California Department of Corrections and Rehabilitation (CDCR)

THE NUMBERS

- Reduced server environment by approximately 60 percent
- Cost avoidance of $250,000

IN BRIEF

Objective
The California Department of Corrections and Rehabilitation needed to scale its IT infrastructure to meet growing demands and increasing complexity. Failure to do so could mean catastrophic results, such as serious risks to public safety and security, and serious sanctions as a result of failure to comply with legislative and legal mandates.

Solution
Virtualization allows the department to meet increasing demands on its IT resources in a more streamlined, efficient and cost-effective manner.

Business Impact
- Implementing new servers takes a day, instead of weeks or months.
- Better capacity utilization: one project required only 5 servers, instead of 37, reducing that project's hardware costs by $250,000.
- Change control is improved.
- Patch deployment times reduced by two-thirds.
- Energy costs and power consumption reduced.
- Disaster recovery capabilities improved.

California State Agency Maximizes Cost Avoidance and Optimizes Disaster Recovery Plan Through Virtualization with VMware

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— Joe Panora, Agency Chief Information Officer, CDCR

The California Department of Corrections and Rehabilitation (CDRC), one of the largest correctional agencies in the nation, has the daunting task of maintaining an extensive Information Technology environment and infrastructure. The department's IT supports 66,000 employees responsible for more than 168,000 incarcerated adult and juvenile offenders and 113,000 parolees. Adding further complexity, the offender populations are supervised by staff in 33 adult institutions, 42 camps and community correctional facilities, and 6 juvenile facilities; in addition, the infrastructure supports more than 200 parole offices throughout the state from the Oregon to Mexico borders. The department's annual budget has exceeded $9 billion per year over the past two years.

As a result of the size of the department and the complexity of its mission, the demands on IT resources and the infrastructure have been unparalleled. The stakes are also high. If the IT platform and applications fail to support the department in meeting its legislative and court-mandated requirements, the impact can be catastrophic, resulting in serious risks to safety and security of the department's facilities and communities throughout the state, increased costs to the state, and serious sanctions as a result of failure to comply with legislative and legal mandates.

Looking to the Industry Leader

In order to meet these challenges, the department has established itself as a forerunner in aggressively and proactively pursuing IT innovations such as virtualization. CDCR first considered virtualization in 2005 to address the increasing demands placed on its IT resources when several smaller correctional departments and boards, including the California Youth Authority, were merged under the department's umbrella. In response to these demands, the department's IT team upgraded its Microsoft Exchange and Active Directory applications and migrated legacy hardware onto the latest Microsoft operating system. However, it recognized it did not have the hardware resources required to support some of the upgrades.

The department therefore became one of the first State of California agencies to turn to virtualization to assist with solving this very common problem. CDCR looked to strategic partners VMware and Enterprise Networking Solutions Inc. as industry leaders with a proven track record of success, and embraced VMware virtualization as its hypervisor server configuration standard. CDCR collaborated with ENS-Inc to develop a holistic virtualization strategy to ensure not only near-term project success, but also the long-term operational success desired to meet the department's business needs. ENS-Inc in turn leveraged its long-term track record of providing virtualization strategy consulting services, as well as its extensive public sector experience. This ensured that there was not a lot of rework required during the initiative, and enabled the department to share "lessons learned" with its State of California peers.

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Flexibility, Responsiveness and Cost Effectiveness

In the past, CDCR's IT environment relied on deploying applications on dedicated servers. With over 800 servers in use, the dedicated facilities for housing the servers were running out of both space and power capacity. In addition, procuring and implementing dedicated servers used to take weeks or even months. The VMware environment and virtualization enabled the department to configure a new server implementation within a day, and support redundancy and the 24-hour-a-day, 7-day-a-week availability necessary to support critical around-the-clock operations. Today, more than one-third of the department's Windows servers are virtualized and, as a result of the increased flexibility and responsiveness realized through VMware, over 40 legacy servers have been decommissioned.

VMware has also significantly improved CDCR's ability to deploy new IT projects more efficiently and cost effectively. In one example, the CDCR IT team leveraged virtualization to implement an application refresh. Without virtualization, the effort would have required 37 physical servers. With virtualization, only 5 servers were required, resulting in a cost avoidance of approximately $250,000. Virtualization has also facilitated more efficient use of the department's datacenter resources without expanding power usage. To date, through virtualization, CDCR has reduced its total server environment by 60 percent.

CDCR has relied on virtualization to improve change control. For example, if a major change is made to an application, it is cloned first; and if something goes wrong with the upgrade, the department can revert to the old version. In addition, the department leverages VMware tools to manage server patches and upgrades and analyze server performance. The time spent on patch deployment alone has decreased by two-thirds, allowing resources to be re-dedicated to other critical functions.

Green IT

CDCR has long recognized the benefits of Green IT; this department priority was further reinforced when the State of California issued a policy and set forth guidelines identifying energy-saving measures and initiatives as a priority for state agencies. CDCR has been a forerunner in reducing the energy demands of its IT environment through proactive measures such as server consolidation and dynamic management of its computer assets. And VMware technology has played a major role in allowing the department to significantly reduce energy costs through virtualization, server consolidation, low period powering off, more efficient memory management and increased hardware utilization. All of this has been accomplished without jeopardizing data integrity or sacrificing reliability or service levels.

Rapid Recovery from Disasters

Disaster recovery is particularly crucial to a department tasked with supervising the most serious criminal offenders and ensuring public safety and security. Disaster recovery plans previously used by CDCR required timely and complex manual steps to recover lost data and files and validate that systems were ready for use. "VMware virtualization has simplified and enhanced disaster recovery significantly by storing hardware configuration, firmware, operating system install, and application install as data in just a few files on disk," says Joe Panora, Agency Chief Information Officer, CDCR.

By protecting these files using backup or replication software, the department has in essence protected the entire system. These files can then be recovered to any hardware without requiring any changes because virtual machines are hardware-independent. Hardware independence also eliminates the complexity of maintaining the recovery site by eliminating failures due to hardware differences. With VMware, the department can

"CDCR is committed to a server virtualization strategy to achieve desired reductions in costs, energy consumption, and datacenter space needs, while positioning to be able to adapt and take advantage of cloud computing."

— Andrea K. Wallin-Rohmann, Chief Information Officer, CDCR

provide rapid and reliable recovery without requiring identical hardware or duplicate servers. In addition, in the virtualized environment, testing has become easier by allowing the department to execute nondisruptive tests using existing resources.

Moving Forward

In 2008, CDCR continued its role as a leader in the innovative use of IT in California state government: it joined with Office of Technology Services (OTech) as a strategic partner and aligned with California Prison Health Care Services and the California Department of Health Care Services as cofounding tenants of a Federated Data Center (FDC) for centralization and virtualization of most, if not all, of the server environments. The timing for a shared facility aligned with the state government's larger goals as set forth in a Governor's Executive Order mandating that each state agency reduce the size of its datacenter floors by 25 percent by July 2010 and by 50 percent by July 2011. In addition, the order required agencies to reduce energy consumption of their IT and telecom infrastructure by 10 percent by July 2011, 20 percent by July 2011, and 30 percent by July 2012. New legislation, Assembly Bill 2408, further required that agencies with mission-critical and public-facing applications transition to Tier III datacenters designed by the California Office of the State Chief Information Officer, and that all other existing server rooms be closed by June 2013.

"Within the next year CDCR will close its datacenter and realize a significant energy and cost reduction by decreasing the existing environment of 70 racks/800 servers to one high-density virtualized environment consisting of 3 racks at the FDC," Panora notes.

All of this has created an opportunity for the FDC to provide state agencies with a valuable option to comply with the Executive Order. As other state agencies make the transition to the FDC, they will also realize the cost reduction and efficiencies of the original tenants, and the positive impact on state operations will be fully realized by both government agencies and citizens throughout the state. VMware will continue to play a critical role in this statewide effort.

IMPLEMENTATION OVERVIEW

VMware Products:	Applications:	Platform:
VMware vSphere® 4.1	Windows Server 2000, 2003, 2008	HP Blades
VMware vCenter™ Server Agent	Red Hat Linux	Dell PowerEdge 2900 and 2950
VMware vCenter Update Manager	**Partner:**	
VMware View™	Enterprise Networking Solutions Inc.	

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