

State Agency Collaborates Securely with Outside Organizations

California Department of Water Resources enabled borderless collaboration with advanced data center solutions.

EXECUTIVE SUMMARY
<p>CALIFORNIA DEPARTMENT OF WATER RESOURCES</p> <ul style="list-style-type: none"> • Government • Sacramento, California • 3500 Employees
<p>CHALLENGE</p> <ul style="list-style-type: none"> • Collaborate with other government entities, businesses, and citizens • Reduce operational and capital costs • Empower workforce to support the department's missions
<p>SOLUTION</p> <ul style="list-style-type: none"> • Borderless infrastructure based on Cisco Data Center Business Advantage solutions • Cisco Services for planning, design, and implementation
<p>RESULTS</p> <ul style="list-style-type: none"> • Enabled secure collaboration by creating 20 distinct security zones • Reduced total cost of ownership for network by 30 percent • Accelerated network performance by 40 percent

Challenge

The California Natural Resources Agency restores, protects and manages the state's natural resources, including water. One of the largest departments within the agency is the Department of Water Resources (DWR), with about 3500 employees. DWR supplies and manages the water delivery systems for California, provides flood protection through improvement of California's levees, inspects 1200 dams, and helps coordinate the state's integrated water management strategies.

To meet these goals, department personnel need to access and manipulate large data sets to model the effects of the environment on the water system. "Many of our missions require close collaboration with other federal, state, and local government organizations, subject matter experts, and the people of California," says Tim Garza, chief information officer for the Natural Resources Agency and the Department of Water Resources.

Previously, DWR had limited ability to share data outside the department, which made it difficult to make timely decisions. For example, the data center network lacked the bandwidth for large file transfers and server virtualization. In addition, the network had only two

security zones, for people inside and outside the firewall. The lack of flexibility meant that the department's environmental scientists could not invite federal government scientists to review environmental-impact studies on the department's servers.

DWR wanted a new data center infrastructure that could adapt easily to support changing business needs. The immediate need was for borderless collaboration with all stakeholders, including local, state, and federal government and private sector entities. To design the end-to-end IT infrastructure, DWR sought an experienced services partner. "We wanted expert guidance to make sure the new infrastructure would be flexible, cost-effective, and adaptable to future business needs and regulatory requirements," Garza says. "Our primary goal was to make sure our IT infrastructure acted as an enabler for the department's business mission instead of a constraint."

"We can more quickly model the effects of projected changes in water flow and water level. Accelerated network performance and real-time collaboration capabilities help us model more often, and with more variables."

– Steve Croft, IT Enterprise Architect Chief, California Department of Water Resources

Solution

DWR met its goals by engaging Cisco Services to help plan, design, and implement a flexible data center network architecture. “Cisco Services has expertise in using the network as the platform for collaboration, and we had confidence they could help us think through the business issues and tactically execute,” says Garza. “We also liked that Cisco uses open standards, which is important in a multivendor, multiplatform environment.”

As the first step, DWR needed to virtualize its server environment, to reduce server sprawl. Cisco Services recommended Cisco Nexus switches to provide the needed 10Gbps bandwidth at a low cost per port, and to give the department the option to adopt Fibre Channel over Ethernet in the future. “After the proof of concept, we concluded that Cisco data center network solutions and roadmaps are technically sound, sustainable, and would provide the flexibility and extensibility the department needs,” says Steve Croft, IT enterprise architect chief.

Next, to enable secure, borderless collaboration, Cisco Services assisted DWR in developing a data center security zone model. To do this, Cisco engineers first interviewed DWR’s IT enterprise architects and application owners to identify different application attributes, including how they communicated with other applications. The outcome of the discovery process was 20 distinct application categories that correspond to the department’s current applications as well as those it might adopt in the future. Then Cisco Services and the DWR Network Team used Cisco Data Center Business Advantage solutions to set up different logical security zones corresponding to these application categories. As a result, users inside and outside the department can securely access information and applications based on their credentials. For example, DWR can now share document management services and geographic information services (GIS) with other public and private sector organizations.

Cisco Services worked side-by-side with the DWR IT team at every stage of planning, design, and implementation so that the team was prepared to manage implementation and operations at the conclusion of the engagement. “Cisco Services complemented our internal IT team, filling in on some of the new technology areas, helping to close knowledge gaps, and helping to develop our staff in the design, use, and operations of the new network environment,” says Tony Morshed, business network and telecommunication chief. “We knew where we wanted to go, and an experienced partner helped us get there.”

“Enhanced collaboration – government-to-government, government-to-business, and government-to-citizen – helps our lines of business share and develop information and solutions related to the mission of the Department of Water Resources.”

– Tim Garza, Chief Information Officer, California Natural Resources Agency and Department of Water Resources

Results

DWR’s data center is now certified as Tier 3. The combination of Cisco technology and services enabled DWR to meet its goals for borderless collaboration, efficiency, and agility.

Lower Total Cost of Ownership

“We now have the best collaboration capabilities in our department’s history, and we’ve simultaneously reduced total cost of ownership,” Garza says. In combination, the engagement with Cisco Services and the new data center network architecture decreased total cost of ownership by 30 percent, including:

- 40 percent fewer switches because of the high port density in the Cisco Nexus 7000 Switch
- 42 percent lower cooling costs
- 45 percent lower power consumption
- 20 percent less management overhead

One reason for the decreased management overhead is that the IT team no longer has to take down the network to upgrade switch software or apply patches. The enablers are the In-Service Software Upgrade (ISSU) feature of Cisco Nexus switches and the redundant data center design.

Overall, the department projects 20- to 30-percent savings from operational cost avoidance over three to four years, for maintenance, support, and energy bills.

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Increased Productivity and Support for the Mission

In addition to reducing costs, the Cisco Nexus switch architecture helped accelerate application performance by 40 percent, increasing workforce productivity. The difference is particularly noticeable for large file transfers, utility grid transactions, and enterprise resource planning (ERP) transactions. “We can view GIS images 20 times faster than before,” says Croft.

Other ways the new environment supports the department’s missions include:

- Helping reduce downtime and improved availability of information. “We have not had a single unplanned outage, and we can conduct scheduled maintenance without disruptions,” says Morshed.
- Helping to increase availability of critical information and foster global collaboration. “Enhanced collaboration – government-to-government, government-to-business, and government-to-citizen – helps our lines of business share and develop information and solutions related to the mission of the Department of Water Resources,” Garza says.
- Contributing to public safety. “We can more quickly model the effects of projected changes in water flow and water level,” says Croft. “Accelerated network performance and real-time collaboration capabilities help us model more often, and with more variables.”
- What’s more, DWR scientists can now collaborate on the models with other government scientists, thanks to the borderless infrastructure with security zones that Cisco Services designed and implemented.”

Trusted Advisor

DWR appreciates the relationship with Cisco Services, which gives the department access to expertise to meet constantly evolving regulations and mission needs. “Cisco Services helped us design a network that meets today’s known needs and has the flexibility to adapt to tomorrow’s unknown needs,” says Morshed. “Had we tried to design the network ourselves, we might have limited our options. Together, our DWR network engineers and Cisco have provided DWR with a network infrastructure that acts as a business enabler instead of an inhibitor.”

Next Steps

Now DWR and Cisco Services are working together to extend the network to the 24 other departments in the California Natural Resource Agency, supporting the state’s IT consolidation efforts. Sharing network services across departments will reduce government network management costs, lower storage costs by eliminating the need for redundant databases, and lay the foundation for other types of shared services, such as document management and GIS. “We’re creating a federated Natural Resources Agency cloud,” says Garza.

To further reduce costs, DWR plans to adopt some form of unified communications. The upgraded LANs and WAN already provide the bandwidth and quality of service (QoS) to carry voice and video traffic over the existing data network, eliminating the capital and operational costs of separate networks.

Garza looks forward to continuing the relationship with Cisco Services. “The Cisco team has become part of our solutions team, contributing their data center expertise, security expertise, service delivery methodology, and the knowledge they’ve gained from working with other global government customers.”

Technical Implementation

DWR uses the Cisco Nexus 7000 Virtual Device Context (VDC) feature to partition a single physical switch into two logical switches for the core and distribution layers, reducing the number of network nodes. “The Cisco Nexus 7000 VDC feature enables us to securely share information outside the department without the expense of creating separate physical networks,” Croft says.

Cisco Nexus 5000 Switches provide server aggregation, connecting to rack servers by way of Cisco Nexus 2148 Switches and to blade servers by way of Cisco 3120X Switches. Two pairs of Cisco ASA 5000 Series Adaptive Security Appliances provide security services. DWR uses Cisco Data Center Network Manager to automate provisioning, secure the network, and actively monitor for performance degradation.

PRODUCT LIST	
Data Center	
•	Cisco Nexus 7000 Switches
•	Cisco Nexus 5000 Switches
•	Cisco Nexus 2148 Fabric Extenders
•	Cisco ASA 5580 and 5540 Adaptive Security Appliances
•	Cisco Catalyst Switch 4948
•	Cisco Secure Access Control Server
•	Cisco Data Center Network Manager
Cisco Services	
•	Planning, Design, and Implementation Services

For More Information

To find out more about Cisco Data Center Business Advantage solutions, visit: www.cisco.com/go/dc.

To find out more about Cisco Services, visit: www.cisco.com/go/services.



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