Cisco Digital Network Architecture

BENEFITS

- Fast network service deployment
- Simplified network operations
- Deployment cost savings of up to 79 percent through service automation
- Reduced risk; detect and contain threats in hours instead of days or months
- Improved user satisfaction through delivery of personalized experiences
- Resource optimization through virtualization and big-data analytics

Transform Your Network for the Digital Age

Cisco® Digital Network Architecture is an open and extensible, software-driven architecture that accelerates and simplifies your enterprise network operations. The programmable architecture frees your IT staff from time-consuming, repetitive network configuration tasks so they can focus instead on innovation that positively transforms your business. You finally have the flexibility to turn up network functions with a few clicks and to serve customers in engaging new ways as soon as you think of them. All while lowering costs and reducing your risk.

Going forward, network connectivity will be easy. Just like the World Wide Web hid the Internet's complexities and made it usable by nearly anyone, corporate networking is shifting to an open and extensible model. That means you can finally turn things around fast. The architectural components deliver the network insights, automation, and security you need to move ahead at digital speed as you work to:

- Make customers happy **now**
- Stop security threats in their tracks
- Help employees do their jobs better
- Equip a new branch today and open it tomorrow
- Enable a network that keeps pace with new digital business needs

Cisco Digital Network Architecture lets you do that with controller-based automation, rich contextual analytics, network functions virtualization (NFV), and the limitless scalability of the cloud. Most Cisco routers, switches, and wireless systems shipping today support this architecture now or with a software update. And with Cisco ONE™ Software, you can continue to protect your investments and benefit from new architecture innovations that can be activated through software.

Digital Possibilities

How does an open, software-driven network help you in business terms? It delivers network-based insights, automates processes, and protects against threats. For example, in the digital age, you can mine network analytics that reveal users' locations and behaviors. Analytics can tell you how customers move through your store or venue and how that's reflected in what they consume.

And network devices can detect and shut down a pipeline spill automatically. Or track energy usage in your manufacturing plant.

What makes all this possible is a fundamental transformation occurring in how networks are built and run:

- Closed and hardware-centric models are giving way to open, programmable, and software-centric ones.
- Manual, repetitive command-line-interface-driven management is being largely superseded by policy-based automation.
- Perimeter-based, reactive security has been supplanted by network-embedded, context-based security that reaches from the cloud to enterprise edge.
- IT-centric analytics are morphing into business-centric analytics.

The Cisco Digital Network Architecture reflects all these changes. With this architecture, business and IT can become far more nimble and respond to business conditions quicker and more intelligently.

> "Using location intelligence, we can identify the nearest hotel staff to provide faster assistance to guests. We can help people find their way around, or help them find others in their group. If more bartenders are needed, we know right away. We're providing a better guest experience by using location more effectively."
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> **— Dania Duke, General Manager, Santa Clara Hyatt Regency, Santa Clara, California**

Speed and Simplicity to Meet Growing Demands

Traditional networks continue to face box-by-box deployment and management challenges. Provisioning, monitoring, and troubleshooting services are a painstakingly manual process. While compute cycles can be delivered in seconds, networking functions and services traditionally require weeks and sometimes months to deploy.

It's time for that situation to change. Cisco has reimagined our network architecture with the following characteristics:

- **Virtualization –** Network virtualization through the decoupling of hardware from software gives you the freedom to run services on any platform and to run third-party applications over the network.
- **Automation –** Controllers simplify the network through abstraction and automation and provide a platform for consistent policy enforcement. This speeds up application and service rollouts while reducing risk. IT staff gain the time to focus on business strategy instead of operations.
- **Analytics –** A digital-ready network can reveal rich contextual insights into users, applications, devices, and threats to help the business and IT make better decisions.
- **Cloud –** Cloud-based services provide fast service adoption with on-demand scale and support a broad partner ecosystem.

We've applied these characteristics to Cisco Digital Network Architecture technologies so you can move forward with building an open, extensible, and agile enterprise network. Table 1 lists and describes many of the architecture innovations, and Figure 1 depicts the architecture graphically.

Table 1.   Cisco Digital Network Architecture Components and Innovations

Component	Description	Benefits
Enhanced Cisco IOS®-XE Software	Enhanced operating system software for Cisco devices that supports programmability, controller-based automation, and serviceability.	Provides IT flexibility through programmability, network functions virtualization (NFV), and software-defined networking (SDN)-based automation.
Cisco Application Policy Infrastructure Controller Enterprise Module (APIC-EM)	Software controller that works with your existing network infrastructure to support a software-defined network (SDN).	Automates tasks, orchestrates workflows and policies, and simplifies operations.
Cisco Intelligent WAN App	Simplifies deployment of WAN services using APIC-EM.	Lets you build a rich and highly secure corporate WAN and deliver a great user experience.
Cisco Path Trace	An application that visually displays every element of the network path from your source to your destination using APIC-EM.	Can enable faster troubleshooting and reduces network downtime.
Cisco Plug and Play for day-0 automation	Automatically sends a device's location to the APIC-EM. The controller then auto-configures the device to start communicating with the network.	Accelerates deployments and lowers costs (up to 79 percent).
Cisco Easy Quality of Service (EasyQoS) for dynamic application prioritization	An app that provisions application priority instantly (in 250 ms or less) with APIC-EM.	Delivers optimal application experience without the cost of manually tuning of the network for applications performance.
Cisco Enterprise Network Functions Virtualization (NFV)	Decouples software services, such as routing, switching, firewall, WAN acceleration, and others, from underlying proprietary hardware. Multiple functions can instead be hosted as virtual appliances on a Cisco Integrated Services Router, Cisco UCS® server, or x86 server platform.	Lets you start up software instances of network functions wherever you need them in the network quickly, without having to buy, deploy, and test proprietary hardware appliances.
Cisco Network as a Sensor and Enforcer with Cisco Identity Services Engine and StealthWatch	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.
Cisco CMX Cloud	Collects analytics on user behavior; sets up a captive Wi-Fi portal for guest onboarding.	Gives you user insights so you can better engage and serve customers.

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

Figure 1.   Cisco Digital Network Architecture
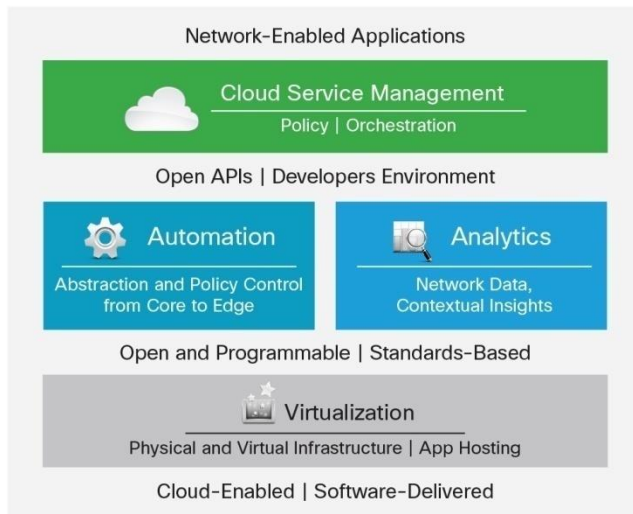
Cisco Capital

Financing to Help You Achieve Your Objectives

Cisco Capital can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce capital expenditures (CapEx), accelerate your growth, and optimize your investment and return on investment (ROI). Cisco Capital® financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. Learn more.

Faster Airport Service Rollout for IBM Aviation

Challenges

- Rollout of services to multiple airports was too slow

- Increased labor cost and complexity

- Inconsistent services delivered across different airports

Digital Network Architecture Services Used

- APIC-EM with IWAN App

Business Outcomes

- 40 percent customer satisfaction increase

- Accelerated remote branch configuration from weeks to days

- Provided local IT with limited ability to implement dynamic network change

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Security and Compliance for Major Healthcare Organization

Challenges
- Exposed network and compliance issues
- Protect patient and healthcare data from breaches
- Reduce time to detect and remediate attacks

Digital Network Architecture Services Used
- Network as a Sensor with StealthWatch NetFlow analysis
- Network as an Enforcer with Cisco Identity Services Engine policy control and Cisco TrustSec® software-defined segmentation technology
- Cisco Firepower™ Next-Generation Intrusion Prevention System (NGIPS) and firewall, Cisco Advanced Malware Protection (AMP), email and web security

Business Outcomes
- Security and risk compliance assurance
- Faster time to remediation

Creating Personalized Mobile Experiences for Hyatt Guests

Challenges
- Low guest satisfaction ratings
- Lack of modern services, such as poor guest Wi-Fi coverage
- Limited visibility into guest preferences and behavior

Digital Network Architecture Services Used
- 802.11ac Wi-Fi with Cisco Aironet® 3700 Series Access Points
- Cisco Connected Mobile Experience (CMX) and Hyperlocation services

Business Outcomes
- 20 percent increase in non-room revenue
- 65-point increase in customer satisfaction
- 25 to 40 percent increase in lobby bar spend

Why Cisco?

Software is at the heart of the network's transformation to the digital age. Cisco is a leader in software development, participating in major initiatives such as the OpenConfig Customer Forum and IETF. We have the broadest ecosystem, with more than 300 partners in software development. And we've innovated with solutions such as the APIC-EM and enhanced IOS-XE Software, both purpose-built for the networks of the digital age.

Going digital takes thought and experience. Piecemeal, non-integrated solutions defeat the objective of end-to-end digitization. With our deep understanding of technology and relationships with IT, Cisco can help bring IT and the boardroom together to work effectively toward a joint solution. Using our Digital Network Architecture, we can help you:

- Define your digital opportunities

- Visualize and develop a holistic approach

- Plan for the security vulnerabilities that arise with the multitude of people and devices now connected to the network

The depth of our network and IT experience can help you create revenue opportunities, lower costs, reduce risks, and ensure compliance. And we can help you simplify your network and accelerate its response time to business needs.

Next Steps

For more information, visit our Digital Network Architecture website at http://www.cisco.com/go/dna