County Builds Centralized Data Center

King County used Nexus platform and MDS switch to build a highly efficient data center shared by all departments.

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EXECUTIVE SUMMARY

King County, Washington
- Government
- 1.9 Million Residents

Business Impact
- Helped to ensure continuity of government
- Increased equipment utilization
- Simplified network management
- Increased government agility

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Challenge

Located on Puget Sound in Washington State, King County is home to more than 1.9 million people, making it the 14th most populous county in the United States. When the county's data center lease expired, the county Office of Information Resource Management (OIRM) decided to build a highly efficient, scalable, and green data center. "Organizations typically redesign the data center only once every 15 years, so we seized the opportunity to design an architecture that would conserve taxpayer dollars while increasing government service effectiveness," says Gary Lemenager, IT enterprise business solutions director, King County.

Requirements for the new data center network architecture included high availability, 10 Gigabit Ethernet to support server virtualization, ease of management to minimize operational costs, and high port density to minimize equipment costs, power, and cooling.

Solution and Results

King County OIRM built the new data center network using the Cisco Nexus® platform and Cisco® MDS 9222i Switches. Approximately 476 servers, more than half of the county's total, have been moved to the new data center.

OIRM designed the data center to minimize space requirements while increasing availability. Each data center pod contains 12 server racks that connect over Gigabit Ethernet to another rack containing Cisco Nexus 2148 Fabric Extenders. These fabric extenders aggregate into two Cisco Nexus 5020 Switches in the same rack, which connect over 10 Gigabit Ethernet to a pair of Cisco Nexus 7010 Switches. The county also continues to use its older 100-MB servers, connecting them to the Cisco Nexus 7010 Switches by way of Cisco Catalyst® 3750E Switches.

To access a shared storage area network (SAN), standalone servers connect to a pair of Cisco MDS 9222i Switches, and blade enclosures connect through an internal Cisco MDS 9124e Fabric Switch or third-party switch. Operating the blade server switches in N-Port Virtualization (NPV) mode avoids interoperability issues and simplifies SAN management.

Cisco Advanced Services tested Cisco switches in the county's environment in the Cisco Customer Proof of Concept (CPOC) Lab, and also provided optimization services after the switches were implemented. The main benefits of the Cisco Data Center 3.0 solutions for King County include:

- **Continuity of government:** Factors contributing to high network availability include:
  - **Equipment consolidation:** "Cisco Data Center 3.0 solutions contribute to a smaller data center footprint, making it easier to diagnose and remediate network issues and help ensure continuity of government services," says Roger Kirouac, interim county chief information officer.
  - **Redundancy:** Cisco Advanced Services advised the IT team on using the virtual PortChannel (vPC) feature of the NX-OS software to make each pair of Cisco Nexus 5020 and 7010 Switches look like a single logical switch to attached devices. If one switch fails, the other takes over without any noticeable interruption to the service.
  - **Nondisruptive software upgrades:** Using the Cisco Nexus switch In-Service Software Upgrade (ISSU) capability, OIRM can upgrade switch software without interrupting access to critical applications for public safety, law, justice, and more. "The ability to upgrade Cisco Nexus switches without taking them down supports public safety, citizen service, and government workforce productivity," says Jim Keller, IT governance director, King County.
- **Economies of scale:** Departments that house their services in the new data center share ports on the Cisco Nexus switches and Cisco MDS 9222i Switches instead of purchasing their own equipment, reducing government costs. To isolate each department's traffic and management, the IT team can easily create virtual SANs (VSANs).
- **Support for new, cost-saving technologies:** The Cisco Nexus 5020 switch provides the 10 Gigabit Ethernet connectivity needed for server virtualization, which has helped avoid server sprawl and associated power and cooling costs. The 10 Gigabit Ethernet connectivity will also enable the county to adopt Fibre Channel over Ethernet (FCoE), saving the cost of separate adapters, cables, and switch ports for data and storage traffic.
- **Reduced power consumption:** OIRM designed the data center to minimize environmental impact. The high port density of the Cisco Nexus switches contributes to the county's green initiative by minimizing the number of devices to power and cool.
- **Simplified management:** The IT team saves time by managing all Cisco Nexus 2048 Fabric Extenders as part of the Cisco Nexus 5020 Switch. Provisioning is faster as well, because the IT team can very quickly create VSANs on the Cisco MDS 9222i Switch for individual departments and applications instead of provisioning physical SANs. In the future, OIRM plans to further simplify management by using Cisco Data Center Network Management (DCNM) Software to manage all Cisco Nexus switches and the Cisco MDS switches from a single interface.

Lori Dickneite, supervisor of engineering design for King County, summarizes the benefits: "Cisco Nexus and MDS switches helped us create a clean network architecture that simplifies troubleshooting and gives us the ability to respond quickly to each department's changing business needs."

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—Roger Kirouac, Interim Chief Information Officer, King County, Washington

For more information about Cisco Data Center 3.0 solutions, visit: http://www.cisco.com/go/dc

For more information about Cisco Nexus switches, visit: http://www.cisco.com/go/nexus

For more information about Cisco MDS Multilayer Switches, visit: http://www.cisco.com/go/mds

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