
 NORID DRIVER REGISTERET FOR NORSKE DOMENENAVN norid.no	EXTERNAL Spec	Document Number: N2007-Spec-023	Status: Approved	1 (36)
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Norid


EPP Interface Specification

This document specifies the EPP interface to the Norid EPP Registry System.

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1 INTRODUCTION

This document describes the interface to the Norid EPP Registry System. With a few exceptions, the registry system will follow the EPP protocol standard for domain name, host and contact registrations.

The EPP interface is based on the Extensible Provisioning Protocol (EPP) described in RFC5730 [1], together with the standard EPP extensions for domain, host and contact objects as described in RFC5731 [2], RFC5732 [3], RFC5733 [4] and RFC5910 [6].

Chapters 2 through 4 describe the EPP-commands, attributes and their usage.

In addition to this, the EPP interface uses some local extensions which are described in chapter 5. It is assumed that the reader is familiar with the EPP protocol and the extension mechanisms it provides.

The interface described in this document is informal. The formal interface specification is found in the EPP XML-Schemas for .NO [7]. In case of discrepancies between this document and the XML-schemas, the XML-schemas shall have precedence.

1.1 Scope


The document is part of the Norid EPP registry product.

1.2 Related Documents

Ref	Title	Doc nr
[1]	Extensible Provisioning Protocol (EPP)	RFC5730
[2]	Extensible Provisioning Protocol (EPP) Domain Name Mapping	RFC5731
[3]	Extensible Provisioning Protocol (EPP) Host Mapping	RFC5732
[4]	Extensible Provisioning Protocol (EPP) Contact Mapping	RFC5733
[5]	Extensible Provisioning Protocol (EPP) Transport Over TCP	RFC5734
[6]	Domain Name System (DNS) Security Extensions Mapping for the Extensible Provisioning Protocol (EPP)	RFC5910
[7]	EPP XML-Schemas for .NO (v1.0.2)	https://teknisk.norid.no/registrar/system/dokumentasjon/EPP-XML-Schemas-1.0.2.no.tar.gz

1.3 Glossary

See [1].

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2 DATA MODEL ISSUES

2.1 Ids


Each EPP client has its own server unique client id. This id will be the local part of the registrar handle.

EPP requires that each domain, host and contact object has a globally unique repository object identifier (roid). The roid is a concatenation of a local identifier, a hyphen ("-"), and a repository identifier. In the EPP registry, the roid will correspond to the "object handles" of Norid's current registry database (e.g. UNA31O-NORID, UH1R-NORID).

In addition to the roid, each domain, host and contact has a local name. The local name is always used when an object is referred to in an EPP request or response. For domains, the local name is the full domain name. For hosts, the local name is the full host name. For contact objects, the local name is the local part of the roid.

2.2 Object sponsorship


In the EPP data model, each object is required to have a sponsor. In the EPP registry, the sponsor is the registrar currently 'owning' the object. The client who creates an object automatically becomes the sponsor for it. The sponsorship of a domain can be changed by the domain transfer command (see chapter 4). The sponsorship of a contact or host cannot be changed. Only the sponsor is allowed to perform a transformation of an object (update, renew, withdraw, delete). An object may be used (referred from) by another object with the same sponsor.

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2.3 Domain object attributes

The following domain object attributes should be available in EPP commands: The Norid extension commands and attributes are described in more depth in chapter 5.

name	properties	commands	visibility
RFC5731			
name	required	create, info, check, delete, update, transfer request, transfer execute ¹⁾ , transfer query, transfer cancel, renew, withdraw ¹⁾	all
roid	required	info	all
status	required, multiple	info, update	all
registrant	required	create, info, update	all
contact, admin	not allowed	create, info, update	all
contact, tech	required, multiple	create, info, update	all
clID	required	info	all
crID	required	info	all
crDate	required	info	all
upDate	required	info	all
trDate	required	info	all
exDate	required	info	sponsor
ns ²⁾	required	create, info, update	all
hostObj	required, multiple	create, info, update	all
authInfo ³⁾	required ³⁾	create, info, update	sponsor
period ⁴⁾	optional	create, renew, transfer execute	-
Norid extensions			
token ⁵⁾	optional	transfer execute	-
notify ⁶⁾	optional	transfer request	
mobilePhone ⁶⁾	optional	transfer request	
email ⁶⁾	optional	transfer request	
deleteFromDNS	optional	delete	-
deleteFromRegistry	optional	Delete	-
Norid extensions (1.1 version only)			
applicantDataset ⁷⁾	optional ⁸⁾	create, info, update	all
versionNumber ⁷⁾	required	create, info, update	all
acceptName ⁷⁾	required	create, info, update	all
acceptDate ⁷⁾	required	create, info, update	all
updateClientID ⁷⁾	required	info	all
updateDate ⁷⁾	required	info	all
SecDNS-1.1 extensions ⁹⁾ RFC5910			

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name	properties	commands	visibility
maxSigLife ¹⁰⁾	not allowed ¹⁰⁾	create, info, update	all
dsData ¹¹⁾	optional ¹¹⁾	create, info, update	all
keyTag	required	create, info, update	all
alg	required	create, info, update	all
digestType	required	create, info, update	all
digest	required	create, info, update	all
keyData ¹²⁾	optional ¹²⁾	create, info, update	all
flags	required	create, info, update	all
protocol	required	create, info, update	all
alg	required	create, info, update	all
pubKey	required	create, info, update	all
keyData ¹³⁾	not allowed ¹³⁾	create, info, update	all
urgent ¹⁴⁾	not allowed ¹⁴⁾	update	sponsor

¹⁾ Norid command extension

²⁾ Name server delegations must be specified as references to host objects, not domain attributes.

³⁾ authInfo is required unless sponsor is reg0, in which case it will be empty. To make it possible for a non-sponsoring registrar to see whether a domain has an authInfo set or not, the authInfo is carried over EPP as described in ch. 3.3.1. After introduction of the new data model, this is relevant only for domains sponsored by reg0.

⁴⁾ The 'period' field specifies the length of the next renewal period. The period can be specified in the units of months or years. The maximum period allowed is 1 year. A domain create can only specify 1 year, whilst a renew or a transfer execute may specify a smaller period of 1-12 months.

⁴⁾ The 'token' field is used for specifying a one-time password in a domain transfer execute.

^{5) 6)} If a registrar initiates a one-time-token scenario as shown in chapter. 4.2.3, the one-time-token will as default be sent to the primary email address of the registrant contact. An alternative address for the token can be specified in the notify extension, which may carry either an 'email' or a 'mobilePhone' field. The email address specified must then match one of the email-addresses registered for the domain's admin contact or registrant. Likewise, if the mobilePhone is specified, it must match the mobile phone number registered for the admin contact or the registrant.


⁷⁾ Domain1.1 extensions are used to carry information for the applicantDataset:

⁸⁾ The applicantDataset extension is allowed and used only when the 1.1 version is negotiated by EPP-greeting and EPP-login.

⁸⁾ An applicantDataset is required in a domain-create.

⁸⁾ An applicantDataset is required in a domain-update in case the update performs a registrant change.

⁸⁾ An applicantDataset can be updated in case an applicant, for some reason, has issued a new applicant statement. A domain-update that corresponds to the new applicant statement can then be sent in.

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⁸⁾An applicantDataset is returned in the response of an info-command, but only if the 1.1 version is negotiated and only if an applicantDataset is registered on the domain.

Attributes in the applicantDataset are:

- versionNumber: The version number of the applicant statement which was displayed to and accepted by acceptName.
- acceptName: The name of the person who accepted the applicant statement.
- acceptDate: The date/time when acceptName accepted the applicant statement.
- updateClientID: The client identifier of the registrar who has performed the latest update of the applicantDataset. (Note that the crID attribute tells who created the domain and thus also the initial applicantDataset).
- updateDate: The date/time for the latest update of the applicantDataset.

⁹⁾ sec-DNS-1.1 extensions are used to carry information for DNSSEC DS and key data. DNSSEC data are allowed only when the secDNS-1.1 version is negotiated by EPP-greeting and EPP-login.

¹⁰⁾ The maxSigLife element is not allowed and will be rejected.

¹¹⁾ DNSSEC data shall be maintained using the DS Data Interface with OPTIONAL Key Data by use of the 'dsData' element. The 'dsData' element is optional, but must be used to maintain DS data. See section 2.3.1 Registrars and the 'DNSSEC enabled' flag for more information about how and when to use DNSSEC data.

¹²⁾ The 'keyData' element inside a 'dsData' is optional, but must be used to maintain key data related to a DS.

¹³⁾ The 'keyData' element via the Key Data Interface is not allowed and will be rejected.

¹⁴⁾ The domain-update 'urgent' attribute is not allowed and will be rejected.


2.3.1 Registrars and the 'DNSSEC enabled' flag

A registrar account has a specific 'DNSSEC enabled' flag, which states whether the registrar is able and willing to handle DNSSEC data.

The flag need to be enabled to allow a registrar to register and maintain DNSSEC data on his domains.

If the flag is not enabled, the registrar will only be allowed to remove any DNSSEC data that might be registered on a domain. The remove 'all' variant must then be used, and all DNSSEC data is then removed, and will effectively unsecure the domain.

Specific rules applies for registrar transfers. See ch. 4.3Transfer of a domain secured by DNSSEC for details.

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2.4 Host object attributes

The following host object attributes should be available in EPP commands:

name	properties	commands	visibility
RFC5732			
name ¹⁾	required	create, info, check, delete, update	all
roid	required	info	all
status	required, multiple	info	all
²⁾ addr	optional, multiple	create, info, update	all
crID	required	info	all
crDate	required	info	all
upDate	required	info	all
Norid extensions			
contact	optional	create, info, update	all
sponsoringClientID ³⁾	optional	info	-


¹⁾ The 'name' attribute is used as lookup key for hosts in EPP info requests. Since multiple registrars may have a host object with the same name, the info command can as its default behavior only be used to lookup a registrars own objects. See 'sponsoringClientID' for extended functionality.

²⁾ IP-addresses may not be registered on external hosts (host names outside the .no zone). For host names within the .no zone, one or more ip-addresses is required.

³⁾ The 'sponsoringClientID' extension is defined to make it possible for a registrar to lookup host objects owned by another registrar.

A host object can be created before the host name exists in DNS. If the host name is within the .no zone, the superordinate domain must be the first domain to be registered on the host.

When a domain is transferred to another registrar, a copy of the host object is created for the new registrar if it does not already exist with the new registrar as sponsor.

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2.5 Contact object attributes


The following contact object attributes should be available in EPP commands:

name	properties	commands	visibility
RFC5733			
id	required	create, info, delete, update	all
roid	required	info	all
status	required, multiple	info	all
postallInfo ¹⁾	required	create, info, update	all
name	required	create, info, update	all
org ²⁾	optional ²⁾	create, info, update	all
addr	required	create, info, update	all
street	optional, multiple	create, info, update	all
city	required	create, info, update	all
pc	required	create, info, update	all
cc	required	create, info, update	all
voice	optional	create, info, update	all
fax	not allowed	create, info, update	all
email	required	create, info, update	all
clID	required	info	all
crID	required	info	all
crDate	required	info	all
upID	required	info	all
upDate	required	info	all
Norid extensions			
type ³⁾⁴⁾	required	create, info	all
organization ⁴⁾	not allowed ⁴⁾	create, info, update	all
Identity ⁶⁾	optional ⁵⁾	create, info, update	all
mobilePhone	optional	create, info, update	all
email	optional, multiple	create, info, update	all
roleContact ⁴⁾	not allowed ⁴⁾	create, info, update	all

¹⁾ Only the local variant ('loc' attribute) of postallInfo (name and post address) is supported.

²⁾ The 'org' field is required for a registrant organization contact, and shall contain the organization name. In this case, the 'name' field shall contain the name of the legal contact.

³⁾ The 'type' field is required for all contact objects. A contact can be of type person, organization or role.

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4) After introduction of the new data model, person and role contacts can have no organization relations, and role contacts can have no person contact relations. Also, a registrant must be an organization or a person, and a technical contact must be a role.

5) For a registrant contact, an Identity attribute is always required.

6) A registrant contact object must be registered with a unique identity:

- For an organization, the identity is the organization number as registered in the Brønnøysund Register Center. The identityType must be set to 'organizationNumber' and the 'identityValue' must be set to the 9 digit Brønnøysund number.
- Some organizations or organization types may not have an official Brønnøysund number. Such organizations can still be registered. To be uniquely identified, they must be assigned a local identifier issued by the registry. The identityType must then be set to 'localIdentity' and the 'identityValue' must be set to the identity value assigned by the registry.
- For a private individual, the identity is the one generated for the individual by the Norid PID automate service. The identityType must be set to 'anonymousPersonIdentity' and the 'identityValue' must be set to the 'N.PRI.xxxxxxxx' private identity.
- The identityType 'nationalIdentityNumber' is not yet supported and must not be used.

2.5.1 Disclose usage

The voice, fax, email and the extensions mobilePhone and email has an optional <disclose> element. This element notes the clients preference to allow or restrict disclosure of the respective phone number or email address. If not present, the servers stated data collection policy is used.


Note that disclose elements cannot be used towards the Registry System, attempts to use disclose will be rejected by server policy.

2.6 Status flags

The EPP standard provides a set of status flags which serve as locking mechanisms for objects in the registry.

The flag 'serverTransferProhibited' may in the future be set by the Registry to lock domain objects. The flag is then set and unset by the Registry and locks the domain so that all transfer requests are rejected.

For other objects, no flags are supported. This means that no flags can be set by a registrar.

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3 EPP COMMANDS

3.1 Transport layer


The EPP registry server will use the Transport over TCP mapping as described in RFC5734. Transport Layer Security (TLS) will be used to secure the connection. Server certificate will be used for authentication.

3.2 Session management

The server supports the two session management commands login and logout, which are used to open and close a session. On login, the client must supply a client id and a plain text password. The client may also supply a new password which will replace the old password for subsequent logins.

The server will have restrictions on:

1. The number of simultaneously open sessions per client.
2. The maximum timespan of a session.
3. The maximum timespan of inactivity in a session.

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3.3 Query commands

Query commands are used to retrieve information about registry objects and service messages. The query commands available are 'info', 'poll' and 'transfer query'. For all these commands, a result should be produced immediately without pending actions.

Query commands	
command	object
info	domain, host, contact
check	domain, host
transfer query	domain
poll	message queue

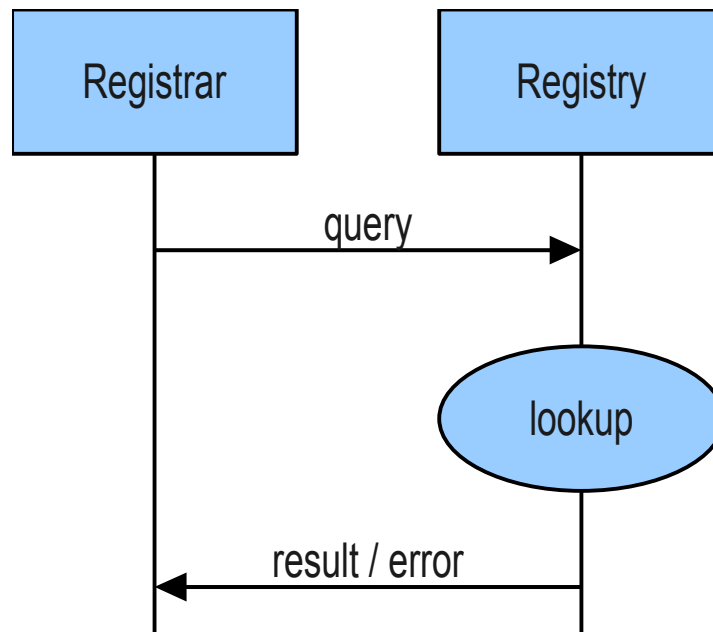



Illustration 1: Query command
 Illustration 2: Command with pending action


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3.3.1 The authInfo attribute in the domain info response

A registrar who is not the sponsor for a domain is not permitted to see the authInfo value when it is set. However, it is interesting for the registrar to know whether the domain has an empty authInfo, because then a transfer can be performed without use of authInfo or one time token procedures.

The server will signal these two cases as described in the below table. The example domain 'dom-auth-set.no' has an authInfo set to 'dwa-secret', and the example domain 'dom-auth-empty.no' has an empty authInfo.

Domain name	Info response contents	Registrar is sponsor (Comment)
dom-auth-set.no	<pre><domain:infData ... : <domain:upDate>2010-...</domain:upDate> <domain:exDate>2011-...</domain:exDate> <domain:authInfo> <domain:pw>dwa-secret</domain:pw> </domain:authInfo> </domain:infData> :</pre>	<p>Yes</p> <p>(Sponsors will get the real authInfo value)</p>
dom-auth-set.no	<pre><domain:infData ... : <domain:upDate>2010-...</domain:upDate> <domain:authInfo> <domain:pw></domain:pw> </domain:authInfo> </domain:infData> :</pre>	<p>No</p> <p>(Non-sponsors will get the authInfo element, but with an empty pw which indicates that an authInfo value is set.)</p>
dom-auth-empty.no	<pre><domain:infData ... : <domain:upDate>2010-...</domain:upDate> <domain:exDate>2011-...</domain:exDate> </domain:infData> :</pre>	<p>Yes</p> <p>(Sponsors will get no authInfo element, which indicates that the authInfo is empty.)</p>
dom-auth-empty.no	<pre><domain:infData ... : <domain:upDate>2010-...</domain:upDate> </domain:infData> :</pre>	<p>No</p> <p>(Non-sponsors will get no authInfo element, which indicates that the authInfo is empty.)</p>

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3.4 Transform commands

Transform commands are used to perform changes on registry objects. The transform commands available are 'create', 'delete', 'update', 'renew', 'transfer' and 'withdraw'. The flow sequence of general transform commands are shown in Illustration 2 and Illustration 3. The 'transfer' command involves the registrant, and have a more complex run, see chapter 4.

Transform commands	
command	object
create	domain, host, contact
update	domain, host, contact
renew	domain
transfer request	domain
transfer cancel	domain
transfer execute (.no extension)	domain
delete	domain, host, contact
withdraw (.no extension)	domain

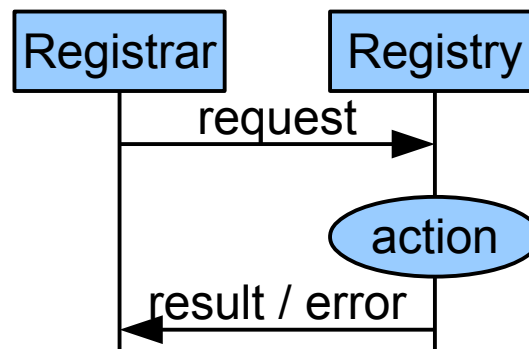



Illustration 2: Command executed immediately

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3.4.1 Pending actions

Transformation commands may require one or more pending actions to be executed before the command is completed. In that case, an immediate response is produced with the result 'command completed successfully, pending action'. When the command completes, the result is queued in the clients service message queue.

A number of situations may trig a pending action, and some typical examples are:

command	conditions	pending actions
Create domain	* The domain is flagged by the registry with the flag: - domain create is restricted * The domain name contains a parent domain name which is defined as a category domain	Offline review. The operator will decide whether the application can be accepted.
Create domain Update domain	The registrant contact is flagged by the registry with the flag: - identity as registrant restricted	Offline review. The operator will decide whether the application can be accepted.
Update host	Host name is changed, or IP-addresses are changed/removed/added	Offline review. The operator will perform a Domain DNS check check to verify that DNS is updated to reflect the new name or IP-address change. Advice: Change only the host name or the IP-address by each update.

Offline review:


For some commands, a registry operator must perform an offline review before the command is accepted and executed.

Domain DNS check:

The domain DNS check shall verify that the DNS configuration for a given host and domain is correct. If the check fails, the application may be rejected or kept for a later rerun by the operator.

Registrant confirmation:

For some commands, a confirmation from the current registrant is needed before the command can be executed.

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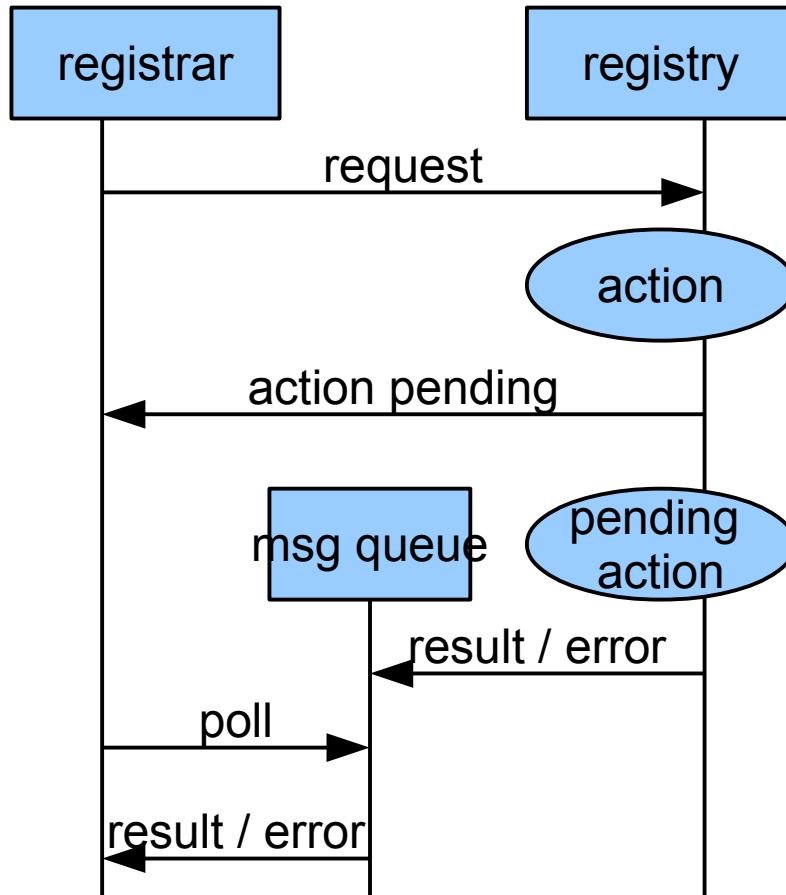



Illustration 3: Command with pending action

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3.4.2 The renew command

The renew command is used to update the expiration date of a domain object. By default, the command increases the expiration date by one year. The 'period' element may be used to specify a smaller time period.

A renewal is effectuated immediately and cannot be canceled.

3.4.3 The delete command

Domains, hosts and contacts can be deleted by the delete command. Hosts and contacts can be deleted only if they are not being referred to from other objects. Host and contact deletion is effectuated immediately.


The 'delete domain' command will start a deletion process for the domain. An optional quarantine date (deleteFromDNS) and a deletion date (deleteFromRegistry) for this process may be specified in the EPP request.

If no dates are specified, the registry will apply sensible default dates to ensure that the domain goes through a quarantine period before it is physically removed. During the quarantine period the domain will not be published in DNS, thus giving the registrant a chance to react in case the deletion was not according to his request.

3.4.4 The withdraw command

The withdraw command is a local extension available in the EPP registry. This command can be used to free a registrar from a domain that he is currently sponsoring. The domain is then transferred to the fictive 'reg0' registrar.

When a domain is sponsored by 'reg0', the authInfo is not set. This makes it easier for a real registrar to transfer it and take sponsorship.

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4 TRANSFER DOMAIN BETWEEN REGISTRARS

A change of sponsorship for a domain is carried out by a transfer operation. Only the sponsor is allowed to make changes to a domain object, and the sponsor is responsible for all the changes done to it. The transfer operation transfers this responsibility to a new registrar, and must therefore be secured in a proper way.

4.1 Who take part in the transfer?

There are four parts in a transfer operation: A registrant, the current registrar, the new registrar and the registry. Normally, all parts wants the operation to be done as fast and simple as possible. But the parts also have some interests which may conflict with another.

The current registrar is responsible for keeping the domain functioning, and wants to be assured that a different registrar can not transfer the domain without the registrants permissions.

A new registrar wants to be able to transfer a domain as long as the registrant agrees to this, regardless whether the current registrar agrees.

The registrant wants to be able to transfer a domain to a new registrar, regardless whether the current registrar agrees to this.

The registry wants to have as little contact with the registrant as possible. Ideally, the registrant should never have to contact the registry directly.

4.2 The auth-info code

After the introduction of the new data model in 2017, a domain shall always be secured with an auth-info code. The auth-info code is then registered as an attribute to the domain object by the registrar and sent to the registrant.

The auth-info will automatically be overwritten by the registry with a newly generated value whenever the domain is transferred or the registrant is changed.

Depending on whether the domain has an auth-info code, and whether this code is available to the registrant, three transfer scenarios are possible:


4.2.1 Simple domain transfer (no auth-info / reg0 only)

If the domain has no auth-info code, any registrar may on the registrants request transfer the domain by issuing an EPP transfer execute to the registry.

Note: With the new data model, this scenario is only possible for domains sponsored by reg0.

- The registrant asks a new registrar to transfer a domain
- The new registrar issues a transfer execute with an empty or missing auth-info
- The transfer is completed.
- The registry notifies both registrars via EPP and the registrant via email

The sequence is identical to Illustration 4, except that the auth-info element is either not present or it contains an empty auth-info value.

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4.2.2 Transferring a domain secured with auth-info

The domain is secured with an auth-info code, and the code is available to the registrant.

- The registrant asks a new registrar to transfer a domain and gives him the auth-info
- The new registrar issues a transfer execute with the auth-info
- The transfer is completed.
- The registry notifies both registrars via EPP and the registrant via email.

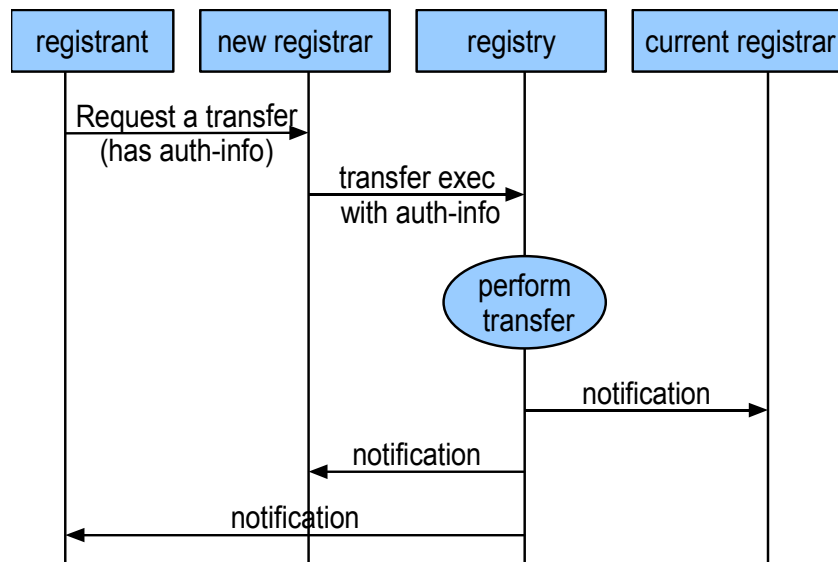



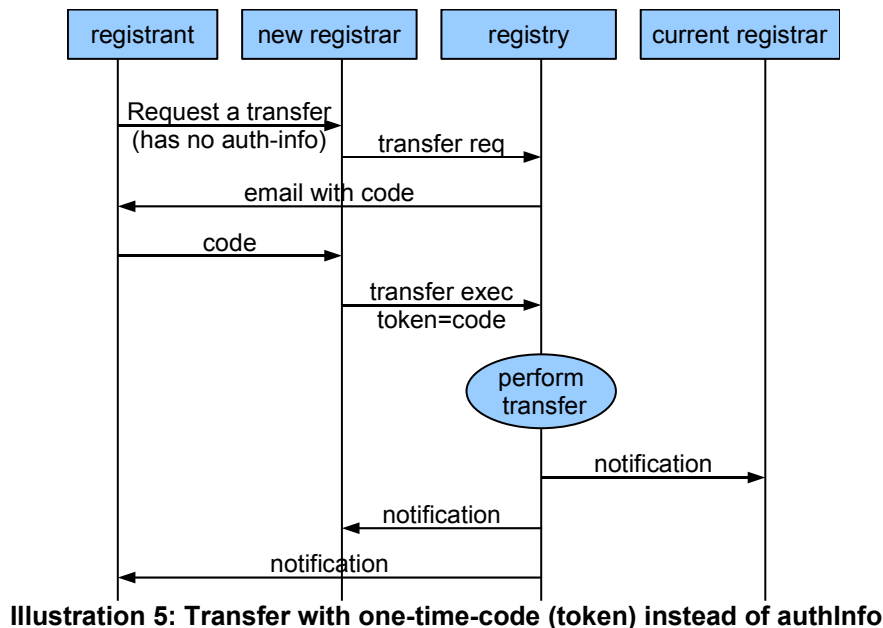
Illustration 4: Transfer with an authInfo

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4.2.3 Transferring a secured domain with a one-time code

If the registrant does not know the auth-info code, the new registrar may issue a transfer request which will make the server send out a one-time token back to the registrant. He must then communicate the token the new registrar who then issues a transfer exec containing the token. This variant can be used e.g. if the registrant has forgotten his auth-info code. The run then becomes as follows:

- The registrant asks the new registrar to transfer the domain
- The new registrar issues a transfer request without auth-info
- The registry generates a one-time transfer code and sends it to the preferred notify address of the registrant (email or mobilePhone as described in chapter 2.3).
- The registrant communicates the code to the new registrar
- The new registrar issues a transfer execute, this time with the token = transfer code
- The transfer is completed.
- The registry notifies both registrars via EPP and the registrant via email




4.3 Transfer of a domain secured by DNSSEC

Two variants exists for transfer of a domain secured by DNSSEC:

1. If the new registrar is 'DNSSEC enabled', the DNSSEC data will be preserved during the transfer.
2. If the new registrar is not 'DNSSEC enabled', the DNSSEC data will be stripped during the transfer. This will effectively unsecure the domain. The new registrar should therefore make sure that the registrant is informed properly that the domain will become unsecure.

Ref. ch. 2.3.1 Registrars and the 'DNSSEC enabled' flag for information about the flag.

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5 EXTENSIONS FOR THE EPP INTERFACE

This chapter describes the EPP XML schema extensions for the EPP interface.

5.1 Domain extensions

The domain command extensions are defined in the XML schema no-ext-epp-1.0.xsd, and should be used as an extension to the command mapping defined in epp-1.0.xsd (RFC5730).

The domain attribute extensions version 1.0 are defined in the XML schema no-ext-domain-1.0.xsd, and should be used as an extension to the domain mapping defined in domain-1.0.xsd (RFC5731).

The domain attribute extensions version 1.1 are defined in the XML schema no-ext-domain-1.1.xsd, and should be used as an extension to the domain mapping defined in domain-1.0.xsd (RFC5731).

5.1.1 Negotiation rules

The EPP registry system will, for a limited time period after 1.1 has been put into production, allow parallel usage of the two domain schema versions, 1.0 and 1.1. This should ensure that client side systems which are not yet updated to handle version 1.1 should still work.


While the time period is active, the server will present both schema versions in the greeting.

When the time period is passed, only the 1.1 version will be presented in the greeting.

The client will need to specify which schema version to use in each EPP-login, and that version has to be used for every domain operation. While the time period is active, both schemas can be selected and used.

A registrar who selects the 1.0 version signals that he is using the old model of how applicant declarations are collected and handled, and need to make sure to handle and archive them locally as before.

A registrar who selects the 1.1 version signals that he is using the new model of how applicant statements are collected and handled, and need not perform local archiving when the applicant statement data has been transferred to Norid by a domain-create or domain-update.

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5.1.2 The domain create command

This section is applicable for the XML schema no-ext-domain-1.1.xsd only.

The domain create command is extended with a required 'applicantDataset' element group containing the following elements:

1. A required <versionNumber> element
2. A required <acceptName> element
3. A required <acceptDate> element

See chapter 2.3 for further description of usage.

```

<element name="create" type="no-ext-domain:createType"/>


<complexType name="createType">
  <sequence>
    <element name="applicantDataset"
      type="no-ext-domain:applicantDatasetCreUpdType"/>
  </sequence>
</complexType>

<complexType name="applicantDatasetCreUpdType">
  <sequence>
    <element name="versionNumber" type="no-ext-domain:versionType"/>
    <element name="acceptName" type="no-ext-domain:acceptNameType"/>
    <element name="acceptDate" type="dateTime"/>
  </sequence>
</complexType>

<simpleType name="versionType">
  <restriction base="token">
    <pattern value="[0-9]+\.[0-9]+"/>
  </restriction>
</simpleType>

<simpleType name="acceptNameType">
  <restriction base="normalizedString">
    <minLength value="1"/>
    <maxLength value="255"/>
  </restriction>
</simpleType>

```


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5.1.3 The domain update command

This section is applicable for the XML schema no-ext-domain-1.1.xsd only.


The domain update command is extended with a required 'applicantDataset' element group containing the same elements as domain create.

See chapter 2.3 for further description of usage.

```
<element name="update" type="no-ext-domain:updateType"/>

  <complexType name="updateType">
    <sequence>
      <element name="chg"
        type="no-ext-domain:applicantDatasetChgType"
        minOccurs="0"/>
    </sequence>
  </complexType>

  <complexType name="applicantDatasetChgType">
    <sequence>
      <element name="applicantDataset"
        type="no-ext-domain:applicantDatasetCreUpdType"/>
    </sequence>
  </complexType>
```

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5.1.4 The domain info response

This section is applicable for the XML schema no-ext-domain-1.1.xsd only.

The domain info response is extended with an optional 'applicantDataset' element group containing the same elements as domain create and domain update, plus the following two additional informational attributes:

1. A required <updateClientID> element
2. A required <updateDate> element

See chapter 2.3 for further description of usage.


```

<element name="infData" type="no-ext-domain:infDataType"/>

<complexType name="infDataType">
  <sequence>
    <element name="applicantDataset"
      type="no-ext-domain:applicantDatasetInfoType"
      minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="applicantDatasetInfoType">
  <sequence>
    <element name="versionNumber" type="no-ext-domain:versionType"/>
    <element name="acceptName" type="no-ext-domain:acceptNameType"/>
    <element name="acceptDate" type="dateTime"/>
    <element name="updateClientID" type="eppcom:clIDType"/>
    <element name="updateDate" type="dateTime"/>
  </sequence>
</complexType>

```

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5.1.5 The domain transfer command

The domain transfer command is extended with an 'execute' operation. Of the standard operations, only 'query', 'request' and 'cancel' will be available. Some of these commands are used differently than specified in the RFC5730 EPP standard.

The 'request' operation is used to request the registry to send out a one-time token to the registrant of the domain. The one-time token will have a limited life time, and can be canceled using the transfer 'cancel' command.

The 'query' operation is used to query the status of ongoing and completed transfer operations.


The 'execute' operation is used to perform the transfer operation. The transfer 'execute' command may contain either the auth-info password of the domain, specified in the <authInfo> element, or a one-time token, specified in the extended <token> element. If the password or token is correct, the transfer is carried out immediately. If not, the transfer is canceled and an error code is returned. The 'execute' operation command may also carry a 'period' element, with behavior as explained in chapter 3.4.2 for the 'renew' command.

```
<element name="transfer" type="no-ext-domain:transferExtensionType"/>

  <complexType name="transferExtensionType">
    <sequence>
      <element name="token" type="no-ext-domain:transferTokenType"
        minOccurs="0"/>
      <element name="notify" type="no-ext-domain:transferNotifyType"
        minOccurs="0"/>
    </sequence>
  </complexType>

  <simpleType name="transferTokenType">
    <restriction base="token">
      <minLength value="1"/>
      <maxLength value="512"/>
    </restriction>
  </simpleType>

  <complexType name="transferNotifyType">
    <choice>
      <element name="email" type="eppcom:minTokenType"/>
      <element name="mobilePhone" type="contact:e164Type"/>
    </choice>
  </complexType>
```

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5.1.6 The domain delete command

The domain delete command is extended with two elements. <deleteFromDNS> specifies the date when the domain will no longer be published in DNS. <deleteFromRegistry> specifies the date when the domain is deleted from the registry.

```
<complexType name="deleteExtensionType">
  <sequence>
    <element name="deleteFromDNS" type="date"/>
    <element name="deleteFromRegistry" type="date"/>
  </sequence>
</complexType>
```


5.1.7 The domain withdraw command

The domain withdraw command is defined in the local protocol extension, and is not part of the base EPP protocol. The command is used by a registrar to withdraw from being the sponsor of a domain. The fictive reg0 registrar then becomes the new temporary sponsor until a new registrar transfers it, or it is deleted for some reason.

The domain withdraw command has one element <name> which should contain the domain name to be withdrawn. The client issuing the domain withdraw request must be the current sponsoring client. If the command succeeds, an EPP response with no <resData> element is returned.

```
<element name="withdraw" type="no-ext-domain:withdrawType"/>

<complexType name="withdrawType">
  <sequence>
    <element name="name" type="eppcom:labelType"/>
  </sequence>
</complexType>
```

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5.2 Host extensions

The host extensions are defined in the XML schema no-ext-host-1.0.xsd, and should be used as an extension to the host mapping defined in host-1.0.xsd (RFC5932).

5.2.1 The host create command

The host create command is extended with an optional <contact> element which is used to specify a host contact. The value should be a local contact object id.

```
<element name="create" type="no-ext-host:createType"/>

<complexType name="createType">
  <sequence>
    <element name="contact" type="eppcom:clIDType"
      minOccurs="0" />
  </sequence>
</complexType>
```

5.2.2 The host info command

A host object is identified by its host name. In the EPP registry, different registrars may register a host object with the same host name. A host extension is defined to make it possible for a registrar to lookup a host object sponsored by another registrar.


The host info command is extended with an optional <sponsoringClientID> element containing the id of the registrar who is the sponsor of the host object. If not used, the client registrar is the default sponsor.

```
<element name="info" type="no-ext-host:infoType"/>

<complexType name="infoType">
  <sequence>
    <element name="sponsoringClientID" type="eppcom:clIDType"
      minOccurs="0"/>
  </sequence>
</complexType>
```

The host info response is extended with a <contact> element which corresponds to the <contact> element in the host create command.

```
<element name="infData" type="no-ext-host:createType"/>
```

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5.2.3 The host update command

The host update command is extended with a <contact> element which corresponds to the <contact> element in the host create command.


```

<element name="update" type="no-ext-host:updateType"/>

<complexType name="updateType">
  <sequence>
    <element name="add" type="no-ext-host:addRemType"
      minOccurs="0"/>
    <element name="rem" type="no-ext-host:addRemType"
      minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="addRemType">
  <sequence>
    <element name="contact" type="eppcom:clIDType"/>
  </sequence>
</complexType>

```

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5.3 Contact extensions

The contact extensions are defined in the XML schema no-ext-contact-1.0.xsd, and should be used as an extension to the contact mapping defined in contact-1.0.xsd (RFC5733).

5.3.1 The contact create command

The contact create command is extended with the following elements:

3. A required <type> element which specifies the type of the contact. The value must be 'organization', 'role' or 'person'.
4. An optional <identity> element which specifies a public identity for the contact. The element has an attribute "type" which specifies the type of the identity.
 - For organizations registered in Brønnøysund (The Norwegian Business register), the type must have the value 'organizationNumber'. The element value must then be the organization number as registered in Brønnøysund.
 - Some special organizations may already be registered in Norid's database with an empty organization number or with a number being '000000000'. These organizations will be given a unique identity number in the EPP registry, and the number will be drawn from a specific number sequence managed locally by Norid. For these kind of organizations, the type must have the value 'localIdentity'. The element value must then be the number given.
 - The last type values, 'anonymousPersonIdentity' and 'nationalIdentityNumber' could carry a persons birth number from a national register or some other unique person identity.
5. An optional <mobilePhone> element which specifies a mobile phone number.
6. Zero or more <email> elements which specify email addresses in addition to the mandatory <email> element in the standard contact create command.
7. Zero or more <organization> elements which specify organizations which the contact belongs to. The value should be the local contact id of an organization object. This element can only be used for role and person contacts.
8. Zero or more <roleContact> elements which specify persons which belongs to a role contact. The value should be the local contact id of a person object. This element can only be used for role contacts.
9. An optional <disclose> element which must contain the child element <mobilePhone>. This element notes the clients preference to allow or restrict disclosure of the mobile phone number. If not present, the servers stated data collection policy is used. As stated in 2.5.1, use of disclose is not yet permitted.

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```

<element name="create" type="no-ext-contact:createType"/>

<complexType name="createType">
  <sequence>
    <element name="type"
      type="no-ext-contact:contactTypeType"/>
    <element name="identity"
      type="no-ext-contact:identityType"
      minOccurs="0"/>
    <element name="mobilePhone" type="contact:e164Type"
      minOccurs="0"/>
    <element name="email" type="eppcom:minTokenType"
      minOccurs="0" maxOccurs="unbounded"/>
    <element name="organization" type="eppcom:clIDType"
      minOccurs="0" maxOccurs="unbounded"/>
    <element name="roleContact" type="eppcom:clIDType"
      minOccurs="0" maxOccurs="unbounded"/>
    <element name="disclose" type="no-ext-contact:discloseType"
      minOccurs="0"/>
  </sequence>
</complexType>


<complexType name="identityType">
  <simpleContent>
    <extension base="eppcom:minTokenType">
      <attribute name="type"
        type="no-ext-contact:identityTypeType"/>
    </extension>
  </simpleContent>
</complexType>

<simpleType name="identityTypeType">
  <restriction base="token">
    <enumeration value="organizationNumber"/>
    <enumeration value="anonymousPersonIdentifier"/>
    <enumeration value="localIdentity"/>
    <enumeration value="nationalIdentityNumber"/>
  </restriction>
</simpleType>

<simpleType name="contactTypeType">
  <restriction base="token">
    <enumeration value="person"/>
    <enumeration value="role"/>
    <enumeration value="organization"/>
  </restriction>
</simpleType>

<complexType name="discloseType">
  <sequence>
    <element name="mobilePhone" minOccurs="0"/>
  </sequence>
  <attribute name="flag" type="boolean" use="required"/>
</complexType>

```


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5.3.2 The contact info command

The contact info response is extended with elements corresponding to the extensions for the contact create command.

```
<element name="infData" type="no-ext-contact:createType"/>
```

5.3.3 The contact update command


The contact update command is extended with add, rem and chg elements with child elements corresponding to all the elements in the contact create extension.

```
<element name="update" type="no-ext-contact:updateType"/>

<complexType name="updateType">
  <sequence>
    <element name="chg" type="no-ext-contact:chgType"
      minOccurs="0"/>
    <element name="add" type="no-ext-contact:addRemType"
      minOccurs="0"/>
    <element name="rem" type="no-ext-contact:addRemType"
      minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="chgType">
  <sequence>
    <element name="identity" type="no-ext-contact:identityType"
      minOccurs="0"/>
    <element name="mobilePhone" type="contact:e164Type"
      minOccurs="0"/>
    <element name="disclose" type="no-ext-contact:discloseType"
      minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="addRemType">
  <sequence>
    <element name="email" type="eppcom:minTokenType"
      minOccurs="0" maxOccurs="unbounded"/>
    <element name="organization" type="eppcom:clIDType"
      minOccurs="0" maxOccurs="unbounded"/>
    <element name="roleContact" type="eppcom:clIDType"
      minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
</complexType>
```

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5.4 Result extensions

The result message is extended with a <conditions> element which contains additional information on command failure. The result extensions are defined in the schema no-ext-result-1.0.xsd.

The <conditions> element contains a list of <condition> elements, each of which has the following child elements:

1. A <msg> element containing a short description of the failure.
2. A <details> element containing a detailed description of the failure.
3. A <code> element specifying an error code local for the Registry.
4. A <severity> element specifying the severity of the error. The possible values are 'info', 'warning', 'error' and 'fatal'.

```

<element name="conditions" type="no-ext-result:conditionListType"/>


<complexType name="conditionListType">
  <sequence>
    <element name="condition" type="no-ext-result:conditionType"
      maxOccurs="unbounded"/>
  </sequence>
</complexType>

<complexType name="conditionType">
  <sequence>
    <element name="msg" type="string"/>
    <element name="details" type="string"/>
  </sequence>
  <attribute name="code" type="no-ext-result:conditionCodeType"
    use="required"/>
  <attribute name="severity"
    type="no-ext-result:conditionSeverityType"
    use="required"/>
</complexType>

<simpleType name="conditionCodeType">
  <restriction base="token">
    <pattern value="[A-Z\d]+"/>
    <maxLength value="24"/>
  </restriction>
</simpleType>

<simpleType name="conditionSeverityType">
  <restriction base="token">
    <enumeration value="info"/>
    <enumeration value="warning"/>
    <enumeration value="error"/>
    <enumeration value="fatal"/>
  </restriction>
</simpleType>

```

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5.5 Service messages

For service messages, a <message> element has been defined. This element is contained in the <resData> element of every service message. The <message> element is defined in the schema no-ext-result-1.0.xsd.

The <message> element carries a 'type' attribute, a <desc> element and an optional <data> element.

1. The "type" attribute has a unique value which identifies the service message type.
2. The <desc> element gives a short textual description for the service message reason.
3. The content of the <data> element depends on the service message type:
 - For a 'late response' service message, it will contain a complete <epp> element containing the final response to the request.
 - For registry initiated service messages, it will contain one or more entry elements, each with a name attribute and a value with supplemental information. The entries contain structured message data suited for parsing by a client.


```
<element name="message" type="no-ext-result:messageType"/>

<complexType name="messageType">
  <sequence>
    <element name="desc" type="string"/>
    <element name="data" type="no-ext-result:messageDataType"
      minOccurs="0"/>
  </sequence>
  <attribute name="type" type="no-ext-result:messageTypeType"
    use="required"/>
</complexType>

<complexType name="messageDataType">
  <sequence>
    <element name="entry" type="no-ext-result:attributeType"
      maxOccurs="unbounded" minOccurs="0"/>
    <any namespace="urn:ietf:params:xml:ns:epp-1.0" minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="attributeType">
  <simpleContent>
    <extension base="string">
      <attribute name="name" type="token"
        use="required"/>
    </extension>
  </simpleContent>
</complexType>

<simpleType name="messageTypeType">
  <restriction base="token">
    <maxLength value="100"/>
  </restriction>
</simpleType>
```

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5.5.1 Service message types

The type attribute can have one of the following values and meanings:

Type values	Description
epp-late-response	A late-response service message containing the final response to a previously pending request.
domain-transferred	An asynchronous service message that informs the registrar that a domain transfer has been performed for a domain. Possible data entry names are: 1. ' <i>domain</i> ', with value being the domain name that has been transferred. 2. ' <i>new_clid</i> ', with value being the clid of the new registrar.
domain-quarantined	An asynchronous service message that informs the registrar that a domain has entered a quarantine state. The effect is that the domain will not be published in DNS. Possible data entry names are: 1. ' <i>domain</i> ', with value being the domain name that has been quarantined.
domain-deleted	An asynchronous service message that informs the registrar that a domain has been deleted from the registry. The effect is that the domain delegation is no longer in effect. Normally, the domain is now free for reregistration. Possible data entry names are: 1. ' <i>domain</i> ', with value being the domain name that has been deleted.
invalid-registrant-started	An asynchronous service message that informs the registrar that a deletion process has been started for a domain. Such processes can be started by the registry if the registrant organization is no longer registered in the Brønnøysund Register Center and is regarded as an invalid registrant.
object-deleted	An asynchronous service message that informs the registrar that an object of type Host or Contact has been deleted by the registry. This will occur as part of a regular background garbage collection, which will remove host or contacts objects which have not been in use for 60 days (as configured per now).