NOKIA

Maturing OpenStack Together To Solve Telco Needs

Ehud Malik

Product Management

Nokia, CloudBand

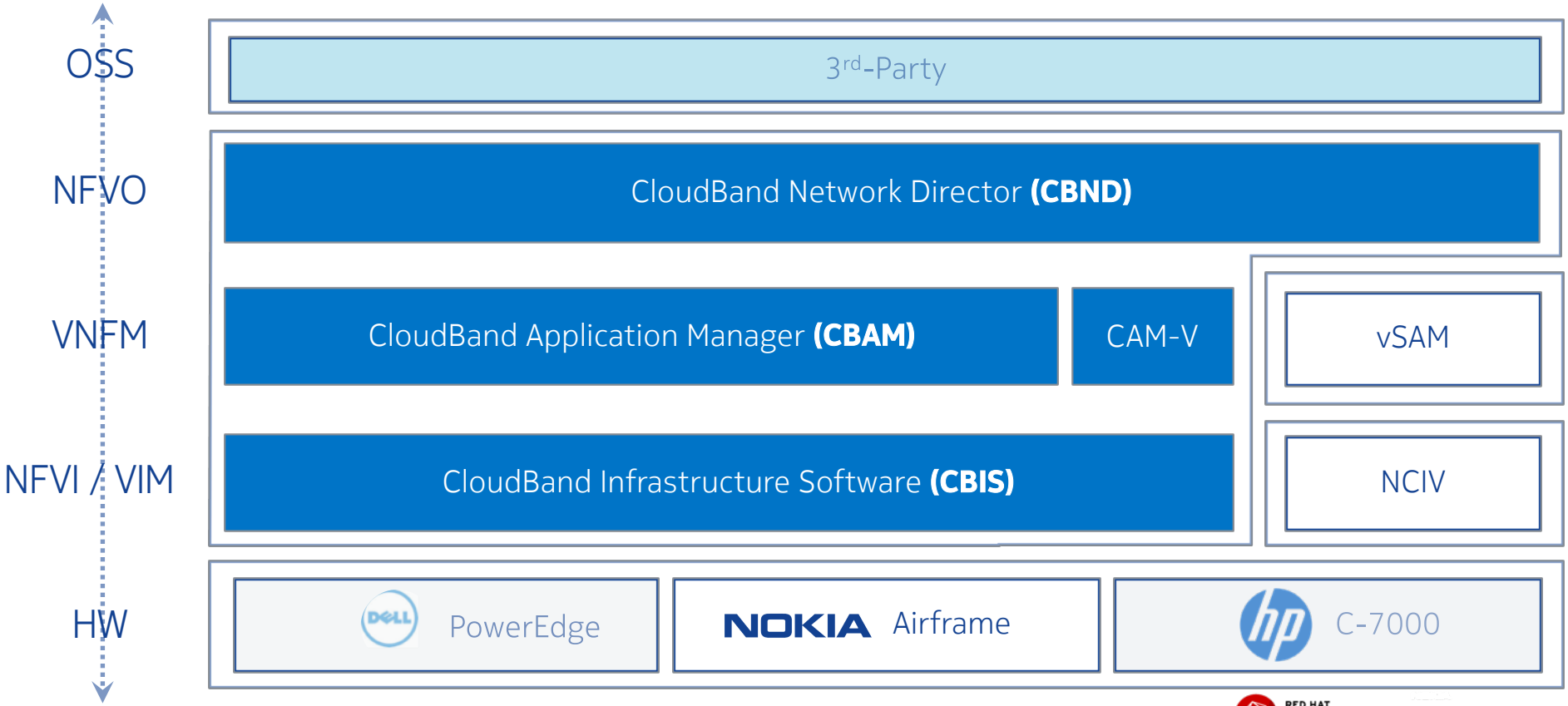
RED HAT FORUM

Europe, Middle East and Africa

Agenda

- Nokia/CloudBand portfolio description
- CloudBand Software Infrastructure with RedHat
- Enabling E2E Telco Grade NFVI/VIM
- Monitoring tools for virtualized infrastructure
- NOVL visibility tool
- Summary

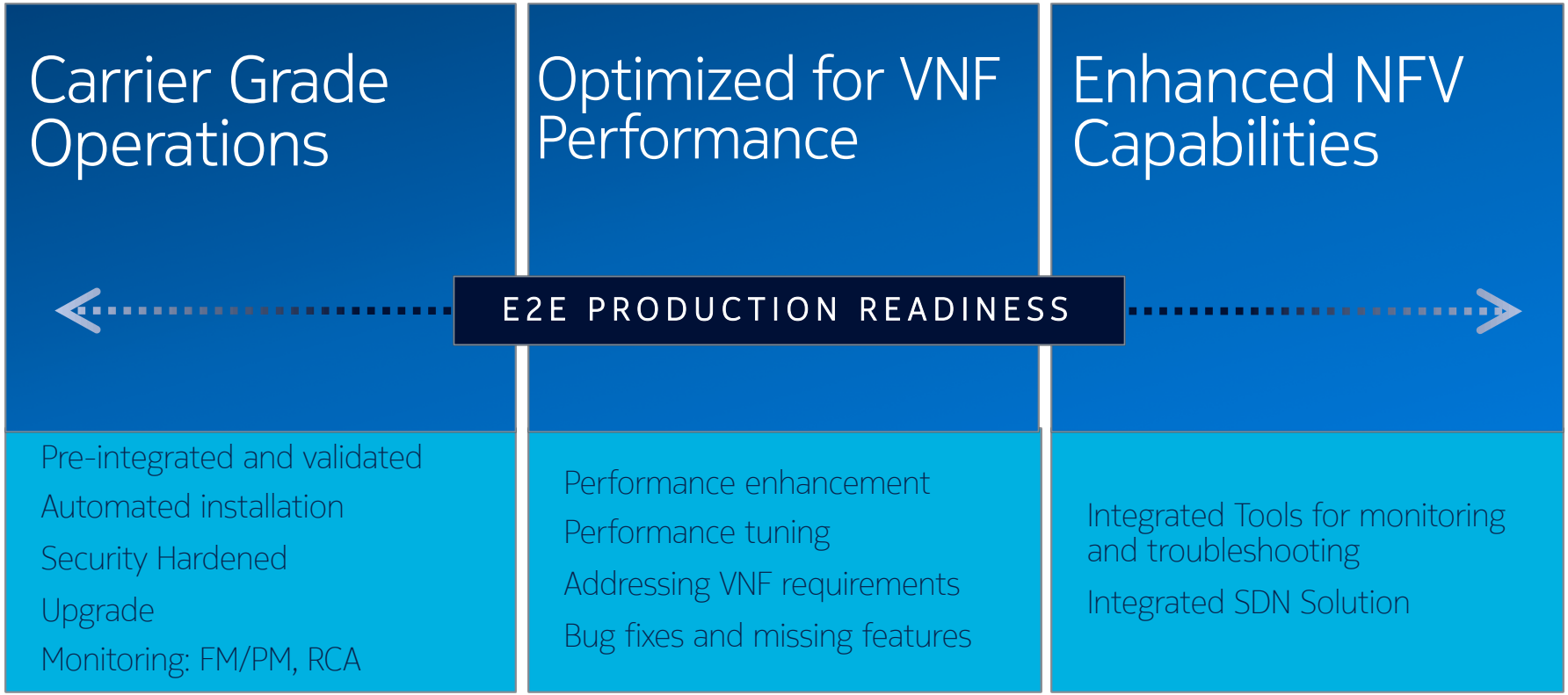
Nokia Telco Cloud End-2-End Solution



RED HAT FORUM Europe, Middle East and Africa NOKIA

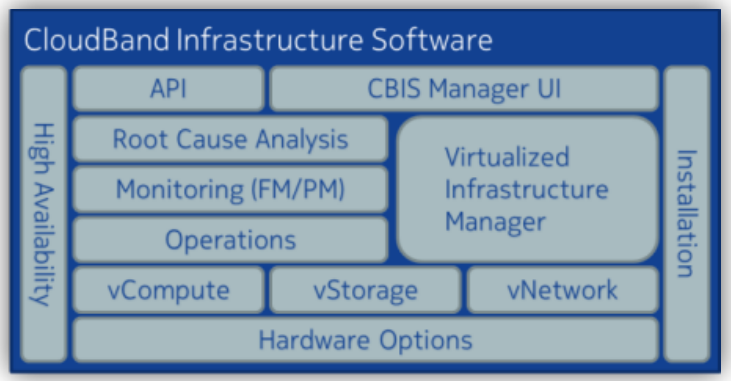
CloudBand Infrastructure Software (NFVI/VIM)

Differentiation & Value Added



CloudBand Infrastructure Software (NFVI/VIM)
Architecture and highlights

- CloudBand Infrastructure Software is a complete NFVI and VIM software stack providing a turnkey solution for service providers deploying NFV
- CloudBand Infrastructure Software is built for operational excellence, with enhanced operational tools that includes a hand picked set of SW components, integrated and tested on a variety of HW choices
- CloudBand Infrastructure Software leverages CloudBand's experience in building and deploying NFV platforms using open source and standard API's, ensuring stability and streamlined operations



Automated Install and Upgrade	Highly Available Architecture (SW and HW)	Integrated SDN And Acceleration	Operational Tools	Open Source and open API	Monitoring and RCA	Flexible storage solutions	Security

RED HAT FORUM Europe, Middle East and Africa NOKIA

CloudBand Infrastructure Software (NFVI/VIM)
CBIS components High Level View

Each component requires special treatment on top of NFVI/VIM to address Telco needs…

- Automated Install and Upgrade
- Highly Available Architecture (SW and HW)
- Integrated SDN And Acceleration
- Operational Tools
- Open Source and open API
- Monitoring
- Flexible storage solutions
- Security

Telco Challenges

RED HAT FORUM Europe, Middle East and Africa NOKIA

NFVI/VIM Platform monitoring

NFVI/VIM layer	Physical/Virtual Resources
HW layer	Servers
	NICs
	Leaf/Spine Switches
	Storage (Internal/External)
Virtualization layer	Host OS
	Hypervisor
	Openstack services
Virtual Resources	VM
	Volumes
	Networks
	VNFs
	CEPH (OSDs), Cinder

Telco challenges

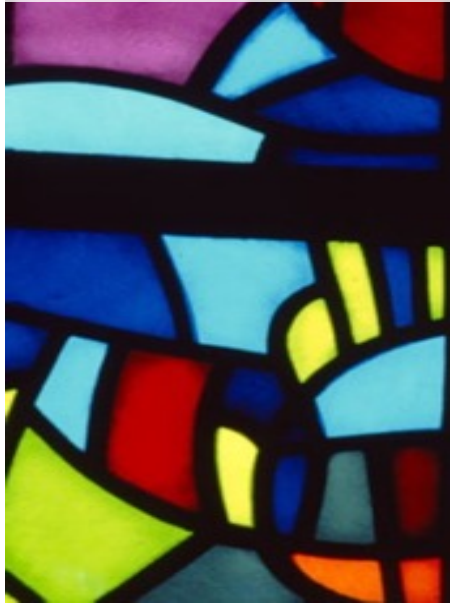
- Physical/Virtual Resources typically monitored by Ceilometer, AODH, Zabbix, Sensu, Nagios or other…
- Those tools provide FM and PM monitoring capabilities per specific resource, however they do not provide a holistic monitoring view of a system

Vitrage in a nutshell

Official OpenStack project for Root Cause Analysis

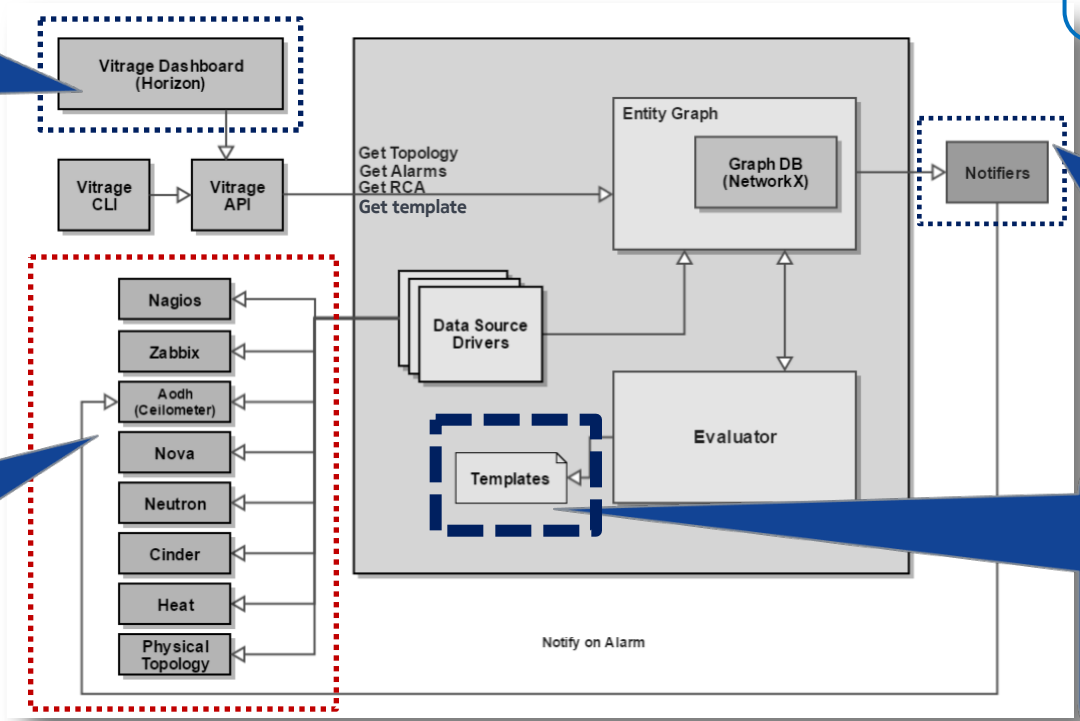
Complete FM/PM support for virtualization environment

- Root Cause Analysis – understand why faults occurred
- Deduced alarms and states – raising alarms and modifying states based on system insights
- Holistic & complete view of the system



Vitrage High Level Architecture

Horizon Plug-in:
- Hierarchical view
- Vitrage alarm list
- RCA diagram per alarm
- Entity graph view
- Templates list



Telco challenges

Expose Vitrage alarms and state **changes to other projects or** external systems

Multiple Data Sources (extendible):
- External monitoring tools: Nagios, Zabbix
- OpenStack projects
- Physical topology

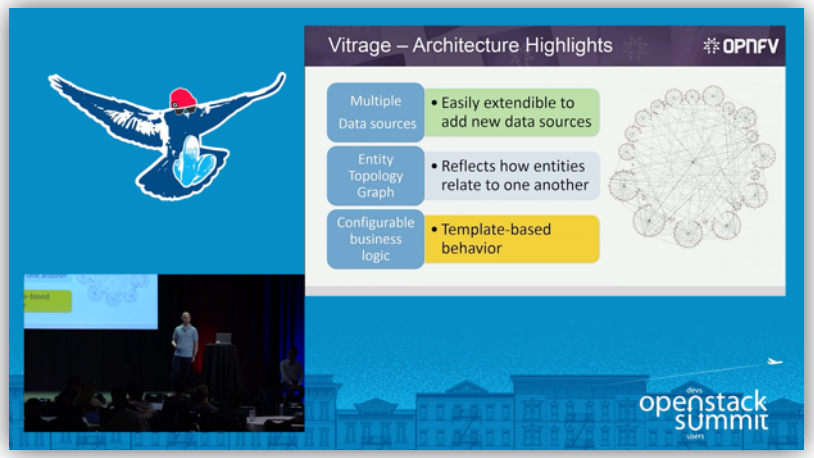
Templates for deduced alarms and RCA:
- Each template can contain one or more scenarios (scenario = condition + action)
- Human readable
- Configurable

RED HAT FORUM Europe, Middle East and Africa NOKIA

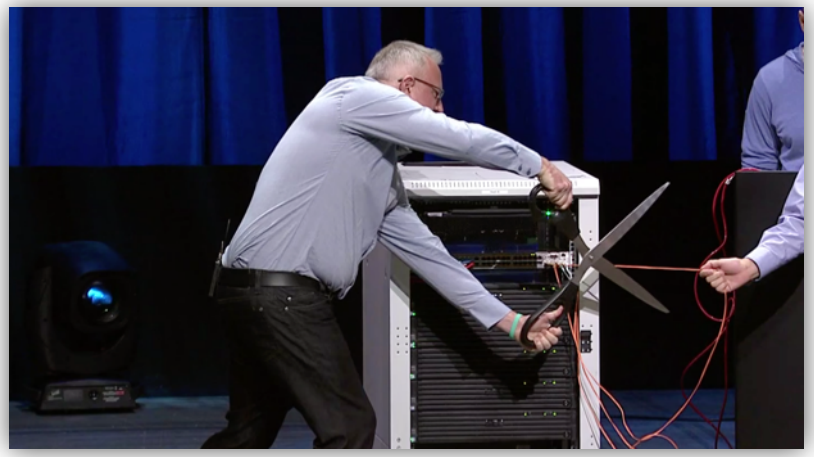
vitrage at OpenStack Summit Barcelona October 2016:

Telco challenges

(click on the images to open)



Fault Management with OpenStack Congress and Vitrage, Based on OPNFV Doctor Framework



Demo: OpenStack and OPNFV – Keeping Your Mobile Phone Calls Connected

RED HAT FORUM Europe, Middle East and Africa NOKIA

CloudBand Infrastructure Software (NFVI/VIM)

CBIS components High Level View

Automated Install and Upgrade	Highly Available Architecture (SW and HW)	Integrated SDN And Acceleration	Operational Tools	Open Source and open API	Monitoring	Flexible storage solutions	Security

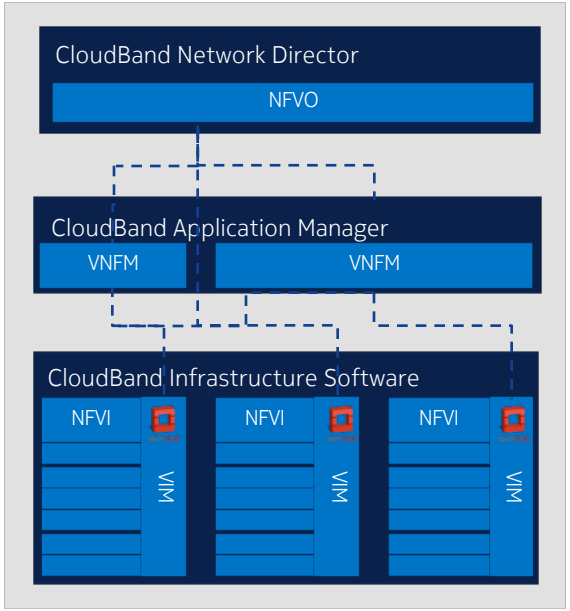
NFVI/VIM
OPEX reduction

RED HAT FORUM Europe, Middle East and Africa NOKIA

NFV Platform Operational Tools
VNFI/VIM Visibility

NFVI/VIM
OPEX reduction

- Each VNF has a specific configuration for virtualization which enables optimal functionality & performance
- As VNFs are spread across multiple components of the infrastructure (Hypervisor, OpenStack controller, network equipment, etc.), during deployment it becomes necessary to enforce the NFVI/VIM configuration rules

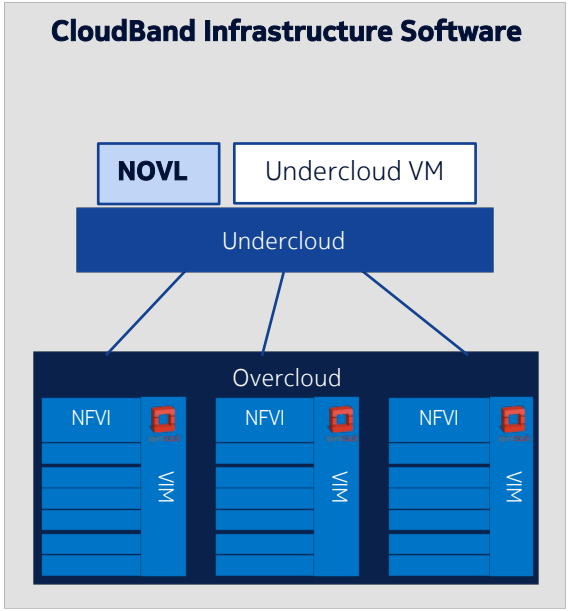


RED HAT FORUM Europe, Middle East and Africa NOKIA

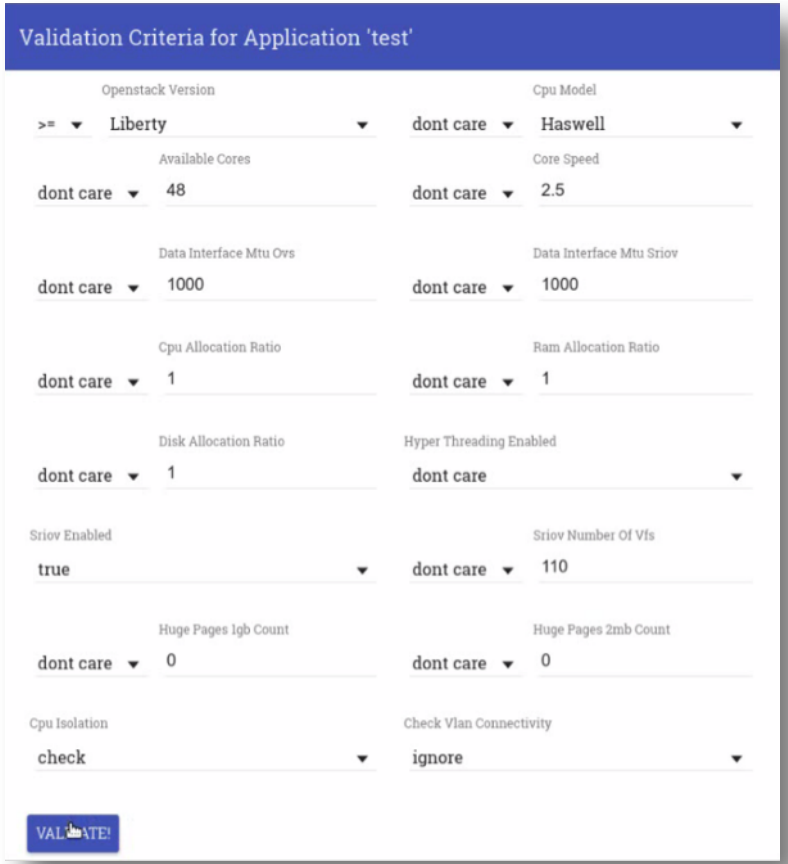
NFV Platform Operational Tools
Introducing NOVL (Node Validation Tool)

- CBIS provides a Node Validation tool (NOVL), which exposes configuration parameters, allowing quick validation per VNF specific need

- This enables swift onboarding of complex VNFs



NOVL User Configuration Parameters



NFVI/VIM
OPEX reduction

- NOVL provides the ability to configure validation criteria parameter limits
- Parameters are related to the physical level and OpenStack related items

Openstack Version
Core speed
CPU Pinning
Mem, CPU allocation
SRIOV
Hyper Threading
Others…

RED HAT FORUM Europe, Middle East and Africa NOKIA

NOVL Report Example

NFVI/VIM
OPEX reduction

Report Summary: 'test' EDIT CRITERIA

⚠ Computes passed all requirements: 2/7

Criteria	Requested	Status	Actual
Online Computes	== 7	✓	7/7
Available Cores	dont care	✓	7/7
Core Speed	dont care	✓	7/7
Cpu Model	dont care	✓	7/7
Openstack Version	>= Liberty	✓	Liberty
Ram Allocation Ratio	dont care	✓	0.85
Disk Allocation Ratio	dont care	✓	1
Cpu Allocation Ratio	dont care	✓	1
Data Interface Mtu Ovs	dont care	✓	7/7
Data Interface Mtu Sriov	dont care	✓	7/7
Sriov Enabled	== true	⚠	3/7
Sriov Number Of Vfs	dont care	✓	7/7
Hyper Threading Enabled	dont care	✓	7/7
Huge Pages 1gb Count	dont care	✓	7/7

NOVL provides a short summary as well as a detailed report which exposes the user to the actual configuration of a complex NFVI/VIM infrastructure

Full Report

Labels
- summary
- compute
- network

Compute Name	Available Cores Requested: dont care	Core Speed Requested: dont care	CPU model Requested: dont care	Hyper Threading Enabled Requested: dont care	Huge Pages 1gb Count Requested: dont care	Huge Pages 2mb Count Requested: dont care	Compute Cpu Isolation Requested: check
ovs_zone1: overcloud-compute-0.localdomain	48	2.5	Haswell-noTSX	true	176	0	FAIL
ovs_zone1: overcloud-compute-1.localdomain	48	2.5	Haswell-noTSX	true	176	0	FAIL
ovs_zone1: overcloud-compute-3.localdomain	48	2.5	Haswell-noTSX	true	176	0	FAIL
ovs_zone1: overcloud-compute-6.localdomain	48	2.5	Haswell-noTSX	true	176	0	FAIL
sriov_zone1: overcloud-compute-2.localdomain	48	2.5	Haswell-noTSX	true	176	0	PARTIAL
sriov_zone1: overcloud-compute-4.localdomain	48	2.5	Haswell-noTSX	true	176	0	SUCCESS
sriov_zone1: overcloud-compute-5.localdomain	48	2.5	Haswell-noTSX	true	176	0	SUCCESS

NOVL helps reduce planning and boarding time for complex VNFs such as IMS, VoLTE, vEPC

Summary

Mature Ecosystem

Monitoring /RCA for Visibility Vitrage

Operational Tools, reduce TTM

Complete solution NFVI, NFVO, VNFM

NOKIA