



The Cisco ONE Enterprise Networks Architecture Enables Business Transformation

November 2013

Prepared by:

Zeus Kerravala

The Cisco ONE Enterprise Networks Architecture Enables Business Transformation

by Zeus Kerravala

November 2013

Introduction: It Is Time for the Enterprise Network to Evolve

The technology industry has changed more in the last five years than in any other period in IT's history. Virtualization has redefined the data center; the network edge has become predominantly wireless; and consumers are calling the shots with regard to business devices. However, two of the areas that have yet to evolve are the corporate local area network (LAN) and wide area network (WAN). Most Enterprises continue to build LANs and WANs with legacy architectures but there are several forces driving the need for the evolution of the overall Enterprise Network. The forces are:

- **Unified communications (UC):** Collaboration has become a top initiative for CIOs today, driving the demand for UC. UC applications such as VoIP and video are latency sensitive and can drive significantly more volume than other applications on the wireless network and the WAN.
- **A focus on user experience:** IT leaders are striving to deliver on the “any” vision: any application, to any worker, no matter where he or she is. This means IT leaders must ensure workers have the same experience whether they are in the corporate headquarters or a branch office. Additionally, the choice of access—whether wired or wireless—must be transparent to the user.
- **Network-centric IT:** Historically, IT has been compute centric as organizations invested heavily in servers and storage. Today, mobile and cloud computing are rapidly becoming the dominant compute models, making the network a key point of strategic differentiation.

Section II: The Cisco ONE Enterprise Networks Architecture

Cisco's Open Network Environment (ONE) Enterprise Networks Architecture transforms the network to provide unprecedented levels of openness and programmability. A network needs to be thought of holistically, meaning the architecture must consider routers, security, switches, and wireless and wired technology.

The Cisco ONE Enterprise Networks Architecture is built on the following layers:

- **Network Element Layer:** This layer provides customers with a broad, rich set of devices. This includes campus and branch networks that span switches and routers and wireless and wired networking, physical and virtual infrastructure as well as integrated security. It provides additional value through service-rich IOS and open APIs. Additional value is provided through service-rich IOS and open APIs. Customers can leverage industry-standard APIs (OpenFlow) and Cisco's own onePK APIs, providing unique capabilities such as location analytics and application visibility and control.

ZK Research

A Division of Kerravala Consulting

zeus@zkresearch.com

Cell: 301-775-7447
Office: 978-252-5314

Influence and insight through social media

- **Network Control Layer:** The control layer enables network services to be provisioned consistently to all network devices through an abstraction layer that sits above the network elements. This improves the agility of the network and accelerates service deployment. Juxtapose this with the legacy model of implementing new features and services using a device-by-device approach, and it is clear that provisioning times can be reduced with significantly fewer errors.
- **Network Application Layer:** This layer provides network-based applications that are developed by Cisco, third parties or customers. The open APIs allow the applications to be built to optimize application performance and user experience as well as innovative new features.

Other key differentiators for Cisco ONE Enterprise Networks Architecture are:

- **Best-in-class software-defined networking (SDN) strategy:** The Cisco ONE Enterprise Networks Architecture has taken all of the best attributes of SDNs and applied them to the Enterprise network to increase network agility and investment protection, and simplify operations.
- **Flexibility in programmability:** Cisco recognizes there are multiple ways to implement programmability and gives developers a number of choices. Cisco's network architecture relies on a set of APIs that includes onePK, OpenFlow and CLI to provide a flexible programming model. The open APIs can expose network information to the application layer to enable innovation and efficiency and provide standard SDN support. Additionally, the CLI as an API allows existing networks to benefit from the latest network capabilities, providing great investment protection.
- **Leading technology:** Cisco is the first vendor to support OpenFlow 1.3 across wired and wireless networks with the Unified Access Data Plane (UADP) ASIC.
- **End-to-end network optimization:** The Network Control Layer in the Cisco ONE Enterprise Networks Architecture allows the application to look at the network as a single entity, develop and run applications consistently and quickly across any network, and span the entire network from branch to campus to the data center.

Cisco's portfolio of Catalyst access switches form a foundational component of the Cisco ONE Enterprise Networks Architecture and provides a platform for enterprise-wide automation and programmability. The broad range of switches helps scale the network infrastructure, rapidly enabling companies to continually meet the challenges of a growing business. Additionally, the Catalyst switches increase network visibility and control, simplify operations and improve overall security.

Catalyst switches can enable IT and business transformation in the following ways:

- **BYOD enablement:** The Cisco Catalyst switches can make bring your own device (BYOD) simpler by providing converged access. Typically, companies need to manually resolve inconsistencies between wired and wireless technology to deliver a consistent user experience. The Catalyst switches allow IT managers to provision a single policy and push it out across both the wired and wireless networks.

Additionally, the Catalyst switches enable pervasive mobility with a consistent, high-quality user experience. In this era of BYOD, users demand a high-quality experience no matter where they are. Cisco access points (APs) have advanced features such as CleanAir for RF interference management and ClientLink for improved coverage and performance of wireless clients.

- **Network security:** Security has become a top initiative for IT and business leaders due to BYOD, compliance concerns and a rise in network attacks. Historically, network technology and security technology have been deployed independently, which can lead to inconsistent security policies and long lead times for deployments and changes. Cisco's Catalyst switches can automate and simplify access control and security for wired, wireless and VPN access with the Cisco Identity Services Engine (ISE) while granting access based on role. This same access policy can be used with multiple devices and integrates with leading mobile device management vendors.

Section III: Cisco ONE Enterprise Networks Architecture Use Cases

The architectural approach is Cisco's biggest differentiator in the networking market today. However, leveraging the architecture is based on understanding how to solve specific customer problems. The following use cases illustrate where Cisco ONE Enterprise Networks Architecture can have the most immediate impact.

Simplification of Network Operations

ZK Research recently polled more than 800 network managers to better understand what problem they were looking to solve with SDNs. The number-one response was to simplify network operations.

Although the concept of simplifying network operations through automation might seem straightforward, building a network that's simple to manage requires more than just commodity switches and an off-the-shelf SDN controller. A network is much more than just switches and SDN controllers and also includes routers, firewalls, wired and wireless infrastructure, security, policy and much more. A network that is simple to manage from a central control point requires high-quality management tools as a front end that can deliver all network services on demand across the whole network infrastructure. It also requires a broad networking portfolio to deliver automated capabilities across the network. Last, and most important, it requires a significant amount of engineering to seamlessly tie all of the components together. Many SDNs make network operations more complicated, but the Cisco ONE Enterprise Networks Architecture automates many tasks to create a seamless, error-free, optimally performing network.

Implementation of BYOD

No trend in IT today might have more momentum than BYOD. ZK Research shows that 82% of CIOs now provide varying levels of support for BYOD initiatives. The majority of the IT industry has focused on making the process of on-boarding consumer devices simpler. Although this is an issue, it's just the starting point. The Cisco ONE Enterprise Networks Architecture not only on-boards the device, but also solves many challenges involved in providing a consistent user experience across wired and wireless networks. Additionally, the Cisco ONE Enterprise Networks Architecture provides APIs that deliver application capabilities such as location information, mobile analytics, personalized services, security and device information to enable IT

departments and third-party software vendors to build a broad set of applications that are uniquely mobile.

Optimized Collaboration Experience

Competitive advantage is based on making the best decision as quickly as possible while involving the right individuals. The desire to move the business in new directions rapidly has put an emphasis on deploying best-in-class collaboration tools to facilitate virtual meetings. The Cisco ONE Enterprise Networks Architecture is ideally suited to meet the demanding challenges of real-time, bandwidth-intensive applications such as video, TelePresence and VoIP. Cisco ONE Enterprise Networks Architecture provides many automated capabilities such as topology discovery, bandwidth and latency measurement, route optimization and flow configuration to ensure the collaboration services provide a high-quality, uninterrupted experience. The need for better corporate collaboration is at an all-time high, but a network foundation such as Cisco ONE Enterprise Networks Architecture is required to ensure that businesses can maximize the benefits of the collaboration tools.

Section IV: Conclusion

Every C-level executive is focused on transforming the business, and IT leaders are tasked with making this happen. The shift to network-centric compute models has thrust the network into a role where it is the key enabler of IT change and, therefore, business transformation. The Cisco ONE Enterprise Networks Architecture can provide the necessary levels of application intelligence, contextual information, visibility and automated control to enable the network to be the foundation for companies today as well as in the future.