Validate anydata with YANG Library context

draft-netana-nmop-yang-anydata-validation

ahmed.elhassany@swisscom.com
thomas.graf@swisscom.com

07. Nov. 2025

Problem statement

- Users cannot validate the YANG data semantics if data is located under *anydata* subtree.
- For example, if a router is sending negative values for counter types.

```
{
 "ietf-yang-push:push-update": {
  "id": 89,
  "datastore-contents": {
   "ietf-interfaces:interfaces": {
   "interface": [
    {
     "name": "eth0",
              "statistics": {"in-octets": -10}
    }]
   }}
 }
}
```

Router is sending negative value for yang:counter64

Survey of existing use of "*anydata*"

- Operations on a YANG datastore
    1. A NETCONF subtree filter to select a subtree on an instantiated YANG data tree; RFC 8526, RFC 9144, and RFC 8641.
    2. The output of a subtree filter or XPATH; RFC 8526, RFC 9144, and RFC 8641.
    3. To represent edit operations on YANG data tree with YANG Patch; RFC 8072.
- Represent a YANG-like data tree (RFCs were not very clear)
    1. Subscribed notifications in RFC 8639.
    2. Error information in RESTCONF RFC 8040.

The goals of this document

- Provide optional way for Network Operators to check the validity of the YANG data at scale.
- YANG data consumer can choose to enable or disable stricter validation of anydata subtrees.
- Data marked as invalid are processed by a different pipeline than the normal one (e.g., logging for further analysis) such that the main business logic is never impacted with misbehaving YANG producers (e.g., integer overflow bug to produce negative counter values).

YANG Library look up

- The namespace of the encoded data nodes under *anydata* can be looked up in a YANG Library context.
- This approach **DOES NOT** restrict what a producer can put under *anydata* subtree.
- It only checks whatever subtree under the *anydata* have a corresponding schema and it is valid according to it.


```
{
"ietf-yang-library:yang-library": {
 "module-set": [
  {
   "name": "complete",
   "module": [
    {
     "name": "yang",
     "revision": "2022-06-16",
     "namespace": "urn:ietf:params:xml:ns:yang:1"
    },
    {
     "name": "ietf-interfaces",
     "revision": "2018-02-20",
     "namespace": "urn:ietf:params:xml:ns:yang:ietf-interfaces",
     "location": ["file://ietf-interfaces@2018-02-20.yang"],
     "feature": [
       "arbitrary-names",
       "pre-provisioning",
       "if-mib"
     ]
    },
   ...
```

Changes since IETF 123

1. Clarify the problem statement and the impact of having unvalidated *anydata* subtrees.
2. A survey of existing usage of *anydata* within IETF documents.

Context

- RFC 7950: The YANG 1.1 Data Modeling Language

  The "anydata" statement is used to represent an unknown set of nodes that can be modeled with YANG, except anyxml, but for which the data model is not known at module design time. It is possible for the data model, though not required, for anydata content to become known through protocol signaling or other means that are outside the scope of this document.