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DK Hostmaster

DK Hostmaster EPP Specification

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Table of Contents

Introduction	3
About this Document	3
Document History	3
The .dk Registry in Brief	3
EPP in Brief	3
EPP Service	4
Available Environments	4
Implementation Limitations	5
Commands	5
Unimplemented commands	6
Authorization	6
DNSSEC	6
Supported Object Transform and Query Commands	6
hello and greeting	7
login	7
logout	7
poll and message queue	7
create domain	8
check domain	9
info domain	10
create host	10
check host	11
info host	11
create contact	11
check contact	14
info contact	14
Data Collection Policy	14
Access	14
Purpose Statement	15
Recipient Statement	15
Retention Statement	15

* DRAFT *



DK Hostmaster

References	15
Resources	16
XML Schemas	16
Mailing list	16
Issue Reporting	16
Additional Information	16
Data Sheet	17
Appendices	18
Greeting	18

Introduction

This document describes and specifies the implementation offered by DK Hostmaster for interaction with the central registry for the ccTLD dk using the Extensible Provisioning Protocol (EPP). It is primarily aimed at a technical audience, and the reader is required to have prior knowledge of DNS registration and EPP.

About this Document

This specification describes version 1 (1.0.x) of the DK Hostmaster EPP Implementation. Future releases will be reflected in updates to this specification, please see the document history section below.

The document describes the current DK Hostmaster EPP implementation, for more general documentation on the EPP protocol, EPP client development or configuration, please refer to the RFCs and additional resources in the References and Resources chapters below.

Any future extensions and possible additions and changes to the implementation are not within the scope of this document and will not be discussed or mentioned throughout this document.

Document History

Rev.	Pub. date	Author	Description
1.0	* DRAFT *	Jonas B. Nielsen	Initial revision

The .dk Registry in Brief

DK Hostmaster is the registry for the ccTLD for Denmark (dk). The current model used in Denmark is based on a sole registry, with DK Hostmaster maintaining the central DNS registry.

The legislation and registry model utilised in Denmark imposes some limitations compared to the EPP protocol in general, since the primary intent of the EPP protocol is focused on a model based on shared-registry rather than a sole-registry model like the one used in Denmark.

These limitations are described in detail below in the chapter entitled Implementation Limitations, and these are explained further in the command descriptions where the single commands deviate from the EPP standard specification. In addition to limitations and deviations found in the above, a few others have been implemented to support DNS registration under Danish legislation, these are described in detail under the individual commands, where relevant.

EPP in Brief

EPP is an XML-based protocol aimed at provisioning data between registries. The protocol is intended for machine-to-machine communication in a *client-server* setup. Please see the References chapter for more information on specifications and references for EPP.

Please note that the service does not support XML entity expansion on the server side, due to security implications related to this feature.

EPP Service

The DK Hostmaster's EPP Service is based on an SOA architecture. EPP implementation is regarded as a service offered to external parties requiring provisioning actions towards DK Hostmaster.

The EPP service requires the use of and possible development of EPP client software. This is beyond the scope of this specification as the API and other assets for assisting in this are the primary object of this document.

In addition to the assets, DK Hostmaster aims to assist users and developers of EPP client software with integration towards DK Hostmaster and therefore provide facilities to ease this integration. This is primarily centered around a sandbox environment and related documentation.

In addition, DK Hostmaster provides a test environment for evaluation of future releases of the service, both for evaluation of new features, but also for opening up for EPP users to assist and guide DK Hostmaster in the EPP service implementation work.

Available Environments

DK Hostmaster offers the following environments:

Name of environment	Role	Policies
Production	Production	<p>This environment will be the production environment.</p> <p>info and check requests made to this environment will reflect live production data.</p> <p>create requests made to this environment will be carried out provided that they comply with business rules and general terms.</p> <ul style="list-style-type: none">- Approved domains will be processed for possible activation and propagation into the zone- Contacts (users) will be created and will be available in other systems like the self-service system etc.- Hosts (name servers) will be processed for possible activation.- The Change Password operation will be available in this environment. Please note that this operation will change the password and this change will be reflected in other systems.

Name of environment	Role	Policies
Sandbox	Sandbox	<p>This environment is intended for client development towards the DK Hostmaster EPP service.</p> <p>info and check requests made to this environment will reflect live production data.</p> <p>create requests made to this environment will be simulated, provided that syntax and data are valid.</p> <ul style="list-style-type: none">- Domains will be enqueued, but will not be processed further nor be available for activation and propagation into the zone- Contacts (users) will be created, but will not be available in other systems like the self-service system etc.- Hosts (name servers) will be queued, but will not be activated.- The Change Password operation will not be available on this environment. This should be done in the production environment (see above).
Test	Test	<p>This environment is intended for server/service evaluation. The environment will contain upcoming releases and is regarded as unstable and therefore availability cannot be guaranteed.</p> <p>info, check and poll requests made to this environment will only reflect dummy data.</p> <p>create requests made to this environment will always be successful, provided that syntax and data are valid.</p> <ul style="list-style-type: none">- Domains/contacts/hosts will not be created.- The Change Password operation will not be available on this environment. This should be done in the production environment (see above). The operation will always be successful.

Implementation Limitations

As mentioned previously the EPP service comes with some limitations.

Commands

The current implementation is limited to the following list of commands:

- hello
- login, including change password

- logout
- poll, including acknowledgement of messages
- info (contact/domain/host)
- check (contact/domain/host)
- create (contact/domain/host)

All commands will be described in detail below.

Unimplemented commands

The following commands have not been implemented in the service described in this specification:

- update (contact/domain/host)
- delete (contact/domain/host)
- transfer (contact/domain)
- renew

The above commands was pulled out of scope, because the overall and primary goal of version 1.0.0, is to implement a standardised replacement for the existing SMTP based form (See: References).

Authorization

More specifically, the service does not support the following features of the EPP protocol:

- Authorization

Comparing the EPP implementation to the existing channel for domain registration using the form via SMTP, the following fields are not supported.

- VID (VIP domain name)
- Billing contact's PO number
- Electronic account code

DNSSEC

In accordance with RFC 5910. We support DS only and not DNSKEY. In addition the maximum signature lifetime (secDNS:maxSigLife) is disregarded. See section 3.3 in the referenced RFC.

Supported Object Transform and Query Commands

The following describes the currently supported EPP commands. As mentioned previously, some of the commands have been extended beyond the basic capabilities of EPP. These minor extensions are described separately under each command and are included in the XSD files listed in the Resources chapter.

Commands that have not been extended are not described in much detail, please refer to the general EPP documentation from IETF (see: the RFCs listed in References).

hello and greeting

This part of the EPP protocol is described in RFC 5730. This command adheres to the standard.

For a more detailed explanation of the data collection policy announced via the greeting, please see the Data Collection Policy chapter.

As announced in the greeting, the following objects are available:

- Host
- Domain
- Contact

With regard to extensions, the following is available:

- secDNS-1.1
- dkhm-1.0

Please see the greeting response included in the appendices for illustration of the actual announcement.

login

This part of the EPP protocol is described in RFC 5730. This command adheres to the standard.

The login uses the general AAA functionality in DK Hostmaster. This means that in addition to the validation of username and password specified as part of the login request, an attempt is made to authorize the authenticated user for access to the actual EPP service and subsequent operations.

Authorisation is currently only available to active registrars, therefore the username provided must point to an entity with the role of registrar with the DK Hostmaster registry.

DK Hostmaster supports the change of passwords via EPP, only in production, however. A password change here will, however, be reflected in other systems. Please refer to the chapter Available Environments.

Currently, the only language supported is English. So the language parameter is ignored and all responses are provided in English.

logout

This part of the EPP protocol is described in RFC 5730. This command adheres to the standard.

There are no special additions or alterations to the specification or use of this command.

poll and message queue

This part of the EPP protocol is described in RFC 5730. This command adheres to the standard.

There are no special additions or alterations to the specification or use of this command.

* DRAFT *

DK Hostmaster

create domain

This part of the EPP protocol is described in RFC 5731. This command adheres to the standard. DK Hostmaster, however, is based on an asynchronous domain creation workflow. All domain requests are enqueued for further processing and their creation will be in a state of pending.

A well-formed request for domain creation will then always result in:

1001, "Command completed successfully; action pending"

The extension in response will provide a unique tracking number, which can be used to identify the creation request across provisioning channels offered by DK Hostmaster. The result of the further processing will be relayed back via EPP, see poll and message queue above.

So the customised response for a domain creation request looks as follows:

```
<?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="1001">
      <msg>Create domain domain1.dk pending.</msg>
    </result>
    <msgQ count="2" id="ABC-1234-XY"></msgQ>
    <extension>
      <dkhm:trackingNo xmlns:dkhm="urn:dkhm:params:xml:ns:dkhm-1.0">1234</
dkhm:trackingNo>
    </extension>
    <trID>
      <clTRID>805a5727e3c1e72e2cc4cf5d9ad6e8b4</clTRID>
      <svTRID>9917BE58-3D53-11E2-A5BD-C532BF0DC46A-1234</svTRID>
    </trID>
  </response>
</epp>
```

This tracking number, listed as an extension and does not replace or interfere with the normal use of EPP's transaction keys, **clTRID** and **svTRID**, but are EPP channel specific, whereas the tracking number is considered *global* in DK Hostmaster. The tracking number is also appended to the **svTRID** in addition to the listing in the extension part. Please see the last digits following the last dash.

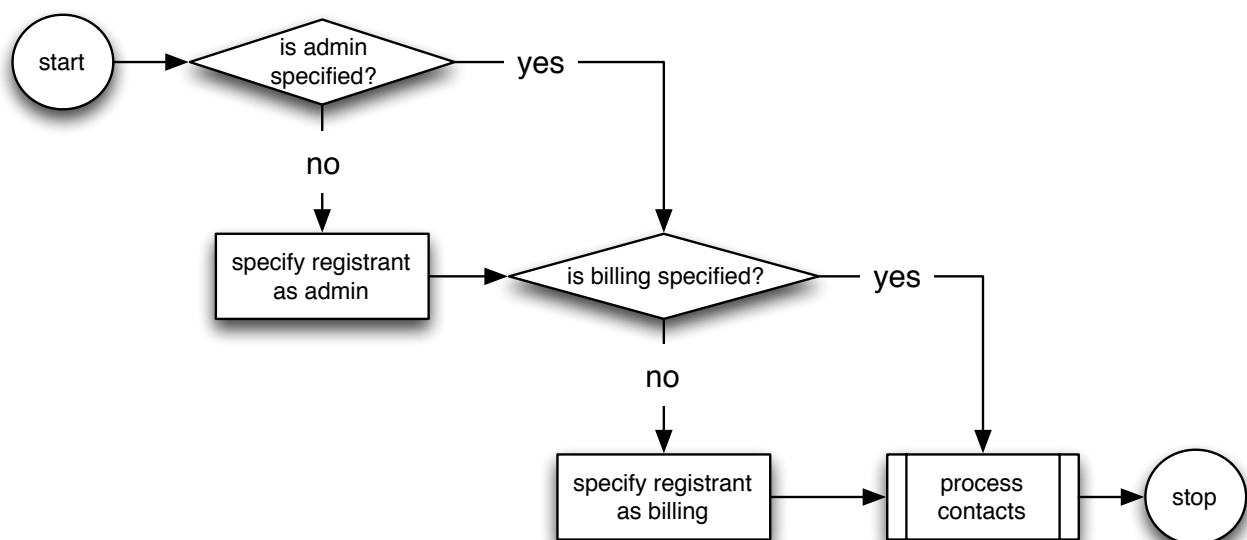
```
<svTRID>9917BE58-3D53-11E2-A5BD-C532BF0DC46A-1234</svTRID>
```

The default value for domain value, if not specified, is one year.

As for the user entities some mappings are made so all relevant roles are specified.

EPP	DKHM	Fallback	Note
admin	administrator (fuldmægtig)	registrant	optional, will use fallback
billing	billing (betaler)	registrant	optional, will use fallback
tech	keyholder (nøgleansvarlig)		optional, will be ignored if keyholder is specified
registrant	registrant		mandatory
<i>keyholder</i>	keyholder (nøgleansvarlig)		optional, if specified it will ignore tech. This is an attribute introduced by DK Hostmaster
registrar	registrar		mandatory

Please note that the command does not support IDN notation for specifying domain names, please use the specified UTF-8 character set.



check domain

This part of the EPP protocol is described in RFC 5731. This command adheres to the standard.

* DRAFT *

DK Hostmaster

info domain

This part of the EPP protocol is described in RFC 5731. This command adheres to the standard.

create host

This part of the EPP protocol is described in RFC 5732.

Creation of hosts requires a contact object to be assigned to the request. The specified contact should be a user entity requested as the name server responsible.

A well-formed request for host creation will always result in:

1000, "Command completed successfully"

A later request for host information will indicate the state of the host.

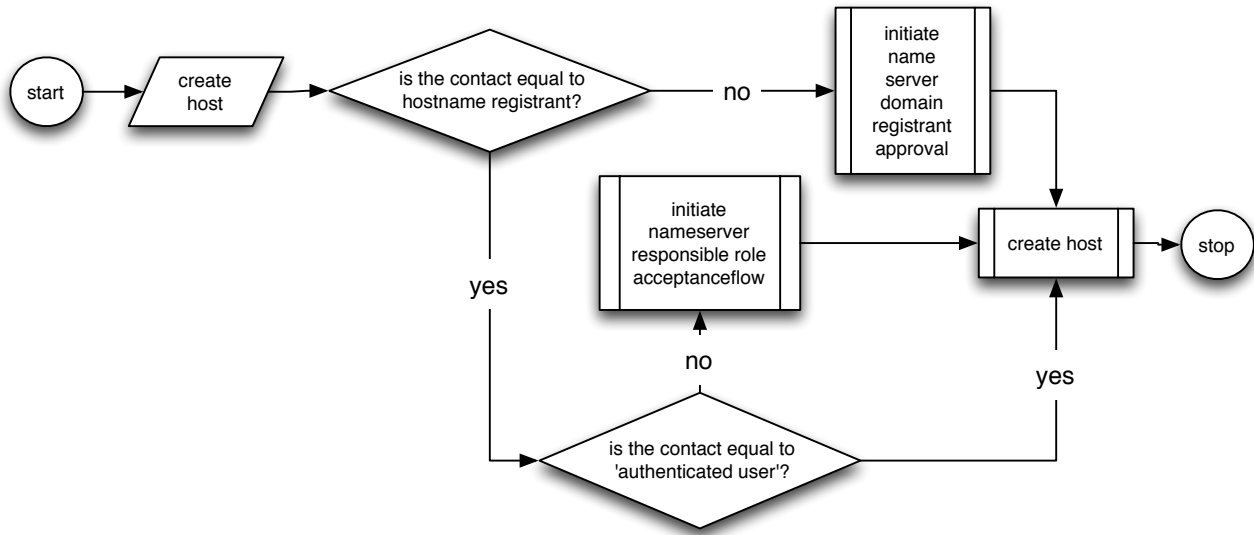
When the contact/user requested as responsible accepts the role of name server responsible, the host will be activated. Upon rejection of the request, a message indicating this will be relayed back via EPP, see poll and message queue above.

```
<?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>
      <host:create xmlns:host="urn:ietf:params:xml:ns:host-1.0"
        xsi:schemaLocation="urn:ietf:params:xml:ns:host-1.0
host-1.0.xsd">
        <host:name>ns2.eriktester.dk</host:name>
        <host:addr ip="v4">127.0.0.1</host:addr>
        <host:addr ip="v6">0:0:0:0:0:0:1</host:addr>
      </host:create>
    </create>
    <extension>
      <dkhm-host:create xmlns:dkhm-host="urn:dkhm:params:xml:ns:dkhm-
host-1.0">
        <dkhm-host:contact>TEST1234-DK</dkhm-host:contact>
      </dkhm-host:create>
    </extension>
    <cLTRID>71a8f4d92d5a23105ad7ba858155d1d8</cLTRID>
  </command>
</epp>
```

This is a diagram depicting the general algorithm used for handling host creation requests:

* DRAFT *

DK Hostmaster



check host

This part of the EPP protocol is described in RFC 5732. This command adheres to the standard.

info host

This part of the EPP protocol is described in RFC 5732. This command adheres to the standard.

create contact

This part of the EPP protocol is described in RFC 5733.

This command has been extended with the following fields:

- User type, which has to be one of:
 - C - indicating a company
 - P - indicating a public organisation
 - A - indicating an association
 - I - indicating an individual

The user type will result in context-specific interpretation of the following fields:

- EAN - this number is only supported for user types: C, P and A. It is only mandatory for A and optional for C and P.
- CVR - (VAT number) this is only supported for user types: C, P and A. The number is required for handling VAT correctly, mandatory for user types C and P and optional for the user type A.

The contact-id field is normally auto-generated and assigned by DK Hostmaster. EPP do however open up for providing a contact-id in the context of the create contact command. This field is validated on the server site, it is however recommended to perform a check contact on the requested contact-id prior to the create contact request.

* DRAFT *

DK Hostmaster

If the client side can however request that the contact-id is auto-generated and assigned by DK Hostmaster by providing the keyword "auto", which will result in an available and validated contact-id for the specified contact object.

```
<contact:id>auto</contact:id>
```

Please note that the auto keyword is in lower-case.

Contact creation under EPP opens for the ability to represent postal information in both local and international representations. Due to the representation in DK Hostmasters system for handling contacts the following rules are applied to postal information.

For Denmark the local representation is chosen and the international representation is discarded. For other countries the international representation is chosen and the local representation is discarded. Please see the table below.

Denmark	Other country
Local representation	Local representation
International representation	International representation

Here follows a basic example:

```
<?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>
      <contact:create xmlns:contact="urn:ietf:params:xml:ns:contact-1.0"
        xsi:schemaLocation="urn:ietf:params:xml:ns:contact-1.0
contact-1.0.xsd">
        <contact:id>EJ123-DK</contact:id>
        <contact:postalInfo type="loc">
          <contact:name>Erik Johansen</contact:name>
          <contact:org>DK Hostmaster</contact:org>
          <contact:addr>
            <contact:street>Kalvebod brygge 45, 3. sal</
contact:street>
            <contact:city>København V</contact:city>
            <contact:sp/>
            <contact:pc>1560</contact:pc>
            <contact:cc>DK</contact:cc>
          </contact:addr>
        </contact:postalInfo>
        <contact:postalInfo type="int">
```

* DRAFT *

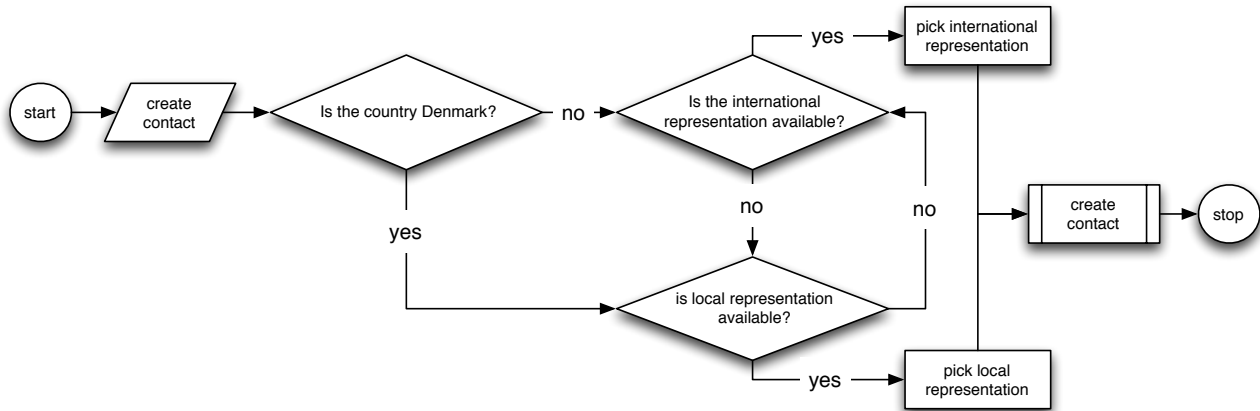
DK Hostmaster

```
<contact:name>Erik Johansen</contact:name>
<contact:org>DK Hostmaster</contact:org>
<contact:addr>
  <contact:street>Kalvebod brygge 45, 3.</
contact:street>
  <contact:city>Copenhagen V</contact:city>
  <contact:sp/>
  <contact:pc>1560</contact:pc>
  <contact:cc>DK</contact:cc>
</contact:addr>
</contact:postalInfo>
<contact:voice>+45.33646060</contact:voice>
<contact:fax/>
<contact:email>info@dk-hostmaster.dk</contact:email>
<contact:authInfo>
  <contact:pw/>
</contact:authInfo>
</contact:create>
</create>
<extension>
contact-1.0">
  <dkhm-contact:create xmlns:dkhm-contact="urn:dkhm:params:xml:ns:dkhm-
  <dkhm-contact:userType>C</dkhm-contact:userType>
  <dkhm-contact:CVR>24210375</dkhm-contact:CVR>
  </dkhm-contact:create>
</extension>
<cLTRID>806f9b0eb180d8b3f95ab98def3acf91</cLTRID>
</command>
</epp>
```

This is a diagram depicting the general algorithm used for resolving the address data. The algorithm presupposes that at least one address is present.

* DRAFT *

DK Hostmaster



It is important to note that if the international representation is specified, but data are provided in local representation or only local representation is provided for an international address, communication to the specified address might prove unreliable.

The handling of name and organisation is also a special case. Where the following mapping is made based on the user type.

User type	Name and Organisation Provided		Only name provided
	name mandatory	organisation optional	name mandatory
C (Company)	attention	name	name
P (Public organisation)	name	-	name
A (Association)	attention	name	name
I (Individual)	attention	name	name

The data is collected as required by danish legislation. See also the data collection policy section below.

check contact

This part of the EPP protocol is described in RFC 5733. This command adheres to the standard.

info contact

This part of the EPP protocol is described in RFC 5733. This command adheres to the standard.

Data Collection Policy

This chapter describes the data collection policy announced via the **greeting** available using the **hello** command.

Please refer to the greeting response included in the appendices as an example.

Access

The EPP service provides access to identified data relating to all available entities (personal and organisational) under the terms and conditions that anonymity will be applied as specified by the entities in question, and in accordance with general terms and conditions and legislation.

* DRAFT *

DK Hostmaster

Purpose Statement

The collected data will be used solely for provisioning and administrative purposes. As specified under access above, and in the recipient statement below, some data are required to be publicly available and therefore some data will be accessible to the public under the circumstances specified in the referred sections.

Address data and contact information is collected as required by danish legislation.

Recipient Statement

Recipients of data are specified as other and unrelated. As specified in the purpose statement section and under access, identified data is made publicly available, therefore DK Hostmaster will not be able to control how the publicly available information is used.

Retention Statement

Data will be retained with DK Hostmaster as required by Danish legislation.

References

Here is a list of documents and references used in this document

- RFC: 3735 Guidelines for Extending Extensible Provisioning Protocol
- RFC: 5730 EPP Basic Protocol
- RFC: 5731 EPP Domain Name Mapping
- RFC: 5732 EPP Host Mapping
- RFC: 5733 EPP Contact Mapping
- RFC: 5910 Domain Name System (DNS) Security Extensions for the Extensible Provisioning Protocol
- Current domain registration form: <https://www.dk-hostmaster.dk/fileadmin/formularer/da-4.00en.txt>
- Documentation on the above form: <https://www.dk-hostmaster.dk/english/technical-administration/forms/register-domainname/>

* DRAFT *

DK Hostmaster

Resources

A list of resources for DK Hostmaster EPP support is found below.

XML Schemas

This is a list of the schemas currently used in the DKHM EPP Service described in this document. Please note that the XSD implementation preserves the original namespace and does not make alterations to this apart from adding the already described XML elements.

- epp-1.0.xsd
- eppcom-1.0.xsd
- contact-1.0.xsd
- domain-1.0.xsd
- host-1.0.xsd
- dkhm-1.0.xsd
- secDNS-1.1.xsd

The files are all available for download from:

<https://www.dk-hostmaster.dk/epp>

Mailing list

DK Hostmaster operates a mailing list for discussion and inquiries about the DK Hostmaster EPP implementation. To subscribe to this list, write to the address below and follow the instructions. Please note that the list is for technical discussion only, any issues beyond the technical scope will not be responded to, please send these to the contact issue reporting address below and they will be passed on to the appropriate entities within DK Hostmaster.

epp-discuss+subscribe@liste-dk-hostmaster.dk

Issue Reporting

For issue reporting related to this specification, the EPP implementation or test, sandbox or production environments, please contact us. You are of course welcome to post these to the mailing list mentioned above, otherwise use the address specified below:

tech@dk-hostmaster.dk

Additional Information

More information and the latest revision of this specification are available at the DK Hostmaster website:

<https://www.dk-hostmaster.dk/epp>

* DRAFT *

DK Hostmaster

Data Sheet

Environment	Version	URI	Notes
Production	1.0.0	epp.dk-hostmaster.dk	Not currently available
Sandbox	1.0.0	epp-sandbox.dk-hostmaster.dk	Not currently available
Test	1.0.0	epp-test.dk-hostmaster.dk	

* DRAFT *

DK Hostmaster

Appendices

Greeting

```
<?xml version="1.0" encoding="utf-8" standalone="no"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
  <greeting>
    <svID>DK Hostmaster EPP Service (unittest): 0.0.4</svID>
    <svDate>2012-11-02T08:50:49.0Z</svDate>
    <svcMenu>
      <version>1.0</version>
      <lang>en</lang>
      <objURI>urn:ietf:params:xml:ns:host-1.0</objURI>
      <objURI>urn:ietf:params:xml:ns:domain-1.0</objURI>
      <objURI>urn:ietf:params:xml:ns:contact-1.0</objURI>
      <svcExtension>
        <extURI>urn:ietf:params:xml:ns:secDNS-1.1</extURI>
        <extURI>urn:dkhm:params:xml:ns:dkhm-1.0</extURI>
      </svcExtension>
    </svcMenu>
    <dcp>
      <access>
        <personalAndOther />
      </access>
      <statement>
        <purpose>
          <admin />
          <prov />
        </purpose>
        <recipient>
          <other />
          <unrelated />
        </recipient>
        <retention>
          <legal />
        </retention>
      </statement>
    </dcp>
  </greeting>
</epp>
```