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	<i>DENIC</i>

# Registry Provisioning Protocol (RPP) Data Objects

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## Abstract

This document defines data objects for the Registry Provisioning Protocol (RPP) and sets up IANA registries to describe and catalogue them. The definitions for domain name, contact, and host objects focus on the logical structure and constraints of the data elements, independent of any specific data representation or media type. This document follows the architecture defined in [I-D.kowalik-rpp-architecture].

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## 1. Introduction

The Registry Provisioning Protocol (RPP) requires a clear definition of its data objects. This document catalogues the fundamental resource objects managed through RPP: domains, contacts, and hosts.

In accordance with the RPP architecture [[I-D.kowalik-rpp-architecture](#)], the definitions herein specify the logical data elements, their meanings, and their constraints, rather than a specific representation format. This approach ensures that the core data model can be consistently implemented across different media types and representation formats.

### 1.1. Conventions and Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

## 2. Resource Definition Principles

### 2.1. Data Element Abstraction

Each resource is composed of logical data elements. A data element is a logical unit of information identified by a stable name, independent of its representation in any given media type. The definition for each element specifies its logical name, purpose, cardinality, data type, and constraints.

### 2.2. Extensibility

The set of data elements for a given resource object is extensible. New data elements, relations or operations MAY be defined and registered with IANA to support new features.

### 2.3. Data Element Semantics

The definition of each data element within an object consists of the following attributes:

- Name: A human-readable name for the data element.
- Identifier: A machine-readable, unique identifier for the element, using camelCase notation.
- Cardinality: Specifies the number of times an element may appear. The notation is as follows:
  - 1 for exactly one

- 0-1 for zero or one
  - 0+ for zero or more
  - and 1+ for one or more
- **Data Type:** Defines the element's data structure, which can be a primitive type (e.g., String, Integer) or a reference to another component object.
  - **Description:** Explains the purpose of the data element and any other relevant information.
  - **Constraints:** Provides specific validation rules or limitations on top of the data type itself, such as value ranges.
  - **Mutability:** Defines the lifecycle of the data element's value. It **MUST** be one of the following:
    - **create-only:** The element's value is provided during the object's creation and cannot be modified thereafter.
    - **read-only:** The element's value is managed by the server. It cannot be set or modified directly by the client, though it may change as a result of server-side operations.
    - **read-write:** The element's value can be set and modified by the client.

## 2.4. Operations

For each resource a set of possible operations is defined together with their respective input and output data.

### 2.4.1. Authorisation

For each operation authorisation requirements and operation behaviour is specified. Wherever "object authorisation" is mentioned, it means that an operation may accept or require additional authorisation data related to the object beyond plain client authorisation. Typically it would be a value related to or derived from Authorisation Information Object attached to the object.

### 2.4.2. Uniform interface

For the typical set of Create, Read, Update and Delete operations the following set of input and output representations is specified on top of additional transient input data, unless an operation for the specific object tells otherwise.

#### 2.4.2.1. Create

- **Input:** Object representation (create-only and read-write properties)
- **Output:** Object representation (read-write and read-only properties)

#### 2.4.2.2. Read

- **Input:** Object identifier
- **Output:** Object representation (read-write and read-only properties)

The output representation **MAY** vary depending on the identity of the querying client, use of authorization information, and server policy towards unauthorized clients. If the querying client is the sponsoring client, all available information **MUST** be returned. If the querying client is not the sponsoring client but the client provides valid authorization information, all available

information SHOULD be returned, however some optional elements MAY be reserved to the sponsoring client only. If the querying client is not the sponsoring client and the client does not provide valid authorization information, server policy determines which OPTIONAL elements are returned, if any, or whether the entire request is rejected.

#### 2.4.2.3. Update

- Input: Object identifier, Object changes representation (read-write properties)
- Output: Object representation (read-write and read-only properties)

#### 2.4.2.4. Delete

- Input: Object identifier
- Output: Object representation (read-write and read-only properties) or no representation

### 2.4.3. Operations beyond uniform interface

For all other operations both input and output representation have to be fully specified.

## 3. Common Data Types

This section defines primitive data types and structures that are re-used across multiple resource object definitions.

### 3.1. Identifier

Identifiers are character strings with a specified minimum length, a specified maximum length, and a specified format outlined in [Section 2.8](#) of [\[RFC5730\]](#). Identifiers for certain object types MAY have additional constraints imposed either by server policy, object specific specifications or both.

### 3.2. Timestamp

Date and time attribute values MUST be represented in Universal Coordinated Time (UTC) using the Gregorian calendar using date-time form as defined in [\[RFC3399\]](#). For compatibility with EPP upper case "T" and "Z" characters SHOULD be used.

### 3.3. Client Identifier

Client identifiers are character strings with a specified minimum length, a specified maximum length, and a specified format. Contact identifiers use the "clIDType" client identifier syntax described in [\[RFC5730\]](#).

TBC: do we need this or is it a relation with an entity/RFC8543 organisation?

### 3.4. Phone Number

Telephone number syntax is derived from structures defined in [ITU.E164.2005]. Telephone numbers described in this specification are character strings that **MUST** begin with a plus sign ("+", ASCII value 0x002B), followed by a country code defined in [ITU.E164.2005], followed by a dot (".", ASCII value 0x002E), followed by a sequence of digits representing the telephone number. An optional "x" (ASCII value 0x0078) separator with additional digits representing extension information can be appended to the end of the value.

## 4. Associations

RPP allows for different types of associations (links) between the objects. The association may be added between 2 independent objects with own lifecycle (UML aggregation) or in the relation when one object's existence and lifecycle is bound to the other parent/owner object (UML composition). In both cases, especially if the relation allows for cardinality higher than one on either side, the association may be assigned additional attributes, not being part of data model of either side of relation. In many cases such relation would be attributed with a single text string label, describing a role or a type of relation. Depending on the context this value might be unique, which allows using such label as a key in a dictionary.

The following generic Association Types are defined for RPP:

### 4.1. Aggregation

Notation: Aggregation[Type]

A relation between two independent objects.

If the cardinality of target object is more than 1, this represents an ordered array. Data producer **MUST** assure the same unchanged data is always inserted in the same order. In case of data insertions, deletions or updates the remaining of the data **SHALL** preserve its order.

### 4.2. Composition

Notation: Composition[Type] or Type

A relation between an independent parent object and a dependent child object.

If the cardinality of target object is more than 1, this represents an ordered array. Data producer **MUST** assure the same unchanged data is always inserted in the same order. In case of data insertions, deletions or updates the remaining of the data **SHALL** preserve its order.

### 4.3. Labelled Aggregation

Notation: LabelledAggregation[Type]

A relation between two independent object with single text string attribute. Multiple associations with the same label are allowed.

A type defining such association MUST define Label Description with semantics of the label and Label Constraints with constraints related to the label.

#### **4.4. Aggregation Dictionary**

Notation: AggregationDictionary[Type]

A relation between two independent object with single text string attribute. Only single association with the same label is allowed allowing it to be used as dictionary key.

A type defining such association MUST define Label Description with semantics of the label and Label Constraints with constraints related to the label.

#### **4.5. Labelled Composition**

Notation: LabelledComposition[Type]

A relation between an independent parent object and a dependent child object with single text string attribute. Multiple associations with the same label are allowed.

A type defining such association MUST define Label Description with semantics of the label and Label Constraints with constraints related to the label.

#### **4.6. Composition Dictionary**

Notation: CompositionDictionary[Type]

A relation between an independent parent object and a dependent child object with single text string attribute. Only single association with the same label is allowed allowing it to be used as dictionary key.

A type defining such association MUST define Label Description with semantics of the label and Label Constraints with constraints related to the label.

### **5. Component Objects**

This section defines common component objects that are re-used in the definitions of top-level resource objects.

#### **5.1. Period Object**

- Name: Period Object
- Description: Represents a duration of time.



- Data Elements:
  - Value
    - Identifier: value
    - Cardinality: 1
    - Mutability: read-write
    - Data Type: Integer
    - Description: The numeric value of the period.
    - Constraints: The value MUST be from 1 to 99, inclusive.
  - Unit
    - Identifier: unit
    - Cardinality: 1
    - Mutability: read-write
    - Data Type: String
    - Description: The unit of the period.
    - Constraints: The value MUST be one of: "y" (years) or "m" (months).

## 5.2. Domain Status Object

- Name: Domain Status Object
- Description: Represents one of the status values associated with the domain name
- Data Elements:
  - Label
    - Identifier: label
    - Cardinality: 1
    - Mutability: create-only
    - Data Type: String
    - Description: computer-readable enum label of a status
    - Constraints: Status can be set as outlined in [2.3](#). Additional statuses can be set as outlined in [\[RFC3915\]](#). This enumeration can be expanded by extensions. Statuses MAY be either set by the server with "server" prefix, or set by the client with "client" prefix.
  - Reason
    - Identifier: reason
    - Cardinality: 0-1
    - Mutability: create-only
    - Data Type: String
    - Description: a human-readable text that describes the rationale for the status applied to the object.
    - Constraints: None

- Due
  - Identifier: due
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: Timestamp
  - Description: a timestamp, when this status is going to be removed automatically, or changed to other status. This field can be used to expresse lifecycle related information.
  - Constraints: servers MAY restrict possibility to set or update this value by the client.

### 5.3. Nameserver Object

- Name: Nameserver Object
- Description: Represents a single nameserver.
- Data Elements:
  - Host Name
    - Identifier: hostName
    - Cardinality: 1
    - Mutability: read-write
    - Data Type: String
    - Description: Fully qualified name of a host.
    - Constraints: The value MUST be a syntactically valid host name.
  - DNS Resource Records
    - Identifier: dns
    - Cardinality: 0+
    - Mutability: read-write
    - Data Type: Composition[DNS Resource Record]
    - Description: DNS Resource Records related to the host.
    - Constraints: In EPP compatibility the entries would be limited to A and AAAA entries for IPv4 and IPv6 glue records respectively. The labels of DNS entries MUST be subordinate to the Host Name of the Nameserver.

### 5.4. DNS Resource Record

- Name: DNS Resource Record
- Description: Represents a DNS Entry
- Data Elements:
  - Label
    - Identifier: hostNameLabel
    - Cardinality: 1
    - Mutability: read-write

- Data Type: String.
- Description: DNS entry label.
- Constraints: The value MUST be a syntactically valid DNS host name in Zone file string representation. Absolute FQDNs and relative host names are allowed.
- Type
  - Identifier: type
  - Cardinality: 1
  - Mutability: read-write
  - Data Type: String.
  - Description: DNS entry type.
  - Constraints: Each value MUST valid Zone file string representation of resource record type as defined in [\[RFC1035\]](#). Allowed values MAY be constrained by server policies. For domain provisioning typically the Type would be constrained to allowed parent side entries.
- Data
  - Identifier: data
  - Cardinality: 1
  - Mutability: read-write
  - Data Type: String.
  - Description: DNS entry value.
  - Constraints: Each value MUST be a syntactically valid resource record data for a Type in Zone file string representation.
- TTL
  - Identifier: ttl
  - Cardinality: 1
  - Mutability: read-write
  - Data Type: Number.
  - Description: TTL value for a resource record.
  - Constraints: TTL value of a resource record as defined in [\[RFC1035\]](#). The value MAY be constrained by server policy.

## 5.5. Authorisation Information Object

- Name: Authorisation Information
- Description: Contains information used to authorise operations on a resource object. It may hold different kind of authorisation information.
- Data Elements:
  - Method
    - Identifier: method
    - Cardinality: 1

- Mutability: create-only
- Data Type: String
- Description: The identifier of the RPP authorisation method.
- Constraints: The value MUST be one of the values registered at IANA. Initial values AuthInfo.
- Authorisation Information
  - Identifier: authdata
  - Cardinality: 1
  - Mutability: create-only
  - Data Type: String or Object
  - Description: The value of the authorisation information. It might be as simple as password string, but also more complex values like public key certificates or tokens are possible.
  - Constraints: authorisation information objects are immutable. If the information changes (for example password is updated) a new instance MUST be created. Depending on the method and server policy authorisation Information MAY not be available for reading.

## 5.6. Postal Address Object

- Name: Postal Address Object
- Description: Contains the components of a postal address.
- Data Elements:
  - Street
    - Identifier: street
    - Cardinality: 0+
    - Mutability: read-write
    - Data Type: String
    - Description: The contact's street address.
    - Constraints: Some implementation MAY limit the maximum length of entries or character set.
  - City
    - Identifier: city
    - Cardinality: 0-1
    - Mutability: read-write
    - Data Type: String
    - Description: The contact's city.
    - Constraints: Some implementation MAY limit the maximum length of entries or character set. For EPP compatibility this data element is obligatory.

- State/Province
  - Identifier: sp
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: String
  - Description: The contact's state or province.
  - Constraints: Some implementation MAY limit the maximum length of entries or character set.
- Postal Code
  - Identifier: pc
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: String
  - Description: The contact's postal code.
  - Constraints: Some implementation MAY limit the maximum length of entries or character set. The limitations MAY differ depending on Country Code (cc) data element.
- Country Code
  - Identifier: cc
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: String
  - Description: The contact's country code.
  - Constraints: The value MUST be a two-character identifier from [\[ISO3166-1\]](#). For EPP compatibility this data element is obligatory.

## 5.7. Postal Info Object

- Name: Postal Info Object
- Description: Contains postal-address information in either internationalised or localised forms.
- Data Elements:
  - Contact Type
    - Identifier: type
    - Cardinality: 0-1
    - Mutability: read-write
    - Data Type: String
    - Description: Specifies whether the contact is and individual or an organisation.
    - Constraints: The value MUST be one of: "PERSON" (individual) or "ORG" (organisation).

- Name
  - Identifier: name
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: String
  - Description: The name of the individual or role.
  - Constraints: Some implementation MAY limit the maximum length of entries or character set. For EPP compatibility this data element is obligatory. The implementations MAY require this field if Contact Type (type) is set to "PERSON".
- Organisation
  - Identifier: org
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: String
  - Description: The name of the organisation.
  - Constraints: Some implementation MAY limit the maximum length of entries or character set. The implementations MAY require this field if Contact Type (type) is set to "ORG".
- Address
  - Identifier: addr
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: Postal Address Object
  - Description: The detailed postal address.
  - Constraints: For EPP compatibility this data element is obligatory.

## 5.8. Disclose Object

TODO: Model Disclose in universal (extendible) way

- Name: Disclose
- Identifier: disclose
- Description: TBD

## 6. Domain Name Resource Object

### 6.1. Object Description

- Name: Domain Name Resource Object
- Identifier: domainName

- Description: A Domain Name resource object represents a domain name and contains the data required for its provisioning and management in the registry.

## 6.2. Data Elements

The following data elements are defined for the Domain Name resource object.

- Name
  - Identifier: name
  - Cardinality: 1
  - Mutability: create-only
  - Data Type: String
  - Description: The fully qualified name of the domain object.
  - Constraints: The value MUST be a fully qualified domain name that conforms to the syntax described in [\[RFC1035\]](#). A server MAY restrict allowable domain names to a particular top-level domain, second-level domain, or other domain for which the server is authoritative. The trailing dot required when these names are stored in a DNS zone is implicit and MUST NOT be provided when exchanging host and domain names.
- Repository ID
  - Identifier: repositoryId
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Identifier
  - Description: A server-assigned unique identifier for the object. For EPP compatibility this data element is obligatory.
  - Constraints: (None)
- Status
  - Identifier: status
  - Cardinality: 0+
  - Mutability: read-only
  - Data Type: Domain Status Object
  - Description: The current status descriptors associated with the domain.
  - Constraints: Possible combinations of Domain Status Labels is specified in [Section 2.3](#) of [\[RFC5731\]](#) and [\[RFC3915\]](#)

TBC: IANA registry for statuses?
- Registrant
  - Identifier: registrant
  - Cardinality: 0-1

- Mutability: read-write
- Data Type: Contact Object.
- Description: The contact object associated with the domain as the registrant.
- Constraints: The identifier MUST correspond to a valid Contact resource object known to the server.

TBC: leave registrant here or move it to contacts with a type?

- Contacts

- Identifier: contacts
- Cardinality: 0+
- Mutability: read-write
- Data Type: LabelledAggregation[Contact Object]
  - Label Description: The role of the associated contact.
  - Label Constraints: For domain name associations, the value MUST be one of: "admin", "billing", or "tech".
- Description: A collection of other contact objects associated with the domain object.
- Constraints: Maximum number of associated contacts might be restricted by server policy

- Nameservers

- Identifier: nameservers
- Cardinality: 0+
- Mutability: read-write
- Data Type: Composition[Host Resource Object] or Aggregation[Host Resource Object]
- Description: A collection of nameservers associated with the domain.
- Constraints: (None)

- DNS

- Identifier: dns
- Cardinality: 0+
- Mutability: read-write
- Data Type: Composition[DNS Resource Record]
- Description: A collection of DNS entries related to the domain name.
- Constraints: The Type of the entries MAY be constrained by the server policy. Typically the values would be limited to allowed parent side resource record types. In EPP compatibility with DNSSEC Extension allowed values would be DS and DNSKEY. The labels of DNS entries MUST be subordinate to the domain name and MUST NOT be below zone cut in case of present delegation.



- Subordinate Hosts
  - Identifier: subordinateHosts
  - Cardinality: 0+
  - Mutability: read-only
  - Data Type: Aggregation[Host Object]
  - Description: A collection of subordinate host objects that exist under this domain.
  - Constraints: (None)
- Sponsoring Client ID
  - Identifier: sponsoringClientId
  - Cardinality: 1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that is the current sponsor of the domain object.
  - Constraints: (None)
- Creating Client ID
  - Identifier: creatingClientId
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that created the domain object.
  - Constraints: (None)
- Creation Date
  - Identifier: creationDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp.
  - Description: The date and time of domain object creation.
  - Constraints: The value is set by the server and cannot be specified by the client.
- Updating Client ID
  - Identifier: updatingClientId
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that last updated the domain object.
  - Constraints: This element MUST NOT be present if the domain has never been modified.

- Update Date
  - Identifier: updateDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp.
  - Description: The date and time of the most recent domain object modification.
  - Constraints: This element MUST NOT be present if the domain object has never been modified.
- Expiry Date
  - Identifier: expiryDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp.
  - Description: The date and time identifying the end of the domain object's registration period.
  - Constraints: The value is set by the server and cannot be specified by the client.
- Transfer Date
  - Identifier: transferDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp
  - Description: The date and time of the most recent successful domain object transfer.
  - Constraints: This element MUST NOT be provided if the domain object has never been transferred.
- Authorisation Information
  - Identifier: authInfo
  - Cardinality: 0-1
  - Mutability: read-write
  - Data Type: Authorisation Information Object
  - Description: Authorisation information associated with the domain object.
  - Constraints: (None)

## 6.3. Operations

### 6.3.1. Create Operation

The Create operation allows a client to provision a new Domain Name resource. The operation accepts as input all create-only and read-write data elements defined for the Domain Name Resource Object.

In addition, the following transient data element is defined for this operation:

- Registration Period
  - Identifier: period
  - Cardinality: 0-1
  - Data Type: Period Object.
  - Description: The initial registration period for the domain name. This value is used by the server to calculate the initial expiryDate of the object. This element is not persisted as part of the object's state.

### 6.3.2. Read Operation

The Read operation allows a client to retrieve the data elements of a Domain Name resource. The server's response MAY vary depending on client authorisation and server policy.

Authorisation: \* Sponsoring client: \* Full object representation \* Other client: \* Without object authorisation: \* Limited (non-confidential) object representation or operation denied \* With object authorisation: \* Full object representation, however some properties only authorised to the sponsoring client MAY be redacted according to server policy

The following transient data elements are defined for this operation:

- Hosts Filter
  - Identifier: hostsFilter
  - Cardinality: 0-1
  - Data Type: String
  - Description: Controls which host information is returned with the object.
  - Constraints: The value MUST be one of "all", "del" (delegated), "sub" (subordinate), or "none". The default value is "all".

### 6.3.3. Delete Operation

The Delete operation allows a client to remove an existing Domain Name resource. The operation targets a specific resource object identified by its name.

The server SHOULD reject a delete request if subordinate host objects are associated with the domain name.

The error response SHOULD indicate the related subordinate host objects.

### 6.3.4. Renew Operation

The Renew operation allows a client to extend the validity period of an existing Domain Name resource. The operation targets a specific resource object identified by its name.

- Input: Domain Name
- Output: Full object representation (read-write and read-only properties), or a minimum representation of properties affected by the operation (Expiry Date).

The following transient data elements are defined for this operation:

- Current Expiry Date
  - Identifier: currentExpiryDate
  - Cardinality: 1
  - Data Type: Timestamp
  - Description: The current expiry date of the domain name. The server **MUST** validate this against the object's current expiryDate to prevent unintended duplicate renewals.
- Renewal Period
  - Identifier: renewalPeriod
  - Cardinality: 0-1
  - Data Type: Period Object
  - Description: The duration to be added to the object's registration period. This value is used by the server to calculate the new expiryDate. The default value **MAY** be defined by server policy. The number of units available **MAY** be subject to limits imposed by the server.

## 7. Contact Resource Object

### 7.1. Object Description

- Name: Contact Resource Object
- Identifier: contact
- Description: A Contact resource object represents the social information for an individual or organisation associated with other objects.

### 7.2. Data Elements

The following data elements are defined for the Domain Name resource object.

- Handle ID
  - Identifier: id
  - Cardinality: 1
  - Mutability: create-only
  - Data Type: Identifier.
  - Description: External unique identifier of the contact object.
  - Constraints: This value **MUST** be supported to be provided by the client. Servers **MAY** support server-side generation of this value.
- Repository ID
  - Identifier: repositoryId
  - Cardinality: 0-1

- Mutability: read-only
- Data Type: Identifier
- Description: A server-assigned unique identifier for the object.
- Constraints: For EPP compatibility this data element is obligatory.
- Postal Information
  - Identifier: postalInfo
  - Cardinality: 1-2
  - Mutability: read-write
  - Data Type: AggregationDictionary[Postal Info Object]
    - Label Description: type of contact data localisation
    - Label Constraints: Allowed values: "int" for "internationalised" all-ASCII version of an address and "loc" for localised forms with possible non-ASCII character sets.
  - Description: Contains postal-address information.
  - Constraints: There MUST be no more that 1 element of type "int" and one element of type "loc".
- Voice Phone Number
  - Identifier: voice
  - Cardinality: 0+
  - Mutability: read-write
  - Data Type: Phone Number
  - Description: Voice phone number associated with the contact
  - Constraints: (None)
- Fax Phone Number
  - Identifier: fax
  - Cardinality: 0+
  - Mutability: read-write
  - Data Type: Phone Number
  - Description: Fax number associated with the contact
  - Constraints: (None)
- E-mail
  - Identifier: email
  - Cardinality: 0+
  - Mutability: read-write
  - Data Type: String.
  - Description: The contact's email address.
  - Constraints: Email address syntax is defined in [[RFC5322](#)].

- Status
  - Identifier: status
  - Cardinality: 0+
  - Mutability: read-only
  - Data Type: String
  - Description: The current status descriptors associated with the contact.
  - Constraints: The value MUST be one of the status tokens defined in the IANA registry for domain statuses. The initial value list MAY be as defined in [\[RFC5733\]](#). In this case the values MUST have the same semantics.
- Sponsoring Client ID
  - Identifier: sponsoringClientId
  - Cardinality: 1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that is the current sponsor of the domain object.
  - Constraints: (None)
- Creating Client ID
  - Identifier: creatingClientId
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that created the contact object.
  - Constraints: (None)
- Creation Date
  - Identifier: creationDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp.
  - Description: The date and time of contact object creation.
  - Constraints: The value is set by the server and cannot be specified by the client.
- Updating Client ID
  - Identifier: updatingClientId
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that last updated the contact object.

- Constraints: This element MUST NOT be present if the contact has never been modified.

- Update Date

- Identifier: updateDate
- Cardinality: 0-1
- Mutability: read-only
- Data Type: Timestamp.
- Description: The date and time of the most recent contact object modification.
- Constraints: This element MUST NOT be present if the contact object has never been modified.

- Transfer Date

- Identifier: transferDate
- Cardinality: 0-1
- Mutability: read-only
- Data Type: Timestamp.
- Description: The date and time of the most recent successful contact object transfer.
- Constraints: This element MUST NOT be provided if the contact object has never been transferred.

- Authorisation Information

- Identifier: authInfo
- Cardinality: 0-1
- Mutability: read-write
- Data Type: Authorisation Information.
- Description: Authorisation information associated with the contact object.
- Constraints: (None)

- Disclose

- Identifier: disclose
- Cardinality: 0-1
- Mutability: read-write
- Data Type: Disclose Object.
- Description: Identifies elements that require exceptional server-operator handling to allow or restrict disclosure to third parties.

TBC: IANA registry for statuses?

### 7.3. Operations

TODO: Describe operations for contacts

## 8. Host Resource Object

### 8.1. Object Description

A Host resource object represents a name server that provides DNS services for a domain name.

### 8.2. Data Elements

The following data elements are defined for the Host Resource Object.

TBC: hostName/dns properties are identical to Nameserver Object. Shall we define something like "Extends"?

- Host Name
  - Identifier: hostName
  - Cardinality: 1
  - Mutability: read-write
  - Data Type: String
  - Description: Fully qualified name of a host.
  - Constraints: The value MUST be a syntactically valid host name.
- DNS Resource Records
  - Identifier: dns
  - Cardinality: 0+
  - Mutability: read-write
  - Data Type: Composition[DNS Resource Record]
  - Description: DNS Resource Records related to the host.
  - Constraints: In EPP compatibility the entries would be limited to A and AAAA entries for IPv4 and IPv6 glue records respectively. The labels of DNS entries MUST be subordinate to the Host Name of the Nameserver.s
- Status
  - Identifier: status
  - Cardinality: 0+
  - Mutability: read-only
  - Data Type: Domain Status Object
  - Description: The current status descriptors associated with the domain.
  - Constraints: Possible combinations of Domain Status Labels is specified in [Section 2.3 of \[RFC5732\]](#)



TBD: this block repositoryId/sponsoringClientId/creationDate/updatingClientId/updateDate/transferDate is the same as for Domain Name. Shall it be abstracted to a new component object like "Provisioning Metadata"?

- Repository ID
  - Identifier: repositoryId
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Identifier
  - Description: A server-assigned unique identifier for the object. For EPP compatibility this data element is obligatory.
  - Constraints: (None)
- Sponsoring Client ID
  - Identifier: sponsoringClientId
  - Cardinality: 1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that is the current sponsor of the host object.
  - Constraints: (None)
- Creating Client ID
  - Identifier: creatingClientId
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Client Identifier.
  - Description: The identifier of the client that created the host object.
  - Constraints: (None)
- Creation Date
  - Identifier: creationDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp.
  - Description: The date and time of host object creation.
  - Constraints: The value is set by the server and cannot be specified by the client.
- Updating Client ID
  - Identifier: updatingClientId
  - Cardinality: 0-1

- Mutability: read-only
- Data Type: Client Identifier.
- Description: The identifier of the client that last updated the host object.
- Constraints: This element MUST NOT be present if the domain has never been modified.
- Update Date
  - Identifier: updateDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp.
  - Description: The date and time of the most recent host object modification.
  - Constraints: This element MUST NOT be present if the host object has never been modified.
- Transfer Date
  - Identifier: transferDate
  - Cardinality: 0-1
  - Mutability: read-only
  - Data Type: Timestamp
  - Description: The date and time of the most recent successful host object transfer.
  - Constraints: This element MUST NOT be provided if the host object has never been transferred.

### 8.3. Operations

TODO: Describe operations for hosts

## 9. IANA Considerations

### 9.1. RPP Object Registry

This document establishes the "Registry Provisioning Protocol (RPP) Object Registry". This registry serves as a definitive, hierarchical catalogue of all resource objects, component objects, data elements, and operations used within RPP.

#### 9.1.1. Registration Policy

The policy for adding new objects, data elements, or operations to this registry is "Specification Required" [[RFC8126](#)].

### 9.1.2. Registry Structure

The registry is organised as a collection of Object definitions. Each Object definition **MUST** include:

- A header containing the Object Identifier, Object Name, Object Type (Resource or Component), a brief description, and a reference to its defining specification.
- A "Data Elements" table listing all persisted data elements associated with the object. Each entry **MUST** specify the element's Identifier, Name, Cardinality, Mutability, Data Type, and description.
- If applicable, an "Operations" section. For each operation, the registry **MUST** provide:
  - The Operation's Name and a description.
  - A "Parameters" table listing all data elements that are provided as input to the operation but are not persisted as part of the object's state. Each entry **MUST** specify the parameter's Identifier, Name, Cardinality, Data Type, and a description.

### 9.1.3. Initial Registrations

The initial contents of the RPP Object Registry are defined below.

Object: period

Object Name: Period Object

Object Type: Component

Description: Represents a duration of time.

Reference: [This-ID]

Data Elements

Element Identifier	Element Name	Card.	Mutability	Data Type	Description
value	Value	1	read-write	Integer	The numeric value of the period.
unit	Unit	1	read-write	String	The unit of the period.

Table 1

Object: nameserver

Object Name: Nameserver Object

Object Type: Component

Description: Represents a single nameserver.

Reference: [This-ID]

#### Data Elements

Element Identifier	Element Name	Card.	Mutability	Data Type	Description
hostName	Host Name	1	read-write	String	The name of the host.
dns	DNS Resource Records	0+	read-write	Composition[DNS Resource Record]	DNS Resource Records related to the host.

*Table 2*

Object: dnsrr

Object Name: DNS Resource Record

Object Type: Component

Description: Represents a DNS Entry.

Reference: [This-ID]

#### Data Elements

Element Identifier	Element Name	Card.	Mutability	Data Type	Description
hostNameLabel	Label	1	read-write	String	DNS entry label.
type	Type	1	read-write	String	DNS entry type.
data	Data	1	read-write	String	DNS entry value.
ttl	TTL	1	read-write	Number	TTL value for a resource record.

*Table 3*

Object: authInfo

Object Name: Authorisation Information

Object Type: Component

Description: Contains authorisation credentials for an operation.

Reference: [This-ID]

## Data Elements

Element Identifier	Element Name	Card.	Mutability	Data Type	Description
method	Method	1	create-only	String	The identifier of the RPP authorisation method.
authdata	Authorisation Information	1	create-only	String / Object	The value of the authorisation information. It might be as simple as password string, but also more complex values like public key certificates or tokens are possible.

Table 4

Object: domainStatus

Object Name: Domain Status

Object Type: Component

Description: Represents one of the status values associated with the domain name.

Reference: [This-ID]

## Data Elements

Element Identifier	Element Name	Card.	Mutability	Data Type	Description
label	Label	1	create-only	String	computer-reasible enum label of a status
reason	Reason	0-1	create-only	String	a human-readable text that describes the rationale for the status applied to the object.
due	Due	0-1	read-write	Timestamp	a timestamp, when this status is going to be removed automatically, or changed to other status. This field can be used to expresse lifecycle related information

Table 5

Object: domainstatus

Object Name: Domain Status Object

Object Type: Component

Description: Represents one of the status values associated with the domain name.

Reference: [This-ID]

Data Elements

Element Identifier	Element Name	Card.	Mutability	Data Type	Description
label	Label	1	create-only	String	computer-readable enum label of a status
reason	Reason	0-1	create-only	String	a human-readable text that describes the rationale for the status applied to the object
due	Due	0-1	read-write	Timestamp	a timestamp, when this status is going to be removed automatically, or changed to other status. This field can be used to expresse lifecycle related information

Table 6

Object: authinfo

Object Name: Authorisation Information

Object Type: Component

Description: Contains information used to authorise operations on a resource object. It may hold different kind of authorisation information.

Reference: [This-ID]

Data Elements

Element Identifier	Element Name	Card.	Mutability	Data Type	Description
method	Method	1	create-only	String	The identifier of the RPP authorisation method.
authdata	Authorisation Information	1	create-only	String or Object	The value of the authorisation information. It might be as simple as password string, but also more complex values like public key certificates or tokens are possible.

Table 7

TODO: IANA table: Postal Address Object  
TODO: IANA table: Postal Info Object  
TODO: IANA table: Disclose Object

Object: domainName

Object Name: Domain Name Resource Object

Object Type: Resource

Description: Represents a domain name and its associated data.

Reference: [This-ID]

Data Elements

Identifier	Name	Card.	Mutability	Data Type	Description
name	Name	1	create-only	String	The fully qualified name of the domain object.
repositoryId	Repository ID	1	read-only	Identifier	A server-assigned unique identifier for the object.

Identifier	Name	Card.	Mutability	Data Type	Description
status	Status	0+	read-only	Domain Status Object	The current status descriptors for the domain.
registrant	Registrant	0-1	read-write	Contact Object	The registrant contact ID.
contacts	Contacts	0+	read-write	LabelledAggregation [Contact Object]	Associated contact objects.
nameservers	Nameservers	0+	read-write	Composition[Host Resource Object] or Aggregation[Host Resource Object]	A collection of nameservers associated with the domain.
dns	DNS	0+	read-write	Composition[DNS Resource Record]	A collection of DNS entries related to the domain name.
subordinateHosts	Subordinate Hosts	0+	read-only	Aggregation [Host Object]	Subordinate host names.
sponsoringClientId	Sponsoring Client ID	1	read-only	Client Identifier	The current sponsoring client ID.
creatingClientId	Creating Client ID	0-1	read-only	Client Identifier	The client ID that created the object.
creationDate	Creation Date	0-1	read-only	Timestamp	Creation timestamp.



Identifier	Name	Card.	Mutability	Data Type	Description
updatingClientId	Updating Client ID	0-1	read-only	Client Identifier	The client ID that last updated the object.
updateDate	Update Date	0-1	read-only	Timestamp	The timestamp of the last update.
expiryDate	Expiry Date	0-1	read-only	Timestamp	Expiry timestamp.
transferDate	Transfer Date	0-1	read-only	Timestamp	The timestamp of the last successful transfer.
authInfo	Authorisation Info	0-1	read-write	authInfo	Authorisation information for the object.

Table 8

## Operations

## Operation: Create

Description: Provisions a new Domain Name resource.

## Parameters

Identifier	Name	Card.	Data Type	Description
period	Registration Period	0-1	period	The initial registration period for the domain name.

Table 9

## Operation: Read

Description: Retrieves the data elements of a Domain Name resource.

## Parameters

Identifier	Name	Card.	Data Type	Description
hostsFilter	Hosts Filter	0-1	String	Controls which host information is returned.
queryAuthInfo	Query Authorisation Information	0-1	authInfo	Credentials to authorise access to full object data.

Table 10

Operation: Delete

Description: Removes an existing Domain Name resource.

Parameters: (None)

Operation: Renew

Description: Extends the validity period of a Domain Name resource.

Parameters

Identifier	Name	Card.	Data Type	Description
currentExpiryDate	Current Expiry Date	1	Timestamp	The expected current expiry date, for validation.
renewalPeriod	Renewal Period	0-1	period	The duration to add to the registration period.

Table 11

TODO: IANA table: Contact Resource Object TODO: IANA table: Host Resource Object

Security Considerations

TODO: write security considerations, if any

## 10. Normative References

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