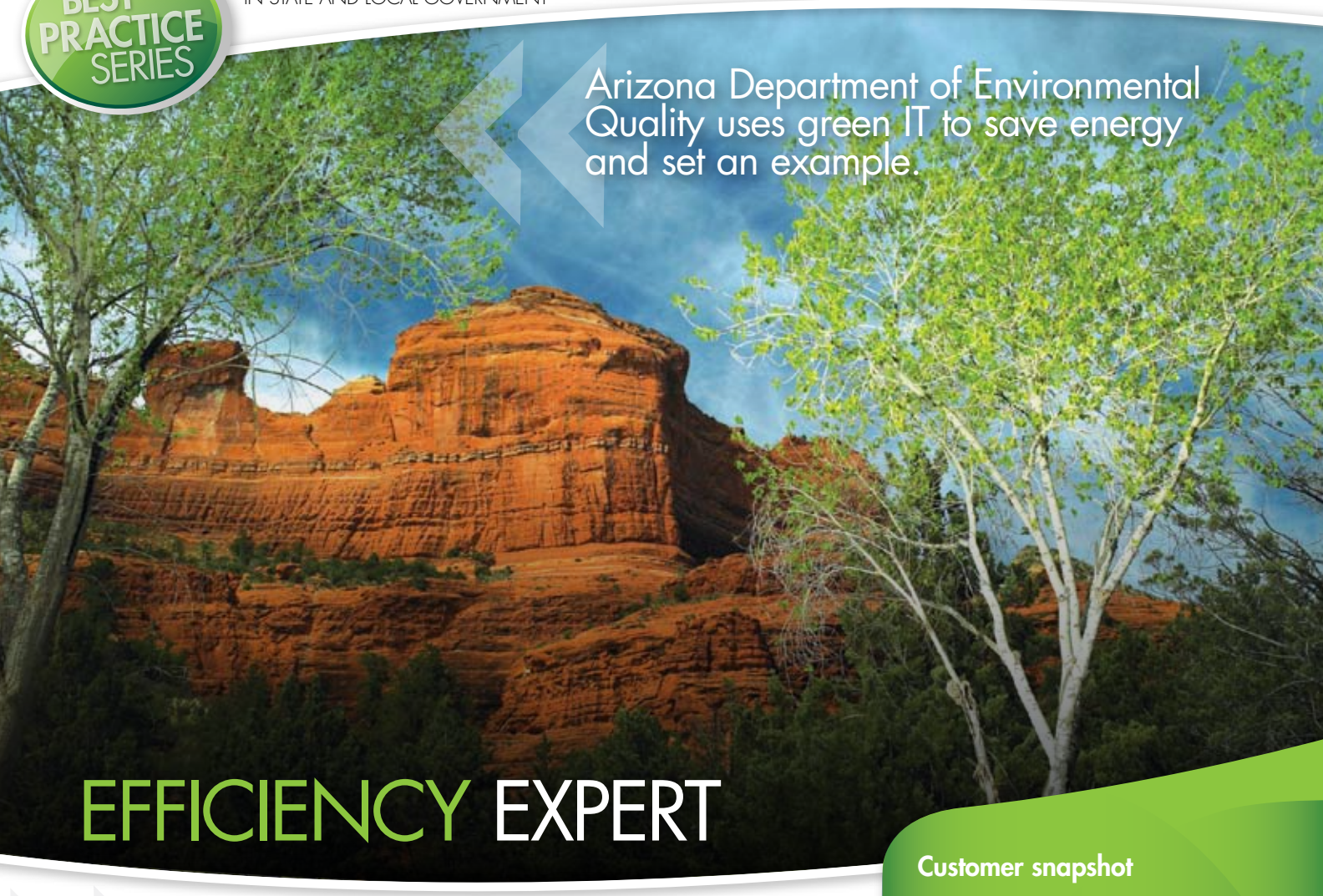

Arizona Department of Environmental Quality uses green IT to save energy and set an example.

EFFICIENCY EXPERT

IT'S FITTING that the Arizona Department of Environmental Quality—charged with safeguarding the state's natural resources—is a leader in using green technologies. Using energy-efficient blade servers and virtualization software, the department recently cut data center energy consumption and lowered IT costs, providing an example for Arizona agencies and businesses to follow.

Created in 1986, the Arizona Department of Environmental Quality (ADEQ) is a Cabinet-level agency responsible for administering all of the state's environmental protection programs. About 700 ADEQ employees support a wide range of programs that ensure the quality of Arizona's air, water and land.

Ron Hardin, CIO of ADEQ, said the agency's environmental efforts aren't only focused externally.

"We really do attempt to practice what we preach," he said. "We are looking to do the very things that we ask our public and our regulated community to do, in buying greener technologies and deploying efficient solutions."

Besides data center improvements, ADEQ is investigating power-management solutions to reduce the energy consumed by end-user PCs. And the agency reworked procurement practices to promote the purchase of efficient computing hardware.

Low-hanging fruit

An ADEQ data center evaluation performed about a year ago led to a series of improvements, including upgrades to the facility's cooling system.

"We were able to understand the air flow so we could do the appropriate

Customer snapshot

Objective: Arizona Department of Environmental Quality (ADEQ) is a Cabinet-level agency responsible for administering all of the state's environmental protection programs.

Approach: The department is setting an example for the public and other state agencies by deploying green technologies that help it meet its goals of reducing its carbon footprint.

IT improvements:

- The department upgraded its cooling/heating system to better manage temperature in its data center.
- Deployed HP Blade servers with Intel processors and virtualization technology to run, on average, almost 10 virtual servers on each blade.
- Adopted printing best practices such as duplex printing.
- Positioned itself to review best practices such as power management software to reduce energy consumption even further.

Business benefits:

- The department expects that the virtualized blade servers will reduce energy consumption by approximately 25 to 30 percent.
- Additional savings of around 40 percent in hardware and maintenance costs using the virtualized blade servers.
- Reduced waste through use of duplex printing and recycled paper.

hot/cold aisles in our data center," said Janine Blake, manager of ADEQ's technical support unit. "Now we don't have a lot of fluctuation in our cooling, and that was huge for us to be able to have a consistent temperature in our data center."

With the cooling system upgraded, ADEQ began deploying powerful blade servers equipped with virtualization software. The combination let the agency deploy an average of almost 10 virtual servers on each physical machine, which cut energy requirements and greatly simplified ADEQ's IT infrastructure.

Blade servers utilizing energy-efficient processors delivered both power and efficiency, Blake said. "When we looked at the type of blades that we wanted to purchase, we needed the very high-end servers with powerful processors, but we still looked for servers that had low-watt processors and low-power RAM."

ADEQ expects these changes to generate dramatic benefits. For instance, Hardin predicts the agency's use of virtualization and highly efficient blade servers will reduce energy consumption by 25 to 30 percent.

Because the agency needs fewer physical servers, it also will avoid a significant amount of hardware and maintenance expenses. "I expect savings of almost 40 percent—and that's being a little conservative, I think," Hardin said. "That's what our portfolio will yield us year after year."

Transformational opportunity

Beyond energy and cost savings, ADEQ's new blade servers provide a flexible foundation for core applications. The agency is moving critical applications to the new infrastructure and evaluating how features like load balancing and hot-swappable parts can strengthen disaster-recovery capabilities.

"We are looking at a data center transformation, and this is just the beginning," Hardin said. "It opens up a whole new world for us in terms of efficiencies and getting the best use out of our investments in infrastructure."

And the transformation doesn't stop with the data center. ADEQ also is exploring other solutions, such as power-management software, to improve the efficiency and manageability of end-user technology.

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>
> *Ron Hardin, CIO, Arizona Department of Environmental Quality*

Although PC users in ADEQ are required to manually shut down their computers at the end of the day, Blake said the agency wants to automate and improve the process. "We are evaluating tools that can be used throughout the business day that do not impact people from doing their work," she said. "If they are not using their computer, we want to be able to shut them down or put them in standby mode."

To reduce waste, ADEQ also uses duplex printing and recycled paper. "We turn duplexing on for certain printers in certain areas because it's important to make sure we're using both sides of the paper," Blake said.

Fighting climate change

ADEQ's green IT initiatives support Arizona's statewide strategy for reducing greenhouse gas (GHG) emissions. A 2006 executive order by Gov. Janet Napolitano set a goal to reduce Arizona's GHG emissions to the 2000 emissions level by the year 2020 and to 50 percent below the 2000 level by 2040.

Napolitano's order includes a series of recommendations developed by the governor's Climate Change Advisory Group, including improving energy efficiency for buildings and appliances, reducing energy demand by consumers and businesses, and increasing the development and use of renewable energy sources.

"Implementing these recommendations should cut our demand for energy by increasing energy efficiency, and improve air quality, all the while saving Arizonans money through reduced fuel costs and lower electricity bills," Napolitano said. "Developing Arizona's renewable energy sources—such as solar, biomass, biofuels, wind and geothermal—will help us reach these goals, and at the same time, create jobs. It's a win-win for all of us."

Hardin said the governor's green commitment is changing how Arizona approaches technology, from beginning to end. "There is a goal coming all the way from our governor's office down through the individual agencies," Hardin said. From green procurement practices, to more efficient use of IT resources, to aggressive recycling campaigns, ADEQ is working to conserve natural resources from the inside out.

And Blake added that ADEQ gladly will share insight gained through its green initiatives with other state agencies.

"We definitely want to share ideas and also be an example to other agencies," she said. "We have the opportunity to do a little bit more because we're not too big and we're not too small. Our size allows us to move forward with some of the more leading-edge technologies, maybe better than some of the other agencies could as quickly as we can."

Customer solution at a glance

Primary applications:
The Arizona DEQ uses server virtualization to reduce the number of physical servers in its data center. The technology reduces both IT costs and energy consumption.

Primary hardware:

- HP Blade servers with efficient Intel processors.