EXTENSIBLE PROVISIONING PROTOCOL MAPPING: <SUGGESTION>

Version 1.2

Change Log

Author(s)	Date	Revision	Description
Paul Sitowitz	10/22/2008	1.1	• Added language element to support the NameSuggestion multilingual release • Modified maximum key length from 128 to 32 to be consistent with the NameSuggestion application
Jeff Faust	8/2/2011	1.2	• Removed maximum key length from the xsd.

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1 Introduction

This document describes a mapping for the Extensible Provisioning Protocol (EPP) [RFC3730]. This mapping is specified using the Extensible Markup Language (XML) 1.0 as described in [XML] and XML Schema notation as described in [XMLS-1] and [XMLS- 2]. The basis for this mapping is the EPP domain name mapping [RFC3731].

[EPP] 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 this document.

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

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].

In examples, “C:” represents lines sent by a protocol client and “S:” represents lines returned by a protocol server. Indentation in examples is provided only to illustrate element relationships and is not a REQUIRED feature of this protocol.

2 Object Attributes

An EPP suggestion object has attributes and associated values that may be viewed and modified by the sponsoring client or the server. This section describes each attribute type in detail.

2.1 Contact and Client Identifiers

All EPP contacts are identified by a server-unique identifier. 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 [EPP].

2.2 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 defined in [ISO8601] MUST be used to represent date- time values as XML Schema does not support truncated date-time forms.

3 EPP Command Mapping

A detailed description of the EPP syntax and semantics can be found in [EPP]. The command mappings described here are specifically for use in provisioning and managing Domain Name Suggestions via EPP.

3.1 EPP Query Commands

EPP provides the <info> command to retrieve domain suggestion information based on the specified domain or keyword sequence.

3.1.1 EPP <info> Command

The EPP <info> command is used to retrieve domain suggestion information based on the specified domain or keyword sequence.

In addition to the standard EPP command elements, the <info> command MUST contain a <suggestion:info> element that identifies the suggestion namespace and the location of the suggestion schema. The < suggestion:info> element contains the following child elements:

- A <suggestion:key> element that contains the domain or keyword sequence on which suggestions will be based. If the "key" value has no spaces, it is treated as a domain.
- An OPTIONAL <suggestion:language> element that identifies the language of both the <suggestion:key> and the returned suggestions. If not specified, this will default to ENG for the english language.
- An OPTIONAL <suggestion:filterid> element. This element uniquely identifies a specific <suggestion:filter> element. It can be given instead of the entire <suggestion:filter> element to specify the kind of results to return.
- An OPTIONAL <suggestion:filter> element that provides the server information on what kind of results to return. The <suggestion:filter> element contains the following child elements and attributes:
    - A sequence of zero or more <suggestion:action> elements describing the actions the server should take to generate domain name suggestions. Each <suggestion:action> element contains the following child attributes:
        - name The name of the action used to generate suggestions. For example, prefix or suffix suggestions are generated using the "basic" action.
        - weight The value to give suggestions generated using this action relative to other actions. This attribute takes a value of "off", "low", "medium", or "high".
    - A sequence of zero or more <suggestion:tld> elements describing the namespaces in which answers may reside. If the "filter" element contains "tld" elements for "COM" and "NET", then resulting answers will be in the "COM" and "NET" domain name spaces.
    - An OPTIONAL "contentfilter" attribute. If this value is "true", then the server will attempt to remove objectionable results from the results set. Otherwise the result set will remain unfiltered.
    - An OPTIONAL "customfilter" attribute. If this value is "true", then the server will apply the user's own list of words to filter. Domain name suggestions containing these custom words will be removed from the result set.

- An OPTIONAL “forsale” attribute which takes a value of “off”, “low”, “medium”, or “high”. If this attribute is specified then resulting domain suggestions MAY be registered but for sale through an alternative channel.
- An OPTIONAL “maxlength” attribute. Resulting domain suggestions SHALL NOT exceed this length.
- An OPTIONAL “maxresults” attribute that indicates the maximum number of domain suggestions to return to the client. The server MAY return fewer domain results, but the server SHALL NOT return more results than the “maxresults” value.
- An OPTIONAL “usehyphens” attribute. If this value is “false” then hyphens SHALL NOT appear in resulting domain suggestions.
- An OPTIONAL “usenumbers” attribute. If this value is “false” then numbers (0-9) SHALL NOT appear in resulting domain suggestions.
- An OPTIONAL “view” attribute that indicates the way the server will organize results. The “view” attribute takes one of the following values:
    - “table” – The server should organize suggestions into a table of rows. Each row will contain a complete domain name suggestion including the second level domain label and the top-level-domain.
    - “grid” – The server should organize results into a grid with rows and columns. Each row will be associated with a second level domain label. Each column will be associated with a top-level-domain. This organization indicates suggestion availability by top-level-domain.
-

Example <info> command:

```
C:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
C:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
C:     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
C:     xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0 epp-1.0.xsd">
C: <command>
C:  <info>
C:   <suggestion:info
C:    xmlns:suggestion="http://www.verisign-grs.com/epp/suggestion-1.1"
C:    xsi:schemaLocation="http://www.verisign-grs.com/epp/suggestion-1.1
C:    suggestion-1.1.xsd">
C:    <suggestion:key>mimisflowershop.com</suggestion:key>
C:    <suggestion:language>ENG</suggestion:language>
C:    <suggestion:filter
C:     contentfilter="false"
C:     customfilter="false"
C:     forsale="off"
C:     maxlength="30"
C:     maxresults="20"
C:     usehyphens="true"
C:     usenumbers="true"
C:     view="grid">
C:     <suggestion:action name="basic" weight="medium"/>
C:     <suggestion:action name="related" weight="high"/>
C:     <suggestion:action name="similar" weight="off"/>
C:     <suggestion:action name="topical" weight="high"/>
C:     <suggestion:tld>COM</suggestion:tld>
C:     <suggestion:tld>Net</suggestion:tld>
C:    </suggestion:filter>
C:   </suggestion:info>
C:  </info>
C:  <clTRID>51364-CLI</clTRID>
```

```
C: </command>
C:</epp>
```

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

- A <suggestion:key> element that contains the domain or keyword sequence on which suggestions have been based.
- An OPTIONAL <suggestion:language> element that identifies the language of both the <suggestion:key> and the returned suggestions. If not specified, this will default to ENG for the english language.
- A sequence of zero or more <suggestion:token> elements. These elements taken together describe the way the server tokenized the input <suggestion:key> element. Each <suggestion:token> element contains the following child elements and attributes:
    - A "name" attribute which contains a substring of the original <suggestion:key> element.
    - A sequence of zero or more <suggestion:related> elements. These "string" elements MAY be English synonyms for the word in the "name" attribute.
- An OPTIONAL <suggestion:answer> element. This element contains the result of the server's work. Depending on the <suggestion:view> element in the original client info command, this element will contain either a <suggestion:table> element or a <suggestion:grid> element.

- A <suggestion:table> element contains 1 or more <suggestion:row> elements. The <suggestion:row> elements contain the actual domain suggestions for the given <suggestion:key> element. Each <suggestion:row> element can contain the following child attributes:
    - A "name" attribute which contains the domain suggestion.
    - A "score" attribute which contains a value for this suggestion related to the entire universe of suggestions. The score is between 0 and 1000.
    - A "status" attribute which describes domain name in the answer returned. The "status" attribute MUST be one of the following:
        - "registered" – The domain name is not available for registration. Only the first <suggestion:row> element SHOULD return a "registered" status, and then only if the "name" attribute matches the <suggestion:key> (ignoring case). These conditions ensure that the server can only return a "registered" result to indicate that the user input is already registered. The server SHOULD NOT return generated answer elements which are not available for registration.
        - "available" – The domain name is available for registration.
        - "forsale" – The domain name is not available for registration, but is for sale by the owner.
    - An OPTIONAL "source" attribute which describes what kind of algorithm the server used to create this suggestion. *This option is not currently implemented on the server.*
    - An OPTIONAL "morelikethis" attribute which contains further information allowing a second query. The second query would return results which are semantically identical to the first. *This option is not currently implemented on the server.*

    - An OPTIONAL “ppcvalue” attribute which contains a value describing the pay-per-click value of the keywords in this domain. *This option is not currently implemented on the server*.

- A <suggestion:grid> element contains 1 or more <suggestion:record> elements. These elements taken together describe the server suggestions for the <suggestion:key> input. Each <suggestion:record> element contains the following child elements and attributes:
    - A “name” attribute which contains the only the second level domain label. No dot “.” or top-level-domain appears in this attribute.
    - An OPTIONAL “source” attribute which describes what kind of algorithm the server used to create this suggestion. *This option is not currently implemented on the server.*
    - An OPTIONAL “morelikethis” attribute which contains further information allowing a second query. The second query would return results which are semantically identical to the first. *This option is not currently implemented on the server*.
    - An OPTIONAL “ppcvalue” attribute which contains a value describing the pay-per-click value of the keywords in this domain. *This option is not currently implemented on the server*.
    - A sequence of zero or more <suggestion:cell> elements describing which top-level-domains still allow the client to register the second level domain label. Each <suggestion:cell> element can contain the following child attributes:
        - A “tld” attribute which contains the name of the top-level-domain.
        - A “score” attribute which contains a value for this suggestion related to the entire universe of suggestions. The score is between 0 and 1000.
        - A “status” attribute which describes domain name in the answer returned. The “status” attribute MUST be one of the following:
            - “registered” – The domain name is not available for registration. Here, within the <suggestion:grid> element, the “registered” status can be more common. As long as the second level domain label is available in one tld, all tlds will be returned with a “registered” status where appropriate.
            - “available” – The domain name is available for registration.
            - “forsale” – The domain name is not available for registration, but is for sale by the owner.

Example <info> response using a <suggestion:table> element:

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:     xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0 epp-1.0.xsd">
S: <response>
S:  <result code="1000">
S:   <msg>Command completed successfully</msg>
S:  </result>
S:  <resData>
S:   <suggestion:infData
S:    xmlns:suggestion="http://www.verisign-grs.com/epp/suggestion-1.0"
S:    xsi:schemaLocation="http://www.verisign-grs.com/epp/suggestion-1.0
S:    suggestion-1.0.xsd">
S:    <suggestion:key>harrypotterquidditchgame.com</suggestion:key>
S:    <suggestion:language>ENG</suggestion:language>
S:    <suggestion:token name="harrypotter">
S:     <suggestion:related>wizard</suggestion:related>
S:    </suggestion:token>
S:    <suggestion:token name="quidditch"/>
S:    <suggestion:token name="game">
S:     <suggestion:related>videogame</suggestion:related>
S:     <suggestion:related>contest</suggestion:related>
S:    </suggestion:token>
S:    <suggestion:answer>
S:     <suggestion:table>
S:      <suggestion:row name="HarrypotterQuidditchGame.com"
S:                      score="1000" status="registered"/>
S:      <suggestion:row name="HarryPotterVideoGame.com"
S:                      score="952" status="available"/>
S:      <suggestion:row name="TheHarryPotterMovie.com"
S:                      score="945" status="available"/>
S:      <suggestion:row name="HarryPotterTehMovie.com"
S:                      score="923" status="available"/>
S:      <suggestion:row name="MovieAboutHarryPotter.com"
S:                      score="919" status="forsale"/>
S:      <suggestion:row name="HarryPotterChatter.com"
S:                      score="899" status="available"/>
S:     </suggestion:table>
S:    </suggestion:answer>
S:   </suggestion:infData>
S:  </resData>
S:  <trID>
S:   <clTRID>51364-CLI</clTRID>
S:   <svTRID>SRV-43659</svTRID>
S:  </trID>
S: </response>
S:</epp>
```

Example <info> response using a <suggestion:grid> element:

```
S:<?xml version="1.0" encoding="UTF-8" standalone="no"?>
S:<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
S:     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
S:     xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0 epp-1.0.xsd">
S: <response>
S:  <result code="1000">
S:   <msg>Command completed successfully</msg>
S:  </result>
S:  <resData>
S:   <suggestion:infData
S:    xmlns:suggestion="http://www.verisign-grs.com/epp/suggestion-1.0"
S:    xsi:schemaLocation="http://www.verisign-grs.com/epp/suggestion-1.0
S:    suggestion-1.0.xsd">
S:    <suggestion:key>harrypotterquidditchgame.com</suggestion:key>
S:    <suggestion:language>ENG</suggestion:language>
S:    <suggestion:token name="harrypotter">
S:     <suggestion:related>wizard</suggestion:related>
S:    </suggestion:token>
S:    <suggestion:token name="quidditch"/>
S:    <suggestion:token name="game">
S:     <suggestion:related>videogame</suggestion:related>
S:     <suggestion:related>contest</suggestion:related>
S:    </suggestion:token>
S:    <suggestion:answer>
S:     <suggestion:grid>
S:      <suggestion:record name="HarrypotterQuidditchGame">
S:       <suggestion:cell tld="com" score="1000" status="registered"/>
S:       <suggestion:cell tld="net" score="543" status="available"/>
S:      </suggestion:record>
S:      <suggestion:record name="HarryPotterVideoGame">
S:       <suggestion:cell tld="com" score="952" status="available"/>
S:       <suggestion:cell tld="net" score="521" status="available"/>
S:      </suggestion:record>
S:      <suggestion:record name="TheHarryPotterMovie">
S:       <suggestion:cell tld="com" score="945" status="forsale"/>
S:       <suggestion:cell tld="net" score="432" status="available"/>
S:      </suggestion:record>
S:      <suggestion:record name="HarryPotterTehMovie">
S:       <suggestion:cell tld="com" score="923" status="available"/>
S:       <suggestion:cell tld="net" score="412" status="registered"/>
S:      </suggestion:record>
S:      <suggestion:record name="MovieAboutHarryPotter">
S:       <suggestion:cell tld="com" score="919" status="available"/>
S:       <suggestion:cell tld="net" score="367" status="available"/>
S:      </suggestion:record>
S:      <suggestion:record name="HarryPotterChatter">
S:       <suggestion:cell tld="com" score="899" status="available"/>
S:       <suggestion:cell tld="net" score="734" status="unknown"/>
S:      </suggestion:record>
S:     </suggestion:grid>
S:    </suggestion:answer>
S:   </suggestion:infData>
S:  </resData>
S:  <trID>
S:   <clTRID>51364-CLI</clTRID>
S:   <svTRID>SRV-43659</svTRID>
S:  </trID>
S: </response>
S:</epp>
```

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

4 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="http://www.verisign-grs.com/epp/suggestion-1.1"
   xmlns:suggestion="http://www.verisign-grs.com/epp/suggestion-1.1"
   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 namespace="urn:ietf:params:xml:ns:eppcom-1.0" schemaLocation="eppcom-1.0.xsd"/>
   <import namespace="urn:ietf:params:xml:ns:epp-1.0" schemaLocation="epp-1.0.xsd"/>

   <annotation>
      <documentation>
         Extensible Provisioning Protocol v1.1
         Suggestion provisioning schema
      </documentation>
   </annotation>

   <element name="info" type="suggestion:infoType"/>

   <complexType name="infoType">
      <sequence>
         <element name="key" type="suggestion:keyType" minOccurs="1" maxOccurs="1"/>
         <element name="language" type="language" minOccurs="0" maxOccurs="1" default="ENG"/>
         <choice>
            <element name="filter" type="suggestion:filterType" minOccurs="0" maxOccurs="1"/>
            <element name="filterid" type="suggestion:filterIdType" minOccurs="0" maxOccurs="1"/>
         </choice>
      </sequence>
   </complexType>

   <simpleType name="keyType">
      <restriction base="string">
      </restriction>
   </simpleType>

   <simpleType name="filterIdType">
      <restriction base="unsignedLong">
      </restriction>
   </simpleType>

   <complexType name="filterType">
      <sequence>
         <element name="action" type="suggestion:actionType" minOccurs="0" maxOccurs="unbounded"/>
         <element name="tld" type="suggestion:tldType" minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
      <attribute name="contentfilter" type="boolean" />
      <attribute name="customfilter" type="boolean" />
      <attribute name="forsale" type="suggestion:weightType"/>
      <attribute name="maxlength" type="suggestion:lengthType"/>
      <attribute name="maxresults" type="suggestion:resultsType"/>
      <attribute name="usehyphens" type="boolean"/>
      <attribute name="usenumbers" type="boolean"/>
      <attribute name="view" type="suggestion:viewType"/>
   </complexType>

   <complexType name="actionType">
      <attribute name="name" type="string" use="required"/>
      <attribute name="weight" type="suggestion:weightType" use="required"/>
   </complexType>
```

```
<simpleType name="tldType">
   <restriction base="token">
      <pattern value="[a-zA-Z]{2,6}"/>
   </restriction>
</simpleType>

<complexType name="weightedTldType">
   <simpleContent>
      <extension base="suggestion:tldType">
         <attribute name="weight" type="suggestion:weightType" />
      </extension>
   </simpleContent>
</complexType>

<simpleType name="weightType">
   <restriction base="string">
      <enumeration value="off"/>
      <enumeration value="low"/>
      <enumeration value="medium"/>
      <enumeration value="high"/>
   </restriction>
</simpleType>

<simpleType name="lengthType">
   <restriction base="unsignedShort">
      <minInclusive value="1"/>
      <maxInclusive value="63"/>
   </restriction>
</simpleType>

<simpleType name="resultsType">
   <restriction base="unsignedShort">
      <minInclusive value="1"/>
      <maxInclusive value="100"/>
   </restriction>
</simpleType>

<simpleType name="viewType">
   <restriction base="token">
      <enumeration value="table"/>
      <enumeration value="grid"/>
   </restriction>
</simpleType>


<element name="infData" type="suggestion:infDataType"/>

<complexType name="infDataType">
   <sequence>
      <element name="key" type="string" minOccurs="1" maxOccurs="1"/>
      <element name="language" type="language" minOccurs="0" maxOccurs="1" default="ENG"/>
      <element name="token" type="suggestion:tokenType" minOccurs="0" maxOccurs="unbounded"/>
      <element name="answer" type="suggestion:answerType" minOccurs="0" maxOccurs="1"/>
   </sequence>
</complexType>

<complexType name="tokenType">
   <sequence>
      <element name="related" type="token" minOccurs="0" maxOccurs="unbounded"/>
   </sequence>
   <attribute name="name" type="string" use="required"/>
</complexType>

<complexType name="answerType">
   <choice>
      <element name="table" type="suggestion:tableType" minOccurs="1" maxOccurs="1"/>
      <element name="grid" type="suggestion:gridType" minOccurs="1" maxOccurs="1"/>
   </choice>
</complexType>

<complexType name="tableType">
   <sequence>
      <element name="row" type="suggestion:rowType" minOccurs="0" maxOccurs="unbounded"/>
   </sequence>
</complexType>
```

```
   <complexType name="rowType">
      <attribute name="name" type="string" use="required"/>
      <attribute name="score" type="suggestion:scoreType" use="required"/>
      <attribute name="status" type="suggestion:statusType" use="required"/>
      <attribute name="source" type="string"/>
      <attribute name="morelikethis" type="string"/>
      <attribute name="ppcvalue" type="integer"/>
   </complexType>

   <complexType name="gridType">
      <sequence>
         <element name="record" type="suggestion:recordType" minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
   </complexType>

   <complexType name="recordType">
      <sequence>
         <element name="cell" type="suggestion:cellType" minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
      <attribute name="name" type="suggestion:labelType" use="required"/>
      <attribute name="source" type="string"/>
      <attribute name="morelikethis" type="string"/>
      <attribute name="ppcvalue" type="integer"/>
   </complexType>

   <complexType name="cellType">
      <attribute name="tld" type="suggestion:tldType" use="required"/>
      <attribute name="score" type="suggestion:scoreType" use="required"/>
      <attribute name="status" type="suggestion:statusType" use="required"/>
   </complexType>

   <simpleType name="labelType">
      <restriction base="token">
         <pattern value="[a-zA-Z0-9]([a-zA-Z0-9\-]*[a-zA-Z0-9])?"/>
      </restriction>
   </simpleType>

   <simpleType name="scoreType">
      <restriction base="unsignedShort">
         <minInclusive value="0"/>
         <maxInclusive value="1000"/>
      </restriction>
   </simpleType>

   <simpleType name="statusType">
      <restriction base="string">
         <enumeration value="available"/>
         <enumeration value="forsale"/>
         <enumeration value="registered"/>
         <enumeration value="unknown"/>
      </restriction>
   </simpleType>

</schema>
```

END

5 References

Document all references.

[RFC3730] Hollenbeck, S., "Extensible Provisioning Protocol (EPP)", RFC 3730, March 2004.

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[RFC3733] Hollenbeck, S., " Extensible Provisioning Protocol Contact Mapping", RFC 3733, March 2004.

[RFC2119] S. Bradner: "Key Words for Use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

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[XMLS-1] Editors H. Thompson et al.: "XML Schema Part 1: Structures", W3C Recommendation 2 May 2001.

[XMLS-2] Editors P. Biron, A. Malhotra: "XML Schema Part 2: Datatypes", W3C Recommendation 2 May 2001.

[RFC2822] P. Resnick: “Internet Message Format”, RFC 2822, April 2001.