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Yale University Shuts Off Computers to Save Energy

How Yale Saves Over \$40 /Desktop PC Annually in Energy Costs

For many years, Yale University Facilities departments had left their computers on 24/7 to accommodate nighttime backups and software updates. While backups and updates are important for maintaining a healthy and secure network, Yale's Facilities Information Systems department realized that energy and dollars were being wasted. Yale University's Facilities department was able to:

"Using in-house tools and some ingenuity, we were able to find a means to continue nighttime updates and shut off computers at night."

Faith Brown - Director of Facilities Information Systems

- Ask their end users to turn off their computers before they leave.
- Automatically wake up, back up and shut off computers at night.
- Save over \$40/computer annually or \$4,700 per year.

Here's how they did it...

TESTING A MEANS TO ACCOMMODATE NIGHT-TIME BACKUPS

Yale University Facilities realized that a simple means to save energy would be if users turned off their computers at night instead of leaving them on 24/7. However, they needed to wake up the computers before scheduled backups. Landon Canida, System Programmer, was tasked with finding a means to wake up the computers before scheduled Tivoli backups, which were typically performed on predetermined schedules at night.

"It was gratifying to find such a simple and effective solution to this problem. The solution help saves money and protects the environment."

Landon Canida - Systems Programmer

On a test network of 20 Dell desktop machines, Mr. Canida manually set the **auto-wakeup values in the BIOS** to 5 minutes prior to the scheduled backup. Auto-wakeup boots up a machine that has been shut off (in the S5 sleep state). When the computers booted up at 10:15 pm, the Tivoli Backup Services automatically started using system credentials, communicated with the backup server, and ran as scheduled.

To save energy after the backup, Mr. Canida sought a means to then shut down the machines again after the backup took place. In order to shut the machine off, he added the following line of code:

```
POSTNschedulecmd 'shutdown -s -f'
```

To the following Tivoli file:

```
C:\Program Files\Tivoli\TSM\baclient\dsm.opt.
```

This code allows Tivoli Backup Service to launch the Windows command "SHUTDOWN", which forces a computer to shutdown and close applications after it completes its backup.

IMPLEMENTING THROUGHOUT THE FACILITIES DEPARTMENT

After successfully waking up and shutting off the computers on the 20-computer test network, the Facilities Information Systems group discussed how this could be implemented throughout the department. They concluded that:

- Forcing computers to power off at night at a set time, although certainly possible, involved too much risk in terms of lost data. Instead, an email campaign asking users to turn off their computers before leaving at night was implemented.
- Certain computers would have to be exempt from this setup such as those used in 24/7 computing processes or needed for remote connection. Laptops, which were generally taken home at night, were also exempted.

Overall, 105 desktop PCs were set up to wakeup at night before scheduled backups. The auto-wakeup values were set across 105 computers by delivering a package via the Landesk Management Suite. The package was created by the Dell Client Configuration Utility, which can be found at the Dell Web site.

THE RESULTS

Yale Facilities personnel have been shutting off computers at night since February 2006. In addition to saving \$4,700 per year, shutting off the computers:

- Prevented the emissions of 61,000 Lbs CO₂
- Saved enough electricity to power 34 homes
- Was equivalent to planting 8 acres of trees.

The next step is to determine where this approach can be used on the rest of campus. With over 10,000 computers at Yale, the savings could be over \$400,000 annually.

FOR MORE INFORMATION

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