CSE 265:
System and Network Administration

- Making mixed environments work

  - Sharing Resources
    - Common authentication
    - Network name resolution
    - Printers
    - Files

  - Making Windows look like Linux and vice versa
    - Add or configure similar interface/functionality
    - Remote desktops
    - Dual-booting
    - OS Emulation/Virtualization

Mixed environments are the norm

- Windows + UNIX/Linux/Mac

- Why care about Win*doze*? (thanks to CJ)

  - It's everywhere (dun dun DUN!)

  - Chances are, more of your clients will be using it than *NIX

  - It has brought computing to the average Joe – billions of 'em

  - It uses inferior multi-user technology, and we should help them where possible

  - It's not leaving anytime soon – get over it
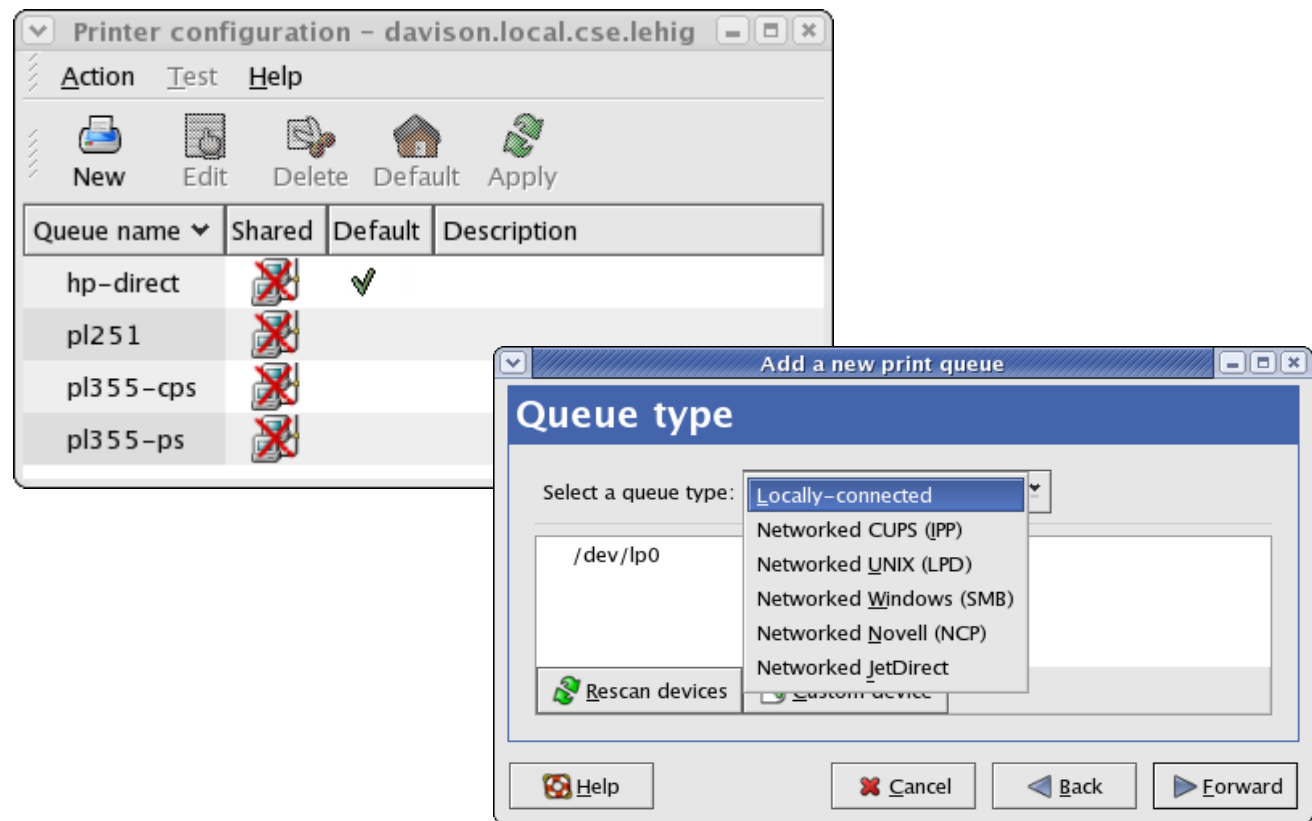
Sharing Resources (1)

- ## Regardless of OS, clients want:

  - Common authentication
    - NIS, LDAP, Active Directory
  - Network name services
    - DNS, NetBIOS, WINS

Sharing Resources (2)

- Regardless of OS, clients want: Access to printers
  - CUPS
  - LPD
  - SMB
  - Novell
  - JetDirect

Sharing Resources (3)

- ## Regardless of OS, clients want: Access to files

  - ### NFS
    - UNIX can be client or server
    - PC client is available

  - ### SMB
    - Windows & UNIX can be client or server

  - ### Novell – not so popular

  - ### AFS – prob. upcoming lab
    - OpenAFS.org PC client avail.
    - UNIX can be client or server


```
brian@davison:/home/brian
[root@davison brian]# df
Filesystem           1K-blocks      Used Available Use% Mounted on
/dev/sda3             30233928  10951964  17746152  39% /
/dev/sda2               101105     31120     64764  33% /boot
none                   1032576         0   1032576   0% /dev/shm
/dev/sda7             24375448     77876  23059364   1% /export
/dev/sda5             20161172     77892  19059140   1% /free
wume2:/backup        115377664  31038688  78478080  29% /snapshots
wume1:/home           60476072  26795840  30608208  47% /home
wume1:/var/spool/mail
                      15259376   3517464  10966776  25% /var/spool/mail
p6:/datasets         230762136 189245336  39172392  83% /datasets
wume4:/raid1         971455816 926783064  44672752  96% /farm/1
wume4:/raid2         971463880 925498216  45965664  96% /farm/2
p5:/raid             769172016 729507112  31850568  96% /farm/3
wume3:/raid         1166753416 1027818608 138934808  89% /farm/4
p1:/raid             388187088 356760800  27519128  93% /farm/p1
p2:/raid             388187088 114779656 273407432  30% /farm/5
//kato/brian          35008512   8455168  26553344  25% /home/brian/sun-files-wi
ndows
wume2:/usr/local      34218656  21403776  11076672  66% /usr/local
[root@davison brian]#
```
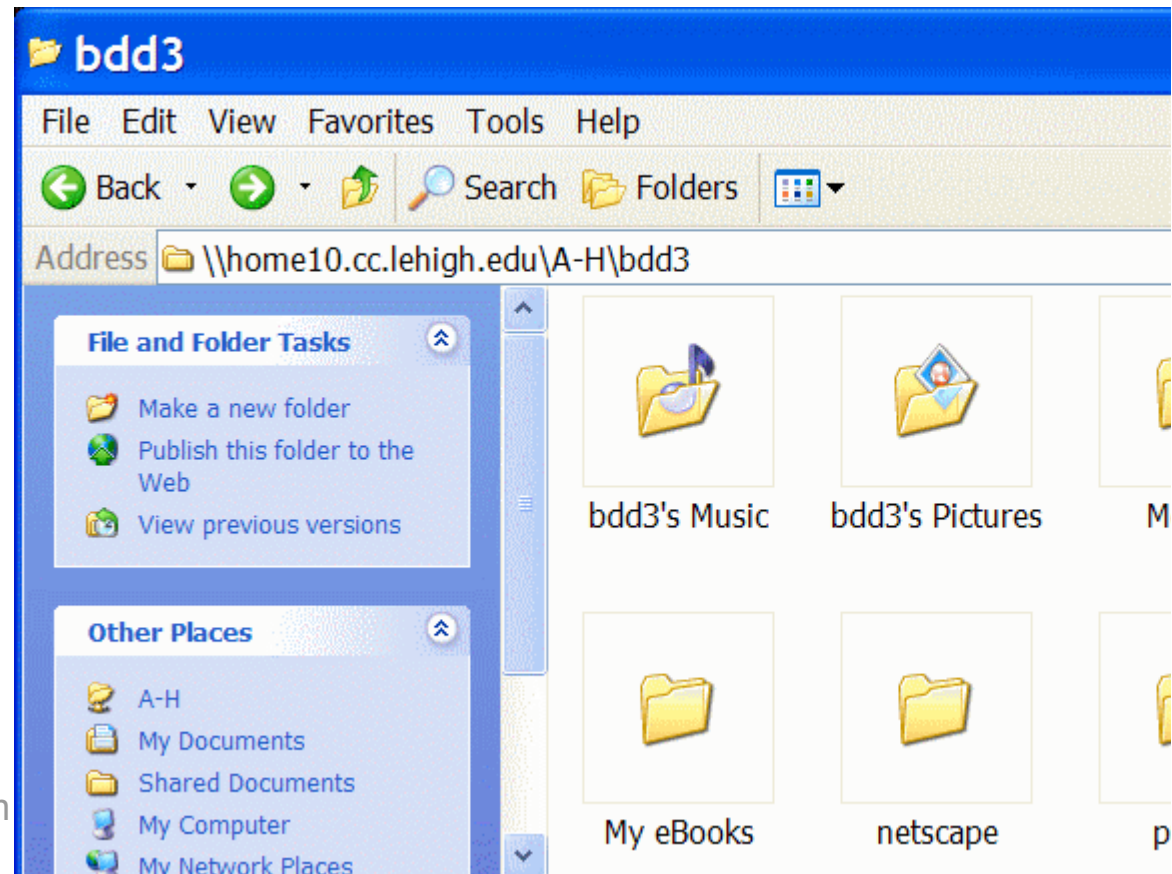
Network Drives

auto1 on 'afs' (O:)	Network Drive	1.99 TB	0.99 TB

Samba

– Samba can allow for peaceful coexistence between Windows & Linux/UNIX systems wrt:

- Provide/Assist with Windows Internet Name Service (WINS)
- Printer sharing
- Client Authentication
- Backup PCs (smbtar)
- File sharing

– Will do only setup of file sharing today

How does Samba do it?

- SMB = Server Message Block
  - SMB is an extension added by MS to allow DOS to redirect calls to NetBIOS
  - NetBIOS = (crude) interface between network and application

- CIFS = Common Internet File System
  - Different paradigm than NFS
    - Per-user authentication
  - Based on protocols from SMB
  - Now supported directly by Linux

Samba Configuration

- Only config file: /etc/samba/smb.conf

- Two daemons

  - **smbd** – file and print services, authentication

  - **nmbd** – NetBIOS name service, browsing

- Start with /etc/init.d/smbd start

Samba Status

– Samba runs as a service; usually needs little attention

- Can check using **smbstatus**

```
brian.local.davison.net[brian]: smbstatus

Samba version 3.0.14a-2
PID       Username        Group           Machine
-------------------------------------------------------------------
 3038     karen           karen           familydell   (192.168.0.111)
 3038     brian           brian           familydell   (192.168.0.111)


Service         pid      machine         Connected at
-------------------------------------------------------
IPC$            3038     familydell      Sun Mar 26 23:00:24 2006
backups         3038     familydell      Sun Mar 26 23:01:15 2006
IPC$            3038     familydell      Sun Mar 26 21:55:42 2006

No locked files
```

Samba File Sharing Process

- Install Samba (rpm for RHEL/CentOS)
- Customize /etc/samba/smb.conf
- Add users and set passwords
  - (Add user using **useradd**)
  - (Set regular user password using **passwd**)
  - Set Samba password using **smbpasswd**
- Restart Samba
  - **/etc/init.d/smb restart**

/etc/samba/smb.conf

- ## Standard, simple scheme

  attribute = value

  # or ; denotes a comment

- ## Sample Headings:

  [global] – global settings, network IDs
  [homes] – users' home directories
  [printers] – printing utilities
  [public] – open share to all

Shares and Attributes

- ## [global]
  - workgroup = name of Windows network group
  - netbios name = system name to appear in Windows Network Neighborhood
  - hosts allow = list of IPs or networks (whitespace-delineated) to have access to SMB shares

- ## [homes]
  - browseable = yes, will map directly to /home/*user*; much like "My Documents" ability on campus
  - writable = yes (same as read only = no); by default, all shares are read-only

Common Shares and Attributes

- ## [public]
  - path = path to RW storage space
  - Often also set read only = no and browseable = yes
  - Note: gives full RW access to anyone – be careful
- ## [printers]
  - printable = yes
  - path = /var/spool/samba
- ## [music]
  - path = path to music files
  - public = yes, will allow access to all users
  - write list = list of users that can write
  - invalid users = list of users that cannot access

Accessing Samba/Win Shares

- From Windows Network Places
  - Act and look like normal shares
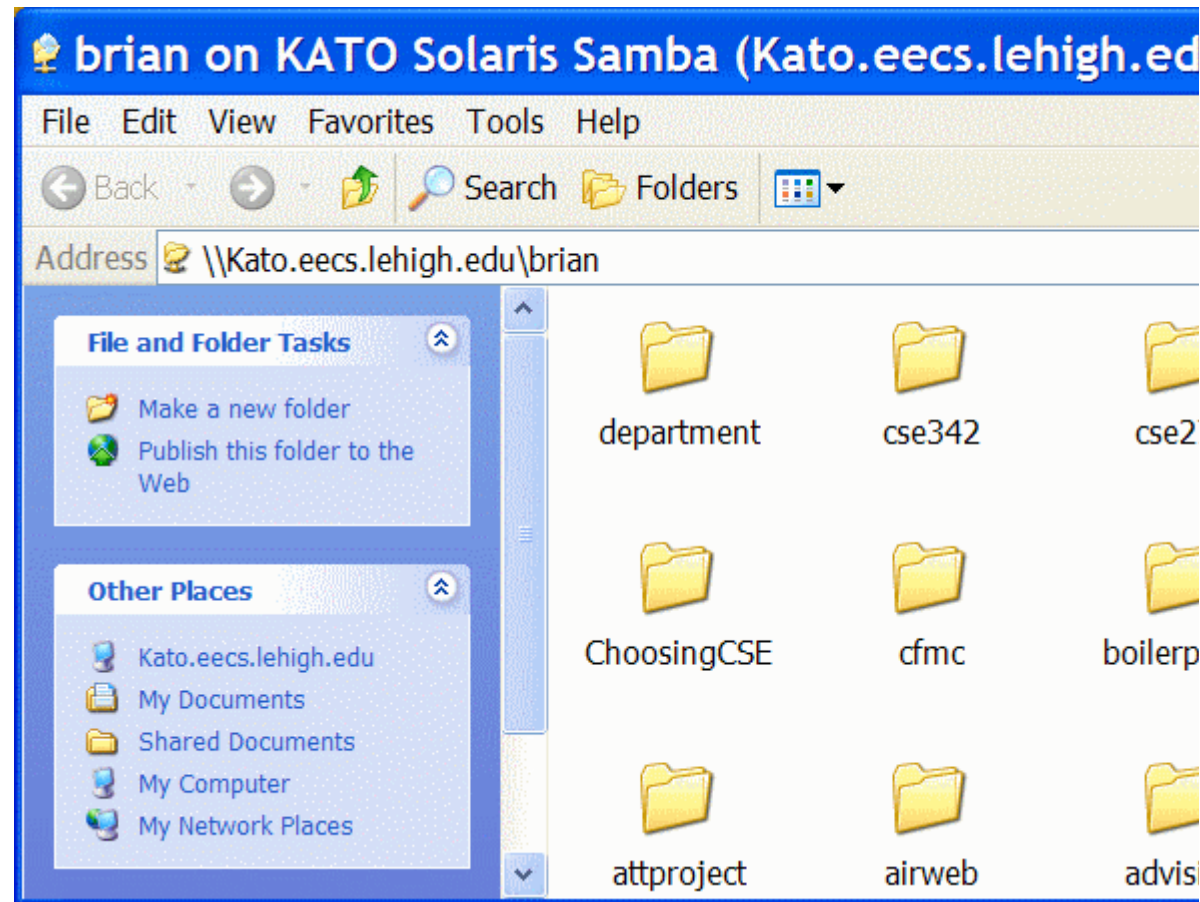
- From Linux/UNIX
  - Using a file manager (like Konqueror or Nautilus)

  - Mount them
    - in /etc/fstab
      - //*SMB_server*/*share local_mount_dir* smbfs *options* 0 0
    - **mount.cifs –o username=name //SMB_server/share mount_dir**

Making Windows look like Linux
(and vice versa)

- Dual-booting

  - Not always convenient

- Add or configure similar interface/functionality

  - OpenOffice.org – Microsoft Office file access

  - WINE – support for many Windows clients

  - cygwin – UNIX-like shell, commands, perl, gcc, etc.

  - ssh clients – access to UNIX shells

  - multi-platform web browsers, chat and email clients

Making Windows look like Linux
(and vice versa)

- **Remote desktops**
  - X-Windows
    - Display separate from computation
    - Clients available for Windows, built-in to most UNIX
  - Windows Remote Desktop
    - Clients available for Windows + UNIX
  - VNC
    - Real remote desktop, even within browser (Java-based)
    - Any platform can operate any other platform
    - Continue working on whatever PC is nearby
  - Services: GoToMyPC.com, LogMeIn.com

Making Windows look like Linux
(and vice versa)

- OS Emulation, Virtualization
  - QEmu
  - VMware
  - Xen
  - VirtualBox
  - Windows Virtual PC

  - *And more...* in an upcoming lecture

Resources

- http://www.samba.org/
  - Tons of documentation, including <u>Using Samba</u> from O'Reilly, all online
- http://www.realvnc.com/
  - Free and commercial clients and servers
- http://www.cygwin.com/
  - Shell, X-Windows, gcc and more for PC
- http://www.openoffice.org/
  - Microsoft Office compatible files
- http://www.winehq.org/