Samba –
Opening Windows to a Wider World

Computer System and Network Administration

Department of Computer Science & Information Engineering
National Cheng Kung University
2016 Fall

Introduction

- Samba is a free software re-implementation of the SMB/CIFS networking protocol, originally developed by Andrew Tridgell in 1992.
- Samba provides file and print services for various Microsoft Windows clients.

Andrew Tridgell
(1967/2/28~)

UNIX-Windows Communication

- SAMBA
  - 1991 – Andrew Tridgell developed the first version of Samba
    - Using a packet sniffer on DEC Pathworks server software
  - A UNIX application that speak SMB protocol
  - Can not use the Original Name: Server Message Block (SMB)
    - Samba
- Why samba ?

Network-based File Sharing

- NFS (UNIX-based)
  - mountd is responsible for mount request
  - nfsd and nfsiod
  - Based on RPC
- CIFS (Microsoft since 1996)
  - Common Internet File System
  - 網路芳鄰
  - Originally known as SMB (Server Message Block)
  - Share access to files, printers, …
  - Based on NetBIOS

Service of SMB and NetBIOS

- NetBIOS
  - Name Service for name registration and resolution
  - Session service for connection-oriented communication
  - Datagram distribution service for connectionless communication
- SMB
  - File and printer sharing service
  - Authentication
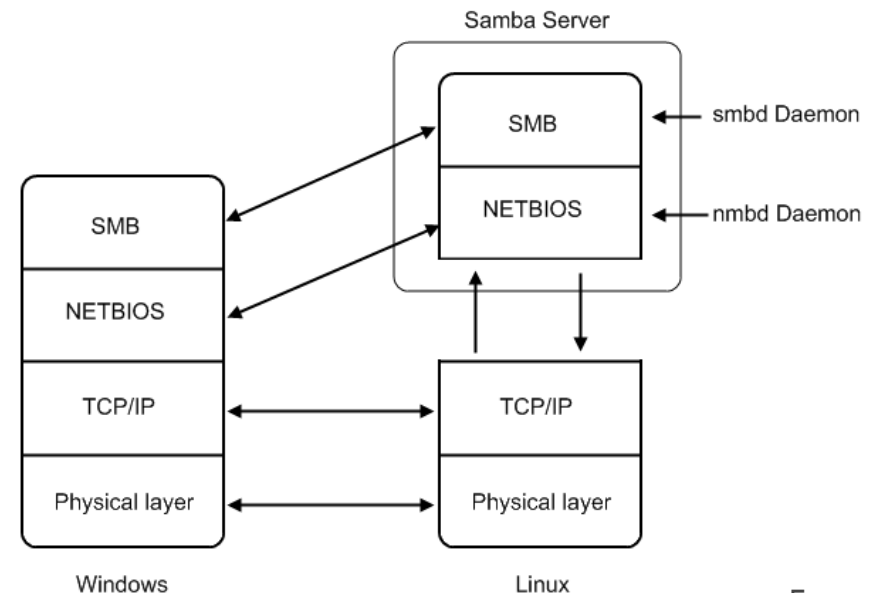
NetBIOS – Network Basic Input/Output System

- 1983 – developed as an API for software communication over IBM's PC-Network LAN
- 1985 – Microsoft created a NetBIOS implementation for its MS-Net network topology
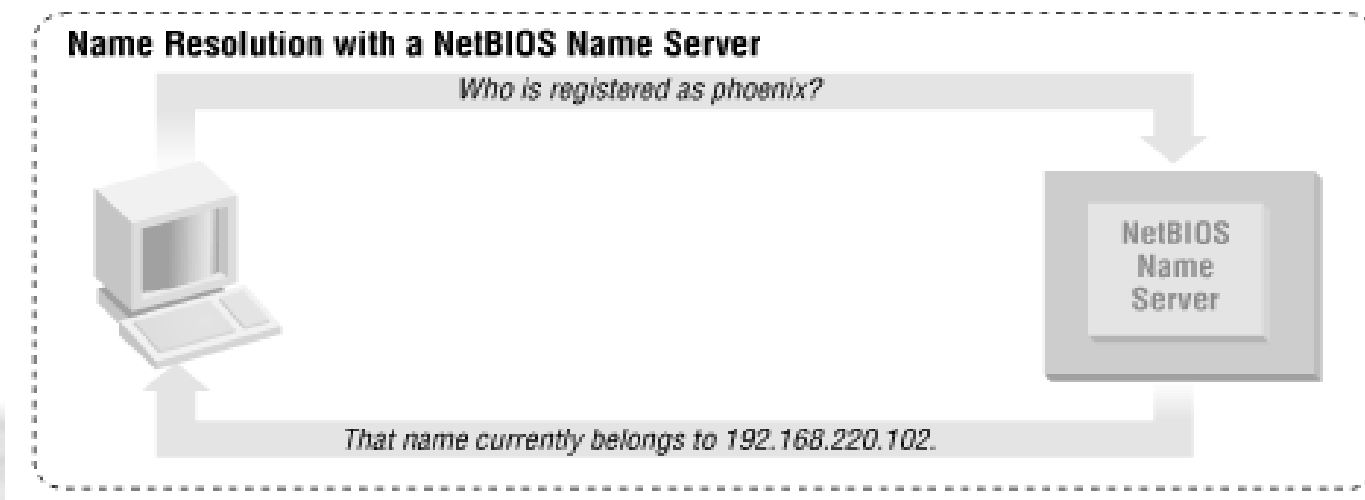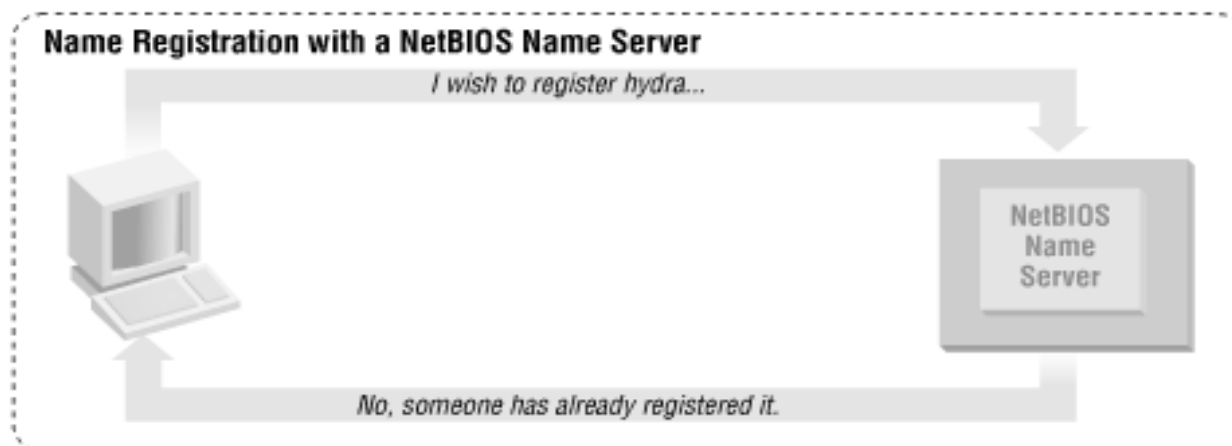- Used to share or access network-based filesystem just as BIOS does in local filesystem

- Workgroup model (Peer to peer)
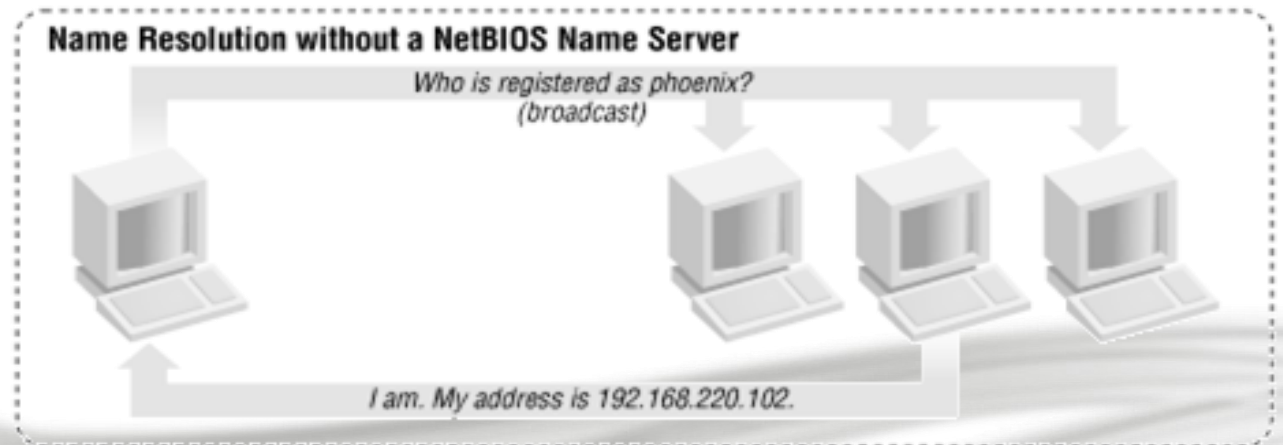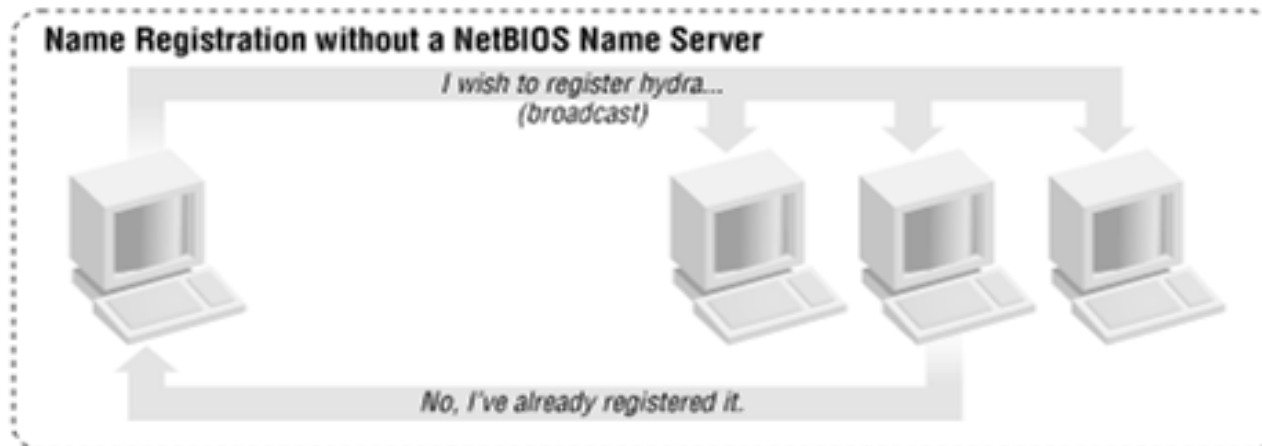
NetBIOS Naming Service

- Domain model
    - WINS (Windows Internet Name Service)

SMB – Server Message Block

- Original designed by IBM with the aim of turning DOS interrupt local file access into a network filesystem
  - Run on top of netbios
- 1990 – Microsoft merged the SMB protocol with LAN Manager
- 1992 – Microsoft merged and add features to SMB protocol in Windows for Workgroup
- 1996 – Microsoft renames SMB as CIFS
  - Support for symbolic link, hard link, larger file sizes, …
- 2006 – Microsoft introduced SMB2 with Windows vista
- Windows 7 – SMB 2.1
  - Performance enhancement with a new opportunistic locking

What SAMBA can do?

- Sharing
  - Sharing files or printers just like Microsoft does
  - Authenticate user identity just like Microsoft does
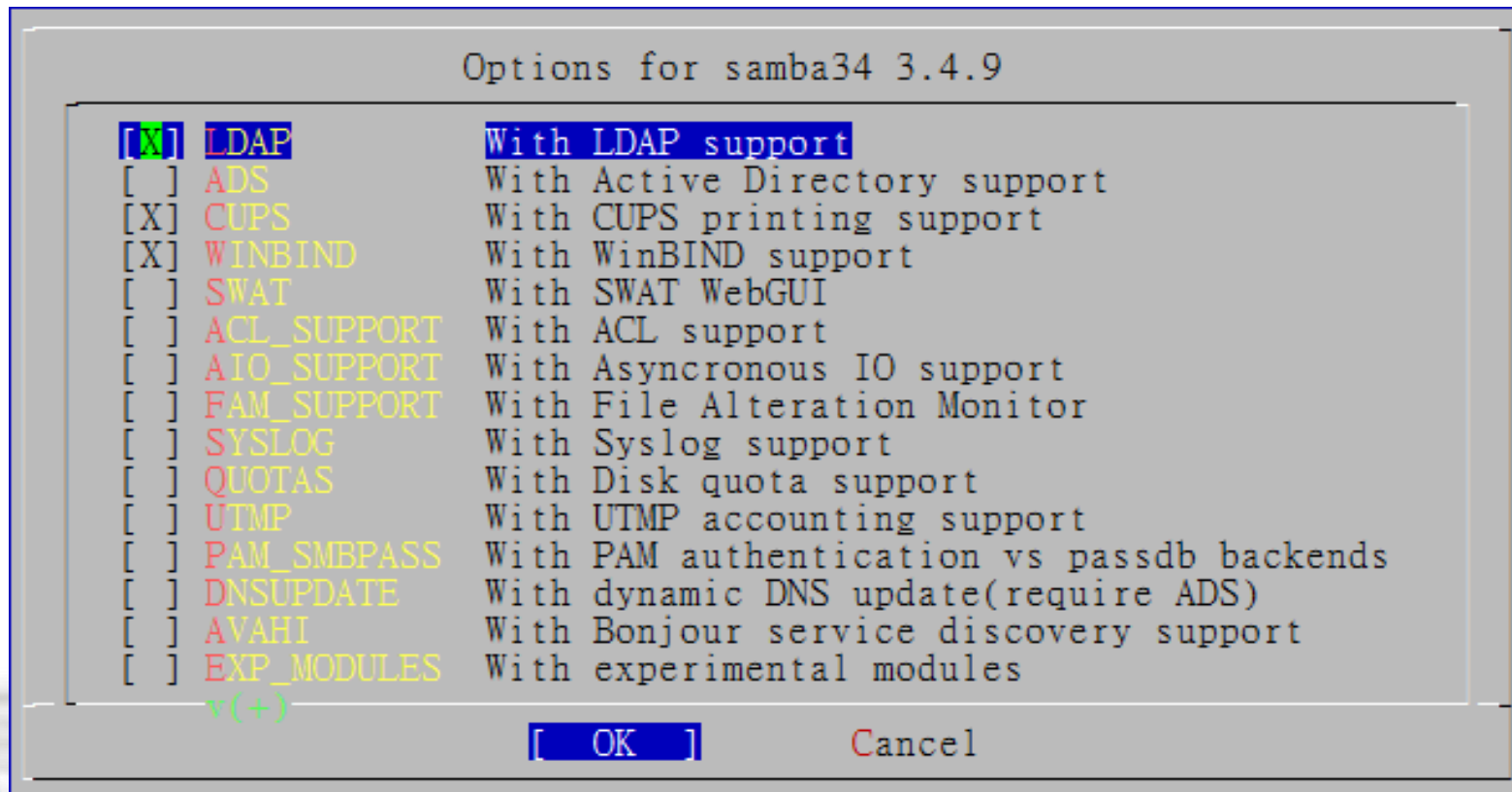 - Resolve NetBIOS name just like Microsoft does
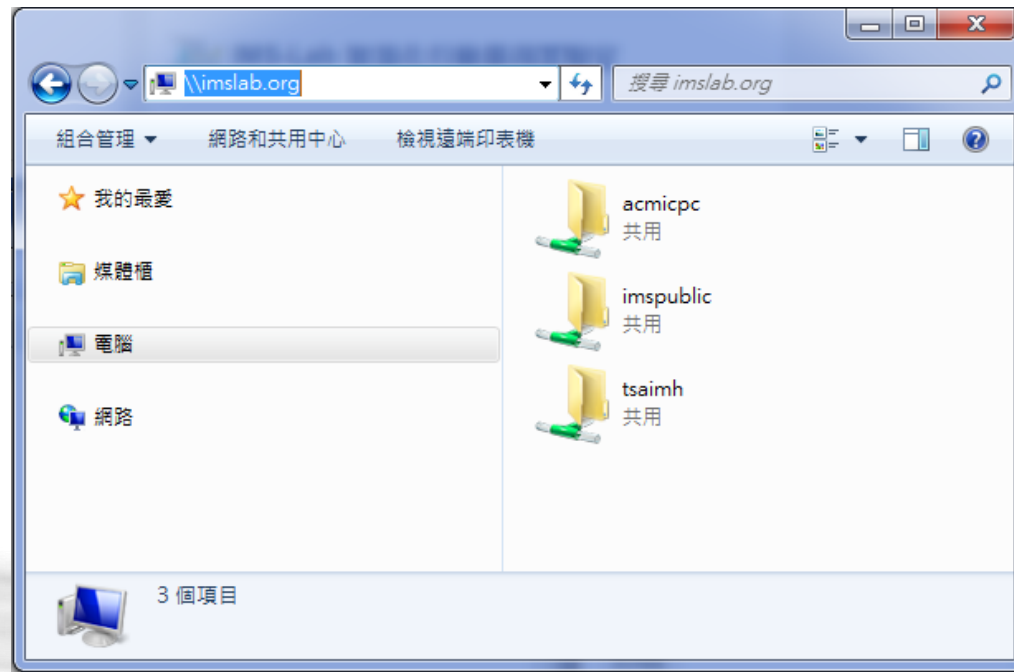
Install SAMBA

- Using ports
  - % cd /usr/ports/net/samba36
  - % portmaster –BD net/samba36

```
                  Options for samba34 3.4.9

  [X] LDAP            With LDAP support
  [ ] ADS            With Active Directory support
  [X] CUPS           With CUPS printing support
  [X] WINBIND        With WinBIND support
  [ ] SWAT           With SWAT WebGUI
  [ ] ACL_SUPPORT    With ACL support
  [ ] AIO_SUPPORT    With Asyncronous IO support
  [ ] FAM_SUPPORT    With File Alteration Monitor
  [ ] SYSLOG         With Syslog support
  [ ] QUOTAS         With Disk quota support
  [ ] UTMP           With UTMP accounting support
  [ ] PAM_SMBPASS    With PAM authentication vs passdb backends
  [ ] DNSUPDATE      With dynamic DNS update(require ADS)
  [ ] AVAHI          With Bonjour service discovery support
  [ ] EXP_MODULES    With experimental modules
      v(+)

          [  OK   ]          Cancel
```

SAMBA components

- Configuration files
  - /usr/local/etc/smb.conf.default → /usr/local/etc/smb.conf
  - /usr/local/etc/lmhosts
- Major execution files
  - smbd (/usr/local/sbin/smbd)
    - Management of sharing directories, files and printers
  - nmbd (/usr/local/sbin/nmbd)
    - Resolve NetBIOS name and manage workgroup
  - smbpasswd (/usr/local/bin/smbpasswd)
    - Change a user's SMB password

SAMBA configuration file

- smb.conf
  - Sections
    - Three default sections
    - Global Setting
    - Printer Sharing Setting
    - Home Sharing Setting

```
# comments
[global]
  para1 = value1
  ...

[printers]
  para2 = value2
  ...

[homes]
  para3 = value3
  ...

[share-dir]
  para4 = value4
  ...
```

SAMBA configuration file – Global Setting (1)

- workgroup
  - Group name to join   (ex. workgroup = imslab)
- server string
  - Description of this host (ex. server string = Samba Server of CSNA Course)
- netbios name
  - NetBIOS name of this host (ex. netbios name = csnabsd)
- Charset Settings
  - "display charset", "unix charset", "dos charset"
  - ex. display charset = UTF8
        unix charset = UTF8
        dos charset = UTF8
- hosts allow
  - Apply to all services, regardless or individual service setting
  - ex. hosts allow = 140.116.82. , 140.116.

SAMBA configuration file – Global Setting (2)

- guest ok (or public = yes)
  - If this is yes, no password is required
  - ex. guest ok = no
- guest account
  - If guest can use this samba service, any guest request will map to this guest account
  - ex. guest account = ftp
    - Add this account into your /etc/passwd
  - Otherwise, the user nobody is used
- log file
  - Full path of log file
    - ex. log file = /var/log/samba/log.%m
- max log size (KB)
  - ex. max log size = 500

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SAMBA configuration file – Global Setting (3)

- security = [share/user/server/domain]
  - share: no need of id and password to login
  - user: default option, login with id and password
  - domain: check id and password by domain controller

  - ex.
    - security = user
    - passdb backend = tdbsam

SAMBA configuration file – Global Setting (4)

- Example of global setting

```
[global]
    workgroup          = imslab
    server string      = imslab samba server
    netbios name       = csnabsd
    display charset    = UTF8
    unix charset       = UTF8
    dos charset        = UTF8
    printcap name      = /etc/printcap
    load printers      = yes
    printing           = cups
    log file           = /var/log/samba/log.%m
    max log size       = 500
    security           = user
    passdb backend     = tdbsam
```

Samba parameters

- Default parameters in samba
  - %m   Client NetBIOS name
  - %M   Client Hostname
  - %I   Client IP
  - %L   Samba server NetBIOS name
  - %h   Samba server Hostname
  - %H   User home directory
  - %U   Login name
 - %T   Current Date time

SAMBA configuration file – Home Sharing Setting (1)

- comment
    - Description of this directory
- path
    - Sharing directory path
- browseable
    - Display sharing name or not
- read only , writeable
- write list
    - Only users on this can write content if read only
- create mode / create mask
    - Default permission when file is created
- directory mode / directory mask
    - Default permission when directory is created
- guest ok (or public = yes)

SAMBA configuration file – Home Sharing Setting (2)

- Example of directory sharing

```
[Image]
    comment              = Book Picture
    path                 = /home/image
    read only            = no
    public               = yes
    writable             = yes
    create mode          = 0664
    directory mode       = 0775
```
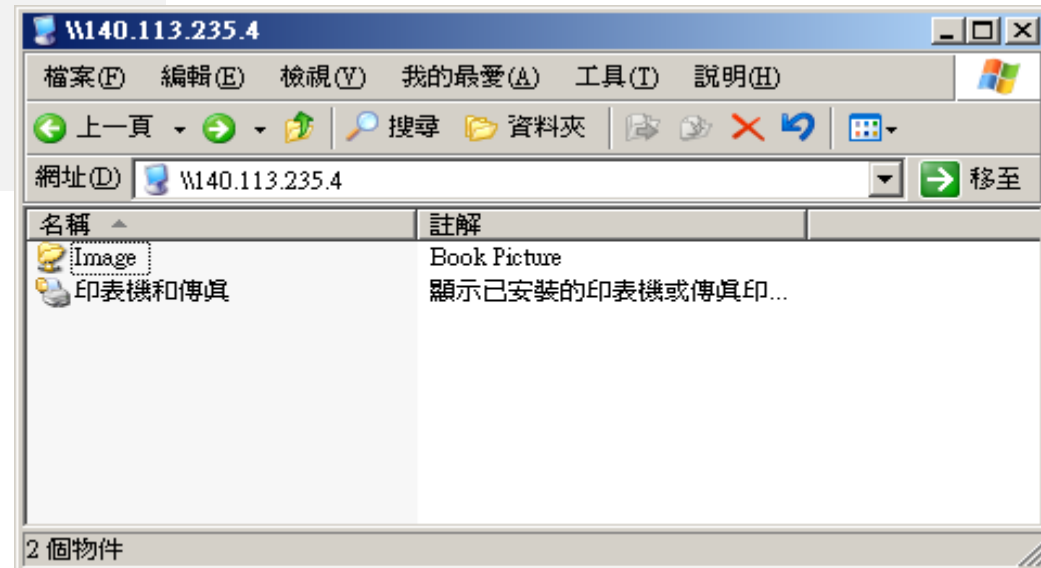
Starting SAMBA

- Script
  - /usr/local/etc/rc.d/samba {start|stop}
  - /etc/rc.conf
    - samba_enable= "YES"
    or
    - smbd_enable= "YES"
    - nmbd_enable= "YES"

SAMBA password

- smb password file
  - Now samba stores accounts and passwords in tdb
    - Default database path: /var/db/samba
- smbpasswd command
  - -a
    - Add new user
  - -d
    - Let some account in smbpasswd file can not login (to disable)
  - -e
    - Let some disable account resume (to enable)

smbstatus

- Report on current Samba connections

```
> smbstatus

Samba version 3.6.0
PID     Username    Group       Machine
------------------------------------------------------------------

Service     pid     machine     Connected at
-----------------------------------------------------------
IPC$        65519   meng-dormpc   Mon Dec 16 01:07:28 2013
imspublic   49861   meng-officepc  Thu Dec 12 13:27:32 2013
tsaimh      65519   meng-dormpc   Mon Dec 16 01:07:28 2013
IPC$        49861   meng-officepc  Thu Dec 12 13:27:32 2013
tsaimh      49861   meng-officepc  Mon Dec 16 09:16:23 2013

Locked files:
Pid       Uid     DenyMode    Access    R/W     Oplock        SharePath   Name   Time
--------------------------------------------------------------------------------------------
49861     1002    DENY_NONE   0x100081  RDONLY  NONE          /home/tsaimh /
course/CSNA   Tue Dec 17 22:17:27 2013
```

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Tool: smbclient (1)

- A client program that can talk to an SMB server
- Usage:
  - -L [hostname]
    - List sharable resource
  - -U [username]
    - Login with username

Tool: smbclient (2)

```
> smbclient -L imslab.org -U tsaimh
Enter tsaimh's password:
Domain=[IMS_LABORATORY] OS=[Unix] Server=[Samba 3.6.0]
   Sharename      Type      Comment
   ---------      ----      -------
   imspublic      Disk      IMSLab Shared Public Directory
   IPC$           IPC       IPC Service (IMSLab Samba Server)
   tsaimh         Disk      Home Directories
Domain=[IMS_LABORATORY] OS=[Unix] Server=[Samba 3.6.0]
   Server          Comment
   ---------       -------
   IMSLAB           IMSLab Samba Server

   Workgroup        Master
   ---------        -------
   ALGORITHM_LAB       SERVER-173
   IMS_LABORATORY      IMSLAB
   MYGROUP            FTP
   NAS               CIAL
   WORKGROUP          PAPERWIN01
```

SWAT (1)

- Edit /etc/inetd.conf
  - Unmark

swat	stream	tcp	nowait/400	root	/usr/local/sbin/swat	swat

- Restart inetd

- Browse http://imslab.org:901/

Logged in as **chwong**

HOME   STATUS   VIEW   PASSWORD

Welcome to SWAT!

Please choose a configuration action using one of the above buttons

Samba Documentation

- **Daemons**
  - smbd - the SMB daemon
  - nmbd - the NetBIOS nameserver
  - winbindd - the winbind daemon
- **Configuration Files**
  - smb.conf - the main Samba configuration file
  - lmhosts - NetBIOS hosts file
  - smbpasswd - SMB password file
- **Administrative Utilities**

完成   網際網路

SWAT (2)

- Root access