Introduction to Lenovo Intelligent Network Controller
Positioning Information (withdrawn product)

Enterprise CIOs are seeking to become truly virtual by implementing IT models such as Hybrid Cloud and various infrastructure offerings to drive better cost efficiencies and agile operations. On the other hand, Telco providers are seeking to develop new business models to capitalize on these enterprise requirements and address disruptions to their traditional revenue streams.

Lenovo Intelligent Network Controller is available to address the challenges faced by both IT departments and telco providers in building an intelligent network that can adopt to new business requirements. Intelligent Network Controller is a Software Defined Network (SDN) controller built on Tungsten Fabric (formerlly OpenContrail), which demonstrates Lenovo's commitment to open solutions while providing quality customer experiences.

Features

Intelligent Network Controller has the following key features:

- Linux Foundation Project, Tungsten Fabric (continuous community sync)
- Multi-tenancy
- VXLAN encapsulations
- Forwarding Class Bit-marking QoS
- Multicast Services
- Service Function Chaining (SFC) with LBaaS/FWaaS/VPNaaS supporting commercial VNFs (Virtualized Network Functions)
- High Availability
- Enhanced Lenovo GUI
- Rich Analytics
- VM Live Migration
- Rich Northbound REST APIs
- Support and services offerings

Virtualization platforms

The following operating systems and virtualization platforms are supported:

- Red Hat OpenStack 10 (RHOSP10) – OpenStack Newton
- Red Hat Enterprise Linux 7.5
- Lenovo ThinkCloud Solution (for China only)

Benefits

Intelligent Network Controller has the following key customer benefits:

- **Simple**
  Lenovo Intelligent Network Controller is designed with simplicity in mind. It is easy to learn, intuitive to use, and well automated for a simple day-1 setup with orchestration systems such as Red Hat OpenStack and Lenovo ThinkCloud. The controller also provides user interface options with Simplified Chinese language for customers in China.

- **Open**
  Intelligent Network Controller is based on Tungsten Fabric, The Linux Foundation open-source project (formerly OpenContrail) and community of developers and users. It eliminates the risk of being lock-in by leveraging long-standing, well-proven open industry standards plus Lenovo's quality commitment.

- **High Scale and Performance**
  Several large Enterprises and Telco currently have Open Contrail in production, standing up to the challenge of some of the most massive data center clouds. One controller installation can support thousands of virtual machines or Containers.

- **Seamless Integration**
  Intelligent Network Controller integrates with existing environments seeking to migrate to Private Cloud models. It includes support for standard protocols and integration with orchestration systems such as OpenStack. The Virtual router can integrate with routing protocols such as BGP and OSPF to enable undisrupted traffic paths.

System Architecture

The following figure shows an architecture that consists of distributed vRouters on each hypervisor node. These vRouters peers with Lenovo switches or third-party routers and switches for internal and external routing to physical workloads. The Neutron plugin is the integration point with Openstack or Lenovo ThinkCloud.

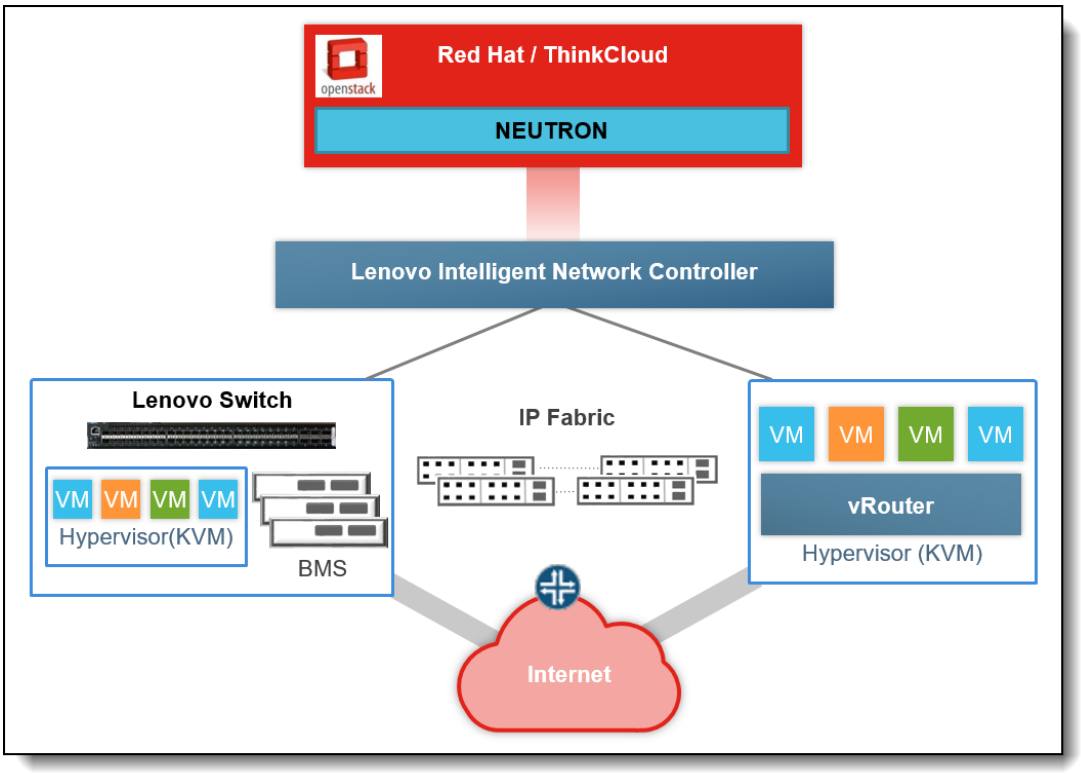

Figure 1. System architecture

Use Cases

The following are key use cases:

- **Network Virtualization and Security**
  Creating virtual overlay networks across L2 or L3 infrastructure with VXLAN support. The controller also enables policies to secure these networks based on workload access requirements.
- **Service Function Chaining**
  In addition to built-in policy capabilities, additional Virtual Network Functions (VNF) services integrated into the network path to create as a “Service Chains”. Typical VNFs includes Firewalls, Load Balancers, IPS and others.
- **Virtual to Physical Mapping**
  IT Environments with both physical and virtual workloads requires mapping from one domain to the other. Lenovo Intelligent Network Controller can provide mapping from virtualized servers into physical legacy servers connected to Lenovo or third-party switches with VXLAN encapsulation support. This allows for unified management of these environments.

Tungsten Fabric Community

The original Contrail architecture was initiated by Juniper Networks and has expanded into an open community, now called Tungsten Fabric and is part of the Linux Foundation Networking group. Several community members are deploying Tungsten Fabric to production. Lenovo is a very active contributor to this community and provides a controller that is fully qualified into our Telco and Enterprise solutions.

Technical requirements

The minimum recommended hardware for a highly availability system in production is three servers with the following components:

- 256 GB RAM
- 500 GB storage
- 16 CPU cores
- Two Intel Ethernet ports (82599 or newer)
- Linux OS (CentOS or RHEL)

In a Proof of Concept (PoC) environment, Intelligent Network Controller can run with the following minimum hardware requirements:

- 32 GB RAM
- 350 GB storage
- 8 CPU cores
- Two Intel Ethernet ports (82599 or newer), or E1000/VXNET3 compatible vNICs in the virtual environment

For More Information

For more information about Lenovo Intelligent Network Controller, go to the following web page:

https://github.com/lenovo/Intelligent-network-controller

Lenovo Intelligent Network Controller is currently available for Customer Proof of Concept (PoC). Please contact Lenovo at -sdn-marketing@lenovo.com for more information.

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