

Multi VIM/Cloud (5/11/17)

Project Name:

- Proposed name for the project: Multi VIM/Cloud for Infrastructure Providers
- Proposed name for the repository: multicloud

Project description:

Motivation

- ONAP needs underlying virtualized infrastructure to deploy, run, and manage network services and VNFs.
- The service providers always look for flexibility and choice in selecting virtual and cloud infrastructure implementations, for example, on-premise private cloud, public cloud, or hybrid cloud implementations, and related network backends.
- ONAP needs to maintain platform backward compatibility with every new release.

Goal

- Multi-VIM/Cloud project aims to enable ONAP to deploy and run on multiple infrastructure environments, for example, OpenStack and its different distributions (e.g. vanilla OpenStack, Wind River, etc...), public and private clouds (e.g. VMware, Azure), and micro services containers, etc.
- Multi-VIM/Cloud project will provide a Cloud Mediation Layer supporting multiple infrastructures and network backends so as to effectively prevent vendor lock-in.
- Multi-VIM/Cloud project decouples the evolution of ONAP platform from the evolution of underlying cloud infrastructure, and minimizes the impact on the deployed ONAP while upgrading the underlying cloud infrastructures independently.

Scope:

The scope of Multi-VIM/Cloud project is a plugable and extensible framework that

1. provides a **Multi-VIM/Cloud Mediation Layer** which includes the following functional modules
 - a. **Provider Registry** to register infrastructure site/location/region and their attributes and capabilities in A&AI
 - b. **Infra Resource** to manage resource request (compute, storage and memory) from SO, DCAE, or other ONAP components, so as to get VM created and VNF instantiated at the right infrastructure
 - c. **SDN Overlay** to configure overlay network via local SDN controllers for the corresponding cloud infrastructure
 - d. **VNF Resource LCM** to perform VM lifecycle management as requested by VNFM (APP-C or VNF-C)
 - e. **FCAPS** to report infrastructure resource metrics (utilization, availability, health, performance) to DCAE Collectors for Close Loop Remediation
2. provides a common northbound interface (NBI) / Multi-Cloud APIs of the functional modules to be consumed by SO, SDN-C, APP-C, VF-C, DCAE etc.
3. provides a common abstraction model
4. provides the ability to
 - a. handle differences in models
 - b. generate or extend NBI based on the functional model of underlying infrastructure
 - c. implement adapters for different providers.

Across the project, the implementation of any differentiated functionalities will be done in a way where ONAP users can decide if to use or not to use those functionalities.

Multi-VIM/Cloud project will align with the Common Controller Framework to enable reuse by different ONAP elements.

Deliverables of Release One:

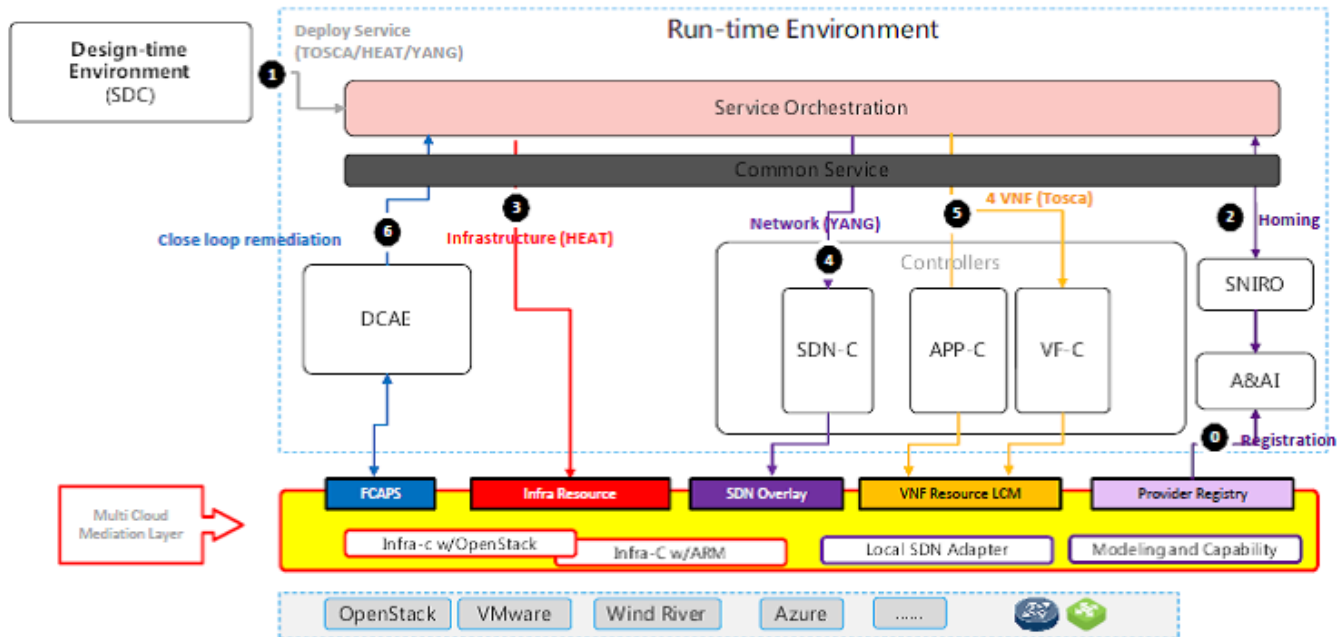
In R1, we target to support

- Maintain OpenStack APIs as the primary interface (Nova, Neutron, etc) to mitigate the risk and impact to other projects
 - As of this date, we expect to support Vanilla OpenStack based on Ocata, and commercial OpenStack based on Mitaka (see below)
 - Other OpenStack distributions in theory should work, but need other cloud providers to commit resources in the scope of R1 (Redhat, Mirantis, Canonical, etc)
- Provide support for 4 cloud providers and align with R1 use case
 - Vanilla OpenStack, VMware Integrated OpenStack, Wind River Titanium Server, and Microsoft Azure (Azure to provide HEAT to ARM translator)
 - *Minimal goal*: any single cloud provider from above across multi-sites (TIC edge and TIC core)
 - including implementation of the adapters for above clouds
 - *Stretch goal*: mix-match of different cloud providers across multi-sites

Architecture Alignment:

- How does this project fit into the rest of the ONAP Architecture?

The proposed **Multi-VIM/Cloud Mediation Layer** consists of five functional modules, which interacts with SO, SDN-C, APP-C, VF-C, DCAE and A&AI respectively. It will act as the single access point to be called by these components for accessing the cloud and virtual infrastructure. Furthermore, it will interact with SDN-C component to configure overlay network via local SDN controllers for both intra-DC connectivity and inter-DC connectivity of the corresponding cloud infrastructure. Thus it is also the single access point for SDN-C to work with other local SDN Controllers. Applications/VNFs can be homed to the different cloud providers through the standard ONAP methods. For automated homing (SNIRO), different cloud providers can register attributes that differentiate their cloud platforms (e.g., reliability, latency, other capabilities) in A&AI and application placement policies/constraints can request for these specific properties (e.g., reliability > 0.999).



- Is there any overlap with other ONAP components or other Open Source projects?
 - There is no intentional or unintentional overlap with other ONAP components or other Open Source projects to the best of our knowledge
- What other ONAP projects does this project depend on?
 - *Consumers of Multi-VIM/Cloud* – SO, SDN-C, APP-C, VF-C, DCAE
 - *Producers for Multi-VIM/Cloud* – DCAE, A&AI
 - *Dependencies* – Modeling
 - *Alignment of Reusable APIs* – Common Controller Framework
 - *Indirect Impact and Collaboration* – SNIRO, SDC
- How does this align with external standards/specifications?
 - Support existed functions
 - Information/data models by ONAP modeling project
 - Compliant with ETSI NFV architecture framework
 - VIM, NFVI, Vi-Vnfm, and Or-Vi
- Are there dependencies with other open source projects?
 - Cassandra, OpenStack Java sdk, AWS Java sdk, Azure and Bare metal.

Resources:

- PTL
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- Project Roles (include RACI chart, if applicable)

Other Information:

- link to seed code (if applicable)

OPEN-O

- seed code for Multi VIM/Cloud framework: <https://gerrit.open-o.org/r/multivimdriver-broker>
- seed code for OpenStack: <https://gerrit.open-o.org/r/multivimdriver-openstack>
- seed code for VMware: <https://gerrit.open-o.org/r/multivimdriver-vmware-vio>

ECOMP

- seed code for Multi VIM/Cloud framework: <https://github.com/att/AJSC/tree/master/cdp-pal/cdp-pal-common>
- seed code for OpenStack: <https://github.com/att/AJSC/tree/master/cdp-pal/cdp-pal-openstack>
- Vendor Neutral
 - if the proposal is coming from an existing proprietary codebase, have you ensured that all proprietary trademarks, logos, product names, etc., have been removed?
- Meets Board policy (including IPR)

Use the above information to create a key project facts section on your project page

Key Project Facts

Project Name:

- JIRA project name: multcloud
- JIRA project prefix: multcloud

Repo name:

- org.onap.multcloud/framework
- org.onap.multcloud/openstack
- org.onap.multcloud/vmware
- org.onap.multcloud/azure

IRC: <http://webchat.freenode.net/?channels=onap-multcloud>

Lifecycle State: incubation

PTL: Bin Yang, Wind River

mailing list tag: multcloud

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*Link to TSC approval:

Link to approval of additional submitters:

in selecting virtual and cloud infrastructure implementations