OPNFV Summit 2015 Presentation

Coexistence of Commercial Solutions with OpenSource OPNFV Platform

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OPNFV Making Progress

- Arno and Brahmaputra releases
- Project pipeline
- Pharos community lab
- Upstream projects and SDOs
- Multiple POCs
- Large community and service provider participation
Service Provider Realities

- NFV, SDV adoption driven by services
- Applications and workloads dictate infrastructure config
- Application reality will require diverse environments
OPNFV Community Challenges – Diversity

• Diversity due to performances affinities:
  ➢ VNF requirements for specific hypervisors & network controllers
  ➢ Openstack distros generally optimized for own virtualization platforms
  ➢ ODL, ONOS, Contrail perform well with Linux OpenStack
  ➢ NSX performs well on VMWare stack
  ➢ Startup VNF providers evolving to containers
OPNFV Community Challenges – Distributions

• Every OpenStack distribution is commercial
• Application/VNF requirements may force specific distributions
• Multiple distribution deployments likely
• Dual stack environment, vmware and KVM seems the norm

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<tr>
<th>Name</th>
<th>Configuration</th>
<th>Price</th>
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<tr>
<td>Redhat</td>
<td>Open</td>
<td>Paid</td>
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<td>VMware</td>
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NFVi Infrastructure

- OpenStack Control
- Container Control
- VMware Control
OPNFV Telecom Projects

Carrier Grade & Availability

Fault Prediction & Remediation

Fault Management (Doctor)
Data Collection (Prediction)
Fault Localization (Pinpoint)

Deployment & Management

Release Engineering (Releng)
Virtual Infra Deployment (Copper)
Multi-site Virtual Infra (Multisite)
Juju OPNFV Infra Deploy (JOID)
Apex, Compass, Fuel OPNFV Installers
OPNFV Solution for Multi-Personality Stack

**Continuous Integration**

**OPNFV Achievement**

• **Octopus** – Continuous Integration
• Fill in the gaps of upstream open source projects

**What is Missing**

• Integration with well proven commercial stacks
• Commercial automation, infrastructure management and monitoring tools
• Commercial system & performance testing & verification tools
• Commercial SDN and virtualization stacks
But Integration Challenges Remain At All Layers

- Application Service Catalog
- Developer Interface
- Application Interface
- Application Services

- Service Catalog
- Cloud User Management
- VM Interface

- Persona Management
- Persona Install and Configure
- Persona Patching
- Data Services Install + Configure

- Heterogeneous HW Support
- HW Configuration
- Fault Detection
- Bios/Firmware Management
- Baseline of HW

- Application Utilization
- License Management
- And More...

- Multi-Tenancy
- Multi-Cloud Management
- And More...

- Data Services Management
- Resource Optimization
- And More...

- Telemetry
- Utilization
- Inventory
- Locality
- Baseline of HW
- And More...
Continuous Integration Challenges

• Fault detection and prediction is much more complex and current solution is missing key features

• Multi-stack deployment automation is a challenge as well

• Facilitating carrier grade in mixed commercial/opensource environments
**Fault Detection and Prediction**

**OPNFV Doctor, Prediction, Pinpoint Achievements**

- Fault notification from host, hypervisor and hardware
- Data from Nova, Ceilometer, Zabbix and Monasca
- Localize faults

**What’s Missing**

- Fault prediction
- Remediation
- Fast detection
- Root cause analysis
- Resource optimization
- Capacity & workload planning
OPNFV Integration w/ Commercial Fault Prediction Sw

• Create adapters to integrate ONFV
• Outbound notification plugins to ONFV
  – Log, REST, SNMP, ...
• Configure custom object & application groups to ONFV
• SDK Integration with ONFV
• Enhancements to ONFV
  ➢ Proactive remediation
  ➢ Comprehensive visibility
  ➢ Capacity optimization & workload balancing
  ➢ Resource optimization

VMWare vRealize
Operations (vROPs)
CA Unified
Infrastructure Mgmt
Dell Foglight for
Virtualization
Microsoft Systems
Center Ops Mgr
SolarWinds, Splunk,
VMTurbo, Xangati
VMWare vROPs Log
Insight
Deployment & Management

**OPNFV Releng, Copper, Multisite, JOID Achievements**

- Collect requirements
- Deploy on bare metal – MaaS
- Comply to VNF needs

**What’s Missing**

- Infrastructure resource management
- Automation authoring
- Hardware & infrastructure monitoring
- Automated lifecycle management of distributed NFV Infrastructure
- Multi-stack
- More complete orchestration at the edge

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Deployment and Management Needs

Self Service Infrastructure
• Web-based Portal

Infrastructure Management
• Inventory tracking, capacity management
• Visual environment modeling
• Reservation & scheduling system

Automation Platform
• Visual based drag and drop interface
• Open interface for rapid integrations

Fault detection
• Gather telemetry from hardware and infrastructure

Proactive fault prediction
• Detect faults ahead of time

Proactive remediation
• Fix hardware and infrastructure before faults happen

Resource optimization
• Use resources at optimal capacity
OnRack™ Open Sourcing in Q4 2015

Integrated

EMC Converged Infrastructure Appliances

Open Source

RackHD™

Q4 - 2015

Enterprise

Paid Subscription Model

Coming in 2016

https://github.com/rackhd
RackHD™ is Not Just a Deployment Tool

Operational Building Block for the 3M’s

- **Management**
  - Discovery, Inventory, Genealogy, Power,…
- **Monitoring**
  - Telemetry, Health, Performance,…
- **Maintenance**
  - Firmware updates,…

Orchestration of Rack Elements (Hardware)

- Provisioning
- Configuration
- Re-Provisioning
- Erasure
Why Use Open Source RackHD™ with OPNFV?

**Management**
- Hw Discovery
- BIOS/Firmware Discovery
- Server Locality
- Power on/off hw
- Reset hw to provision new services
- Server Locality

**Monitoring**
- Hw Telemetry
- Hw Utilization
- Fault Detection
- Hw Performance and Configuration Baseline
- Verify hw meets service needs
- Verify firmware version

**Maintenance**
- Hw Configuration
- Firmware updates
- Install your services
- Optimize services
- Feed the catalog to schedulers
**Proven Carrier Grade Cloud**

**OPNFV Availability Achievements**
- HA for hardware, infrastructure & services
- Service availability timings comply with ETSI GS NFV-REL 001 V1.1.1

**What’s Missing**
- Mostly high level requirements
- Backup, Failover & Disaster recovery
- Designs for uptime and designs for failure
- Analytics based guided recovery and remediation
99.9999% High Availability Design Principles

Architect for Uptime (Improving MTTF):

- **Redundancy**: Eliminate any single point of failure with optimal amount of redundancy
- **Predictive Analytics**: Identify failure conditions before they cause disruption
- **Intelligent Placement**: Optimizing placement of the workload to reduce resource over-commitment or to enforce anti-affinity policy

Architect for Recovery (Reducing MTTR):

- **Detection and Remediation**: At every level of system across application, virtual infrastructure, and hardware.
- **Event correlation**: Identify root cause and reduce unwanted noise
- **Serviceability**: Self healing and automatic recovery to minimize manual intervention and human error
Predictive Analytics Increases MTTF

W/O Prediction (Reactive)

MTTF

Required MTTR

With Prediction (Proactive)

Predictive analysis ID’s potential failure early

Standby VM(s) activated before actual failure; suspect node fenced off

Suspect node is tested/repaired at a later time

Occasionally need to handle unpredicted failure per SLA…but fewer of them
OPNFV Coexistence with Commercial Offers

OPNFV

openstack

KVM

LXC

ceph

docker

OPEN DAYLIGHT

ONOS

(open network operating system)

OPNCONTRAIL

vmware

ESXi

Microsoft Hyper-V

nuagenetworks

NSX

ScaleIO

Foglight

Microsoft System Center Operations Manager

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