

RESTCONF Protocol

draft-ietf-netconf-restconf-03
NETCONF WG
IETF #91 Honolulu, HI, USA

Andy Bierman <andy@yumaworks.com>
Martin Björklund <mbj@tail-f.com>
Kent Watsen <kwatsen@juniper.net>

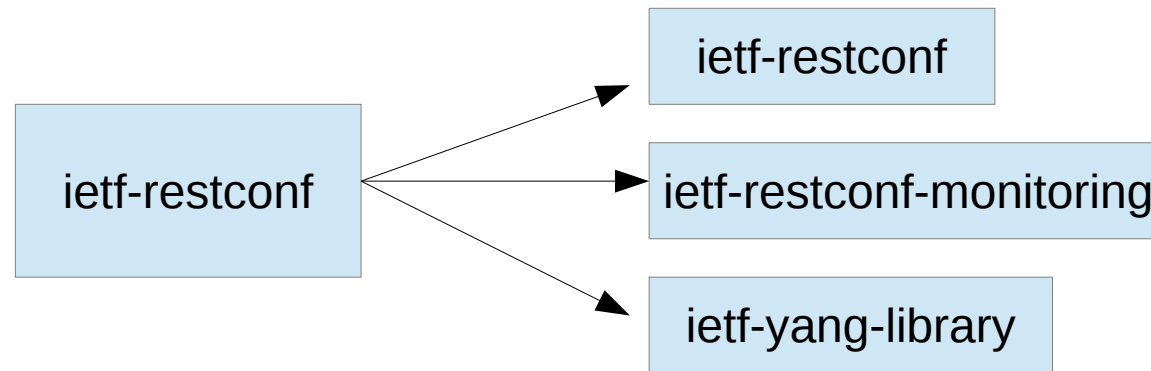
v0.3

Agenda

- RESTCONF-03 Update highlights
- Review resolution proposals for open issues
 - <https://github.com/netconf-wg/restconf/issues>
 - Almost all issues have been addressed in this draft
- Next Steps
- YANG Patch Status

RESTCONF -03 Highlights

- YANG Modules Split



- Collection resource added
- XML encoding is mandatory, JSON is optional; Query parameters are optional

ietf-restconf.yang

- Purpose:
 - API entry points
 - Conceptual definitions for message content
- Groupings instead of datastore content
 - collection: application/yang.collection
 - errors: application/yang.errors
 - notification: application/yang.stream
 - restconf: application/yang.api

ietf-restconf-monitoring.yang

- Purpose:
 - Advertise server capabilities and notification streams

+--ro restconf-state

+--ro capabilities

| +--ro capability* inet:uri

+--ro streams

+--ro stream* [name]

+--ro name string

+--ro description? string

+--ro replay-support? boolean

+--ro replay-log-creation-time? yang:date-and-time

+--ro events inet:uri

ietf-yang-library.yang

- Purpose: Specify the YANG module conformance information claimed by the server

+--ro modules

+--ro module-set-id? string

+--ro module* [name revision]

+--ro name yang:yang-identifier

+--ro revision union

+--ro schema? inet:uri

+--ro namespace inet:uri

+--ro feature* yang:yang-identifier

+--ro deviation* yang:yang-identifier

+--ro conformance boolean

+--ro submodules

+--ro submodule* [name revision]

+--ro name yang:yang-identifier

+--ro revision union

+--ro schema? inet:uri

#2) netconf-state monitoring support

- How to monitor RESTCONF sessions?
 - Proposal: Define a “restconf-tls” transport identity so the server can add long-lived RESTCONF sessions in /netconf-state/sessions/session list
 - TBD: Define protocol specific augmentations to the 'session' list
 - Issues:
 - Counters in the module are all NETCONF-specific
 - RESTCONF does not use sessions and has no definition of a session

#2) netconf-state monitoring (2)

- New session leaf?
 - The 'session' list only has a 'transport' leaf
 - Assumes the protocol is NETCONF
 - All the transport identities couple a transport with a protocol
 - Should a new leaf be added to identify the protocol?
 - Help protocol-specific augments
 - Should the 'transport' leaf be changed to only identify the transport protocol?
 - YANG module advertisement for specific RFC conformance

#3) add collection resource

```
GET /restconf/data/example-jukebox:jukebox/library/artist=Foo%20Fighters  
/album/?limit=2  
Content-Type: application/yang.collection+xml
```

```
<collection xmlns="urn:ietf:params:xml:ns:yang:ietf-restconf">  
  <album xmlns="http://example.com/ns/example-jukebox">  
    <name>Foo Fighters</name>  
    <year>1995</year>  
    ...  
  </album>  
  <album xmlns="http://example.com/ns/example-jukebox">  
    <name>The Color and the Shape</name>  
    <year>1997</year>  
    ...  
  </album>  
</collection>
```

#3) add collection: JSON example

GET /restconf/data/example-jukebox:jukebox/library/
artist=Foo%20Fighters/album/?limit=2&offset=2
Content-Type: application/yang.collection+json

```
{
  "collection": {
    "example-jukebox:album" : [
      {
        "year" : 1999,
        "name" : "There is Nothing Left to Loose",
        ...
      },
      {
        "year" : 2002,
        "name" : "One by One",
        ...
      }
    ]
  }
}
```

#4) defaults handling

- No changes to RESTCONF defaults handling made
- It is possible to define a query parameter to add the 'with-defaults' leaf from RFC 6243
- Proposal: (not in draft-03)
 - Add text to sec. 2.5.2:
 - A server MUST advertise its “with-defaults” basic mode according to section 4 of RFC 6243.

#5) protocol capability URIs

- /restconf/capabilities container added
- leaf-list capability URI similar in structure to /netconf-state/capabilities
 - RESTCONF capabilities can be different, even if co-located with a NETCONF server
- URIs defined for RESTCONF query parameters

#6) how to identify query parameters supported

- Query parameter URIs defined to be retrieved by client from `/restconf/capabilities`
 - `:content:` urn:ietf:params:restconf:capability:content:1.0
 - `:depth:` urn:ietf:params:restconf:capability:depth:1.0
 - `:filter:` urn:ietf:params:restconf:capability:filter:1.0
 - `:insert:` urn:ietf:params:restconf:capability:insert:1.0
 - `:page:` urn:ietf:params:restconf:capability:page:1.0
 - `:select:` urn:ietf:params:restconf:capability:select:1.0
 - `:replay:` urn:ietf:params:restconf:capability:replay:1.0

#7) mandatory encoding

- Server **MUST** support XML encoding and **MAY** support JSON encoding.

#8) move restconf data

- The streams and capabilities have been moved to a regular YANG module
 - ietf-restconf-monitoring is listed in the ietf-yang-library by server, if any capabilities and streams exist
 - Now available as `/restconf/data/restconf-state`

#9) Define how authentication is performed

- Proposal:
 - Mutual authentication based on X.509 certificates
 - just like NETCONF/TLS
 - Require HTTP/1.1 for persistent connections
 - Decide: MUST, SHOULD, or MAY?
 - Recommend a reasonable idle timeout
 - Suggest 5 minute timeout
 - Apache default is 5 seconds

#10) Naming convention for query parameter

- Text added to advise vendors to use a name prefix for all proprietary query parameters
- IETF RESTCONF query parameters do not have any prefix
- /restconf/data/capabilities will contain the query parameter URI, which provides a more global identifier

#11) get-bulk query parameters

- Paging capability
 - “offset” and “limit” parameters added for iterating through large numbers of list instances, using the collection resource type
- Additional filtering and server processing deferred to future work
 - New query parameter URIs will be defined

#12) target resource list keys

- list and leaf-list key values are not required for GET if the client is requesting a collection resource (Accept header)
- Solution for issue #3 resolves this issue

#13) ietf-yang-library: which RFC

- ietf-yang-library.yang may be useful for any protocol using YANG modules
 - Constrained Management Interface (CoMI)
 - draft-vanderstok-core-comi-05
 - Implementation of ietf-yang-library is mandatory
 - NETCONF could require it for YANG 1.1, instead of advertising YANG 1.1 module capability URIs
- Proposal: move this module to the YANG Conformance draft

Next Steps

- Declare consensus to close RESTCONF issues with complete solution proposals
- Make decisions on the few issues without complete solution proposals
- Get cross area reviews
- Update the draft based on comments
- Begin WGLC on RESTCONF-05 (Dec 2014)

YANG Patch

- draft-ietf-netconf-yang-patch-01
 - Waiting for RESTCONF to be completed
 - No open issues
 - Needs cross area review with RESTCONF draft
 - Plan WGLC in December with RESTCONF draft