At A Glance

Environment

- Business Services Office of a US State
- Users - 4,000
- 69 Locations
- 80 Servers

Challenge

Build a reliable, high-performance network underlay to support an extensive VMware environment and deliver on the goal of creating a completely software-defined data center

Extreme Solution Components

- ExtremeSwitching™ VDX 8770
- ExtremeSwitching VDX 6740
- Extreme VCS Fabric technology

Results

- Achieved incomparable high availability and performance
- Aligned the physical network with its VMware environment and applications
- Improved process efficiency significantly
- Accelerated progress to SDN automation and a software-defined data center

State Agency Boosts Availability and Performance with SDN Underlay

The business services office of a large state provides a variety of services to multiple state agencies. It provides solutions to 4,000 users across 69 locations, from procurement and acquisition, real estate management, and environmentally friendly transportation, to professional printing, Web services, legal services, and fire safety for public schools. The department's network is essential for the department to deliver high-quality services.

The office's IT team is forward-thinking, and they considered future scalability and easier manageability on top of merely upgrading existing capabilities. Their goal is to deploy a completely software-defined data center, which will enable automation for greater efficiency, repeatable processes for high reliability, and the ability to quickly and easily meet the needs of network users. The department has made continuous investments in VMware solutions to facilitate its progress, but the existing network was holding them back.

The network had consisted of switches and routers that were supposed to deliver high-availability. In reality, they were plagued with instability. For example, servers couldn't maintain connectivity to the virtualized environment, and the team couldn't use VMware vMotion to virtualize 80 servers. Changes to core devices resulted in inexplicable convergence and routing problems. There were numerous hardware and firmware failures and frequent instances of buggy software, all of which made troubleshooting a nightmare.

Whenever a problem arose—which was frequently—the IT team had to halt their other responsibilities, build troubleshooting scripts, and spend hours identifying the problem.

Every time something went down, it was down for at least three hours. All mission-critical business applications were affected, and the IT team lost many hours of sleep over network problems. It was simply unacceptable.

From the Old IP to the New IP

The office wanted to move closer to IT-as-a-Service for customers while minimizing management. That meant evolving to an open software-defined architecture to gain more automation, orchestration with the VMware environment, and gaining the flexibility to scale and provision new services almost on demand. The office wanted the new IP, since the old IP wasn't working.

As the IT team looked at replacing the department's network, these considerations ranked at the top of their list. They also needed the ability to easily pull in existing VLANs and IP addresses to the new network. Most importantly, the new network had to work with VMware NSX, which the department uses as its virtualization platform for its Software-Defined Data Center (SDDC). The department reviewed analyst rankings, compared technical qualifications, and narrowed their choice to three vendors, one of which was Extreme.

They also talked to other customers for recommendations, all of whom praised their Extreme solutions.

Extreme customers gave excellent referrals and were excited about their Extreme networks. It was also easy for the IT team to find lots of Extreme information, documentation, best practices, training, and customer discussions online. And Extreme provided equipment that the team could test.

"With the Extreme underlay in place, the office has no more worries about network availability or integration as it moves toward a software-defined data center. The team is ready to begin automating and optimizing a range of processes and capabilities—and they consider this the fun part."

These factors, led the state office to choose Extreme as its networking vendor.
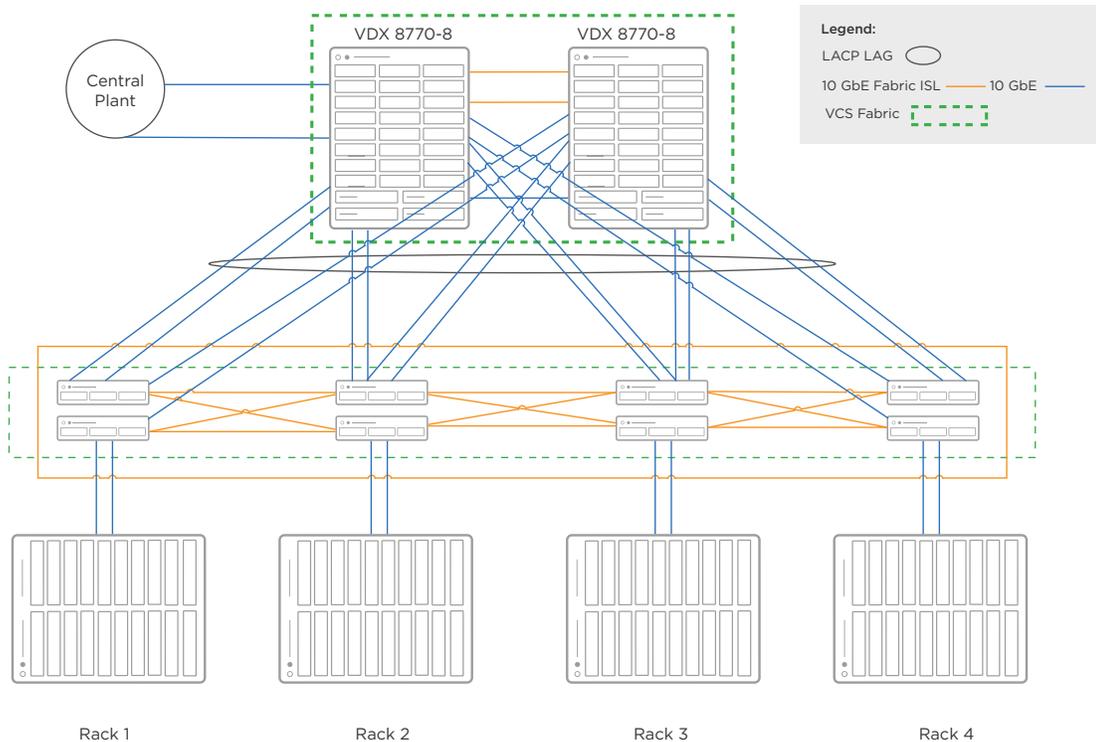

Figure 1: Main Data Center Deployment

Building the SDN Underlay

The new network is built on Extreme VDX Switches and Extreme VCS Fabric technology as an underlay for its evolution to a SDDC. Extreme VDX 8770 Switches form the network core for the data center and a disaster recovery site. The Extreme VDX 8770 is designed to support Software-Defined Networking (SDN) technologies within data, control, and management planes.

Extreme VDX 6740 Switches are Ethernet Top of Rack (ToR) switches that connect to the data center and disaster recovery cores through 160 Gbps trunks. These switches deliver high performance with low latency while simplifying the network architecture. The Extreme VDX 6740 Switches also offer the automation needed to support its highly virtualized environments.

Extreme VCS Fabric technology connects all Extreme VDX 6740 Switches into a software-driven infrastructure that simplifies management. The office's IT team can manage the entire Extreme VCS Fabric as a single switch through Extreme VCS Logical Chassis. A single point of management eliminates the need to manually configure and manage each switch, reduces operational costs, and minimizes the risk of configuration errors. In addition, Extreme VCS Fabric technology provides fabric-embedded VM-aware network automation for secure connectivity and full visibility to virtualized resources with dynamic learning and activation of port profiles.

Third party edge switches are deployed at more than 20 remote locations to provide access and power DGS' Voice over IP (VoIP) infrastructure. All remote sites are connected to the Extreme VDX 8770 Switches at the disaster recovery site. From here, Layer 3 traffic is routed using Open Shortest Path First (OSPF) routing.

Seamlessly Adding the Virtual Overlay

The office has implemented a number of VMware solutions on its journey to an SDDC, and the new Extreme network runs them effortlessly. Virtual eXtensible Local Area Network (VXLAN), a part of VMware vCloud Networking and Security, is completely seamless when combined with the Extreme network. The office is also making VMware NSX its foundation network virtualization platform and plans to use it to reduce VLAN sprawl in the data center; simplify provisioning; distribute and segment firewall features for per-virtual-machine stateful security; as a load balance proxy, and to collapse the DMZ into the data center architecture. The Extreme VDX Switches run NSX seamlessly.

The new Extreme network switches also offer adapters to the office's vRealize Suite data center and cloud management solutions. Adapters enable the department to further automate vital data center processes and simplify orchestration.

It Just Works

Working with Kovarus, an IT services provider, the office had the new Extreme network and virtual environment up in just two weeks. The new network increased network speed from 40 Gbps to 160 Gbps, delivering significant performance enhancement for the virtual environment.

The cutover and subsequent operation of the new Extreme network were rock solid. The infrastructure can lose up to 16 links and the office can still do business.

Aligning with the Virtualized Environment

Extreme VCS Fabric technology enables the office to easily align its virtual and physical environments. Extreme Automatic Migration of Port Profiles (AMPP) and VM-aware network automation features are intrinsic to the fabric. By integrating with VMware vSphere, the Extreme VCS Fabric technology now allows the office to move running virtual machines from one physical server to another without downtime, as well as automatically maintaining their port profiles and connectivity services. This helps ensure consistency across all physical and logical fabric elements and minimizes downtime due to human error.

Efficiency Prevails

The state business office gained tremendous efficiency. In the past, it would have required three staff to support the work that takes just one engineer now. The office deployed a completely new network and virtualized capabilities without adding staff.

With the fabric, the office can add new tenants to the network quickly and easily. The Extreme team also helped the office's IT team solve a complicated server configuration challenge. With the old network, the HP servers required significant manual effort to reconfigure. Extreme showed the IT team how two uplinks could reduce that time from hours to just a few minutes.

The old network was accompanied by poor customer service and an unwillingness to identify core issues. The Extreme network is characterized by exceptional customer service and a commitment to the office's success.

Now for the Fun Part

With the new network, the office is prepared to move full speed ahead on its road to an SDDC. The office is eager to begin exploiting the full capabilities of the Extreme VCS Fabric technology and its VMware environment.

With the Extreme underlay in place, there are no more worries about network availability or integration as it moves toward a software-defined data center. The team is ready to begin automating and optimizing a range of processes and capabilities.

Extreme
®
Connect Beyond the Network

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