Cisco Open Network Environment

Organizations are looking to harness trends such as cloud, mobility, social networking, and video to fuel the next wave of business innovation. Their primary business requirements include improving customer experiences, increasing employee productivity, gaining competitive advantage, and monetizing new services. The industry is moving toward stronger ties between software platforms and network infrastructure as a primary element in a holistic strategy to achieving these goals. A programmable network promises to simplify management tasks, while optimizing network behavior for applications running on shared infrastructures.

The Cisco® open network environment is a programmable framework that consists of three alternative programmability models for both enterprises and service providers:
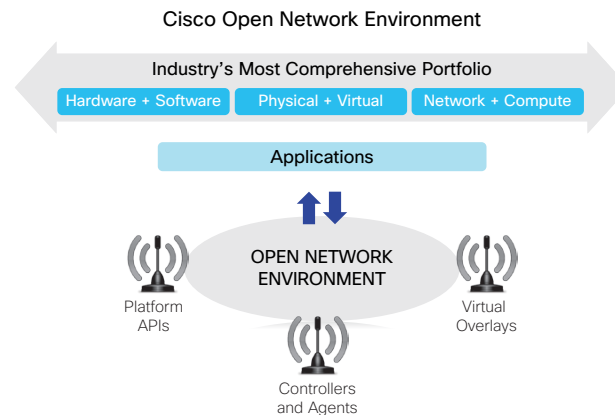
· Controllers and agents

· Programmatic Interfaces

· Virtual network overlays

It is designed to allow organizations to create applications that harvest network intelligence and extract greater business value from the underlying network.

Cisco's Strategy for Network Programmability

The Cisco Open Network Environment is a customizable framework to harness the entire value of the intelligent network, offering openness, programmability, and abstraction at multiple layers in an evolutionary manner. The Cisco Open Network Environment offers a choice of protocols, industry standards, use-case-based deployment models, and integration experiences, while laying the foundation for a dynamic feedback loop of user, session, or application analytics through policy programming.

Figure 1. Cisco provides a comprehensive and flexible approach to deploying software defined networks

The Cisco Open Network Environment is delivered through a variety of mechanisms, including APIs, agents, and controllers. Benefits include increased infrastructure agility, simplified operations, and greater application visibility and awareness. These offer flexible deployment options with consistency across both physical and virtual environments. The Cisco approach complements traditional approaches to software defined networking (approaches that primarily focus on decoupling the control and data planes), while also encompassing the entire solution stack from transport to automation and orchestration.

The Cisco Open Network Environment is differentiated from the SDN definition in a couple of ways:

· First, network programmability and many of the use cases that require it, require APIs or interfaces at multiple layers of the network (not just at the control and forwarding plane). There are deeper internals in our operating systems, and hardware and ASICs, that

can be accessed to extend and enhance the network. Similarly, further up this network stack are higher level services, such as the management and orchestration APIs, such as our Network Services Manager (NSM) API that supports orchestration and cloud portal applications such as Cisco Intelligent Automation for Cloud (CIAC). In the Cisco environment, we are enabling application environments to leverage APIs at all levels of the network.
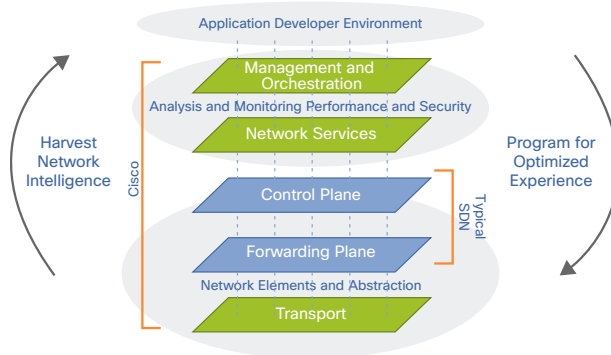
· Second, many of the use cases for which organizations are looking for not only require programming the network to the desired or optimal behavior, but also are seeking to extract the enormous amount of information and intelligence contained in the network infrastructure. Deeper and more insightful network intelligence can be pulled into a new class of analytical applications that can promote more sophisticated network policies and support business logic that drives the network. This ultimately makes the network more valuable and can support more innovative and revenue-generating services.

What sets Cisco apart is the abilty to create multifunction, continuous feedback loops that deliver network intelligence and optimization across infrastructure and applications – for example, between analytics engines, policy engines, and network infrastructure.

By replacing a monolithic view of the network and opaque application requirements with a multidimensional model that spans from the application to the ASIC, we allow a deeper and more intelligent interaction between applications and the network.

Figure 2. Cisco Open Network Environment

Delivering Practical Use Case Solutions with Cisco Open Network Environment

Customer Segment	Solution or Use Case
Hyperscale Data Centers	By exposing the OS and underlying ASICs directly, we allow MSDCs to directly gather the large amount of granular diagnostic and usage information held within the network. This provides them with the raw information they need to effectively manage, optimize, and troubleshoot their environments.
Service providers	• Allows direct integration with "front-end" customer portals and operational and business (OSS/BSS) systems to lower costs and accelerate enhanced service creation • Delivers scalable virtual overlay network capabilities with broader hypervisor support and sophisticated L4-7 capabilities • Supports integration with analytics engines for policy management, security monitoring, and real-time network adapation to maintain service level agreements
Cloud providers	• Scalable multitenancy support • Allows integration of "front-end" customer portals directly optimize application delivery and resource utilization into operational systems to lower costs and • Supports sophisticated L4-7 capabilities and analytics
Universities	The controller provides universities and research organizations with the functionality needed to address their primary demands: • High-performance computing or interoperability lab: connection to external networks with peak data transfer bandwidth requirements • Operations: Mixing data and video traffic on campus networks • Research: Isolation of network "slices" for experimental use with the flexibility to use their own controllers locally • Dynamically partitioning network resources on demand
Enterprises	Overlay virtualization infrastructure provides the network virtualization capabilities for enterprises with heavy server virtualization and/or private cloud. The Cisco open network environment framework makes sure that customers maintain investment protection and future-proofing of their infrastructure resources.

Summary

Cisco is expanding current notions of SDN in terms of scope of functional capabilities, solving specific business problems with practical, modular solutions that introduce new capabilities, while protecting our customers' existing investments. Specifically, the Cisco open network environment provides the following benefits:

• Extends the capabilities of existing, proven infrastructure to significantly reduce risk and time to deploy on existing platforms

• Can be deployed in an incremental manner preserving investments

• Cisco open network environment uses both Cisco innovation and industry-driven development of SDN-related technologies and standards

• A vision that defines a holistic framework, unlocking capabilities across all planes from ASICs to management planes