Lecture: Week 9 - 2



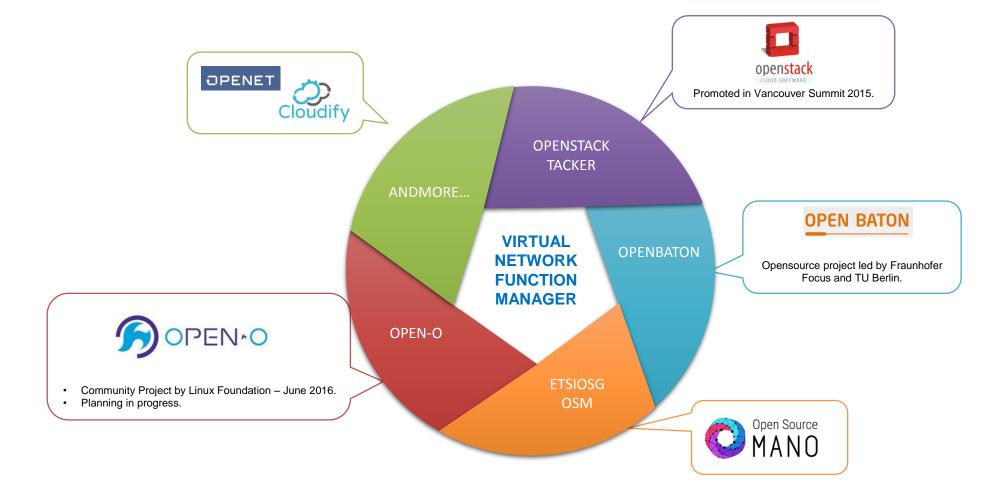
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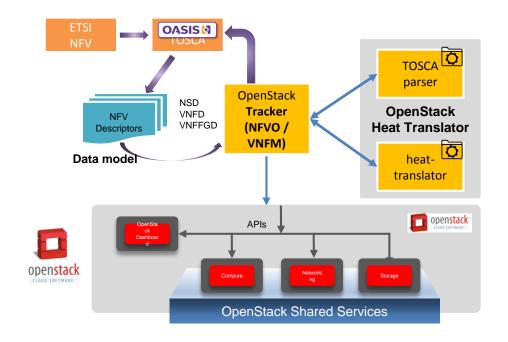
Open Source NFVOs and VNFMs

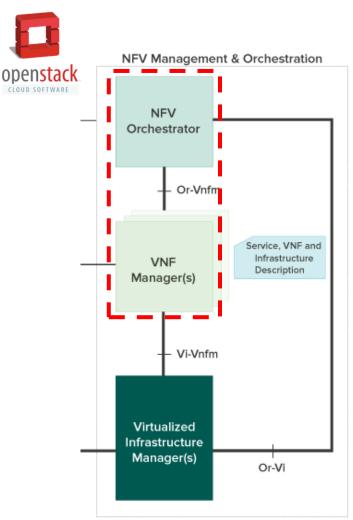




OpenStack Tacker

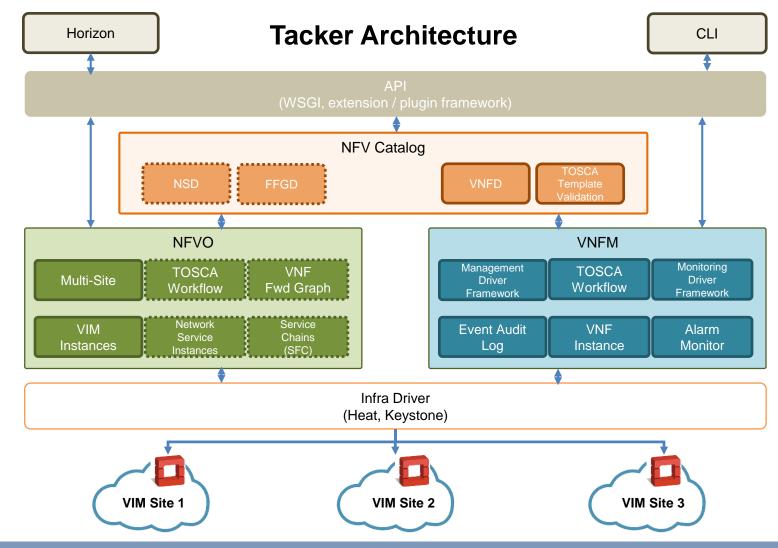
- Managed under the OpenStack umbrella
- Integrated NFVO and VNFM
- VNF Catalog VNFDs in database
- VNF Instantiation and Termination with HEAT and TOSCA
- VNF Configuration injection with VNF specific management driver







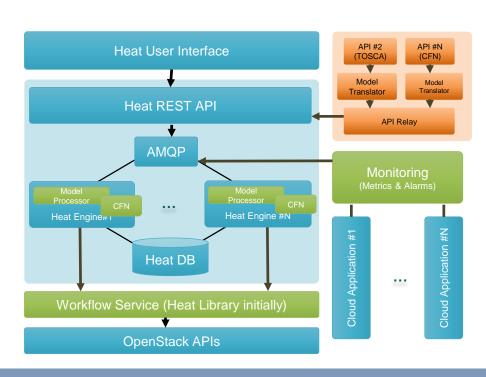
OpenStack Tacker





OpenStack HEAT

- A tool for orchestrating OpenStack, partially cover MANO orchestrator
- Automatically configures and deploys resources in stacks
- Stack
 - A collection of resources associated with a template
- Template
 - AWS CloudFormation (CFN) → JSON formatted
 - HOT (Heat Orchestration Template)
 → YAML formatted
- Components
 - heat-api
 - OpenStack native REST APIs
 - heat-api-cfn
 - AWS-style Query API
 - heat-engine
 - Orchestrates the launch of templates and providing events back to the API consumer







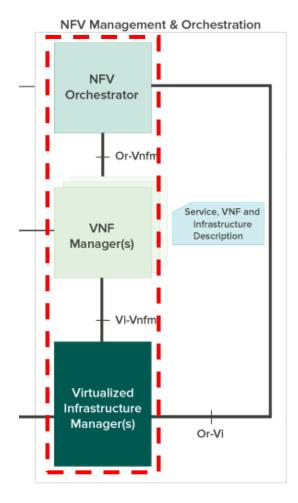


- From ETSI OSG group
 - April 2016, started with running code
- Initiative driven by service providers
- NFVO
 - Resource Orchestrator (RO): OpenMANO
 - Network Service Orchestrator (NSO): RIFTware
- VNFM
 - VNF models & configuration
 - Juju charms
- Multiple connectors
 - OpenVIM, OpenStack, VMWare, etc.
 - SDN
 - Support ODL and Floodlight

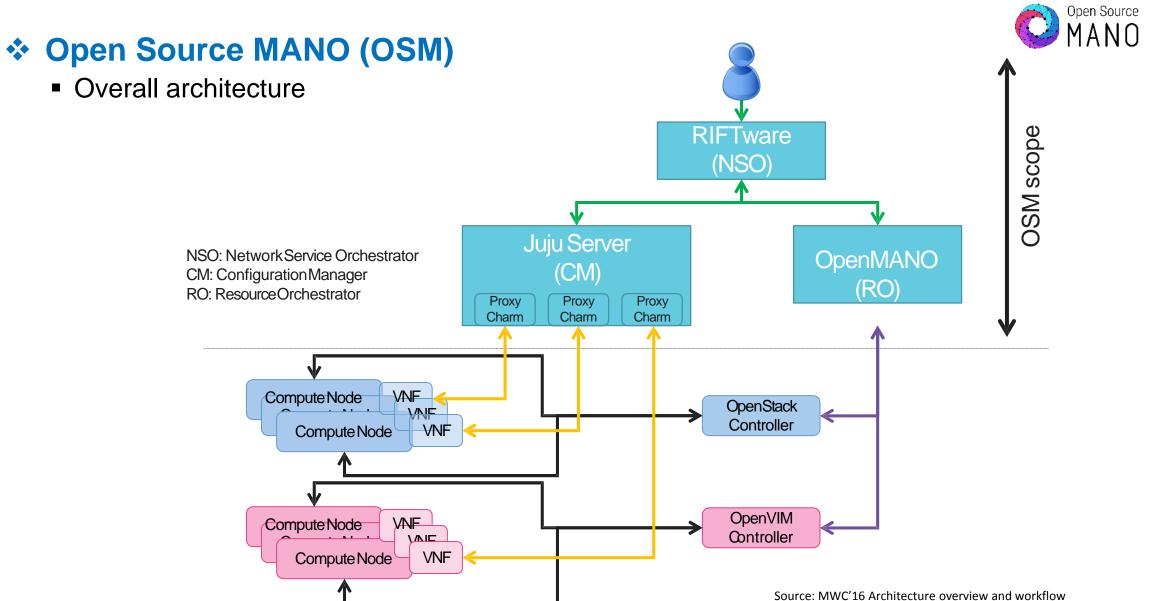










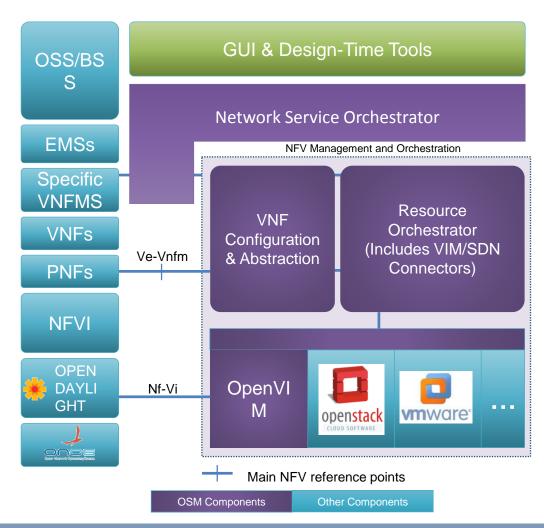








- Plugin model for integrating multiple SDN controllers
 - Allows to push OpenFlow flow rules through OpenVIM API
 - Supports ODL and Floodlight
- Plugin model for integrating multiple VIMs
- Integrated Generic VNFM with support for integrating Specific VNFMs
- Supports Physical Network Function (PNF)
- Greenfield and brownfield deployments



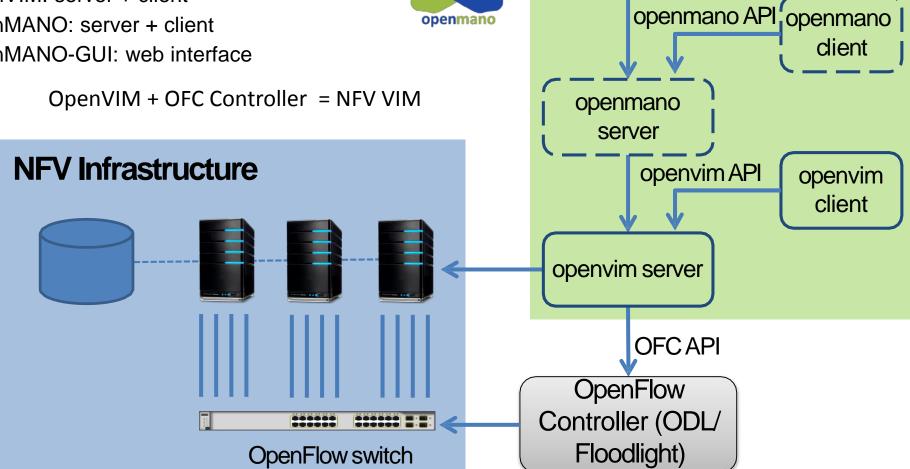


OpenMANO

openmano

gui

- OpenMANO
 - OpenVIM: server + client
 - OpenMANO: server + client
 - OpenMANO-GUI: web interface







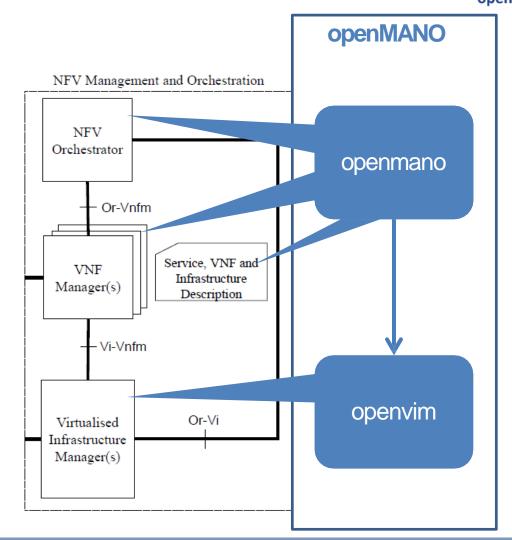
Open Source MANO (OSM)

OpenMANO

- · Tenant and datacenter mgmt.
- VNF catalogue mgmt.
- Network Scenarios (NS) catalogue mgmt.
- NS and VNF deployment
- Simplified VNF life cycle mgmt.

OpenVIM

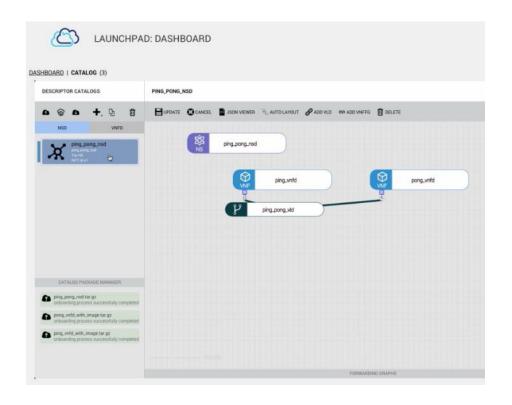
- NFVI tenant mgmt.
 - · Compute, storage, etc.
- Image mgmt.
- Flavor mgmt.
- Network and port mgmt.







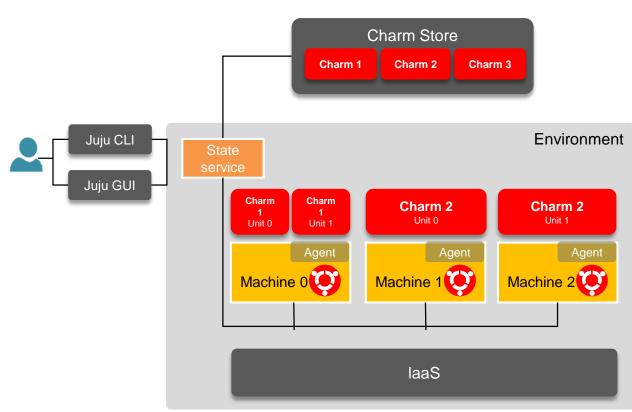
- RIFTWare
 - Network Service Orchestrator (NSO)
 - Model driven customization of lifecycle events
 - Catalog management
 - Onboarding of NS/VNF packages
 - Update of NS/VNF packages
 - More...
 - UI composer
 - Catalog manager
 - Canvas
 - VNF/NS descriptor editor
 - Management infrastructure
 - Data model translator
 - Translate YANG Model based descriptor
 - Configuration management







- Juju
 - Open source application modeling tool for service-oriented architecture and deployments
 - Services, called **charms**, are tools used by developers to create applications
 - Charms are provided by community through the Charms Store
 - Only works for Ubuntu distribution
- State service
 - Creates a machine that contains an agent
 - Agent communicates with state service, passing through info.
- Unit
 - Where charm code runs in
- Juju inside OSM
 - Offers generic VNF manager functionality
 - Processes configuration attributes of the VNFD

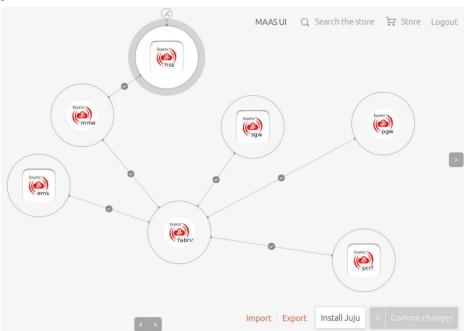






- Juju Charm
 - metadata.yaml
 - Contains basic meta information + service required or provided by charm
 - config.yaml (optional)
 - Configuration file where the a set of options required for running app to be stored
 - Hooks
 - Install, start, stop, config-changed, upgrade-charm, etc.

```
config.yaml
hooks
config-changed
install
relation-name-relation-broken
relation-name-relation-changed
relation-name-relation-departed
relation-name-relation-joined
start
stop
upgrade-charm
icon.svg
metadata.yaml
README.ex
```







Open Source MANO (OSM)

VNFD with Juju Charm

OSM INTERNALS

