File Serving Solutions Using Samba

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Abstract

Many Samba presentations focus on Samba and the basics of file serving. This presentation focuses on solutions and assumes a working knowledge of Samba. Therefore some of the more advanced features and Samba can be addressed. The issues and solutions addressed are:

* Samba political boundaries - Will the Windows administrator reset my Samba trust?
* Samba installation (distributor/custom RPM, .tar.gz), start-up script and SWAT
* Using winbind for authentication
* Using [homes] and automatic user creation for low maintenance
* Sharing files in teams
* Permissions and ACLs
* Data migration issues - Windows workgroups, Windows domains, Novell Netware
* Updated information regarding Samba 3.0

Code and command examples are supplied that you can easily take back home and use with your Linux on zSeries images.

Outline for this hour

- Introductions and overview of Samba
- Samba-3 new function
- Samba solutions!
  - Simple file serving
  - Set up SWAT
  - Set up a logical volume
  - Authenticate via winbind
  - Include an adduser script
  - Share files read/write in teams
  - Set up a z/VM front end
- Migration and coexistence
- Samba Performance
- Documentation and resources

Introductions - Who am I, Who are you?

- Who am I?
  - Michael MacIsaac, 17 years with IBM
    - 10 years programmer (Fortran, C, C++)
    - 7 years with S/390 (Linux tech support, ITSO project lead)
  - Linux (open source/freeware) advocate
  - e-mail - mikemac@us.ibm.com
- Who are you?
  - Linux servers in production?
  - Linux on your desktop?

Enterprise View

- It's a Windows desktop world, it's a UNIX server world
- Windows desktops rule 1 and rule 2:
  - Rule 1: Windows clients should not have to be modified.
  - Rule 2: When a change is needed to Windows client, see rule 1
- Samba crosses enterprise political boundaries
  - Samba works well in small groups and among friendly fiefdoms
  - Don't push Samba where political walls are high
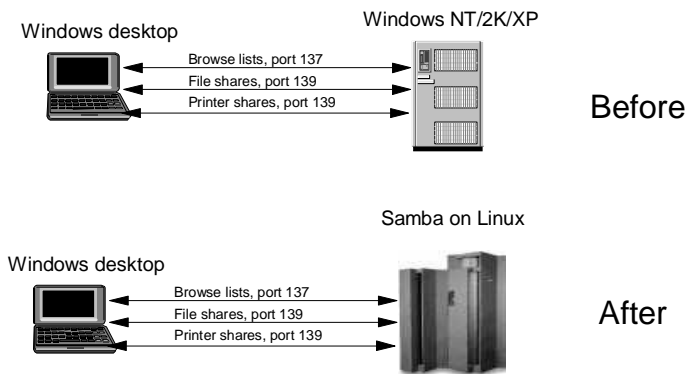 - Befriend the NT guys

Samba background

- Samba Team
  - Has done an incredible job of "staying with" Microsoft
  - Founder Andrew Tridgell - founder:
    - Wrote Samba because it was more fun than his PhD dissertation
    - Had a Linux PC at home and wanted to share files with his wife's Windows PC
    - Now an IBMer
  - Some of the more prominent members:
    - Jeremy Allison
    - Jerry Carter
    - Chris Hertel
    - Richard Sharpe
    - Jim McDonough, Steve French - IBMers funded by the LTC
- License - GPL
- History - coincidentally shadows the history of Linux

Samba services

- File serving via **smbd**
  - Large file systems - LVM + journalled FS
  - Sharing files among teams
  - Using Access Control Lists
- Print serving via **smbd**
  - An existing print server must first exist - lpd, LPRng or CUPS
  - smbd acts as "middle-man" between print server and Windows clients
- Browse lists via **nmbd**
  - Viewable via "Network Neighborhood" or "My Network Places"
  - Not the UNIX model for file shares, however, useful for printers
- Time Serving via **smbd**
  - middle-man between existing time server and Windows clients
- Domain login via **smbd**
- Authentication via **winbind** and administration via **swat**
  - Not really services, but important issues

Samba services

Windows desktop — Windows NT/2K/XP
Browse lists, port 137
File shares, port 139
Printer shares, port 139
Before

Windows desktop — Samba on Linux
Browse lists, port 137
File shares, port 139
Printer shares, port 139
After

Samba administration

- Via the command line
  - vi, smb.conf, smbpasswd, smb startup script, log files, etc.
- SWAT - the Samba Web Administration Tool
  - Enable via inetd or xinetd
  - Sometimes using read/only is a compromise
- z/VM front end - EZLNXID
  - IBM-written freeware
  - Good for shops with better VM skills than Linux skills
  - See:
    ftp://www.redbooks.ibm.com/redbooks/REDP3604/

Authentication - can be done many ways

- Not at all (guest = OK)
- Traditional UNIX style:
  - On Linux with encrypted passwords /etc/passwd and /etc/smbpasswd
  - On Linux with unencrypted passwords - /etc/passwd - See Rule 1
- Windows NT style
  - With Samba acting as a PDC
  - On the Windows Domain Controller with winbind
  - On the Windows DC + auto home directories and /etc/passwd file
    - use the smb.conf parameter:
      add user script = /usr/local/samba/bin/addSambauser
    - this script is run *before* authentication is done and before a process is forked
- LDAP style
  - Allows an enterprise directory running on Linux
  - OpenLDAP seems to be getting "hot"

Authentication via winbind
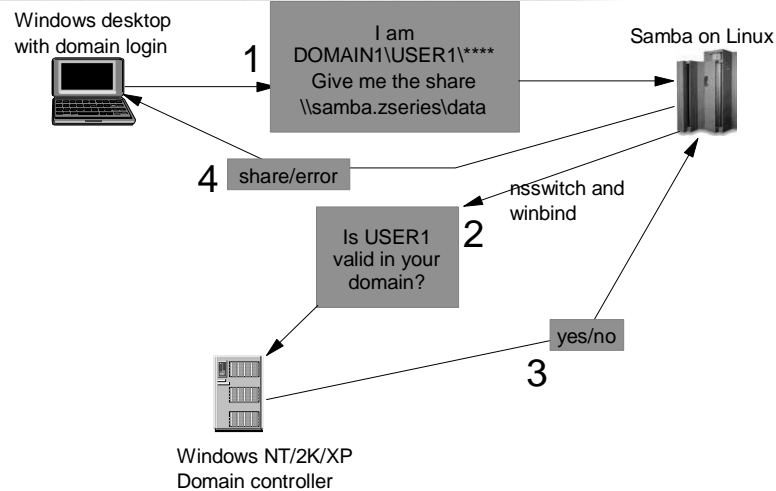
Samba installation options

- Samba Installation options
  - RPM with Linux distribution
  - Updated RPM from distributor or Web
  - Roll your own RPM
  - Build from source

Linux for zSeries Distribution	Kernel level	Samba level
SuSE SLES-7	2.4.7	2.2.0a
SuSE SLES-8	2.4.19	2.2.5
SuSE SLES-8+SP3	2.4.21	2.2.8a-108
Red Hat 7.2	2.4.9	2.2.1a
RHEL-3	2.4.21	3.0.0-14.3E
Debian 3.0	2.4.17	2.2.3a

The smb.conf file

- The smb.conf file consists of:

```
[sections]
        parameters = values
```

- Default /etc/samba/smb.conf with SuSE SLES-8

```
[global]
        workgroup = TUX-NET
        os level = 2
        time server = yes
        unix extensions = yes
        encrypt passwords = yes
        log level = 1
        syslog = 0
        printing = CUPS
        printcap name = CUPS
        socket options = SO_KEEPALIVE IPTOS_LOWDELAY TCP_NODELAY
        wins support = no
        veto files = /*.eml/*.nws/riched20.dll/*.{*}/
```

- Other special sections

```
[homes]
[printers]
[print$]
[netlogon]
```

Samba-3 new function

- Samba version 3 adds new function:
  - Active Directory support. Samba-3 can join an AD realm as a member server and authenticate users using LDAP/kerberos. It cannot be an Active Directory forest or tree.
  - UNICODE and multi-byte character set support
  - Full NT4 PDC support - a true replacement for MS Windows NT
  - tdbsam - stores all information stored in the smbpasswd file plus the extended Windows NT/2000/XP SAM information.
  - ldapsam - works with OpenLDAP and the new Samba schema format.
  - Better printing support including AD printer attributes
  - New **net** command modelled after the DOS command
  - NT 4 style domain trust relationships
  - Ability to map Windows groups to Linux groups using the net groupmap command.
  - Net RPC vampire - will be able to obtain NT4 SAM accounts into it's own tdbsam or into an ldapsam database.

Solution - Simple file serving

- Verify that Samba is installed

```
# rpm -q | grep samba
```

- Add some shares to smb.conf

```
# cd /etc/samba
# vi smb.conf  ...  add the following lines
        netbios name = mp3klnx3
        interfaces = 9.117.119.67/24    # needed with CTC interfaces
[sharedocs]
        path = /usr/share/doc/packages

[sambadocs]
        path = /usr/src/samba/docs
```

- Add a user:

```
# useradd user01
# mkdir ~user01
# chown user01.users ~user01
# passwd user01
...
# smbpasswd -a user01
...
# grep user01 /etc/samba/smbpasswd
user01:501:E77101BFD32FF9EBAAD3B435B51404EE:....:[UX   ]:LCT-3E26BAF1:
```

Solution - Simple file serving

- Start Samba if not running

```
# ls -l `which rcsmb`
lrwxrwxrwx  1 root 20 Jan 14 /usr/sbin/rcsmb -> ../../etc/init.d/smb*
# rcnmb start        # needed with SLES-8, not SLES-7, Red Hat
Starting Samba ldap NMB daemon                              done
# rcsmb start
Starting Samba ldap SMB daemon                              done
```

- Set Samba to start at boot time, if not set

```
# ls -l /etc/init.d/rc3.d/*[sn]mb
ls: /etc/init.d/rc3.d/*[sn]mb: No such file or directory
# chkconfig nmb on
# chkconfig smb on
# ls -l /etc/init.d/rc3.d/*[sn]mb
lrwxrwxrwx 1 root 6 Jan 17 07:46 /etc/init.d/rc3.d/K08smb -> ../smb*
lrwxrwxrwx 1 root 6 Jan 17 07:46 /etc/init.d/rc3.d/K14nmb -> ../nmb*
lrwxrwxrwx 1 root 6 Jan 17 07:46 /etc/init.d/rc3.d/S09nmb -> ../nmb*
lrwxrwxrwx 1 root 6 Jan 17 07:46 /etc/init.d/rc3.d/S15smb -> ../smb*
```

- Get a share from Windows (DOS prompt)

```
C:\>net use * \\9.117.99.215\smbdocs
Drive F: is now connected to \\9.117.99.215\smbdocs.
C:\> F:
```

Solution - Simple file serving: Map Network Drive
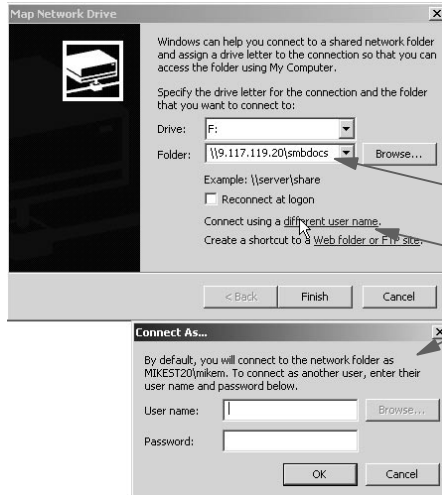
UNC

try to avoid

Solution - set up SWAT

- SWAT is typically available but commented out in inetd.conf
  ```
  # which swat
  /usr/sbin/swat
  # cd /etc
  # grep swat services inetd.conf
  services:swat          901/tcp        # CONFLICT, not official
  inetd.conf:# swat is the Samba Web Administration Tool
  inetd.conf:# swat stream  tcp nowait.400  root  /usr/sbin/swat  swat
  # vi inetd.conf                # just remove the pound sign (hash)
  # rcinetd status
  Checking for inetd:                                           unused
  mp3klnx6:/etc # rcinetd start
  Starting inetd                                               done
  ```
  - If your system uses xinetd, create a file /etc/xinetd/swat appropriately
- Enable inetd to start at IPL time (SLES-8)
  ```
  # chkconfig inetd
  inetd  off
  # chkconfig inetd on
  ```
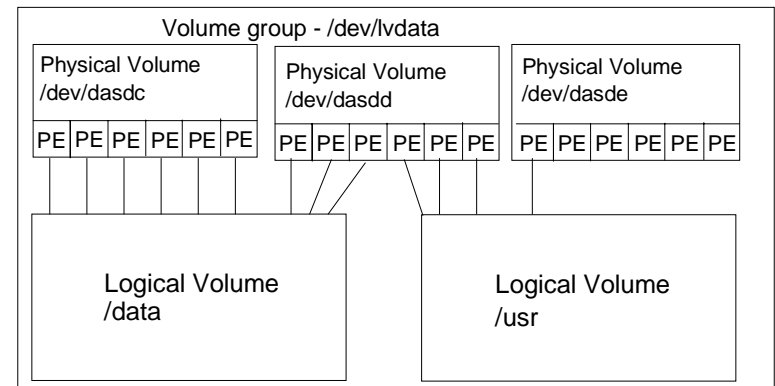- Point browser to http://your.server.IP.addr:901

Solution - SWAT main page
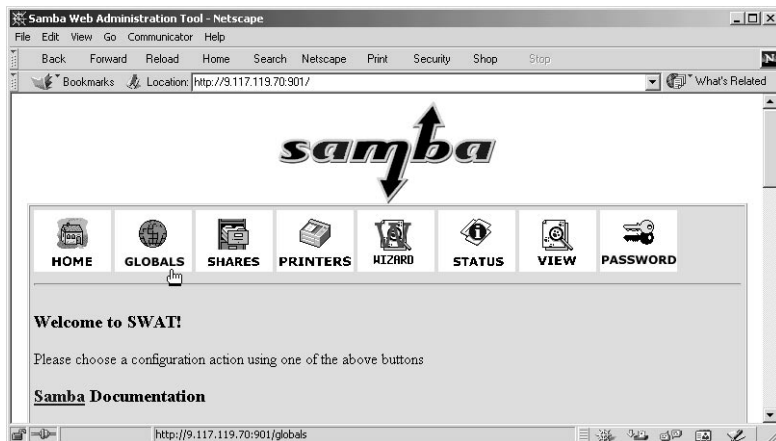
Solution - Set up a logical volume

- LVM block diagram

- Overall
  - Get some DASD defined to the VM user ID
  - Add the DASD in Linux
  - Format each DASD, carve into a single partition and verify
  - Create physical volumes for each DASD
  - Verify physical volumes
  - Create the volume group and verify
  - Create a striped logical volume using most of the volume group
  - Create a journalled file system and mount the logical volume
  - Give group write privileges and make a Samba share of the directory:
  - Set the LVM to come up at IPL (boot) time

- Get some DASD defined to the VM user ID

```
USER MP3KLNX6 LNX6 128M 512M    G
 INCLUDE LNXDFLT
 MDISK 100 3390 0001 3338 VM20F  MR RPASS WPASS MPASS
 MDISK 101 3390 0751 0100 VM218  MR RPASS WPASS MPASS
 MDISK 200 3390 0001 3338 VM210  MR RPASS WPASS MPASS
 MDISK 201 3390 0001 3338 VM211  MR RPASS WPASS MPASS
 MDISK 202 3390 0001 3338 VM212  MR RPASS WPASS MPASS
 MDISK 203 3390 0001 3338 VM213  MR RPASS WPASS MPASS
 MDISK 204 3390 0001 3338 VM214  MR RPASS WPASS MPASS
 MDISK 191 3390 0851 0050 VM218  MR RPASS WPASS MPASS
```

- Add the DASD in Linux

```
# dasd add 200-204
# dasd list
0100(ECKD) at ( 94:  0) is dasda : active at blksz: 4096, 2347 MB
0101(ECKD) at ( 94:  4) is dasdb : active at blksz: 4096, 70 MB
0200(ECKD) at ( 94:  8) is dasdc : active n/f
0201(ECKD) at ( 94: 12) is dasdd : active n/f
0202(ECKD) at ( 94: 16) is dasde : active n/f
0203(ECKD) at ( 94: 20) is dasdf : active n/f
0204(ECKD) at ( 94: 24) is dasdg : active n/f
```

- Sidebar - neat script (from "Large Scale Deployment" redbook)

```
# cat `which dasd`
#!/bin/sh
# dasd - simple utility for dynamic DASD management
if [ "$1" = "add" -a "$2" != "" ]; then
  echo "add range=$2" > /proc/dasd/devices
elif [ "$1" = "on" -a "$2" != "" ]; then
  echo "set device range=$2 on" > /proc/dasd/devices
elif [ "$1" = "off" -a "$2" != "" ]; then
  echo "set device range=$2 off" > /proc/dasd/devices
elif [ "$1" = "list" ]; then
  cat /proc/dasd/devices
else
  echo "Usage: dasd add|on|off vdev_or_range" 1>&2
  echo " dasd list" 1>&2
  exit 2
fi
```

- Format each DASD, carve into a single partition and verify

```
# for i in c d e f g
> do
>   dasdfmt -b 4096 -y -f /dev/dasd$i
>   fdasd -a /dev/dasd$i
> done
Finished formatting the device.
Rereading the partition table... ok
...
# dasd list
0100(ECKD) at ( 94:  0) is dasda : active, 2347 MB
0101(ECKD) at ( 94:  4) is dasdb : active, 70 MB
0200(ECKD) at ( 94:  8) is dasdc : active, 2347 MB
...
0204(ECKD) at ( 94: 24) is dasdg : active, 2347 MB
```

- Initialize LVM

```
# vgscan
vgscan -- reading all physical volumes (this may take a while...)
vgscan -- "/etc/lvmtab" and "/etc/lvmtab.d" successfully created
vgscan -- This program does not do a VGDA backup of your volume group
```

- Create physical volumes for each DASD
  ```
  # pvcreate /dev/dasd[cdefg]1
  pvcreate -- physical volume "dasdc1" successfully created
  pvcreate -- physical volume "dasdd1" successfully created
  pvcreate -- physical volume "dasde1" successfully created
  pvcreate -- physical volume "dasdf1" successfully created
  pvcreate -- physical volume "dasdg1" successfully created
  ```
- Verify physical volumes
  ```
  # pvscan
  pvscan -- reading all physical volumes (this may take a while...)
  pvscan -- inactive PV "/dev/dasdc1" is in no VG  [2.29 GB]
  pvscan -- inactive PV "/dev/dasdd1" is in no VG  [2.29 GB]
  pvscan -- inactive PV "/dev/dasde1" is in no VG  [2.29 GB]
  pvscan -- inactive PV "/dev/dasdf1" is in no VG  [2.29 GB]
  pvscan -- inactive PV "/dev/dasdg1" is in no VG  [2.29 GB]
  pvscan -- tot: 5 [11.46 GB] / in use: 0 [0] / in no VG: 5 [11.46 GB]
  ```

- Create the volume group and verify:
  ```
  # vgcreate datavg /dev/dasd[cdefg]1
  vgcreate -- INFO: using default physical extent size 4 MB
  vgcreate -- INFO: maximum logical volume size is 255.99 Gigabyte
  vgcreate -- doing automatic backup of volume group "datavg"
  vgcreate -- volume group "datavg" successfully created and activated
  # ls -ld /dev/datavg
  dr-xr-xr-x   2 root    root     72 Jan 16 14:29 /dev/datavg/
  # ls -l /dev/datavg
  crw-r-----   1 root    disk    109,   0 Jan 16 14:06 group
  # vgdisplay datavg | grep Size
  MAX LV Size           255.99 GB
  VG Size               11.43 GB
  PE Size               4 MB
  Alloc PE / Size       0 / 0
  Free  PE / Size       2925 / 11.43 GB
  ```

- Create a striped logical volume using most of the volume group
  ```
  # lvcreate --stripes 5 --size 11.4G -n lv1 /dev/datavg
  lvcreate -- INFO: using default stripe size 16 KB
  lvcreate -- rounding size up to physical extent boundary
  lvcreate -- rounding to stripe boundary size
  lvcreate -- doing automatic backup of "datavg"
  lvcreate -- logical volume "/dev/datavg/lv1" successfully created
  # lvdisplay /dev/datavg/lv1
  --- Logical volume ---
  LV Name               /dev/datavg/lv1
  VG Name               datavg
  LV Write Access       read/write
  LV Status             available
  LV #                  1
  # open                0
  LV Size               11.41 GB
  ...
  # vgdisplay datavg | grep Size
  MAX LV Size           255.99 GB
  VG Size               11.43 GB
  PE Size               4 MB
  Alloc PE / Size       2920 / 11.41 GB
  Free  PE / Size       5 / 20 MB
  ```

- Create a journalled file system and mount the logical volume
  ```
  # mke2fs -j /dev/datavg/lv1
  ...
  # mkdir /data
  # mount /dev/datavg/lv1 /data
  # df -h
  Filesystem            Size  Used Avail Use% Mounted on
  /dev/dasda1           2.3G  1.6G  744M  69% /
  shmfs                 62M     0   62M   0% /dev/shm
  /dev/datavg/lv1       12G   33M   11G   1% /data
  ```
- Give group write privileges and make a Samba share of the directory:
  ```
  # cd /
  # chown root.users data
  # chmod g+sw data
  # ls -ld data
  drwxrwsr-x   4 root    users       4096 Jul 22 13:27 data/
  # cd /etc/samba
  # vi smb.conf                      # add the entry
  # cat smb.conf
  ...
  [data]
         path = /data
         read only = no
  ```

- Set the LVM to come up at IPL (boot) time

```
# cd /etc
# cp zipl.conf zipl.conf.orig
# vi zipl.conf                          # add DASD 200-204
# cat zipl.conf
...
[ipl]
target=/boot/zipl
image=/boot/kernel/image
ramdisk=/boot/initrd
parameters="dasd=100-101,200-204 root=/dev/dasda1"
...
# zipl
# cp fstab fstab.orig
# vi /etc/fstab                         # and add a line
# cat /etc/fstab
/dev/dasda1        /          reiserfs   defaults           1 1
/dev/datavg/lv1    /data      ext3       acl                0 2
/dev/dasdb1        swap       swap       pri=42             0 0
devpts             /dev/pts   devpts     mode=0620,gid=5    0 0
proc               /proc      proc       defaults           0 0
# shutdown -r now
...
```

- Overall steps:
  - Create an `lmhosts` file
  - winbind library in `/lib`
  - Modify `nsswitch.conf` to use winbind
  - Stop or restart `nscd` so it won't use its cache
  - Join the Windows domain
  - Start Samba and winbind
  - Test getting a share using domain credentials

- Create an lmhosts file with the assumptions:
  - NT server IP = 7.117.119.70, NetBIOS name = LCCWIN2K
  - The server is Domain Controller for the domain POKLCC

```
# cd /etc/samba
# vi lmhosts                          #add two lines
# cat lmhosts
9.117.119.70 LCCWIN2K
9.117.119.70 POKLCC
```

- Verify or copy winbind library to `/lib`

```
# locate libnss | grep winbind
/lib/libnss_winbind.so
/lib/libnss_winbind.so.2
```

  - If building from source:

```
# cd /usr/src/samba/source/nsswitch/
# cp libnss_winbind.so /lib/libnss_winbind.so.2
```

- Modify the `/etc/nsswitch.conf` file to use the new library.

```
# cd /etc
# cp nsswitch.conf nsswitch.conf.orig
# vi nsswitch.conf    # add "winbind" to the passwd and group lines:
passwd: files winbind
group:  files winbind
```

- If building from source, make the libnss_winbind library available

```
# ldconfig -v | grep winbind
```

- Stop the name service caching daemon

```
# /etc/init.d/nscd stop
Shutting down Name Service Cache Daemon                       done
# chkconfig nscd off
# chkconfig nscd
nscd  off
```

- Join the domain via the `smbpasswd` command with the -j and -r flags.

```
# smbpasswd -j POKLCC -r LCCWIN2K
2002/07/30 09:55:56 : change_trust_account_password: Changed \
password for domain POKLCC.
Joined domain POKLCC.
```

- Start Samba (SuSE SLES-8) and verify it is running

```
# /etc/init.d/smb start
Starting SAMBA nmbd :                                          done
Starting SAMBA smbd :                                          done
Starting SAMBA winbindd :                                      done
```

- List the users, groups and machine trust in the POKLCC domain

```
# wbinfo -u
POKLCC+Administrator
POKLCC+Guest
...
# wbinfo -g
POKLCC+Domain Admins
POKLCC+Domain Users
...
# wbinfo -t
Secret is good
```

- Try to identify the a specific domain user:

```
# id POKLCC+user1
uid=10008(POKLCC+user1) gid=10001(POKLCC+Domain Users) \
 groups=10001(POKLCC+Domain Users)
```

- When winbind is authenticating it is nice for all administration to be done on the Windows PDC
- Often a share for each user is desirable
  - The [homes] section allows for a no-maintenance smb.conf file
  - But [homes] goes to /etc/passwd for $HOME - so an automated /etc/passwd is needed
  - Samba has an smb.conf parm named **add user script:**

```
For sites that use Windows NT account databases as their primary
user database creating these users and keeping the user list in
sync with the Windows NT PDC is an onerous task. This option allows
smbd to create the required UNIX users ON DEMAND when a user
accesses the Samba server.
When the Windows user attempts to access the Samba server, at login
(session setup in the SMB protocol) time, smbd contacts the password
server and attempts to authenticate the given user with the given
password. If the authentication succeeds then smbd attempts to find
a UNIX user in the UNIX password database to map the Windows user
into. If this lookup fails, and add user script is set then smbd
will call the specified script AS ROOT, expanding any %u argument
to be the user name to create.
```

```
#!/bin/sh
# add user and create home directory for the Samba [homes] share
# 1 arg = user name in form DOMAIN+userid - first set some variables
umask 077
dt=`date`
group="POKLCC+Domain Users"
userid=`echo $1 | sed s/poklcc+//`
logFile=/tmp/addSambaHomeLog.txt
# be sure the Windows user has a valid UID and the home directory doesn't exist
uid=`id -u $1`
rc=$?
if [ $rc != 0 ]; then
  echo "$dt: error in $0: id $1 returned $rc" >> $logFile
  exit 1
fi
if [ -d /home/$userid ]; then
  echo "$dt: error in $0: /home/$userid already exists" >> $logFile
  exit 2
fi
# append to /etc/passwd and create home directory
# we can't use the useradd command here because we want the Linux user name
# to be the Windows user name without the leading DOMAIN+
# useradd won't allow adding an ID with a duplicate UID
passwdEntry="$userid:x:$uid:ID for Samba homes:/home/$userid:/bin/false"
echo $passwdEntry >> /etc/passwd
mkdir /home/$userid
chown "$1.$group" /home/$userid
# log action
echo "$dt: added userid: $userid group: $group" >> $logFile
```

- UNIX (Linux) groups work well
  - Users can belong to multiple groups
  - Assumption: 1 Linux group = 1 team = 1 directory = 1 Samba share
  - Should work equally well from both Windows (SMB share) and Linux (telnet/ssh session) interfaces
  - The following should be true:
    1. The group (team) must exist
    2. Users must be members of the goup
    3. Files and directories created by group members set the group owner correctly.
    4. Files and directories created have the group write permission bit set
- Example
  - Set umask, add group team1 add user user1:

```
# umask 002
# groupadd team1
# useradd -G team1 user1
# passwd user1
...
# smbpasswd -a user1
...
```

Solution - Share files read/write in teams

- Make directory
  ```
  # cd /data
  # mkdir team1
  # chown user1.team1 team1
  # ls -ld team1
  drwxrwsr-x   2 user1    team1       4096 Jul 22 14:09 team1/
  ```
- Example share definition in smb.conf
  ```
  [team1]
          path = /data/team1
          writeable = Yes
          force group = +team1
          create mask = 0775
          directory mask = 0775
          force directory mode = 2775
  ```

Solution - Set up a z/VM front end

- The tool EZLNXID was written at ITSO in Poughkeepsie, NY
- Gives a z/VM front-end with a Linux back-end via REXX/regina
- Allows users, groups, passwords and shares to be manipulated:
  - Define new users and sets Linux and Samba passwords
  - Define new groups for access to Samba file systems
  - Create new file system directories
  - Creates Samba share definitions for the Linux file system
  - Authorizes new and existing users to groups
  - Change passwords, both for Linux and Samba
  - Removes users from groups
  - Removes users from Linux system
  - List users, groups, Samba shares, and Linux file system usage
- Create a huge logical volume under /data, for example, and add shares beneath that
- Think of a SWAT for VM
- See the redpaper "*Linux on IBM zSeries and S/390: Managing a Samba Server From z/VM*", on the Web at:
  ```
  http://publib-b.boulder.ibm.com/Redbooks.nsf/RedpaperAbstracts/redp3604.html
  ```

Solution - Set up a z/VM front end (cont'd)

```
Session A - [32 x 80]                                                    _ □ X
File  Edit  View  Communication  Actions  Window  Help
System: MP3KLNX6 Share: /data  EZLNXID Linux support  20 Jan 2003 10:50:46

CMS Command or
Option:  => i_
User:    =>                 Group: =>                 (Directory=Group
Password =>                 Owner: => Samba 2.2.5 on with ezlnxid
lnxshare   S Setup group , owner & filespace directory name in data share
lnxdgrp    R Remove group name only (filespace directory remains as is)
lnxqgrp    G Query all groups and who has access  B Query all Samba accesses
lnxqfspa   I Query all filespace directory names  O Find orphans

lnxauth    A Authorize a user to a group          ( user= ? or $anyname )
lnxdauth   D Delete authority for a user from a group ( user= ? or $anyname )
lnxqugrp   Q Query all the groups defined for a particular user
lnxqgusr   E Query all the users defined for a particular group

lnxnuser   N Defines new user and password  (default password = user )
lnxduser   X Deletes user from linux system
lnxnpw     P Sets new password for user    (default password = user )
lnxquser   U Query all users defined

lnxqspac   F Query filesystem (Filesystem Size Used Avail Use'/. Mounted-on)




F1=Help  F4=Id-lists  F5=Execs  F6=Log  F3/F12=Return
MA            a                                                        04/016
Connected to remote server/host 9.117.119.20 using port 23
```

Solution - Migration and coexistense

- Migration and coexistence - no "best practices"
  - There are issues:
    - Winbind mapping of NT RID to Linux UID is dynamically allocated
    - How to backup/restore to same UID
    - POSIX ACLs are slightly different than Windows ACLs
  - There are a lot of tools to work around these issues
    - Winbind (today)
    - Active directory support (Samba 3.0)
    - tar/zip + FTP
    - Drag and drop
    - Scripts

Samba Performance

- Observations by the Linux Scalability Center:
  - With a single Gbe OSA card up to 25 guests with one concurrent request each and an aggregate throughput of 13.37 MB/second could be supported. Maximum OSA throughput was reached between 12-15 SMB processes.
  - With a single guest server and a single OSA card we were able to support up to 30 concurrent users at an aggregate throughput of 19.4 MB/second.
  - Summary of Native results vs. VM guest results. The cost in throughput between the 2.4.17 kernel in a native LPAR vs. running the timer change version of this kernel on z/VM is most significant with small numbers of Guests.
    - Cost for the first 1-10 guests was 20-26% total.
    - Cost for 15 - 35 guest was only 9.7-16% total.
  - SuSE SLES 7 throughput is not as good as new internal kernel. At 35 connections the 2.4.17 Timer kernel produced up to 125% improvement over SuSE SLES 7. It is likely that significant improvement would be seen in SuSE SLES 8 vs. SLES 7.

Samba Performance (cont'd)

- Recommendations by the IBM Linux Scalability Center
  - Network configuration for communications: Use direct connections from OSA gigabit or fast ethernet cards to each Samba server guest.
  - If the configuration must use connections to one or more Linux guests used as a router, the recommendations for routing are as follows:
    - Use VM guest LAN rather than VCTC to connect the guests to the Linux system that is providing routing capability, or
    - Use VM TCP/IP routing from the OSA card to the guest servers.
  - Recommended virtual memory size: 128 MB. If a large number of guests are to be implemented, the goal should be to keep the Samba server virtual memory size as small as possible while avoiding Linux guest paging.
  - Real memory: to avoid paging, 128 MB per guest is recommended.
  - Minidisk caching was of little value and used a large amount of VM storage.

Samba Performance (cont'd)

- Recommendations by the Linux Scalability Center (cont'd)
  - The SuSE SLES 7 (2.4.7 kernel) QDIO communications provided significantly less throughput than the 2.4.17 kernel. With the changes provided in the 2.4.17 kernel and device drivers, the internal throughput improved by up to 100% in a heavily loaded guest, and by approximately 15% in a lightly loaded multiple guest configuration.
  - Download the latest QETH and QDIO device drivers supported for your kernel from IBM developerWorks to ensure that the installation is running at peak
- Recommendations from unofficial testing
  - The following smb.conf settings may give you better performance.
    ```
    max xmit = 8192
    socket options = TCP_NODELAY IPTOS_LOWDELAY \
       SO_SNDBUF=14596 SO_RCVBUF=14596
    dead time = 10
    ```

Documentation and resources

- Documentation
  - Migrating Windows Servers to Samba, Michael MacIsaac
    ```
    http://linuxvm.org/present/misc/SambaMig.pdf
    ```
  - SuSE docs, Samba and more - put this in smb.conf:
    ```
    [sharedocs]
            path = /usr/share/doc/packages
    ```
  - *Using Samba*, Jay Ts, Robert Eckstein, David Collier-Brown (2nd ed)
  - SWAT - includes *Using Samba* (1st edition) on line
  - *SAMBA Essentials for Windows Administrators*, Gary Wilson
  - Redbooks
    - *Linux for S/390*
      ```
      http://www.redbooks.ibm.com/abstracts/sg244987.html
      ```
    - *Linux for zSeries and S/390: Distributions*
      ```
      http://www.redbooks.ibm.com/abstracts/sg246264.html
      ```
    - *Understanding LDAP*, SG24-4986
      ```
      http://www.redbooks.ibm.com/abstracts/sg244986.html
      ```

- Web sites
  - Linuxvm.org - the Linux on zSeries portal:
    `http://linuxvm.org`
  - DeveloperWorks - IBM Boeblingen
    `http://www10.software.ibm.com/developerworks/opensource/linux390/index.shtml`
  - ISV applications for Linux on zSeries:
    `www.ibm.com/servers/eserver/zseries/solutions/s390da/linuxproduct.html`
  - z/VM and Linux:
    `http://www.vm.ibm.com/linux`
  - linux-390 archives:
    `http://www.marist.edu/htbin/wlvindex?linux-390`
  - z/VM publications:
    `http://www.vm.ibm.com/pubs/`
- Mailing lists
  - linux-390 mailing list (subscribe at bottom of page)
    `http://www.marist.edu/htbin/wlvindex?linux-390`
  - Samba mailing list (this host or other mirror)
    `http://us2.samba.org/samba/archives.html`