SOAP API Documentation

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1. Introduction

The Internet's rising importance for enterprise-critical applications is posing rapidly increasing challenges to the operation of name servers for Internet addresses (domain names). In many cases, the evolved technical architectures have been insufficient for quite some time. But this is often recognized too late, namely when, e.g., DoS attacks cause outages to Internet addresses.

Enterprises and domain registrars are often lacking the ability to deal with this issue properly. Moreover, it is advisable for them to focus on their core business and leave the operation of their DNS infrastructure to experts.

This gap can be addressed using the services provided by ironDNS®. It can supplement the customer's name server infrastructure, or even replace it completely.

The technology behind ironDNS® was developed from scratch by Knipp developers. The ironDNS® service represents the first global solution involving the ironDNS® engine. It has been deployed for several customers requiring mission-critical Internet infrastructure.

1.1. Accessing ironDNS®

There are three different ways to access and make use of the ironDNS® services:

- web Control Panel (https://manager.irondns.net/)
- SOAP API (this documentation)
- REST API (see http://www.irondns.net/technology/provisioning/rest.faces)

2. SOAP API

As summarized in the Introduction, the purpose of the system is to support the customer in creating, maintaining, and publishing DNS zones. Basically, there are two different ways for the customer to transfer his zone data to the ironDNS® zone manager:

- The zone data, i.e., its resource records, is submitted **literally** (either as a complete replacement of previous data, or as a so-called delta that describes removals and additions with regard to a specific previous version of a zone.
- The zone is set up with a primary **stealth name server** that feeds the zone data to the ironDNS® zone manager.

Subsequent sections of this document describe the API requests necessary to manage the customer's zones in both cases. In order to achieve a high degree of platform and programming language independence, the ironDNS® API is exposed as a **SOAP 1.2 web service**, which offers a couple of simple operations for zone data provisioning. For each operation, a well-defined request is sent to the SOAP API's HTTPS endpoint (as an XML document),

and a response (also in XML) is returned to the client. All API endpoints and further information (like IP addresses of the fetchers) are published on the Control Panel at https://manager.irondns.net/api.faces. Please refer to http://www.w3.org/TR/soap for more information on SOAP.

2.1. API Authentication

Each user of the ironDNS® SOAP API receives a set of credentials, consisting of a user name and a password (the same credentials can also be used for the Control Panel or REST API), which have to be provided for each request sent to the SOAP interface (the API is stateless). Note: When a request is sent, the user name/password pair is not part of the SOAP request's XML representation. Instead, the credentials need to be provided in the header of the HTTP request as standard basic authentication data according to RFC 2617, i.e. in the `Authorization` header of the request, like this:

```
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
```

Please refer to http://tools.ietf.org/html/rfc2617 for more Information on basic authentication in HTTP.

To allow administrators to act on behalf of a certain user, there are two optional XML attributes `effCustomer` and `effCustomerSource` for all operations described in this document. If a user who is not an administrator specifies these attributes, the `effCustomer` has to match the ID of the customer issuing the request and the `effCustomerSource` has to match the user's source (or left empty for the user's own source).

2.2. Zone Management

This section describes the heart of the ironDNS® system, namely the management of zones. For this the basic operations to create, delete, and update a zone as well as obtain the zone's data via the info operation are defined. Additionally a list operation allows to get an overview of all zones. Finally the notifyDSUpdate operation is used in the DNSSEC context to inform ironDNS® about an update of the zone's DS record within its parent zone.

As an additional security feature ironDNS® introduces the two factor authentication for zone changes. This optional feature allows customers to lock important zones as a safeguard against unintentional or unauthorized updates. To enable the feature an e-mail address together with its public PGP key has to be provided to the ironDNS® support team (please contact support@ironDNS.net for details).

In order to use the zone locks within the SOAP interface the create, update, initiateFetch, delete, and notifyDSUpdate operations each have an optional `<otpData>` element in their request. This element can be used to obtain a new One Time Password (OTP) for the operation to be executed (by setting the `<generateOtp>` sub-element to true). In which case the operation is not executed, but an OTP is generated and sent via encrypted e-mail. Optionally the `<clientId>` sub-element can be used to set an arbitrary token which will also be in-

cluded in the encrypted e-mail (making it easier to connect the e-mail with the intended operation). The result of such a request contains the `otpGenerated` attribute set to true informing the customer that the actual request has not been executed, but instead the OTP has been generated and sent in a PGP encrypted e-mail. After receiving the OTP the same operation has to be executed a second time. This time without the `<generateOtp>` sub-element and instead submitting the received OTP in the `<otp>` sub-element. An example of the workflow can be found in the section describing the delete operation (see 2.2.3).

2.2.1. Create operation

This operation creates a new zone object with an arbitrary ID and a static domain name. Once the zone has been created, neither its ID nor its domain name can be changed. For every zone one of the user's available products has to be selected. By omitting the product name in the create request, the user's default product will be used (the default product can be changed in the ironDNS® Control Panel). Furthermore, the list of target name servers has to be supplied. These are the name servers on which the zone will be deployed. For the zone's content there are two choices: either the literal content or the list of source name servers is given. Optionally the customer can decide for which events he wants to receive notification poll messages, how strict the zone validation should be carried out, and which ACL template should be used for the zone. ACL (= Access Control List) templates allow full zone transfers to certain IP addresses and can be managed via the ironDNS® Control Panel. Finally the user can assign an arbitrary comment to the zone which serves solely informational purposes and may help the user administrating his zones.

Next to the ironDNS® name servers it is also possible to use one or more secondary name servers operated by the user for which some ironDNS® name servers act as primary (stealth) name servers. The setup for this scenario is very easy. The create operation takes a list of secondary name servers (IPs) as an optional argument and returns a list of primary stealth name servers. The primary stealth name servers cannot be chosen by the user but will be automatically selected. They will send notifies and allow zone transfers to the configured secondary name servers, but will not be publicly visible. This way it is possible, for example, to use the ironDNS® DNSSEC feature for easy zone signing while still operating one or more name servers in-house.

The `<createRequest>` and `<createResponse>` elements describe the request and response, respectively. The `<createRequest>` contains the optional attribute `zoneid` (if omitted an ID will be generated). Allowed elements in the request (compare Figure 1) are (wherein `<content>` and `<src>` are mutually exclusive and exactly one of them has to be defined):

`<product>` the zone's product name; if omitted the user's default product will be used for the zone creation

`<domainname>` the domain name the zone is created for; cannot be modified

`<notifications>` specifying a list of notifications that should result in a poll message; possible notifications are `user-deployment` (notification about a finished user-induced zone update), `system-deployment` (notification about a finished system-induced zone update), `transfer-failure` (notification about a failed zone transfer from the master server), `parent-ds-update` (notification about the requirement to update the DS record

at the parent zone, i.e., in most cases the registry), and `general-error` (notification about a general error not caused by ironDNS®)

`<nameservers>` specifying a list of `<ns>` objects, each of which contains one of the possible destination name servers

`<aclTemplate>` specifying one of the ACL templates to be used to define access to this zone; the available ACL templates can be managed via the ironDNS® Control Panel

`<dnssec>` DNSSEC specific configuration; this tag takes the boolean attribute `sign`, which defines whether ironDNS® should sign the zone and generate DS records for the parent zone; setting `sign` to false has the same effect as omitting the `<dnssec>` tag

`<lockMode>` the mode used to lock the zone after creation; if missing the default value of `no-lock` is used which means that the zone is not locked; the other two possible values are `locked-with-fetch` and `locked-no-fetch`; in both cases all further updates and the deletion of the zone have to be authorized by providing a One Time Password; the only difference is for zones having source name servers: the former lock still allows regular updates of the zone content from its source name servers, while the latter mode also prohibits those automatic updates and each zone transfer will have to be initiated and authorized using an OTP; see also the general explanation in Section 2.2

`<content>` the literal content of the zone; this tag takes the optional attribute `version`, which tags the zone content with a version token; the actual content is contained in an `<rfc>` element whose content is strongly interpreted according to the rules of RFC 1034/1035; it is possible to omit the SOA record and/or the NS records, these will then be generated automatically by the ironDNS® zone manager

`<src>` the definition of a self-run Master name server or hidden Primary/Stealth name server; this tag contains one or more repetition of the `<server>` tag; each of those takes an optional `priority` attribute (possible values are `low`, `medium` (default if omitted), and `high`) and one ore more `<ipv4>` or `<ipv6>` tags containing the source server's IPv4 or IPv6 addresses, respectively; each address may have an an optional `port` attribute to contact the Master name server on a port other than the standard 53 port; optionally the `<server>` tag may contain a `<comment>` tag for a user-defined arbitrary comment describing the server and one `<tsig>` tag describing the server's TSIG information supplied via the two attributes `alg` for the TSIG key's algorithm (possible values are `hmac-md5`, `hmac-sha224`, `hmac-sha256`, `hmac-sha384`, and `hmac-sha512`) and name for the TSIG key's name; the BASE64 encoded TSIG key is submitted as the tag's content

`<comment>` an optional comment (up to 64 characters) describing the zone or its usage; this value has no impact on the zone's operation

`<promotionCode>` an optional promotion code (16 characters long separated into four groups divided by an '-' e.g. 'AfxQ-d5bN-Vzv2-vzJp') used to create a zone without being charged for a defined amount of months.

`<validationMode>` optional field to specify one of the four validation modes (`strong`, `normal`, `soft`, `off`); if no value is given the user's default setting is used (which can be changed via the ironDNS® Control Panel)

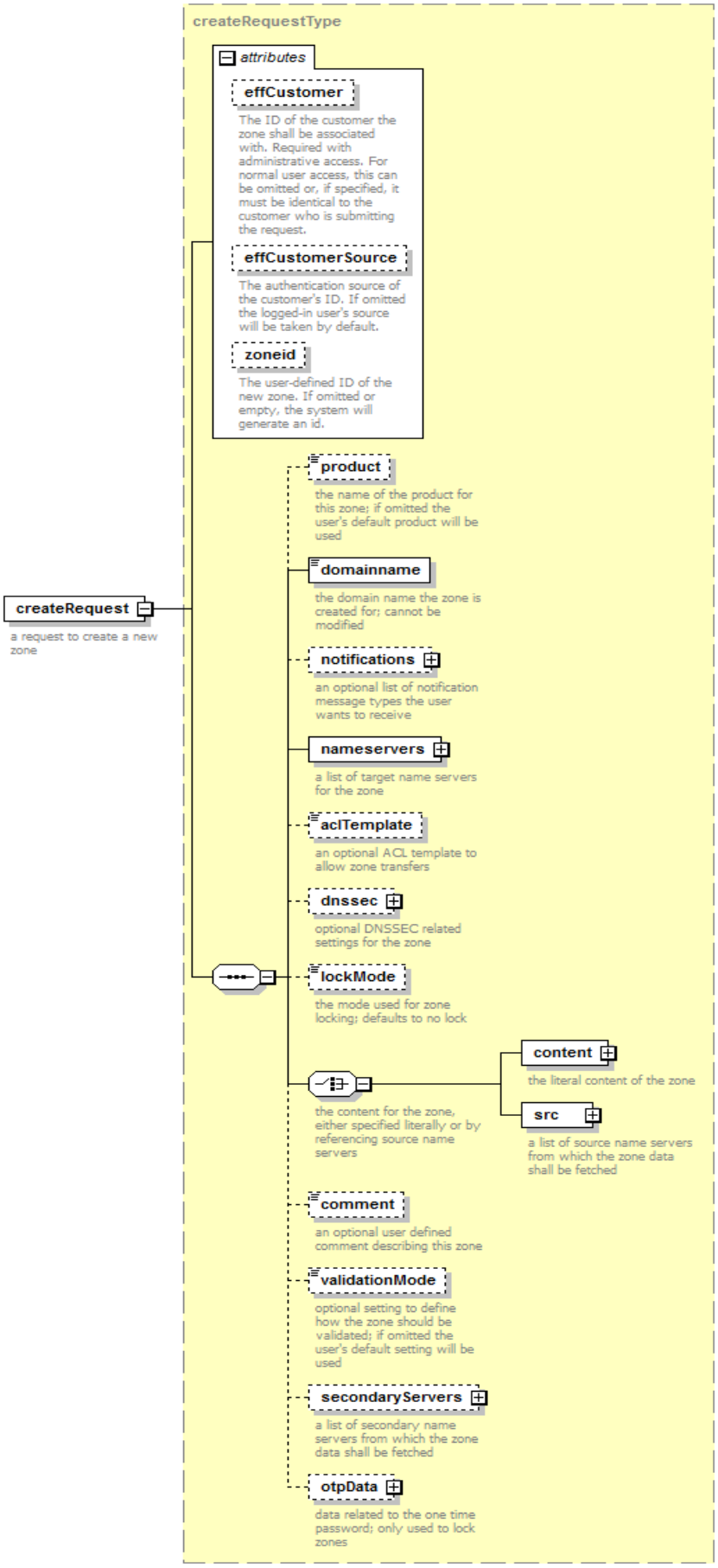

Figure 1: `createRequest` schema

`<secondaryServers>` the definition of one or more self-run secondary name servers; this tag contains one or more repetition of the `<server>` tag; each of those takes an optional boolean `notify` attribute to define whether notifies should be sent to the name server (default is true) and one ore more `<ipv4>` or `<ipv6>` tags containing the secondary server's IPv4 or IPv6 addresses, respectively; optionally the `<server>` tag may contain a `<comment>` tag for a user-defined arbitrary comment (up to 256 characters) describing the server and one `<tsig>` tag describing the server's TSIG information supplied via the two attributes `alg` for the TSIG key's algorithm (possible values are `hmac-md5`, `hmac-sha224`, `hmac-sha256`, `hmac-sha384`, and `hmac-sha512`) and name for the TSIG key's name; the BASE64 encoded TSIG key is submitted as the tag's content

`<otpData>` the data used to create a locked zone and generate and enter the necessary One Time Password; see also the general explanation in Section 2.2

Example (with literal content)

Create a zone for the domain example.com with the ID testZone1 (used for referring to the zone during delete, update, and info requests). The user requests notifications whenever the zone has been deployed through user intervention. The zone shall be deployed on the two name servers `ns1.irondns.net` and `ns2.irondns.net`. Since neither a SOA nor NS records are submitted via the literal content element, those records will be generated automatically.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:createRequest zoneid="testZone1">
         <typ:product>Basic 1</typ:product>
         <typ:domainname>example.com</typ:domainname>
         <typ:notifications>
            <typ:notification>user-deployment</typ:notification>
         </typ:notifications>
         <typ:nameservers>
            <typ:ns>ns1.irondns.net</typ:ns>
            <typ:ns>ns2.irondns.net</typ:ns>
         </typ:nameservers>
         <typ:aclTemplate>my test template</typ:aclTemplate>
         <typ:dnssec sign=”false”/>
         <typ:lockMode>no-lock</typ:lockMode>
         <typ:content version="myVersionID">
            <typ:rfc>www  3600 IN A    193.232.12.23
 AAAA 234:231::
sub 900 IN A 127.0.0.123
sub2 1800 IN A 127.0.0.124</typ:rfc>
         </typ:content>
         <typ:comment>My example domain.</typ:comment>
         <typ:validationMode>strong</typ:validationMode>
      </typ:createRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <createResponse zoneid=”testZone1” otpGenerated=”false”
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

Example (with source name servers)

Create a zone for the domain example.com with the ID `testZone2`. The user requests notifications whenever the zone has been deployed (no matter how the deployment has been initiated), whenever a transfer failure occurred (e.g., source name server is not reachable), and in case of other not specified errors. The zone shall be deployed on the two name servers `ns1.irondns.net` and `ns2.irondns.net` and at first the name server with address 127.0.0.2 (IPv4) or ::2 (IPv6) will be queried (since the server has the default priority medium) using the given TSIG data. If this fails, the second server with low priority is queried (without TSIG validation). The second server uses the port number 1053 instead of the standard 53 port. Only if the zone cannot be transferred from both servers, an error message is generated and added to the user's poll message queue.

Additionally a secondary name server (without TSIG) with address 192.168.0.1 shall be used. The response tells what hidden primary name servers will provide the zone content for transfer and will send notifies (in this case `ns1.hidden.irondns.net` and `ns2.hidden.irondns.net`).

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:createRequest zoneid="testZone2">
         <typ:product>Basic 1</typ:product>
         <typ:domainname>example2.com</typ:domainname>
         <typ:notifications>
            <typ:notification>transfer-failure</typ:notification>
            <typ:notification>user-deployment</typ:notification>
            <typ:notification>system-deployment</typ:notification>
            <typ:notification>general-error</typ:notification>
         </typ:notifications>
         <typ:nameservers>
            <typ:ns>ns1.irondns.net</typ:ns>
            <typ:ns>ns2.irondns.net</typ:ns>
         </typ:nameservers>
         <typ:aclTemplate>my test template</typ:aclTemplate>
         <typ:src>
            <typ:server priority="low">
               <typ:ipv4 port=”1053”>127.0.0.1</typ:ipv4>
               <typ:ipv6 port=”1053”>::1</typ:ipv6>
               <typ:comment>Secondary Name Server (US)</typ:comment>
            </typ:server>
            <typ:server>
               <typ:ipv4>127.0.0.2</typ:ipv4>
               <typ:ipv6>::2</typ:ipv6>
               <typ:tsig alg="hmac-sha1"
 name="a.b.c.d">eW91IHN0aW5rIGxpa2UgbW9ua2V5IGJ1dHQ=</typ:tsig>
               <typ:comment>Primary Name Server (Head Quarters)</typ:comment>
            </typ:server>
         </typ:src>
         <typ:comment>My other example domain.</typ:comment>
         <typ:validationMode>normal</typ:validationMode>
         <typ:secondaryServers>
            <typ:server notify=”true”>
               <typ:ipv4>192.168.0.1</typ:ipv4>
               <typ:comment>Secondary Server (CAN)</typ:comment>
            </typ:server>
         </typ:secondaryServers>
      </typ:createRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <createResponse zoneid=”testZone2” otpGenerated=”false”
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0">
         <hiddenPrimaryServers>
            <ns>ns1.hidden.irondns.net</ns>
            <ns>ns2.hidden.irondns.net</ns>
         </hiddenPrimaryServers>
      </createResponse>
   </S:Body>
</S:Envelope>
```

2.2.2. Initiate Fetch operations

This operation initiates a zone fetch operation. It can only be used for zones having source name servers. Zones with literal content will result in an error message. As a result of the successful execution of this operation the zone will immediately be scheduled for fetching, i.e., the ironDNS® Fetcher will contact the zone's source name server(s) and check if a new version is available. If so, the zone will be updated with the new version.

The `<initiateFetchRequest>` and `<initiateFetchResponse>` elements describe the request and response, respectively. The `<initiateFetchRequest>` contains the mandatory attribute `zoneid` which specifies the ID of the zone object to be fetched. The allowed elements in the request are the `<force>` flag (to determine whether a fetch should be initiated even if the serial has not changed) and the optional `<otpData>`. It has to be used to generate and submit the One Time Password needed to fetch locked zones, see also the general explanation in Section 2.2.

Example

Initiate fetching of the (unlocked) zone with ID testZone1 even if the serial has not changed.

Request

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:initiateFetchRequest zoneid="testZone1">
        <typ:force>true</typ:force>
      </typ:initiateFetchRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <initiateFetchResponse otpGenerated=”false”
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.2.3. Delete operation

This operation deletes a zone object.

The `<deleteRequest>` and `<deleteResponse>` elements describe the request and response, respectively. The `<deleteRequest>` contains the mandatory attribute `zoneid` which specifies the ID of the zone object to be deleted. The only allowed element in the request is the optional `<otpData>`. It has to be used to generate and submit the One Time Password needed to delete locked zones, see also the general explanation in Section 2.2.

Example (delete a non-locked zone)

Delete the zone with the ID testZone1.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:deleteRequest zoneid="testZone1"/>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <deleteResponse otpGenerated=”false”
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

Example (delete a locked zone)

Delete the locked zone with the ID testZone2. The example consists of two separate requests. At first the necessary One Time Password (OTP) needs to be generated in Request 1. The OTP is then send in an encrypted e-mail and has to be submitted in a second request.

Request 1 (generate OTP):

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:deleteRequest zoneid="testZone2">
         <typ:otpData>
            <typ:generateOtp>true</typ:generateOtp>
            <typ:clientId>deleteTestZone2</typ:clientId>
         </typ:otpData>
      </typ:deleteRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <deleteResponse otpGenerated="true"
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

Request 2 (delete zone with OTP):

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:deleteRequest zoneid="testZone2">
         <typ:otpData>
            <typ:otp>123456</typ:otp>
         </typ:otpData>
      </typ:deleteRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <deleteResponse otpGenerated="false"
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.2.4. Info operation

This operation retrieves the data associated with the zone.

The `<infoRequest>` and `<infoResponse>` elements describe the request and response, respectively. The request does not have any elements, but the mandatory attribute `zoneid` specifying the ID of the zone object to retrieve. Optionally the attribute `include` may be used to selectively retrieve partly information about the zone (if omitted all information will be retrieved). Possible values (space separated) are:

`config` retrieve the zone's configuration, i.e., the product name, domain name, comment, target and source name servers, secondary and hidden primary name servers, the validation mode, whether the zone is locked, and the used ACL template (if any)

`content-received` retrieve the zone's content, as received from the user via literal data or from the master server

`content-published` retrieve the zone's content, as published on the name servers (includes auto-generated SOA and NS records, as well as DNSSEC enhancements if enabled)

`deployment` retrieve deployment (version/serial number) information for the zone

`dnssec` retrieve DNSSEC related information for the zone; in particular this includes the DNS key and respective DS records that need to be submitted to and deployed in the parent zone in order to establish a chain of trust

Example

Obtain configuration and deployment information for the zone with ID testZone3.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:infoRequest zoneid="testZone3" include="config deployment"/>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <infoResponse
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0">
         <product>Basic 1</product>
         <domainname>example.com</domainname>
         <notifications>
            <notification>user-deployment</notification>
         </notifications>
         <nameservers>
            <ns>ns1.irondns.net</ns>
            <ns>ns2.irondns.net</ns>
         </nameservers>
         <aclTemplate>my test template</aclTemplate>
         <deployment newestSerial="1" oldestSerial="1"
            newestVersion="myVersionID" oldestVersion="myVersionID"/>
         <comment>My example domain.</comment>
         <validationMode>strong</validationMode>
         <secondaryServers>
            <server notify="true">
               <ipv4>192.168.0.1</ipv4>
            </server>
         </secondaryServers>
         <hiddenPrimaryServers>
            <ns>ns1.hidden.irondns.net</ns>
            <ns>ns2.hidden.irondns.net</ns>
         </hiddenPrimaryServers>
      </infoResponse>
   </S:Body>
</S:Envelope>
```

2.2.5. Update operation

This operation updates the data for the given zone object. Similarly to the `<createRequest>` the zone's configuration and/or data can be changed. Apart from the zone's ID and domain name every data supplied in the create request can be updated. Additionally it is possible to update the literal content (if it exists) via the delta mechanism, i.e., provide resource records that should be removed from or resource records that should be added to the existing zone content.

The `<updateRequest>` and `<updateResponse>` elements describe the request and response, respectively. The `<updateRequest>` contains the mandatory attribute `zoneid`. Allowed elements in the request (compare 2) are `<product>`, `<notifications>`, `<nameservers>`,

<aclTemplate>, <dnssec>, <lockMode>, <content>, <src> (wherein <content> and <src> are mutually exclusive and exactly one of them has to be defined), <comment>, <validationMode>, the <secondaryServers>, and the <otpData>. Since all elements except <content> are the same as in the <createRequest>, we will only describe the <content> in more detail.

As in the create request, the <content> element takes the optional attribute version, which tags the zone content with a version token. Within the <content> element there is the choice between the two elements <replace> and <delta>. The former takes the new content in an <rfc> element as defined in the create request. The latter element has the optional attribute from-version, which can be used to ensure the current zone is the one expected. If the from version is submitted, it has to be the same as the zone's current version token, otherwise an error is reported. Furthermore, the <delta> element contains the two optional elements <add> and <rem>, which both take an <rfc> element as defined in the create request. Any records defined in the <rem> element will be removed from the zone (an error will be generated if such a record does not exist) and any record from the <add> element will be added to the existing records.

If the zone is setup with secondary name servers for the first time the response contains the hidden primary name servers to be used for the secondary name servers. In all other cases the response is empty. If a zone with secondary name servers has its secondary name servers updated the assigned hidden primary name servers will always stay the same.

Example

Update the zone with ID testZone1. Change the product to “Basic 2”, leave notification settings, ACL template, destination name server settings, secondary name server settings, and the validation unchanged, but update the zone's content, by removing the record sub2 1800 IN A 127.0.0.124 and adding sub5 1800 IN A 127.0.0.125.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:updateRequest zoneid="testZone1">
         <product>Basic 2</product>
         <typ:content version="myVersionNewID">
            <typ:delta from-version="myVersionID">
               <typ:add>
                  <typ:rfc>sub5 1800 IN A 127.0.0.125</typ:rfc>
               </typ:add>
               <typ:rem>
                  <typ:rfc>sub2 1800 IN A 127.0.0.124</typ:rfc>
               </typ:rem>
            </typ:delta>
         </typ:content>
      </typ:updateRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <updateResponse otpGenerated=”false”
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.2.6. List operation

This operation lists all zones (zone ID and domain name) associated with a user.

The `<listRequest>` and `<listResponse>` elements describe the request and response, respectively. There are no particular elements or attributes for this kind of request.

Example

List all zones associated with the current user.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:listRequest/>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <listResponse
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0">
         <zone domainname="example.com" zoneid="testZone1"/>
         <zone domainname="example2.com" zoneid="testZone2"/>
      </listResponse>
   </S:Body>
</S:Envelope>
```

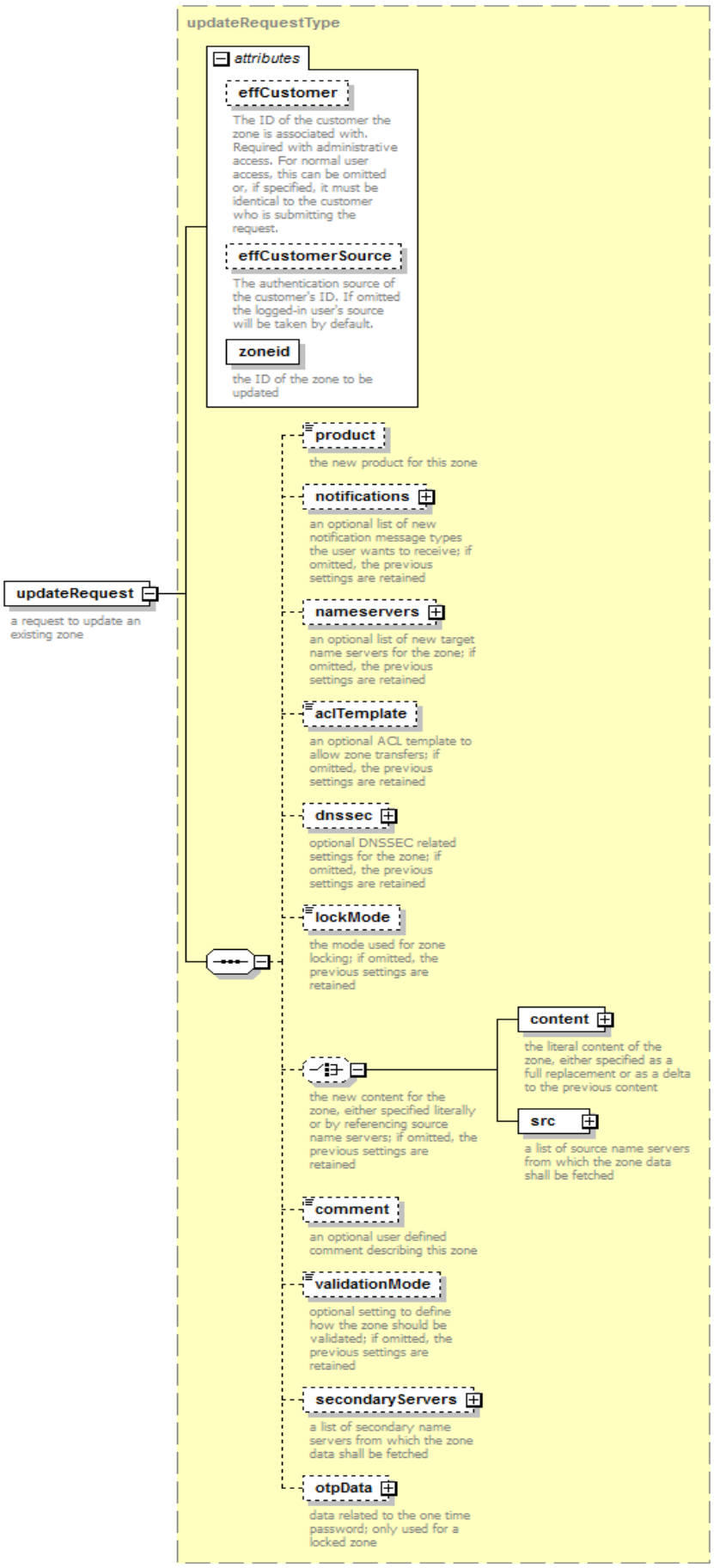

Figure 2: `updateRequest` schema

2.2.7. NotifyDSUpdate operation

This operation tells ironDNS® that the DS record has been updated at the parent zone. When ironDNS® manages the signing of your zone it will generate a DNS key and its respective DS record. Whenever new DNSSEC data is generated you will receive a corresponding poll message and can obtain the data via the Info command. After you have transmitted this data to the zone's parent (and it has been propagated to all respective name servers) you will need to send this SOAP request to inform ironDNS® about the successful update.

The `<notifyDSUpdateRequest>` and `<notifyDSUpdateResponse>` elements describe the request and response, respectively. The `<notifyDSUpdateRequest>` contains the mandatory attribute `zoneid` which specifies the ID of the zone object whose DS record has been updated. The only allowed element in the request is the optional `<otpData>`. It has to be used to generate and submit the One Time Password needed to update locked zones, see also the general explanation in Section 2.2.

Example

Inform the zone signing component of ironDNS® about the fact that the DS record for the zone with ID testZone2 has been updated at the parent zone.

Request

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:notifyDSUpdateRequest zoneid="testZone2"/>
   </soap:Body>
</soap:Envelope>
```

Response

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <notifyDSUpdateResponse otpGenerated=”false”
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.3. Messages

2.3.1. Poll operation

This operation retrieves the user's oldest poll message. In order to retrieve the next poll message, the oldest one has to be acknowledged first. There are five different poll message types, which correspond to the five notification types defined in the Create operation in Section 2.2.1).

The <pollRequest> and <pollResponse> elements describe the request and response, respectively. There are no particular elements or attributes for this kind of request.

Example

Retrieve the oldest (not acknowledged) poll message.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:pollRequest />
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <pollResponse
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0">
         <msg date="2009-01-01T10:10:00.00+02:00" msgid="1">
            <system-deployment serial="1" zoneid="example.com">
               <message>A user-initiated deployment has been completed: the
zone example.com with serial number 1 has been successfully deployed on all
name servers.</message>
            </system-deployment>
         </msg>
      </pollResponse>
   </S:Body>
</S:Envelope>
```

2.3.2. Poll-ack operation

This operation acknowledges a certain poll message, i.e., deletes the poll message. This does not have to be the oldest poll message, but can be an arbitrary one. In order to read the second oldest poll message, the oldest has to be acknowledged first.

The <pollAckRequest> and <pollAckResponse> elements describe the request and response, respectively. The request does not have any elements, but a mandatory message ID to define, which poll message should be acknowledged.

Example

Acknowledge/delete the poll message with ID 1.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
   xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:pollAckRequest msgid="1"/>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <pollAckResponse
        xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.4. Statistics

The ironDNS® statistics component allows the user to define different ways how the DNS traffic should be gathered and aggregated. A combination of statistic aggregation parameters is called Collection. Using the SOAP requests `createCollection` and `updateCollection` it is possible to define such Collections and start the statistic gathering process in the background. Reports will then be generated automatically and with the SOAP request `listAvailableStatistics` a filter can be used to find the required statistic reports.

2.4.1. CreateCollection operation

This operation creates a new statistic Collection. The Collection has six parameters that define how and which data should be gathered. It is possible to either collect all data for certain (explicitly specified) zones only or to collect the data for all zones in the user's account. Furthermore, the query types and the report intervals can be set.

The `<createCollectionRequest>` and `<createCollectionResponse>` elements describe the request and response, respectively. The request contains the mandatory attribute `name`. The name of the Collection must be unique and is used as an identifier for the following operations. It is also needed for retrieving the reports generated by the Collection. The allowed elements of the request are:

`<zones>` the list of zones (referenced by their ID) that should be included in the generated reports; if omitted the reports will contain the data for the DNS requests related to any of the user's active zones

`<intervals>` specifying the list of intervals that should be used for the report generation; at least one interval has to be given; if more than one interval is given, reports for each interval will be generated; possible values are `OneMinute` (1 min), `FiveMinutes` (5 min), `FifteenMinutes` (15 min), `OneHour` (1 h), `SixHours` (6 h), `OneDay` (1 d), `OneWeek` (1 wk), and `OneMonth` (1 mo); each report will combine one or more files having the defined interval (e.g., specifying the one minute interval will generate a report every hour containing 60 files each having the data of one minute).

`<recordTypes>` specifying the DNS queries that should be counted; possible values are `A` (A records, IPv4 address), `AAAA` (AAAA records, IPv6 address), `MX` (MX records, e-mail), `NS` (NS records, name server), `NAPTR` (NAPTR records, name authority pointer), `TXT` (TXT records, text), `DNSSEC` (DNSSEC-related records, i.e., RRSIG, NSEC, NSEC3, NSEC3PARAM, DS, DNSKEY), and `Other` (all other queries); note that if `Other` is selected, all not selected record types will be counted as Other records (e.g., if you only select `A` and `Other`, a query

for the AAAA record will be counted towards the Other records); at least one record type or `Other` needs to be specified.

`<reportType>` specifying the type of the report to be generated. Possible values are:

- `General`: this generates the usual report depending on all input parameters and grouping the data by source IP address, record type and domain name; for each record type / domain name combination only the top source IP addresses are listed individually, while the others are combined;
- `NonExisting`: this is a special report type for registries and can only be used with a single zone; the report will then contain the top queries to domain names which do not exist within the zone
- `IcannReport`: this is a special report for registry zones for which an ICANN report according to the new gTLD policies has to be created; the report may only be used with an interval of one month and a single zone; it sums up all queries received and answered for that zone during that interval grouped by their protocol type (UDP vs. TCP)

`<reportCutOff>` optional value specifying maximum number of IP addresses (for the General report) or domain names (for the NonExisting report) after which all further lines are combined. If missing, a suitable default value is used.
`<ignoreSourceIPs>` specifying whether the source IP addresses are ignored and only the domain names and record types are considered. This value is optional, if missing it is set to `false`. It is only used for reports of type `General`.

Example

Start the DNS query statistic logging for the two zones having the ID myZone1 and myZone2, respectively. The aggregation interval should be one minute and one day and the DNS queries should be divided into queries for A records and all other queries. The reports can be accessed using the Collection name testCollection.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:createCollectionRequest name="testCollection">
         <typ:zones>
            <typ:zoneid>myZone1</typ:zoneid>
            <typ:zoneid>myZone2</typ:zoneid>
         </typ:zones>
         <typ:intervals>
            <typ:interval>OneMinute</typ:interval>
            <typ:interval>OneDay</typ:interval>
         </typ:intervals>
         <typ:recordTypes>
            <typ:recordType>A</typ:recordType>
            <typ:recordType>Other</typ:recordType>
         </typ:recordTypes>
         <typ:reportType>
            General
         </typ:reportType>
         <typ:reportCutOff>50</typ:reportCutOff>
         <typ:ignoreSourceIPs>
            false
         </typ:ignoreSourceIPs>
      </typ:createCollectionRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <createCollectionResponse
        xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.4.2. DeleteCollection operation

This operation deletes a Collection. The aggregation of DNS queries will be stopped immediately. All previously generated reports will also be deleted. Therefore it should be ensured that all still needed data is downloaded before the execution of this operation. The operation is irreversible. Note that the deletion may take a short while. During this time the data Collection cannot be accessed anymore, but neither can its name be used for a new Collection. After the deletion is completed, the Collection name is free again and can be used in the `<createCollectionRequest>` to create another Collection.

The `<deleteCollectionRequest>` and `<deleteCollectionResponse>` elements describe the request and response, respectively. The request does not have any elements, only an attribute `name` specifying the name of the Collection to be deleted.

Example

Delete the Collection with the name testCollection.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:deleteCollectionRequest name="testCollection"/>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <deleteCollectionResponse
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.4.3. GetCollection operation

This operation retrieves the parameters associated with the Collection.

The `<getCollectionRequest>` and `<getCollectionResponse>` elements describe the request and response, respectively. The request does not have any elements, but the mandatory attribute `name` specifying the name of the Collection to retrieve. The response then contains the same elements that can be specified in the `<createCollectionRequest>` element.

Example

Obtain configuration parameters for the Collection with name testCollection.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:getCollectionRequest name="testCollection"/>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <getCollectionResponse
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0">
         <name>testCollection</name>
         <zones>
            <zoneid>myZone1</zoneid>
            <zoneid>myZone2</zoneid>
         </zones>
         <intervals>
            <interval>OneMinute</interval>
            <interval>OneDay</interval>
         </intervals>
         <recordTypes>
            <recordType>A</recordType>
            <recordType>Other</recordType>
         </recordTypes>
         <reportType>
            General
         </reportType>
         <reportCutOff>50</reportCutOff>
         <ignoreSourceIPs>
            false
         </ignoreSourceIPs>
      </getCollectionResponse>
   </S:Body>
</S:Envelope>
```

2.4.4. UpdateCollection operation

This operation updates the parameters for the given Collection. Similarly to the `<createCollectionRequest>` the Collection's configuration can be changed. Apart from the Collection's name and the report type, every data supplied in the create request can be updated. The name attribute will be used to identify the Collection to be updated. Note that in order to change the type of the report it is necessary to delete the old Collection and create a new one.

The `<updateCollectionRequest>` and `<updateCollectionResponse>` elements describe the request and response, respectively. The `<updateCollectionRequest>` contains the mandatory attribute `name`. Allowed elements in the request are `<zones>`, `<intervals>`, `<recordTypes>`, and the `<reportCutOff>`. Since all these elements have the same meaning and possible values as in the `<createCollectionRequest>`, their description can be looked up at the create operation. Note, that the `<reportType>` and the `<ignoreSourceIPs>` values can not be changed for an existing collection.

Example

Update the DNS query statistic logging with the name testCollection. The statistics for all zones in the user's account should be gathered and summed up to daily reports. The reports should only contain A and NS records.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:updateCollectionRequest name="testCollection">
         <typ:intervals>
            <typ:interval>OneDay</typ:interval>
         </typ:intervals>
         <typ:recordTypes>
            <typ:recordType>A</typ:recordType>
            <typ:recordType>NS</typ:recordType>
         </typ:recordTypes>
         <typ:reportCutOff>60</typ:reportCutOff>
      </typ:updateCollectionRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <updateCollectionResponse
        xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0"/>
   </S:Body>
</S:Envelope>
```

2.4.5. ListCollections operation

This operation lists all active Collections associated with a user.

The `<listCollectionRequest>` and `<listCollectionResponse>` elements describe the request and response, respectively. There are no particular elements or attributes for this kind of request. The response contains a list of names. The actual parameters of the Collections have to be obtained using the `getCollection` operation.

Example

List all Collections associated with the current user.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:listCollectionsRequest />
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <listCollectionsResponse
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0">
         <name>testCollection</name>
      </listCollectionsResponse>
   </S:Body>
</S:Envelope>
```

2.4.6. ListAvailableStatistics operation

This operation allows to get a list of all available statistic reports. The request has several filter parameters to narrow down the result list of reports. The response contains a list of links which can be used to download the report files. In order to access the link, the user needs to be logged in to the ironDNS® Control Panel. The credentials are the same as the ones for this SOAP interface.

The `<listAvailableStatisticsRequest>` and `<listAvailableStatisticsResponse>` elements describe the request and response, respectively. The allowed elements of the request are:

`<name>` the name of the Collection that generated the reports; if omitted all available reports within the specified parameter range are returned

`<fileFormat>` the format of the report data files; currently only `TSVZIP` is a supported file format; this format describes a ZIP file that contains a content.xml file containing the metadata for the downloaded file (i.e., it lists the data files and their parameters including the header description of the TSV files) and the data files; each data file is in TSV (tab separated values) format containing the aggregated statistic samples

`<from>` only reports containing data after the given date will be listed; if omitted there is no restriction

`<to>` only reports containing data before the given date will be listed; if omitted there is no restriction

`<minAggrInterval>` this duration value defines the minimum aggregation interval for the returned reports; if omitted there is no restriction

`<maxAggrInterval>` this duration value defines the maximum aggregation interval for the returned reports; if omitted there is no restriction

Example

List the available reports generated by the Collection testCollection having the file format TSVZIP (this could be omitted as there are no other file formats for the time being). The result should only contain reports that contain data from January 31, 2012, the minimum report interval should be one minute and the maximum report interval should be 30 minutes.

Request:

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:typ="http://xmlns.irondns.net/ws/manager/client/types-1.0">
   <soap:Header/>
   <soap:Body>
      <typ:listAvailableStatisticsRequest>
         <typ:name>testCollection</typ:name>
         <typ:fileFormat>TSVZIP</typ:fileFormat>
         <typ:from>2012-01-31T00:00:00.000+01:00</typ:from>
         <typ:to>2012-02-01T00:00:00.000+01:00</typ:to>
         <typ:minAggrInterval>PT1M</typ:minAggrInterval>
         <typ:maxAggrInterval>PT30M</typ:maxAggrInterval>
      </typ:listAvailableStatisticsRequest>
   </soap:Body>
</soap:Envelope>
```

Response:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
   <S:Body>
      <listAvailableStatisticsResponse
         xmlns="http://xmlns.irondns.net/ws/manager/client/types-1.0">
         <collection
location="https://manager.irondns.net/report/download/testCollection-20120131-
0000-60.zip" name="testCollection" fileFormat="TSVZIP" collectionStart="2012-
01-31T00:00:00.000+01:00" collectionEnd="2012-01-31T01:00:00.000+01:00"
aggrInterval="P0Y0M0DT0H1M0.000S"/>
         <collection
location="https://manager.irondns.net/report/download/testCollection-20120131-
0100-60.zip" name="testCollection" fileFormat="TSVZIP" collectionStart="2012-
01-31T01:00:00.000+01:00" collectionEnd="2012-01-31T02:00:00.000+01:00"
aggrInterval="P0Y0M0DT0H1M0.000S"/>
         <collection
location="https://manager.irondns.net/report/download/testCollection-20120131-
0200-60.zip" name="testCollection" fileFormat="TSVZIP" collectionStart="2012-
01-31T02:00:00.000+01:00" collectionEnd="2012-01-31T03:00:00.000+01:00"
aggrInterval="P0Y0M0DT0H1M0.000S"/>
         <collection
location="https://manager.irondns.net/report/download/testCollection-20120131-
0300-60.zip" name="testCollection" fileFormat="TSVZIP" collectionStart="2012-
01-31T03:00:00.000+01:00" collectionEnd="2012-01-31T04:00:00.000+01:00"
aggrInterval="P0Y0M0DT0H1M0.000S"/>
         <collection
location="https://manager.irondns.net/report/download/testCollection-20120131-
0400-60.zip" name="testCollection" fileFormat="TSVZIP" collectionStart="2012-
01-31T04:00:00.000+01:00" collectionEnd="2012-01-31T05:00:00.000+01:00"
aggrInterval="P0Y0M0DT0H1M0.000S"/>
      </listAvailableStatisticsResponse>
   </S:Body>
</S:Envelope>
```