A Brief Introduction to File and Print Sharing on Linux Using Samba

Jeff Muday

Wake Forest University

What will be covered

- Introduce Samba Services
- Install Samba on Linux
- Use the SWAT configuration tool
- Use Samba Client tools
- Configure a shares on Samba

What will NOT be covered

- Details of the SMB/CIFS protocol
- Configuration of Samba as a PDC
- Samba as "print gateway"
- Security Authentication
- Other "advanced" issues such as SSL, performance tuning, scalability, etc.

Introducing Samba

- Samba is a free implementation of Microsoft's SMB (Server Message Block) Protocol.

- "Reinvented" as CIFS

- Samba enables UNIX systems to participate in Windows networks as a File and Print Server or Client.

- Samba can allow UNIX to be a PDC

Samba History

- Written by Andrew Tridgell in 1991
  - while a grad student Australian National University in Canberra. Still actively guiding Samba.org
- through creative reverse-engineering, he designed it to be a tool to allow DEC computers to connect to SUN workstations with an obscure protocol
- At the time, he didn't know he was implementing rudimentary NetBIOS and SMB protocols!

More History…

- Released to the community in 1992 as SMBserver
- Due to legal issues, was renamed Samba (based on "grep" search)
- Made popular by the Linux community
- Released under a GNU GPL

Samba Supported Platforms:

- Linux
- Solaris 2.x
- SunOS 4.x
- HP-UX
- FreeBSD
- NetBSD
- OpenBSD

- IRIX
- Ultrix
- AIX
- Mach BSD
- Macintosh OSX
- SCO Unix
- And others…

Why use Linux/Samba?

- Samba easily replaces a Windows NT File/Print Server
- Because of its GNU/Open Source License, both Linux and Samba are free of licensing costs and Client Access Licensing fees.
- Samba has increased Stability/Performance compared to Windows NT

Why use Linux/Samba?

- allows interoperability between UNIX and Windows workstations.
- Can serve as a Windows Primary Domain Controller.
- Can serve as a highly stable WINS server.
- Can be used to stabilizing windows browsing services.

Samba Capabilities

- Establish shares on UNIX that are accessible to Windows users
- Share printers
- Create a naming scheme (via netbios) so you can use user-friendly names rather than IP addresses
- Make UNIX a Windows Internet Naming Service (WINS) server

Installing Samba

- The entire Samba suite is included with most distributions. It may be in a binary package or source package.
- To get the latest source and binary distributions, you may download from:
  - Samba.org (http://www.samba.org)
  - Rpmfind.net (http://www.rpmfind.net)
  - or at the web site of your Linux distro

Samba Server Components

The Samba server consists of two daemons and several files.

- **nmbd**: Provides NetBIOS names over the network -- mimics a Windows system.

- **smbd**: Server Message Block daemon, provides services, such as shares and printing, over the network.

Important Samba Files

- ***smb.conf***: the main configuration file. May be edited directly with a text editor, or via a utility program like SWAT or Webmin.

- ***smbpasswd***: Contains the names of users to which smbd refers when asked to enforce user-level access control.

- ***smbusers***: Provides the names of samba's administrative users and those users with *specialized* Samba access.

- ***/etc/rc.d/init.d/smb***: The System V initialization script that starts, stops, and restarts the **smbd** and **nmbd**.

User Administration

- **/usr/bin/smbadduser**: a binary that synchronizes the /etc/passwd file with /etc/smbpasswd

- **/usr/bin/smbpasswd**: a binary that allows a user to sync their current Windows password with /etc/smbpasswd file

Samba access modes

- Share: Establishes a password-protected share similar to a Windows98/2000 system. (this is the least secure mode)

- User: Creates a user-based share that requires authentication from the /etc/passwd or /etc/shadow file. Encryption must be enabled to allow access by WindowsNT computers

Samba access modes cont'd

- Server: Requires authentication from a remote server, which can be another UNIX or a Windows NT server. Encryption must be enabled on your Samba system in order for it to be used by WinNT.

- Domain: Uses a Windows NT Primary Domain Controller (PDC) to obtain passwords. Encryption must be enabled on your Samba system in order for your NT server to communicate.

Installing Samba

- Using your distribution's RPM binary packages…
- Locate the RPM files for samba
- As the root user:

```
host# mount /dev/cdrom
host# cd /mnt/cdrom/(your distro)/RPMS
Host#host# rpm -ivh --force samba-common*
host# rpm -ivh --force samba-2*
host# rpm -ivh --force samba-client*
```

Installing from Tarball

Quite easy, but requires installation of C/C++ development libraries.

Installing Samba cont'd

- **Edit the /etc/services file to have the line**

`swat            901/tcp`

- **Edit the main config file**

`/etc/samba/smb.conf`

- **Finally, start samba**

`Host# /etc/rc.d/init.d/smb start`

Configuration

- Samba relies on a single configuration file. Typically this is smb.conf, located at:
    - `/etc/smb.conf`
    - `/etc/samba/smb.conf`
    - `/usr/local/samba/lib/smb.conf`
- Location is dictated by how you or your distribution creator compiled Samba

Configuration continued

SMB.CONF

is divided into four sections:

- global - defines global parameters
- homes - allows users to access their home directories
- printers - entries related to shared printers
- shares - defines other shares available

Lest we forget…

- Don't forget to create the *smbpasswd* file!
- Users can be added manually with the smbpasswd command
  (It is analogous to *passwd* command)

  ```
  # smbpasswd -a username
  ```

- Also note:
  - Once a user has been added by "root", they can manipulate their own password at the shell command prompt.
  - You can also configure a "password chat" script for users that have not been given shell access.

Windows Samba Clients

All Windows systems have built-in Samba clients. These include:

- The Network Neighborhood Applet
- The Windows Explorer "Map Network Drive" utility.
- Direct UNC access via Explorer
  - \\computername\sharename

Linux Samba Clients

Linux systems have several clients available. The most reliable are:

- **Smbclient**: an interactive program that operates much like an FTP client
- **Smbmount**: Similar to mount, allows you to mount a Windows or UNIX based SMB share.

Smbfs - Samba File System

- Linux has a Virtual File System (VFS) that provides a generic interface for mounting filesystems.

- **smbmount** - to mount SMB shares.
  - ◆ smbmount service mount-point [options]

  $ smbmount //winbox/myshare /mnt/myshare -l winuser

- **umount** - to unmount mounted shares.

The SWAT configuration tool

- SWAT provides a graphical user interface modality to SAMBA configuration
- Should be configured to be run over SSL or localhost only
- Requires "root" authentication
  - Or a highly privileged user

Enabling SWAT

- Check /etc/services (enable 901)
- Check /etc/inetd.conf (ensure that samba is uncommented)
- Restart the inet daemon

`/etc/rc.d/init.d/inet restart`

- Test swat

`Lynx localhost:901`

Using SWAT to configure Samba

- Due to limitation in the classroom, we'll skip this for today ☹

Samba Client Tools

- **smbclient** - provides an FTP like interface to a remote share
- **smbmount** - provides the ability to mount SMB shares onto the Linux VFS
- **smbstatus** - returns the current state of the server
- **smbtar** - allows remote TAR (tape archive) backup of a windows share

smbclient

- The `smbclient` program is part of the Samba distribution that provides an FTP-style interface to an SMB server.
- Syntax--

  $ smbclient *service options*

Using SmbClient

- Must specify **host name**, **share name**, and **user name** to connect to a windows share.

- **Host name** and **share name** are represented in a modified UNC fashion using forward-slash in place of the Windows style backward-slash.

Smbclient commands

- get: retrieves a file from current directory
- mget: retrieves multiple files from the server, based on file wildcards (*,?)
- put: puts a file from the local machine to remote share
- cd: change directory
- ! cd: changes the directory on local machine

Hands On: smbclient

Issue the following command at a shell prompt…

Host# /usr/bin/smbclient //gw/demo -U demo

Password: xxxx

Smbmount

- The smbmount command alllows us to mount a windows share onto a previously created directory.
  ```
  # mkdir /mnt/win
  # smbmount //192.168.1.1/demo /mnt/win
  -o username=demo
  ```

Smbtar

- Samba has a remote backup utility. Like other clients in the package, it can mount SMB shares on Windows or other Samba installations.

- Smbtar uses the UNIX tar modality to create tape archives of remote shares.

Summary: Samba services

- make a Linux and Unix machines work well in a Windows network
- is easy to install on most Linux based computers
- allow a machine to function as a replacement for Windows NT File and Print Server
- allow a machine to function as a Windows PDC
- allow a machine to replace a WINS server.

Thanks!

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