Today's Enterprise Needs a Next-Generation WAN Edge Platform

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) White Paper
Prepared for Cisco

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EXECUTIVE SUMMARY

Wide-area network (WAN) transformation is forcing network architects to rethink the edge of their networks. Today's enterprises need a WAN edge platform that is multi-cloud ready, resilient, open, and programmable. This white paper looks at the trends driving change at the WAN edge, and the requirements enterprises should set for their WAN edge platforms. Finally, it introduces the Cisco Catalyst 8000 Edge Platforms, a new family of solutions for tomorrow's digital enterprise.

TRENDS DRIVING DEMAND FOR A NEW WAN EDGE

Enterprise WANs have not just transformed over the last decade. They have become critical to digital businesses, particularly at the edge of the WAN, where the traditional black-box router no longer serves the needs of the modern enterprise. Speeds and feeds remain important, but today's networks require a WAN edge platform that is agile, flexible, and open.

The mass migration of enterprise applications into the public cloud has revolutionized the WAN. Forty-three percent of enterprises say that public cloud and multi-cloud initiatives are driving their network strategies.[1] Enterprises have shifted to internet-based hybrid WAN architectures to support cloud connectivity. To minimize latency, direct cloud access from remote sites has become the norm. As more applications migrate to the cloud, bandwidth demand at the WAN edge is growing.

New edge technology adoption is accelerating and increasing demands at the edge of the WAN. Edge computing, the Internet of Things (IoT), and 5G connectivity are new requirements. For instance, 42% of network managers say their organizations are researching or planning an edge computing initiative, and 52% are implementing or are already in production with it.[2] Meanwhile, 72% of enterprises have IoT devices connecting to the corporate networks, particularly at the WAN edge.

The definition of the WAN edge has also expanded to include the home office. "Work from anywhere" is the new paradigm for many employees. EMA research found that the number of people working from home has at least doubled since the COVID-19 pandemic started, which has strained existing secure remote access solutions. This is not a temporary situation. Most enterprises tell EMA that they do not expect their work-from-home (WFH) populations to ever return to pre-pandemic levels.

WAN complexity also requires a new approach to network operations. EMA has observed rising interest in AIOps-driven network management. Enterprises are seeking solutions that can apply AI and machine learning technology to anomaly detection, fault isolation, and root-cause analysis. AIOps requires access to more granular and real-time telemetry for deep analysis of the WAN edge. The WAN edge platform must be able to support this data collection.

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[1] EMA, "Network Management Megatrends 2020: Enterprises Embrace NetSecOps, the Internet of Things, and Streaming Network Telemetry," May 2020.
[2] ibid.

These trends are driving complexity and increasing change in the network. Enterprises need a WAN edge platform that can stabilize this disruption. The new WAN edge must be flexible. It should support everything as a service and be a place where the infrastructure team can deploy new network and security functions, as well as services, rapidly and affordably. Infrastructure teams need to consume these network and security capabilities as software so they can adopt them quickly, scale up as needed, and pay for what they need now, not what they may need in the future. WAN edge hardware platforms should support this agile architecture.

YOUR CHECKLIST FOR TOMORROW'S WAN EDGE PLATFORM

Enterprises should consider three main pillars when identifying their next-generation WAN edge solution. First, the WAN edge must support multi-load connections, enabling a variety of edge connectivity options at corporate sites as well as virtual routing for connectivity into the cloud. Next, the WAN edge should offer multi-dimensional resiliency, including service resiliency, operational resiliency, and business resiliency. Finally, the edge should be open and programmable so enterprises can integrate the WAN edge with a variety of IT systems, including the network automation pipelines.

MULTI-CLOUD CONNECTIVITY

A WAN edge platform should be flexible enough to support both legacy and next-generation access technology. Today, nearly every enterprise is moving applications to the cloud and leveraging software-defined WAN (SD-WAN) solutions to connect to those applications. SD-WAN is also evolving toward the secure access service edge (SASE), which combines SD-WAN with cloud-based security and secure remote access. This is just the latest example of how a WAN edge platform should be extensible to next-generation solutions. No one wants to rip and replace a WAN edge device because it can't support the migration from SD-WAN to SASE. Another example is wireless transformation. Enterprises are preparing to migrate their wireless WAN connectivity from 4G to 5G for increased bandwidth and flexible connectivity.

Enterprises should have a WAN edge platform that can provide a high-performance hardware layer for all of these technologies. This prevents a disruption when innovation drives significant change. This platform should also provide simplified deployment and administration of new software functions and services as they become available.

MULTI-DIMENSIONAL RESILIENCY

The WAN edge is critical to digital services, so the platform must be resilient across multiple dimensions.

Starting with service resiliency, it should have the resources to enable any new WAN services with enough throughput and scalability to meet performance expectations. It should be adaptable to wireless WAN technology like 5G, which will support business continuity if terrestrial connectivity fails. Many enterprises will also need compute resources and secure container support for edge computing services.

Next, this platform should enable operational resiliency. It should be able to generate rich and granular telemetry for AIOps-driven network operations and security analytics. The WAN edge should be resilient enough to generate this telemetry without degrading WAN performance.

Finally, the WAN edge platform should support business resiliency. It should be backward-compatible with legacy platforms to eliminate the need for a "forklift upgrade." For instance, enterprises rarely upgrade an entire network to SD-WAN all at once. During a transition, legacy routing support is essential to ensure connectivity between legacy and SD-WAN network protocols. The WAN edge should also support zero-touch upgrades to new network software platforms so services are not disrupted during the transition to SD-WAN, SASE, and other technologies.

OPENNESS AND AGILITY

WAN edge platforms must also be open and agile. This is a priority for network engineers and network administrators who are tasked with managing any changes to the network.

A WAN edge platform should have open APIs that enable network automation and integration with other IT management systems. For instance, security operations teams may need to manage security services at the edge, so integration with security monitoring and management may be required. IT service management may want to integrate their ticketing platform to improve support of users. These platforms must enable the integration and operationalization of new technologies as they are added.

Openness to third-party services is also essential. Enterprises may already have third-party technology they prefer for various functions and want to avoid having to rack multiple boxes that are managed independently. A WAN edge platform should be open to enable support of IoT gateways, security controls, and other edge applications and services.

CISCO CATALYST 8000 EDGE PLATFORMS FAMILY: THE NEXT-GENERATION WAN EDGE PLATFORM

The demands on your network at the edge will increase continuously. You need a portfolio of WAN edge hardware and software platforms to address the growing demands you will face. These platforms should function as more than simple edge routers. Instead, you should seek WAN edge platforms that can serve a variety of roles and enable multiple technologies. To meet all of the requirements described in this paper, Cisco has introduced the Catalyst 8000 family. It begins with two hardware platforms, the Catalyst 8300 Series modular edge access series that scales up to 10 Gbps, and the Catalyst 8500 Series data center or core platform series that scales to 40 and 100 Gbps. For virtual networking and multi-cloud connectivity, enterprises need a flexible software option, too. Cisco has added the Catalyst 8000V Edge Software, which is a next-generation virtual WAN edge platform for virtual routing and multi-cloud connectivity.

These platforms are part of Cisco's broad portfolio of Catalyst intent-based networking platforms for enterprise LAN and WAN infrastructure.

Cisco offers tiered software subscriptions with the Catalyst 8000 family. These subscription tiers will allow organizations to consume a variety of network and security solutions on these WAN edge platforms, beginning with the ability to operate these platforms as traditional edge and data or core routers.

Enterprises can license Cisco SD-WAN and leverage the Catalyst 8000 platforms' dynamic compute resource allocation for higher-performance SD-WAN. The platform will support enhanced segmentation, application optimization, and cloud on-ramps. The Catalyst 8500 head-end also offers enough scalability to aggregate 8,000 SD-WAN tunnels. The platform is ready to support 5G connectivity via Cisco Catalyst Cellular Gateways and pluggable interface modules, which the Cisco SD-WAN solution can use as part of a hybrid connectivity architecture.

The Catalyst 8000 family also supports the transition to SASE, with the ability to support converged networking and security architecture, tying together both on-premises and cloud-delivered services, such as Cisco SD-WAN and Cisco Umbrella.

It can host a multi-layered security stack via software upgrades that turn the Catalyst 8000 into a multi-layer security solution for SD-WAN and other edge networking use cases. Enterprises can run next-generation firewalls, intrusion detection and prevention, URL filtering, DNS monitoring, and Layer 2 point-to-point encryption (WAN MACSec).

The Catalyst 8000 family is also ready for software-defined branch (SD-branch) solutions. Its openness and programmability will allow enterprises to consolidate Cisco and third-party network functions and services, such as virtual branch network functions, third-party security services, and Cisco voice services.

The platform's multi-core X86 resources and secure container architecture are ideal for edge computing use cases. It can host third-party IoT and operational technology applications, which will reduce latency and improve the security of critical edge services.

Finally, the Catalyst 8500 Series features silicon developed by Cisco that can generate advanced telemetry and metadata for distributed AIOps-driven network assurance, paving the way for self-healing networks.

EMA PERSPECTIVE

Cloud migration, AIOps, software innovation, and the COVID-19 pandemic have converged at this moment to drive unprecedented change in the WAN. This change is profound and ongoing. The WAN edge of tomorrow will look nothing like the WAN edge of five years ago.

Enterprises need an edge platform that is resilient, agile, and powerful enough to provide a stable foundation for the changes happening today and those that have yet to reveal themselves. Whether enterprises are focused on multi-cloud connectivity, SD-WAN, SASE, edge computing, SD-branch, or all of the above, the Cisco Catalyst 8000 Edge Platforms Family addresses all the requirements EMA has identified in its research. Enterprises should take note of this new platform.

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