Virtual Network Function Configuration Architecture

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NFV Configuration

Controller
- OSS/BSS
- User
  - VNF Software Vendor
- VNF Management
- VNF
  - NFV Management
  - NFV Infrastructure

VNF --> VNF
Principles

• Controller is the brain
  – A user does not have to communicate directly with its multiple VNFs, but a simple controller
  – Act as a broker to retrieve the existing parameters, and configure VNFs and their connections

• Controller is agnostic of the configured service parameters
  – But is aware of how/when to apply configurations to which VNFs, or related forwarding equipments

• The key is the information and the data model
  – VNF model
  – Resource model
  – Service/forwarding graph model
  – Monitoring/reporting status
User-Controller Interface

- Lifecycle management
  - VNF installation
    - VNF name, quantity, preferred locations (e.g. data center level), components selection,
    - resource requirements, capability requirements,
    - Whether on-demand resource allocation, and the automatic scale-out/scale-in needs resource policy which will trigger the event from the user or provider
  - VNF update, termination
  - A forwarding graph data model for service flow
- Configuration
  - A service template containing: Identify of VNF, user signature, service parameters
- Report Information from the Controller
  - Status, logging, accounting
Software Vendor-Controller Interface

• VNF descriptor from the software vendor
  – Type (options provided by controller for classification), function description, resource requirements, software environment requirement, capability per instance, pricing and etc.
  – Publish, update, off-the-shelf of a VNF

• Software packages
Controller-VNF Interface

• Lifecycle management
  – Create, delete, update

• Automatic scale-out/scale-in
  – With creating new instances or deleting existing instances

• Monitoring
  – Resource (CPU, link and etc) usage

• Coordinate with the infrastructure management module
  – Splitting traffic for load balancing (change the forwarding rules)
Controller-Infrastructure Interface

- Configure the underlying network and forwarding rules
- Lifecycle management of VMs
- There are some existing tools for it
  - Openstack, Cloudstack...

- *May leave it out of scope*
  - *Too many implementation details*
Security

• All user controller interactions MUST be validated bi-directionally
• An encryption of messages is mandatory
Next Step

• Gap analysis with NetConf and NetMod
Thanks!
POC Prototype
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