the name of an area within a country such as a state, province, department, or prefecture.</p> <p>Occurs 0 or 1 time.</p> <p>Source: ISO 8459-4</p>
Street	<p>Text string; gives the name of the location of a house, building or building complex within a city or district.</p> <p>Occurs 0 or 1 time. See Required Usage note in Structured Address for more details on the usage requirements for Street.</p> <p>Source: Variation on ISO 8459-4</p>
Structured Holdings Data	<p>Required Usage: Structured Holdings Data consists of Holdings Chronology AND/OR Holdings Enumeration. Neither of these component elements is repeatable.</p>
Holdings Chronology	<p>Complex element; contains a sequence of Chronology Level Instances, which together express a time period covered by the Item as a specific part of a bibliographic item and shows the relationship of that Item to the entire bibliographic item.</p> <p>Occurs 0 or 1 time, but 1 and only 1 time if Holdings Enumeration is not present.</p> <p>Examples: To provide the Holdings Chronology for a newspaper issue with a publication date 1998/04/16:</p> <p>Chronology Level Instance 1</p> <ul style="list-style-type: none"> - Chronology Level = 1 - Chronology Caption = Year - Chronology Value = 1998 <p>Chronology Level Instance 2</p> <ul style="list-style-type: none"> - Chronology Level= 2 - Chronology Caption = Month - Chronology Value = 04 <p>Chronology Level Instance 3</p> <ul style="list-style-type: none"> - Chronology Level = 3 - Chronology Caption = Day - Chronology Value = 16
Chronology Level Instance	<p>Complex element; provides structured information that describes the hierarchical relationship of the specific part held by an Agency to a whole Item, expressed in chronological terms.</p>

Data Element Name	Data Element Definition
	Occurs 1 or more times. Chronology Level Instance consists of Chronology Value and a choice of Chronology Caption AND/OR Chronology Level. None of these component elements are repeatable.
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
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 <ul style="list-style-type: none"> - Enumeration Level = 1 - Enumeration Caption = Volume - Enumeration Value = 235 Enumeration Level Instance 2 <ul style="list-style-type: none"> - Enumeration Level= 2 - Enumeration Caption = Issue - Enumeration Value = 13 Enumeration Level Instance 3 <ul style="list-style-type: none"> - 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
Structured Personal User Name	Complex element; provides components of a personal name; structure permits parsing and allows for the component elements to be manipulated in the order and format most suited to a given use.
Given Name	Text string; gives simple, double, or compound name that distinguishes an individual within a family carrying a common name. Christian names and forenames are included as given names. Occurs 0 or 1 time. Source: ISO 8459-4
Initials	Text string; provides the initial letter or letters of the given name. Occurs 0 or 1 time.
Prefix	Text string; gives name element, placed before other personal name elements such as surname and given names that, in association with these elements, serves to identify an individual, but does not form an integral part of a name. Occurs 0 or 1 time. Examples: titles, epithets, indication of office, such as Mr., Hon., Dr. Source: 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
Surname	Text string; gives surname or family name of the User. A surname

Data Element Name	Data Element Definition
	<p>may consist of a single word, or may be compound, that is, joined by a hyphen or contain more than one word.</p> <p>Occurs 1 and only 1 time.</p> <p>Examples:</p> <ul style="list-style-type: none"> - single word: Stevens - compound: Bridges-Webb - multiple words: Van der Meer, Day Lewis <p>Source: Variation of ISO 8459-4</p>
To Agency Id	Unique identification of the Agency (i.e., Unique Agency Id) to which a message is sent. See Unique Agency Id for a definition of this element.
To System Id	Open enumerated type; identifies the system to which a message is sent.
Unique Agency Id	Open enumerated type; identifies an Agency. Examples: MARC Organization Code List maintained by the Library of Congress, Canadian Library Symbols
Unique Bibliographic Id	Unique identification of a bibliographic item by either the Bibliographic Item Id or the Bibliographic Record Id. Required Usage: Unique Bibliographic Id consists of a single occurrence of either Bibliographic Item Id OR Bibliographic Record Id.
Bibliographic Item Id	See definition for this element under Bibliographic Description. Occurs 1 and 1 only time, but only if Bibliographic Record Id is not present.
Bibliographic Record Id	See definition for this element under Bibliographic Description. Occurs 1 and 1 only time, but only if Bibliographic Item Id is not present.
Unique Item Id	
Unique Agency Id	Occurs 1 and only 1 time.
Item Identifier Value	Text string; identifies, in context of a specific Agency, the Item involved in a circulation transaction. Identifier may take the form of a barcode, a record number, an accession number, etc. Occurs 1 and only 1 time.
Unique Request Id	
Request Identifier Value	Text string; provides the value of a specific request identifier. Occurs 1 and only 1 time.
Unique Agency Id	Occurs 1 and only 1 time.
Unique User Id	
Unique Agency Id	Occurs 1 and only 1 time.
User Identifier Value	Text string; specifies a User within an Agency. Occurs 1 and only 1 time. Examples: patron bar code, patron record number, university identification number
Unstructured Address	

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.
Unstructured Address Type	Open enumerated type; identifies the type of formatting present in Unstructured Address Data. Occurs 1 and only 1 time. Examples: HTML, newline-delimited text
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. Required Usage: User Address Information consists of User Address Role Type, a choice of Physical Address OR Electronic Address, and, optionally, Valid From Date AND/OR Valid To Date. None of these elements are repeatable. Source: Data structure adapted from preliminary draft of ISO/DIS 2146
Electronic Address	Occurs 1 and only 1 time, but only if Physical Address is not present.
Physical Address	Occurs 1 and only 1 time, but only if Electronic Address is not present.
User Address Role Type	Open enumerated type; 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
Valid From Date	Occurs 0 or 1 time.
Valid To Date	Occurs 0 or 1 time.
User Element Type	Closed enumerated type; identifies all the elements of the User Object on which queries (i.e., lookups) can be made. Scheme: http://www.niso.org/ncip/v1_0/schemes/userelementtype/userelementtype.scm Common name: NCIP User Element Type Scheme Values: <ul style="list-style-type: none"> - Authentication Input - Block Or Trap - Date Of Birth - Name Information - User Address Information

Data Element Name	Data Element Definition
	<ul style="list-style-type: none"> - User Language - User Privilege - Visible User Id
User Fiscal Account	Record of a User's fiscal obligations to or credit with an Agency.
Account Balance	<p>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.</p> <p>Occurs 1 and only 1 time.</p>
Account Details	<p>Details of a fiscal transaction affecting the User's account.</p> <p>Occurs 0 or more times.</p>
Accrual Date	<p>Date/time type; indicates when the amount specified in Fiscal Transaction Information was accrued to the User's account.</p> <p>Occurs 1 and only 1 time.</p>
Fiscal Transaction Information	Occurs 1 and only 1 time.
User Fiscal Account Desired	Empty element; indicates that the requester desires information about the User's fiscal account.
User Language	<p>Closed enumerated type; identifies one or more languages, in order of preference, in which the User wishes to receive written communication.</p> <p>Values are from the list of Alpha-3 Terminology Codes as specified in <i>ISO 639-2/T</i>.</p> <p>Examples: eng (English), fra (French), deu (German)</p>
User Notice Details	<p>A message to be displayed or otherwise sent to a User.</p> <p>Required Usage: User Notice Details consists of Notice Type, and optionally Notice Content. In addition, there is a choice among three data elements, Notice Item OR User Fiscal Account OR User Privilege.</p>
Notice Content	Occurs 0 or 1 time.
Notice Type	Occurs 1 and only 1 time.
Notice Item	Occurs 1 or more times, but only if neither User Fiscal Account nor User Privilege are present.
User Fiscal Account	Occurs 1 and only 1 time, but only if neither Notice Item nor User Privilege are present.
User Privilege	Occurs 1 and only 1 time, but only if neither Notice Item nor User Fiscal Account are present.
User Optional Fields	Complex element; used in update response messages. Carries data elements describing the User Object as requested in the initiation message of an update service. Also used in the initiation message of a notification service to describe the User Object.
Block Or Trap	Occurs 0 or more times.
Date Of Birth	Occurs 0 or 1 time.
Name Information	Occurs 0 or 1 time.
User Address Information	Occurs 0 or more times.
User Language	Occurs 0 or more times.

Data Element Name	Data Element Definition
User Privilege	Occurs 0 or more times.
Visible User Id	Occurs 0 or more times.
User Privilege	Complex element; contains details concerning a specified privilege accorded to a User by a specific Agency, such as fees charged for the privilege, the status of the privilege, or the dates during which the privilege is in force.
Agency User Privilege Type	Occurs 1 and only 1 time.
Unique Agency Id	Occurs 1 and only 1 time.
User Privilege Description	Text string; describes a specific user privilege. Occurs 0 or 1 time.
User Privilege Fee	Occurs 0 or 1 time.
Amount	Occurs 1 and only 1 time.
Payment Method Type	Open enumerated type; 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
User Privilege Status	Occurs 0 or 1 time.
Date Of User Privilege Status	Date/time type; indicates when the current user privilege status came into effect. Occurs 0 or 1 time.
User Privilege Status Type	Open enumerated type; indicates the current status of a user privilege. Occurs 1 and only 1 time. Examples: active, cancelled
Valid From Date	Occurs 0 or 1 time.
Valid To Date	Occurs 0 or 1 time.
User Transaction	Information concerning a User's loan or request, including the Item(s) that a User has on loan or on request, together with the Agency to which the Item(s) belong or to which the request was sent.
Loaned Item	Occurs 0 or more times.
Requested Item	Occurs 0 or more times.
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.
Version	Text string; identifies the NCIP version to which the message belongs.
Version Supported	Text string; identifies an NCIP version supported by an application.
Visible User Id	

Data Element Name	Data Element Definition
Unique Agency Id	Occurs 0 or 1 time.
Visible User Identifier	Text string; gives a barcode or another eye-readable identifier affixed to an identification card assigned to a User. The value of the identifier may be identical to the User Identifier Value used in the Unique User Id. Occurs 1 and only 1 time.
Visible User Identifier Type	Open enumerated type; identifies the type of Visible User Identifier used. Occurs 1 and only 1 time. Example: barcode

6.4 Closed Enumerated Types

All Closed Enumerated Types defined in this Standard are listed below. Definition of values for Agency Element Type, Item Element Type, Language, User Element Type, and User Language are found in the Data Dictionary (Section 6). Definition of values for Messaging Error Type and Processing Error Type are found in Appendix A.

For the following data elements included in the Closed Enumerated Types, the ONLY valid Schemes are those specified below. For each Scheme, the values listed are the ONLY valid values. An application conformant with this Standard shall support the Schemes specified below.

6.4.1 Data Element: Agency Element Type

Scheme: http://www.niso.org/ncip/v1_0/schemes/agencyelementtype/agencyelementtype.scm

Common Name: NCIP Agency Element Type Scheme

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

6.4.2 Data Element: Item Element Type

Scheme: http://www.niso.org/ncip/v1_0/schemes/itemelementtype/itemelementtype.scm

Common Name: NCIP Item Element Type Scheme

Values: Bibliographic Description
Circulation Status
Electronic Resource
Hold Queue Length
Item Description
Item Use Restriction Type
Location

Physical Condition
 Security Marker
 Sensitization Flag

6.4.3 Data Element: Language

Scheme: <http://lcweb.loc.gov/standards/iso639-2/bibcodes.html>
 Common Name: ISO 639-2 Alpha-3 Bibliographic Codes
 Values: See ISO 639-2/B (bibliographic codes) for the list of valid values.

6.4.4 Data Element: Messaging Error Type

Scheme: http://www.niso.org/ncip/v1_0/schemes/messagingerrortype/messagingerrortype.scm
 Common Name: NCIP Messaging Error Type Scheme
 Values: Invalid Message Syntax Error
 Protocol Error
 Unknown Element
 Unknown Scheme
 Unknown Service
 Unknown Value From Known Scheme

6.4.5 Data Element: Processing Error Type

Service: ALL LOOKUP AND UPDATE SERVICES

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/generalprocessingerror.scm
 Common Name: NCIP General Processing Error Scheme
 Values: Agency Authentication Failed
 Invalid Amount
 Invalid Date
 Needed Data Missing
 System Authentication Failed
 Temporary Processing Failure
 Unauthorized Combination Of Element Values For Agency
 Unauthorized Combination Of Element Values For System
 Unauthorized Service For Agency
 Unauthorized Service For System
 Unknown Agency
 Unknown System
 Unsupported Service

Service: ACCEPT ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/acceptitemprocessingerror.scm
 Common Name: NCIP Accept Item Processing Error Scheme
 Values: Cannot Accept Item
 Cannot Guarantee Restrictions On Use
 Element Rule Violated
 Unknown Item

Unknown Request
Unknown User
User Ineligible To Check Out This Item

Service: AUTHENTICATE USER

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerror/type/authenticateuserprocessingerror.scm
Common Name: NCIP Authenticate User Processing Error Scheme
Values: Unknown User
User Authentication Failed

Service: CANCEL RECALL ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerror/type/cancelrecallitemprocessingerror.scm
Common Name: NCIP Cancel Recall Item Processing Error Scheme
Values: Item Not Checked Out
Recall Cannot Be Cancelled At This Time
Unknown Item

Service: CANCEL REQUEST ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerror/type/cancelrequestitemprocessingerror.scm
Common Name: NCIP Cancel Request Item Processing Error Scheme
Values: Element Rule Violated
Request Already Processed
Unknown Item
Unknown Request
Unknown User
User Authentication Failed

Service: CHECK IN ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerror/type/checkinitemprocessingerror.scm
Common Name: NCIP Check In Item Processing Error Scheme
Values: Item Not Checked Out
Unknown Item

Service: CHECK OUT ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerror/type/checkoutitemprocessingerror.scm
Common Name: NCIP Check Out Item Processing Error Scheme
Values: Item Does Not Circulate
Maximum Check Outs Exceeded
Resource Cannot Be Provided
Unknown Item
Unknown Request
Unknown User
Unsupported Shipping Address Type

User Authentication Failed
 User Blocked
 User Ineligible To Check Out This Item

Service: CREATE AGENCY

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/createagencyprocessingerror.scm

Common Name: NCIP Create Agency Processing Error Scheme

Values: Duplicate Agency
 Element Rule Violated

Service: CREATE ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/createitemprocessingerror.scm

Common Name: NCIP Create Item Processing Error Scheme

Values: Duplicate Item
 Element Rule Violated

Service: CREATE USER

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/createuserprocessingerror.scm

Common Name: NCIP Create User Processing Error Scheme

Values: Duplicate User
 Element Rule Violated
 User Authentication Failed

Service: CREATE USER FISCAL TRANSACTION

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/createuserfiscaltransactionprocessingerror.scm

Common Name: NCIP Create User Fiscal Transaction Processing Error Scheme

Values: Account Access Denied
 Duplicate Fiscal Transaction
 Element Rule Violated
 Unable To Add Element
 Unknown Item
 Unknown Request
 Unknown User
 User Access Denied
 User Authentication Failed

Service: LOOKUP AGENCY

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/lookupagencyprocessingerror.scm

Common Name: NCIP Lookup Agency Processing Error Scheme

Values: Agency Access Denied
 Element Rule Violated

Service: LOOKUP ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/lookupitemprocessingerror.scm

Common Name: NCIP Lookup Item Processing Error Scheme

Values: Element Rule Violated
Item Access Denied
Non-Unique Item
Unknown Item

Service: LOOKUP USER

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/lookupuserprocessingerror.scm

Common Name: NCIP Lookup User Processing Error Scheme

Values: Element Rule Violated
Non-Unique User
Unknown User
User Access Denied
User Authentication Failed

Service: RECALL ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/recallitemprocessingerror.scm

Common Name: NCIP Recall Item Processing Error Scheme

Values: Item Cannot Be Recalled
Item Not Checked Out
Unknown Item
Unsupported Shipping Address Type

Service: RENEW ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/renewitemprocessingerror.scm

Common Name: NCIP Renew Item Processing Error Scheme

Values: Item Not Checked Out
Item Not Renewable
Maximum Renewals Exceeded
Renewal Not Allowed - Item Has Outstanding Requests
Unknown Item
Unknown User
User Authentication Failed
User Blocked
User Ineligible To Renew This Item

Service: REPORT CIRCULATION STATUS CHANGE

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/reportcirculationstatuschangeprocessingerror.scm

Common Name: NCIP Report Circulation Status Change Processing Error Scheme

Values: Element Rule Violated

Item Not Checked Out To This User
 Unknown Item
 Unknown User
 User Authentication Failed

Service: REQUEST ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/requestitemprocessingerror.scm

Common Name: NCIP Request Item Processing Error Scheme

Values: Duplicate Request
 Element Rule Violated
 Item Does Not Circulate
 Item Not Available By Need Before Date
 Unknown Item
 Unknown User
 User Authentication Failed
 User Blocked
 User Ineligible To Request This Item

Service: SEND USER NOTICE

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/sendusertnoticeprocessingerror.scm

Common Name: NCIP Send User Notice Processing Error Scheme

Values: Element Rule Violated
 Item Not Checked Out
 Unknown Item
 Unknown User
 Unsupported Notice

Service: UNDO CHECK OUT ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/undocheckoutitemprocessingerror.scm

Common Name: NCIP Undo Check Out Item Processing Error Scheme

Values: Unknown Item
 Unknown User
 User Authentication Failed

Service: UPDATE AGENCY

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/updateagencyprocessingerror.scm

Common Name: NCIP Update Agency Processing Error Scheme

Values: Agency Access Denied
 Element Rule Violated
 Unable To Add Element
 Unable To Delete Element

Service: UPDATE CIRCULATION STATUS

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/

updatecirculationstatusprocessingerror.scm

Common Name: NCIP Update Circulation Status Processing Error Scheme

Values: Element Rule Violated
 Item Access Denied
 Unable To Add Element
 Unable To Delete Element
 Unknown Item

Service: UPDATE ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/updateitemprocessingerror.scm

Common Name: NCIP Update Item Processing Error Scheme

Values: Element Rule Violated
 Item Access Denied
 Unable To Add Element
 Unable To Delete Element
 Unknown Item

Service: UPDATE REQUEST ITEM

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/updaterequestitemprocessingerror.scm

Common Name: NCIP Update Request Item Processing Error Scheme

Values: Element Rule Violated
 Item Access Denied
 Unable To Add Element
 Unable To Delete Element
 Unknown Item
 Unknown Request
 Unknown User
 User Authentication Failed

Service: UPDATE USER

Scheme: http://www.niso.org/ncip/v1_0/schemes/processingerrortype/updateuserprocessingerror.scm

Common Name: NCIP Update User Processing Error Scheme

Values: Element Rule Violated
 Unable To Add Element
 Unable To Delete Element
 Unknown User
 User Access Denied
 User Authentication Failed

6.4.6 Data Element: User Element TypeScheme: http://www.niso.org/ncip/v1_0/schemes/userelementtype/userelementtype.scm

Common Name: NCIP User Element Type Scheme

Values: Authentication Input
 Block Or Trap

Date Of Birth
 Name Information
 User Address Information
 User Language
 User Privilege
 Visible User Id

6.4.7 Data Element: User Language

Scheme: <http://lcweb.loc.gov/standards/iso639-2/termcodes.html>
 Common Name: ISO 639-2 Terminological Codes
 Values: See ISO 639-2/T (terminological codes) for list of valid values.

7. State Table Governing Messaging over a Single Connection

The Messaging State Tables define the behavior of the initiating and responding applications with regard to 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 and outgoing. These events are identified below.

Incoming events:

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

Outgoing events:

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

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

Predicates:

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

The single variable contains the message identifier of the last message transmitted or received.

Variables:

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 2. Initiating Application Messaging State Table

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

	Event	IDLE	WAITING
			TERMINAL
7	TIMER		TIMEOUT CLOSE TERMINAL

Note: Table rows 2 and 3 of the initiating application messaging state table differ in respect to the fact that the predicate (p1) is TRUE in row 2 and FALSE ($\wedge p1$) 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 3. Responding Application Messaging State Table

	Event	IDLE	PROCESSING
1	INITind	set MESSAGE.Id var clear timer PROCESSING	signal error #1 CLOSE TERMINAL
2	RESPreq		p1 RESP set timer IDLE
3	RESPind	signal error #2 CLOSE TERMINAL	signal error #2 CLOSE TERMINAL
4	CLOSEreq	CLOSE TERMINAL	CLOSE TERMINAL
5	CLOSEind	CLOSE TERMINAL	signal error #3 TERMINAL
6	TIMER	TIMEOUT CLOSE TERMINAL	

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 Initiation Header and a 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 D). 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 E). 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 F).

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

Appendix A: Definitions of Values for Use within the "Problem" Data Element

(Normative)

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

These values are used in response messages in situations where the responding application encounters a problem (identified as either a messaging error or a processing error) 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 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 Update Request Item Processing Error Scheme

Unknown Scheme

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

Unknown Service

- Service 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 Authenticate User 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 Authenticate User Processing Error Scheme, 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: Structure of the Data Element “Problem” and Illustrations of its Use

(This appendix is not part of the American National Standard Circulation Interchange Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. It is included for information only.)

The data element named "Problem" has the following structure as defined in Section 6:

Problem

```

Messaging Error (R)
  Messaging Error Type
  Scheme
  Value
  Messaging Error Element
  Element Name
  {Messaging Error Element, or
  Messaging Error Value, or neither}

```

or

```

Processing Error (R)
  Processing Error Type
  Scheme
  Value
  Processing Error Element
  Element Name
  {Processing Error Element, or
  Processing Error Value, or neither}

```

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

Processing Error is a repeatable element used by a responding application to indicate that it cannot perform the service requested by the initiating application.

B.1 For Messaging Error

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

Examples:

```

Invalid Message Syntax Error
Protocol Error
Unknown Service
Unknown Value From Known Scheme

```

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

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

Element Name provides the name of the data element in which the error is located.

Messaging Error Value contains the data element value that was in error.

B.2 For Processing Error

Processing Error Type refers to a Scheme (an enumerated list) used to indicate the reason for the processing error. This Standard defines a general processing error scheme with values that are common to all lookup and update services. In addition, a processing error scheme is defined for each lookup and update service, providing service-specific processing error messages.

Examples:

NCIP Check Out Item Processing Error Scheme

- Item Does Not Circulate
- Maximum Check Outs Exceeded
- Resource Cannot Be Provided
- Unknown Item
- Unknown User

NCIP General Processing Error Scheme

- Agency Authentication Failed
- System Authentication Failed
- Temporary Processing Error
- Unsupported Service

Processing Error Element is a recursive structure used to identify the element of the initiation message that is the subject of the error. It shall fully describe the path from (but not including) the root node of the initiation message to the element that is the subject of the error. It contains either another Processing Error Element or Processing Error Value or neither (i.e., just Element Name). Thus, if the presence or absence of an element (rather than the value of an element) is the error, then the Processing Error Element structure ends with a Processing Error Element containing only Element Name.

Element Name provides the name of the data element in which the processing error is located.

Processing Error Value contains the data element value that caused the processing error.

B.3 Illustrative Examples:

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

```

Agency User Privilege Type
  Scheme
  Value

```

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

```

Problem
  MessagingError
    MessagingErrorType                                     # This indicates the type of
                                                         error.
      Scheme
        NCIP Messaging Error Type Scheme
      Scheme
      Value
        Unknown Value From Known Scheme
      Value
    MessagingErrorType
    MessagingErrorElement                                 # This indicates the top level
                                                         element that contained the
                                                         error.
      ElementName
        AgencyUserPrivilegeType                         # This indicates the name of
                                                         the top level element.
      ElementName
      MessagingErrorElement                               # This indicates the next-
                                                         level element that contained
                                                         the error.
        ElementName
          Value                                           # This indicates the name of
                                                         the next-level element.
        ElementName
        MessagingErrorValue
          Graduate                                         # This indicates the incorrect
                                                         value that the element
                                                         actually contained.
        MessagingErrorValue
      MessagingErrorElement
    MessagingErrorElement
  MessagingError
Problem

```

2. An Update Item message contains an element Unique User Id, which is an invalid element in the message. If an application receives an incorrect element in an Update Item initiation message, the Problem element of the Update Item Response message is as follows:

```

Problem
  MessagingError
    MessagingErrorType # This indicates the type of
                        error.
      Scheme
        NCIP Messaging Error Type Scheme
      Scheme
      Value
        Unknown Element
      Value
    MessagingErrorType
    MessagingErrorElement # This indicates the top level
                          element that contained the
                          error.
      ElementName # This indicates the name of
                  the top level element.
        AddItemFields
      ElementName
      MessagingErrorElement # This indicates the next
                            element that contained the
                            error.
      ElementName # This indicates the name of
                  the next element.
        UniqueUserId
      ElementName
      MessagingErrorElement
    MessagingErrorElement
  MessagingError
Problem
  
```

Note that there is no Messaging Error Value element at the innermost level because it is the element that is in error, not its value.

3. A Create User message is recognized by the responding application as a duplicate. In this case, the Problem element of the Create User Response message is as follows:

```

Problem
  ProcessingError
    ProcessingErrorType # This indicates the type of
                        error.
      Scheme
        NCIP Create User Processing Error Scheme
      Scheme
      Value
        Duplicate User
      Value
    ProcessingErrorType
    ProcessingErrorElement # This indicates the top level
                          element that contained the
  
```

ElementName	error.
<i>UniqueUserId</i>	# This indicates the name of the top level element.
ElementName	
ProcessingErrorElement	
ElementName	# This indicates the name of the next level element.
<i>User Identifier Value</i>	
ElementName	
ProcessingErrorValue	# This indicates the incorrect value.
<i>2012400044567x</i>	
ProcessingErrorValue	
ProcessingErrorElement	
ProcessingErrorElement	
ProcessingError	
Problem	

4. A Create User initiation message may contain an optional Date Of Birth, which the responding application requires in order to process the message. If the element is missing in a Create User message, the Problem element of the Create User Response message is as follows. Because the message was not malformed this is an error concerning the message content, not the message itself. Compare with example #2 above.

Problem	
ProcessingError	
ProcessingErrorType	# This indicates the type of error.
Scheme	
<i>NCIP General Processing Error Scheme</i>	
Scheme	
Value	
<i>Needed Data Missing</i>	
Value	
ProcessingErrorType	
ProcessingErrorElement	# This indicates the top level element that contained the error.
ElementName	# This indicates the name of the top level element.
<i>DateOfBirth</i>	
ElementName	
ProcessingErrorElement	
ProcessingError	
Problem	

Appendix C: Enumerated Data Types

(This appendix is not part of the American National Standard Circulation Interchange Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. It is included for information only.)

This Standard provides a data structure that permits the definition of lists of values for Open Enumerated Data Types that have not already been defined by this Standard. The data structure consists of a pair of data elements, Scheme and Value, for each enumerated type. Scheme is a string used to identify the authority of the list of values for the enumerated type, and Value is a number, code, word, or phrase from that authoritative list. The only relationship between or among the values of a list is that implied by their membership in the list.

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

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

For example, the values used by a group of academic libraries for Agency User Privilege Type will be based on academic status, while a public library consortium may base its list of values on age and status in the library. The following example illustrates two such schemes of enumerated data types:

Agency User Privilege Type

Scheme: NCIP Agency User Privilege Type Academic Scheme

Values: Faculty
Graduate
Postdoctoral
Staff
Undergraduate

Scheme: NCIP Agency User Privilege Type Public Scheme

Values: Adult
Child
Senior
Staff
Young Adult

Appendix D: Implementation Profile Template

(This appendix is not part of the American National Standard Circulation Interchange Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. It is included for information only.)

D.1 Purpose

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

D.2 Scope

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

D.3 Referenced Standards

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

D.4 Definitions

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

D.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.

D.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.

D.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.

D.8 Security

Describe the security requirements for this Implementation Profile.

D.9 Scheme /Profile Registration

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

D.10 Extension

Describe any extensibility mechanism allowed by this Implementation Profile.

Appendix E: Application Profile Template

(This appendix is not part of the American National Standard Circulation Interchange Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. It is included for information only.)

E.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.

E.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 the 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

E.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.

E.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.

E.4 Conformance

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

E.5 References

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

E.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.

E.7 Profile Specification

E.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.

E.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.

E.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.”

E.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.

E.7.5 Required Components

Required and Optional Services

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

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.

Enumerated Types

Specify additional schemes for open enumerated types and indicate the open enumerated types including undefined types that are closed by this Application Profile.

E.7.6 Event Table

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"

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				
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				

Triggering Event and Event Location	Initiating Application	Service Initiated	Responding Application	Message Constraints
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				

E.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	Unique Item Id	Media Type

E.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.

E.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.

E.10 Registration of Schemes Used in the Profile

Specify how the Application Profile schemes are registered and maintained.

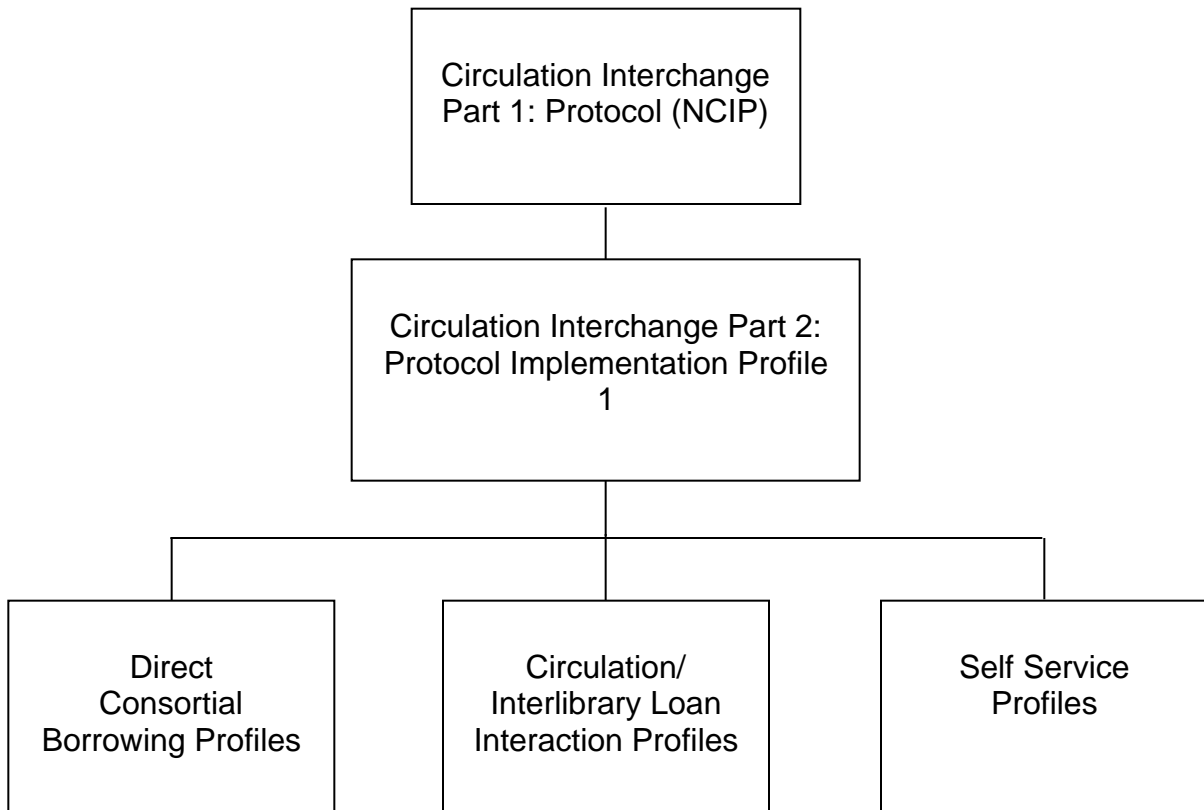
E.11 Non-normative Guidelines

Specify any non-normative guidelines for the Application Profile.

Appendix F: Relationship between This Standard and Associated Profiles

(This appendix is not part of the American National Standard Circulation Interchange Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. 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 developed by Committee AT.



Eight Application Profiles were developed in conjunction with this Standard. Templates for developing Application Profiles are included in Appendix E. 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 at the appropriate time.

Appendix G: Designation of Maintenance Agency and Registration Authority

(This appendix is not part of the American National Standard Circulation Interchange Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. It is included for information only.)

NISO will select an agency to act as a Maintenance Agency and Registration Authority for the NCIP Standard.

G.1 Maintenance Activities

Maintenance activities include:

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 DTD and 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.

Desired maintenance activities include:

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

G.2 Registration Activities

Registration activities include:

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

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

(This appendix is not part of the American National Standard Circulation Interchange, Part 1: Protocol (NCIP), ANSI/NISO Z39.83-2002. It is included for information only.)

Account Balance	64	Author Of Component	41
Account Details	64	Bibliographic Description.....	
Accrual Date	6438, 41, 45, 48, 49	
Acknowledged Fee Amount.....	38, 45	Bibliographic Item Id.....	41, 62
Acknowledged Item Use Restriction		Bibliographic Item Identifier.....	41
Type.....	38	Bibliographic Item Identifier Code....	41
Actual Resource	46	Bibliographic Level	41
Add Agency Fields	38	Bibliographic Record Id	41, 62
Add Item Fields	38	Bibliographic Record Identifier	41
Add Request Fields.....	38	Bibliographic Record Identifier Code	41
Add User Fields.....	38	Bin Number.....	57
Address, ElectronicSee Electronic		Block Or Trap.....39, 43, 45, 63, 64	
Address		Block Or Trap Type	43
Address, PhysicalSee Physical		Call Number.....	47
Address		Care Of	58
Address, StructuredSee Structured		Chronology Caption.....	60
Address		Chronology Level.....	60
Address, UnstructuredSee		Chronology Level Instance.....	59
Unstructured Address		Chronology Value	60
Agency Address Information 38, 39, 44		Circulation Status	43, 48, 49, 50, 56
Agency Address Role Type	39	Component Date of PublicationSee	
Agency Element Type	39	Publication Date Of Component	
Agency User Privilege Type.....		Component Id	42
.....38, 39, 44, 65		Component Identifier	42
Amount	39, 46, 50, 52, 65	Component Identifier Type.....	42
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Authentication Data Format Type....	40	Copy Number.....	47
Authentication Input	39, 40, 45	Country	58
Authentication Input Data.....	40	Currency Code	40
Authentication Input Type	40	Current Borrower	49
Authentication Prompt....38, 39, 40, 44		Current Borrower Desired	44
Authentication Prompt Data	41	Current Requester	49
Authentication Prompt Type.....	41	Current Requesters Desired	44
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Date For Return DesiredSee Desired Date For Return		Electronic Address Type	46
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Date of Pickup ExpirySee Pickup Expiry Date		Enumeration Level Instance	60
Date of PublicationSee Publication Date		Enumeration Value	61
Date of Publication Of Component..... . See Publication Date Of Component		Fiscal Action Type.....	46
Date Of User Privilege Status	65	Fiscal Transaction Description	46
Date Of User Request	38, 44, 45	Fiscal Transaction Identifier Value	46, 55
Date Placed.....	44, 56	Fiscal Transaction Information ...	46, 64
Date Recalled	44	Fiscal Transaction Reference Id.....	46
Date Received	44	Fiscal Transaction Reference Id, RelatedSee Related Fiscal Transaction Reference Id	
Date Renewed	48	Fiscal Transaction Type.....	46, 47
Date Reported Returned	44, 49	From Agency Authentication	47, 57
Date Returned.....	48	From Agency Id.....	47, 57
Date Sent	44	From System Authentication	47, 57
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Date Valid To	See Valid To Date	Hold Queue Length.....	47, 49
Date Will Send	44	Hold Queue Position	47, 56
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