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Internationalized Domain Name Mapping Extension for the Extensible
Provisioning Protocol (EPP)
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Abstract

This document describes an Extensible Provisioning Protocol (EPP) extension mapping for the provisioning of Internationalized Domain Names (IDN) stored in a shared central repository. Specified in XML, this mapping extends the EPP domain name mapping to provide additional features required to implement registrations of domain names in characters sets other than ASCII.

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1. Introduction

The EPP protocol, provides a complete description of EPP command and response structures. A thorough understanding of the base protocol specification is necessary to understand the mapping described in is document.

This document is being written in consideration with the Guidelines for Extending the Extensible Provisioning Protocol as defined in [RFC3735].

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 [RFC2119].

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

"idn-epp-extension-1.0" is used as an abbreviation for "urn:ietf:params:xml:ns:idn-epp-extension-1.0".

The tag name "idn" is used to reference the "idn-epp-extension-1.0" namespace. Applications are expected implement parsers and writers that are capable of identifying elements by its namespaces without relying on this name tag.

3. Object Attributes

The purpose of this extension, is to add additional data elements to the EPP Domain mapping, to allow for association of a domain name to a language tag.

This extension only adds one additional element to the EPP Domain Mapping, however, the extension itself can be extended to incorporate more, as required and mandated by registry policy.

3.1. Language Tag

3.1.1. Rationale

To comply with the Guidelines for the Implementation of Internationalized Domain Names [1], it is required to associate each label to be registered with a single script, as defined by the code division of the Unicode code chart.

This requirement imposes a challenge for registries using the EPP protocol, since there is no such field currently in the domain mapping to allow for this information to be exchanged.

4. EPP Command Mapping

A detailed description of the EPP syntax and semantics can be found in the [RFC5730].

4.1. EPP Query Commands

EPP provides four query commands:

- o EPP <check>: To determine if an object can be provisioned within the repository.
- o EPP <info>: To retrieve information associated with a particular object.
- o EPP <poll>: To discover and retrieve service messages queued by a server for individual clients.
- o EPP <transfer> query: allows a client to determine real-time status of pending and completed transfer requests.

4.1.1. EPP <check> Command

This extension does not add any elements to the EPP <check> command or <check> response.

4.1.2. EPP <info> Command

This extension does not add any elements to the EPP <info> command.

On the <info> response, the extension MUST contain the <idn:language> element if the extension was requested during the session <login> command.

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:       <domain:info
C:         xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
C:           <domain:name hosts="all">example.com</domain:name>
C:           <domain:authInfo>
C:             <domain:pw>2fooBAR</domain:pw>
C:           </domain:authInfo>
C:         </domain:info>
C:       </info>
C:     <clTRID>ABC-12345</clTRID>
C:   </command>
C: </epp>
```

Example <info> response for an authorized client:

```
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>Command completed successfully</msg>
S:    </result>
S:    <resData>
S:      <domain:infData
S:        xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
S:        <domain:name>example.com</domain:name>
S:        <domain:roid>EXAMPLE1-REP</domain:roid>
S:        <domain:status s="ok"/>
S:        <domain:registrant>jd1234</domain:registrant>
S:        <domain:contact type="admin">sh8013</domain:contact>
S:        <domain:contact type="tech">sh8013</domain:contact>
S:        <domain:ns>
S:          <domain:hostObj>ns1.example.com</domain:hostObj>
S:          <domain:hostObj>ns1.example.net</domain:hostObj>
S:        </domain:ns>
S:        <domain:host>ns1.example.com</domain:host>
S:        <domain:host>ns2.example.com</domain:host>
S:        <domain:clID>ClientX</domain:clID>
S:        <domain:crID>ClientY</domain:crID>
S:        <domain:crDate>1999-04-03T22:00:00.0Z</domain:crDate>
S:        <domain:upID>ClientX</domain:upID>
S:        <domain:upDate>1999-12-03T09:00:00.0Z</domain:upDate>
S:        <domain:exDate>2005-04-03T22:00:00.0Z</domain:exDate>
S:        <domain:trDate>2000-04-08T09:00:00.0Z</domain:trDate>
S:        <domain:authInfo>
S:          <domain:pw>2fooBAR</domain:pw>
S:        </domain:authInfo>
S:      </domain:infData>
S:    </resData>
S:    <extension>
S:      <idn:language
S:        xmlns:idn="urn:ietf:params:xml:ns:idn-epp-extension-1.0">en
S:      </idn:language>
S:    </extension>
S:  </extension>
S:  <trID>
S:    <clTRID>ABC-12345</clTRID>
S:    <svTRID>54322-XYZ</svTRID>
S:  </trID>
S: </response>
S:</epp>
```


4.1.3. EPP <poll> Command

This extension does not add any elements to the EPP <poll> command or <poll> response.

4.1.4. EPP <transfer> Command

This extension does not add any elements to the EPP <transfer> command or <transfer> response.

4.2. EPP Transform Commands

EPP provides five transform commands:

- o EPP <create>: To create an instance of an object.
- o EPP <delete>: To remove an object from the repository.
- o EPP <renew>: To extend the validity period of an object.
- o EPP <transfer>: To manage sponsorship changes.
- o EPP <update> query: To change the information associated with an object.

4.2.1. EPP <create> Command

This extension defines additional elements for the EPP <create> command.

The command MUST contain an <extension> element, which MUST contain a child <idn:language> element

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:     <domain:create
C:       xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
C:       <domain:name>example.com</domain:name>
C:       <domain:period unit="y">2</domain:period>
C:       <domain:ns>
C:         <domain:hostObj>ns1.example.net</domain:hostObj>
C:         <domain:hostObj>ns2.example.net</domain:hostObj>
C:       </domain:ns>
C:       <domain:registrant>jd1234</domain:registrant>
C:       <domain:contact type="admin">sh8013</domain:contact>
C:       <domain:contact type="tech">sh8013</domain:contact>
C:       <domain:authInfo>
C:         <domain:pw>2fooBAR</domain:pw>
C:       </domain:authInfo>
C:     </domain:create>
C:   </create>
C:   <extension>
C:     <idn:language
C:       xmlns:idn="urn:ietf:params:xml:ns:idn-epp-extension-1.0">en
C:     </idn:language>
C:   </extension>
C:   <clTRID>123456</clTRID>
C: </command>
C:</epp>
```

4.2.2. EPP <delete> Command

This extension does not add any elements to the EPP <delete> command or <delete> response.

4.2.3. EPP <renew> Command

This extension does not add any elements to the EPP <renew> command or <renew> response.

4.2.4. EPP <transfer> Command

This extension does not add any elements to the EPP <transfer> command or <transfer> response.

4.3. 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.

```
<?xml version="1.0" encoding="UTF-8"?>
<schema targetNamespace="urn:ietf:params:xml:ns:domain-1.0"
  xmlns:idn="urn:ietf:params:xml:ns:domain-1.0"
  xmlns="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified">
  <annotation>
    <documentation>
      Extensible Provisioning Protocol v1.0 domain name extension
      schema for IDN Lang Tag.
    </documentation>
  </annotation>
  <!-- Child elements found in EPP commands.-->
  <element name="language" type="language"/>
  <!-- End of schema. -->
</schema>
```

5. Security Considerations

The mapping extensions described in this document do not provide any security services beyond those described by EPP [RFC5730] the EPP domain name mapping [RFC5731], and protocol layers used by EPP. The security considerations described in these other specifications apply to this specification as well.

6. References

6.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC5730] Hollenbeck, S., "Extensible Provisioning Protocol (EPP)", STD 69, RFC 5730, August 2009.

6.2. Informational References

- [RFC3735] Hollenbeck, S., "Guidelines for Extending the Extensible Provisioning Protocol (EPP)", RFC 3735, March 2004.
- [RFC5731] Hollenbeck, S., "Extensible Provisioning Protocol (EPP) Domain Name Mapping", STD 69, RFC 5731, August 2009.

URIs

- [1] <<http://www.icann.org/en/topics/idn/idn-guidelines-26apr07.pdf>>

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