



# Optimizing the PC Segment of California's IT Infrastructure

White Paper

## Executive Summary

State of California Chief Information Officer Teri Takai commissioned leading information technology professionals with wide-ranging experience to identify where the state can reduce energy usage, claim operational efficiencies, and improve security in the PC segment of its IT infrastructure. Researchers found that by creating a dynamic IT environment—standardized, centralized, automated, and mobile—California can achieve a greener, more secure computing complex that improves productivity, delivering greater efficiency at a lower cost to taxpayers and the environment.

As it continues its role as a leader in government computing, California is studying the advantages of replacing end-of-life desktops with eco-efficient laptop computers. The state is now moving into the second phase of that evaluation.

Making California's PC-IT infrastructure more efficient has the potential to yield significant savings. A dynamic IT environment could save up to \$44 million in energy costs over the next four-year PC refresh cycle<sup>1</sup> and, of course, could save tens of millions over the industry-recommended three-year refresh cycle as well. Additionally, reduced power use could keep more than 205,000 tons of CO<sub>2</sub> emissions out of the atmosphere—which is equivalent to taking about 34,000 cars off California highways.

PCs based on Intel® vPro™ technology can help realize these savings for California taxpayers. Upgrading from desktops to notebook PCs reduces energy consumption by more than 26 times. Laptops outfitted with vPro™ technology can be repaired or updated remotely, even when they're shut down or the operating system is unresponsive—meaning fewer desk-side support visits, and less energy usage during off hours.

## Current IT Landscape

The state of California has an estimated installed base of approximately 225,000 PCs, with an estimated 90 percent desktop to 10 percent laptop split. In that environment, it is estimated that fewer than 10 percent of PCs use automated power management tools. Currently, there is no standardization for operating system imaging, patch deployment, security asset tracking, or software distribution.

Now is an optimal time for refreshing the state's PC fleet. By transitioning to an environment weighted toward laptops, California can save money by reducing energy use, improving IT productivity, and decreasing user downtime. At the same time, laptops equipped with Intel® vPro™ technology support the state's commitment to environmentally responsible operations, and provide hardware-level security for robust threat protection.

## A Synopsis of Strategies for Achieving Optimization

### Transition to a mobile PC fleet

The transition to a mobile PC fleet being evaluated by California is paramount to optimizing its IT infrastructure. Laptops use up to 90 percent less energy, according to California's "Flex Your Power" initiative.<sup>2</sup>

Researchers studying the state's current computer environment recommend refreshing desktop PCs and CRT monitors with laptops optimized for extended battery life. In four years, an ideal environment would include at least 80 percent laptops and 20 percent desktops.

Global enterprises that have made similar transitions, including Intel, have reported significant savings in the costs of hardware, software, and end-user support costs. Intel reduced total cost of ownership by 67 percent, without including the additional savings from reduced energy use.

Moreover, a mobile PC environment offers additional strategic benefits. Computers outfitted with Intel® Centrino® 2 processors with vPro™ technology deliver cutting-edge performance on the road or in the office. Users that upgrade from a desktop to a notebook computer gain an average 51 minutes of productivity each day. PCs with Intel® Centrino® 2 processor technology also provide up to five times faster wireless connectivity and the longest possible battery life.

### Further benefits include:

- **Work-anywhere flexibility:** If 10 percent of the state's employees do not commute daily, it is the equivalent of taking 500 cars off the road each year, which would remove an additional 6 million pounds of CO<sub>2</sub> emissions from the atmosphere.

- **Disaster resilience:** A larger fleet of battery-optimized mobile PCs will improve the state's ability to respond to disasters, such as fires and earthquakes. It also allows users to continue working even when disasters disrupt commute routes or cause power outages.
- **Improved facilities usage:** As more employees work remotely, California can reduce space requirements and lower facility costs.

### Identify all PC assets

This study surveyed a representative sample of California's PC infrastructure Performed by BDNA. A comprehensive survey of all units is critical to ensuring security and optimizing energy and operational profiles.

### Establish a policy-based power management strategy

A strategy that implements automated, policy-based power management tools will reduce power consumption and carbon emissions per user by 40 percent. (PG&E and SMUD offer rebates to customers using power management software, speeding the return on investment.)

### Simplify imaging, configuration, software distribution and, asset management

Reducing the number of PC configurations and images, automating software distribution and centralizing asset tracking, as well as enabling remote support, could reduce deskside visits by three times.

### Standardize security hardware and software tools

Putting all agencies on the same security platform provides consistent coverage for application, network, and physical vulnerabilities. The hardware-level security provided by Intel® vPro™ technology protects against data loss, virus, and spyware threats by preventing infected, lost, or stolen PCs from gaining network access. vPro™ also enables remote boot-up, patching, and fixing even when the operating system is unresponsive.

### Centralize rollout, deployment, and recycling processes

Centralizing the various loads and other functions that take place during a computer's life can reduce rollout and deployment costs from \$500-700 per PC to \$150-\$200. Centralizing recycling and disposing of e-Waste and packaging will yield additional savings.

IT professionals recommend implementing these strategies over the course of the state's four-year technology refresh cycle. This phased approach makes it easier for employees to adopt new systems and for each optimization step to be thoroughly completed before moving on to the next.

By switching to a mostly laptop-based infrastructure with Intel® vPro™ technology, the state of California agencies can reduce not only costs, but also lighten the carbon footprint. This effort would support California's power conservation initiatives and Governor Schwarzenegger's Green Building Executive Order S-20-04. It would also likely qualify the State for membership in the Climate Savers Computing Initiative, strengthening California's leadership position on climate change.

### **Strategy: Measure**

Historically, California has described its IT Infrastructure based on estimates and high-level statistics. These estimates have largely been derived from surveys and manual inventories (e.g. 254,000 employees, 225,000 computers, 9,500 servers, 100+ email systems). For California to fully implement infrastructure change, there must be a comprehensive and accurate inventory of its current fleet. A detailed inventory will establish an equipment baseline and provide information on all segments of the IT equipment infrastructure. Only with this data can California develop policies, set priorities, and move to a more mobile and efficient PC fleet.

### **Strategy: Standardize**

Many of the IT groups within California's agencies and departments operate independently, which is reasonable given the technology changes of the past 20 years. Having these various organizations adopt consistent best-practice policies will greatly improve the state's efficiency.

**There are several steps to standardization:**

1. **Set policy based on industry best practices** (many of which are included here), and implement it across all state of California organizations.
2. **Continue policy-based vendor selection** through the California Strategic Sourcing Initiative (CSSI).
3. **Institute policy-based power management.** Technology analysts at IDC estimate that 50 cents of each dollar spent during the life of computer hardware goes to energy, and that is expected to rise to 71 cents in the coming four years.<sup>3</sup>

By transitioning to a majority-laptop computer fleet, California has an opportunity to mitigate these costs. When the state of Indiana adopted PCs featuring Intel® vPro™ technology, the government saved up to \$1.38 million over four years by using secure and reliable powering on and off for PCs that were previously on 24 hours a day.<sup>4</sup> Computers with vPro™ technology can also be remotely updated, enabling after-hours patching, even when PCs are powered down.

Older computers also generate more heat, boosting air conditioner and cooling system costs. Updated PCs with better power management can cut these expenses. In addition, requiring computers to use power supplies that conform to the 80 PLUS\* efficiency standard further reduces power consumption.

#### **4. Establish policy-driven security solutions by:**

- Defining security policies that apply across all state government organizations and that apply to all devices, applications, and networks.
- Selecting an enterprise-wide antivirus solution with automatic updates.
- Including hardware-based security on all PCs, like that delivered by Intel® Centrino® 2 with vPro™ technology.
- Maintaining and augmenting the Incidence Response Program of California's Office of Information Security and Privacy.
- Providing funding to establish and maintain the California Information Sharing and Analysis Center (CA-ISAC) as a clearinghouse for information on cyber threats to the state's critical infrastructure.
- Instituting policy-based technology refresh cycles on a three-year basis.

### **Strategy: Centralize**

Bringing California's wide fleet of PCs under central governance allows an organization to maintain inventory control and monitor all PCs connected to a network. A central management console lets IT staff manage, update, and secure all PCs through an intuitive interface. If those PCs are equipped with Intel® vPro™ technology, IT workers can access PCs at the hardware-level, even if they are turned off, inoperable, or stolen.

By enabling upgrades and patches to be downloaded to computers even when they are powered down, vPro™ technology ensures that all PCs receive every update, maintaining a high currency level across the network.

The cost and time savings are significant. With a central management console and vPro™ technology, updating software across 5,000 PCs takes 95 percent less time than doing it without vPro™.<sup>5</sup> The time it takes to diagnose a software problem on a single computer is cut by 88 percent.

Finally, when California makes the transition to a majority-laptop fleet, it can also establish maintenance and repair depots for those hardware failures that require physical inspection and repair. These centers allow technicians to service multiple laptops simultaneously, increasing productivity by three to four times.

## Strategy: Simplify

California is not alone in having an IT infrastructure with multiple operating system versions and myriad software applications installed on single PCs, often without the knowledge of IT staff. The problems with such variegated systems are many, including outdated machines, software conflicts, and security risks. Disparate deployment policies also increase the risk of missing hardware or unsecure equipment disposal. A few steps can reduce these risks:

1. **Implement single imaging for all newly deployed PCs.** Along with a management console, uniform imaging can help IT personnel see what is on a computer and identify unauthorized software. (There are, of course, software exceptions for certain employees, such as CAD programs for engineers.)
2. **Optimize rollouts and logistics to streamline deployment.** Deployment is a multistep process that encompasses staging, logistics, applications loading, user-state migration, operating system image loading, program management, and post-deployment support. Simplifying those tasks through efficient operation—including the possible use of resources available on strategic sourcing contracts for some steps—can bring the cost of deployment down from \$675 to \$260 per computer.<sup>6</sup>
3. **Implement secure recycling of packaging and e-Waste.** By using a strategic sourcing resource, the state can reduce disposal costs per PC and keep employee time required to a minimum.

## Strategy: Automate

As California makes the transition to a mostly mobile PC fleet with Intel® vPro™ technology, IT staff will be able to automate software patches and upgrade installation even when machines are powered down.

## Strategy: Mobilize

Moving to a laptop-based workforce can net considerable energy cost savings. Upgrading from desktop units to notebooks with Intel® processors using vPro™ technology reduces energy costs by more than 26 times. And increasingly efficient systems bring the added benefit of longer battery life.

## Conclusion

By transitioning to a majority-laptop IT infrastructure over the next four years, the state of California has the potential to yield substantial savings in energy costs and employee time. In addition, a dynamic IT landscape that is mobile, standardized, centralized, simplified, and automated will result in a system that is better equipped to face security threats and more efficient at meeting California's environmental goals.



Western Blue

1. Calculated using Energy Star Computer Power Management Savings Calculator, [www.energystar.gov](http://www.energystar.gov)
2. [http://www.fypower.org/com/tools/energy\\_tips\\_results.html?tips=office](http://www.fypower.org/com/tools/energy_tips_results.html?tips=office)
3. <http://www.idc.com.sg/briefings/bbsin-0801-GIT/default.asp>
4. State of Indiana case study, <http://communities.intel.com/servlet/JiveServlet/previewBody/1703-102-2-2745/320101-002US.PDF>
5. An Analysis of Early Testing of Intel® vPro™ processor technology in Large IT Departments by CHL Global Associates
6. IDC, 2007

PCs with Intel® vPro™ technology include Intel® Active Management Technology (Intel® AMT). Intel AMT requires the computer to have an Intel AMT-enabled chipset, network hardware and software, a connection with a power source, and a network connection. Data, results, and estimated improvements reported in this study are based on an evaluation of prototype Intel vPro technology equipment. Actual improvements in a production environment might vary. Other companies may see different results, depending on their IT service environment.

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