Windows 2000 Conversion Wrapup

Al Williams (alw@psu.edu)

Penn State Teaching and Learning with Technology

SHARE 98, Nashville, TN

Session 5822

Introduction

- We've reorganized (again, and again, and …)
- Teaching and Learning with Technology
- Provides resources and support
  - For teaching
  - For students (labs)
- Do not do PSU Administrative Computing
- Have no authority over Colleges or Departments
  - Part of Computer and Information Systems
    - Oops – that's now Information Technology Services
    - ITS @ Penn State

My Group

- Classroom and Lab Computing (name changed from Distributed Computing)
  - About 30 full time & 60 hourly employees
  - Student Labs (44)
  - Technology Classrooms (126)
  - Workstations and Servers (2000)
  - Serve up applications (hundreds)
  - 42K Students at University Park campus
  - 80K Students system-wide

Topics of Discussion

- Status last summer
- Completed Windows 2000 Upgrade
- Caused a political firestorm
- Current efforts
- Windows XP for summer 2002
- Lessons Learned
- What next?

You Missed a Good One

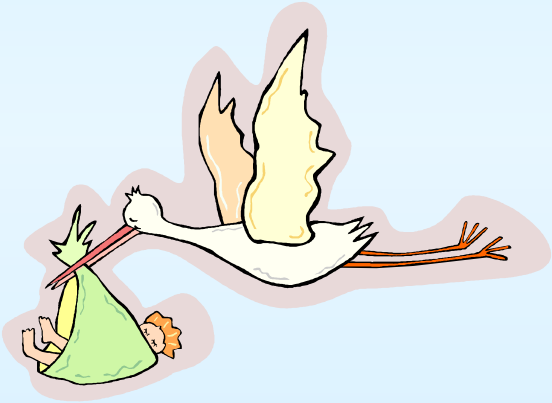
- Monday 1:30 Session 5800
- Windows 2000 and .NET Security Solutions and Technologies
- Rand Morimoto
- Look for it in the Proceedings
- Great detail
- This session more introductory in nature

Status Summer 2001

- In middle of W2K upgrade
- Big effort to manage applications
- Replaced older hardware
- Optimistic that we could make it

New GINA

- Graphical Interface for Network Authentication
- Create new PSUGINA
  - Providing an installer
  - Uses stub facility
    - Registry points to PSUGINA
    - We load MSGINA
  - Keeps MSGINA



New GINA

- Logon Interface
  - Capture userid and password
  - Writes security event
- PSUGINA communicates with PALS (encrypted UDP)
- Calls MSGINA for Domain Logon

Print Accounting and Logon Server (PALS)

- Provides proxy server for DCE authentication
- W2K server running Gradient DCE
- DCE (K5) and K4 capable
- Secure, encrypted exchange with PSUGINA
- Enables same service to Mac
- Keeps log of who logs on

Windows 2000 Conversion Completed!

- Up and running for Fall Semester
- One lab renovation not finished
- Considerations for support of other operating systems
- Looked good
  - Systems more stable than NT 4
  - Applications up and running

Supporting Other Operating Systems

- Need to support NTLM (authorization)
  - All Access Account users joined to top Domain
  - Passwords synchronized dynamically
- Users can connect from
  - NT 4
  - W9X, ME
- Added software to Student File Server
  - Apple IP Server
  - Supports Mac file access on a cluster

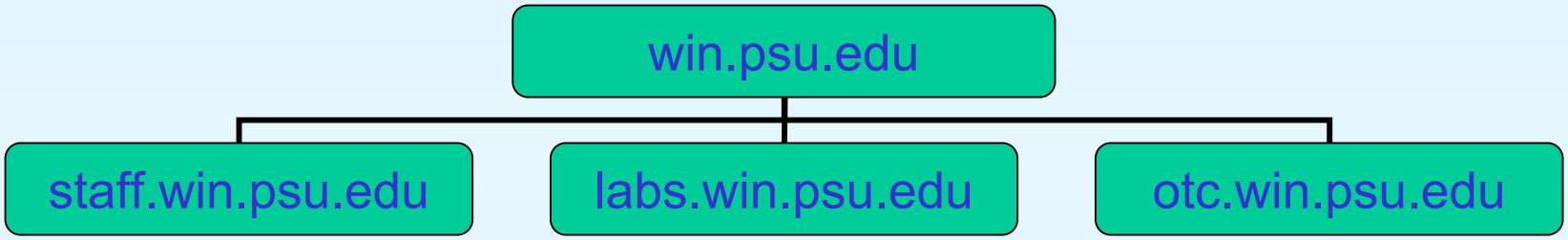
Access Account Userids?

- In 1991 started project for single userid
  - Called Access Account
  - Everyone gets one when they join Penn State
  - Central authentication service
    - Started as MIT Kerberos V4 KDC and AFS
    - Migrated to DCE and DFS

Userids and Passwords

- All Access Account userids in win domain
  - Nightly update for changes
- PALS server still checking logon authentication
  - Sets W2K password if not the same as DCE
- Added service to our win DC to accept password sets and user joins
- Disabled password change from workstation
- Use a web page to set DCE password

Domain Structure

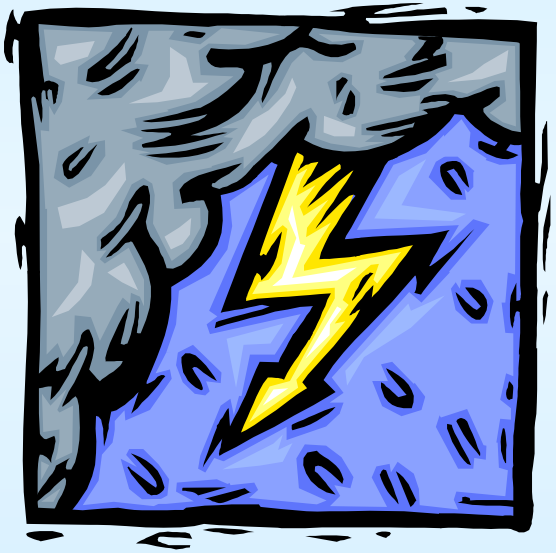


Other Services

- Added AIX Samba Server
  - Provides access to DFS for Windows
- Provide mapping mechanism on desktop
- Added Sun Solaris Netatalk Server
  - Provides DFS access to Mac
- Added Apple IP product to student file server

Political Firestorm

- Thought I had buyoff
- Some viewed synchronizing passwords as stealing passwords
- Some thought this was a security violation
- CIO got involved
- 7 week delay in services



Issues

- Issue of who owns the KDC
- Issue of whether duplicate sets of userids and passwords is a bad thing
- Issue of control point
- Lack of understanding of
  - How Windows 2000 works
  - Services that we deliver
  - What customers want

Why is CLC Doing This?

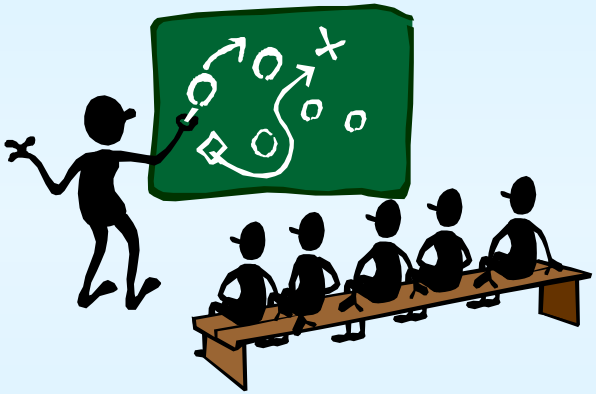
- Developed expertise to support lots of computers in a distributed environment
- Shared that expertise
- Started delivering support and services
  - Each one blessed
  - No one appreciated the aggregate implication

What Implications?

- Other departments and colleges want what we have
  - Want to authenticate to our Active Directory
  - Want to use our software (when possible)
- PALS has become integral to PSU security
  - Only record of logon / logoff
  - Lots of folks using our GINA code
  - Controlling Karl Bridge router authentication for all of PSU

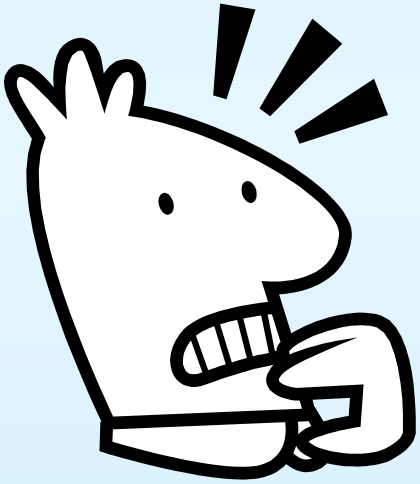
Strategic Implications

- Should CLC be setting domain strategy for PSU?
- Is this the only way to deliver the services?
- Up till now, no interest in doing Windows Domain planning for PSU.
- Have stirred up interest! (or at least fear)



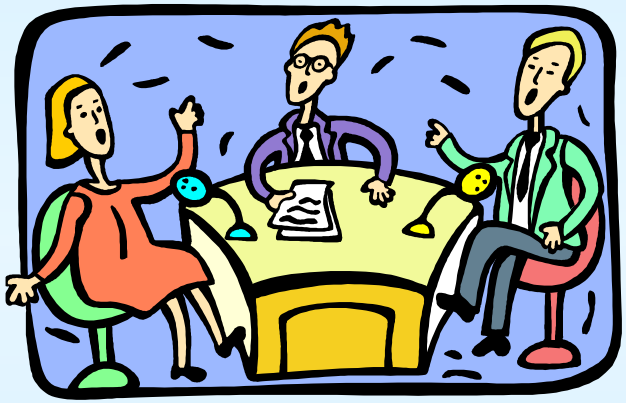
What Fears?

- Everything that we visited before is back
  - DNS
    - Why does my machine have that DNS name?
    - Why do you want to run DNS?
    - Why is it integrated with AD?
  - File service
    - Why are you doing file service?
  - AD Accounts
    - Why do you have Access Accounts in AD?
    - Why do you need the real passwords?



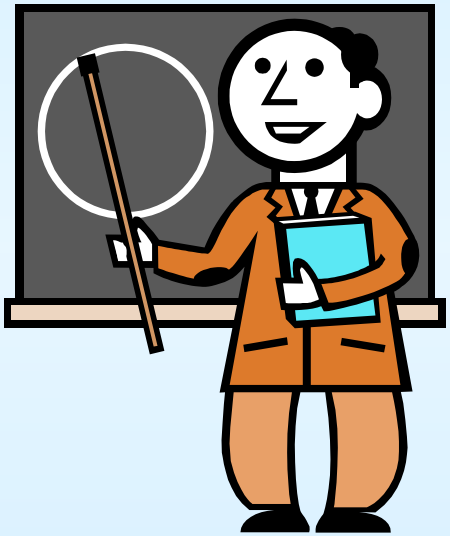
Communications Breakdown

- Developed services strategy a year ago
- Communicated to my management
- It was largely ignored
- Perhaps no one thought we could do all that
- Not being ignored now



Current Efforts

- Educate
  - Bridge the understanding gap
  - Market the services strategy
  - Build consensus
- Placate
  - Try a one-way relationship with DCE
    - Building and testing a separate AD Domain
    - See what works and doesn't



Meanwhile Windows XP

- Target conversion this summer
- Roll out even more services
  - Terminal server for software access
  - Roaming profiles
- Services dependant on both authentication and authorization

Why Windows XP?

- Only way to get Windows 2000 maintenance
- Improvements in handling MSI packages
- Some nice new features
- Annual window of opportunity
  - Only do major changes in summer
- Prepare for .Net

What XP Features?

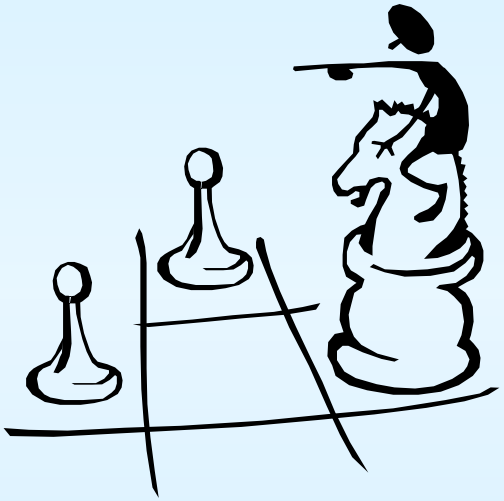
- Built in terminal server on Workstation
  - This might be real useful for help desk
- Application Compatibility Mode
  - Allows us to run some applications that don’t run on Windows 2000
- Native CD write capability
- Reliability improvement
  - Seems even better than Windows 2000

What XP Features?

- Better plug and play
  - Recognizes and uses more devices
  - Not universal plug and play
- Digital media?
  - New media player, movie maker, photo support
- Better power management (for laptops)
- 64-bit itanium support
- More policies

Windows XP Plan

- Prototype lab next month
- Only do XP equipment upgrades
- Migrate our way through all labs and classrooms this summer
- Improve servers to support
  - Roaming profiles
  - User file space upgrade
  - Terminal server



Lessons Learned

- Sometimes it’s better to be a planner than a doer
- Last reorganization diverted attention away from windows strategies
- Need to formalize our windows strategy
- Need to market the strategy and obtain senior management buy in
- We aren’t just supporting PCs any more

Lessons Learned

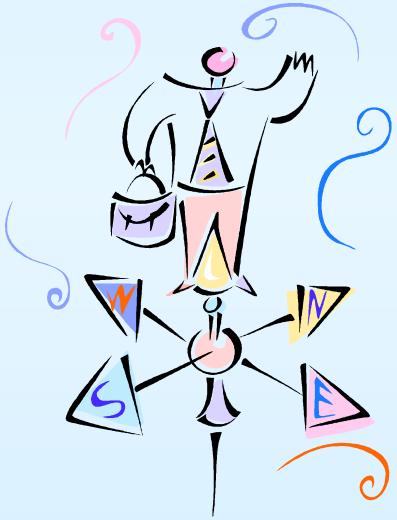
- Active Directory really works
- Our objectives seem quite attainable
  - Services for both DFS and NTFS
  - Ubiquitous Access Account
  - Ultimately – Single Signon
- Lots of Windows applications are not Kerberized
- Still need NTLM

Lessons Learned

- Authorization is much more difficult than authentication
- They don’t understand what I’m saying
  - Need to provide more basic windows education
    - For peers
    - For management

What Next?

- When in doubt – reorganize!
- I have new job
  - Develop strategy
  - Recommend policy
  - Market the ideas
  - Build consensus



What Next

- Continue with XP conversion
- Also happen to be doing Mac OS X
- Build test bed for Active Directory integration into Kerberos / DCE realm
- Document everything in open forum
- Spend lots of time doing presentations

Objective

- Teach about services and capabilities of Windows
- Focus on services for customers
- Reach senior management
- Propose policy
- Build a Penn State Domain Strategy

What are Our Alternatives for Authentication?

- Continue with current
- Develop K5 interoperability with AD
- Extend the current process
- Deploy CyberSafe Active Trust style solution
- Drop back to NT4 approach

Continue With Current

- No changes to accounts process
- No changes to DCE password change web page
- All synchronization done by CLC
  - Will add web service for password change management
- Works OK but
  - Prefer central management of userid/password
  - Prefer central management of password change

K5 Interoperable AD

- Need MIT Kerberos 5
- Establish Trust between AD and K5 (DCE)
- All users joined to AD
- No passwords in AD
- Use K5 for Authentication
- Breaks NTLM and other services
  - No services for older Windows (NT4 or older)
- Authorization synchronization is problematic

Extend Current Process

- Institutionalize control by
  - Accounts sets passwords at user join
  - www.work does password change for windows
  - Accounts does immediate suspend
- Users and passwords in the root domain
- Authorizations work natively
- Single Sign On much easier
- All native services work

CyberSafe Active Trust Solution

- Third KDC mitigates and populates both
  - K5 KDC
  - Active Directory
- Works well
- Expensive
- Complicated
- No advantage over our synchronized approach

Return to NT4 Model

- No users in Active Directory
- No Authorization capability
- Use our own MSGINA
- Use PALS to do all authentication to DCE
- No capability to offer services for the rest of PSU
- Retains single point of control
- Roll back all new services

And the Winner Is?

- Watch this space for future developments!

References

- Lots available through Microsoft web pages
- New detailed information about AD authorization
  - http://msdn.microsoft.com/library/en-us/dnkerb/html/MSDN_PAC.asp?frame=true
- Look at what other Universities are doing
- Web references tend to move
- Building my own collection
  - http://dsg.cac.psu.edu/support/domains/domstrat

Questions?