SAMBA

Windows file shares and Linux

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1. Introduction

1.1. **SAMBA** – www.samba.org

a) From the SAMBA website:

"Samba is an Open Source/Free Software suite that provides seamless file and print services to SMB/CIFS clients. Samba is freely available under the GNU General Public License."

Since MS Windows file shares use the SMB/CIFS protocols SAMBA provides a means for Linux computers to share and access files on a MS Windows network.

b) History

The origin of SAMBA comes from when Andrew Tridgell was attempting to access DEC pathworks shares from a SUN workstation. DEC Pathworks also used the SMB protocols. For an interesting read check out:
http://ftp.samba.org/ftp/unpacked/samba/docs/history

1.2. **Linux** – www.kernel.org

a) From the Kernel.org website:

"Linux is a clone of the operating system Unix, written from scratch by Linus Torvalds with assistance from a loosely-knit team of hackers across the Net. It aims towards POSIX and Single UNIX Specification compliance."

There are several different distributions of Linux, for the purposes of this presentation RedHat Linux has been used

1.3. **MS windows** – www.microsoft.com/windows/

a) MS windows is presently the dominant desktop operating system. There are also server version of the operating system. For this presentation Primary Windows 2000 Professional and Windows XP Professional have been used.

2. Software Requirements:

2.1. Linux

a) The SAMBA packages are needed, for RedHat Linux this includes the following:
- samba
- samba-client
- samba-common

b) You may also install the samba web configuration utility called SWAT:
- samba-swat

c) For this presentation I have used version 2.2.x series which has reliable Domain Controller support.

2.2. Windows

a) The only thing you need to make sure is that you are running an NT based version of Windows (NT4.x, 2000, XP pro) if you wish to use a Primary Domain Controller. These machines will need windows networking installed which is usually a default. Windows 95-Me and Windows XP home can not join a Domain, though they may access file and print shares in a workgroup.

3. Optional Software

3.1. Network Neighborhood browsers for Linux

a) xfsamba - xfsamba.sourceforge.net
- This is my preferred windows file browser for Linux. It supports browsing, username changes (browsing name), uploads/downloads and file share mounting.

b) Komba - zeus.fh-brandenburg.de/~schwanz/php/komba.php3
- This is the KDE windows file share browser, it is part of the KDE desktop. I haven't tried it since I run the GNOME desktop and don't feeling like tracking down all the dependencies right now.

c) Konqueror - www.konqueror.org
- Konqueror also has default support for browsing file shares on windows networks. This is also part of the KDE desktop.

d) Nautillus - nautilus.eazel.com
- Nautilus can also be used to browse non user restricted shares using the smb:/// command in the URL field. This is part of the GNOME desktop.

e) And many others, these are just a few I have used or heard of the most. See the us2.samba.org/samba/GUI/ for many more (active and not active)

4. Network Design
4.1.Active Directory (AD) for Windows
a) This is very simple, AVOID. At present active directory isn't supported in the stable versions of SAMBA, I have read little bits and pieces about this, but I don't know of anyone running in this environment reliably.

4.2.Windows Domain (no AD)
a) This takes some work but can be used very reliably. In this configuration your Linux SAMBA server acts as a Windows NT 4 Primary Domain Controller acting as the master browser and authentication server for your network. With this you can share files, printers, and authenticate users off the PDC server. You can also setup Roaming Profiles for Windows 2000 Pro and Windows XP Pro workstations.

4.3.Windows Workgroup
a) In this setup each Windows/Linux workstation uses it's own authentication and has it's own independent file shares. Each client can browse other clients within the same workgroup and access files if permission has been granted on the host. This can work very well for a small network (like most home networks) where users do not need central authentication. Files and printers can be shared.

5.Network Setup
5.1.Windows Workgroup
a) Linux Samba workstation
- Assuming you have a working Linux server/workstation and have installed the basic SAMBA packages correctly, see Appendix A for an example of a basic /etc/samba/smb.conf file for workstations.
- You will need to verify that all users have a working Linux account and all add each user manually to the smbpasswd file (the password needs to be set to the same as Linux if possible):

```
smbpasswd -a someuser
```

- Please check to make sure that directories have permissions and users set correctly on the Linux side:

```
chmod 0770 /home/private
chmod 1777 /home/public
```

- Also verify you have a guest account such as smbguest with a corresponding smbguest group. They do not need to have logins active:

```
groupadd smbguest
Useradd -d /home/smbguest -g smbguest -s /bin/false -m
                                              smbguest
```

- The file shares should be browseable and printable by anyone with an account on the Linux machine, or anyone for the public directory and printing.
- This sets up a basic Windows file and print server. I would recommend setting up a Linux print spool that uses the Raw Print Queue for use for windows clients printing to your server.

5.2. Windows Domain (no AD)

a) Linux SAMBA PDC

- Assuming you have a working Linux server/workstation and have installed the basic SAMBA packages correctly, see Appendix B for an example of a basic /etc/samba/smb.conf file for a PDC server.
- For this config file you need a /home/samba directory which will contain profile information as well as logon scripts (if any). Change this to what ever you prefer. Wild card definitions:
  %v = the Samba version
  %m = the NetBIOS name of the client machine (very useful)
  %u = user name of the current service, if any
  %L = the NetBIOS name of the server
  %U = session user name
- You will need to verify that all users have a working Linux account and all add each user manually to the smbpasswd file (the password needs to be set to the same as Linux if possible):

```
smbpasswd –a someuser
```

- Please check to make sure that directories have permissions and users set correctly on the Linux side:

```
chmod /home/private 0770
```

- This provides file and printing shares as well as domain logins for machines that are joined to the domain.

b) Linux SAMBA PDC with Roaming Profiles

- Assuming you have a working Linux server/workstation and have installed the basic SAMBA packages correctly, see Appendix C for an example of a basic /etc/samba/smb.conf file for a PDC w/Roaming Profiles.

- For this config file you need a /home/samba directory which will contain profile information as well as logon scripts (if any). Change this to what ever you prefer. Wild card definitions:
  %v = the Samba version
  %m = the NetBIOS name of the client machine (very useful)
  %u = user name of the current service, if any
  %L = the NetBIOS name of the server
  %U = session user name

- You will need to verify that all users have a working Linux account and all add each user manually to the smbpasswd file (the password needs to be set to the same as Linux if possible):

```
smbpasswd -a someuser
```

- Please check to make sure that directories have permissions and users set correctly on the Linux side:

```
chmod /home/private 0770
```

- This provides file and printing shares as well as roaming profiles for machines that are joined to the domain.

c) Joining windows clients.
- With the previous setup joining clients is fairly easy. You will need the root user account and password. You also need to setup a samba password with the following:

```
smbpasswd -a root
```

This command creates a samba user password match in the samba password file, this file is separate from the Linux password file and command. They do not automatically sync when passwords are changed on the Linux side. The above smb.conf file does support automatic samba-to-Linux password changes when passwords are changed using the Windows Domain Client to change passwords.

- Machine accounts will be created automatically with the above smb.conf file so you don't need to worry about that. To do this manually please check the SAMBA HOW-TOs.

- Windows NT SP4 or greater:
In the Identification Changes menu enter the domain name, and check the box "Create a Computer Account in the Domain." In this case, joining the domain proceeds as below for Windows 2000

- Windows 2000:
Log in with a local Administrator on the Windows Client Machine. In your System Properties, locate the Computer Name section, and click Change. From here, you can join your Samba domain, which is the "Workgroup" parameter from your smb.conf file. You'll be prompted for a name and password of an account with permissions to join the domain; only the user account "root" will work here, and the account must exist both on your Linux box (of course) and in your smbpasswd file.

- Windows XP pro:
  Same as windows 2000 except the following very important bit:
  To allow Windows XP Professional to join a Samba Domain, you will need to first make the following changes to your registry and reboot:

  ```
  [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Net
  logon\Parameters]
  "requiresignorseal"=dword:00000000
  "signsecurechannel"=dword:00000000
  ```

- For other versions of windows I suggest checking the Samba HOW-TO.

6. Linux Client Setup
6.1. Some Basic Command line tools:
a) `smbclient -L hostname`
  - to see available shares on a host

b) `smbclient //hostname/sharename`
  - connect to a host like ftp/sftp

c) `smbmount //hostname/sharename /mnt/sharename`
  - This requires root user or smbmnt suid root.
  - You can also setup smbmounts in your /etc/fstab file like such:
    `//hostname/sharename  /mnt/sharename auto noauto,users,owner 0 0`
    You will need SMB support installed in your kernel for this (RedHat supports this).

6.2. Using GUI file browsers
a) You can use xfsamba, Konqueror, Komba and others to do the same as above, usually more easily. Please check the respect sites from above for more details.

6.3. Printing
a) In Redhat Linux printing to samba/windows shared printers is pretty easy. You should run the printconfig-gui tool. In this tool you need to specify windows print shares (in RH7.x you may need to allow advanced options and look for SMB printing) and give the appropriate windows networking information (hostname, sharename, valid user and password if it isn't a public printer).

7. Issues seen
7.1. Printing issues
a) I have yet to get printers to be fully accessible to users in a domain or workgroup. Though all users have been able to print with no problems, they cannot access the print queue and control print jobs. I have heard of many people having no problem, so it's probably some screwup on my part I just haven't figured out yet.

7.2. Removing Machines from a Domain

a) If possible remove a Windows client from the domain using the Settings under network identification on that Windows machine before leaving if you plan on rejoining that same machine name later. It will fail if you don't. This is because a unique token is exchanged when a machine joins a domain. You can manually remove this token with the following command:

```
smbpasswd -x -m machinename
```

7.3. Firewalls

a) If you are running a firewall on your machine remember to open these ports for your clients to connect through:

```
netbios-ns  137/udp #NETBIOS Name Service (used by nmbd)
netbios-dgm 138/udp #NETBIOS Datagram Service (used by nmbd)
netbios-ssn 139/tcp #NETBIOS Session Service (used by smbd)
```

7.4. Files deleted reappearing in roaming profiles on Windows 2000

a) This one is a rare one, but I've got one user having problems with it. I haven't solved it yet, and MS is no help. Go here for the wonderful comments:
http://support.microsoft.com/default.aspx?scid=kb;en-us;283902

8. Links of interest

8.1. Samba

a) SAMBA project Site
http://www.samba.org
b) Unofficial HOW-TO
http://hr.uoregon.edu/davidrl/samba/
c) Official HOW-TO
http://us1.samba.org/samba/docs/man/Samba-HOWTO-Collection.html
d) xfsamba Windows file share browser
http://xfsamba.sourceforge.net/
e) SMB HOW-TO (if you are curious about the protocols)
http://www.tldp.org/HOWTO/SMB-HOWTO.html

8.2. MS Windows

a) Windows 2000 support
http://support.microsoft.com/default.aspx?scid=fh;EN-US;win2000
b) Windows XP support
http://support.microsoft.com/default.aspx?scid=fh;EN-US;winXPpro

8.3. Linux

a) Linux Documentation Project
http://www.tldp.org/

Appendix A
Generic Workgroup Config

```
# SAMBA configuration file
# /etc/samba/smb.conf

[global]

    ;Needed for all Windows Machine past Win 95 and NT4sp4
    encrypt passwords = yes

    ;Unix Guest account
    guest account = smbguest
    workgroup = calug
    netbios name = MyServer
    server string = Lord of Calug: Samba server running %v
    security = user
    socket options = TCP_NODELAY IPTOS_LOWDELAY
                     SO_RCVBUF=8192 SO_SNDBUF=8192

    ;optional limits to local lan and machine IPs
    hosts allow = 192.168.0. 127.

    ;Needed for loading printers from Unix printcap
    ;Use what ever print system you have (bsd,lprng,cups,etc..)
    printing = lprng
    printcap name = /etc/printcap
    load printers = yes

#Sets up users home directories as shares
[homes]
    browseable = no
    read only = no
    create mode = 0600
    directory mode = 0700

#Sets up a public directory for all users and guests to
#access.  No accounts needed
[public]
    browseable = yes
    create mode = 0666
    directory mode = 0777
    guest ok = yes
    guest only = yes
    path = /home/public
    read only = no
```

```
#Only users with valid accounts can access
[private]
     browseable = yes
     create mode = 0660
     directory mode = 0770
     path = /home/private
     read only = no

#All users have access to printers, guests included
[printers]
     comment = All Printers
     path = /var/spool/samba
     browseable = yes
     use client driver=yes
     public = yes
     guest ok = yes
     writable = yes
     printable = yes
```

Appendix B
General PDC Config

```
# /etc/samba/smb.conf
# SAMBA configuration file

[global]
     ;basic server settings
     workgroup = calug
     netbios name = MyServer
     server string = Lord of Calug: Samba PDC running %v
     socket options = TCP_NODELAY IPTOS_LOWDELAY SO_SNDBUF=8192
                      SO_RCVBUF=8192

     ;security and logging settings
     security = user
     encrypt passwords = yes
     domain logons = yes
     log file = /var/log/samba/log.%m
     log level = 2
     max log size = 50
     hosts allow = ALL

     ;sync UNIX passwords win-to-linux only!
     unix password sync = yes
     passwd program = /usr/bin/passwd %u
     passwd chat = *New*password* %n\n *Retype*password* %n\n
     passwd chat debug = no

     ;PDC and master browser settings
     os level = 64
     preferred master = yes
     local master = yes
     domain master = yes
     time server = yes
     wins support = yes

     ;Machine accounts
     add user script = /usr/sbin/useradd -d /dev/null -g
                       machines -s /bin/false -M %u

     ;Windows groups
     domain admin group = root @winadm

     ;Printing
     load printers = yes
     printing = lprng
     printcap name = /etc/printcap
```

```
#
#===Shares===
#

# User Home directories
[homes]
      comment = Home Directories
      browseable = no
      writeable = yes
      create mode = 0600
      directory mode = 0700

#Only users with valid accounts can access
[private]
      browseable = yes
      create mode = 0660
      directory mode = 0770
      path = /home/private
      read only = no

#This is where logon scripts and such would be placed
[netlogon]
      comment = Network Logon Service
      path = /home/samba/netlogon
      read only = yes
      browseable = no
      write list = root

#All unix printers made available to all users
[printers]
      comment = All Printers
      path = /var/spool/samba
      browseable = no
      writable = yes
      printable = yes
      public = yes
```

Appendix C

```
# /etc/samba/smb.conf
# SAMBA configuration file

[global]
      ;basic server settings
      workgroup = calug
      netbios name = MyServer
      server string = Lord of Calug: Samba PDC w/RPro running %v
      socket options = TCP_NODELAY IPTOS_LOWDELAY SO_SNDBUF=8192
                       SO_RCVBUF=8192

      ;security and logging settings
      security = user
      encrypt passwords = yes
      domain logons = yes
      log file = /var/log/samba/log.%m
      log level = 2
      max log size = 50
      hosts allow = ALL

      ;sync UNIX passwords win-to-linux only!
      unix password sync = yes
      passwd program = /usr/bin/passwd %u
      passwd chat = *New*password* %n\n *Retype*password* %n\n
      passwd chat debug = no

      ;PDC and master browser settings
      os level = 64
      preferred master = yes
      local master = yes
      domain master = yes
      time server = yes
      wins support = yes

      ;Machine accounts
      add user script = /usr/sbin/useradd -d /dev/null -g
                        machines -s /bin/false -M %u

      ;Windows admin groups
      domain admin group = root @winadm

      ;user profiles and home directory
      logon home = \\%L\%U\.profile
      logon drive = H:
      logon path = \\%L\profiles\%U
      logon script = netlogon.bat
```

```
      ;Printing
      load printers = yes
      printing = lprng
      printcap name = /etc/printcap

#===Shares===

#User Home directories
[homes]
      comment = Home Directories
      browseable = no
      writeable = yes
      create mode = 0600
      directory mode = 0700

#This is where user roaming profiles are stored
[profiles]
      comment = Roaming Profiles Directory
      path = /home/samba/profiles
      writeable = yes
      browseable = no
      create mask = 0700
      directory mask = 0700

#Only users with valid accounts can access
[private]
      browseable = yes
      create mode = 0660
      directory mode = 0770
      path = /home/private
      read only = no

#This is where logon scripts and such would be placed
[netlogon]
      comment = Network Logon Service
      path = /home/samba/netlogon
      read only = yes
      browseable = no
      write list = root

#All unix printers made available to all users
[printers]
      comment = All Printers
      path = /var/spool/samba
      browseable = no
      writable = yes
      printable = yes
      public = yes
```