

Internet Engineering Task Force
Internet-Draft
Intended status: Standards Track
Expires: June 3, 2019

L. Zhou
CNNIC
N. Kong
Consultant
G. Zhou
J. Yao
CNNIC
J. Gould
Verisign, Inc.
November 30, 2018

Extensible Provisioning Protocol (EPP) Organization Mapping
draft-ietf-regext-org-12

Abstract

This document describes an Extensible Provisioning Protocol (EPP) mapping for provisioning and management of organization objects stored in a shared central repository. Specified in Extensible Markup Language (XML), this extended mapping is applied to provide additional features required for the provisioning of organizations.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

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."

This Internet-Draft will expire on June 3, 2019.

Copyright Notice

Copyright (c) 2018 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of

publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1. Introduction	3
2. Conventions Used in This Document	3
3. Object Attributes	3
3.1. Organization Identifier	4
3.2. Organization Roles	4
3.2.1. Role Type	4
3.2.2. Role Status	4
3.2.3. Role Identifier	4
3.3. Contact and Client Identifiers	5
3.4. Organization Status Values	5
3.5. Role Status Values	6
3.6. Parent Identifier	7
3.7. URL	7
3.8. Dates and Times	7
4. EPP Command Mapping	8
4.1. EPP Query Commands	8
4.1.1. EPP <check> Command	8
4.1.2. EPP <info> Command	10
4.1.3. EPP <transfer> Query Command	16
4.2. EPP Transform Commands	16
4.2.1. EPP <create> Command	16
4.2.2. EPP <delete> Command	20
4.2.3. EPP <renew> Command	21
4.2.4. EPP <transfer> Command	21
4.2.5. EPP <update> Command	22
4.3. Offline Review of Requested Actions	26
5. Formal Syntax	28
6. Internationalization Considerations	37
7. IANA Considerations	37
7.1. XML Namespace	37
7.2. EPP Extension Registry	38
7.3. Role Type Values Registry	38
7.3.1. Registration Template	38
7.3.2. Initial Registry Contents	38
8. Implementation Status	39
8.1. Verisign EPP SDK	40
8.2. CNNIC Implementation	40
9. Security Considerations	41
10. Acknowledgment	41

11. References	41
11.1. Normative References	41
11.2. Informative References	42
Appendix A. Change Log	43
Authors' Addresses	46

1. Introduction

There are many entities, such as registrars, resellers, DNS service operators, or privacy proxies involved in the domain registration business. These kind of entities have not been formally defined as having an object in Extensible Provisioning Protocol (EPP). This document provides a way to specify them as "organization" entities.

This document describes an organization object mapping for version 1.0 of the EPP [RFC5730]. This mapping is specified using the XML 1.0 as described in [W3C.REC-xml-20040204] and XML Schema notation as described in [W3C.REC-xmlschema-1-20041028] and [W3C.REC-xmlschema-2-20041028].

2. 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 BCP 14 [RFC2119][RFC8174] when, and only when, they appear in all capitals, as shown here.

In examples, "C:" represents lines sent by a protocol client and "S:" represents lines returned by a protocol server. Indentation and white space in examples are provided only to illustrate element relationships and are not a required feature of this specification.

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

The XML namespace prefix "org" is used for the namespace "urn:ietf:params:xml:ns:epp:org-1.0", but implementations MUST NOT depend on it and instead employ a proper namespace-aware XML parser and serializer to interpret and output the XML documents.

3. Object Attributes

An EPP organization object has attributes and associated values that can 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.

3.1. Organization Identifier

All EPP organizations are identified by a server-unique identifier. Organization identifiers are character strings with a specified minimum length, a specified maximum length, and a specified format. Organization identifiers use the "clIDType" client identifier syntax described in [RFC5730]. Its corresponding element is <org:id>.

3.2. Organization Roles

The organization roles are used to represent the relationship an organization could have. Its corresponding element is <org:role>. An organization object MUST always have at least one associated role. Roles can be set only by the client that sponsors an organization object. A client can change the role of an organization object using the EPP <update> command.

3.2.1. Role Type

An organization role MUST have a type field. This may have any of the values listed in Section 7.3. An organization could have multiple roles with different role types. Its corresponding element is <org:type>.

3.2.2. Role Status

A role of an organization object MAY have its own statuses. Its corresponding element is <org:status>. The values of the role status are defined in Section 3.5.

3.2.3. Role Identifier

A role MAY have a third-party-assigned identifier such as the IANA ID for registrars. Its corresponding element is <org:roleID>.

Example of organization role identifier:

```
<org:role>
  <org:type>registrar</org:type>
  <org:status>ok</org:status>
  <org:status>linked</org:status>
  <org:roleID>1362</org:roleID>
</org:role>
```

3.3. Contact and Client Identifiers

All EPP contacts are identified by server-unique identifiers. Contact identifiers are character strings with a specified minimum length, a specified maximum length, and a specified format. Contact identifiers use the "clIDType" client identifier syntax described in [RFC5730].

3.4. Organization Status Values

An organization object MUST always have at least one associated status value. Status values can be set only by the client that sponsors an organization object and by the server on which the object resides. A client can change the status of an organization 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 server 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 server status values that can be added or removed by a server are prefixed with "server". The "hold" and "terminated" status values are server-managed when the organization has no parent identifier [Section 3.6] and otherwise MAY be client-managed based on server policy. Other status values that do not begin with either "client" or "server" are server-managed.

Status Value Descriptions:

- o ok: This is the normal status value for an object that has no operations pending or active prohibitions. This value is set and removed by the server as other status values are added or removed.
- o hold: Organization transform commands and new links MUST be rejected.
- o terminated: The organization which has been terminated MUST NOT be linked. Organization transform commands and new links MUST be rejected.
- o linked: The organization object has at least one active association with another object. The "linked" status is not

explicitly set by the client. Servers should provide services to determine existing object associations.

- o `clientLinkProhibited`, `serverLinkProhibited`: Requests to add new links to the organization MUST be rejected.
- o `clientUpdateProhibited`, `serverUpdateProhibited`: Requests to update the object (other than to remove this status) MUST be rejected.
- o `clientDeleteProhibited`, `serverDeleteProhibited`: Requests to delete the object MUST be rejected.
- o `pendingCreate`, `pendingUpdate`, `pendingDelete`: 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.

"`pendingCreate`", "`ok`", "`hold`", and "`terminated`" are mutually exclusive statuses. Organization MUST have exactly one of these statuses set.

"`ok`" status MAY only be combined with "`linked`" status.

A client or server MAY combine "`linked`" with either "`clientLinkProhibited`" or "`serverLinkProhibited`" if new links must be prohibited.

"`pendingDelete`" status MUST NOT be combined with either "`clientDeleteProhibited`" or "`serverDeleteProhibited`" status.

The `pendingCreate`, `pendingDelete`, and `pendingUpdate` status values MUST NOT be combined with each other.

If "`clientUpdateProhibited`" or "`serverUpdateProhibited`" is set, the client will not be able to update the object. For "`clientUpdateProhibited`", the client will first need to remove "`clientUpdateProhibited`" prior to attempting to update the object. The server can modify the object at any time.

3.5. Role Status Values

A role SHOULD have at least one associated status value. Valid values include "`ok`", "`linked`", "`clientLinkProhibited`", and "`serverLinkProhibited`".

Status Value Descriptions:

- o ok: This is the normal status value for a role that has no operations pending or active prohibitions. This value is set and removed by the server as other status values are added or removed.
- o linked: The role of an organization object has at least one active association with another object. The "linked" status is not explicitly set by the client. Servers SHOULD provide services to determine existing object associations.
- o clientLinkProhibited, serverLinkProhibited: Requests to add new links to the role MUST be rejected.

3.6. Parent Identifier

There can be more than one layer of organizations, such as a reseller. The parent identifier, as defined with the <org:parentId> element, represents the parent organization identifier in a child organization.

The case of reseller organizations provides an example. The parent identifier is not defined for the top level reseller, namely the registrar of the registry. An N-tier reseller has a parent reseller and at least one child reseller. A reseller customer has a parent reseller and no child resellers.

Loops MUST be prohibited. For example: if organization A has B as its parent identifier, organization B cannot have organization A as its parent identifier. The same is true for larger loops involving three or more organizations.

3.7. URL

The URL represents the organization web home page, as defined with the <org:url> element.

3.8. 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 [W3C.REC-xmlschema-2-20041028] 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.

4. EPP Command Mapping

A detailed description of the EPP syntax and semantics can be found in the EPP core protocol specification [RFC5730]. The command mappings described here are specifically for use in provisioning and managing organization information via EPP.

4.1. EPP Query Commands

EPP provides two commands to retrieve organization information: `<check>` to determine if an organization object can be provisioned within a repository, and `<info>` to retrieve detailed information associated with an organization object. This document does not define a mapping for the EPP `<transfer>` command to retrieve organization-object transfer status information.

4.1.1. EPP `<check>` Command

The EPP `<check>` command is used to determine if an object can 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, as object-provisioning requirements are ultimately a matter of server policy.

In addition to the standard EPP command elements, the `<check>` command MUST contain an `<org:check>` element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The `<org:check>` element contains the following child elements:

- o One or more `<org:id>` elements that contain the server-unique identifier of the organization 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:  <command>
C:    <check>
C:      <org:check
C:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
C:          <org:id>res1523</org:id>
C:          <org:id>re1523</org:id>
C:          <org:id>1523res</org:id>
C:        </org: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 `<org:chkData>` element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The `<org:chkData>` element contains one or more `<org:cd>` elements that contain the following child elements:

- o An `<org:id>` element that identifies the queried 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 cannot be provisioned.
- o An OPTIONAL `<org:reason>` element that may be provided when an object cannot be provisioned. If present, this element contains server-specific text to help explain why the object cannot be provisioned. This text MUST be represented in the response language previously negotiated with the client; an OPTIONAL "lang" attribute as defined in [RFC5646] 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:  <response>
S:    <result code="1000">
S:      <msg lang="en">Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <org:chkData
S:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
S:        <org:cd>
S:          <org:id avail="1">res1523</org:id>
S:        </org:cd>
S:        <org:cd>
S:          <org:id avail="0">re1523</org:id>
S:          <org:reason lang="en">In use</org:reason>
S:        </org:cd>
S:        <org:cd>
S:          <org:id avail="1">1523res</org:id>
S:        </org:cd>
S:      </org:chkData>
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 <check> command cannot be processed for any reason.

4.1.2. EPP <info> Command

The EPP <info> command is used to retrieve information associated with an organization object. In addition to the standard EPP command elements, the <info> command MUST contain a <org:info> element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The <org:info> element contains the following child elements:

- o An <org:id> element that contains the server-unique identifier of the organization 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:  <command>
C:    <info>
C:      <org:info
C:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
C:          <org:id>res1523</org:id>
C:        </org: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 `<org:infData>` element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The `<org:infData>` element contains the following child elements:

- o An `<org:id>` element that contains the server-unique identifier of the organization object, as defined in Section 3.1.
- o An `<org:roid>` element that contains the Repository Object Identifier assigned to the organization object when the object was created.
- o One or more `<org:role>` elements that contain the role type, role statuses and optional role id of the organization.
 - * An `<org:type>` element that contains the type of the organization, as defined in Section 3.2.
 - * One or more `<org:status>` elements that contain the role statuses. The values of the role status are defined in Section 3.5.
 - * An OPTIONAL `<org:roleID>` element that contains a third-party-assigned identifier, such as IANA ID for registrars, as defined in Section 3.2.3.
- o One or more `<org:status>` elements that contain the operational status of the organization, as defined in Section 3.4.
- o An OPTIONAL `<org:parentId>` element that contains the identifier of the parent object, as defined in Section 3.6.
- o Zero to two `<org:postalInfo>` elements that contain postal-address information. Two elements are provided so that address

information can be provided in both internationalized and localized forms; a "type" attribute is used to identify the two forms. If an internationalized form (type="int") is provided, element content MUST be represented in a subset of Unicode in the range U+0020 - U+007E. If a localized form (type="loc") is provided, element content MAY be represented in unrestricted UTF-8. The <org:postalInfo> element contains the following child elements:

- * An <org:name> element that contains the name of the organization.
- * An OPTIONAL <org:addr> element that contains address information associated with the organization. A <org:addr> element contains the following child elements:
 - + One, two, or three <org:street> elements that contain the organization's street address.
 - + An <org:city> element that contains the organization's city.
 - + An OPTIONAL <org:sp> element that contains the organization's state or province.
 - + An OPTIONAL <org:pc> element that contains the organization's postal code.
 - + An <org:cc> element that contains the alpha-2 organization's country code. The detailed format of this element is described in section 2.4.3 of [RFC5733].
- o An OPTIONAL <org:voice> element that contains the organization's voice telephone number. The detailed format of this element is described in Section 2.5 of [RFC5733].
- o An OPTIONAL <org:fax> element that contains the organization's facsimile telephone number.
- o An OPTIONAL <org:email> element that contains the organization's email address. The detailed format of this element is described in section 2.6 of [RFC5733].
- o An OPTIONAL <org:url> element that contains the URL to the website of the organization. The detailed format of this element is described in [RFC3986].
- o Zero or more <org:contact> elements that contain identifiers for the contact objects to be associated with the organization object.

Contact object identifiers MUST be known to the server before the contact object can be associated with the organization object. The required "type" is used to represent contact types. The type values include "admin", "tech", "billing", "abuse", and "custom". The OPTIONAL "typeName" attribute is used to define the name of a "custom" type.

- o An OPTIONAL <org:clID> element that contains the organization identifier of the sponsoring client. There is no <org:clID> element if the organization is managed by the registry.
- o An <org:crID> element that contains the identifier of the client that created the organization object.
- o An <org:crDate> element that contains the date and time of organization object creation.
- o An <org:upID> element that contains the identifier of the client that last updated the organization object. This element MUST NOT be present if the organization has never been modified.
- o An <org:upDate> element that contains the date and time of the most recent organization object modification. This element MUST NOT be present if the organization object has never been modified.

Example <info> response for "Example Registrar Inc." organization organization object with identifier "registrar1362":

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
S:  <response>
S:    <result code="1000">
S:      <msg lang="en">Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <org:infData
S:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
S:        <org:id>registrar1362</org:id>
S:        <org:roid>registrar1362-REP</org:roid>
S:        <org:role>
S:          <org:type>registrar</org:type>
S:          <org:status>ok</org:status>
S:          <org:status>linked</org:status>
S:          <org:roleID>1362</org:roleID>
S:        </org:role>
S:        <org:status>ok</org:status>
S:        <org:postalInfo type="int">
```

```
S:      <org:name>Example Registrar Inc.</org:name>
S:      <org:addr>
S:          <org:street>123 Example Dr.</org:street>
S:          <org:street>Suite 100</org:street>
S:          <org:city>Dulles</org:city>
S:          <org:sp>VA</org:sp>
S:          <org:pc>20166-6503</org:pc>
S:          <org:cc>US</org:cc>
S:      </org:addr>
S:      </org:postalInfo>
S:      <org:voice x="1234">+1.7035555555</org:voice>
S:      <org:fax>+1.7035555556</org:fax>
S:      <org:email>contact@organization.example</org:email>
S:      <org:url>https://organization.example</org:url>
S:      <org:contact type="admin">sh8013</org:contact>
S:      <org:contact type="billing">sh8013</org:contact>
S:      <org:contact type="custom"
S:          typeName="legal">sh8013</org:contact>
S:      <org:crID>ClientX</org:crID>
S:      <org:crDate>1999-04-03T22:00:00.0Z</org:crDate>
S:      <org:upID>ClientX</org:upID>
S:      <org:upDate>1999-12-03T09:00:00.0Z</org:upDate>
S:      </org:infData>
S:  </resData>
S:  <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54322-XYZ</svTRID>
S:  </trID>
S: </response>
S:</epp>
```

Example <info> response for "Example Reseller Inc." organization object of reseller type managed by identifier "registrar1362":

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
S:  <response>
S:    <result code="1000">
S:      <msg lang="en">Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <org:infData
S:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
S:        <org:id>reseller1523</org:id>
S:        <org:roid>reseller1523-REP</org:roid>
S:        <org:role>
S:          <org:type>reseller</org:type>
S:          <org:status>ok</org:status>
S:          <org:status>linked</org:status>
S:        </org:role>
S:        <org:status>ok</org:status>
S:        <org:parentId>registrar1362</org:parentId>
S:        <org:postalInfo type="int">
S:          <org:name>Example Reseller Inc.</org:name>
S:          <org:addr>
S:            <org:street>123 Example Dr.</org:street>
S:            <org:street>Suite 100</org:street>
S:            <org:city>Dulles</org:city>
S:            <org:sp>VA</org:sp>
S:            <org:pc>20166-6503</org:pc>
S:            <org:cc>US</org:cc>
S:          </org:addr>
S:        </org:postalInfo>
S:        <org:fax>+1.7035555556</org:fax>
S:        <org:url>https://organization.example</org:url>
S:        <org:contact type="admin">sh8013</org:contact>
S:        <org:clID>1362</org:clID>
S:        <org:crID>ClientX</org:crID>
S:        <org:crDate>1999-04-03T22:00:00.0Z</org:crDate>
S:        <org:upID>ClientX</org:upID>
S:        <org:upDate>1999-12-03T09:00:00.0Z</org:upDate>
S:      </org:infData>
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 an <info> command cannot be processed for any reason.

4.1.3. EPP <transfer> Query Command

The transfer semantics does not apply to organization object. No EPP <transfer> query command is defined in this document.

4.2. EPP Transform Commands

This document provides three commands to transform organization object information: <create> to create an instance of an organization object, <delete> to delete an instance of an organization object, and <update> to change information associated with an organization object. This document does not define a mapping for the EPP <transfer> and <renew> 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 that 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, the client MUST be notified using a service message that the action has been completed and that the status of the object has changed. Other notification methods MAY be used in addition to the required service message.

4.2.1. EPP <create> Command

The EPP <create> command provides a transform operation that allows a client to create an organization object. In addition to the standard EPP command elements, the <create> command MUST contain a <org:create> element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The <org:create> element contains the following child elements:

- o An <org:id> element that contains the desired server-unique identifier for the organization to be created, as defined in Section 3.1.
- o One or more <org:role> elements that contain the role type, role statuses and optional role id of the organization.
- * An <org:type> element that contains the type of the organization, as defined in Section 3.2.

- * Zero or more <org:status> elements that contain the role statuses. The values of the role status are defined in Section 3.5.
- * An OPTIONAL <org:roleID> element that contains a third-party-assigned identifier, such as IANA ID for registrars, as defined in Section 3.2.3.
- o Zero or more <org:status> elements that contain the operational status of the organization, as defined in Section 3.4.
- o An OPTIONAL <org:parentId> element that contains the identifier of the parent object, as defined in Section 3.6.
- o Zero to two <org:postalInfo> elements that contain postal-address information. Two elements are provided so that address information can be provided in both internationalized and localized forms; a "type" attribute is used to identify the two forms. If an internationalized form (type="int") is provided, element content MUST be represented in a subset of Unicode in the range U+0020 - U+007E. If a localized form (type="loc") is provided, element content MAY be represented in unrestricted UTF-8. The <org:postalInfo> element contains the following child elements:
 - * An <org:name> element that contains the name of the organization.
 - * An OPTIONAL <org:addr> element that contains address information associated with the organization. A <org:addr> element contains the following child elements:
 - + One, two, or three <org:street> elements that contain the organization's street address.
 - + An <org:city> element that contains the organization's city.
 - + An OPTIONAL <org:sp> element that contains the organization's state or province.
 - + An OPTIONAL <org:pc> element that contains the organization's postal code.
 - + An <org:cc> element that contains the alpha-2 organization's country code. The detailed format of this element is described in section 2.4.3 of [RFC5733].

- o An OPTIONAL <org:voice> element that contains the organization's voice telephone number. The detailed format of this element is described in Section 2.5 of [RFC5733]
- o An OPTIONAL <org:fax> element that contains the organization's facsimile telephone number.
- o An OPTIONAL <org:email> element that contains the organization's email address. The detailed format of this element is described in section 2.6 of [RFC5733].
- o An OPTIONAL <org:url> element that contains the URL to the website of the organization. The detailed format of this element is described in [RFC3986].
- o Zero or more <org:contact> elements that contain identifiers for the contact objects associated with the organization object.

Example <create> command:

```

C:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
C:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
C:  <command>
C:    <create>
C:      <org:create>
C:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
C:          <org:id>res1523</org:id>
C:          <org:role>
C:            <org:type>reseller</org:type>
C:          </org:role>
C:          <org:parentId>1523res</org:parentId>
C:          <org:postalInfo type="int">
C:            <org:name>Example Organization Inc.</org:name>
C:            <org:addr>
C:              <org:street>123 Example Dr.</org:street>
C:              <org:street>Suite 100</org:street>
C:              <org:city>Dulles</org:city>
C:              <org:sp>VA</org:sp>
C:              <org:pc>20166-6503</org:pc>
C:              <org:cc>US</org:cc>
C:            </org:addr>
C:          </org:postalInfo>
C:          <org:voice x="1234">+1.7035555555</org:voice>
C:          <org:fax>+1.7035555556</org:fax>
C:          <org:email>contact@organization.example</org:email>
C:          <org:url>https://organization.example</org:url>
C:          <org:contact type="admin">sh8013</org:contact>
C:          <org:contact type="billing">sh8013</org:contact>
C:        </org: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 <org:creData> element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The <org:creData> element contains the following child elements:

- o An <org:id> element that contains the server-unique identifier for the created organization, as defined in Section 3.1.
- o An <org:crDate> element that contains the date and time of organization-object creation.

Example <create> response:

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
S:  <response>
S:    <result code="1000">
S:      <msg lang="en">Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <org:creData
S:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
S:        <org:id>res1523</org:id>
S:        <org:crDate>1999-04-03T22:00:00.0Z</org:crDate>
S:      </org: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 cannot be processed for any reason.

4.2.2. EPP <delete> Command

The EPP <delete> command provides a transform operation that allows a client to delete an organization object. In addition to the standard EPP command elements, the <delete> command MUST contain an <org:delete> element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The <org:delete> element MUST contain the following child element:

- o An <org:id> element that contains the server-unique identifier of the organization object to be deleted, as defined in Section 3.1.

An organization object MUST NOT be deleted if it is associated with other known objects. An associated organization MUST NOT be deleted until associations with other known objects have been broken. A server MUST notify clients that object relationships exist by sending a 2305 error response code when a <delete> command is attempted and fails due to existing object relationships.

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:  <command>
C:    <delete>
C:      <org:delete
C:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
C:          <org:id>res1523</org:id>
C:        </org: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:  <response>
S:    <result code="1000">
S:      <msg lang="en">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 cannot be processed for any reason.

4.2.3. EPP <renew> Command

Renewal semantics do not apply to organization objects, so there is no mapping defined for the EPP <renew> command.

4.2.4. EPP <transfer> Command

Transfer semantics do not apply to organization objects, so there is no mapping defined for the EPP <transfer> command.

4.2.5. EPP <update> Command

The EPP <update> command provides a transform operation that allows a client to modify the attributes of an organization object. In addition to the standard EPP command elements, the <update> command MUST contain a <org:update> element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The <org:update> element contains the following child elements:

- o An <org:id> element that contains the server-unique identifier of the organization object to be updated, as defined in Section 3.1.
- o An OPTIONAL <org:add> element that contains attribute values to be added to the object.
- o An OPTIONAL <org:rem> element that contains attribute values to be removed from the object.
- o An OPTIONAL <org:chg> element that contains attribute values to be changed.

At least one <org:add>, <org:rem> or <org:chg> element MUST be provided if the command is not being extended. All of these elements MAY be omitted if an <update> extension is present. The OPTIONAL <org:add> and <org:rem> elements contain the following child elements:

- o Zero or more <org:contact> elements that contain the identifiers for contact objects to be associated with or removed from the organization object. Contact object identifiers MUST be known to the server before the contact object can be associated with the organization object.
- o Zero or more <org:role> elements that contain the role type, role statuses and optional role id of the organization.
 - * An <org:type> element that contains the role type of the organization, as defined in Section 3.2. The role type uniquely identifies the role to update.
 - * Zero or more <org:status> elements that contain the role statuses. The values of the role status are defined in Section 3.5.
 - * An OPTIONAL <org:roleID> element that contains a third-party-assigned identifier, such as IANA ID for registrars, as defined in Section 3.2.3.

- o Zero or more <org:status> elements that contain the operational status of the organization.

An OPTIONAL <org:chg> element contains the following child elements, where at least one child element MUST be present:

- o An OPTIONAL <org:parentId> element that contains the identifier of the parent object.
- o Zero to two <org:postalInfo> elements that contain postal-address information. Two elements are provided so that address information can be provided in both internationalized and localized forms; a "type" attribute is used to identify the two forms. If an internationalized form (type="int") is provided, element content MUST be represented in a subset of Unicode in the range U+0020 - U+007E. If a localized form (type="loc") is provided, element content MAY be represented in unrestricted UTF-8. The change of the postal info is defined as a replacement of that postal info element with the contents of the sub-elements included in the update command. An empty <org:postalInfo> element is supported to allow a type of postal info to be removed. The <org:postalInfo> element contains the following child elements:
 - * An <org:name> element that contains the name of the organization.
 - * An OPTIONAL <org:addr> element that contains address information associated with the organization. A <org:addr> element contains the following child elements:
 - + One, two, or three <org:street> elements that contain the organization's street address.
 - + An <org:city> element that contains the organization's city.
 - + An OPTIONAL <org:sp> element that contains the organization's state or province.
 - + An OPTIONAL <org:pc> element that contains the organization's postal code.
 - + An <org:cc> element that contains the alpha-2 organization's country code. The detailed format of this element is described in section 2.4.3 of [RFC5733].
- o An OPTIONAL <org:voice> element that contains the organization's voice telephone number. The detailed format of this element is described in Section 2.5 of [RFC5733]

- o An OPTIONAL <org:fax> element that contains the organization's facsimile telephone number.
- o An OPTIONAL <org:email> element that contains the organization's email address. The detailed format of this element is described in section 2.6 of [RFC5733].
- o An OPTIONAL <org:url> element that contains the URL to the website of the organization. The detailed format of this element is described in [RFC3986]

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:  <command>
C:    <update>
C:      <org:update>
C:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
C:          <org:id>res1523</org:id>
C:          <org:add>
C:            <org:contact type="tech">sh8013</org:contact>
C:            <org:role>
C:              <org:type>privacyproxy</org:type>
C:              <org:status>clientLinkProhibited</org:status>
C:            </org:role>
C:            <org:status>clientLinkProhibited</org:status>
C:          </org:add>
C:          <org:rem>
C:            <org:contact type="billing">sh8014</org:contact>
C:            <org:role>
C:              <org:type>reseller</org:type>
C:            </org:role>
C:          </org:rem>
C:          <org:chg>
C:            <org:postalInfo type="int">
C:              <org:addr>
C:                <org:street>124 Example Dr.</org:street>
C:                <org:street>Suite 200</org:street>
C:                <org:city>Dulles</org:city>
C:                <org:sp>VA</org:sp>
C:                <org:pc>20166-6503</org:pc>
C:                <org:cc>US</org:cc>
C:              </org:addr>
C:            </org:postalInfo>
C:            <org:voice>+1.7034444444</org:voice>
C:            <org:fax/>
C:          </org:chg>
C:        </org: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:  <response>
S:    <result code="1000">
S:      <msg lang="en">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 cannot be processed for any reason.

4.3. Offline Review of Requested Actions

Commands are processed by a server in the order they are received from a client. Though an immediate response confirming receipt and processing of the command is produced by the server, a server operator MAY perform an offline review of requested transform commands before completing the requested action. In such situations, the response from the server MUST clearly note that the transform command has been received and processed, but the requested action is pending. The status in the response of the corresponding object MUST clearly reflect processing of the pending action. The server MUST notify the client when offline processing of the action has been completed.

Examples describing a <create> command that requires offline review are included here. Note the result code and message returned in response to the <create> command.

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
S:  <response>
S:    <result code="1001">
S:      <msg lang="en">Command completed successfully;
S:        action pending</msg>
S:    </result>
S:    <resData>
S:      <org:creData
S:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
S:        <org:id>res1523</org:id>
S:        <org:crDate>1999-04-03T22:00:00.0Z</org:crDate>
S:      </org:creData>
S:    </resData>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54321-XYZ</svTRID>
S:    </trID>
S:  </response>
S:</epp>
```

The status of the organization object after returning this response MUST include "pendingCreate". The server operator reviews the request offline, and informs the client of the outcome of the review by queuing a service message for retrieval via the <poll> command; it MAY additionally use an out-of-band mechanism to inform the client of the outcome.

The service message MUST contain text that describes the notification in the child <msg> element of the response <msgQ> element. In addition, the EPP <resData> element MUST contain a child <org:panData> element. This element or its ancestor element MUST identify the organization namespace "urn:ietf:params:xml:ns:epp:org-1.0". The <org:panData> element contains the following child elements:

- o An <org:id> element that contains the server-unique identifier of the organization object. The <org:id> element contains a REQUIRED "paResult" attribute. A positive boolean value indicates that the request has been approved and completed. A negative boolean value indicates that the request has been denied and the requested action has not been taken.
- o An <org:paTRID> element that contains the client transaction identifier and server transaction identifier returned with the original response to process the command. The client transaction

identifier is OPTIONAL and will only be returned if the client provided an identifier with the original <create> command.

- o An <org:paDate> element that contains the date and time describing when review of the requested action was completed.

Example "review completed" service message:

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
S:  <response>
S:    <result code="1301">
S:      <msg lang="en">Command completed successfully;
S:        ack to dequeue</msg>
S:    </result>
S:    <msgQ count="5" id="12345">
S:      <qDate>1999-04-04T22:01:00.0Z</qDate>
S:      <msg>Pending action completed successfully.</msg>
S:    </msgQ>
S:    <resData>
S:      <org:panData
S:        xmlns:org="urn:ietf:params:xml:ns:epp:org-1.0">
S:        <org:id paResult="1">res1523</org:id>
S:        <org:paTRID>
S:          <clTRID>ABC-12345</clTRID>
S:          <svTRID>54321-XYZ</svTRID>
S:        </org:paTRID>
S:        <org:paDate>1999-04-04T22:00:00.0Z</org:paDate>
S:      </org:panData>
S:    </resData>
S:    <trID>
S:      <clTRID>BCD-23456</clTRID>
S:      <svTRID>65432-WXY</svTRID>
S:    </trID>
S:  </response>
S:</epp>
```

5. Formal Syntax

An EPP object mapping is specified in XML Schema notation. The formal syntax presented here 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:epp:org-1.0"
  xmlns:org="urn:ietf:params:xml:ns:epp:org-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:eppcom-1.0"/>
  <import namespace="urn:ietf:params:xml:ns:epp-1.0"/>

  <annotation>
    <documentation>
      Extensible Provisioning Protocol v1.0
      organization provisioning schema.
    </documentation>
  </annotation>

  <!--
  Child elements found in EPP commands.
  -->
  <element name="create" type="org:createType"/>
  <element name="delete" type="org:sIDType"/>
  <element name="update" type="org:updateType"/>
  <element name="check" type="org:mIDType"/>
  <element name="info" type="org:infoType"/>
  <element name="panData" type="org:panDataType"/>

  <!--
  Utility types.
  -->
  <simpleType name="statusType">
    <restriction base="token">
      <enumeration value="ok"/>
      <enumeration value="hold"/>
      <enumeration value="terminated"/>
      <enumeration value="clientDeleteProhibited"/>
      <enumeration value="clientUpdateProhibited"/>
      <enumeration value="clientLinkProhibited"/>
      <enumeration value="linked"/>
      <enumeration value="pendingCreate"/>
      <enumeration value="pendingUpdate"/>
      <enumeration value="pendingDelete"/>
    </restriction>
  </simpleType>
</schema>
```

```
        <enumeration value="serverDeleteProhibited"/>
        <enumeration value="serverUpdateProhibited"/>
        <enumeration value="serverLinkProhibited"/>
    </restriction>
</simpleType>

<simpleType name="roleStatusType">
    <restriction base="token">
        <enumeration value="ok"/>
        <enumeration value="clientLinkProhibited"/>
        <enumeration value="linked"/>
        <enumeration value="serverLinkProhibited"/>
    </restriction>
</simpleType>

<complexType name="roleType">
    <sequence>
        <element name="type" type="token"/>
        <element name="status" type="org:roleStatusType"
            minOccurs="0" maxOccurs="3"/>
        <element name="roleID" type="token" minOccurs="0"/>
    </sequence>
</complexType>

<complexType name="postalInfoType">
    <sequence>
        <element name="name"
            type="org:postalLineType"/>
        <element name="addr"
            type="org:addrType" minOccurs="0"/>
    </sequence>
    <attribute name="type"
        type="org:postalInfoEnumType"
        use="required"/>
</complexType>

<complexType name="contactType">
    <simpleContent>
        <extension base="eppcom:clIDType">
            <attribute name="type" type="org:contactAttrType"
                use="required"/>
            <attribute name="typeName" type="token"/>
        </extension>
    </simpleContent>
</complexType>

<simpleType name="contactAttrType">
    <restriction base="token">
```

```
        <enumeration value="admin"/>
        <enumeration value="billing"/>
        <enumeration value="tech"/>
        <enumeration value="abuse"/>
        <enumeration value="custom"/>
    </restriction>
</simpleType>

<complexType name="e164Type">
    <simpleContent>
        <extension base="org:e164StringType">
            <attribute name="x" type="token" />
        </extension>
    </simpleContent>
</complexType>

<simpleType name="e164StringType">
    <restriction base="token">
        <pattern value="(\+[0-9]{1,3}\.[0-9]{1,14})?" />
        <maxLength value="17" />
    </restriction>
</simpleType>

<simpleType name="postalLineType">
    <restriction base="normalizedString">
        <minLength value="1" />
        <maxLength value="255" />
    </restriction>
</simpleType>

<simpleType name="optPostalLineType">
    <restriction base="normalizedString">
        <maxLength value="255" />
    </restriction>
</simpleType>

<simpleType name="pcType">
    <restriction base="token">
        <maxLength value="16" />
    </restriction>
</simpleType>

<simpleType name="ccType">
    <restriction base="token">
        <length value="2" />
    </restriction>
</simpleType>
```

```
<complexType name="addrType">
  <sequence>
    <element name="street" type="org:optPostalLineType"
      minOccurs="0" maxOccurs="3" />
    <element name="city" type="org:postalLineType" />
    <element name="sp" type="org:optPostalLineType"
      minOccurs="0" />
    <element name="pc" type="org:pcType"
      minOccurs="0" />
    <element name="cc" type="org:ccType" />
  </sequence>
</complexType>

<simpleType name="postalInfoEnumType">
  <restriction base="token">
    <enumeration value="loc" />
    <enumeration value="int" />
  </restriction>
</simpleType>

<!--
Child element of commands that require only an identifier.
-->
<complexType name="sIDType">
  <sequence>
    <element name="id" type="eppcom:clIDType"/>
  </sequence>
</complexType>

<!--
Child element of commands that accept multiple identifiers.
-->
<complexType name="mIDType">
  <sequence>
    <element name="id"
      type="eppcom:clIDType" maxOccurs="unbounded"/>
  </sequence>
</complexType>

<!--
Pending action notification response elements.
-->
<complexType name="panDataType">
  <sequence>
    <element name="id" type="org:paCLIDType"/>
    <element name="paTRID" type="epp:trIDType"/>
    <element name="paDate" type="dateTime"/>
  </sequence>
```



```
</complexType>

<complexType name="paCLIDType">
  <simpleContent>
    <extension base="eppcom:clIDType">
      <attribute name="paResult" type="boolean"
        use="required"/>
    </extension>
  </simpleContent>
</complexType>

<!--
Child elements of the <info> commands.
-->
<complexType name="infoType">
  <sequence>
    <element name="id"
      type="eppcom:clIDType"/>
  </sequence>
</complexType>

<!--
Child elements of the <create> command.
-->
<complexType name="createType">
  <sequence>
    <element name="id"
      type="eppcom:clIDType"/>
    <element name="role"
      type="org:roleType" maxOccurs="unbounded"/>
    <element name="status"
      type="org:statusType" minOccurs="0" maxOccurs="4"/>
    <element name="parentId"
      type="eppcom:clIDType" minOccurs="0"/>
    <element name="postalInfo"
      type="org:postalInfoType" minOccurs="0" maxOccurs="2"/>
    <element name="voice"
      type="org:e164Type" minOccurs="0"/>
    <element name="fax"
      type="org:e164Type" minOccurs="0"/>
    <element name="email"
      type="eppcom:minTokenType" minOccurs="0"/>
    <element name="url"
      type="anyURI" minOccurs="0"/>
    <element name="contact"
      type="org:contactType"
      minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
```

```
</complexType>

<!--
Child elements of the <update> command.
-->
<complexType name="updateType">
  <sequence>
    <element name="id"
      type="eppcom:clIDType"/>
    <element name="add"
      type="org:addRemType" minOccurs="0"/>
    <element name="rem"
      type="org:addRemType" minOccurs="0"/>
    <element name="chg"
      type="org:chgType" minOccurs="0"/>
  </sequence>
</complexType>

<!--
Data elements that can be added or removed.
-->
<complexType name="addRemType">
  <sequence>
    <element name="contact"
      type="org:contactType" minOccurs="0" maxOccurs="unbounded"/>
    <element name="role" type="org:roleType"
      minOccurs="0" maxOccurs="unbounded"/>
    <element name="status" type="org:statusType"
      minOccurs="0" maxOccurs="9"/>
  </sequence>
</complexType>

<!--
Data elements that can be changed.
-->
<complexType name="chgType">
  <sequence>
    <element name="parentId"
      type="eppcom:clIDType" minOccurs="0"/>
    <element name="postalInfo"
      type="org:chgPostalInfoType"
      minOccurs="0" maxOccurs="2"/>
    <element name="voice"
      type="org:e164Type" minOccurs="0"/>
    <element name="fax"
      type="org:e164Type" minOccurs="0"/>
    <element name="email"
      type="eppcom:minTokenType" minOccurs="0"/>
  </sequence>
</complexType>
```

```
        <element name="url"
            type="anyURI" minOccurs="0"/>
    </sequence>
</complexType>

<complexType name="chgPostalInfoType">
    <sequence>
        <element name="name"
            type="org:postalLineType" minOccurs="0"/>
        <element name="addr"
            type="org:addrType" minOccurs="0"/>
    </sequence>
    <attribute name="type"
        type="org:postalInfoEnumType" use="required"/>
</complexType>

<!--
Child response elements.
-->
<element name="chkData" type="org:chkDataType"/>
<element name="creData" type="org:creDataType"/>
<element name="infData" type="org:infDataType"/>

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

<complexType name="checkType">
    <sequence>
        <element name="id" type="org:checkIDType" />
        <element name="reason" type="eppcom:reasonType"
            minOccurs="0" />
    </sequence>
</complexType>

<complexType name="checkIDType">
    <simpleContent>
        <extension base="eppcom:clIDType">
            <attribute name="avail" type="boolean"
                use="required" />
        </extension>
    </simpleContent>
</complexType>
```

```
</complexType>

<!--
<info> response elements.
-->
<complexType name="infDataType">
  <sequence>
    <element name="id"
      type="eppcom:clIDType"/>
    <element name="roid"
      type="eppcom:roidType"/>
    <element name="role"
      type="org:roleType" maxOccurs="unbounded"/>
    <element name="status"
      type="org:statusType" maxOccurs="9"/>
    <element name="parentId"
      type="eppcom:clIDType" minOccurs="0"/>
    <element name="postalInfo"
      type="org:postalInfoType" minOccurs="0" maxOccurs="2"/>
    <element name="voice"
      type="org:e164Type" minOccurs="0"/>
    <element name="fax"
      type="org:e164Type" minOccurs="0"/>
    <element name="email"
      type="eppcom:minTokenType" minOccurs="0"/>
    <element name="url"
      type="anyURI" minOccurs="0"/>
    <element name="contact"
      type="org:contactType" minOccurs="0" maxOccurs="unbounded"/>
    <element name="clID"
      type="eppcom:clIDType" minOccurs="0"/>
    <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"/>
  </sequence>
</complexType>

<!--
<create> response elements.
-->
<complexType name="creDataType">
  <sequence>
    <element name="id" type="eppcom:clIDType" />
    <element name="crDate" type="dateTime" />
  </sequence>
</complexType>
```

```
        </sequence>
      </complexType>

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

6. Internationalization Considerations

EPP is represented in XML, which provides native support for encoding information using the Unicode character set and its more compact representations including UTF-8. Conformant XML processors recognize both UTF-8 [RFC3629] and UTF-16 [RFC2781]. Though XML includes provisions to identify and use other character encodings through use of an "encoding" attribute in an <?xml?> declaration, use of UTF-8 is RECOMMENDED.

As an extension of the EPP organization object mapping, the elements and element content described in this document MUST inherit the internationalization conventions used to represent higher-layer domain and core protocol structures present in an XML instance that includes this extension.

7. IANA Considerations

7.1. XML Namespace

This document uses URNs to describe XML namespaces and XML schemas conforming to a registry mechanism described in [RFC3688]. IANA is requested to assign the following URI.

Registration request for the organization namespace:

URI: urn:ietf:params:xml:ns:epp:org-1.0

Registrant Contact: IESG

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

Registration request for the organization XML schema:

URI: urn:ietf:params:xml:schema:epp:org-1.0

Registrant Contact: IESG

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

7.2. EPP Extension Registry

The EPP extension described in this document should be registered by the IANA in the EPP Extension Registry described in [RFC7451]. The details of the registration are as follows:

Name of Extension: Extensible Provisioning Protocol (EPP)
Organization Mapping

Document status: Standards Track

Reference: RFCXXXX (please replace "XXXX" with the RFC number for this document after a number is assigned by the RFC Editor)

Registrant Name and Email Address: IESG, iesg@ietf.org

TLDs: Any

IPR Disclosure: None

Status: Active

Notes: None

7.3. Role Type Values Registry

IANA has created a new category of protocol registry for values of the organization roles. The name of this registry is "EPP Organization Role Values". The registration policy for this registry is "Expert Review" [RFC8126].

7.3.1. Registration Template

Value: the string value being registered.

Description: Brief description of the organization role values.

Registrant Name: For IETF RFCs, state "IESG". For others, give the name of the responsible party.

Registrant Contact Information: an email address, postal address, or some other information to be used to contact the registrant.

7.3.2. Initial Registry Contents

Followings are the initial registry contents:

Value: registrar

Description: The entity object instance represents the authority responsible for the registration in the registry.

Registrant Name: IESG

Registrant Contact Information: iesg@ietf.org

Value: reseller

Description: The entity object instance represents a third party through which the registration was conducted (i.e., not the registry or registrar).

Registrant Name: IESG

Registrant Contact Information: iesg@ietf.org

Value: privacyproxy

Description: The entity object instance represents a third-party who could help to register a domain without exposing the registrants' private information.

Registrant Name: IESG

Registrant Contact Information: iesg@ietf.org

Value: dns-operator

Description: The entity object instance represents a third-party DNS operator that maintains the name servers and zone data on behalf of a registrant.

Registrant Name: IESG

Registrant Contact Information: iesg@ietf.org

8. Implementation Status

Note to RFC Editor: Please remove this section and the reference to [RFC7942] before publication. This section records the status of known implementations of the protocol defined by this specification at the time of posting of this Internet-Draft, and is based on a proposal described in [RFC7942]. The description of implementations in this section is intended to assist the IETF in its decision processes in progressing drafts to RFCs. Please note that the listing of any individual implementation here does not imply endorsement by the IETF. Furthermore, no effort has been spent to

verify the information presented here that was supplied by IETF contributors. This is not intended as, and must not be construed to be, a catalog of available implementations or their features. Readers are advised to note that other implementations may exist.

According to [RFC7942], "this will allow reviewers and working groups to assign due consideration to documents that have the benefit of running code, which may serve as evidence of valuable experimentation and feedback that have made the implemented protocols more mature. It is up to the individual working groups to use this information as they see fit".

8.1. Verisign EPP SDK

Organization: Verisign Inc.

Name: Verisign EPP SDK

Description: The Verisign EPP SDK includes both a full client implementation and a full server stub implementation of draft-ietf-regext-org.

Level of maturity: Development

Coverage: All aspects of the protocol are implemented.

Licensing: GNU Lesser General Public License

Contact: jgould@verisign.com

URL: https://www.verisign.com/en_US/channel-resources/domain-registry-products/epp-sdks

8.2. CNNIC Implementation

Organization: CNNIC

Name: EPP Organization Mapping

Description: CNNIC is trying to update EPP organization mapping from previous reseller mapping according to this document.

Level of maturity: Development

Coverage: EPP organization mapping

Contact: zhouguiqing@cnnic.cn

9. Security Considerations

The organization object may have personally identifiable information, such as <org:contact>. This information is not a required element in this document which can be provided on a voluntary basis. If it is provided, both client and server MUST ensure that authorization information is stored and exchanged with high-grade encryption mechanisms to provide privacy services, which is specified in [RFC5733]. The security considerations described in [RFC5730] or those caused by the protocol layers used by EPP will apply to this specification as well.

10. Acknowledgment

The authors would like to thank Rik Ribbers, Marc Groeneweg, Patrick Mevzek, Antoin Verschuren and Scott Hollenbeck for their careful review and valuable comments.

11. References

11.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC3629] Yergeau, F., "UTF-8, a transformation format of ISO 10646", STD 63, RFC 3629, DOI 10.17487/RFC3629, November 2003, <<https://www.rfc-editor.org/info/rfc3629>>.
- [RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.
- [RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, DOI 10.17487/RFC3986, January 2005, <<https://www.rfc-editor.org/info/rfc3986>>.
- [RFC5646] Phillips, A., Ed. and M. Davis, Ed., "Tags for Identifying Languages", BCP 47, RFC 5646, DOI 10.17487/RFC5646, September 2009, <<https://www.rfc-editor.org/info/rfc5646>>.
- [RFC5730] Hollenbeck, S., "Extensible Provisioning Protocol (EPP)", STD 69, RFC 5730, DOI 10.17487/RFC5730, August 2009, <<https://www.rfc-editor.org/info/rfc5730>>.

- [RFC5733] Hollenbeck, S., "Extensible Provisioning Protocol (EPP) Contact Mapping", STD 69, RFC 5733, DOI 10.17487/RFC5733, August 2009, <<https://www.rfc-editor.org/info/rfc5733>>.
- [RFC7942] Sheffer, Y. and A. Farrel, "Improving Awareness of Running Code: The Implementation Status Section", BCP 205, RFC 7942, DOI 10.17487/RFC7942, July 2016, <<https://www.rfc-editor.org/info/rfc7942>>.
- [RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <<https://www.rfc-editor.org/info/rfc8126>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [W3C.REC-xml-20040204]
Bray, T., Paoli, J., Sperberg-McQueen, C., Maler, E., and F. Yergeau, "Extensible Markup Language (XML) 1.0 (Third Edition)", World Wide Web Consortium First Edition REC-xml-20040204, February 2004, <<http://www.w3.org/TR/2004/REC-xml-20040204>>.
- [W3C.REC-xmlschema-1-20041028]
Thompson, H., Beech, D., Maloney, M., and N. Mendelsohn, "XML Schema Part 1: Structures Second Edition", World Wide Web Consortium Recommendation REC-xmlschema-1-20041028, October 2004, <<http://www.w3.org/TR/2004/REC-xmlschema-1-20041028>>.
- [W3C.REC-xmlschema-2-20041028]
Biron, P. and A. Malhotra, "XML Schema Part 2: Datatypes Second Edition", World Wide Web Consortium Recommendation REC-xmlschema-2-20041028, October 2004, <<http://www.w3.org/TR/2004/REC-xmlschema-2-20041028>>.

11.2. Informative References

- [RFC2781] Hoffman, P. and F. Yergeau, "UTF-16, an encoding of ISO 10646", RFC 2781, DOI 10.17487/RFC2781, February 2000, <<https://www.rfc-editor.org/info/rfc2781>>.
- [RFC7451] Hollenbeck, S., "Extension Registry for the Extensible Provisioning Protocol", RFC 7451, DOI 10.17487/RFC7451, February 2015, <<https://www.rfc-editor.org/info/rfc7451>>.

Appendix A. Change Log

Initial -00: Individual document submitted.

-01:

- * Updated abstract text.
- * Added sentences to avoid loop of parent identifiers in section 3.4.
- * Revised typos in section 3.6.
- * Added explanation of contact type attribute in section 4.1.2.
- * Updated <info> responses.
- * Deleted description of <transfer> command in section 4.1 and 4.2.
- * Deleted whoisInfo disclose type in XML schema.
- * Deleted maxOccurs of addRemType.
- * Deleted extra "OPTIONAL" in section 4.2.5.
- * Updated typos in <update> response.

-02:

- * Changed author information.
- * Updated url definition.
- * Updated XML schema.

-03:

- * Changed author information.
- * Updated section 3.1.
- * Refactoried the XSD file. Added <chgPostalInfoType> element.
- * Added acknowledgment.

WG document-00: WG document submitted

WG document-01: Keep document alive for further discussion.
Reseller object or entity object with multiple roles?

Organization WG document-00: Change to a generic organization object mapping.

Organization WG document-01: Added "Implementation Status" section.

Organization WG document-02: Accepted some of the feedbacks on the mailing list.

Organization WG document-03:

- * Updated section 3.2, changed the structure of organization role.
- * Updated section 4.2.5 for the "add", "rem" and "chg" example.
- * Updated section 5 of formal syntax.
- * Updated section 7.2 for the registration template and initial values.
- * Updated section 8 of implementation status.

Organization WG document-04:

- * Updated section 3.2, changed the structure of organization role.
- * Updated references.
- * Updated section 8 of implementation status.

Organization WG document-05:

- * Updated the description of <org:status> of a role.
- * Removed the third paragraph of "Implementation Status".
- * Remove the Informative Reference to draft-ietf-regext-reseller from the draft.

Organization WG document-06:

- * Updated typos.
- * Added "Query" for "<Transfer> Query Command".

- * Change "Registrant Contact" to IESG in section 7.1.
- * Modified section 7.2.

Organization WG document-07:

- * Updated typos.
- * Added dns-operator in section 7.1.
- * Added "OPTIONAL" for <org:addr>

Organization WG document-08:

- * Updated "Offline Review of Requested Actions".

Organization WG document-09:

- * Updated "This element or its ancestor element MUST identify the organization namespace." in section 4.1.1 and other parts of this document.
- * Updated text in section 2 match RFC 8174.
- * Modified "roleid" to "roleID".
- * Updated text about loops in section 3.6.
- * Referred section 2.5 of RFC5733 for voice format.
- * Updated XML schema for the maxOccurs value of "reason" element.
- * Updated section 7.3.
- * Replaced "http" with "https" in the examples.
- * Updated writing typos.
- * Modified XML namespace and schema.

Organization WG document-10:

- * Modified XML namespace and schema.
- * Removed the maxOccurs value of "reason" element.

Organization WG document-11:

- * Typo of RFC2781 and moved this reference in "Informative References".
- * "Loops MUST be prohibited." in section 3.6.

Organization WG document-12:

- * Removed "OPTIONAL" when "zero or more" or "zero to two" appears.
- * Updated the "Organization Status Values" text.
- * Updated the full xml namespace.
- * Updated the text in "Offline review".
- * Updated the text in "Security Considerations".
- * Added "Document satus" and "Reference" in section "EPP Extension Registry".
- * Added references of RFC3688, RFC3986 and RFC5646.

Authors' Addresses

Linlin Zhou
CNNIC
4 South 4th Street, Zhongguancun, Haidian District
Beijing, Beijing 100190
China

Email: zhoulinlin@cnnic.cn

Ning Kong
Consultant

Email: ietfing@gmail.com

Guiqing Zhou
CNNIC
4 South 4th Street, Zhongguancun, Haidian District
Beijing, Beijing 100190
China

Email: zhouguiqing@cnnic.cn

Jiankang Yao
CNNIC
4 South 4th Street, Zhongguancun, Haidian District
Beijing, Beijing 100190
China

Email: yaojk@cnnic.cn

James Gould
Verisign, Inc.
12061 Bluemont Way
Reston, VA 20190
US

Email: jgould@verisign.com