The Art of Efficient Systems Administration

System Administrator's Dilemma: “The great paradox of efficiency is that the more we speed up, the more acute our frustrations when we’re forced to slow down.” -- Jennifer Senior (nymag.com)

Sales Pitch for Virtualization: Improved utilization of hardware, reduced long-term hardware costs, “easier” to manage more servers

Virtualization in the Real World: Faster deployment of new systems, ability to isolate services on a single server, hardware independence (somewhat), easier to reconfigure (change disk/ram/cpu) of servers

Why Virtualization: Abstract services from servers (adopt a network centric approach), increase flexibility and scalability while decreasing software dependencies

Why Xen: Open source (free), available as packaged software for Debian/Ubuntu/Fedora, easy to migrate existing physical server to virtual server host, rapid deployment of new systems (about 3 commands), ability to run 64 bit and 32 bit systems on same host platform

Initial Target Environment for Virtualization: 6 physical servers providing various network services (email, file sharing, network management, web, database, application hosting, development versions of each)

Pre-Xen: (6) physical boxes - (6) physical servers
Post-Xen: (2) physical boxes - (10) virtual servers – reduced server count by 1/3 and increased total servers 5/3

Realized Gains: Able to utilize >4GB of RAM per physical server, can reboot systems in 32 seconds, can deploy new servers in about 15 minutes,

Where to Next: Virtualization of Windows 2003/XP Servers, virtualization of remaining unix servers

Initial benchmarks look promising with GPL/Open Source Paravirtualized Windows disk & network drivers (postmark settings; set number 10000; set transactions 20000; set subdirectories 5; set size 500 1000000; set read 4096; set write 4096)

- server: ubuntu 8 64bit / xen / estfs
- storage: direct attached / raid0 / 2x255gb 7.2k sata / idle
- 548.25 megabytes read (3.51 megabytes per second)
- 1358.80 megabytes written (15.80 megabytes per second)

- server: windows 2003 server 32bit / xen 1.2 / estfs (with xen PV 0.9.6 drivers)
- storage: direct attached / raid0 / 2x255gb 7.2k sata / idle
- new routes using tap: vla10 (live driver for windows 2003) server “drive”
- 548.25 megabytes read (4.25 megabytes per second)
- 1358.80 megabytes written (8.98 megabytes per second)

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UC Shared Images at Santa Barbara

What is it?
UCSB is building image collections in ARTstor in a unique system-wide partnership involving CDL, ARTstor, UC libraries, Visual Resources Curators, IT and ID departments.

How does it work?
In ARTstor, each collection is separate, however, a simple keyword search finds images across all collections. Collection names are preceded by “UC Share” to identify them as part of UC Shared Images.

Why is it good?
For the first time, UCSB along with the other UC campuses can collaboratively develop image collections and share them across the University of California system, reducing redundant effort and providing a convenient, single point of access to the essential images faculty need for teaching.

UCSB image collections can now be collaboratively constructed by image users, by image professionals, and by ARTstor, all of whom play crucial roles in building an extended image community.

UC Shared Images delivers essential image collections UC-wide for teaching.

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UC Shared Images in ARTstor:
www.artstor.org

More info:
www.cdlib.org/inside/projects/image/