



Alabama Department of Transportation Puts the Brakes on Decentralized IT

FOUR KEY IT INITIATIVES ARE ENABLED BY VIRTUALIZATION TECHNOLOGY.

How do you get nine divisions, 22 bureaus and 107 sites all on the same IT page? With nearly 400 physical servers spread across the state, the Alabama Department of Transportation (ALDOT) realized that it needed to find an answer. The department, which provides a safe and efficient intermodal transportation system for residents and visitors, didn't have the kind of control over its IT infrastructure that the agency needed to provide the most efficient and secure services to its users.

ALDOT found a solution in virtualization technology from VMware. Virtualization technology separates applications from specific, physical servers, so the old "one server, one application" model no longer applies. With the ability to put numerous virtual machines on one physical machine, fewer physical servers are needed — reducing costs for buying, maintaining and powering equipment. And virtualization's flexibility makes IT shops more responsive to changing business needs.

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— KEN HAYNES, SPECIAL PROJECTS SUPERVISOR, COMPUTER SERVICES/NETWORK OPERATIONS, ALABAMA DEPARTMENT OF TRANSPORTATION

Virtualization is now a significant part of four key initiatives for ALDOT aimed at achieving greater management capabilities, lowering costs, and improving security and disaster recovery. ALDOT is using virtualization to consolidate servers in the data center located in its main office in Montgomery. Once that effort is complete, the department will virtualize the environments in its nine divisional offices. It will also virtualize its DMZ — the infrastructure between internal and public-facing networks — and improve disaster recovery for the entire department.

"We want to virtualize every resource that we can, so we can have centralized management of those resources," said Ken Haynes, special projects supervisor in

Computer Services/Network Operations for ALDOT. "With virtualization, we'll be able to more readily — and on a scheduled basis — manage those resources."

Two-Stage Consolidation

With a variety of locations, divisions and bureaus within ALDOT, management of its IT systems will be easier and more efficient once all locations are on the same virtual platform. In addition to lower costs for equipment, power and cooling, the agency will have greater control of its resources. If a server goes down, for example, it can restore a virtual machine much faster than a physical one.

Haynes said the Computer Services/Network Operations team is starting with the bureaus in the main office to prove the value of virtualization before expanding the initiative to division offices located around the state. "If we lead the way and virtualize the systems we have control of," he said, "then the users that we support will have confidence in it too."

BENEFITS OF VIRTUALIZATION

The Alabama Department of Transportation is using virtualization to achieve numerous operational and cost advantages, including:

- Lower costs (equipment, power, cooling)
- Greater business agility
- More flexibility with hardware and software
- Ability to centrally manage resources
- Simplified security for the DMZ
- Improved disaster recovery capabilities



The department's 22 bureaus — Bridge, Design, Transportation Planning, Maintenance and others — each have a physical location within ALDOT's main offices. The bureaus were keeping their own servers in their individual areas there, but the department is consolidating those servers into one central data center.

Virtualization fits perfectly into the consolidation project for the agency. "We started running our virtualization efforts in parallel with the data center consolidation," Haynes noted. "If we saw any underutilized servers that we were moving as part of the consolidation, we virtualized those machines because it took up less storage space."

At this writing, the data center consolidation in ALDOT's main office is only half done — but it's already produced solid results. The department is running 117 virtual machines in the data center on 14 servers. "We've seen a lot of different benefits," Haynes said. "Patch management is better, and of course remediation of software as far as patches go. Also, it's easier to make sure our resources are being backed up and our equipment is being properly maintained. Before, it was hard to maintain resources and make sure everything was working."

And the virtualization is reducing costs. "In our existing virtual environment, we're seeing a cost savings on hardware maintenance of approximately 90 percent, compared to physical servers," Haynes said. With fewer servers needed, savings on power are adding up too. "In our data center, we're powering 40 percent of the servers — virtual machines — for just 10 percent of the cost to power physical servers," Haynes added.

Soon ALDOT hopes to bring its nine divisions located around the state onto a virtual platform so that it has greater control over these resources as well.

Security Without Complexity

ALDOT also plans to virtualize its DMZ, the infrastructure that secures access



IMPROVEMENTS AND COST SAVINGS IN THE DATA CENTER

Virtualization has brought immediate positive results in the data center at the Alabama Department of Transportation:

- The data center now has **117 virtual machines** running on 14 physical servers.
- It has achieved **90 percent** savings on hardware maintenance.
- The main office has virtualized **40 percent** of its servers, which use just **10 percent** of the power previously required for physical machines.

between the internal and external parts of its network where servers for Web, e-mail, smartphones and other services are hosted. The current approach to securing the DMZ involves use of legacy firewall solutions to ensure that only authorized traffic flows to and from these services. But once these services are virtualized, the legacy solutions result in "sprawl," where numerous firewall rules are necessary to segment these services to comply with security policy.

In order to provide the necessary security within the virtualized environment while reducing complexity, the department will use VMware vShield Zones, a firewall built into VMware vSphere Enterprise Plus. "We don't want a wide open network; we want to provide access to information along a specific path," said Rod Rives, specialist in Computer Services/Network Operations for ALDOT. "vShield Zones gives us the option

of making smaller environments, in a virtual manner, where we can control access."

The VMware solution will also mesh with the department's existing requirements for DMZ security, enabling creation of equivalent firewall rules in the virtualized environment. "We really weren't going to keep our security guys happy unless we could demonstrate for them how we could keep their current security policies in place," Rives said.

Disaster-Ready

Another key component of the virtualization plan for the department is improved disaster recovery (DR). With VMware's Site Recovery Manager (SRM), the department won't need to have hundreds of duplicate physical servers to create a disaster recovery site. Instead, it will use SRM to mirror data to other sites. "We envision a private cloud here," said Haynes. "Inside that, we want to virtualize our environment and then replicate it to different sites in the state for disaster recovery." SRM helps tremendously by automating the recovery process and eliminating the complexity involved in a manual recovery process. The result is a faster, worry-free recovery.

Because everything is on one easily managed central platform, implementation will be much simpler. "I can set up an environment on another site and replicate the data using one central point of access," Haynes said. "I'll have a DR solution for all my servers. And we know this will work, because we've done it on a small scale already." The department has already set up identical environments in two separate divisions located in different cities, with positive results.

VMware's SRM will also make management of disaster recovery much easier. It automates the entire process, so an administrator doesn't have to bring up another site and make sure it's working. SRM does all of that.



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Virtualization Enables the Cloud

In the future, ALDOT plans to achieve on-demand IT capabilities through cloud computing, which will leverage the department's investment in virtualization. Haynes said VMware really understands cloud computing, which will help ALDOT get maximum efficiency from the cloud.

Haynes said both managers and end-users believe in virtualization. It's a confidence that was hard-won at times, since some are way of change. But the proof of virtualization's virtues has been convincing. "Once people see it, they love it," said Haynes. "It's proven, it's reliable, and it's been a great match for us. We're excited about it."

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