Samba

Sharing files (and printers) with Windows.

NetBIOS–Network basic I/O System. Protocols for sharing files among Windows Machines.

SMB–System Message Block: a method of communication between Windows machines built on top of NetBIOS.
Many levels/revisions of SMB exist.
Can run native on a local net.
Can be encapsulated in TCP/IP packets.

Samba: a software suite that runs SMB protocol on Unix.

Concept: Workgroup–a group of machines cooperating in some way.
Each workgroup or NT domain has a (simple) name.
Example: CECSNT

Machines announce their presence with variations of this name:

CECSNT<00>– any server in the work group, any machine supplying a share (exported file system) or a printer.

CECSNT<1E>– any machine willing to be a master browser

CECSNT<1C>– any machine willing to verify network logons.

CECSNT<1B>– the NT primary domain controller or the master browser for the domain.

You find out about services/shares/printers by contacting a browser.
Any machine acting as a browser maintains a list.

SMB can be set up for a workgroup (or NT domain).

The six important (Microsoft) versions of the SMB protocol: PCLAN 1.0 (Core), MS Networks 1.03 (Core Plus), Lanman 1.0, Lanman 2.0, NTLM 0.12, CIFS 1.0 and several other versions.

Sample SMB network exchange:

Client: Negotiate protocol (list protocols client can do)
Server: Negotiate protocol response (here's the best)

set up a session: includes username/password
set up response: indicates if username/password was valid. Server also assigns a session ID.

tree connect: mount/attach a share
connect response: returns a tree identifier.

Samba

A Unix program that provides SMB service.
Using this service, the Unix machine can make "shares"
available or access shares from Windows servers.

Samba configuration specifies what file systems to share
and what Windows file options to provide.
Remember: Samba configuration provides Windows
options, not Unix options.

Samba Servers

`smbd -D`: handles SMB requests. Concurrent Multiprocess
server (forks a child for each client).

`nmbd -D`: handles NetBIOS name server requests.
Can be a domain master browser, PDC or WINS server.

`smb.conf`: configuration file for both
(found in `/etc/samba`).

Clients

`nmblookup`: do a NetBIOS lookup

`smbprint`: print on a shared Windows/smb printer

`smbclient`: access a share (using ftp-like command line
shell)

`smbtar`: backup a (remote) share to a (local) tape drive

smb.conf

Three special sections, Multiple general sections.

Special section `[globals]`
items that apply to general service or all sections.

```
workgroup = HEART
```
— the Windows workgroup/Domain name

```
encrypt passwords = yes
```
— no means plain text which NT4.0 needs a regedit to support

```
hosts allow = 134.139.
```
— can restrict access

```
security = user
```
— username and password required (or = `share`)

```
server string = Heart Samba Server
```
— A nice long version of our name.

```
local master = yes
prefered master = no
domain master = no
wins support = no
```
— nmbd/NetBIOS options for becoming a Master Browsers and supporting browsing

```
socket options = SO_KEEPALIVE
```

— send ACKs, if the client doesn't respond, shut the connection down.

```
domain logons = no
```
— Do we authenticate Windows logons?

Passwords: NT 4.0 ships encrypted passwords. The encryption is different from the Unix encryption. Must maintain a separate list of NT4.0 encryptions (`smbpasswd` file)

Other Windows options include specifications for file locks, oplocks, maximum file sizes ...

Special section [homes]
Each user home directory appears as a share.
Usually you set this up to need the user's password.

```
browsable = no
```
— the home directories do not appear in the Windows
networking panel

```
writeable = yes
```
— the user can write in the home directory
If you are doing a "public share" this should be "no"

```
valid users = %S
```
— Only the user can access the home directory

Special section [printers]
Allows access to any printer specified in printcap
If you are making printers available to Windows.
This is for the Windows print protocol only.
A windows machine can be set to use lpr protocol.

A general share section

```
[publicstuff]
  path = /usr/public
  read only = yes
  public = yes
```

Share/Service Verification

if a Windows client requests a service such as joe Samba:

1) checks for a [joe] section.
if this misses and there is a [homes] section
2) checks for a user named joe
if these miss and there is a [printers] section
3) checks for a printer or printer alias named joe

So...duplicate identifiers can be a problem