

ENUM EPP mapping document

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1. Introduction

This document gives a proposed EPP mapping for the provision of an ENUM object in Nominet's registry.

The following operations are included:

- <create> operation for the registration of a range of enumbers. A signed token (2 described in section 2) valid for the registration period requested is required for this.
- <update> operations to modify the details of a registration. A token is required to update registrant data.
- <transfer> operation to move the registration to a different registrar. A token is required for this and so either push or pull registrar change are possible.
- <renew> operation to renew the registration. A token, valid for the requested registration period is required for this and so the data provided in the token can be changed at renewal.
- <delete> operation to remove the registration
- <info> operation to query the details of the registration
- <check> operation to indicate if a subsequent <create> operation would succeed or not.

2. <token> element

We will use the <token> element provided in RFC 5105.

The <token> will contain two main sub elements

- <validation> containing information about the registrar, the enum range registered and the authentication of the application.
- <tokendata> containing information about the registrant.

2.1 <validation> element

This has a "serial" attribute giving a unique token identifier and the following sub elements:

- <E164Number> giving the first number authorised.
- <lastE164Number> giving the last number authorised.
- <validationEntityID> identifying the validation agency.
- <registrarID > identifying the registrar.
- <methodID> identifying the validation method used by the validation agency.
- <executionDate> giving the date of authentication
- <expirationDate> giving the date the authentication expires.

When a token is provided for an operation, the range given by the <E164Number> and <lastE164Number> sub-elements must encompass the range applied for.

2.2 <tokendata> element

This contains the following sub elements giving registrant information:

- <organisation>
- <title>
- <firstname>
- <lastname>
- An <address> element containing the following sub-elements:
 - <streetName>
 - <locality>
 - <countyStateOrProvince>
 - <postalCode>

- <ISOcountryCode>

3. EPP Create command

The <create> command allows a client to create an object. In order to create an ENUM registration, the command must contain an <enum:create> element as defined below.

3.1 <enum:create>

The <enum:create> element contains the following sub-elements:

- Either a <token> element, as described in section 2, containing the signed <token> element as returned by the Authentication Agency. The token specifies the range of registrations applied for.
- An optional <enum:ns> element containing the nameservers for the enum registration. This has one to ten elements each of which can be either of the following types:
 - <ns:create> containing the sub-elements of a nameserver object to be created and used.
 - <enum:nsObj> containing the identifier of a nameserver object to be used.
- An optional <enum:notes> field giving registrar notes.

The <ns:create> element contains the following sub-elements:

- A <ns:name> field.
- A <ns:ipv4> field
- A <ns:ipv6> field.

3.2 <enum:creData>

On successful creation of an ENUM registration, the <enum:creData> element will contain the following:

- A <enum:roid> element giving the repository unique identifier for the registration
- <enum:first-enumber > element
- <enum:last-enumber> element
- A <enum:ns> element giving creData elements for all nameserver elements created as part of the registration
- A <enum:crDate> giving the created date.
- A <enum:exDate> element giving the expiry date for the registration

3.3 Example ENUM registration request.

The following gives an example ENUM registration request. The example <token> element is "borrowed" from RFC 5105

```
<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <create>
      <enum:create
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
```

```

"http://www.nominet.org.uk/epp/xml/nom-enum-1.0
nom-enum-1.0.xsd">
<token xmlns="urn:ietf:params:xml:ns:enum-token-1.0"
  Id="TOKEN"
  xsi:schemaLocation=
    "http://urn:ietf:params:xml:ns:enum-token-1.0.xsd
enum-token-1.0.xsd">
<validation serial="acmeve-000001">
  <E164Number>+442079460000</E164Number>
  <lastE164Number>+442079461000</lastE164Number>
  <validationEntityID>ACME-VE</validationEntityID>
  <registrarID>ENUM-EXAMPLE</registrarID>
  <methodID>42</methodID>
  <executionDate>2007-05-08</executionDate>
  <expirationDate>2009-05-08</expirationDate>
</validation>
<tokendata
  xmlns="urn:ietf:params:xml:ns:enum-tokendata-1.0"
  xsi:schemaLocation=
    "urn:ietf:params:xml:ns:enum-tokendata-1.0
enum-tokendata-1.0.xsd">
  <contact>
    <organisation>Example Inc.</organisation>
    <title>Dr.</title>
    <firstname>Max</firstname>
    <lastname>Mustermann</lastname>
    <address>
      <streetName>10 Main Street</streetName>
      <locality>London</locality>
      <countyStateOrProvince>London</countyStateOrProvince>
      <ISOcountryCode>GB</ISOcountryCode>
    </address>
  </contact>
</tokendata>
<Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
  <SignedInfo>
    <CanonicalizationMethod
      Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
    <SignatureMethod
      Algorithm=
        "http://www.w3.org/2001/04/xmldsig-more#rsa-sha256" />
    <Reference URI="#TOKEN">
      <Transforms>
        <Transform Algorithm=

```

```

"http://www.w3.org/2000/09/xmldsig#envelopedsignature"/>
  <Transform
    Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
    <InclusiveNamespaces
      xmlns="http://www.w3.org/2001/10/xml-exc-c14n#"
      PrefixList="enum-token enum-tokendata"/>
    </Transform>
  </Transforms>
  <DigestMethod
    Algorithm="http://www.w3.org/2001/04/xmlenc#sha256" />
  <DigestValue

```

```

>VxqsBxSNPFwPAULCHts3g3DehcexnB1dqUz+GypLZ0k=</DigestValue>
  </Reference>
</SignedInfo>
<SignatureValue>
QKqphKRNpOKVZFbenje+HZZV+RLrNweGnlWBw7ngAtH+rtuslR8LhMLmC4D1Bb9V
HvKI t1+7zLGm3VgYsqfHH8q3jCl1mFxiUIuLlIPqtpJs+xAHAJDzZ+vmsF/q2IgrS
K0uMmKuU5V1gydBOvIipcJx+PrPYyXYZSjQXkWknK8=</SignatureValue>
  <KeyInfo>
    <X509Data>
      <X509Certificate>
MIIDZjCCAs+gAwIBAgIBBDANBgkqhkiG9w0BAQQFADB0MQswCQYDVQQGEwJBVDEP
MA0GA1UEBxMGMVml1bm5hMRQwEgYDVQQKEwtCT0ZIIENlcnRzLjEhMBkGA1UEAxMS

```

```

Q0VSVFMuYm9maC5wcml2LmF0MSEwHwYJKoZIhvcNAQkBFhJjZXJ0c0Bib2ZoLnBy
aXYuYXQwHhcNMDQwNzIwMTMxNTA5WhcNMDUwNzIwMTMxNTA5WjB/MQswCQYDVQQL
EwJBVDEKMAgGA1UECBMLEPMA0GA1UEBxMGVml1bm5hMR0wGwYDVQQKEXRBY211
IEVOVU0gVmFsaWRhdGlvbjEQMA4GA1UEAxMhYWNTZS1WRTEiMCAGCSqGSIb3DQEJ
ARYTbm9ib2R5QGvudW0tYWNTZS5hdDCBnzANBgkqhkiG9w0BAQEFAAOBjQAwgYkC
    </X509Certificate>
    </X509Data>
  </KeyInfo>
</Signature>
</token>
<enum:ns>
  <enum:nsObj>NS5849658</enum:nsObj>
  <ns:create
    xmlns:ns="http://www.nominet.org.uk/epp/xml/nom-ns-1.0">
    <ns:name>ns0.enum-example.co.uk</ns:name>
  </ns:create>
</enum:ns>
  <enum:auto-bill>5</enum:auto-bill>
</enum:create>
</create>
</command>
</epp>

```

3.4 Example response to a successful Enum registration.

```

<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <response>
    <result code='1000'>
      <msg>Command completed successfully</msg>
    </result>
    <resData>
      <enum:creData
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <enum:E164Number>+441865332200</enum:E164Number>
        <enum:lastE164Number>+441865332500</enum:lastE164Number>
        <enum:ns>
          <ns:creData
            xmlns:ns="http://www.nominet.org.uk/epp/xml/nom-ns-1.0">
            <ns:roid>NS100054</ns:roid>
            <ns:name>ns0.example.co.uk</ns:name>
            <ns:crDate>2007-10-30T12:00:02</ns:crDate>
          </ns:creData>
        </enum:ns>
        <enum:crDate>2007-10-23T12:00:01</enum:crDate>
        <enum:exDate>2008-10-23T12:00:01</enum:exDate>
      </enum:creData>
    </resData>
    <trID>
      <clTRID>ABC-12345</clTRID>
      <svTRID>10654896</svTRID>
    </trID>
  </response>
</epp>

```

4. EPP update command

The EPP update command will allow the details of an enum registration to be modified. It will be possible to do the following:

- a) Change the nameservers for the registration

- b) Modify the billing and notes fields.
- c) Change the registrant data provided in the <tokendata> element. This will require authorisation.
- d) Perform a registrar change.

In addition, nameserver objects can be modified directly using the existing <ns:modify> command.

The <enum:modify> element will contain the following sub elements:

- A <enum:E164Number> element. This identifies the ENUM registration to be updated and must match the first element in the range of the registration.
- An optional <enum:lastE164Number> element. If present then this must match the lastE164Number stored for the <enum:E164Number> provided.
- An optional signed <token> element containing the registrant data to be modified. The token ENUM range must match the ENUM registration exactly.
- An optional <enum:ns> element containing the nameservers for the domain name. This has one to ten elements each of which can be either of the following types:
 - <ns:create> containing the sub-elements of a nameserver object to be created and used.
 - <domain:nsObj> containing the identifier of a nameserver object to be used.
- An optional <enum:auto-bill> field giving the new auto-bill entry for the registration.
- An optional <enum:next-bill> field giving the new next-bill entry for the registration.
- An optional <enum:notes> field giving the new notes entry for the registration.

4.1 Example request to move an ENUM to a new nameserver

```
<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <update>
      <enum:update
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation="
          http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <enum:E164Number>+441865332300</enum:E164Number>
        <enum:ns>
          <ns:create
            xmlns:ns="http://www.nominet.org.uk/epp/xml/nom-ns-1.0">
            <ns:name>ns3.enum-example.co.uk</ns:name>
          </ns:create>
        </enum:ns>
      </enum:update>
    </update>
  </command>
</epp>
```

4.2 Example request to modify the auto-bill fields on a registration

```
<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <update>
      <enum:update
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
```

```

    "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
    nom-enum-1.0.xsd">
    <enum:E164Number>+441865332100</enum:E164Number>
    <enum:auto-bill>5</enum:auto-bill>
  </enum:update>
</update>
</command>
</epp>

```

5. EPP Delete command

The <epp:delete> command can be used to remove an ENUM registration and all its domain names. The <enum:delete> element contains the following sub element to identify the registration to delete:

- A <enum:E164Number> element

5.1 Example request to delete a registration

```

<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <delete>
      <enum:delete
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <enum:E164Number>+441865332100</enum:E164Number>
      </enum:delete>
    </delete>
  </command>
</epp>

```

6. EPP Renew command

The <epp:renew> command is used to renew an ENUM registration. The <enum:renew> element contains the following sub-elements:

- A signed <token> element giving authorisation to renew the range of numbers in the registration and identifying the registration to be renewed. The range on the token must match the range on the registration exactly.

6.1 Example renewal request including a signed token

```

<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <renew>
      <enum:renew
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <token
          xmlns="urn:ietf:params:xml:ns:enum-token-1.0"
          Id="TOKEN"

```

```

xsi:schemaLocation="urn:ietf:params:xml:ns:enum-token-1.0
nom-enum-token-1.0.xsd">
<validation serial="acmeve-000001">
  <E164Number>+442079460123</E164Number>
  <lastE164Number>+442079461000</lastE164Number>
  <validationEntityID>ACME-VE</validationEntityID>
  <registrarID>ENUM-EXAMPLE</registrarID>
  <methodID>42</methodID>
  <executionDate>2007-05-08</executionDate>
  <expirationDate>2009-05-08</expirationDate>
</validation>
<tokendata
  xmlns="urn:ietf:params:xml:ns:enum-tokendata-1.0"
  xsi:schemaLocation="urn:ietf:params:xml:ns:enum-tokendata-1.0
enum-tokendata-1.0.xsd">
  <contact>
    <organisation>Example Inc.</organisation>
    <title>Dr.</title>
    <firstname>Max</firstname>
    <lastname>Mustermann</lastname>
    <address>
      <streetName>10 Main Street</streetName>
      <locality>London</locality>
      <countyStateOrProvince>London</countyStateOrProvince>
      <ISOcountryCode>GB</ISOcountryCode>
    </address>
  </contact>
</tokendata>
<Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
  <SignedInfo>
    <CanonicalizationMethod
      Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
    <SignatureMethod
      Algorithm=
        "http://www.w3.org/2001/04/xmldsig-more#rsa-sha256" />
    <Reference URI="#TOKEN">
      <Transforms>
        <Transform Algorithm=
          "http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
        <Transform
          Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
          <InclusiveNamespaces
            xmlns="http://www.w3.org/2001/10/xml-exc-c14n#"
            PrefixList="enum-token enum-tokendata" />
          </Transform>
        </Transforms>
      <DigestMethod
        Algorithm="http://www.w3.org/2001/04/xmlenc#sha256" />
      <DigestValue
>VxqsBxSNPFwPAULCHts3g3DehcexnB1dqUz+GypLZ0k=</DigestValue>
      </Reference>
    </SignedInfo>
    <SignatureValue>
QKqphKRNPKokVZFbenje+HZZV+RLrNweGnlWBw7ngAtH+rtuslr8LhMLmC4D1Bb9V
HvKIitl+7zLGm3VgYsqfHH8q3jCl1mFxUIuLlIPqtpJs+xAHAJDzZ+vmsF/q2IgrS
K0uMmKuU5V1gydDBOvIipcJx+PrPYyXYZSjQXkWknK8=</SignatureValue>
    <KeyInfo>
      <X509Data>
        <X509Certificate>
MIIDZjCCAs+gAwIBAgIBBDANBgkqhkiG9w0BAQQFADB0MQswCQYDVQQGEwJBVDEP
MA0GA1UEBxMGVml1bm5hMRQwEgYDVQQKEwtCT0ZIIENlcnRzLjEhMBkGA1UEAxMS
Q0VSVFMuYm9maC5wcml2LmF0MSEwHwYJKoZIhvcNAQkBFHJjZXJ0c0Bib2ZoLnBy
aXYuYXQwHhcNMDQwNzIwMTMxNTA5W5hcnMDUwNzIwMTMxNTA5WjB/MQswCQYDVQQG
EwJBVDEKMAgGA1UECBMLEPMA0GA1UEBxMGVml1bm5hMR0wGwYDVQQKEwRBY211
IEVOVU0gVmFsaWRhdGlvbjEjEQMA4GA1UEAxMHYWNtZS1WRTEiMCAgCSqGSIb3DQEJ
</X509Certificate>
        </X509Data>
      </KeyInfo>
    </Signature>

```

```

    </token>
  </enum:renew>
</renew>
</command>
</epp>

```

7. EPP Info command

The <epp:info> command can be used to obtain the details of an ENUM registration or domain name. This is only available to the sponsoring registrar. The <enum: info> element contains the following sub element:

- An <enum:E164Number> element identifying the registration to query.

7.1 Info reply

The <enum:infData> element contains the following sub-elements:

- A <enum:E164Number> element
- A <enum:lastE164Number> element.
- A signed <token> element.
- An optional <enum:ns> element contain details about the nameservers for the registration
- An optional <enum:notes> field giving any notes on the registration.
- A <enum:clID> element giving the tag that the ENUM is registered to.
- A <enum:crDate> element giving the date that the ENUM was registered.
- An optional <enum:upID> element identifying who last modified the registration.
- An optional <enum:update> element giving the date that the ENUM was last modified.
- An <enum:exDate> element giving the date that the registration expires.

7.2 Example <enum:info> response

```

<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <response>
    <result code="1000">
      <msg>Command completed successfully</msg>
    </result>
    <resData>
      <enum:infData
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <enum:E164Number>+442079460120</enum:E164Number>
        <enum:lastE164Number>+442079460140</enum:lastE164Number>
        <token
          xmlns="urn:ietf:params:xml:ns:enum-token-1.0" Id="TOKEN"
          xsi:schemaLocation=
            "urn:ietf:params:xml:ns:enum-token-1.0 enum-token-1.0.xsd">
          <validation serial="acmeve-000001">
            <E164Number>+442079460100</E164Number>
            <lastE164Number>+442079460900</lastE164Number>
            <validationEntityID>ACME-VE</validationEntityID>
            <registrarID>EXAMPLE-TAG</registrarID>
            <methodID>42</methodID>
          </validation>
        </token>
      </enum:infData>
    </resData>
  </response>
</epp>

```

```

    <executionDate>2007-05-08</executionDate>
  </validation>
  <tokendata
    xmlns=
      "urn:ietf:params:xml:ns:enum-tokendata-1.0"
    xsi:schemaLocation=
      "urn:ietf:params:xml:ns:enum-tokendata-1.0
nom-enum-tokendata-1.0.xsd">
    <contact>
      <organisation>Example Inc.</organisation>
      <title>Dr.</title>
      <firstname>Max</firstname>
      <lastname>Mustermann</lastname>
      <address>
        <streetName>10 Main Street</streetName>
        <locality>London</locality>
        <countyStateOrProvince>London</countyStateOrProvince>
        <postalCode>NW1 1AA</postalCode>
        <ISOcountryCode>GB</ISOcountryCode>
      </address>
    </contact>
  </tokendata>
  <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
    <SignedInfo>
      <CanonicalizationMethod
        Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
      <SignatureMethod
        Algorithm=
          "http://www.w3.org/2001/04/xmldsig-more#rsa-sha256" />
      <Reference URI="#TOKEN">
        <Transforms>
          <Transform Algorithm=
            "http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
          <Transform
            Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
            <InclusiveNamespaces
              xmlns="http://www.w3.org/2001/10/xml-exc-c14n#"
              PrefixList="enum-token enum-tokendata" />
            </Transform>
          </Transforms>
          <DigestMethod
            Algorithm="http://www.w3.org/2001/04/xmlenc#sha256" />
          <DigestValue
>VxqsBxSNPFwPAULCHts3g3DehcexnB1dqUz+GypLZ0k=</DigestValue>
          </Reference>
        </SignedInfo>
        <SignatureValue>
QKqphKRNPKVZFbenje+HZZV+RLrNweGnlWBw7ngAtH+rtuslR8LhMLmC4D1Bb9V
HvKIItl+7zLGm3VgYsqfHH8q3jCl1mFxiUuLlIPqtpJs+xAHAJDzZ+vmsF/q2IgrS
K0uMmKuU5V1gydDBOvIipcJx+PrPYyXYZSjQXkWknK8=</SignatureValue>
        <KeyInfo>
          <X509Data>
            <X509Certificate>
MIIDZjCCAs+gAwIBAgIBBDANBgkqhkiG9w0BAQQFADB0MQswCQYDVQQGEwJBVDEP
MA0GA1UEBxMGVml1bm5hMRQwEgYDVQQKEwtCT0ZIIEN1cnRzLjEhMBkGA1UEAxMS
Q0VSVFMuYm9maC5wcm12LmF0MSEwHwYJKoZIhvcNAQkBFhJjZXJ0c0Bib2ZoLnBy
aXYuYXQwHhcNMDQwNzIwMTMxNTA5WhcNMDUwNzIwMTMxNTA5WjB/MQswCQYDVQQG
EwJBVDEKMAgGA1UECBMLEPMA0GA1UEBxMGVml1bm5hMR0wGwYDVQQKEwRBY211
IEVOVU0gVmFsaWRhdGlvbjEQMA4GA1UEAxMHYWNTZS1WRTEiMCAgCSqGSIb3DQEJ
ARYTbm9ib2R5QG9vudW0tYWNTZS5hdDCBnzANBgkqhkiG9w0BAQEFAAOBjQAwgYkC
</X509Certificate>
          </X509Data>
        </KeyInfo>
      </Signature>
    </token>
  <enum:ns
    xmlns:ns="http://www.nominet.org.uk/epp/xml/nom-ns-1.0">
    <ns:infData>
      <ns:roid>NS12345</ns:roid>

```

```

<ns:name>ns1.example.co.uk</ns:name>
<ns:addr ip="v4">10.10.10.10</ns:addr>
<ns:clID>ENUM-EXAMPLE</ns:clID>
<ns:crID>domains@isp.com</ns:crID>
<ns:crDate>1999-04-03T22:00:00.0Z</ns:crDate>
<ns:upID>domains@isp.com</ns:upID>
<ns:upDate>1999-12-03T09:00:00.0Z</ns:upDate>
</ns:infData>
<ns:infData>
  <ns:roid>NS12346</ns:roid>
  <ns:name>ns1.example.com</ns:name>
  <ns:clID>ENUM-EXAMPLE</ns:clID>
  <ns:crID>domains@isp.com</ns:crID>
  <ns:crDate>1999-04-03T22:00:00.0Z</ns:crDate>
  <ns:upID>domains@isp.com</ns:upID>
  <ns:upDate>1999-12-03T09:00:00.0Z</ns:upDate>
</ns:infData>
</enum:ns>
<enum:auto-bill>12</enum:auto-bill>
<enum:clID>EXAMPLE-TAG</enum:clID>
<enum:crDate>2007-12-01T12:00:00</enum:crDate>
<enum:exDate>2008-12-01T12:00:00</enum:exDate>
</enum:infData>
</resData>
<trID>
  <clTRID>ABC-1234</clTRID>
  <svTRID>65849654</svTRID>
</trID>
</response>
</epp>

```

8. EPP check command

The <enum:check> command queries the server to determine whether a number range is available for registration.

The <enum:check> command contains the following a number of sequences of the following sub-elements to identify enumber ranges to query:

- A <enum:E164Number> element giving the first e-number in the range queried.
- An optional <enum:lastE164Number> element giving the last e-number in the range queried.

8.1 Example <enum:check> command

```

<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <check>
      <enum:check
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation="
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <enum:E164Number>+441865332100</enum:E164Number>
        <enum:lastE164Number>+441865332500</enum:lastE164Number>
      </enum:check>
    </check>
    <clTRID>ABC-125849</clTRID>
  </command>
</epp>

```

8.2 Example <enum:check> response when the whole range is available.

```
<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <response>
    <result code="1000">
      <msg>Command completed successfully</msg>
    </result>
    <resData>
      <enum:chkData
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <enum:cd avail="1">
          <enum:E164Number>+441865332100</enum:E164Number>
          <enum:lastE164Number>+441865332500</enum:lastE164Number>
        </enum:cd>
      </enum:chkData>
    </resData>
    <trID>
      <clTRID>ABC-12345</clTRID>
      <svTRID>10654896</svTRID>
    </trID>
  </response>
</epp>
```

8.3 Example <enum:check> response when range is unavailable

This response is given when the range requested cannot be registered. It may be that a subset of the range is in fact available.

```
<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <response>
    <result code="1000">
      <msg>Command completed successfully</msg>
    </result>
    <resData>
      <enum:chkData
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <enum:cd avail="0">
          <enum:E164Number>+441865332100</enum:E164Number>
          <enum:lastE164Number>+441865332500</enum:lastE164Number>
        </enum:cd>
      </enum:chkData>
    </resData>
    <trID>
      <clTRID>ABC-12345</clTRID>
      <svTRID>10654896</svTRID>
    </trID>
  </response>
</epp>
```

If more than one ENUM range is queried then there will be a list of <enum:cd> elements in the response appropriately.

9. EPP transfer command

The <enum:transfer> command allows an ENUM registration to be transferred to another registrar. It contains a single signed <token> element described in RFC 5105 giving the details of the registration and the registrar ID that the registration is to be transferred to.

The <enum:transfer> element contains the following sub-element:

- A <token> element giving the registration to transfer, authorisation to transfer and the registrar to transfer to.

9.1 Example transfer request

```
<?xml version="1.0" encoding="UTF-8"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <transfer op="request">
      <enum:transfer
        xmlns:enum="http://www.nominet.org.uk/epp/xml/nom-enum-1.0"
        xsi:schemaLocation=
          "http://www.nominet.org.uk/epp/xml/nom-enum-1.0
          nom-enum-1.0.xsd">
        <token
          xmlns="urn:ietf:params:xml:ns:enum-token-1.0"
          Id="TOKEN"
          xsi:schemaLocation=
            "urn:ietf:params:xml:ns:enum-token-1.0 enum-token-1.0.xsd">
          <validation serial="acmeve-000001">
            <E164Number>+442079460123</E164Number>
            <validationEntityID>ACME-VE</validationEntityID>
            <registrarID>ENUM-EXAMPLE2</registrarID>
            <methodID>42</methodID>
            <executionDate>2007-05-08</executionDate>
          </validation>
          <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
            <SignedInfo>
              <CanonicalizationMethod
                Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
              <SignatureMethod
                Algorithm=
                  "http://www.w3.org/2001/04/xmldsig-more#rsa-sha256" />
              <Reference URI="#TOKEN">
                <Transforms>
                  <Transform Algorithm=
                    "http://www.w3.org/2000/09/xmldsig#enveloped-
signature" />
                  <Transform
                    Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
                    <InclusiveNamespaces
                      xmlns="http://www.w3.org/2001/10/xml-exc-c14n#"
                      PrefixList="enum-token enum-tokendata" />
                    </Transform>
                  </Transforms>
                <DigestMethod
                  Algorithm="http://www.w3.org/2001/04/xmenc#sha256" />
                <DigestValue
                  >VxqsBxSNPFwPAULCHts3g3DehcexnB1dqUz+GypLZ0k=</DigestValue>
                </Reference>
              </SignedInfo>
              <SignatureValue>
                QKqphKRNPKokVZFbenje+HZZV+RLrNweGnlWBw7ngAtH+rtuslR8LhMLmC4DlBb9V
                HvKIItl+7zLGm3VgYsqfHH8q3jC1lmFxUIuLlIPqtpJs+xAHAJDzZ+vmsF/q2IgrS
                K0uMmKuU5V1gydDBOvIipcJx+PrPYyXYZSjQXkWknK8=</SignatureValue>
              <KeyInfo>
```

```

        <X509Data>
          <X509Certificate>
MIIDZjCCAs+gAwIBAgIBBDANBgkqhkiG9w0BAQQFADB0MQswCQYDVQQGEwJBVDEP
MA0GA1UEBxMGVml1bm5hMRQwEgYDVQQKEwtCT0ZIIENlcnRzLjEhMBkGA1UEAxMS
Q0VSVFmuYm9maC5wcm12LmF0MSEwHwYJKoZIhvcNAQkBFhJjZXJ0c0Bib2ZoLnBy
aXYuYXQwHhcNMDQwNzIwMTMxNTA5WhcNMDUwNzIwMTMxNTA5WjB/MQswCQYDVQQG
EwJBVDEKMAgGA1UECBMLTEPMA0GA1UEBxMGVml1bm5hMR0wGwYDVQQKEwRBY211
          </X509Certificate>
        </X509Data>
      </KeyInfo>
    </Signature>
  </token>
</enum:transfer>
</transfer>
</command>
</epp>

```

10. Notifications

Two ENUM notifications will be available via the EPP Poll mechanism.

- Enum cancelled notification.
- Enum released notification.

10.1 ENUM cancelled notification

This notification is generated when an ENUM is cancelled by Nominet, due to non-payment or another reasons.

10.1.1 <epp:resData> element

The <resData> element contains a single <n:cancData> element with the details of the cancellation. This contains the following sub-elements:

- An <n:E164Number> element giving the first number in the range cancelled.
- An <n:lastE164Number> element giving the last number in the range cancelled.
- An <n:orig> element giving the originator of the cancellation.

10.1.2 Example of an ENUM cancelled notification

```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
epp-1.0.xsd">
  <response>
    <result code="1301">
      <msg>Command completed successfully; ack to dequeue</msg>
    </result>
    <msgQ count="10" id="12345">
      <qDate>2007-09-26T07:31:30</qDate>
      <msg>ENUM Cancellation Notification</msg>
    </msgQ>
    <resData>
      <n:cancData
        xmlns:n="http://www.nominet.org.uk/epp/xml/nom-enum-
notifications-1.0"
        xsi:schemaLocation="http://www.nominet.org.uk/epp/xml/nom-enum-
notifications-1.0

```

```

    nom-enum-notifications-1.0.xsd">
    <n:E164Number>+441865332100</n:E164Number>
    <n:lastE164Number>+441865332300</n:lastE164Number>
    <n:orig>example@nominet</n:orig>
    </n:canData>
  </resData>
</trID>
  <clTRID>ABC-12345</clTRID>
  <svTRID>123456</svTRID>
</trID>
</response>
</epp>

```

10.2 Enum released Notification

This notification is generated when an ENUM is moved from one tag to another and informs the donor tag of the operation.

10.2.1 <epp:resData> element

The <resData> element contains a <n:relData> element which contains the following sub-elements:

- An <n:E164Number> element giving the first number in the range transferred.
- An <n:lastE164Number> element giving the last number in the range transferred.
- An <n:from> element giving the tag the ENUM has moved from.
- An <n:registrar-tag> element giving the tag the ENUM has moved to.

10.2.2 Example of an ENUM released notification

```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <response>
    <result code="1301">
      <msg>Command completed successfully; ack to dequeue</msg>
    </result>
    <msgQ count="10" id="12345">
      <qDate>2007-09-26T07:31:30</qDate>
      <msg>ENUM Released Notification</msg>
    </msgQ>
    <resData>
      <n:relData
        xmlns:n="http://www.nominet.org.uk/epp/xml/nom-enum-
notifications-1.0"
        xsi:schemaLocation="http://www.nominet.org.uk/epp/xml/nom-enum-
notifications-1.0
nom-enum-notifications-1.0.xsd">
        <n:E164Number>+441865332100</n:E164Number>
        <n:lastE164Number>+441865332300</n:lastE164Number>
        <n:from>EXAMPLE1-TAG</n:from>
        <n:registrar-tag>EXAMPLE2-TAG</n:registrar-tag>
      </n:relData>
    </resData>
    <trID>
      <clTRID>ABC-12345</clTRID>
      <svTRID>123456</svTRID>
    </trID>
  </response>
</epp>

```

