
NetFiles

The File Storage Service at the University of Illinois

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University of Illinois at Urbana-Champaign Campus Profile

- 29,300 undergraduate and 11,050 graduate students
- 7,900 faculty and staff
- 272 major buildings on 1,458 acres (5.9 sq km)
- Located in central Illinois, about 225 km (140 mi) south of Chicago in a town of 100,000.
- Total budget in FY05 \$1318M

UIUC Academic Profile

- A first-tier research institution with internationally renowned faculty.
- Consistently one of the top 5 ranked engineering schools in the USA, especially: Computer Science, Civil Engineering, Aeronautical Engineering,...
- Top ranked for Business, Agriculture, ...
- NCSA (National Center for Supercomputing Applications) -- Home of MOSAIC, the first mass-used web browser.

Campus Information Technology and Educational Services -- CITES

- Basic IT Services
- Learning Management Systems
- Network infrastructure and connectivity
- Labs and classrooms
- Operations Center
- Help Desk
- Cost recovery services
- Security
- Software contracts

CITES Primary Mission

- To provide services, not technology, to our customers.

Our guiding principle in selecting a new product is the quality of service that can be built on that technology.

Some Criteria in Building a Service

- Integration with existing services
- Account provisioning/management
- Scalability
- Manageability
- Compatibility with Campus and University IT policies
- Personnel to build and manage the service
- User training
- Vendor support and stability
- Exit strategy
- Time to deployment
- TCO – Total Cost of Ownership

File Storage

- We formerly offered a technology, not a service – a cluster of Unix servers.
- In 2001-2002 we surveyed software and hardware solutions
- Requirements were developed for a next generation service.
- We determined that the marketplace was ready.

Requirements – Examples

Minimal and Operational Requirements

- Multiple platform support
- No special purpose client software required
- Web browser accessible
- Platform native clients (e.g., WebDAV)
- Scalability
- Reliability
- Authentication mechanism
- Password encryption
- Server hardware support
- System and user account management
- Backup/restore/disaster recovery
- Vendor support

Investigation Phase of Project

- Xythos had been identified by an evaluation committee to have a viable technology.
- Pilot study was initiated, using Xythos, to
 - Confirm that the service is relevant and usable
 - Confirm our infrastructure was sufficient
 - Identify operational issues and requirements
 - Determine resources (staffing, hardware, impact on the department,...)
 - Create a business plan

Results of Pilot Study

- No technology problems were identified
- Internal issues we needed to address –
 - Lack of internal database administration experience with Oracle
 - Lack of robust enterprise directory
 - Need to evaluate SAN devices
 - Minor software customizations needed

Purchasing and Selection

- State government requires a competitive bid process for large purchases.
- An RFP (Request for Proposal) was issued.
- We received a complete response from two vendors.
- Xythos was selected
 - Best compliance with requirements in the RFP
 - Best cost

After Software Selection

- Select SAN hardware
- Service creation, for example –
 - Integration with UIUC authentication/authorization
 - Backup/recovery implementation
 - Documentation
 - Help desk training
 - Finalize business plan
 - Tools for migration to the new service
 - Service monitoring

NetFiles - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

https://netfiles.uiuc.edu/xythoswfs/webui/tuchman

CITES NetFiles

Logged in as:
Allan Michael Tuchman

Log out

Bookmarks

- /tuchman

Searches

Utilities

- Preferences
- Contacts and Groups
- Empty Trash
- CITES NetFiles Documentation
- Vendor Documentation
- Change AD Password
- Log out

Up Search Refresh New Directory Upload Move Copy Delete Rename Download Email Help

Directory: /tuchman/PAG

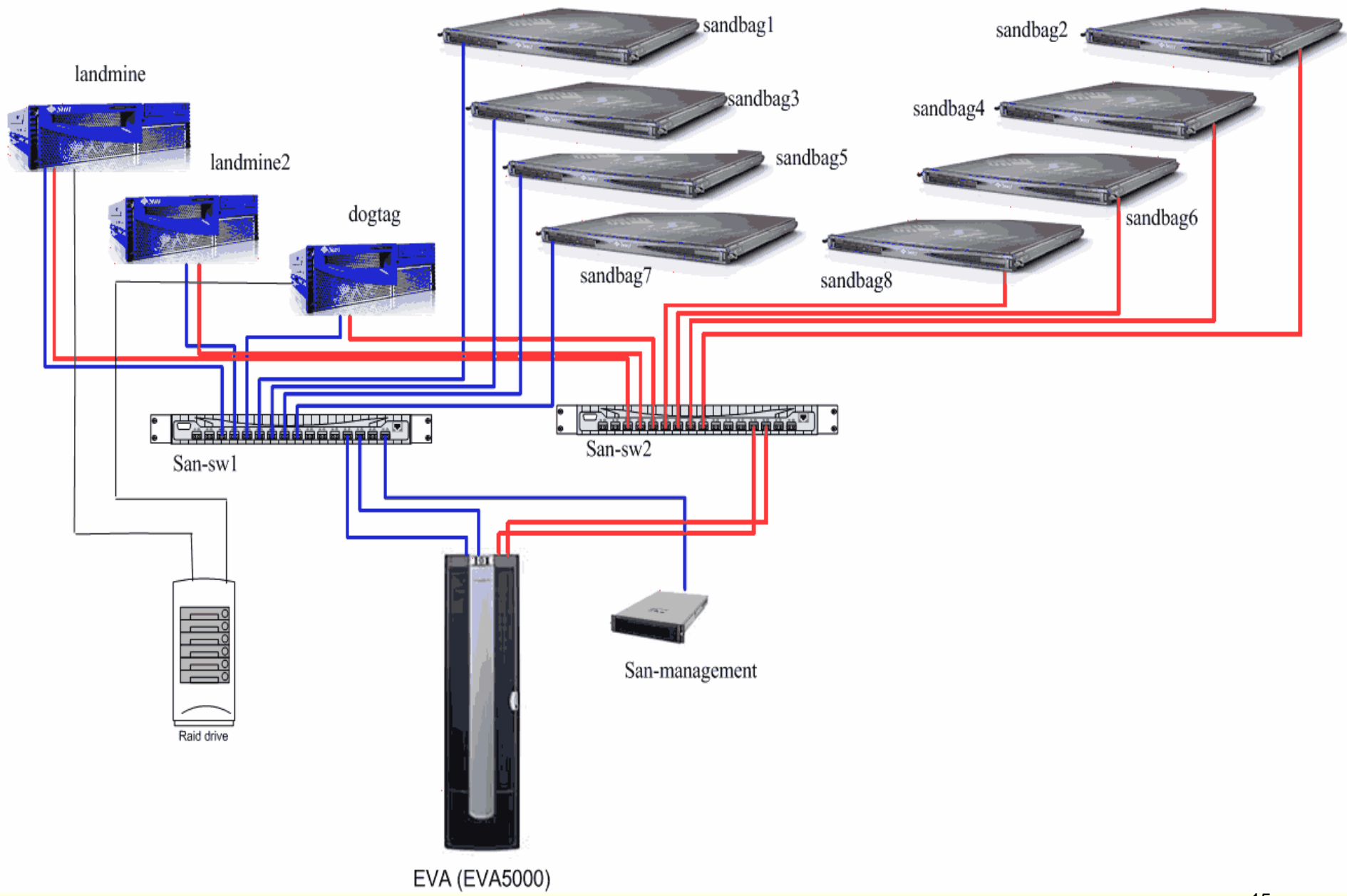
Name	Manage	Share	Lock	Delete	Modified	Size
Cluster-retire					7/9/04 5:46:51 PM CDT	29KB
Express					2/16/06 7:52:17 AM CST	21.5KB
Hiring					2/10/06 11:17:34 AM CST	2.09MB
Newer PAG web					9/26/05 5:04:46 PM CDT	118.4KB
PAGweb					3/25/05 4:34:08 PM CST	22.1KB
Personnel					2/20/06 1:43:54 PM CST	3.86MB
Position Announcements					7/14/05 1:24:48 PM CDT	517.5KB
TSM					11/5/04 6:29:15 PM CST	83.5KB
Cluster Retirement milestones.doc					2/5/04 1:11:47 PM CST	26KB
Email Limits-1.jpg					1/8/06 5:04:02 PM CST	25.0KB
Email Limits-1.sdr					1/8/06 5:03:10 PM CST	27.8KB
Email Limits-2.gif					1/8/06 5:30:23 PM CST	19.5KB
Email Limits-2.jpg					1/8/06 5:29:26 PM CST	29.8KB
Email Limits-2.sdr					1/8/06 5:28:20 PM CST	32.0KB
Email Limits.sdr					1/6/06 5:22:03 PM CST	21.8KB
FY05 equipment.xls					4/22/05 1:04:35 PM CDT	19.5KB
HighSpeed					1/30/04 4:56:25 PM CST	1KB
Migration draft timeline.xls					2/5/04 6:50:23 AM CST	18.5KB
pag					2/5/04 9:43:52 AM CST	1KB
PAG_Checkpoint2005.doc					2/8/05 8:47:52 AM CST	47.5KB
PAG_Checkpoint2005.pdf					2/8/05 8:48:59 AM CST	47.8KB
RFP1TJT722_Evaluation_Matrix.xls					4/5/05 5:54:22 PM CDT	45KB
22 items					Total size: 7.07MB (Quota: None, Available: 394.8MB)	

NetFiles 1

Done netfiles.uiuc.edu

General Architecture

- 10 front end servers (Sun V210)
- Load balancing switch (Foundry ServerIron SLB)
- Oracle database server (Sun V880) spare ready with Oracle Dataguard
- Sun QFS file system
- HP EVA 5000 SAN (1.8 TB RAID 0+1)
- 3 TB RAID for disaster recovery (AC & NC)
- Highly redundant, few single points of failure, robust



System Utilization

February 2006

- 29,514 users
- 3.15 M files
- 812 GB space used
- 578 active tickets (point in time)
- 1,144 Registered Student Organization directories

- 26 GB/day or 1.5 TB/month
- 200,000 unique visitors/month
- 400,000 visits of 2.7M pages

Migration from Existing Unix System

- We developed a tool to move files from accounts on our Unix system to a NetFiles (Xythos) account.
 - Moves all files except mail folders and files beginning with a dot.
 - Preserves web content and automatically publishes.
 - Sensitive to .htaccess file permissions
 - Preserves permissions on files
 - URL redirection on old system

Benefits – to CITES

- Unix cluster was retired.
 - Direct cost savings on hardware, software, and Unix system management.
- Operationally we have a more reliable, robust, scalable service.
- Less Help Desk support
- Compliant with campus IT and security policies.
- Successful cross-group collaboration in the project investigation and implementation.

Benefits – to Users

- Collaborative features
- Direct web publishing
- WebDAV clients (web folders on Windows)
- Usage is more familiar and easier to use than Unix tools for modern computer users
- Better security
- Better access to files from any location
- An alternative to large email attachments
- Other new features

NetFiles Projects/Futures

- Registered Student Organization web sites
- Grants and Contracts proposals submission
- ePortfolios
- Integration with WebCT Vista
- Podcasting
- Scanning service, scan-to-account
- Photo archive with sales
- Library – many projects including electronic reserves and digital repository

Summary

- NetFiles service has been developed using Xythos technology. Well-received from its release to our campus in October 2003 .
- NetFiles integrates well with our strategy for highly robust, reliable, relevant services.
- NetFiles is identified as a strategic service for us – one that we will build upon.
- Xythos, as a company, has been a strategic partner.