Executive summary

HP is introducing new innovations for Virtual Application Networks to deliver end-to-end software-defined networking (SDN). With these innovations, HP is enabling organizations to apply business logic to network behavior in a dynamic way.

These new capabilities span across the SDN architecture as defined by the Open Networking Foundation (ONF) and include infrastructure, control, and application layers. The HP Virtual Application Networks framework brings these elements together under a single pane of glass management layer.

Figure 1. HP Virtual Application Networks framework

HP OpenFlow support

HP is continuing its expansion of OpenFlow support across the HP FlexNetwork portfolio. Now, with over 40 switch models supporting OpenFlow, representing more than 20 million ports in the market, HP continues to lead in OpenFlow enablement. HP is the only vendor to offer a full portfolio of enterprise data center and campus switches that are SDN-ready with OpenFlow support.

Figure 2. HP OpenFlow-enabled switches

HP Virtual Application Networks SDN Controller

The HP Virtual Application Networks SDN Controller is a robust platform for enabling SDN. As the centerpiece of the SDN architecture, the control layer is made into a dynamic control plane with the intelligence to automate and program the network. The controller features:

• Availability as either software or an appliance
• Full support for the OpenFlow protocol
• Open APIs to enable third-party SDN application development
• An extensible, scalable, and resilient controller architecture
• Availability of HP SDN applications and an OpenFlow-enabled infrastructure for an end-to-end solution

Figure 3. HP Virtual Application Networks SDN Controller
HP Virtual Cloud Network

The HP Virtual Cloud Network application enables public cloud service providers to provide tenant-facing networking as a cloud service by addressing the scalability challenges faced by cloud providers. It does this by eliminating traditional scalability limits while automating network configuration.

Some of the key features include:

- Runs on HP Virtual Application Networks SDN Controller
- Automates network provisioning, enabling a self-service cloud
- Limits provisioning actions to low-risk infrastructure elements
- Enables scaling beyond traditional hardware limits
- Delivers virtual networking for OpenStack public and private clouds

![Figure 4. HP Virtual Cloud Network application](image)

HP Sentinel Security

HP Sentinel Security application stops threats before they can cause damage. Sentinel Security can be used in any network environment where security is a concern, including the data center and cloud computing environments. HP envisions a network where Sentinel Security can be implemented on any network device anywhere in the network for unprecedented network visibility, event correlation accuracy, and security control.

HP Sentinel Security features include:

- Runs on HP Virtual Application Networks SDN Controller
- Consumes real-time reputation security intelligence from the HP TippingPoint DVLabs cloud service
- Protects from over 700,000 botnets, malware, and spyware malicious sites
- Provides native integration for improved visibility and accuracy with ArcSight solutions
- Has OpenFlow-enabled switches to detect applications, malware, and botnets
- Has the ability to create a whitelist and blacklist
- Has dynamic switch learning with HP OpenFlow-enabled switches, which distributes detection into the switch infrastructure
- Provides security enforcement decision feedback with the HP Intelligent Management Center

![Figure 5. HP Sentinel Security application](image)

HP UC&C SDN Application

Deploying trusted and granular quality of service (QoS) can be extremely complex and require implementing tedious and time-intensive manual configurations on a device-by-device basis. In fact, it is nearly impossible to implement traffic policy using deep packet inspection (DPI) for soft clients with legacy networks because of because of SIP TLS encryption and dynamic application ports used by UC&C applications, resulting in poor application traffic visibility.

HP is announcing a new technology prototype UC&C SDN application to address these issues. This SDN application will automate policy deployment dynamically on a per-connection basis for voice, video, and application sharing to deliver a better user experience and reduce operational costs. When a desktop sharing, voice, or video connection is initiated using the Microsoft® Lync client in the campus or branch office, the Lync Server in the data center provides the HP UC&C SDN Application with call details such as source and destination IP address, protocol type, application ports, and bandwidth requirements at the start and end of every call. The SDN application then uses these per-connection application details to dynamically provision the end-to-end network path and QoS policy via the HP Virtual Application Networks SDN Controller using OpenFlow.

Once the QoS policies and path are programmed via OpenFlow, the call is connected to the destination client. The HP UC&C SDN Application uses the intelligence from Lync Server and the Lync SDN API proof of concept, along with the robust capabilities of the HP SDN controller, to implement best path routing, consistent QoS, and bandwidth guarantee. All of this is done dynamically through a central point of control; eliminating the need for manual, device-by-device configuration via the CLI, which greatly simplifies policy deployment and reduce the likelihood of human errors.

![Figure 6. HP UC&C SDN Application](image)

Availability

- HP OpenFlow-enabled switches are currently shipping. Please visit hp.com/networking/openflow for more details.
- The HP Virtual Application Networks SDN Controller and HP Virtual Cloud Networks are currently in a limited customer beta.