Frequently asked questions

Bridging the data center of today and tomorrow with SDN

Software-defined Networking paves the way for customer success in the cloud

Q: What is HP announcing?
HP is announcing the new open standards-based Software-defined Networking (SDN) solutions that rapidly virtualize the datacenter, enabling customers to deploy secure, isolated cloud networks in minutes versus months.

Bridging the datacenter of today and tomorrow requires networks to evolve at the speed of software. To help customers maximize business value from cloud deployments, HP has introduced the HP Virtual Cloud Networking SDN Application available first as part of HP Helion OpenStack®, a new network virtualization solution based on open-source and open-standards. The HP Virtual Cloud Networking SDN Application combined with new HP FlexFabric datacenter switches and the recently announced HP Helion OpenStack helps customers bring projects to market quickly while reducing overall costs.

Q: What are the key components of this announcement?
• HP Virtual Cloud Networking (VCN) SDN Application
• The HP FlexFabric 7900 Switch Series
• HP TS Trusted Network Transformation

Q: What are the key benefits of this solution?
The HP VCN SDN Application is bundled with HP Helion OpenStack to provide a fully tested, converged solution for commercial OpenStack deployments. This solution delivers the agility and scalability needed to successfully implement private and hybrid clouds, enabling application deployment whenever required.

This not only helps you monetize applications quickly to drive bottom-line value, but also improves the end-user application experience. It opens the door to new innovations with the HP open SDN ecosystem and HP SDN App Store. The new data center switches join a rich SDN-enabled product portfolio that is easily and seamlessly integrated with the cloud, improving network performance, simplifying the end-user experience, and enhancing efficiency, thereby reducing TCO.

HP Virtual Cloud Networking SDN Application

Q: What is HP Virtual Cloud Networking?
The HP VCN SDN App is available as an enhanced OpenStack networking module (Neutron) in HP Helion OpenStack, which is part of our contribution to OpenStack. The VCN SDN App delivers network virtualization enabled by SDN which orchestrates the entire data center infrastructure.

This application supports multi-hypervisor, multi-tenant data center applications. Integrated in the HP VAN SDN Controller, VCN enables support for the HP Networking FlexFabric portfolio. The SDN-based solution will enable you to customize your data centers with additional differentiated value-added applications via the SDN SDK and App Store.
Q: What problem is the HP Virtual Cloud Networking SDN App helping to solve?
The instantiation of network services is aligned with the needs of applications. The network should act dynamically to establish the required connectivity within and across data centers, and do so in a manner that is consistent with the defined policies of Communication Service Providers (CSP) and their tenants. Today that process is slow, manual and error-prone, relying on work orders to establish a multitude of vendor dependent configurations.

Q: How can I benefit from the VCN SDN Application?
HP VCN removes the constraints of the datacenter network through an innovative, open, SDN architecture that abstracts network capabilities and automates service instantiation.
- Scalable, secure and hardened enterprise cloud networking
- Automated delivery of secure isolated networks in minutes vs. weeks
- Unified physical and virtual visibility and control enabled by SDN
- Access to open SDN ecosystem including SDN applications

Q: How does VCN extend the value over current OpenStack® Neutron networking capabilities?
The HP VCN SDN App provides several enhancements to Neutron as detailed in the table below.

<table>
<thead>
<tr>
<th>Capability</th>
<th>Neutron</th>
<th>Virtual Cloud Networking enhancements</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVS vSwitch</td>
<td>✔️</td>
<td>✔️ + Adds enhanced control of standard OVS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>KVM Hypervisor</td>
<td>✔️</td>
<td>✔️ + Supports both KVM and VMware ESX</td>
</tr>
<tr>
<td>Network Node routing</td>
<td>✔️</td>
<td>✔️ + Adds support for Distributed Virtual Router (DVR)&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>VXLAN virtual overlay</td>
<td>✔️</td>
<td>✔️ + Adds hardware VTEP (S9300 L2 VXLAN gateway)</td>
</tr>
<tr>
<td>Single controller</td>
<td>✔️</td>
<td>✔️ + Adds support for High Availability (HA)</td>
</tr>
<tr>
<td>Single network node</td>
<td>✔️</td>
<td>✔️ + Adds scale-out network node capability</td>
</tr>
<tr>
<td>VPNaaS (inter-DC IPsec)</td>
<td>✔️</td>
<td>✔️ + Adds support for client SSL VPNaaS&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Security groups</td>
<td>✔️</td>
<td>✔️ + Enhanced OVS access control&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scalability</td>
<td>50 nodes ✔️</td>
<td>✔️ + Adds scale-out for up to 1,000 nodes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>SDN support/ecosystem</td>
<td>–</td>
<td>✔️ + Adds support for SDN and open ecosystem</td>
</tr>
</tbody>
</table>

<sup>1</sup> HP OpenStack open source contributions
<sup>2</sup> HP-led OpenStack projects
Q: What sets the HP network virtualization solution apart from others?

- HP delivers a complete and hardened OpenStack distribution that enhances current networking performance and eliminates scale bottlenecks
- HP provides strategic integration and partnerships with major solution providers - e.g., VMware vCenter integration and NSX federation
- HP enables access to HP SDN ecosystem with third-party SDN App -API access to both OpenStack and SDN drives innovative data center solutions
- HP is committed to standard based solutions such as OpenFlow—which provides a common syntax for implementing data center network policy—Open vSwitch and FlexFabric both support OpenFlow 1.3
- HP builds a better network underlay. Our FlexFabric architecture efficiently delivers any scale of public or private cloud—Open standards eliminate vendor lock-in and enable easy product transitions

Q: Does VCN support both bridged and routed networking from VM to VM?

VCN implements distributed virtual routing in addition to bridged networking.

Q: Will VCN work in Virtual Connect environments?

VCN provides virtual networking functionality for OpenStack that will work with any standards based switching infrastructure, including Virtual Connect.

Q: Does VCN support VXLAN for multi-tenancy?

Yes. VCN does support VXLAN. It provides a Neutron network virtualization service for multi-hypervisor, multi-tenant data center applications.

Q: Is VCN also able to program Virtual Switches (5900v, vSwitch, etc) running in the hypervisor and create tunnels between in a VXLAN topology?

VCN programs virtual switches as well as the physical underlay via the HP VCN SDN Controller.

Q: Is it possible to deploy HP VCN SDN implementation in competitive network architectures?

The HP VCN SDN App works with any competitive network architecture. Hardware L2 VTEP (for VXLAN) requires 5930 and SDN application support requires OpenFlow enabled switches.

Q: When will the HP VCN SDN Application be available?

The HP VCN SDN Application will be available worldwide in August 2014 as part of the HP Helion OpenStack commercial edition.

**HP Helion OpenStack**

Q: What is HP Helion OpenStack?

HP Helion is a portfolio of cloud products and services that make it easier for you to build, manage, and consume workloads in a hybrid IT environment. This solution brings together all the benefits and agility of cloud computing, the interoperability of open source, and the security and reliability that enterprises need to move forward with confidence.

HP Helion solutions and data centers are being used by over 1/31 of the Fortune 100 around the world.

Q: What is OpenStack?

OpenStack is an open-source cloud platform. OpenStack software controls large pools of compute, storage, and networking resources throughout a data center. It is managed by a dashboard that gives administrators control, while empowering their developers to instantly provision resources through an API or web interface.

1 Source: HP internal analysis
Figure 2. OpenStack—Open source cloud platform

Q: What is OpenStack Networking module (Neutron)?
OpenStack Networking (Neutron, formerly Quantum) is a pluggable, scalable and API-driven system for managing networks and IP addresses. Like other aspects of the cloud operating system, it can be used by administrators and users to increase the value of existing data center assets. OpenStack Networking ensures the network will not be the bottleneck or limiting factor in a cloud deployment and gives users real self-service, even over their network configurations. OpenStack Neutron provides networking models for different applications or user groups.

Q: What is network virtualization?
According to Gartner, network virtualization is one of the first enterprise-ready use cases of SDN. It is a good fit for organizations that want to extend the benefits of server virtualization from individual workloads to complete applications or even entire data centers. Network virtualization (NV) is also needed to achieve the necessary agility and isolation for running multi-tenant infrastructure. It is a key component in a fully orchestrated, self-service cloud infrastructure. Legacy approaches, such as VLAN technology, lack some key capabilities required to implement the fully dynamic networks and automation processes that are necessary in the cloud computing era.¹

Q: Why should I consider using Network Virtualization?
The use of public cloud providers has conditioned business units to expect resources to be available in an on-demand, always-on, self-service manner, regardless of location. Therefore, IT organizations are being forced to offer IT services using the same flexible and agile model that service providers offer or risk marginalization.² However, enterprise data center networks have lagged behind virtualized computing infrastructure in terms of deployment speed, agility and scalability. Now, SDN-based network virtualization can finally enable deployment of the agile and user-configurable enterprise data center networks that customers are demanding.

HP VAN SDN Controller

Q: What is the HP Virtual Application Networks SDN Controller?
The HP Virtual Application Networks (VAN) SDN controller is the central building block of HP’s SDN solution. The controller operating in an OpenFlow-enabled network provides simplified management, provisioning, and orchestration in the SDN architecture.

Solutions, such as various networking applications for all types of network environments and customers, can be implemented with the controller including service provider and enterprise, as well as data center, campus, and branch focused applications. HP Virtual Application Networks (VAN) SDN Controller Software provides a unified control point.

Q: What are the key differentiators and features for the VAN SDN Controller?
The HP Virtual Application Networks SDN Controller offers open APIs for customers and third parties to build applications and allows for business applications to interface directly with the controller for network-aware applications.

- Centralized automation for your SDN-enabled network
- Compliant with OpenFlow 1.0 and 1.3 protocols
- Supports over 50 OpenFlow-enabled HP switch models and 10 routers

¹² Magic Quadrant for Data Center Networking, ID: G00262141
• Open APIs to enable third party SDN application development
• Extensible, scalable, resilient controller architecture

Q: Can the controller work with third-party equipment?
Yes, the controller will work with any third-party infrastructure supporting the corresponding version of the OpenFlow as well as NETCONF and SNMP.

Q: What products and solutions has HP announced in support of Virtual Application Networks Controller?
In August 2013, HP and VMware, Inc., announced to deliver the industry’s first federated network solution, designed to provide customers unified automation of, and visibility into, their physical and virtual data center networks, enabling business agility and improving business continuity. Also the controller works with HP and 3rd party SDN applications.

Q: What are the Virtual Application Networks Controller pricing and availability details?
The controller is available as licensed software priced at $499 USD for 50 Nodes. It is managed by HP Intelligent Management center (IMC), and supports standard-based OpenFlow 1.0 and 1.3 protocols available from today.

Virtual Application SDN Application vs. Competitors

Q: How is the HP VCN SDN Application differentiated vs. other competitor’s solutions? The table below shows a comparison between HP VCN SDN App and Cisco ACI and Arista EOS.

<table>
<thead>
<tr>
<th></th>
<th>HP VCN</th>
<th>Cisco ACI</th>
<th>Arista EOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Virtualization approach</td>
<td>Application Centric</td>
<td>Hardware centric</td>
<td>Switch centric</td>
</tr>
<tr>
<td>Integration with OpenStack</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Open source network virtualization</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Complete CI solution</td>
<td>Server, Storage Network Software</td>
<td>Server, Network Software</td>
<td>Network</td>
</tr>
<tr>
<td>Runs on existing infrastructure</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>SDN open ecosystem</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>OpenStack service and support</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Unification of physical and virtual environment</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Federation with VMware</td>
<td>Yes- Full Federation</td>
<td>No</td>
<td>Yes- Partial Federation</td>
</tr>
</tbody>
</table>

Market Landscape
HP has been leading the SDN market landscape since its inception in 2007 with the most comprehensive SDN offering. While some niche vendors only address certain aspects of data center and cloud, others market disjointed and priority hardware-defined fork-lift upgrades.

Figure 3. Achieve business outcomes with HP Cloud networking solutions
The HP cloud networking offering is built on this foundation and provides not only the most comprehensive Software-defined networking cloud solution with VCN, but also one that is open and enables investment protection, offers flexibility, and provides a competitive advantage.

Q: How is HP VCN positioned vs. Arista EOS?

Since VCN is based on the open-source Neutron distribution, it supports all existing APIs, including the ML2 plug-in. This means that VCN is compatible with the Arista ML2 plug-in, and can therefore manage an Arista data center environment while delivering all of the benefits of the VCN enhanced capabilities. Arista as a company can only provide the physical network infrastructure, and they choose to leverage the proprietary EOS programming interface to control their switches.

HP believes that the physical and virtual networking infrastructure should leverage the standards-based OpenFlow control mechanisms to deliver a common dynamic programming framework. Because HP is developing the network virtualization component as well as OpenFlow-enabled infrastructure, HP can provide a unified view and application interface for both the virtual and physical network. An Arista EOS environment forces you to maintain disjointed control domains, adding unnecessary complexity in an environment where agility is required. HP on the other hand offers an SDN open ecosystem with a centralized controller for the SDN community to innovate.

Q: How is HP VCN positioned vs. Cisco ACI?

Cisco has developed a hardware-centric model for cloud networking. They claim to improve performance and functionality through the use of proprietary hardware-based virtualization enhancements and proprietary ethernet frame formats. This is contrary to the direction of the industry over the last decade, which has embraced the flexibility of software-based virtual switches operating on industry-standard servers, and the transparency of standard Layer 2 and Layer 3 protocols for switching and routing. Cisco locks customers into an endless series of hardware upgrades in order to keep up with the rapid evolution of cloud-based data centers (as evidenced by the accelerating transitions Cisco is making from Cat6500 to Nexus 7000 to Nexus 9000).

On the other hand, HP is leveraging the industry-standard open-source Open vSwitch (OVS), and the industry-standard OpenFlow SDN control paradigm to deliver a flexible solution that does not require the purchase of any new networking devices to get started with an enterprise-class, VLAN-based private cloud. HP offers the option for customers to add a hardware VTEP based on the HP FlexFabric 5930 for VXLAN gateway support, quite different from Cisco’s requirement that multiple ACI-compliant switches be purchased as part of every ACI deployment. Rather than a proprietary hardware-based programming model, HP delivers a scalable, cloud based on OpenFlow programming rules, deployed at the virtual or physical network edge and standard L2/L3 protocols running across the fabric. This provides unified physical/virtual cloud data center architecture. Cisco claims that this can’t be done at scale, but HP proves them wrong.

Q: How is HP VCN positioned vs. VMware NSX?

VCN provides a multi-tenant network virtualization service for KVM and VMware ESX multi-hypervisor data center applications. It offers you the best solution for an open source solution based on OpenStack networking module as well as proprietary technologies such as VMware NSX. You need to have visibility and control of the foundational aspects of the physical network. HP and VMware developed a new solution that federates their two controllers to provide visibility and control of both underlay and overlay devices.

Q: What is the HP-VMware solution?

HP and VMware have developed a solution that federates NSX (multi-hypervisor environments) with our HP Virtual Application Network (VAN) SDN Controller to offer value added differentiation. HP and VMware are creating virtualized networks with the ability to:

- Unify virtual and physical devices, and bridge virtual and physical networks
- Simplify network lifecycle management and deploy additional bandwidth rapidly
- Provide end-to-end visibility, rapid root-cause analysis and troubleshooting

Q: What is the availability of HP-VMware solution?

The solution will be available in 2H of 2014.

For more information for about this product please check HP-VMware Solution FAQ.

**HP FlexFabric 7900 Series**

Q: What is the HP FlexFabric 7900 series?

The HP FlexFabric 7900 is a compact modular data center core switch designed to support virtualized data centers and evolutionary needs of private and public clouds deployments.
Q: What are the benefits of the HP FlexFabric 7900 series?
The 7900 delivers unprecedented levels of performance, buffering, scale, and availability with high density 10GbE, 40GbE, and 100GbE interfaces at a lower cost, using only a fraction of the footprint used by traditional chassis. The switch supports Full Layer 2 and 3 features, including advanced features such as TRILL and HP Intelligent Resilient Fabric (IRF), which enable scale-out, two-tier leaf-spine architectures.

Q: What are the features of HP FlexFabric 7900 series?
The 7900 series has a compact modular design and support for standard-based network virtualization (VXLAN, NVGRE and OpenFlow) and VMware NSX virtual overlays which help customers a seamless transition to cloud in an migratory and non-disruptive way.

Q: What will be the availability and pricing of the FlexFabric 7900?
The HP FlexFabric 7900 switch series has a starting list price of $55,500 USD (40GbE base configuration) and is available now.

**TS High Confidence Data Center Network Transformation**

Q: What is the HP TS Trusted Network Transformation?
The HP TS Trusted Network Transformation is a proven and trusted transformation methodology. The methodology starts with aligning the IT (and networking as a subset of IT) strategy with the business. This aligned strategy is the guiding principle applied throughout the transformation, as we move into current environment assessment and analysis, strategy and architecture, validated design, integration and implementation and then supported in a high touch data center care model. This entire journey is wrapped with high touch program management and includes Management of Change across infrastructure and operations, as well as looking at all financial options and strategies.

Q: What problem is the HP TS Trusted Network Transformation helping to solve?
Today’s networks are both based on decades-old design principles and mission critical—everything touches the network, and the network touches everything. This paradox means enterprises recognize that the network must evolve in order to take advantage of the mega-trends of cloud, big data and mobility, but the evolution itself can represent significant risk to the enterprise. HP’s Networking Transformation brings a trusted and prescriptive path to take you from your current network state to a software defined network.

Q: How can I benefit from the HP TS Trusted Network Transformation?
By leveraging the TS Trusted Network transformation you benefit in two ways:

- An evolution roadmap is created which completely aligns to your business objectives and current status. It includes your existing infrastructure, capital budget, refresh strategy and timelines, and a prioritization of simpler opportunities.

- By following a proven transformation path that considers all the moving parts of that transformation, your journey to a network that is able to respond to the business at the speed of business will be as safe as possible.
When will the HP TS Trusted Network Transformation be available?

Q: The HP TS Trusted Network Transformation is available now. HP is taking a phased approach to launching, with pre-selected/vetted customers. For more information please contact Rich Jones (richard.m.jones@hp.com).

Learn more at hp.com/networking/cloudnetworking