Augmented-by Addition into the ietf-yang-library

draft-lincla-netconf-yang-library-augmentdeby-01
Author: Zhuoyao Lin, Benoit Claise, Ignacio Dominguez Martinez-Casanueva

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Presenter: Zhuoyao Lin
Overview

Background:
Augment the ietf-yang-library to provide the augmented-by list that tells the module is augmented by which other modules (refer to Fig.1).

Use Case: (draft-ietf-nmop-yang-message-broker-integration)
Improve YANG-Push receiver solution by reducing the amount of time taken to find subscribed module relationship. Integrated in libyangpush.

module: ietf-yang-library
  +---ro yang-library
  |     +---ro module-set* [name]
  |     |     +---ro name string
  |     |     +---ro module* [name]
  |     |     |     +---ro name yang:yang-identifier
  |     |     |     +---ro revision? revision-identifier
  |     |     |     +---ro namespace inet:uri
  |     |     |     +---ro location* inet:uri
  |     |     +---ro submodule* [name]
  |     |     |     +---ro name yang:yang-identifier
  |     |     |     +---ro revision? revision-identifier
  |     |     |     +---ro location* inet:uri
  |     |     |     +---ro feature* yang:yang-identifier
  |     |     |     +---ro deviation* - > ../../module/name
  |     |     |     +---ro yanglib-aug:augmented-by* - > ../../yanglib:module/name

Figure 1. YANG-Push receiver diagram
Hackathon Plan

• <What problem we are working on?>
  • The implementation for draft-lincla-netconf-yang-library-augmentdeby
  • Provide a light weight solution for finding reverse dependency (from potentially minutes to near seconds)
    This is required for closed-loop
• <How do we planned to solve it?>
  • Create an docker image for netopeer2 with the augmented-by feature
  • Implement find-dependency solution with augmented-by list
Hackathon Plan

- <What we have improved?>
  - IETF119 Hackathon:
    - Augmented by feature implemented with libyang and sysrepo and tested with netopeer2
  - IETF120 Hackathon:
    - Netopeer2 and related library upgraded and tested with the newest version
    - The feature implementation is wrapped using Docker
    - Integrate libyangpush find-dependency solution with augmented-by feature
What got done

**Netopeer2 Docker**

- To facilitate people who are interested in this feature to run and test it, a Docker for running netopeer2 and libyangpush is created.
- The augmented-by feature is integrated in the [libyang](#) and [sysrepo](#)
- By connecting to the netopeer2-server in this docker, user can query yanglib and get the augmented-by list.
What got done

Netopeer2 Docker
What got done

Netopeer2 Docker

```
> get --filter-xpath /ietf-yang-library:yang-library/module-set/module[name='ietf-interfaces']/*

DATA
<data xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <yang-library xmlns="urn:ietf:params:xml:ns:yang:ietf-yang-library">
    <module-set>
      <name>complete</name>
      <module>
        <name>ietf-interfaces</name>
        <revision>2018-02-20</revision>
        <location>file:///sysrepo/build/repository/yang/ietf-interfaces@2018-02-20.yang</location>
      </module>
    </module-set>
  </yang-library>
</data>
```
What got done

Libyangpush find-dependency

• The find-dependency solution of libyangpush is implemented to use the yanglib content to find reverse dependency
• Compared to the previous get-all-schemas solution, it can help collector reduce the time to process and get required module and dependency
What got done

Libyangpush find-dependency
What got done

Libyangpush find-dependency

```xml
<get xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <yang-library xmlns="urn:ietf:params:xml:ns:yang:ietf-yang-library">
      <module-set>
        <name>complete</name>
        <module>
          <name>ietf-interfaces</name>
          <revision>2018-02-20</revision>
          <location>file:///sysrepo/build/repository/yang/ietf-interfaces@2018-02-20.yang</location>
        </module>
      </module-set>
    </yang-library>
  </data>
</get>
```

 augmentation list size 2
 deviation list size 0
 augmented-by module:
  ietf-ip
  ietf-network-instance
What got done

Libyangpush find-dependency

- This avoid getting all modules to find reverse dependency.
- Get all modules is usually a heavy task. According to Cisco XR published YANG module (more than 1k)
- With this solution we shrink the processing time from minutes to milliseconds.
Wrap Up

Team members:
Zhuoyao Lin
<zephyre888@gmail.com>
Benoit Claise
<benoit.claise@huawei.com>
IGNACIO DOMINGUEZ MARTINEZ-CASANUEVA
<ignacio.dominguezmartinez@telefonica.com>

Resources:
- https://github.com/Zephyre777/draft-lincla-netconf-yang-library-augmentation.git
- https://github.com/network-analytics/libyangpush/tree/feature/draft_augmentedby
- https://github.com/Zephyre777/sysrepo
- https://github.com/Zephyre777/libyang

Reference: