



IETF Hackathon: Mediator Framework Project

**IETF 109
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Online**



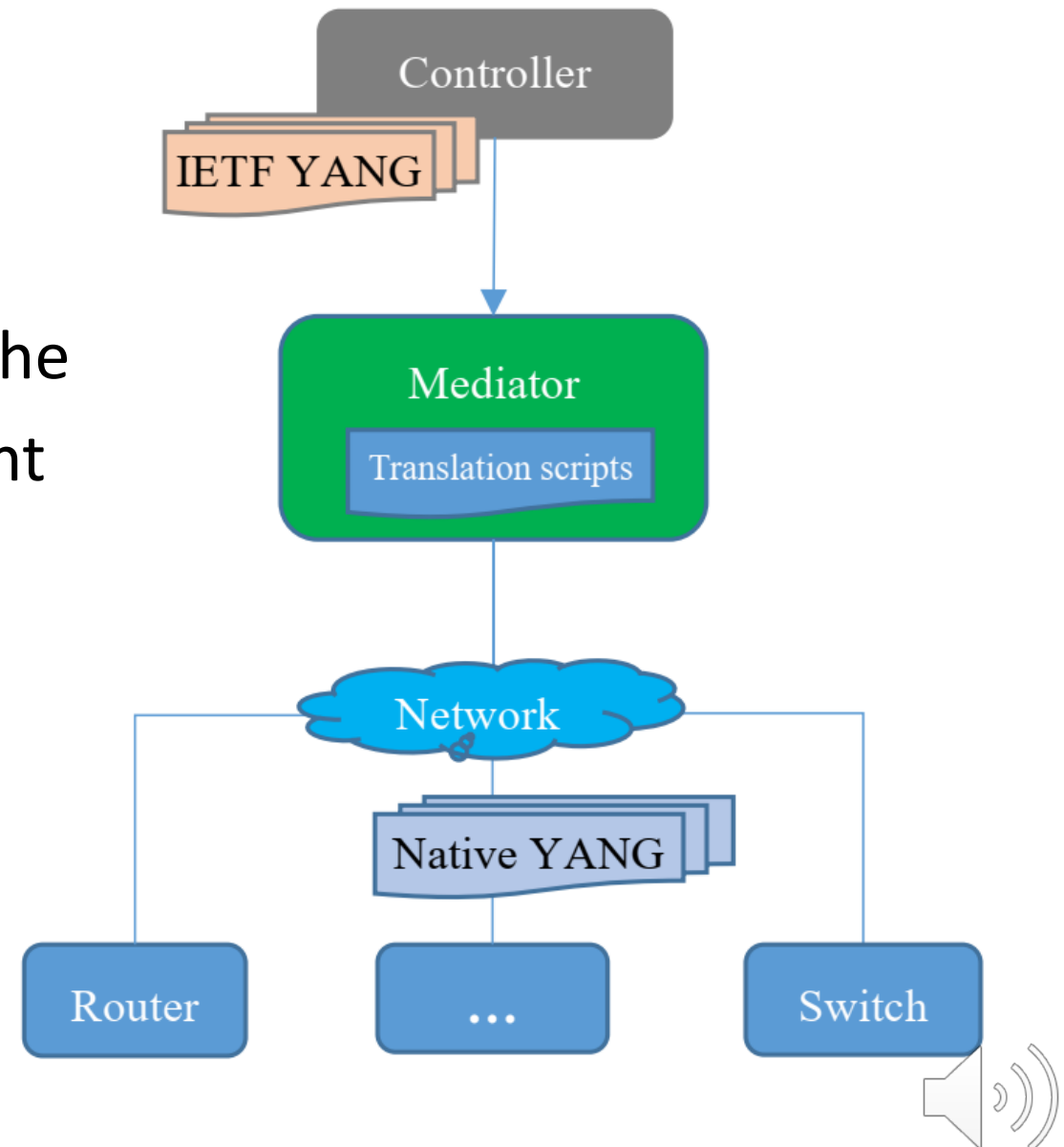
Hackathon plan

- We designed Mediator Framework for 3rd developer to implement YANG Models conversion.
- We hope Mediator can adapt to different deployment scenarios.
- Important drafts
 - <https://tools.ietf.org/html/draft-yby-netmod-usecase-of-ymc/>
 - <https://tools.ietf.org/html/draft-ietf-opsawg-model-automation-framework>
 - <https://tools.ietf.org/html/draft-ietf-opsawg-l3sm-l3nm/>
 - <https://datatracker.ietf.org/html/draft-ietf-bess-l3vpn-yang/>
 - <https://datatracker.ietf.org/html/draft-ietf-idr-bgp-model/>



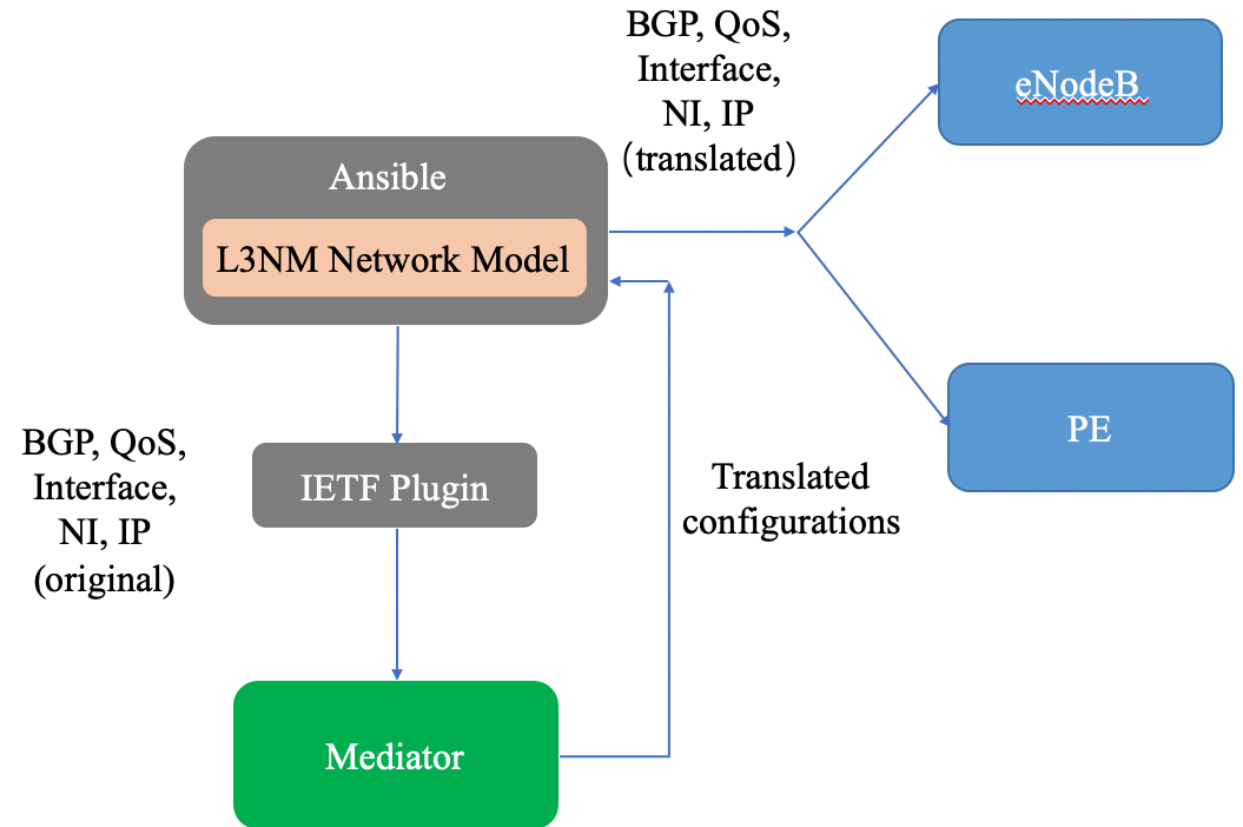
Mediator Framework

- Mediator is a framework to facilitate the translation YANG models from different vendors or standard organizations.
- Three ways of deployment
 - Independent
 - Integrated with controller
 - Integrated with device



Sample scenario

- Conversion between IETF yang and Vendors yang.
- Sample of 4G access
 - BGP configuration for eNodeB and PE.
 - L3NM: VPN configuration for PE.



Sample Messages

```
<l3vpn-ntw xmlns="urn:ietf:params:xml:ns:yang:ietf-l3vpn-ntw">
  <vpn-services>
    <vpn-service>
      <vpn-id>4G</vpn-id>
      <customer-name>mycustomer</customer-name>
      <vpn-service-topology>custom</vpn-service-topology>
      <description>VPN to deploy 4G services</description>
      <vpn-nodes>
        <vpn-node>
          <vpn-node-id>44</vpn-node-id>
          <ne-id>10.0.0.1</ne-id>
          <local-autonomous-system>65550</local-autonomous-system>
          <rd>0:65550:1</rd>
          <vpn-targets>
            <vpn-target>
              <id>1</id>
              <route-targets>
                <route-target>0:65550:1</route-target>
              </route-targets>
              <route-target-type>both</route-target-type>
            </vpn-target>
          </vpn-targets>
          <vpn-network-accesses>
            <vpn-network-access>
              <vpn-network-access-id>1</vpn-network-access-id>
              <port-id>GigabitEthernet 3/0/0</port-id>
              <description>Interface DATA to eNODE-B</description>
              <status>
                <admin-enabled>true</admin-enabled>
              </status>
              <routing-protocols>
                <routing-protocol>
                  <id>1</id>
                  <type xmlns:vpn-common = "urn:ietf:params:xml:ns:yang:ietf-vpn-common">vpn-common:bgp</type>
                  <bgp>
                    <peer-autonomous-system>200</peer-autonomous-system>
                    <local-autonomous-system>65550</local-autonomous-system>
                    <address-family>ipv4</address-family>
                    <neighbor>192.0.2.2</neighbor>
                  </bgp>
                </routing-protocol>
              </routing-protocols>
            </vpn-network-access>
          </vpn-network-accesses>
        </vpn-node>
      </vpn-nodes>
    </vpn-service>
  </vpn-services>
</l3vpn-ntw>
```

Input :
Message
instantiated from
IETF-l3vpn.yang
(partial)



Output :
Message
correspond to
**Vendor network-
instance.yang**

```
<network-instance xmlns="urn:huawei:yang:huawei-network-instance">
  <instances>
    <instance>
      <name> mycustomer </name>
      <afs xmlns="urn:huawei:yang:huawei-l3vpn">
        <af>
          <type>ipv4-unicast</type>
          <route-distinguisher>0:65550:1</route-distinguisher>
          <vpn-targets>
            <vpn-target>
              <value>0:65550:1</value>
              <type>import-extcommunity</type>
            </vpn-target>
            <vpn-target>
              <value>0:65550:1</value>
              <type>export-extcommunity</type>
            </vpn-target>
          </vpn-targets>
        </af>
      </afs>
      <bgp xmlns="urn:huawei:yang:huawei-bgp">
        <base-process>
          <afs>
            <af>
              <type>ipv4uni</type>
              <ipv4-unicast>
                <import-routes>
                  <import-route>
                    <protocol>static</protocol>
                    <process-id>0</process-id>
                  </import-route>
                </import-routes>
              </ipv4-unicast>
            </af>
          </afs>
        </base-process>
      </bgp>
    </instance>
  </instances>
</network-instance>
```



What got done

- We developed Mediator framework which can provide python APIs for 3rd developers to design their own translation scripts.
- We developed translation scripts between IETF I3NM model & Huawei native yang.
- We developed Ansible plugin which can integrate Mediator with Ansible to offer service.
- We have successfully delivered configuration instantiated from IETF model to Huawei device with the help of mediator.



Advantage of Mediator

- Python API minimizes the barriers for developing translation scripts
- Offer support for complex scenarios of messages conversion(e.g. one to many)
- Script template enables faster developing speed.
- Support Plugins which can integrate mediator with controllers.
- Decoupled from network management protocol, enabling flexible deployment.



What we learned

- Current ways of developing translation scripts are inefficient.
- Next Step
 - Automatic scripts generation
 - More tests with different service provider
 - API with Higher availability



The crews

- Hackathon Team
 - Champion
 - Yongqiang Dong (SEU--dongyq@seu.edu.cn)
 - Member
 - Yongbo Liu (SEU)
 - Qiang Zhang (SEU)
 - Participant
 - Guangying Zheng (Huawei)
 - Qin Wu (Huawei)
 - Maqiufang (Huawei)
 - Yongli Zhao (BUPT)
 - Jaehoon Paul Jeong (SKKU)
- Open Source Project
 - <https://github.com/icanlab/mediator>
- Demo
 - <https://youtu.be/1Nj5Bu8XMMM>

