



oVirt – Quantum Integration

January 2013

Agenda

- ◆ oVirt Network Configuration
- ◆ Quantum
- ◆ Integration Benefits
- ◆ POC Concepts
- ◆ Demo
- ◆ Future Work

Network View



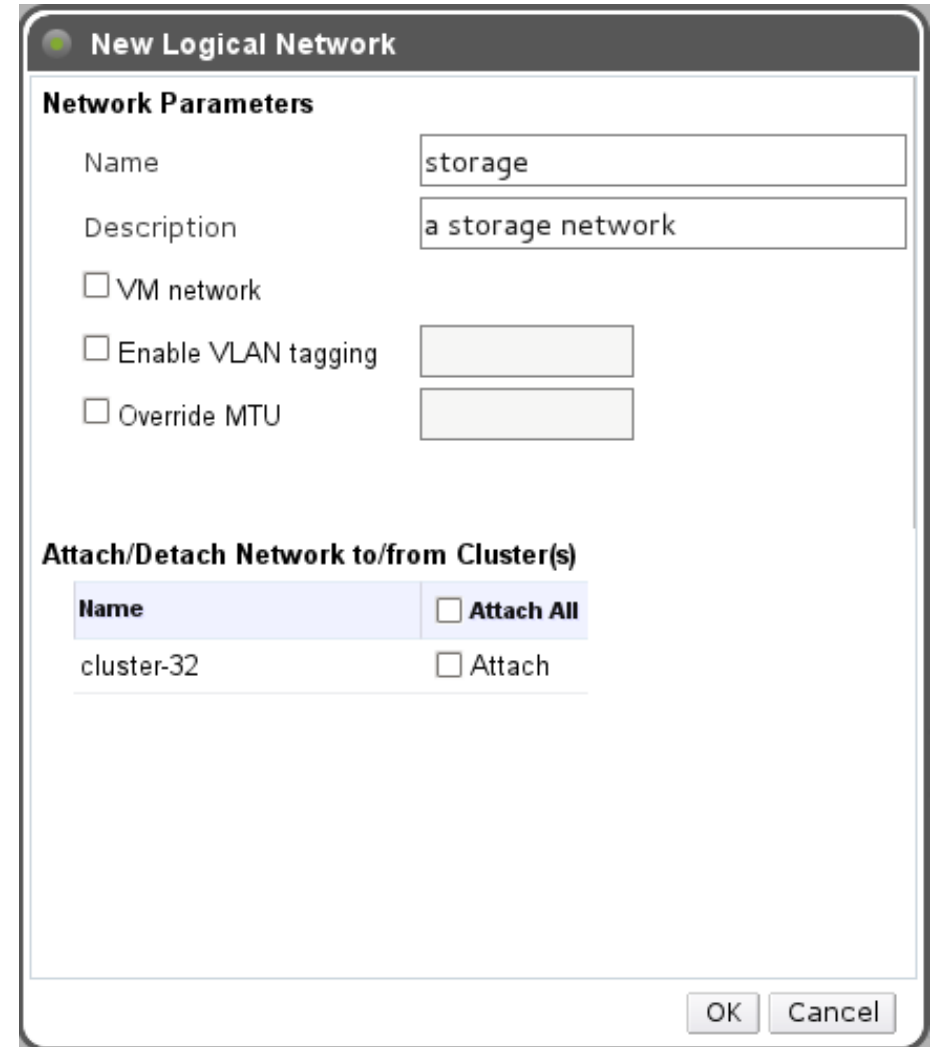
- ◆ Network - a logical entity that represents a layer 2 broadcast domain
- ◆ Defined within the scope of a Data Center

The screenshot shows the oVirt Open Virtualization Manager interface. The top navigation bar includes the oVirt logo, the text "Open Virtualization Manager", and the user information "Logged in user: admin@internal | Configure | Guide | About | Sign Out". A search bar contains the query "Network: name = des datacenter = datacenter31". Below the search bar are tabs for "Clusters", "Hosts", "Networks", "Virtual Machines", and "Templates", with "Networks" selected. On the left is a "Tree" view showing a hierarchy: System > datacenter31 > Networks > des. The main area displays a table with the following data:

Name	Data Center	VM Network	VLAN tagging	MTU	Description
des	datacenter31	true	20	default	VM network for VMs on V

Adding a New Network

- ◆ Define network properties (VLAN, MTU, Role)
- ◆ Make the network available in selected clusters



New Logical Network

Network Parameters

Name: storage

Description: a storage network

VM network

Enable VLAN tagging

Override MTU

Attach/Detach Network to/from Cluster(s)

Name	Attach
cluster-32	<input type="checkbox"/> Attach All <input type="checkbox"/> Attach

OK Cancel

Host Level Configuration

- ◆ Optional Vs. Required Networks
- ◆ Host level configuration:

Setup Host Networks

Drag to make changes

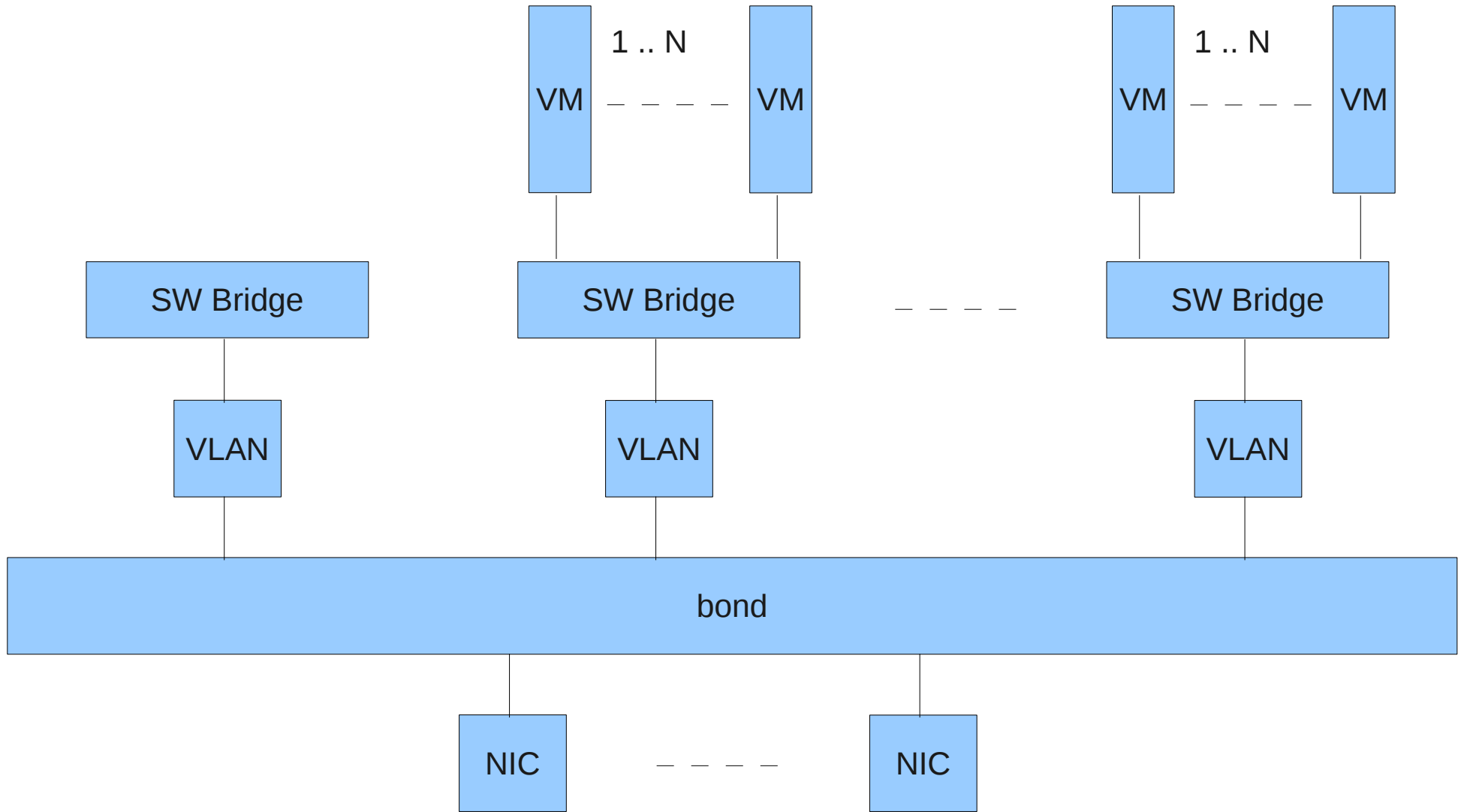
Interfaces	Assigned Logical Networks	Unassigned Logical Networks
bond0	NOVM_VLAN_MTU_5 (VLAN 500)	Required
eth1	VLAN_MTU_5000 (VLAN 222)	NON_VM_MTU_5000
eth2	VLAN_MTU_5000_2 (VLAN 52)	Non Required
bond1	no network assigned	NON_VM_MTU_9000
eth3		NOVM_VLAN_MTU_9 (VLAN 900)
eth4		VLAN_MTU_9000 (VLAN 9)
eth0	ovirtmgmt	VLAN_MTU_9000_2 (VLAN 92)

Verify connectivity between Host and Engine

Save network configuration

OK Cancel

Supported Configuration - Linux Bridge

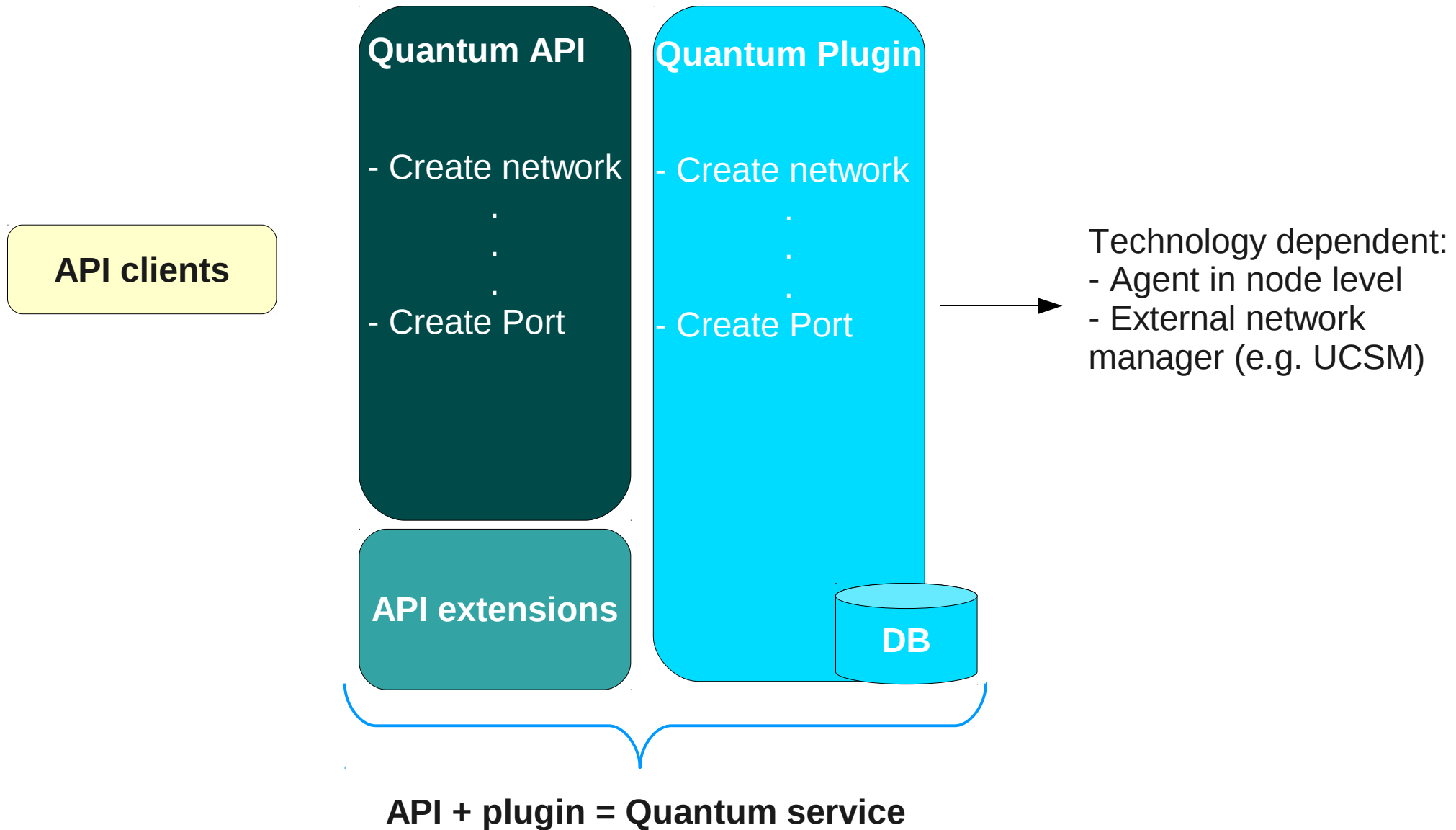


Quantum



- ◆ Quantum provides network connectivity-as-a-service
- ◆ Quantum offers a plug-in architecture designed to support various network technologies through vendor specific plug-ins and API extensions.
- ◆ Exposes REST API for accessing the service
- ◆ Available plugins: Linux-Bridge, OVS, Cisco Nexus, NVP, Ryu, NEC etc.

Quantum high level architecture



Integration Benefits

- ◆ Add support in oVirt for the various network technologies provided via Quantum plugins
- ◆ Leverage L3 services modeled in Quantum
- ◆ Enjoy both worlds:
 - ◆ Quantum for managing VM networks
 - ◆ oVirt for managing infrastructure networks (Migration network, storage network etc.)
- ◆ Quantum networks are exposed side by side with oVirt networks which allows the user to use oVirt mature implementation for network configuration

Work In Progress

- ◆ This is initial work done based on a few upstream discussions regarding quantum integration
- ◆ The initial concepts were extended to include general terms we find appropriate in the context of oVirt, relevant beyond the network domain
- ◆ Definitions and interpretations of the concepts are open for discussion, they change as we go...

External Network Provider



- ◆ **Internal network** - network that was added directly in oVirt
- ◆ **External network** - network that is managed by an external network provider and is consumed within oVirt
- ◆ **External network provider** - an independent network manager which collaborates with oVirt by implementing a predefined API.
- ◆ External networks can be discovered in oVirt and then can be used within oVirt for example in VMs.
- ◆ User can configure permissions on external networks once they are discovered, like they do for internal networks.

POC – Quantum integration



- ◆ Quantum is considered an external network provider
- ◆ Quantum can be deployed with the user choice of plug-in
- ◆ Quantum and oVirt are deployed side by side, both oVirt and Quantum can be used for creating VM networks
- ◆ Quantum networks are considered 'external' networks in oVirt and cannot be edited from within oVirt (more on this in Future Work slide)
- ◆ A single oVirt instance can work with multiple Quantum instances

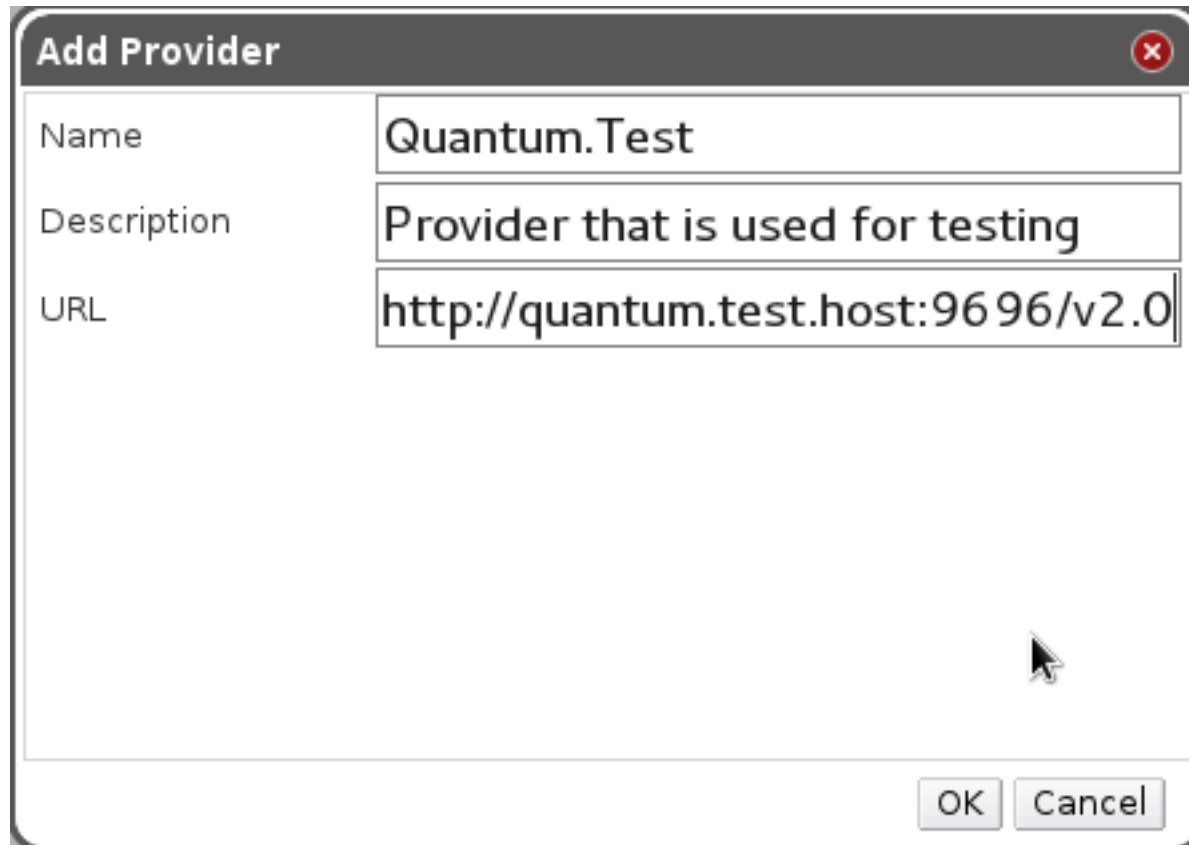
POC – Quantum integration



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POC - Flow

1. Deploy oVirt and Quantum
2. Define a network in Quantum
3. Define the Quantum instance as an external provider in oVirt



Field	Value
Name	Quantum.Test
Description	Provider that is used for testing
URL	http://quantum.test.host:9696/v2.0

External Providers Main Tab



oVirt Open Virtualization Manager

Logged in user: **admin@internal** | [Configure](#) | [Guide](#) | [About](#) | [Sign Out](#)

Search: Provider:

Providers (highlighted)

Name	Description	URL
Quantum	Quantum external provider	http://10.35.17.30:9696/v2.0

System

- System
 - dc
 - Storage
 - Networks
 - Templates
 - Clusters
 - Default

Bookmarks

Tags

Last Message: 2013-Jan-21, 21:15 User admin@internal logged in. Alerts (2) Events Tasks (0)

POC - Flow



4. Perform a network discovery operation in oVirt

The screenshot shows the oVirt Open Virtualization Manager interface. The top navigation bar includes the oVirt logo, the text "Open Virtualization Manager", and the user information "Logged in user: admin@internal | Configure | Guide | About | Sign Out". Below the navigation bar is a search field labeled "Search: Provider:". The main content area is divided into several tabs: Data Centers, Clusters, Hosts, Networks, Storage, Disks, Virtual Machines, Pools, Templates, Volumes, Providers, and Users. The "Providers" tab is currently selected. On the left side, there is a "System" sidebar with a tree view showing the hierarchy: System, dc, Storage, Networks, Templates, Clusters, and Default. The "Networks" folder is expanded, and the "Discover" button is highlighted with a red rectangle. The main content area displays a table with the following data:

Name	Description	URL
Quantum	Quantum external provider	http://10.35.17.30:9696/v2.0

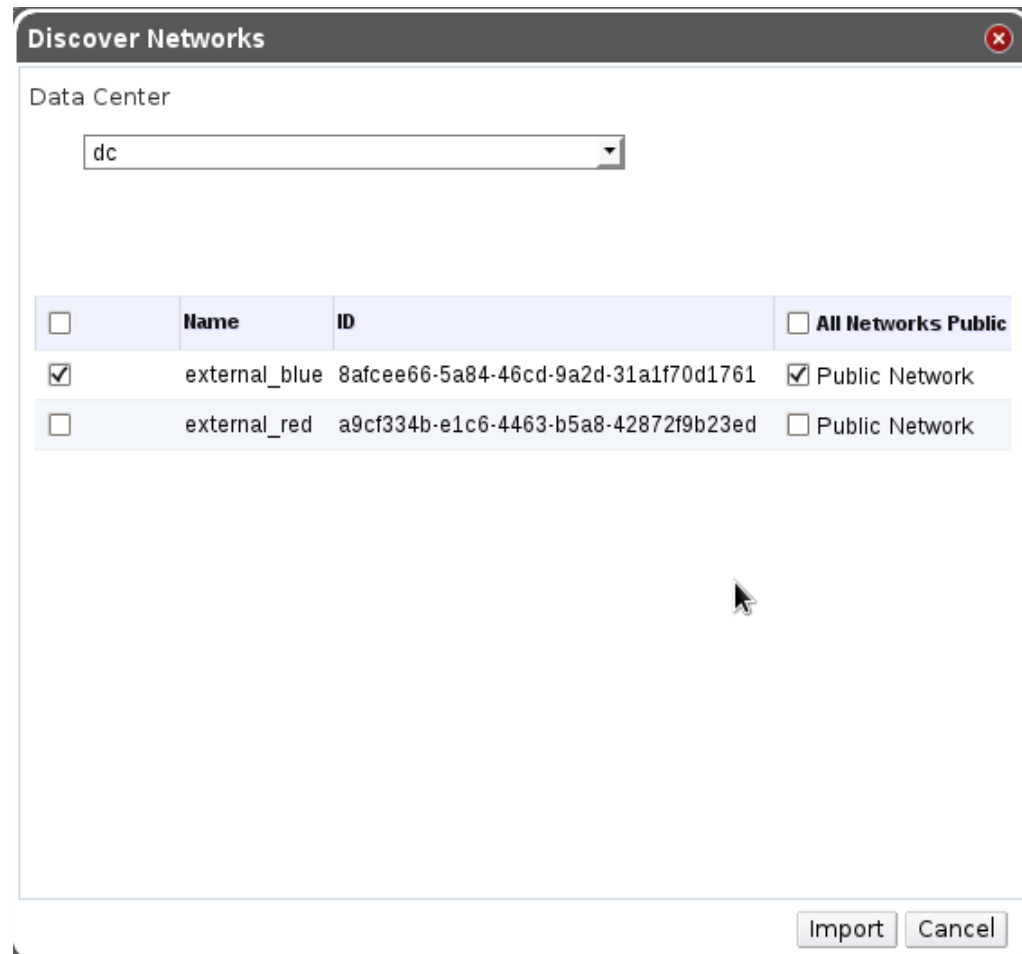
Below the table, there are two tabs: "General" and "Networks". The "Networks" tab is selected, and it shows a table with the following data:

Name	External ID
external_red	a9cf334b-e1c6-4463-b5a8-42872f9b23ed

At the bottom of the interface, there is a status bar with the text "Last Message: 2013-Jan-21, 21:28 User admin@internal logged in." and a notification area showing "Alerts (2)", "Events", and "Tasks (0)".

POC - Flow

5. Choose which networks you would like to make available in oVirt



External Network Provider Indicator



oVirt Open Virtualization Manager

Logged in user: admin@internal | Configure | Guide | About | Sign Out

Search: Network: [x] [star] [magnifying glass]

Data Centers Clusters Hosts **Networks** Storage Disks Virtual Machines Pools Templates Volumes Providers Users

System

New Edit Remove [refresh] [down arrow] Events

Name	Data Center	Description	Role	VLAN tag	Provider
external_red	dc		lm	-	Quantum
ovirtmgmt	dc	Management Network	lm	-	-
ovirtmgmt	Default	Management Network	lm	-	-

System

- dc
 - Storage
 - Networks
 - Templates
 - Clusters
 - Default

Bookmarks

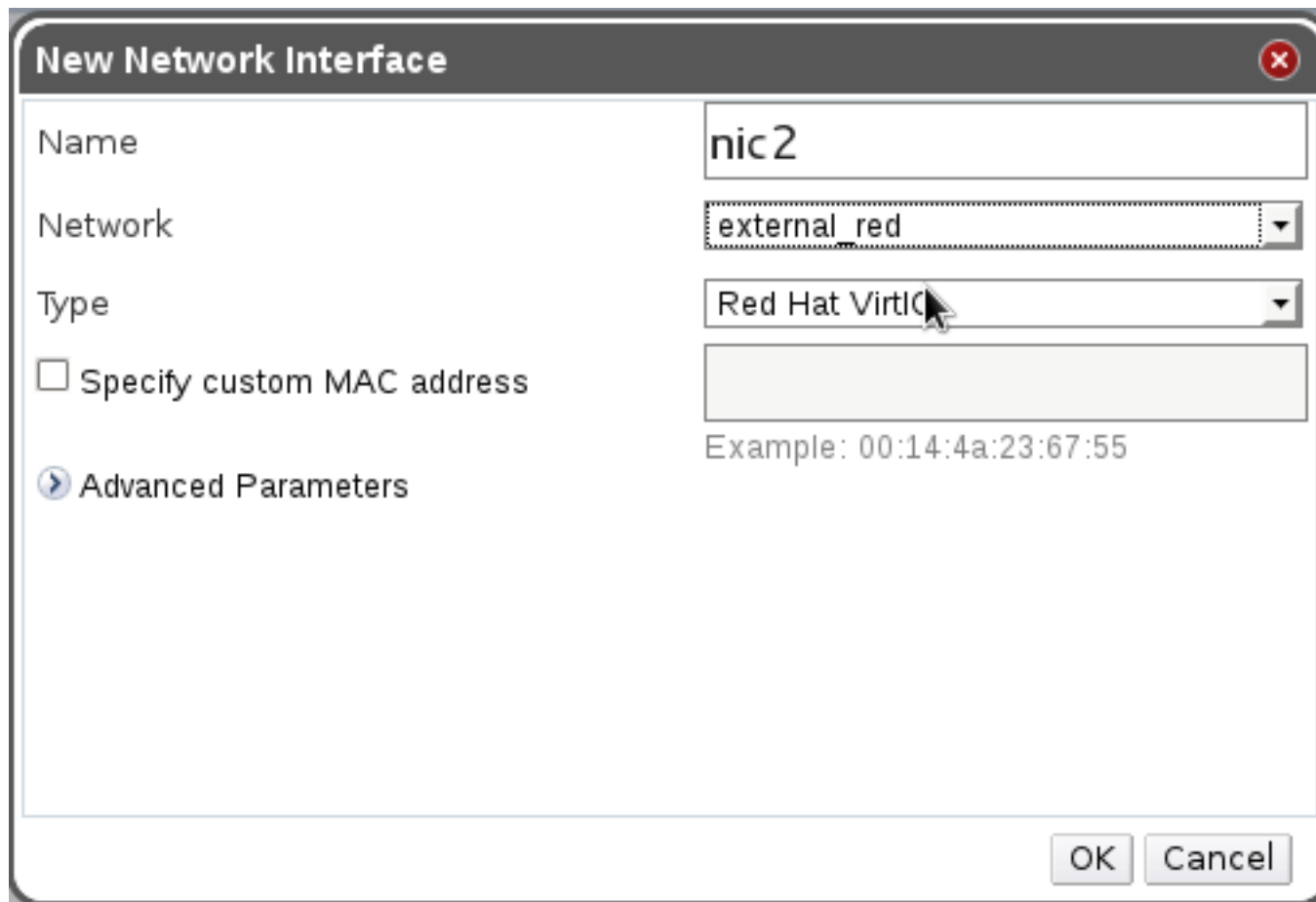
Tags

Last Message: 2013-Jan-21, 21:29 User admin@internal logged in. Alerts (2) Events Tasks (0)

POC - Flow

6. Attach the networks to the desired clusters

7. Use the networks within oVirt VMs



The image shows a 'New Network Interface' dialog box with the following fields and options:

- Name:** A text input field containing 'nic2'.
- Network:** A dropdown menu with 'external_red' selected.
- Type:** A dropdown menu with 'Red Hat VirtIO' selected.
- Specify custom MAC address:** An unchecked checkbox.
- Advanced Parameters:** A section with a right-pointing arrow icon.
- Example:** A text field containing 'Example: 00:14:4a:23:67:55'.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

Network-VMs Association



oVirt Open Virtualization Manager

Logged in user: **admin@internal** | [Configure](#) | [Guide](#) | [About](#) | [Sign Out](#)

Search: Network:

Data Centers Clusters Hosts **Networks** Storage Disks Virtual Machines Pools Templates Volumes Providers Users

System

Expand All Collapse All

- System
 - dc
 - Storage
 - Networks
 - Templates
 - Clusters
 - Default

Networks

New Edit Remove **Events**

Name	Data Center	Description	Role	VLAN tag	Provider
external_red	dc			-	Quantum
ovirtmgmt	dc	Management Network		-	

Virtual Machines

Remove

Running Not Running

Name	Cluster	IP Address	Vnic Status	Vnic	Description
vm-1	cl			nic1	

Bookmarks

Tags

Last Message: 2013-Jan-21, 21:11 User admin@internal logged in. Alerts (2) Events Tasks (0)

Demo

- ◆ The 1st part (the providers tab, discovery, etc)
<http://www.youtube.com/watch?v=yXqN17KktjE>
- ◆ The 2nd part (VM connectivity)
<http://www.youtube.com/watch?v=uW3vrY2Y3xc>

Future Work and Open Questions



- ◆ Authentication mechanism
 - ◆ Integrate with Keystone
 - ◆ Integrate oVirt authentication module within Quantum
- ◆ Auto-discovery mechanism
 - ◆ Open issues - Which Data Center? Which permissions?
- ◆ Manipulate external network within oVirt
- ◆ Import a network multiple times? With different properties, different SLA, different DC etc.
- ◆ Multiple providers associated with a single oVirt network, enables support of multiple technologies for the same network on different physical segments

Future Work and Open Questions

- ◆ Take into account the external provider input in VM scheduling considerations
 - ◆ Which host has access to which network
- ◆ Integrate the tenant concept into oVirt

More info

- ◆ Quantum
 - ◆ <http://wiki.openstack.org/Quantum>
- ◆ Ovirt
 - ◆ http://www.ovirt.org/Network_Provider
- ◆ Mailing lists
 - ◆ users@ovirt.org
 - ◆ arch@ovirt.org
 - ◆ engine-devel@ovirt.org
 - ◆ vdsm-devel@lists.fedorahosted.org
- ◆ IRC Channel
 - ◆ #ovirt channel on irc.OFTC.net

oVirt

THANK YOU !

Questions ?