Cisco and Red Hat: Application Centric Infrastructure Integration with OpenStack

Cisco and Red Hat Extend the Cisco ACI Policy Framework to Red Hat Enterprise Linux OpenStack Platform Enabled Environments

Overview

Cisco and Red Hat are collaborating to offer customers an Application Centric Infrastructure (ACI) that is integrated with Red Hat Enterprise Linux OpenStack Platform (RHEL OpenStack Platform). The solution will enable the next-generation cloud deployments that drive business agility, lower operational costs and avoid vendor lock-in.

Cisco's vision for ACI is to provide highly flexible application policy and infrastructure control that can dramatically accelerate application deployment and operations through centralized configuration, testing, monitoring of network connectivity, security and other L4-7 services. Red Hat is a leading supplier of open source solutions offering compelling enterprise ready OpenStack cloud solutions through RHEL OpenStack Platform. Together, Cisco and Red Hat are extending the Cisco ACI policy framework to OpenStack environments, to enable customers to build rich application driven network policies in their cloud environments.

Cisco and Red Hat offer a certified, supported, turn-key ACI based OpenStack solution. This solution enables customers to deploy the full range of service and deployment models with OpenStack to meet the most demanding needs of their cloud deployments.

Challenges

Businesses today are unable to scale cost-effectively. Increasingly, they are looking for innovative, open technologies to reduce costs and avoid vendor lock-in while maintaining existing infrastructure investments.

In addition, new cloud applications with mobile, social and big data workloads are much more dynamic due to higher demand peaks, more distributed users, broader device support, varying performance needs, 24x7 global usage and changing security vulnerabilities. Furthermore, to run economically at scale with performance and availability, these applications need a mix of virtualized and dedicated, "bare-metal" resources.

In order to simplify IT operations and bridge across different technology and organizational silos such as network, compute, storage, application, security, cloud, there is a need to provide a unified interface for policy, orchestration, reporting and automation across their physical, virtual and cloud infrastructure.

Enterprise and IT leaders want solutions based on OpenStack as their unified interface to swiftly deploy and scale IT infrastructure without sacrificing security or performance. They are looking for OpenStack integrated solutions that deliver on the flexibility and speed of software, without compromising on the performance and scale of hardware.

Increasingly, customers expect OpenStack to evolve and provide the same level of richness provided today by the leading cloud infrastructure vendors. They are looking for leading infrastructure vendors to embrace OpenStack and enable the functionality and reliability they need for their cloud environments.

## Solution: Integrating Cisco ACI fabric with Red Hat Open Stack

Cisco's ACI Fabric combines ACI-ready Nexus 9000 switches with application policy, enabling applications to drive networking behavior, not the other way around. Pre-defined application requirements and descriptions automate the provisioning of the network, application services, security policies, tenant subnets and workload placement. Automating the provisioning of the complete application network reduces IT costs, reduces errors, accelerates deployment and makes the business more agile.

Cisco and Red Hat have collaborated to build a joint solution on RHEL OpenStack Platform through integration with existing OpenStack Neutron APIs, Open vSwitch, and the Cisco Application Policy Infrastructure Controller (APIC).

The APIC is the main architectural component of the Cisco ACI solution. It is the unifying point of automation and management for the fabric, policy programming, and health monitoring.

The solution integrates with the APIC OpenStack Neutron plug-in, the Cisco ACI-ready fabric and the Red Hat Enterprise Virtualization Hypervisor, based on KVM technology, running Open vSwitch and OpenStack Nova (OVS; Figure 1).

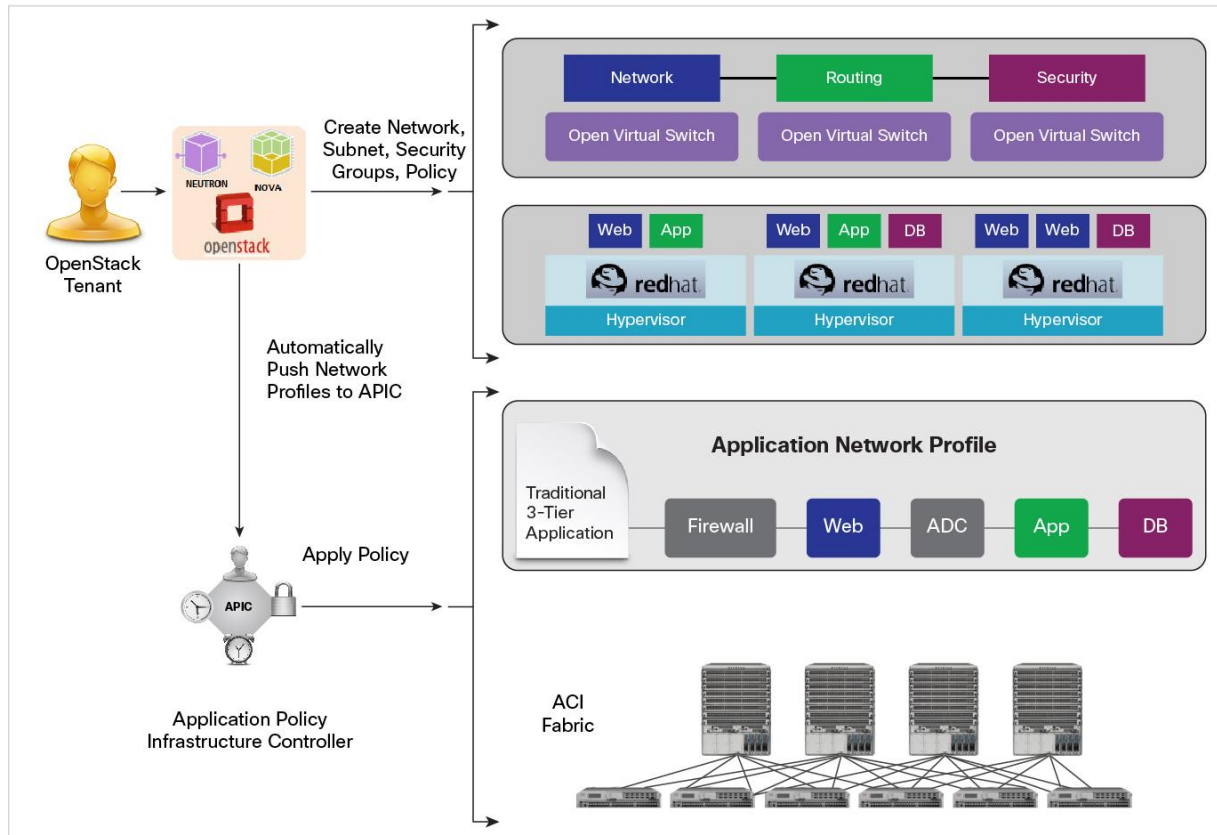**Figure 1:** Cisco APIC Integration with RHEL OpenStack Platform
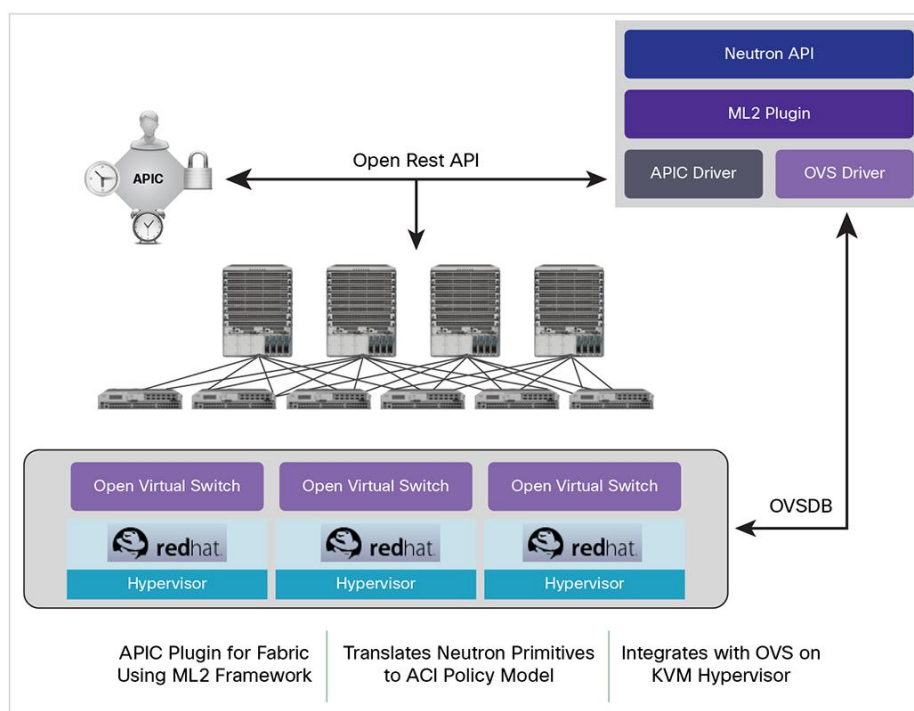
The Cisco® APIC extends transparently to RHEL OpenStack Platform environments as a plug-and-play. The network constructs created within OpenStack (networks, subnet and security policies) are automatically mapped to APIC application policies. Leveraging these Application Network Profiles, Cisco APIC automatically instantiates network and L4-7 Service policies onto the infrastructure at the points where the application connects to the network, regardless of whether they are virtual or physical without any intervention from the infrastructure administrator.

Additionally, Cisco and Red Hat plan to extend Cisco ACI APIs to Red Hat products starting with:

- **Red Hat Enterprise Linux OpenStack Platform:** Adapts the OpenStack Neutron APIs to reflect the capabilities of Cisco's application centric policy framework

- **Red Hat Enterprise Virtualization Hypervisor with Open vSwitch:** Evolves OVS functionality to reflect Cisco's application centric policy approach in Red Hat Enterprise Linux OpenStack Platform

Figure 2: Cisco ACI Integration with RHEL OpenStack Platform

Solution Benefits

Cisco ACI integration with RHEL OpenStack Platform delivers the following benefits:

- Provides certified, supported, integrated, and deployable solution for running RHEL OpenStack Platform on application centric networking infrastructure

- Simplifies and accelerates deployment and management of applications and infrastructure in private, public, and hybrid clouds using OpenStack

- Enables scalability, performance, and agility in cloud environments by combining the flexibility of software (RHEL OpenStack Platform and Cisco ACI) with the performance of hardware (Cisco ACI)

- Provides the capability to build comprehensive application-based network policies in the cloud

- Benefits the open source community through the evolution of network concepts using extensions to the OpenStack Neutron model to achieve a more application centric infrastructure

- Provides enhanced automation and programmability capabilities through open APIs to enable a broader ecosystem

For More Information

- Cisco ACI strategy: http://www.cisco.com/go/aci

- Red Hat: http://www.redhat.com/products/enterprise-linux/openstack-platform/

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