oVirt – Quantum Integration

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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
Adding a New Network

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

Setup Host Networks

Drag to make changes

Interfaces

- bond0
  - eth1
  - eth2
- bond1
  - eth3
  - eth4
- eth0

Assigned Logical Networks

- NOVM_VLAN_MTU_5 (VLAN 500)
- VLAN_MTU_5000 (VLAN 222)
- VLAN_MTU_5000_2 (VLAN 52)
- ovirtmgmt

Unassigned Logical Networks

- Required
  - NON_VM_MTU_5000
- Non Required
  - NON_VM_MTU_9000
  - NOVM_VLAN_MTU_9 (VLAN 9)
  - VLAN_MTU_9000 (VLAN 9)
  - VLAN_MTU_9000_2 (VLAN 92)

Verify connectivity between Host and Engine

Save network configuration
Supported Configuration - Linux Bridge

- VM
- SW Bridge
- VLAN / Native
- VLAN / Native
- VLAN
- bond
- NIC
- NIC
- 1..N
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

Quantum API
- Create network
- Create Port

Quantum Plugin
- Create network
- Create Port

API clients

API + plugin = Quantum service

Technology dependent:
- Agent in node level
- External network manager (e.g. UCSM)
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 exposed in 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
DEMO TIME

- Part I
  http://www.youtube.com/watch?v=yXqN17KktjE

- Part II
  http://www.youtube.com/watch?v=uW3vrY2Y3xc
POC - Flow

1. Deploy oVirt and Quantum

2. Define a network in Quantum

3. Define the Quantum instance as an external provider in oVirt
External Providers Main Tab
4. Perform a network discovery operation in oVirt
5. Choose which networks you would like to make available in oVirt
External Network Provider Indicator

![External Network Provider Indicator](image)

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Center</th>
<th>Description</th>
<th>Role</th>
<th>VLAN tag</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>external_red</td>
<td>dc</td>
<td></td>
<td></td>
<td></td>
<td>Quantum</td>
</tr>
<tr>
<td>ovirtmgmt</td>
<td>dc</td>
<td>Management Network</td>
<td></td>
<td>-</td>
<td>-</td>
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<td>ovirtmgmt</td>
<td>Default</td>
<td>Management Network</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
POC - Flow

6. Attach the networks to the desired clusters
7. Use the networks within oVirt VMs
Network-VMs Association
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](http://wiki.openstack.org/Quantum)

- Ovirt
  - [http://www.ovirt.org/Network_Provider](http://www.ovirt.org/Network_Provider)

- Mailing lists
  - users@ovirt.org
  - arch@ovirt.org
  - engine-devel@ovirt.org
  - vdsms-devel@lists.fedorahosted.org

- IRC Channel
  - #ovirt channel on irc.OFTC.net
THANK YOU!

Questions