



YANG Instance Data for Documenting Server Capabilities

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[draft-lengyel-netmod-yang-instance-data](#)

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Documenting server capabilities

- › Server capabilities are often readable via Netconf/Restconf
 - Ietf-yang-library: Modules, revisions, features, deviations, datastores
 - Ietf-netconf-monitoring : Netconf-capabilities, etc.
 - Alarms supported
 - YangPush on-change notification capabilities
- › Most are set/fixed at implementation time and don't change
- › Server capabilities needed in implementation-time
 - To start the NMS implementation in parallel
 - Operator buying decision may depend on the OAM capabilities,
- › Standard formal YANG based form of documentation preferred
 - SW / automation needs to read capabilities
 - Makes capabilities available both via Netconf and via documentation
 - › Same format on Netconf and documents
 - Encourages easy to read uniform documentation

Preloading Data

- › Define sets of default data for configuration
 - Default Access control groups
 - › readOnlyUser, systemAdministrator, securityAdministrator
 - Default rule-lists, rules for the default groups
- › Default monitoring routines for a node
- › Document/Load these in YANG instance-data-sets
- › May later be modified

Instance Data Format

- › Simple – Nothing new
- › XML & JSON format
 - (later maybe CBOR)
- › Based on GET reply formats – already defined
- › Add metadata (name, revision, description)
- › Follows YANG modules that define the relevant datastore parts (target YAMs)
 - Allow partial data sets
- › May contain configuration and/or state data

Changes

- › Recommendation to document server capabilities changed to be just the primary use-case
 - It is a very important message. Should we really exclude it?
- › Redefined using yang-data-ext
- › Moved meta data into ordinary leafs/lists
 - Allows more precise definition of metadata
- › Clarified encoding
 - XML declaration
 - UTF-8 encoding
 - We follow RFC 7950/7951 rules
- › In case of conflict live data from Netconf/Restconf has precedence over instance data

Open Issues 1

- › Shall we recommend as a general practice: servers SHOULD document their capabilities using instance data
 - › Proposal: Yes
 - › It is an important recommendation that might get lost otherwise
 - › If no :
 - › defining instance-data format is still important
 - › Would you support a new draft/bis to recommend that data in ietf-yang-library SHOULD be documented as instance-data ?
- › How the correct versions of the target models used inside instance data are defined
 - Proposal: Don't use revisions – way to strict.
 - › Wait for Versioning draft and reuse their import-by-semantic-version solution.

Open Issues 2

- › Should we use yang-data-ext to define the instance data module?
 - › Proposal: yes. This is the perfect use case for it.
 - › It does not affect the actual instance-data-file format.
 - › but
 - › It maybe more difficult for some tools. Exactly how ?
 - › It might be important for mixed modules, but not here
- › Shall we add a datastore parameter for config=true data?
 - Proposal: Only if we find a use-case for it, so not now
 - The draft does not specify how instance data is used by the YANG server
 - For now all config=false data belongs to operational, all config=true data belongs to running/candidate

Open Issues 3

- › Allow multiple instance-data-sets in one file
 - › Proposal: No. Even in YANG one-file=one-module is the practice. The convention to use the main contained item as a file name is useful
- › Create tags to hold instance data blocks in RFCs
 - like <CODE BEGINS> <CODE ENDS>
 - e.g. <INSTANCE DATA BEGINS> <INSTANCE DATA ENDS>
 - Proposal: No, Yang examples are not using the <CODE> tags either
- › Shall we include a semantic version for the instance-data-set
 - Proposal: Don't do it, maybe later.
 - What does compatibility mean for instance data?
 - Who would use the semver numbers?

Way Forward

- › Request adoption as workgroup document
- › Received support on last IETF
- › Received support and comments on the mailing list

Background slides

Metadata Yang Module

- › module *ietf-yang-instance-data*
- › Defines metadata annotations to for YANG Instance Data sets
 - instance-data-set : name of the instance data
 - Contact
 - Organization
 - Description
 - Revision

XML Format

```
<instance-data-set xmlns="urn:ietf:params:xml:ns:yang:ietf-yang-instance-data">
  <name>acme-router-modules</name>
  <revision>2108-01-25</revision>
  <description>The set of modules that acme-router will contain. </description>
  <data>
    <yang-library xmlns="urn:ietf:params:xml:ns:yang:ietf-yang-library">
      <module-set>
        <name>basic</name>
        <module>
          <name>ietf-system</>
          <revision>2014-08-06</revision>
          <namespace>urn:ietf:params:xml:ns:yang:ietf-system</namespace>
          <feature>authentication</feature>
          <feature>radius-authentication</feature>
        </module>
      </module-set>
    </yang-library>
  </data>
</instance-data-set>
```

Needed - Used

- › Already used in multiple implementations
 - Based on similar principles, but slightly different formats
- › Needed for YangPush
 - Proposed to be used for documenting on-change notification capabilities
- › Needed for Yang-Library
 - ietf-yang-library contains a lot of server capabilities that are usually set in implementation file, but may change

Out-of-Scope

- › Which server capabilities to document
 - Separate drafts e.g. draft-lengyel-netconf-notification-capabilities
- › Which yang modules to preload with data
- › How instance data is loaded by the server
 - Using an instance-data-file
 - Any other way
- › Life-cycle of any documented/preloaded data
 - Is it ***protected*** from modification, or it ***may change*** later
 - YangPush may supply notifications about any change