

Cisco Digital Network Architecture

Q. What is Cisco® Digital Network Architecture?

A. An open and extensible, software-driven network architecture designed to rapidly deliver services that enable IT to innovate faster, reduce costs and complexity, lower risk, and comply with regulatory requirements.

Q. Market drivers: Why do organizations require a Cisco Digital Network Architecture?

A. Digitization is fueled by key technology trends: mobility, the Internet of Things (IoT) and cloud. Only the network brings all these elements together to allow organizations to reach their full potential. Customers looking to digitize their business will need to evolve to a network that operates at digital speed:

- Speed for business data and insights that provide real-time and historical information for better decision-making, or for building new business models.
- Speed for IT by simplifying the network and automating processes, enabling IT to quickly adapt to new business requirements while meeting service-level agreements.
- Speed for security by quickly identifying threats through real-time network wide visibility and rapid threat containment, while achieving sustainable compliance.

Q. How does Cisco Digital Network Architecture accelerate digital transformation?

A. Cisco has reimaged the network to become **open, extensible, and software-driven** through programmability, service extensibility and virtualization. This allows IT to quickly adapt to the ever-changing demands of business with innovative services that provide:

- **Insights and experiences:** Support business innovation through network wide deep visibility into user, application, and device information exposed through open APIs. For example, Cisco Connected Mobile Experiences provides customer insights and personalized engagement.
- **Automation and assurance:** We have rebuilt our operating systems from the ground up with rich, model-driven, programmable APIs; controller-based management; application hosting; and virtualization to enable IT to provision, orchestrate, adapt, and manage with simplicity at scale. With our software-defined network (SDN) controller, Cisco Application Policy Infrastructure Controller Enterprise Module (APIC-EM) and applications such as Cisco Plug and Play for day-zero automation, EasyQoS for dynamic quality of service (QoS), IWAN App for software-defined WAN (SD-WAN), and Enterprise Services Automation (ESA) for branch virtualization.
- **Security and compliance:** We have embedded security networkwide—across routing, switching, wireless, and the cloud—to help IT continuously detect and contain threats faster, using the Cisco Identity Services Engine, Cisco TrustSec® software-defined segmentation, Stealthwatch NetFlow analysis system, and Cisco Umbrella™ (OpenDNS) cloud security.

Q. What are the key principles of the architecture?

A. The following are the core principles of the architecture, which is designed to help businesses innovate faster, reduce cost and complexity, and lower risk:

- **Virtualization:** Cisco is virtualizing 30 years of networking innovation by decoupling software from hardware and giving customers the freedom to run Cisco and third-party services on any platform, as well as the flexibility to run applications over the network.
- **Automation:** Using controllers and open APIs, Cisco is simplifying the network through abstraction and centralized policy enforcement that allows IT to focus on business intent and consistently apply configurations to improve service and keep operations consistently secure from the core to the edge.
- **Analytics:** Cisco is exposing network data to deliver rich contextual insight into users, applications, devices, and threats to help the business and IT make better decisions.
- **Cloud services management:** To provide IT on-demand scale of network services and faster time to value, Cisco is building for cloud consumption. Cisco will continue to adopt more cloud-managed models for simplified management, provide cloud-edge network services for public and hybrid cloud deployments, and, where possible, deliver cloud software as a service (SaaS) for ease of consumption.

Q. What are the benefits of the Digital Network Architecture for customers?

- A.** **IT agility and scale:** Through policy-based automation, IT can roll out and manage services across hundreds of devices and sites that meet the business intent consistently. For example, the Cisco Intelligent WAN app reduces the effort required to make workflow changes down to 10 GUI clicks, for 85 percent faster network service provisioning. In addition, through virtualized services, IT delivers a more dynamic network that can easily provision, expand, and reallocate services quickly across different hardware platforms with no service calls.
- **Lower IT costs:** Through service automation such as Plug and Play Cloud for day-zero provisioning, customers have reduced network installation costs by 79 percent.
 - **Reduced risk:** By embedding security everywhere with the industry's best threat protection, IT can detect and contain threats over 1000 times faster than the industry average based on a Cisco Aggregation Services Router (ASR) 1000 Series industry report that showed the average threat detection is 200 days while Cisco brought it down to 17.5 days.
 - **Improved user experience:** IT can deliver differentiated end-to-end application experiences through EasyQoS, which dynamically updates the network for optimal application performance across all segments of the network consistently.
 - **Resource optimization:** Through big data analytics and contextual insights, IT and business can better understand network patterns related to users, applications, and things. For example, IT can help the business make decisions on issues such as staffing, effectiveness of promotions, workplace efficiency, customer trends, and more.
 - **Investment protection:** Cisco ONE Software provides customers with license portability, allowing them to transfer their software to future generations of supported platforms. Cisco ONE Software also provides significantly more customer value through a portfolio of software suites, when compared to traditional feature-level purchasing. This allows customers to start their digital transformation today and be ready for additional Digital Network Architecture innovations in the future.

Q. What are the proof points?

A. Cisco IOS® XE Software: Cisco is modernizing the enterprise operating system for programmability, controller-based automation, and serviceability across enterprise routers and switches on a single code train. Evolved Cisco IOS XE Software will gradually be supported across most of the Cisco core Enterprise Networks infrastructure over a two-year timeline. The new operating system includes an open platform with model-driven APIs, software-defined management, application hosting using containers, fog/edge computing, and Enterprise Network Functions Virtualization.

Enterprise Network Functions Virtualization (NFV): Enterprise NFV decouples hardware from software and enables virtualized network functions (VNF) such as vISR, vWAAS, vASA, NGFWv, and vWLC to run on Cisco purpose-built appliances such as the Cisco 5400 Series Enterprise Network Compute System (ENCS), Cisco UCS® E-Series, and eventually non-Cisco x86 servers. The Enterprise NFV software stack includes the virtualization layer (NFVIS), virtual network functions, and orchestration using the ESA application.

In addition, Cisco is announcing new digital network and security services.

New Service	What Is It?	Customer Value	Availability
Insights and Actions			
Customer insights and engagement via Cisco Connected Mobile Experiences (CMX) Cloud	CMX Presence Analytics and Connect Services delivered through a cloud consumption model.	Location services at lower costs for small to medium-sized deployments, lowering investment risk to validate service value.	Now
Automation and Assurance			
Day-zero automation via Cisco Plug and Play	Simplifies and speeds up day-zero provisioning securely through zero touch.	Dramatic reduction in operating expense: customer data indicates up to 79 percent reduction in device installation costs.	Now
Dynamic application prioritization via EasyQoS	Instantly updates QoS in real time across the network, based on application requirements.	Improved user experience through service assurance across every segment of the network. Findings show 300 percent lower jitter, 50 percent improved video.	Now
Branch agility via Enterprise Service Automation and IWAN App	SD-WAN for branch connectivity and branch virtualization using VNF.	Easier for IT to manage and scale, resulting in higher resource utilization and faster service delivery at lower costs.	Now
Security and Compliance			
Cisco Network as a Sensor and Enforcer with Cisco Identity Services Engine and Cisco TrustSec, Stealthwatch, and Umbrella	The Digital Network Architecture-ready infrastructure turns the network into an end-to-end sensor and enforcer that detects and stops sophisticated security threats.	The network detects and stops threats faster across all segments to better protect business assets.	Now

Q. How do customers consume this architecture?

A. Cisco Digital Network Architecture services will be delivered through Cisco ONE Software, which provides simplified, high-value solutions with license portability and purchase flexibility. Customers can start their Digital Network Architecture journey today on our current portfolio and know that they can continue to adopt network innovations in the months and years ahead through the power of software.

Q. How does Cisco Meraki® fit into the Digital Network Architecture?

A. Meraki's cloud-managed product offering foreshadows the ease of use and deployment that will become a design pattern across the entire Cisco enterprise product portfolio. The architectural goals will focus on providing consistency of orchestration across all domains, including networks based on Meraki.

-
- Q.** What makes the Digital Network Architecture security approach different than traditional perimeter-based security?
- A.** In the past security has typically been predicated upon a perimeter defense comprised of technologies such as firewalls, intrusion detection, VPN and access control. As threats become more prevalent in the increasing numbers and diversity of attached endpoints this model becomes more difficult to defend unless you have advanced security on every network port to both ‘see’ and ‘control’ every activity on the network. This security approach enhances the ability to see every communication on the network and cloud using the NetFlow data created by network devices. This data is analyzed to detect and clarify threats using the Stealthwatch NetFlow analysis, Identity Services Engine (ISE), and Umbrella cloud-based security.

This approach also allows IT to take instant action by directing Cisco TrustSec to rapidly contain a threat right from the Stealthwatch management console. The result is an integrated solution with visibility and control for virtually every communication, which could be missed with a traditional perimeter security approach.

- Q.** What’s the difference between SDN and Cisco Digital Network Architecture? How do they relate to each other?
- A.** The Open Networking Foundation (ONF) defines SDN as “an emerging architecture that is dynamic, manageable, cost-effective, and adaptable, making it ideal for the high-bandwidth, dynamic nature of today’s applications. This architecture decouples the network control and forwarding functions, enabling the network control to become directly programmable and the underlying infrastructure to be abstracted for applications and network services.”

Cisco Digital Network Architecture transcends the technology-centric collection of network technologies that make up SDN and concerns itself with bringing these technologies together into a holistic architecture to achieve business outcomes. Cisco Digital Network Architecture is a way to make network services relevant as well as easy to use in an enterprise architecture journey to digital transformation. It is an architectural suite that includes ready-to-use applications as well as easily consumable APIs. Cisco is committed to help our customers to successfully evolve to SDN while maximizing their investment protection.

- Q.** How do I get started?
- A.** Cisco Advanced Services and authorized Cisco partners can help you begin your journey with strategy and analysis services and readiness assessments, as well as planning, design, and migration services.
- Q.** Where do I learn more?
- A.** <http://www.cisco.com/go/dna>.



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)