

Samba

Interoperating with Windows

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A computing department

Samba

- Implements Microsoft's SMB protocol
- SMB = Symmetric Message Block, gave project its name
- achieved through reverse engineering Microsoft's proprietary protocols (no help from MS, but hindrance)
- good reputation for stability and performance outperforming MS servers in both respects
- Current production version supports use as a Windows NT compatible server (file sharing, printing, support for network browsing)
- Runs on many platforms, including very powerful Solaris machines
 - Most powerful windows servers run Solaris, not Microsoft software!

Samba 2.2.x

- The release provided with current Linux systems
- Works as an NT 4 compatible PDC
- *Winbind* (part of samba) allows Linux and Unix machines to join a Windows Domain
- Samba can use LDAP to authenticate against
- Both samba 2.2.x and 3 have been put into commercial products, such as Network Attached Storage (NAS) hardware
- Macintosh OS X uses samba to provide services to Windows clients, and also to access Windows services.

Limitations of Samba 2.2.x — 1

- Does not support Active Directory in the way that a Windows 2000 server does
- Samba 2.2 cannot interact with a Microsoft Backup Domain Controller (BDC) but it can be a BDC for another samba server
- User information stored on a Samba PDC is not as complete as that stored on a Windows PDC
- Samba obeys Linux group file access permissions on the PDC, but it does not tell the client machine about it properly. Group file permissions are hard to set from a client.

Limitations of Samba 2.2.x — 2

- Full support for ACLs (access control lists) depends on applying a patch to the Linux kernel and recompiling the kernel, or waiting till the Linux 2.6.x kernel is released
- When samba is working as a WINS server, it cannot replicate to other WINS servers, whether Microsoft or samba.
- Support for Unicode is not very good (greatly improved in samba 3)

Samba Version 3 (alpha release)

- Currently used in some commercial systems, but documentation not complete
- See <http://us1.samba.org/samba/ftp/alpha/WHATSNEW.txt>
- Supports Active Directory: a Samba 3 server can join an ADS realm as a member server and authenticate users using LDAP/kerberos
- Supports migrating from a Windows NT 4 domain
- Supports trust relationships with Windows NT domain controllers
- `samba-3.0alpha24-1.i386.rpm` is available since 16 May 2003 from <http://www.samba.org/>

Parts of Samba

- Samba consists of two services:
 - `smbd`, which does the file sharing, provides print services, and handles authentication of clients, which can be any version of Windows or Linux;
 - `nmbd`, which does name resolution (the “WINS” server), and provides support for browsing the network in the “Network Neighbourhood”
- The other parts you will work with include:
 - The configuration file, `/etc/samba/smb.conf`
 - `testparm` which checks the syntax of `/etc/samba/smb.conf`
 - The `smbpasswd` program for setting and changing samba passwords

Other Samba Utilities

- `nmblookup` is useful for troubleshooting NetBIOS name lookup from WINS servers or from samba
- `smbclient` is useful for testing samba and Microsoft servers
- `smbmount` mounts SMB shares from samba or Windows servers locally.
 - Usually not necessary to call this directly, you can use `mount`.
- `smbtar` is useful for backing up a Windows machine over the network to a Linux or Unix machine.
- Many others, all with `man` pages. See `rpm -ql samba-client`.

Is samba installed? — 1

- On an RPM based system, such as Red Hat Linux, do:

```
$ rpm -qa | grep samba  
samba-swat-2.2.7-5.8.0  
samba-2.2.7-5.8.0  
samba-client-2.2.7-5.8.0  
samba-common-2.2.7-5.8.0
```

This tells us that:

- the samba server is installed, together with
- the `swat` web configuration system, and that
- samba version 2.2.7 is installed

Is samba installed? — 2

- You can also check on any system that samba is installed, and find the version with:

```
$ smbd -V
```

```
Version 2.2.7-security-rollup-fix
```

```
$ nmbd -V
```

```
Version 2.2.7-security-rollup-fix
```

Note that this is an updated version, for Red Hat version 8.0.

Starting, Stopping Samba

- Starting, stopping the samba service is the same as with any other service on Linux.
- Here we assume that `/sbin` is on your `PATH`. If not, you can simply type `/sbin/service` instead of `service`.
- Is the service running?

```
$ sudo service smb status  
smbd is stopped  
nmbd is stopped
```

Starting, Stopping Samba — 2

- To start the two samba daemons:

```
$ sudo service smb start
```

```
Starting SMB services:
```

```
[ OK ]
```

```
Starting NMB services:
```

```
[ OK ]
```

- We can verify that they are running:

```
$ sudo service smb status
```

```
smbd (pid 2523) is running...
```

```
nmbd (pid 2527) is running...
```

- We can stop the service in the same way as other services:

```
$ sudo service smb stop
```

```
Shutting down SMB services:
```

```
[ OK ]
```

```
Shutting down NMB services:
```

```
[ OK ]
```

Starting Samba Automatically

- To ensure samba starts when the server boots is the same as for any other service.
- Is the service configured to start on boot?

```
$ chkconfig smb --list
```

```
smb          0:off  1:off  2:off  3:off  4:off  5:off  6:off
```

This tells us that it is not configured to start at any runlevel.

```
$ sudo chkconfig smb on
```

- Now let's check to see if we turned it on:

```
$ chkconfig smb --list
```

```
smb          0:off  1:off  2:on   3:on   4:on   5:on   6:off
```

- Now it will start automatically in runlevels 2, 3, 4 and 5.

Configuration: `/etc/samba/smb.conf`

- Divided into *sections*
- Two kinds of sections:
 - *global* section, holds information about the operation of the whole server
 - *share* sections, holds information about each “share” or service provided by server
- *Comments* start with either a hash ‘#’ or a semi-colon ‘;’
- Extensive documentation in `man smb.conf`

Example /etc/samba/smb.conf — 1

```
1  [global]
2      netbios name = my-name
3      workgroup = my-named
4      add user script = /usr/sbin/useradd \
5          -n -g machines \
6          -c 'Samba Machine PDC member' \
7          -d /dev/null -s /bin/false -M %m$
8      security = user
9      encrypt passwords = yes
10     smb passwd file = /etc/samba/smbpasswd
11     username map = /etc/samba/smbusers
12     os level = 65
13     domain logons = yes
14     logon script = scripts\%U.bat
15     wins server = 192.168.68.240
```

Discussing Example — 1

- Configuration is for a Primary Domain Controller (PDC)
- slide 15 shows global options that determine overall behaviour of samba
 - lines 2 and 3 determine the “computer name” and domain name of this PDC
 - lines 4–7 are executed to automatically create a special account for any computer that joins the domain
 - line 8 requires a username and password for someone to access resources from the server
 - line 11 tells samba to use a file that maps Windows names to Linux names, e.g., `administrator` → `root`

Discussion of global section — 2

- line 12 increases samba's chances of winning "browser elections" with Windows machines (see the documentation about browsing)
- line 13 says that this is a PDC
- line 14 tells samba where to find login scripts
- line 15 tells samba to act as a WINS client of that machine
 - To make samba a WINS server, provide a line like this:

```
wins support = yes
```

Example /etc/samba/smb.conf — 2

```
1  [homes]
2      comment = Home Directories
3      browseable = no
4      writable = yes
5  [netlogon]
6      comment = Network Logon Service
7      path = /var/samba/netlogon
8      guest ok = no
9      share modes = no
10 [printers]
11     comment = All Printers
12     path = /var/spool/samba
13     browseable = no
14     guest ok = no
15     printable = yes
```

Discussing slide 18

- slide 18 shows configuration for individual shares and services offered by the server
- The *homes* section (lines 1–4) allow users to automatically access their Linux home directories from the client when they log into the domain.
 - Will appear as a share with the same name as the Linux username.
- The *netlogon* section (lines 5–9) is necessary to handle domain log[io]ns, which fail if this share does not exist.
 - It stores log[io]n scripts and system policy files.
- The *printers* section (lines 10–15) allows any user to print from a Windows client to a Linux printer.

profiles share

```
[profiles]
  path = /var/samba/profiles
  browsable = no
  writeable = yes
  create mask = 0600
  directory mask = 0700
```

- Supports roaming profiles on NT/2000/XP
- The directory in `path` must exist and be writable:

```
$ sudo mkdir -p /var/samba/{profiles,netlogon}
$ sudo chmod 775 /var/samba/netlogon
$ sudo chmod 777 /var/samba/profiles
```

Samba Accounts

- Note that each user needs to have *two* account entries:
 - a POSIX account entry (i.e., an entry in `/etc/passwd`, or an LDAP POSIX account)
 - a Samba account entry, which for samba 2.2 is generally in `/etc/samba/smbpasswd`, but can also be in an LDAP directory.
- Unless both exist, you will not get access to the samba server from any client.
- Machines that join the domain also need an entry in the `/etc/passwd` file (or in the LDAP directory).
- This is created automatically with the `add user` script entry in your `smb.conf` file.
 - See lines 4–7 of slide 15

Documentation

- Enormous amounts of documentation in `/usr/share/doc/samba-2.2.*/`
 - `Samba-HOWTO-Collection.pdf` is very helpful
- The manual pages are extensive and quite complete. `man smb.conf` is helpful.
- You can visit the samba website to see more documentation:
`http://us1.samba.org/samba/samba.html`
- The printed book, *Using Samba*, 2nd Edition, O'Reilly, 2003, ISBN 0-596-00256-4 is very clear and helpful.