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J. Yao
L. Zhou
H. Li
CNNIC
N. Kong
Consultant
J. Xie
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Extensible Provisioning Protocol (EPP) Domain Name Mapping Extension for Strict Bundling Registration

Abstract

This document describes an extension of Extensible Provisioning Protocol (EPP) domain name mapping for the provisioning and management of strict bundling registration of domain names. Specified in XML, this mapping extends the EPP domain name mapping to provide additional features required for the provisioning of bundled domain names. This is a nonstandard proprietary extension.

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1. Introduction

In RFC 4290 [RFC4290], the "variant(s)" are character(s) and/or string(s) that are treated as equivalent to the base character. In this document, variants are those strings that are treated as equivalent to each other according to the domain name registration policy. Bundled domain names are those that share the same Top-Level Domain (TLD) but whose second-level labels are variants or those that have identical second-level labels for which certain parameters are shared in different TLDs. For example, the Public Interest Registry has requested to implement bundling of second-level domains for .NGO and .ONG. So we have two kinds of bundled domain names. The first one is in the form of "V-label.TLD", in which the second-level label (V-label) is a variant sharing the same TLD. The second one is in the form of "LABEL.V-tld", in which the second-level label (LABEL) remains the same but ends with a different TLD (V-tld) and these different V-tlds are managed by the same entity.

Bundled domain names normally share some attributes. Policy-wise bundling can be implemented in three ways. The first one is strict bundling, which requires all bundled names to share many of the same attributes. When creating, updating, or transferring any of the bundled domain names, all bundled domain names will be created, updated, or transferred atomically. The second one is partial bundling, which requires the bundled domain names to be registered by the same registrant. The third one is relaxed bundling, which has no specific requirements on the domain registration. This document mainly addresses the strict bundling name registration.

For the name variants, different registries have different policies. Some registries adopt the policy that variant Internationalized Domain Names (IDNs) should be blocked. But some registries adopt the policy that variant IDNs that are identified as equivalent are allocated or delegated to the same registrant. For example, most registries offering a Chinese Domain Name (CDN) adopt a registration policy whereby a registrant can apply for an original CDN in any form: Simplified Chinese (SC) form, Traditional Chinese (TC) form, or other variant forms. The corresponding variant CDN in SC form and in TC form will also be delegated to the same registrant. All variant names in the same TLD share a common set of attributes. This document mainly discusses the situation in which variant IDNs that are identified as equivalent are allocated or delegated to the same registrant.

The basic Extensible Provisioning Protocol (EPP) domain name mapping [RFC5731] provides the facility for single domain name registration. It does not specify how to register the strict bundled names that share many of the attributes.

In order to meet the above requirements of strict bundled name registration, this document describes an extension of the EPP domain name mapping [RFC5731] for the provisioning and management of bundled names. This document describes a nonstandard proprietary extension. This extension is especially useful for registries performing Chinese

Domain Name registration. This method is also useful for other language domain names that have similar issues with Chinese Domain Names. This document is specified using Extensible Markup Language (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].

The EPP core protocol specification [RFC5730] provides a complete description of EPP command and response structures. A thorough understanding of the base protocol specification is necessary to understand the extension mapping described in this document.

This document uses many IDN concepts, so a thorough understanding of the IDNs for Application (IDNA, described in [RFC5890], [RFC5891], and [RFC5892]) and the variant approach discussed in [RFC4290] is assumed.

2. Terminology

Variants in this document are those strings that are treated as equivalent to each other according to the domain name registration policy for certain TLDs.

Bundled domain names are bundled together according to the domain name registration policy. For example, many Chinese Domain Name registries follow the principle described in RFC 3743 [RFC3743]. Bundled domain names should belong to the same owner. If bundled domain names are under different TLDs, those TLDs should be managed by the same entity.

The terms "registered domain name" (RDN) and "bundled domain name" (BDN) are used in this document. RDN represents the valid domain name that registrants submitted for the initial registration. BDN represents the bundled domain name produced according to the bundled domain name registration policy. In current practice, the number of BDNs is usually kept at one according to the registration policy set by the registry. Both the RDN and BDN specified in this document will be registered via EPP. All other domain names related to the RDN will be blocked.

The "uLabel" attribute in this document is used to express the U-label of an Internationalized Domain Name as a series of characters where non-ASCII characters will be represented in the format of "&#xXXXX;" where XXXX is a Unicode point by using the XML escaping mechanism. The U-label is defined in [RFC5890]. This document chooses this format of literal HTML ampersand codes, not the expected Unicode character codes. Unicode characters may not be displayed correctly in some text file readers, while HTML numeric character references are easy for HTML processors. The implementation following this document should use Unicode characters directly.

This document uses the prefix "b-dn" for the namespace "urn:ietf:params:xml:ns:epp:b-dn" throughout. Implementations cannot assume that any particular prefix is used and must employ a namespace-aware XML parser and serializer to interpret and output the XML documents.

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

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

3. Overview

Domain registries have usually adopted a registration model whereby metadata relating to a domain name, such as its expiration date and

sponsoring registrar, are stored as properties of the domain object. The domain object is then considered an atomic unit of registration on which operations such as update, renewal, and deletion may be performed.

Bundled names brought about the need for multiple domain names to be registered and managed as a single package. In this model, the registry typically accepts a domain registration request (i.e., EPP domain <create> command) containing the domain name to be registered. This domain name is referred to as the RDN in this document. As part of the processing of the registration request, the registry generates a set of bundled names that are related to the RDN, either programmatically or with the guidance of registration policies, and places them in the registration package together with the RDN.

The bundled names share many properties, such as expiration date and sponsoring registrar, by sharing the same domain object. So when registrants update any property of a domain object within a bundle package, that property will be updated at the same time for all other domain objects in the bundle package.

4. Requirement for Bundling Registration of Names

The bundled names, whether they are in the form of "V-label.TLD" or "LABEL.V-tld", should share some parameters or attributes associated with domain names. Typically, bundled names will share the following parameters or attributes:

- * Registrar ownership
- * Registration and expiry dates
- * Registrant, admin, billing, and technical contacts
- * Name server association
- * Domain status
- * Applicable grace periods (add grace period, renew grace period, auto-renew grace period, transfer grace period, and redemption grace period) [RFC3915]

Because the domain names are bundled and share the same parameters or attributes, the EPP command should do some processing for these requirements:

- * When performing a domain <check> command, either the BDN or RDN can be queried with the EPP command and will return the same response.
- * When performing a domain <info> command, either the BDN or RDN can be queried, and the same response will include both BDN and RDN information with the same attributes.
- * When performing a domain <create> command, if the domain name is available, both the BDN and RDN will be registered.
- * When performing a domain <delete> command, either the BDN or RDN will be accepted. If the domain name is registered, both the BDN and RDN will be deleted.
- * When performing a domain <renew> command, either the BDN or RDN will be accepted. Upon a successful domain renewal, both the BDN and RDN will have their expiry date extended by the requested term. Upon a successful domain renewal, both the BDN and RDN will conform to the same renew grace period.
- * When performing a domain <transfer> command, either the BDN or RDN will be accepted. Upon successful completion of a domain transfer request, both the BDN and RDN will enter a pendingTransfer status. Upon approval of the transfer request, both the BDN and RDN will

be owned and managed by the same new registrant.

- * When performing a domain <update> command, either the BDN or RDN will be accepted. Any modifications to contact associations, name server associations, domain status values, and authorization information will be applied to both the BDN and RDN.

5. Object Attributes

This extension defines the following additional elements to the EPP domain name mapping [RFC5731]. All of these additional elements are returned from the <domain:info> command.

5.1. RDN

The RDN is an ASCII name or an IDN with the A-label [RFC5890] form. In this document, its corresponding element is <b-dn:rdn>. An optional attribute "uLabel" associated with <b-dn:rdn> is used to represent the U-label [RFC5890] form.

For example:

```
<b-dn:rdn uLabel="&#x5B9E;&#x4F8B;.example"> xn--  
    fsq270a.example</b-dn:rdn>
```

5.2. BDN

The BDN is an ASCII name or an IDN with the A-label [RFC5890] form that is converted from the corresponding BDN. In this document, its corresponding element is <b-dn:bdn>. An optional attribute "uLabel" associated with <b-dn:bdn> is used to represent the U-label [RFC5890] form.

For example:

```
<b-dn:bdn uLabel="&#x5BE6;&#x4F8B;.example"> xn--  
    fsqz41a.example</b-dn:bdn>
```

6. 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 bundled names via EPP.

6.1. EPP Query Commands

EPP provides three commands to retrieve domain information: <check> to determine if a domain object can be provisioned within a repository, <info> to retrieve detailed information associated with a domain object, and <transfer> to retrieve domain-object transfer status information.

6.1.1. EPP <check> Command

This extension does not add any element to the EPP <check> command or <check> response described in the EPP domain name mapping [RFC5731]. However, when either the RDN or BDN is sent for a check, the response should contain both RDN and BDN information, which may also give some explanation in the reason field to tell the registrant that the associated domain name is a produced name according to some bundle domain name policy.

```
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:chkData
```

```

S:      xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
S:      <domain:cd>
S:      <domain:name avail="1">
S:      xn--fsq270a.example</domain:name>
S:      </domain:cd>
S:      <domain:cd>
S:      <domain:name avail="1">
S:      xn--fsqz41a.example
S:      </domain:name>
S:      <domain:reason>This associated domain name is
S:      a produced name based on bundle name policy.
S:      </domain:reason>
S:      </domain:cd>
S:      </domain:chkData>
S:      </resData>
S:      <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54322-XYZ</svTRID>
S:      </trID>
S:      </response>
S: </epp>

```

Figure 1: Example <check> Response

6.1.2. EPP <info> Command

This extension does not add any element to the EPP <info> command described in the EPP domain mapping [RFC5731]. However, additional elements are defined for the <info> response.

When an <info> command has been processed successfully, the EPP <resData> element must contain child elements as described in the EPP domain mapping [RFC5731]. In addition, unless some registration policy has some special processing, the EPP <extension> element should contain a child <b-dn:infData> element that identifies the extension namespace if the domain object has data associated with this extension and based on its registration policy. The <b-dn:infData> element contains the <b-dn:bundle>, which has the following child elements:

- * A <b-dn:rdn> element that contains the RDN, along with the attribute described below.
- * An optional <b-dn:bdn> element that contains the BDN, along with the attribute described below.

The above elements contain the following attribute:

- * An optional "uLabel" attribute represents the U-label of the element.

```

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>xn--fsq270a.example</domain:name>
S:         <domain:roid>58812678-domain</domain:roid>
S:         <domain:status s="ok"/>
S:         <domain:registrant>123</domain:registrant>
S:         <domain:contact type="admin">123</domain:contact>
S:         <domain:contact type="tech">123</domain:contact>
S:         <domain:ns>
S:           <domain:hostObj>ns1.example.cn
S:         </domain:hostObj>
S:         </domain:ns>
S:         <domain:clID>ClientX</domain:clID>

```

```

S:      <domain:crID>ClientY</domain:crID>
S:      <domain:crDate>2019-04-03T22:00:00.0Z
S:      </domain:crDate>
S:      <domain:exDate>2022-04-03T22:00:00.0Z
S:      </domain:exDate>
S:      <domain:authInfo>
S:      <domain:pw>2fooBAR</domain:pw>
S:      </domain:authInfo>
S:      </domain:infData>
S:    </resData>
S:    <extension>
S:      <b-dn:infData
S:        xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn">
S:        <b-dn:bundle>
S:          <b-dn:rdn uLabel="#x5B9E;#x4F8B;.example">
S:            xn--fsq270a.example
S:          </b-dn:rdn>
S:          <b-dn:bdn uLabel="#x5BE6;#x4F8B;.example">
S:            xn--fsq41a.example
S:          </b-dn:bdn>
S:        </b-dn:bundle>
S:      </b-dn:infData>
S:    </extension>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54322-XYZ</svTRID>
S:    </trID>
S:  </response>
S:</epp>

```

Figure 2: Example <info> Response for an Authorized Client

The <info> response for the unauthorized client has not been changed, see [RFC5731] for details.

An EPP error response must be returned if an <info> command cannot be processed for any reason.

6.1.3. EPP <transfer> Query Command

This extension does not add any element to the EPP <transfer> command or <transfer> response described in the EPP domain mapping [RFC5731].

6.2. EPP Transform Commands

EPP provides five commands to transform domain objects: <create> to create an instance of a domain object, <delete> to delete an instance of a domain object, <renew> to extend the validity period of a domain object, <transfer> to manage domain object sponsorship changes, and <update> to change information associated with a domain object.

When these commands have been processed successfully, the EPP <resData> element must contain child elements as described in the EPP domain mapping [RFC5731]. Unless some registration policy has some special processing, this EPP <extension> element should contain the <b-dn:bundle>, which has the following child elements:

- * A <b-dn:rdn> element that contains the RDN, along with the attribute described below.
- * An optional <b-dn:bdn> element that contains the BDN, along with the attribute described below.

The above elements contain the following attribute:

- * An optional "uLabel" attribute represents the U-label of the element.

6.2.1. EPP <create> Command

This extension defines additional elements to extend the EPP <create>

command described in the EPP domain name mapping [RFC5731] for bundled names registration.

In addition to the EPP command elements described in the EPP domain mapping [RFC5731], the <create> command shall contain an <extension> element. Unless some registration policy has some special processing, the <extension> element should contain a child <b-dn:create> element that identifies the bundle namespace and a child <b-dn:rdn> element that identifies the U-label form of the registered domain name with the "uLabel" attribute. The U-label is used for easy reading by the registrants and easy debugging by the registrars and the registries.

```
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>xn--fsq270a.example</domain:name>
C:        <domain:period unit="y">2</domain:period>
C:        <domain:registrant>123</domain:registrant>
C:        <domain:contact type="admin">123</domain:contact>
C:        <domain:contact type="tech">123</domain:contact>
C:        <domain:authInfo>
C:          <domain:pw>2fooBAR</domain:pw>
C:        </domain:authInfo>
C:      </domain:create>
C:    </create>
C:    <extension>
C:      <b-dn:create
C:        xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn">
C:        <b-dn:rdn uLabel="&#x5B9E;&#x4F8B;.example">
C:          xn--fsq270a.example
C:        </b-dn:rdn>
C:      </b-dn:create>
C:    </extension>
C:    <clTRID>ABC-12345</clTRID>
C:  </command>
C:</epp>
```

Figure 3: Example <create> Command

When a <create> command has been processed successfully, the EPP <creData> element must contain child elements as described in the EPP domain mapping [RFC5731]. In addition, unless some registration policy has some special processing, the EPP <extension> element should contain a child <b-dn:creData> element that identifies the extension namespace if the domain object has data associated with this extension and based on its registration policy. The <b-dn:creData> element contains the <b-dn:bundle> element.

```
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:creData
S:        xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
S:        <domain:name>xn--fsq270a.example</domain:name>
S:        <domain:crDate>2019-04-03T22:00:00.0Z</domain:crDate>
S:        <domain:exDate>2021-04-03T22:00:00.0Z</domain:exDate>
S:      </domain:creData>
S:    </resData>
S:    <extension>
S:      <b-dn:creData
S:        xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn">
S:        <b-dn:bundle>
S:          <b-dn:rdn uLabel="&#x5B9E;&#x4F8B;.example">
```

```

S:         xn--fsq270a.example
S:         </b-dn:rdn>
S:         <b-dn:bdn uLabel="&#x5BE6;&#x4F8B;.example" >
S:         xn--fsqz41a.example
S:         </b-dn:bdn>
S:         </b-dn:bundle>
S:         </b-dn:creData>
S:         </extension>
S:         <trID>
S:         <clTRID>ABC-12345</clTRID>
S:         <svTRID>54322-XYZ</svTRID>
S:         </trID>
S: </response>
S:</epp>

```

Figure 4: Example <create> Response

An EPP error response must be returned if a <create> command cannot be processed for any reason.

6.2.2. EPP <delete> Command

This extension does not add any element to the EPP <delete> command described in the EPP domain mapping [RFC5731]. However, additional elements are defined for the <delete> response.

When a <delete> command has been processed successfully, the EPP <delData> element must contain child elements as described in the EPP domain mapping [RFC5731]. In addition, unless some registration policy has some special processing, the EPP <extension> element should contain a child <b-dn:delData> element that identifies the extension namespace if the domain object has data associated with this extension and based on its registration policy. The <b-dn:delData> element should contain the <b-dn:bundle> element.

```

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:    <extension>
S:      <b-dn:delData
S:        xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn">
S:        <b-dn:bundle>
S:          <b-dn:rdn uLabel="&#x5B9E;&#x4F8B;.example">
S:            xn--fsq270a.example
S:          </b-dn:rdn>
S:          <b-dn:bdn uLabel="&#x5BE6;&#x4F8B;.example">
S:            xn--fsqz41a.example
S:          </b-dn:bdn>
S:        </b-dn:bundle>
S:      </b-dn:delData>
S:    </extension>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54321-XYZ</svTRID>
S:    </trID>
S:  </response>
S:</epp>

```

Figure 5: Example <delete> Response

An EPP error response must be returned if a <delete> command cannot be processed for any reason.

6.2.3. EPP <renew> Command

This extension does not add any element to the EPP <renew> command described in the EPP domain name mapping [RFC5731]. However, when either the RDN or BDN is sent for renewal, the response should

contain both RDN and BDN information. When the command has been processed successfully, the EPP <extension> element shall be contained in the response if the domain object has data associated with bundled names. Unless some registration policy has some special processing, this EPP <extension> element should contain the <b-dn:renData>, which contains the <b-dn:bundle> element.

```
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:renData
S:        xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
S:        <domain:name>xn--fsq270a.example</domain:name>
S:        <domain:exDate>2022-04-03T22:00:00.0Z</domain:exDate>
S:      </domain:renData>
S:    </resData>
S:    <extension>
S:      <b-dn:renData
S:        xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn">
S:        <b-dn:bundle>
S:          <b-dn:rdn uLabel="&#x5B9E;&#x4F8B;.example">
S:            xn--fsq270a.example
S:          </b-dn:rdn>
S:          <b-dn:bdn uLabel="&#x5BE6;&#x4F8B;.example" >
S:            xn--fsqz41a.example
S:          </b-dn:bdn>
S:        </b-dn:bundle>
S:      </b-dn:renData>
S:    </extension>
S:    <trID>
S:      <clTRID>ABC-12345</clTRID>
S:      <svTRID>54322-XYZ</svTRID>
S:    </trID>
S:  </response>
S:</epp>
```

Figure 6: Example <renew> Response

6.2.4. EPP <transfer> Command

This extension does not add any element to the EPP <transfer> command described in the EPP domain name mapping [RFC5731]. However, additional elements are defined for the <transfer> response in the EPP object mapping. When the command has been processed successfully, the EPP <extension> element shall be contained in the response if the domain object has data associated with bundled names. Unless some registration policy has some special processing, this EPP <extension> element should contain the <b-dn:trnData>, which contains the <b-dn:bundle> element.

```
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>Command completed successfully; action pending</msg>
S:    </result>
S:    <resData>
S:      <domain:trnData
S:        xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
S:        <domain:name>xn--fsq270a.example</domain:name>
S:        <domain:trStatus>pending</domain:trStatus>
S:        <domain:reID>ClientX</domain:reID>
S:        <domain:reDate>2021-04-03T22:00:00.0Z</domain:reDate>
S:        <domain:acID>ClientY</domain:acID>
S:        <domain:acDate>2021-04-08T22:00:00.0Z</domain:acDate>
S:        <domain:exDate>2022-04-03T22:00:00.0Z</domain:exDate>
S:      </domain:trnData>
```

```

S: </resData>
S: <extension>
S:   <b-dn:trnData
S:     xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn">
S:     <b-dn:bundle>
S:       <b-dn:rdn uLabel="&#x5B9E;&#x4F8B;.example">
S:         xn--fsq270a.example
S:       </b-dn:rdn>
S:       <b-dn:bdn uLabel="&#x5BE6;&#x4F8B;.example">
S:         xn--fsqz41a.example
S:       </b-dn:bdn>
S:     </b-dn:bundle>
S:   </b-dn:trnData>
S: </extension>
S: <trID>
S:   <clTRID>ABC-12345</clTRID>
S:   <svTRID>54322-XYZ</svTRID>
S: </trID>
S: </response>
S: </epp>

```

Figure 7: Example <transfer> Response

6.2.5. EPP <update> Command

This extension does not add any element to the EPP <update> command described in the EPP domain name mapping [RFC5731]. However, additional elements are defined for the <update> response in the EPP object mapping. When the command has been processed successfully, the EPP <extension> element shall be contained in the response if the domain object has data associated with bundled names. Unless some registration policy has some special processing, this EPP <extension> element should contain the <b-dn:upData>, which contains the <b-dn:bundle> element.

```

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:     <extension>
S:       <b-dn:upData
S:         xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn">
S:         <b-dn:bundle>
S:           <b-dn:rdn uLabel="&#x5B9E;&#x4F8B;.example" >
S:             xn--fsq270a.example
S:           </b-dn:rdn>
S:           <b-dn:bdn uLabel="&#x5BE6;&#x4F8B;.example">
S:             xn--fsqz41a.example
S:           </b-dn:bdn>
S:         </b-dn:bundle>
S:       </b-dn:upData>
S:     </extension>
S:     <trID>
S:       <clTRID>ABC-12345</clTRID>
S:       <svTRID>54322-XYZ</svTRID>
S:     </trID>
S:   </response>
S: </epp>

```

Figure 8: Example <update> Response

7. Formal Syntax

An EPP object name mapping extension for bundled names 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.

```

<CODE BEGINS>
<?xml version="1.0" encoding="UTF-8"?>

<schema targetNamespace="urn:ietf:params:xml:ns:epp:b-dn"
  xmlns:b-dn="urn:ietf:params:xml:ns:epp:b-dn"
  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:iana:xml:ns:eppcom-1.0"/>

  <annotation>
    <documentation>
      Extensible Provisioning Protocol v1.0
      Bundle Domain Extension Schema v1.0
    </documentation>
  </annotation>

  <!--
    Child elements found in EPP commands.
  -->
  <element name="create" type="b-dn:createDataType"/>

  <!--
    Child elements of the <b-dn:create> command.
    All elements must be present at time of creation
  -->
  <complexType name="createDataType">
    <sequence>
      <element name="rdn" type="b-dn:rdnType"
        minOccurs="0"/>
    </sequence>
  </complexType>

  <!--
    Child response elements in <b-dn:infData>, <b-dn:delData>,
    <b-dn:creData>, <b-dn:renData>, <b-dn:trnData> and <b-dn:upData>.
  -->
  <element name="infData" type="b-dn:bundleDataType"/>
  <element name="delData" type="b-dn:bundleDataType"/>
  <element name="creData" type="b-dn:bundleDataType"/>
  <element name="renData" type="b-dn:bundleDataType"/>
  <element name="trnData" type="b-dn:bundleDataType"/>
  <element name="upData" type="b-dn:bundleDataType"/>

  <complexType name="bundleDataType">
    <sequence>
      <element name="bundle" type="b-dn:bundleType" />
    </sequence>
  </complexType>

  <complexType name="bundleType">
    <sequence>
      <element name="rdn" type="b-dn:rdnType" />
      <element name="bdn" type="b-dn:rdnType"
        minOccurs="0" maxOccurs="unbounded" />
    </sequence>
  </complexType>

  <complexType name="rdnType">
    <simpleContent>
      <extension base="eppcom:labelType">
        <attribute name="uLabel" type="eppcom:labelType"/>
      </extension>
    </simpleContent>
  </complexType>

```

```
<!--  
  End of schema.  
-->  
</schema>  
<CODE ENDS>
```

8. Internationalization Considerations

EPP is represented in XML, which provides support for encoding information using the Unicode character set and its more compact representations, including UTF-8. Conformant XML processors recognize both UTF-8 and UTF-16. 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 domain name 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.

9. IANA Considerations

9.1. XML Namespace and XML Schema

This document uses URNs to describe XML namespaces and XML schemas conforming to a registry mechanism described in [RFC3688].

9.1.1. BDN Namespace

IANA has assigned the following for the BDN namespace in the "ns" subregistry of the "IETF XML Registry", with this document as the reference:

URI: urn:ietf:params:xml:ns:epp:b-dn
Registrant Contact: See the "Authors' Addresses" section of this document.
XML: None. The namespace URI does not represent an XML specification.

9.1.2. BDN XML Schema

IANA has made the following assignment in the "schema" subregistry of the "IETF XML Registry" for the BDN XML schema, with this document as the reference:

URI: urn:ietf:params:xml:schema:epp:b-dn
Registrant Contact: See the "Authors' Addresses" section of this document.
XML: See the "Formal Syntax" section of this document.

9.2. EPP Extension

IANA has registered the EPP extension described in this document in the "Extensions for the Extensible Provisioning Protocol (EPP)" registry described in [RFC7451]. The details of the registration are as follows:

Name of Extension: "Domain Name Mapping Extension for Strict Bundling Registration"
Document Status: Informational
Reference: This document
Registrant Name and Email Address: See the "Authors' Addresses" section of this document.
TLDs: Any
IPR Disclosure: <https://datatracker.ietf.org/ipr/2479>
Status: Active
Notes: None

10. Security Considerations

Normally, the EPP server will only be connected by the authorized EPP client, which knows whether the EPP server supports the extension described in this document via out-of-band service. The EPP client should avoid sending this extension to the unimplemented EPP server. In case a client that supports this document sends a request to a server that does not support this document, the server will return the result code 2103 according to Section 3 of [RFC5730]. Section 3 of [RFC5730] has the following information for result code 2103.

2103 "Unimplemented extension"

This response code MUST be returned when a server receives a valid EPP command element that contains a protocol command extension that is not implemented by the server.

Some registries and registrars have more than 15 years' experience with the bundled registration of domain names (especially Chinese Domain Names). They have not found any significant security issues. One principle that the registry and registrar should let the registrants know is that bundled registered domain names will be created, transferred, updated, and deleted together as a group. The registrants for bundled domain names should remember this principle when performing operations to these domain names. [RFC5730] also introduces some security consideration.

This document does not take a position regarding whether or not the bundled domain names share a key for Delegation Signer (DS) and/or DNS Public Key (DNSKEY) resource records. The DNS administrator can choose whether DS/DNSKEY information can be shared or not. If a DS/DNSKEY key is shared, then the bundled domain names share fate if there is a key compromise.

11. References

11.1. Normative References

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Authors' Addresses

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

Phone: +86 10 5881 3007
Email: yaojk@cnnic.cn

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

Phone: +86 10 5881 2677
Email: zhoulinlin@cnnic.cn

Hongtao Li
CNNIC

4 South 4th Street, Zhongguancun, Haidian District
Beijing
Beijing, 100190
China

Email: lihongtao@cnnic.cn

Ning Kong
Consultant

Email: ietfing@gmail.com

Jiagui Xie

Email: jiagui1984@163.com