Improving IT Support for Academic Research: Integration and Infrastructure Expansion

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Overview

- What is the Nicholas School?
- The past: a pre-2001 view
- The present: what we changed
- The future: what's next?
- Summary
- Questions
What is the Nicholas School?

- History
- Divisions & Locations
- Community
- Facilities
History

- 2000
  - Name is “tweaked”
- 1997
  - Geology Dept. joins as EOS
- 1995
  - Renamed Nicholas School
- 1991
  - merge of School of Forestry and Duke Marine Lab
Divisions and Locations

- LSRC (Durham)
- Old Chem (Durham)
- DUML (Beaufort)

- ESP division
- EOS division
- CSSP division
Community

- Faculty: 90
  - 50 (ESP), 25(EOS), 15(CSSP)
- PhD students: 107
  - 60 (ESP), 20(EOS), 27(CSSP)
- Master's students: 261
  - 203(ESP), 58(CSSP)
- Undergraduates
  - 69 (ESP/EOS), transitory (CSSP)
- Research Centers: 11
- Staff:111
  - 62(ESP), 8(EOS), 41(CSSP)
Facilities

- Oceanographic research vessels
- 8000 acre forest
- Computing labs specializing in geospatial and statistical applications (46 seats/ESP; 4/EOS; 20/CSSP).
The Past: a pre-2001 view

- **Political climate**
  - IT played “favorites”
  - General distrust
  - Differently unhappy groups
  - Policies are for babies

- **Financial climate**
  - Retrenchment
  - Change in Dean

- **Technical climate**
Technical Climate

• IT-managed domains
  – ESP: Solaris, Windows NT 4.0, Active Directory, Netware
  – CSSP: Active Directory (separate from ESP)
  – EOS: what?

• Operating systems
  – ESP/CSSP: Solaris, Windows NT, 95, 98, 2000
  – EOS: above, plus Linux, Mac OS 9, OSX, IRIX, Tru64

• Security: all your bases belong to us

• Services: why not?
Divisional Differences-1

- **Staff size**
  - ESP: 2 (1 UNIX, 1 Windows)
  - EOS: 1
  - CSSP: 2.? (Windows, dive instructor, AV guy)

- **Support mandate**
  - ESP: “Just say no” to research support
  - EOS: “No is not an option” [but service is ad hoc]
  - CSSP: “Make 'em pay” [rich get richer?]
Divisional Differences-2

• **Services**
  - CSSP: file, print, license, apps
  - School (ESP): DNS, web, mail
  - ESP: same as CSSP but X3
  - EOS: web

• **System infrastructure**
  - Replacement schedules
  - Backup systems: local vs. network
  - Shared resources
Problem Summary

- Distrust of IT
- No money
- Changing Dean
- More OS than staff
- Lax security
- Inconsistent support
- Scalability issues
- “miles to go before we sleep”
What happened?

- Got two things: resources and responsibility

  - Resources
    - New Dean with startup money
    - Recognition of the need to commit funds to IT

  - Responsibility
    - Dean decided to centralize IT, with me as director
    - What influenced his decision?
IT Organizational Change: why?

- “State of IT” Report
  - Based on tracked data
  - Indicated systems development and security weaknesses
  - Indicated need for staff development
- Email on inability to secure resources

Requests by customer area

- Faculty 31%
- Staff 28%
- Students 26%
- Labs/centers 15%
IT Administrative Change

- IT Director reports to Dean
- Staff changes:
  - Durham location goes from 3 to 5 FTE
    - 3 of 5 hired after restructuring
  - Beaufort location goes from 2.? staff to 2 full time, IT-only staff
    - One hired after restructuring
- Nonspecific agenda from Dean works to our advantage
Changes Implemented

- Technical changes
  - Domains
  - Operating systems
  - Security
  - Services
  - System infrastructure

- Support changes
  - EOS staff
  - Research groups and centers
Technical Changes-1

- **Domains**
  - Retired Netware
  - Restructured Windows NT 4.0 and Active Directory into one domain (now Samba PDC)
  - Migrated from Solaris to Linux with NIS/Kerberos

- **Operating systems**
  - Retired NT, Netware, Windows 95, 98, ME
  - No dual boots - vmware

- **Security**
  - No root access; few users are administrators
  - Port filters on router; testing perimeter firewall
Technical Changes-2

- Services
  - Consolidated Durham services
  - Retired IIS: migrated EOS to ESP server
  - No individual mail
  - Clients on DHCP
  - Centralized printers and licenses
Technical Changes-3

- **System infrastructure**
  - Inventoried desktops; standardized replacement schedules
  - Backup systems: down from seven to three:
    - Sony AIT-3 library for all servers
    - Retrospect for those not yet migrated (~10)
    - IRIX research group tape drive
  - Shared resources
    - Free color lasers; low-cost poster printer
    - Networked storage, apps, installs
Support Changes

• EOS staff 100% migrated

• Research groups and centers
  – Tru64 group: “odd OS”
  – Wetlands lab: “Help, we have no backup!”
  – Soils lab: “Being an admin isn't fun anymore”
  – Env. Health: protecting patient data

• Conceptual shift: you tell us the goal; we tell you how to achieve it
When Integration Fails: research support problems

- Developers of IT services, e.g. map servers
- Work groups that cannot be upgraded without major expense
- Researchers who operate insecurely
What next?

- Firewalls
- Cluster computing
- CSSP bandwidth
- Network access
- Expanding videoconferencing
- New building!
Summary

- Most research needs are generic: space and processors
- Do not duplicate effort
- Think globally and act locally
- No decisions are final
- Integrating research support benefits:
  - Saves IT time
  - Provides better support
  - Grants can fund hardware that others can share
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