

Internet Engineering Task Force

Internet-Draft
November 2005

Ning Zhang
William Tan
Trung Tran
Sharon Wodjenski
Les Chasen
NeuStar, Inc.
Expires: May 2006

Extensible Provisioning Protocol XRI I-Number Mapping
<epp-xri-inu-03.pdf>

Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of Section 10 of RFC 2026.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress".

The list of current Internet-Drafts can be accessed at
<http://www.ietf.org/ietf/lid-abstracts.txt>

The list of Internet-Draft Shadow Directories can be accessed at
<http://www.ietf.org/shadow.html>.

Abstract

This document describes an Extensible Provisioning Protocol (EPP) mapping for the provisioning and management of XRI i-numbers, stored in a shared centralized repository (a.k.a. XRI Registry). Specified in XML, the mapping defines EPP command syntax and semantics as applied to XRI i-number objects.

Conventions Used In This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119].

In examples, "C:" represents lines sent by an EPP client and "S:" represents lines returned by an EPP server. Indentation and white space in examples is provided only to show element relationships and is not a REQUIRED feature of the proposal.

XML is case sensitive. Unless stated otherwise, XML specifications and examples provided in this document MUST be interpreted in the character case presented to develop a conforming implementation.

Namespace Naming Convention

For the purpose of illustration, the target namespace defined in this document is designated using the IETF convention:

`urn:ietf:params:xml:ns:xriINU-1.0`

However, in the case that this document is not submitted to IETF as an Internet Draft, but used for NeuStar internal development only instead, the target namespace shall be denoted as a NeuStar specific character string, such as

`http://www.neustar.biz/xrp/xriINU-1.0`

The exact syntax of the NeuStar specific namespace denotation will be defined in other documents.

Table of Contents

1. Introduction.....	4
2. Object Attributes.....	5
2.1 XRI I-Numbers	5
2.2 Reference Identifiers	5
2.3 XRI Authority Identifiers.....	5
2.4 Priorities.....	5
2.5 Client Identifiers.....	6
2.6 Status Values	6
2.7 Dates and Times.....	8
2.8 Validity Periods.....	8
3. EPP Command Mapping.....	8
3.1 EPP Query Commands.....	8
3.1.1 EPP <check> Command.....	9
3.1.2 EPP <info> Command.....	11
3.1.3 EPP <transfer> Query Command	13
3.2 EPP Transform Commands.....	13
3.2.1 EPP <create> Command.....	14
3.2.2 EPP <delete> Command.....	18
3.2.3 EPP <renew> Command.....	19
3.2.4 EPP <transfer> Command.....	21
3.2.5 EPP <update> Command.....	21
4. Formal Syntax.....	23
5. Internationalization Considerations	28
6. IANA Considerations.....	28
7. Security Considerations.....	29

8. Acknowledgements	29
9. References	29
10. Appendix A - Authors' Addresses.....	30
11. Appendix B - Full Copyright Statement.....	30

1. Introduction

The OASIS Extensible Resource Identifiers (XRIs) [XRI] provide a standard means of abstractly identifying a resource independent of any particular concrete representation of that resource, or, in the case of a completely abstract resource, of any representation at all.

The OASIS XRI Data Interchange (XDI) specifications [XDI] define a standard for sharing, linking, and synchronizing data ("dataweb") over the Internet and other networks using XML documents and Extensible Resource Identifiers (XRIs).

The OASIS XRI abstract identifier and XDI data interchange protocols create a new layer of infrastructure that enables individuals and organizations to establish persistent Internet identities and form long-term, trusted peer-to-peer data sharing relationships.

An i-name is a human-friendly XRI intended for everyday use in browsers, email clients, web pages - anyplace a web address (URI) would appear today, for representing a person or an organization in the real world.

An i-number is a special type of XRI that differs from an i-name in one critical way: once assigned to a resource, it MUST NOT be reassigned. For this reason i-numbers are typically numbers and punctuation characters (similar to an IP address) and are thus much harder for humans to use.

An XRI authority represents the real world entity, and can be one of three types: personal authority, organizational authority and network authority. While XRI personal and organizational authorities share the same properties, XRI network authorities are special entities that provide XRI related services [EPP AU].

In addition to the standard XRI resolution services provided by XRI registries, valued-added third-party services, called i-services, can be subscribed for an XRI authority and its associated i-name/i-number objects.

The Extensible Provisioning Protocol (EPP) [RFC 3730] provides a complete description of EPP command and response structures for provisioning objects in a centralized repository.

This document describes an XRI i-number object mapping for version 1.0 of the Extensible Provisioning Protocol (EPP). This mapping is specified using the Extensible Markup Language (XML) 1.0 as described in [XML] and XML Schema notation as described in [XML SCHEMA]. Notification or delivery methods for XRI i-number objects are not covered by this document.

2. Object Attributes

An EPP XRI i-number object has attributes and associated values that may be viewed and modified by the sponsoring client or the server. This section describes each attribute type in detail. The formal syntax for the attribute values described here can be found in the "Formal Syntax" section of this document and in the appropriate normative references.

2.1 XRI I-Numbers

All EPP XRI i-number objects are uniquely identified by an i-number, which MUST be server unique, or globally unique, subject to local server policies. XRI i-numbers are character strings with a specified minimum length, a specified maximum length, and a specified format. XRI i-numbers MAY be relative to the current registry and the format of XRI i-numbers is subject to local server policies. At global or top level, XRI i-numbers MUST start with a "=", for personal i-numbers, a "@", for organizational i-numbers, or a "!" for network i-numbers. The syntax for XRI i-numbers described in this document MUST conform to the format specified in [XRI]. In EPP XML messages, XRI i-numbers use the "inumberType" syntax described in [XRI AU].

For XRI provisioning purpose, i-numbers can be generated by the server, or supplied by the client, subject to local server policies.

2.2 Reference Identifiers

All EPP XRI i-number objects MUST be associated with a reference identifier, which is supplied by the EPP client when the object is created, if i-numbers are generated by the server. The reference identifier MUST be unique for all EPP XRI i-number objects created by a specific EPP client, or MUST be server unique for all EPP XRI i-number objects in the repository, subject to local server policies.

Reference identifiers are character strings with a specified minimum length, a specified maximum length, and a specified format. Reference identifiers use the "refIdType" reference identifier syntax described in the "Formal Syntax" section of this document.

2.3 XRI Authority Identifiers

All EPP XRI authorities are identified by a server-unique identifier. XRI authority identifiers are character strings with a specified minimum length, a specified maximum length, and a specified format. Authority identifiers use the "authIdType" authority identifier syntax described in [EPP AU].

2.4 Priorities

All EPP XRI i-number objects MUST be associated with a priority value, which is defined as a 16-bit unsigned integer, specified in the XML schema via an "unsignedShort" data type, with lower values corresponding to higher priority.

For XRI provisioning purpose, this field is OPTIONAL. The default value is 10 if not specified. It is used to indicate the preference of XRI internal synonyms to be presented by XRI resolvers for a specific XRI i-number.

2.5 Client Identifiers

All EPP clients are identified by a server-unique identifier. Client identifiers are character strings with a specified minimum length, a specified maximum length, and a specified format. Client identifiers use the "clIDType" client identifier syntax described in described in [RFC 3730].

2.6 Status Values

An XRI i-number object MUST always have at least one associated status value. Status values can be set only by the client that sponsors an XRI i-number object and by the server on which the object resides. A client can change the status of an XRI i-number object using the EPP <update> command. Each status value MAY be accompanied by a string of human-readable text that describes the rationale for the status applied to the object.

A client MUST NOT alter status values set by the server. A server MAY alter or override status values set by a client subject to local server policies. The status of an object MAY change as a result of either a client-initiated transform command or an action performed by a server operator.

Status values that can be added or removed by a client are prefixed with "client". Corresponding status values that can be added or removed by a server are prefixed with "server". Status values that do not begin with either "client" or "server" are server-managed.

Status Value Descriptions:

- clientDeleteProhibited, serverDeleteProhibited

Requests to delete (terminate) the object MUST be rejected.

- clientHold, serverHold

XRI resolution information MUST NOT be published for the object.

- clientRenewProhibited, serverRenewProhibited

Requests to renew the object MUST be rejected, except that the object is in "pendingDelete" or "terminated" status, subject to local server policies.

- clientUpdateProhibited, serverUpdateProhibited

Requests to update the object (other than to remove this status) MUST be rejected.

- ok

This is the normal status value for an object that has no pending operations or prohibitions. This value is set and removed by the server as other status values are added or removed.

- terminated

This is the final status value for an object that has its "pendingDelete" period expired. This value is set by the server and MAY be removed via a <renew> command, subject to local server policies.

- pendingCreate, pendingDelete, pendingRenew, pendingTransfer, pendingUpdate

A transform command has been processed for the object, but the action has not been completed by the server. Server operators can delay action completion for a variety of reasons, such as to allow for human review or third-party action. A transform command that is processed, but whose requested action is pending, is noted with response code 1001.

With one exception, transform commands MUST be rejected when a pendingCreate, pendingDelete, pendingRenew, pendingTransfer, or pendingUpdate status is set. The exception is that a <renew> command to renew an expiring object MAY be processed while an object is in "pendingDelete" status, subject to local server policies.

When the requested action has been completed, the pendingCreate, pendingDelete, pendingRenew, pendingTransfer, or pendingUpdate status value MUST be removed. All clients involved in the transaction MUST be notified using a service message that the action has been completed and that the status of the object has changed.

- "ok" status MUST NOT be combined with any other status.
- "pendingDelete" status MUST NOT be combined with either "clientDeleteProhibited" or "serverDeleteProhibited" status.
- "pendingRenew" status MUST NOT be combined with either "clientRenewProhibited" or "serverRenewProhibited" status.

- "pendingUpdate" status MUST NOT be combined with either "clientUpdateProhibited" or "serverUpdateProhibited" status.

The pendingCreate, pendingDelete, pendingRenew, and pendingUpdate status values MUST NOT be combined with each other. The pendingTransfer status value MAY be combined with one of the pendingCreate, pendingDelete, pendingRenew, and pendingUpdate status values.

Other status combinations not expressly prohibited MAY be used.

2.7 Dates and Times

Date and time attribute values MUST be represented in Universal Coordinated Time (UTC) using the Gregorian calendar. The extended date-time form using upper case "T" and "Z" characters defined in [RFC 3339] MUST be used to represent date-time values as XML Schema does not support truncated date-time forms or lower case "t" and "z" characters.

2.8 Validity Periods

An XRI i-number object MAY have a specified validity period. If server policy supports XRI i-number object validity periods, the validity period is defined when an XRI i-number object is created, and it MAY be extended by an EPP <renew> command on the XRI i-number object or an EPP <transfer> command on the XRI authority object associated with the XRI i-number object. As a matter of server policy, this specification does not define actions to be taken upon expiration of an XRI i-number object's validity period.

Validity periods are measured in years or months with the appropriate units specified using the "unit" attribute. Valid values for the "unit" attribute are "y" for years and "m" for months. The minimum allowable period value is one decimal (1). The maximum allowable value is ninety-nine decimal (99). A server MAY support a lower maximum value.

3. EPP Command Mapping

A detailed description of the EPP syntax and semantics can be found in [RFC 3730]. The command mappings described here are specifically for use in provisioning and managing XRI i-number objects via EPP.

3.1 EPP Query Commands

EPP provides two commands to retrieve XRI i-number information: <check> to determine if an XRI i-number object can be provisioned with a repository,

and <info> to retrieve detailed information associated with an XRI i-number object.

3.1.1 EPP <check> Command

The EPP <check> command is used to determine if an object may be provisioned within a repository. It provides a hint that allows a client to anticipate the success or failure of provisioning an object using the <create> command. Object availability and provisioning conditions are a matter of server policy.

In addition to the standard EPP command elements, the <check> command MUST contain an <xriINU:check> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:check> element contains the following child elements:

- One or more <xriINU:inumber> elements that contain the i-numbers which are used as the identifiers of the XRI i-number objects to be queried.

Example <check> command:

```
C:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
C:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0 epp-1.0.xsd">
C:  <command>
C:    <check>
C:      <xriINU:check
C:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:        xriINU-1.0.xsd">
C:        <xriINU:inumber>=!1001.2222.3333.4444</xriINU:inumber>
C:        <xriINU:inumber>=!1011.2222.3333.ABCD</xriINU:inumber>
C:        <xriINU:inumber>@!1111.1234.5678.ABCD</xriINU:inumber>
C:        <xriINU:inumber>!!1023</xriINU:inumber>
C:        <xriINU:inumber>!!1045!1234</xriINU:inumber>
C:      </xriINU:check>
C:    </check>
C:    <clTRID>ABC-12345</clTRID>
C:  </command>
C:</epp>
```

When a <check> command has been processed successfully, the EPP <resData> element MUST contain a child <xriINU:chkData> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:chkData> element contains one or more <xriINU:cd> elements that contain the following child elements:

- An <xriINU:inumber> element that contains the i-number that is used as the identifier of the queried XRI i-number object. This element MUST contain an "avail" attribute whose value indicates object availability (can it be provisioned or not) at the moment the <check> command was completed. A value of "1" or "true" means that the object can be

provisioned. A value of "0" or "false" means that the object can not be provisioned.

- An OPTIONAL <xriINU:reason> element that MAY be provided when an object can not be provisioned. If present, this element contains server-specific text to help explain why the object can not be provisioned. This text MUST be represented in the response language previously negotiated with the client; an OPTIONAL "lang" attribute MAY be present to identify the language if the negotiated value is something other than the default value of "en" (English).

Example <check> response:

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0 epp-1.0.xsd">
S:  <response>
S:    <result code="1000">
S:      <msg>Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <xriINU:chkData
S:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
S:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
S:        xriINU-1.0.xsd">
S:        <xriINU:cd>
S:          <xriINU:inumber avail="0">
S:            =!1001.2222.3333.4444</xriINU:inumber>
S:          <xriINU:reason>Reserved</xriINU:reason>
S:        </xriINU:cd>
S:        <xriINU:cd>
S:          <xriINU:inumber avail="1">
S:            =!1011.2222.3333.ABCD</xriINU:inumber>
S:          </xriINU:cd>
S:        <xriINU:cd>
S:          <xriINU:inumber avail="0">
S:            @!1111.1234.5678.ABCD</xriINU:inumber>
S:          <xriINU:reason>Not authorized</xriINU:reason>
S:        </xriINU:cd>
S:        <xriINU:cd>
S:          <xriINU:inumber avail="1">
S:            !!1023</xriINU:inumber>
S:          </xriINU:cd>
S:        <xriINU:cd>
S:          <xriINU:inumber avail="0">
S:            !!1045!1234</xriINU:inumber>
S:          <xriINU:reason>Not authorized</xriINU:reason>
S:        </xriINU:cd>
S:      </xriINU:chkData>
S:    </resData>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54321-XYZ</svTRID>
S:    </trID>
S:  </response>
```

S:</epp>

An EPP error response MUST be returned if a <check> command can not be processed for any reason.

3.1.2 EPP <info> Command

The EPP <info> command is used to retrieve information associated with an XRI i-number object. In addition to the standard EPP command elements, the <info> command MUST contain an <xriINU:info> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:info> element contains the following child elements:

An <xriINU:inumber> element that contains the i-number that is used as the identifier of the XRI i-number object to be queried.

Example <info> command:

```
C:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
C:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:    xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0 epp-1.0.xsd">
C:  <command>
C:    <info>
C:      <xriINU:info>
C:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:        xriINU-1.0.xsd">
C:          <xriINU:inumber>@!1234.5678.90AB.CDEF</xriINU:inumber>
C:        </xriINU:info>
C:      </info>
C:    <clTRID>ABC-12345</clTRID>
C:  </command>
C:</epp>
```

When an <info> command has been processed successfully, the EPP <resData> element MUST contain a child <xriINU:infData> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:infData> element contains the following child elements:

- An <xriINU:inumber> element that contains the i-number that is used as the identifier of the XRI i-number object.
- An <xriINU:roid> element that contains the Repository Object Identifier assigned to the XRI i-number object when the object was created.
- One or more <xriINU:status> elements that describe the status of the XRI i-number object.
- An OPTIONAL <xriINU:refId> element that contains the reference identifier supplied by the client when the object was created.

- A REQUIRED <xriINU:authId> element that contains the identifier of the XRI authority object that contains the human or organizational social information associated with the XRI i-number object.
- A REQUIRED <xriINU:priority> element that specifies the preference of of XRI internal synonyms to be presented by XRI resolvers for this XRI i-number.
- An <xriINU:clID> element that contains the identifier of the sponsoring client.
- An <xriINU:crID> element that contains the identifier of the client that created the XRI i-number object.
- An <xriINU:crDate> element that contains the date and time of XRI i-number object creation.
- An OPTIONAL <xriINU:upID> element that contains the identifier of the client that last updated the XRI i-number object. This element MUST NOT be present if the XRI i-number object has never been modified.
- An OPTIONAL <xriINU:upDate> element that contains the date and time of the most recent XRI i-number object modification. This element MUST NOT be present if the XRI i-number object has never been modified.
- An <xriINU:exDate> element that contains the date and time identifying the end of the XRI i-number object's registration period.
- An OPTIONAL <xriINU:trDate> element that contains the date and time of the most recent successful XRI i-number object transfer. This element MUST NOT be provided if the XRI i-number object has never been transferred. Note that XRI i-number objects MUST NOT be transferred directly; XRI i-number objects MUST be transferred implicitly when the XRI i-number object's superordinate XRI authority object is transferred. XRI i-number objects that are subject to transfer when transferring an XRI authority object are listed in the response to an EPP <info> command performed on the XRI authority object.

Example <info> response:

```

S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0 epp-1.0.xsd">
S:  <response>
S:    <result code="1000">
S:      <msg>Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <xriINU:infData
S:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
S:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
S:        xriINU-1.0.xsd">
S:        <xriINU:inumber>@!1234.5678.90AB.CDEF</xriINU:inumber>

```

```

S:      <xriINU:roid>INU_1002-NEUSTAR</xriINU:roid>
S:      <xriINU:status s="clientDeleteProhibited"/>
S:      <xriINU:status s="clientUpdateProhibited"/>
S:      <xriINU:refId>CLIENT-X-REF-ID-12345</xriINU:refId>
S:      <xriINU:authId>AUTHORITY</xriINU:authId>
S:      <xriINU:priority>10</xriINU:priority>
S:      <xriINU:clID>ClientY</xriINU:clID>
S:      <xriINU:crID>ClientX</xriINU:crID>
S:      <xriINU:crDate>2005-05-03T22:00:00.0Z</xriINU:crDate>
S:      <xriINU:upID>ClientX</xriINU:upID>
S:      <xriINU:upDate>2005-05-05T09:00:00.0Z</xriINU:upDate>
S:      <xriINU:exDate>2006-05-03T22:00:00.0Z</xriINU:exDate>
S:      <xriINU:trDate>2005-05-04T09:00:00.0Z</xriINU:trDate>
S:      </xriINU:infData>
S:      </resData>
S:      <trID>
S:        <clTRID>ABC-12346</clTRID>
S:        <svTRID>54321-XYZ</svTRID>
S:      </trID>
S:    </response>
S:  </epp>

```

An EPP error response MUST be returned if an <info> command can not be processed for any reason.

3.1.3 EPP <transfer> Query Command

Transfer semantics do not directly apply to XRI i-number objects, so there is no mapping defined for the EPP <transfer> query command.

3.2 EPP Transform Commands

EPP provides four commands to transform XRI i-number objects: <create> to create an instance of an XRI i-number object, <delete> to delete (terminate) an instance of an XRI i-number object, <renew> to extend the validity period of an XRI i-number object, and <update> to change information associated with an XRI i-number object. This document does not define an XRI i-number object mapping for the EPP <transfer> command.

Transform commands are typically processed and completed in real time. Server operators MAY receive and process transform commands, but defer completing the requested action if human or third-party review is required before the requested action can be completed. In such situations the server MUST return a 1001 response code to the client to note that the command has been received and processed, but the requested action is pending. The server MUST also manage the status of the object that is the subject of the command to reflect the initiation and completion of the requested action. Once the action has been completed, all clients involved in the transaction MUST be notified using a service message that the action has been completed and that the status of the object has changed.

3.2.1 EPP <create> Command

The EPP <create> command provides a transform operation that allows a client to create an XRI i-number object. In addition to the standard EPP command elements, the <create> command MUST contain an <xriINU:create> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:create> element contains the following child elements:

- An OPTIONAL <xriINU:inumber> element that specifies the XRI i-number to be created in the repository. Additionally, this element MUST be used as the prefix of the XRI i-number created, if XRI i-numbers are generated by the server, i.e. the <xriINU:refId> element is specified, subject to local server policies.
- An OPTIONAL <xriINU:refId> element contains the reference identifier supplied by the client. This element MUST be specified if XRI i-numbers are generated by the server, for ensuring that repeated <create> commands do not result in multiple unanticipated successful creations of different XRI i-numbers by the server.
- A REQUIRED <xriINU:authority> element that specifies the identifier and authorization information of the XRI authority object that contains the human or organizational social information associated with the XRI i-number object. It contains the following child elements:
 - A REQUIRED <xriINU:authId> element that specifies the identifier of the XRI authority object.
 - An OPTIONAL <xriINU:authInfo> element that contains authorization information associated with the XRI authority object. If this element is not provided or if the authorization information is invalid, server policy determines if the command is rejected or if response information will be returned to the client.
- An OPTIONAL <xriINU:priority> element that specifies the preference of XRI internal synonyms to be presented by XRI resolvers for this XRI i-number. If not specified, the default value is 10.
- An OPTIONAL <xriINU:period> element that contains the initial registration period of the XRI i-number object. A server MAY define a default initial registration period if not specified by the client.

At least one <xriINU:inumber> or <xriINU:refId> element MUST be provided.

Example <create> command for XRI i-numbers supplied by the client:

```
C:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
C:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
C:  epp-1.0.xsd">
```

```

C: <command>
C:   <create>
C:     <xriINU:create
C:       xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:       xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:       xriINU-1.0.xsd">
C:         <xriINU:inumber>!!1234!5678</xriINU:inumber>
C:         <xriINU:authority>
C:           <xriINU:authId>AUTHORITY</xriINU:authId>
C:           <xriINU:authInfo>
C:             <xriINU:pw>2fooBAR</xriINU:pw>
C:           </xriINU:authInfo>
C:         </xriINU:authority>
C:         <xriINU:priority>20</xriINU:priority>
C:         <xriINU:period unit="y">2</xriINU:period>
C:       </xriINU:create>
C:     </create>
C:     <clTRID>ABC-12345</clTRID>
C:   </command>
C: </epp>

```

Example <create> command for XRI i-numbers generated by the server with a client supplied i-number:

```

C: <?xml version="1.0" encoding="UTF-8" standalone="no"?>
C: <epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:   xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
C:   epp-1.0.xsd">
C:   <command>
C:     <create>
C:       <xriINU:create
C:         xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:         xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:         xriINU-1.0.xsd">
C:           <xriINU:refId>CLIENT-X-REF-ID-12345</xriINU:refId>
C:           <xriINU:authority>
C:             <xriINU:authId>AUTHORITY</xriINU:authId>
C:             <xriINU:authInfo>
C:               <xriINU:pw>2fooBAR</xriINU:pw>
C:             </xriINU:authInfo>
C:           </xriINU:authority>
C:           <xriINU:priority>20</xriINU:priority>
C:           <xriINU:period unit="y">2</xriINU:period>
C:         </xriINU:create>
C:       </create>
C:       <clTRID>ABC-12345</clTRID>
C:     </command>
C:   </epp>

```

Example <create> command for XRI i-numbers generated by the server with a supplied i-number:

```

C: <?xml version="1.0" encoding="UTF-8" standalone="no"?>
C: <epp xmlns="urn:ietf:params:xml:ns:epp-1.0"

```

```

C:      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:      xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
C:      epp-1.0.xsd">
C:    <command>
C:      <create>
C:        <xriINU:create
C:          xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:          xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:          xriINU-1.0.xsd">
C:          <xriINU:inumber>!!1234!5678</xriINU:inumber>
C:          <xriINU:refId>CLIENT-X-REF-ID-12345</xriINU:refId>
C:          <xriINU:authority>
C:            <xriINU:authId>AUTHORITY</xriINU:authId>
C:            <xriINU:authInfo>
C:              <xriINU:pw>2fooBAR</xriINU:pw>
C:            </xriINU:authInfo>
C:          </xriINU:authority>
C:          <xriINU:priority>20</xriINU:priority>
C:          <xriINU:period unit="y">2</xriINU:period>
C:        </xriINU:create>
C:      </create>
C:      <clTRID>ABC-12345</clTRID>
C:    </command>
C:  </epp>

```

When a <create> command has been processed successfully, the EPP <resData> element MUST contain a child <xriINU:creData> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:creData> element contains the following child elements:

- An <xriINU:inumber> element that contains the i-number, either server generated, or supplied by the client in the EPP <create> command, that is used as the identifier of the XRI i-number object created.
- An OPTIONAL <xriINU:refId> element that contains the reference identifier that is supplied by the client in the EPP <create> command, if the i-number is server generated.
- An <xriINU:crDate> element that contains the date and time of XRI i-number object creation.
- An <xriINU:exDate> element that contains the date and time identifying the end of the XRI i-number object's registration period.

If XRI i-numbers are server generated, repeated <create> commands with the same reference identifier MUST result in the same generated i-number and the server MUST return the same <xriINU:creData> element in the EPP responses.

Example <create> response for XRI i-numbers supplied by the client:

```

S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
S:  epp-1.0.xsd">

```



```

S: <response>
S:   <result code="1000">
S:     <msg>Command completed successfully</msg>
S:   </result>
S:   <resData>
S:     <xriINU:creData
S:       xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
S:       xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
S:         xriINU-1.0.xsd">
S:       <xriINU:inumber>!!1234!5678</xriINU:inumber>
S:       <xriINU:crDate>2005-05-02T22:00:00.0Z</xriINU:crDate>
S:       <xriINU:exDate>2007-05-02T22:00:00.0Z</xriINU:exDate>
S:     </xriINU:creData>
S:   </resData>
S:   <trID>
S:     <clTRID>ABC-12345</clTRID>
S:     <svTRID>54321-XYZ</svTRID>
S:   </trID>
S: </response>
S:</epp>

```

Example <create> response for XRI i-numbers generated by the server:

```

S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
S:    epp-1.0.xsd">
S:  <response>
S:    <result code="1000">
S:      <msg>Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <xriINU:creData
S:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
S:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
S:          xriINU-1.0.xsd">
S:        <xriINU:inumber>=!1002.3333.4444.ABCD</xriINU:inumber>
S:        <xriINU:refId>CLIENT-X-REF-ID-12345</xriINU:refId>
S:        <xriINU:crDate>2005-05-02T22:00:00.0Z</xriINU:crDate>
S:        <xriINU:exDate>2007-05-02T22:00:00.0Z</xriINU:exDate>
S:      </xriINU:creData>
S:    </resData>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54321-XYZ</svTRID>
S:    </trID>
S:  </response>
S:</epp>

```

Example <create> response for XRI i-numbers generated by the server with a client supplied i-number

```

S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"

```

```

S:      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:      xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
S:      epp-1.0.xsd">
S:    <response>
S:      <result code="1000">
S:        <msg>Command completed successfully</msg>
S:      </result>
S:      <resData>
S:        <xriINU:creData
S:          xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
S:          xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
S:          xriINU-1.0.xsd">
C:          <xriINU:number>!!1234!5678!ABCD</xriINU:number>
S:          <xriINU:refId>CLIENT-X-REF-ID-12345</xriINU:refId>
S:          <xriINU:crDate>2005-05-02T22:00:00.0Z</xriINU:crDate>
S:          <xriINU:exDate>2007-05-02T22:00:00.0Z</xriINU:exDate>
S:        </xriINU:creData>
S:      </resData>
S:      <trID>
S:        <clTRID>ABC-12345</clTRID>
S:        <svTRID>54321-XYZ</svTRID>
S:      </trID>
S:    </response>
S:  </epp>

```

An EPP error response MUST be returned if a <create> command can not be processed for any reason.

3.2.2 EPP <delete> Command

The EPP <delete> command provides a transform operation that allows a client to terminate an XRI i-number object. In addition to the standard EPP command elements, the <delete> command MUST contain an <xriINU:delete> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:delete> element contains the following child elements:

- An <xriINU:number> element that contains the i-number that is used as the identifier of the XRI i-number object to be terminated.

Example <delete> command:

```

C: <?xml version="1.0" encoding="UTF-8" standalone="no"?>
C: <epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:      xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
C:      epp-1.0.xsd">
C:   <command>
C:     <delete>
C:       <xriINU:delete
C:         xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:         xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:         xriINU-1.0.xsd">
C:           <xriINU:number>!!1002!2222</xriINU:number>
C:         </xriINU:delete>

```

```
C:    </delete>
C:    <clTRID>ABC-12345</clTRID>
C:  </command>
C:</epp>
```

When a <delete> command has been processed successfully, a server MUST respond with an EPP response with no <resData> element.

Example <delete> response:

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:    xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
S:    epp-1.0.xsd">
S:  <response>
S:    <result code="1000">
S:      <msg>Command completed successfully</msg>
S:    </result>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54321-XYZ</svTRID>
S:    </trID>
S:  </response>
S:</epp>
```

An EPP error response MUST be returned if a <delete> command can not be processed for any reason.

3.2.3 EPP <renew> Command

The EPP <renew> command provides a transform operation that allows a client to extend the validity period of an XRI i-number object. In addition to the standard EPP command elements, the <renew> command MUST contain an <xriINU:renew> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:renew> element contains the following child elements:

- An <xriINU:inumber> element that contains the i-number that is used as the identifier of the XRI i-number object whose validity period is to be extended.
- An <xriINU:curExpDate> element that contains the date on which the current validity period ends. This value ensures that repeated <renew> commands do not result in multiple unanticipated successful renewals.
- An OPTIONAL <xriINU:period> element that contains the number of units to be added to the registration period of the XRI i-number object. The number of units available MAY be subject to limits imposed by the server.

Example <renew> command:

```

C:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
C:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
C:    epp-1.0.xsd">
C:  <command>
C:    <renew>
C:      <xriINU:renew
C:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:          xriINU-1.0.xsd">
C:        <xriINU:inumber>=!1002.2222.3333.4444</xriINU:inumber>
C:        <xriINU:curExpDate>2006-05-03</xriINU:curExpDate>
C:        <xriINU:period unit="y">5</xriINU:period>
C:      </xriINU:renew>
C:    </renew>
C:    <clTRID>ABC-12345</clTRID>
C:  </command>
C:</epp>

```

- When a <renew> command has been processed successfully, the EPP <resData> element MUST contain a child <xriINU:renData> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:renData> element contains the following child elements:
- An <xriINU:inumber> element that contains the i-number that is used as the identifier of the XRI i-number object whose validity period has been extended.
- An <xriINU:exDate> element that contains the date and time identifying the end of the XRI i-number object's registration period.

Example <renew> response:

```

S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
S:    epp-1.0.xsd">
S:  <response>
S:    <result code="1000">
S:      <msg>Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <xriINU:renData
S:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
S:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
S:          xriINU-1.0.xsd">
S:        <xriINU:inumber>=!1002.2222.3333.4444</xriINU:inumber>
S:        <xriINU:exDate>2011-05-03T22:00:00.0Z</xriINU:exDate>
S:      </xriINU:renData>
S:    </resData>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54322-XYZ</svTRID>

```

```
S:    </trID>
S:  </response>
S:</epp>
```

An EPP error response MUST be returned if a <renew> command can not be processed for any reason.

3.2.4 EPP <transfer> Command

Transfer semantics do not directly apply to XRI i-number objects, so there is no mapping defined for the EPP <transfer> command. XRI i-number objects are subordinate to an existing superordinate XRI authority object, and as such they are subject to transfer when an XRI authority object is transferred.

3.2.5 EPP <update> Command

The EPP <update> command provides a transform operation that allows a client to modify the attributes of an XRI i-number object. In addition to the standard EPP command elements, the <update> command MUST contain an <xriINU:update> element that identifies the XRI i-number namespace and the location of the XRI i-number schema. The <xriINU:update> element contains the following child elements:

- An <xriINU:inumber> element that contains the i-number that is used as the identifier of the XRI i-number object to be updated.
- An OPTIONAL <xriINU:add> element that contains attribute values to be added to the object
- An OPTIONAL <xriINU:rem> element that contains attribute values to be removed from the object.
- An OPTIONAL <xriINU:chg> element that contains object attribute values to be changed.

At least one <xriINU:add>, <xriINU:rem>, or <xriINU:chg> element MUST be provided. The <xriINU:add> and <xriINU:rem> elements contain the following child elements:

- One or more <xriINU:status> elements that contain status values to be associated with or removed from the object. When specifying a value to be removed, only the attribute value is significant; element text is not required to match a value for removal.

An <xriINU:chg> element contains the following child elements:

- A REQUIRED <xriINU:priority> element that specifies the new preference of of XRI internal synonyms to be presented by XRI resolvers for this XRI i-number.

Example <update> command:

```
C:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
C:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
C:    epp-1.0.xsd">
C:  <command>
C:    <update>
C:      <xriINU:update
C:        xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
C:        xsi:schemaLocation="urn:ietf:params:xml:ns:xriINU-1.0
C:          xriINU-1.0.xsd">
C:        <xriINU:inumber>@!1002.2222.3333.4444</xriINU:inumber>
C:        <xriINU:add>
C:          <xriINU:status s="clientUpdateProhibited" lang="en">
C:            </xriINU:status>
C:        </xriINU:add>
C:        <xriINU:rem>
C:          <xriINU:status s="clientHold"/>
C:          <xriINU:status s="clientRenewProhibited"/>
C:        </xriINU:rem>
C:        <xriINU:chg>
C:          <xriINU:priority>15</xriINU:priority>
C:        </xriINU:chg>
C:      </xriINU:update>
C:    </update>
C:    <clTRID>ABC-12345</clTRID>
C:  </command>
C:</epp>
```

When an <update> command has been processed successfully, a server MUST respond with an EPP response with no <resData> element.

Example <update> response:

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
S:    epp-1.0.xsd">
S:  <response>
S:    <result code="1000">
S:      <msg>Command completed successfully</msg>
S:    </result>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54321-XYZ</svTRID>
S:    </trID>
S:  </response>
S:</epp>
```

An EPP error response MUST be returned if an <update> command can not be processed for any reason.

4. Formal Syntax

An EPP object mapping is specified in XML Schema notation. The formal syntax presented here, in addition to the EPP base schemas [RFC 3730] and EPP XRI base schema [EPP AU], is a complete schema representation of the object mapping suitable for automated validation of EPP XML instances. The BEGIN and END tags are not part of the schema; they are used to note the beginning and ending of the schema for URI registration purposes.

BEGIN

```
<?xml version="1.0" encoding="UTF-8"?>
<schema targetNamespace="urn:ietf:params:xml:ns:xriINU-1.0"
  xmlns:xriINU="urn:ietf:params:xml:ns:xriINU-1.0"
  xmlns:xriCommon="urn:ietf:params:xml:ns:xriCommon-1.0"
  xmlns:epp="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:eppcom="urn:ietf:params:xml:ns:eppcom-1.0"
  xmlns="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified">

  <!--
  Import common element types.
  -->
  <import namespace="urn:ietf:params:xml:ns:epp-1.0"
    schemaLocation="epp-1.0.xsd"/>
  <import namespace="urn:ietf:params:xml:ns:eppcom-1.0"
    schemaLocation="eppcom-1.0.xsd"/>
  <import namespace="urn:ietf:params:xml:ns:xriCommon-1.0"
    schemaLocation="xriCommon-1.0.xsd"/>

  <annotation>
    <documentation>
      Extensible Provisioning Protocol v1.0
      XML schema for XRI I-Number provisioning.
    </documentation>
  </annotation>

  <!--
  Child elements found in EPP commands.
  -->
  <element name="check" type="xriINU:mIdType"/>
  <element name="create" type="xriINU:createType"/>
  <element name="delete" type="xriINU:sIdType"/>
  <element name="info" type="xriINU:infoType"/>
  <element name="renew" type="xriINU:renewType"/>
  <element name="update" type="xriINU:updateType"/>

  <!--
  Child element of commands that require a single i-number
  -->
  <complexType name="sIdType">
    <sequence>
      <element name="inumber" type="xriCommon:inumberType"/>
    </sequence>
  </complexType>

  <!--
```

Child element of commands that accept multiple i-numbers

```
-->
  <complexType name="mIdType">
    <sequence>
      <element name="inumber" type="xriCommon:inumberType"
        maxOccurs="unbounded"/>
    </sequence>
  </complexType>
```

<!--

Child elements of the <create> command.

```
-->
  <complexType name="createType">
    <sequence>
      <choice>
        <element name="inumber" type="xriCommon:inumberType"/>
        <element name="refId" type="xriINU:refIdType"/>
      </choice>
      <sequence>
        <element name="inumber" type="xriCommon:inumberType"/>
        <element name="refId" type="xriINU:refIdType"/>
      </sequence>
    </choice>
    <element name="authority" type="xriINU:authorityType"/>
    <element name="priority" type="unsignedShort"
      minOccurs="0"/>
    <element name="period" type="xriINU:periodType"
      minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="authorityType">
  <sequence>
    <element name="authId" type="xriCommon:authIdType"/>
    <element name="authInfo" type="xriINU:authInfoType" minOccurs="0"/>
  </sequence>
</complexType>

<simpleType name="refIdType">
  <restriction base="token">
    <minLength value="1"/>
    <maxLength value="255"/>
  </restriction>
</simpleType>
```

<!--

Child elements of the <info> command.

```
-->
  <complexType name="infoType">
    <sequence>
      <element name="inumber" type="xriCommon:inumberType"/>
    </sequence>
  </complexType>
```

<!--

Child elements of the <renew> command.

```
-->
  <complexType name="renewType">
```



```

        <sequence>
            <element name="inumber"      type="xriCommon:inumberType"/>
            <element name="curExpDate" type="date"/>
            <element name="period"      type="xriINU:periodType" minOccurs="0"/>
        </sequence>
    </complexType>

<!--
Child elements of the <update> command.
-->
    <complexType name="updateType">
        <sequence>
            <element name="inumber"      type="xriCommon:inumberType"/>
            <element name="add"          type="xriINU:addRemType" minOccurs="0"/>
            <element name="rem"          type="xriINU:addRemType" minOccurs="0"/>
            <element name="chg"          type="xriINU:chgType"      minOccurs="0"/>
        </sequence>
    </complexType>

<!--
Data elements that can be added or removed.
-->
    <complexType name="addRemType">
        <sequence>
            <element name="status" type="xriINU:statusType" maxOccurs="8"/>
        </sequence>
    </complexType>

<!--
Data elements that can be changed.
-->
    <complexType name="chgType">
        <sequence>
            <element name="priority" type="unsignedShort"/>
        </sequence>
    </complexType>

<!--
Child response elements.
-->
    <element name="chkData" type="xriINU:chkDataType"/>
    <element name="creData" type="xriINU:creDataType"/>
    <element name="infData" type="xriINU:infDataType"/>
    <element name="panData" type="xriINU:panDataType"/>
    <element name="renData" type="xriINU:renDataType"/>

<!--
<check> response elements.
-->
    <complexType name="chkDataType">
        <sequence>
            <element name="cd" type="xriINU:checkType"
                maxOccurs="unbounded"/>
        </sequence>
    </complexType>

    <complexType name="checkType">

```

```

        <sequence>
            <element name="inumber" type="xriINU:checkIdType"/>
            <element name="reason" type="eppcom:reasonType"
                minOccurs="0"/>
        </sequence>
    </complexType>

    <complexType name="checkIdType">
        <simpleContent>
            <extension base="xriCommon:inumberType">
                <attribute name="avail" type="boolean"
                    use="required"/>
            </extension>
        </simpleContent>
    </complexType>

    <!--
    <create> response elements.
    -->
    <complexType name="creDataType">
        <sequence>
            <element name="inumber" type="xriCommon:inumberType"/>
            <element name="refId" type="xriINU:refIdType" minOccurs="0"/>
            <element name="crDate" type="dateTime"/>
            <element name="exDate" type="dateTime"/>
        </sequence>
    </complexType>

    <!--
    <info> response elements.
    -->
    <complexType name="infDataType">
        <sequence>
            <element name="inumber" type="xriCommon:inumberType"/>
            <element name="roid" type="eppcom:roidType"/>
            <element name="status" type="xriINU:statusType" maxOccurs="10"/>
            <element name="refId" type="xriINU:refIdType" minOccurs="0"/>
            <element name="authId" type="xriCommon:authIdType"/>
            <element name="priority" type="unsignedShort"/>
            <element name="clID" type="eppcom:clIDType"/>
            <element name="crID" type="eppcom:clIDType"/>
            <element name="crDate" type="dateTime"/>
            <element name="upID" type="eppcom:clIDType" minOccurs="0"/>
            <element name="upDate" type="dateTime" minOccurs="0"/>
            <element name="exDate" type="dateTime"/>
            <element name="trDate" type="dateTime" minOccurs="0"/>
        </sequence>
    </complexType>

    <!--
    <renew> response elements.
    -->
    <complexType name="renDataType">
        <sequence>
            <element name="inumber" type="xriCommon:inumberType"/>
            <element name="exDate" type="dateTime"/>
        </sequence>
    </complexType>

```

```

</complexType>

<!--
Status is a combination of attributes and an optional
human-readable message that may be expressed in languages other
than English.
-->
<complexType name="statusType">
  <simpleContent>
    <extension base="normalizedString">
      <attribute name="s" type="xriINU:statusValueType"
        use="required"/>
      <attribute name="lang" type="language"
        default="en"/>
    </extension>
  </simpleContent>
</complexType>

<simpleType name="statusValueType">
  <restriction base="token">
    <enumeration value="clientDeleteProhibited"/>
    <enumeration value="clientHold"/>
    <enumeration value="clientRenewProhibited"/>
    <enumeration value="clientUpdateProhibited"/>
    <enumeration value="ok"/>
    <enumeration value="pendingCreate"/>
    <enumeration value="pendingDelete"/>
    <enumeration value="pendingUpdate"/>
    <enumeration value="pendingTransfer"/>
    <enumeration value="serverDeleteProhibited"/>
    <enumeration value="serverHold"/>
    <enumeration value="serverRenewProhibited"/>
    <enumeration value="serverUpdateProhibited"/>
    <enumeration value="terminated"/>
  </restriction>
</simpleType>

<!--
Pending action notification response elements.
-->
<complexType name="panDataType">
  <sequence>
    <element name="inumber" type="xriINU:paIdType"/>
    <element name="paTRID" type="epp:trIDType"/>
    <element name="paDate" type="dateTime"/>
  </sequence>
</complexType>

<complexType name="paIdType">
  <simpleContent>
    <extension base="xriCommon:inumberType">
      <attribute name="paResult" type="boolean"
        use="required"/>
    </extension>
  </simpleContent>
</complexType>

```

```

<!--
Auth Info type.
-->
  <complexType name="authInfoType">
    <choice>
      <element name="pw" type="eppcom:pwAuthInfoType"/>
      <element name="ext" type="eppcom:extAuthInfoType"/>
    </choice>
  </complexType>

<!--
Period type.
-->
  <complexType name="periodType">
    <simpleContent>
      <extension base="xriCommon:pLimitType">
        <attribute name="unit" type="xriCommon:pUnitType"
          use="required"/>
      </extension>
    </simpleContent>
  </complexType>

<!--
End of schema.
-->
</schema>
END

```

5. Internationalization Considerations

This memo introduces no international considerations beyond those introduced in [RFC 3730].

6. IANA Considerations

This document uses URNs to describe XML namespaces and XML schemas conforming to a registry mechanism described in [RFC 3688]. If the ISEG approves this memo for publication, then two URI assignments will be requested.

Registration request for the EPP XRI i-number namespace
 URI: urn:ietf:params:xml:ns:xriINU-1.0

Registrant Contact: See the "Authors' Addresses" section of this document.

XML: None. Namespace URIs do not represent an XML specification.

Registration request for the EPP XRI i-number XML schema:

URI: urn:ietf:params:xml:schema:xriINU-1.0

Registrant Contact: See the "Authors' Addresses" section of this document.

XML: See the "Formal Syntax" section of this document.

7. Security Considerations

The mapping extensions described in this document do not provide any security services beyond those described by EPP [RFC 3730]. Security considerations related to XRI and XDI are described in [XRI] and [XDI].

As with other EPP object transforms, the EPP transform operations described in this document MUST be restricted to the sponsoring client as authenticated using the mechanisms described in sections 2.9.1.1 and 7 of [RFC 3730]. Any attempt to perform a transform operation on an XRI i-number by any client other than the sponsoring client MUST be rejected with an appropriate EPP authorization error. Please consult [RFC 3730] for a discussion of EPP-specific security issues.

8. Acknowledgements

TBD

9. References

- [EPP AU] Zhang, N., "Extensible Provisioning Protocol XRI Authority Mapping", Internet-Draft <draft-zhang-epp-xri-au-02.txt>, work in progress.
- [RFC 2046] Freed, N., N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC 2046, November 1996.
- [RFC 2119] Bradner, S., "Key Words for Use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC 3339] Klyne, G. and C. Newman, "Date and Time on the Internet: Timestamps", RFC 3339, July 2002.
- [RFC 3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, January 2004.
- [RFC 3730] Hollenbeck, S., "Extensible Provisioning Protocol (EPP)", RFC 3730, March 2004.
- [XML] Bray, T., et al, "Extensible Markup Language (XML) 1.0 (Third Edition)", W3C Recommendation <<http://www.w3.org/TR/REC-xml>>, February 2004.
- [XML SCHEMA] Thompson, H., Beech, D., Maloney, M., and N. Mendelsohn, "XML Schema Part 1: Structures", W3C Recommendation <<http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/>>, October 2004.

[XDI] OASIS XRI Data Interchange (XDI) <<http://www.oasis-open.org/committees/xdi>>

[XRI] OASIS Extensible Resource Identifier (XRI) <<http://www.oasis-open.org/committees/xri>>

10. Appendix A - Authors' Addresses

NeuStar, Inc
Loudoun Tech Center
45980 Center Oak Plaza
Sterling, VA 20166
U.S.A.
Phone: +1-571-434-5300
Email: ibroker-support@neustar.biz

11. Appendix B - Full Copyright Statement

Copyright (C) The Internet Society 2005. All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Acknowledgement

Funding for the RFC editor function is currently provided by the Internet Society.