Cisco ACI Open Source Device Package Development Project

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## About the Project

<table>
<thead>
<tr>
<th>Item</th>
<th>Detail</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Develop LBaas(HAProxy) by Cisco ACI</td>
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<tr>
<td>Goal</td>
<td>Release sample DevicePackage of HAProxy for CiscoACI on git of OOL</td>
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<tr>
<td>Period</td>
<td>SEP 2016 to MAR 2017</td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td>PO  KIMURA@Cisco</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PM  YOSHIDA@OOL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Member  YOSHIDA@OOL, KIMURA@NTT-Com and KIMURA@Cisco</td>
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The Project was launched at SEP 2016 by Cisco, OOL and NTT-Com, and still going on...
About ACI

Cisco ACI (Application Centric Infrastructure)

- Automation
- Integration of Virtual and Physical
- Scalability
- Multi Tenant
- Programmability
- Visualization
- Trouble shooting

Application Policy Infrastructure Controller
Policy management for whole infrastructure, toward SDN...

Define NW requirement as Policy from Application aspect
Each device behaves autonomously with policy

Multi Dablic supported multi hypervisor and overlay
Manage various virtual and physical infrastructure simply

Visualize Status of application, tenant and infrastructures in real time
Follow Change of work load

Open Ecosystem, Open API
Collaboration with Cisco and third party

L4-7 service  Storage  Server  Cloud Management tool
Configure Leaf-Spine with Switches supported ACI, and connect servers. And then, APIC controller can control both Physical and Virtual Network.
Discussion to decide theme...

What kind of device package is supported ...?

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Products</th>
<th>Software</th>
<th>Latest Certified APIC Release</th>
<th>Link to the Device Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco ASA</td>
<td>ASA 5585 and ASAv</td>
<td>ASA 5585 - 8.4 and later</td>
<td>2.0</td>
<td>ASA Device Packages</td>
</tr>
<tr>
<td>Cisco FirePower</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>A10 Networks</td>
<td>A10 Thunder ADC</td>
<td>ACOS 4.0.0 and later</td>
<td>2.0</td>
<td>A10 Networks Device Package</td>
</tr>
<tr>
<td>Avi Networks</td>
<td>Avi Vantage</td>
<td>15.1 and later (16.2 and 16.2.x)</td>
<td>2.0</td>
<td>Avi Device Package</td>
</tr>
<tr>
<td>Check Point Software Gateway &amp;</td>
<td>Check Point Security Gateway and</td>
<td>Gateway R77.30, Management: R80</td>
<td>2.0</td>
<td>Check Point Device Package</td>
</tr>
<tr>
<td>Management</td>
<td>Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citrix Systems</td>
<td>NetScaler ADC</td>
<td>10.1 Build 129.62 and above</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>F5 Networks</td>
<td>F5 i/Workflow and F5 BIG-IP</td>
<td>F5 Workflow 2.0.0 and F5 BIG-IP 11.5.3 HF2, 11.6.0 HF6 and 12.0</td>
<td>1.2</td>
<td>F5 i/Workflow (Customized device package will be generated by i/Workflow dynamically)</td>
</tr>
<tr>
<td>Fortinet</td>
<td>FG3700, FG3200D, FG31000D, FG30000D, FG15000D, FG12000D, FG10000D, FG6000D, FGVM</td>
<td>V1.0 - FG3700D, FG15000D, FG10000D, FGVM</td>
<td>1.3</td>
<td>Fortinet Device Package</td>
</tr>
<tr>
<td>Palo Alto Networks</td>
<td>PANW physical and virtual FWs</td>
<td>PAN-OS 6.0, PAN-OS 6.1, PAN-OS 7.0</td>
<td>1.2 (Tested by PANW Only)</td>
<td>Palo Alto Device Package</td>
</tr>
<tr>
<td>Radware</td>
<td>Alteon VA and Alteon VX</td>
<td>30.0.4.0 and later (30.2.3)</td>
<td>2.0</td>
<td>Radware Alteon Device Package</td>
</tr>
<tr>
<td></td>
<td>DefensePro</td>
<td>6.14.3, 7.42.3</td>
<td>2.0</td>
<td>Radware DefensePro Device Package</td>
</tr>
</tbody>
</table>

Mostly, commercial products are... Only few Open Source...

Hard to apply for experimental use...
Theme

Theme:
- Apply ACI to Open Source LB and execute scenario test

To Do:
- Develop DevicePackage for LBaaS(HAproxy) of OpenStack to control LBaaS from ACI
- Release DevicePackage on git of OOL
Problems to start development

There were 2 problems to start development

Problem1: How to develop it?
Problem2: Conflict of OpenStack LBaaS and OpFlex

Solve those problems, or project never started...
- Analyze DevicePackage written by other developer!
  → it referred DevicePackage of Nginx to develop

- In other hand, study documents provided by Cisco to figure out detail manner like data transfer method

Development was started!
Solution of Problem 2

If it could not be used...?

Analysis result, difference of ovs-agent for ACI and original ovs-agent was only implementation Behavior is not changed!
So, decided to leave it
Currently, creation of LB was configured from Command/Web Interface
The project automated creation and configuration LB from APIC via OpenStack with RestAPI
What found in development

- LBaaS of OpenStack was not maintained well...
  → It was migrated to project of Octavia!

- Combination operating OpFlex and LBaaS v1 of OpenStack to install together simply is not the best solution...

- Possibility to collaborate with various systems simply
  → Utilizing controllers of other project may realize collaboration with other than SDN ready product

OOL can operate project include development original device packages
Further issues of DevicePackage

Problems
- LBaaS doesn't support v2 and Octavia
- Lack of functions like “Remove”
- Only few parameters can be specified

Further Activities
- Add “Remove” function
- Release result on github on OOL within FEB