Drafts & Requirements

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Existing Documents

1) **RESTful EPP**: Proposal for a new standard for EPP over RESTful transport

- Mapping EPP to RESTful API
- Focus on scalability, performance, security and usability
- Limit use of XML/JSON messages where possible

https://datatracker.ietf.org/doc/html/draft-wullink-restful-epp-01

2) **EPP XML to JSON**: Mapping rules for XML to JSON

- Conversion rules for converting Mapping EPP XML schema to JSON schema
- Reuse established semantics for existing XML object mappings (domain, host, contact …)

https://datatracker.ietf.org/doc/html/draft-wullink-rpp-json-00

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Command Mapping

- EPP Command is mapped to:
  - **HTTP method (e.g. GET, POST)**
  - Resource
  - Request message

Command	Method	Resource	Request	Response
Hello	OPTIONS	/	No	Yes
Login	POST	/session	Yes	Yes
Logout	DELETE	/session	N/A	Yes
Check	HEAD	/{c}/{i}	No	No
Info	GET	/{c}/{i}	Optional	Yes
Poll Request	GET	/messages	No	Yes
Poll Ack	DELETE	/messages/{i}	No	Yes
Create	POST	/{c}	Yes	Yes
Delete	DELETE	/{c}/{i}	Optional	Yes
Renew	POST	/{c}/{i}/renewal	Optional	Yes
Transfer Reques	POST	/{c}/{i}/transfer	Optional	Yes
Transfer Query	GET	/{c}/{i}/transfer	Optional	Yes
Transfer Cancel	DELETE	/{c}/{i}/transfer	Optional	Yes
Transfer Approve	PUT	/{c}/{i}/transfer	Optional	Yes
Transfer Reject	DELETE	/{c}/{i}/transfer	Optional	Yes
Update	PATCH	/{c}/{i}	Yes	Yes

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  - **Resource**
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Renew	POST	/{c}/{i}/renewal	Optional	Yes
Transfer Request	POST	/{c}/{i}/transfer	Optional	Yes
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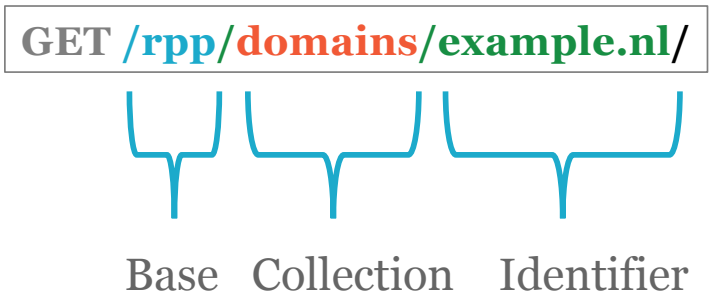
Transfer Cancel	DELETE	/{c}/{i}/transfer	Optional	Yes
Transfer Approve	PUT	/{c}/{i}/transfer	Optional	Yes
Transfer Reject	DELETE	/{c}/{i}/transfer	Optional	Yes
Update	PATCH	/{c}/{i}	Yes	Yes



Command Mapping

- EPP Command is mapped to:
  - HTTP method
  - Resource
  - **Request message (optional)**

Command	Method	Resource	Request	Response
Hello	OPTIONS	/	No	Yes
Login	POST	/session	Yes	Yes
Logout	DELETE	/session	N/A	Yes
Check	HEAD	/{c}/{i}	No	No
Info	GET	/{c}/{i}	Optional	Yes
Poll Request	GET	/messages	No	Yes
Poll Ack	DELETE	/messages/{i}	No	Yes
Create	POST	/{c}	Yes	Yes
Delete	DELETE	/{c}/{i}	Optional	Yes
Renew	POST	/{c}/{i}/renewal	Optional	Yes
Transfer Request	POST	/{c}/{i}/transfer	Optional	Yes
Transfer Query	GET	/{c}/{i}/transfer	Optional	Yes
Transfer Cancel	DELETE	/{c}/{i}/transfer	Optional	Yes
Transfer Approve	PUT	/{c}/{i}/transfer	Optional	Yes
Transfer Reject	DELETE	/{c}/{i}/transfer	Optional	Yes
Update	PATCH	/{c}/{i}	Yes	Yes

EPP Example: Domain Check

Standard XML request

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
  <command>
     <check>
       <domain:check
        xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
         <domain:name>example.nl</domain:name>
       </domain:check>
     </check>
     <clTRID>ABC-12345</clTRID>
 </command>
</epp>
```

Processing steps are relatively expensive: create, serialize, transmit, deserialize, parse, validate all take CPU cycles

RPP Example: Domain Check

Request

```
HEAD /rpp/v1/domains/example.nl HTTP/2
Host: rpp.example.nl
Authorization: Bearer <token>
Accept: application/rpp+json
Accept-Language: en
REPP-Cltrid: ABC-12345
```

Response

```
HTTP/2 200 OK
Date: Wed, 24 Jan 2024 12:00:00 UTC
Server: Example RPP server v1.0
RPP-Cltrid: ABC-12345
RPP-Svtrid: XYZ-12345
RPP-Check-Avail: 0
RPP-Check-Reason: In use
RPP-result-code: 1000
Content-Length: 0
```

No request message required
Request encoded in:
- Method
- URL
- Headers

No response message
Response encoded in HTTP headers

JSON Representation – Automatic Conversion

Automatic conversion using basic rules for

Converting XML schema to to JSON schema

The good:

It (mostly) works

The Bad:

- Tight coupling between XML and JSON
- Duplication of data

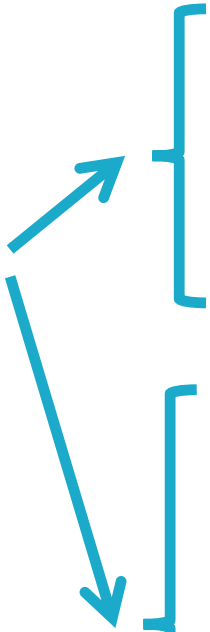
POST /rpp/domains/example.com HTTP/2

- The JSON output is less readable and flexible

JSON Representation – Semantic Conversion

Representation include:

- Object identifiers (1)
- Object definitions (2)
- Mix of identifiers and definitions



```
{
    "name": "example.example",
    "duration": "P1Y",
    "registrant": [
        {
            "id": "CTC42977"
        },
        {
            "id": "NEWID",
            "name": "John Doe",
            "Address": "..."
        }
    ],
    "ns": [
        {
            "name": "ns1.example.net"
        },
        {
            "name": "ns1.example.com",
            "addr": {
                "ipv4": [
                    "192.0.2.2",
                    "192.0.2.29"
                ],
                "ipv6": [
                    "2001:DB8:0:0:8:800:200C:417A"
                ]
            }
        }
    ]
}
```

(1)

(2)

(1)

(2)

Requirements – Hackathon Results

There are many open questions about the requirements for RPP, we already had a good discussion about:

- Authentication
- EPP Compatibility
- Extensibility
- Internationalization
- …

Temporary requirements document, to be moved to WG wiki.

https://github.com/SIDN/ietf-wg-rpp-charter/blob/main/requirements.md

Authentication

Granular authorisation model, using frameworks such as Oauth and include Federation. Going beyond the current auth-code based authorisation for transfers only.

Allow for additional use cases:

- DNS providers
- Registry Lock
- Renewals

EPP Compatibility

What level of EPP compatibility is desired?

- RPP is based on JSON data format
- Reuse the EPP data model or the defined EPP semantics?
- Use Compatibility profiles, for signalling level of EPP compatibility
- Maybe reconsider some EPP design decisions, e.g. Host Attributes?

Extensibility

- Flexible object representations (e.g. EPP Object extension)
- Allow for new operations to be added using URI path extension
  - This may require an IANA registration for extension path element names

Example: RPP extension for registry lock:

```
PUT /rpp/domains/example.nl/lock HTTP/2
```

Internationalization

- Internationalized Domain Names (IDN)
- Email addresses
- Use jsContact for contact representation?
- Localized server responses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Thank You

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