Solution Brief

The Cisco Open Network Environment

Date: June 2012 **Author:** Bob Laliberte, Senior Analyst, and Perry Laberis, Research Associate

Abstract: *Cisco Live saw, among many things, the announcement of Cisco's Open Network Environment approach to network programmability and emerging software-defined networking models. Called Cisco ONE, it will address a number of approaches for deploying an SDN through One Platform Kit, controller software and OpenFlow Agents, and virtual overlay networks. Cisco intends to phase its solutions into the market.*

What Cisco Announced

With Cisco Live as the backdrop, Cisco announced its plans for network programmability and software-defined networking (SDN), a solution it coined Cisco Open Network Environment (Cisco ONE). Cisco ONE is delivered through a rich set of APIs, agents and controllers, and overlay networks. Though Cisco will phase it into the market over time, the solutions include:

- **One Platform Kit**. One Platform Kit (onePK) provides a rich set of APIs for developers across Cisco operating systems and hardware platforms, enabling tight integration with software applications and greater programmability and control of network infrastructure. Phased support will include IOS, IOS-XR, and NX-OS operating systems along with ASR, ISR G2, CRS, and Catalyst and Nexus switches.
- **Controller Software and OpenFlow Agents for SDN**. Cisco is collaborating with academic and research institutions to provide proof-of-concept controller software for SDN models. These solutions will allow universities to partition their networks and enable academic research on an SDN model with uniform policy management.
- **Virtual Overlay Networks**. Cisco is building scalable virtual overlay networks for multi-tenant facilities and IaaS based on the Cisco Nexus 1000V portfolio. The solution will extend support for OpenStack, multiple hypervisors, and virtual local area network (VXLAN) gateway functionality, as well as improve programmability for both physical and virtual networks.

Cisco ONE will be rolled out in a deliberately phased approach; certain pieces, like the 1000v, are currently available.

Analysis

The market has been anticipating Cisco's announcements pertaining to its development and innovation in SDN space. SDN is emerging as one of the most disruptive technologies seen over the last several years: Ultimately, its promise is to address data center networking discontinuity and help to overcome the legacy manual processes plaguing rapidly scaling data centers in order to enable greater levels of innovation and agility. Cisco has taken a multi-threaded approach to SDN and will develop solutions that:

- **Address problems associated with data center network growth**. Consolidation, server virtualization, and web-based applications have data centers and their networks in an accelerated growth phase. In lieu of regional data centers, larger organizations are opting for massive ones housing thousands of physical and virtual devices. These data centers are also becoming multi-tenant and increasingly more complex. Moreover, despite the increasing deployment of server virtualization and horizontally-scaling web applications, many continue to manually operate legacy networking equipment with traditional processes that cannot keep pace with the scale of modern business. What's needed is solutions that enable greater use of software to program the network and eliminate time-consuming manual processes.
- **Are rolled out in a phased and targeted approach.** Indicative of a market leader, Cisco is rolling out its Cisco ONE solutions gradually—but deliberately. Recognizing that there are a number of different approaches to creating a software-defined network, this program was designed for specific use cases. Accordingly, Cisco's

SDN solutions include a proof-of-concept controller and OpenFlow-enabled switches for academia and research, an overlay network for leveraging virtual switches and the cloud, and a development kit to enable service providers and software developers to access all Cisco switches. The onePK tool kit is just the first step in the SDN programmability process, so expect Cisco to build out a robust ecosystem around this functionality over time.

- **Provide a concrete roadmap**. Cisco's competitors in the SDN space have been very vocal about their offerings in the first half of 2012 (and earlier), and it was time Cisco threw its proverbial hat in the ring. Just a couple months shy of its yearly kickoff, the announcement—made to end-users at Cisco Live—serves to educate and retain Cisco's existing client base. Within the next month or so, direct sales, sales engineers, and channel partners should all be trained on the technology and messaging, and ready to start educating customers. Competitors may find it more difficult to differentiate solely on SDN and will have to demonstrate how their offerings differ from Cisco's Open Network Environment solutions.

Other Considerations

This announcement certainly helps to educate Cisco customers and the market. It will also make organizations think about different approaches to SDN. Specifically, organizations should think about:

- What SDN model works best for their environment? Up until this announcement, most discussions around SDN have involved OpenFlow controller-based solutions, either centralized or distributed and for physical or virtual switches. Cisco's onePK leverages a proprietary API to enable software developers to access the switches directly (Juniper QFabric is also proprietary). One of the keys to making this model successful will be the development of a comprehensive software developer ecosystem that can deliver L4-L7 services for service providers and the enterprise. The most common use cases for SDN to date have been load balancing, security, and provisioning.
- How and where Insieme might fit into Cisco ONE. This is a bit of a wild card as no one is really clear about its true purpose; however, at the partner conference earlier this year, John Chambers stated that Insieme would be complimentary to Cisco's SDN strategy (Cisco ONE). If you're planning to adopt Cisco ONE, it might be worthwhile to find out more about Insieme's role in this environment.

The Bigger Truth

Trends such as data center consolidation, increased use of server virtualization, service-based architectures, and web applications are driving network scale and complexity, rendering traditional processes and legacy infrastructure obsolete. To resolve the data center networking discontinuity challenging network administrators, networks require greater levels of automation and orchestration to better align with highly virtualized and dynamic server and storage domains. Software-defined networking, leveraging proprietary APIs or open standards such as OpenFlow, offer just such a solution and is rapidly gaining attention.

Though OpenFlow has received the most ink and many consider it to be synonymous with SDN, there are a number of paths to SDN, and Cisco's Open Network Environment covers a number of them. Its approach will include a rich set of platform APIs, OpenFlow-based agents and controllers, and virtual overlay networks. Cisco ONE will be rolled out in a phased approach, with certain aspects available now; others parts, like the onePK software development ecosystem, will clearly need time to develop. Now that Cisco has announced its intentions to its customer base (including the 17,000 attending Cisco Live and the 125,000 watching online), expect its sales force and channel partners to be busy educating customers on how a Cisco ONE SDN environment will be worth the wait.