Samba Tutorial

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Agenda Day 1 – new ways of joining

- Joining from scratch
  - libsmbconf
  - libnetjoin
- Joining remotely
  - Windows NetJoinDomain call
  - `libnetapi.so`
  - Samba3 server support
- Joining using GUI
  - Domainjoin gtk GUI

Agenda Day 2 – netapi and Group Policy

- Programmatic access to the account database
  - User account management functions
  - Plan: User manager GUI
- Group Policy client
  - Basic Intro
  - Samba – a group policy engine
  - Currently supported options

New ways of joining

Before Samba 3.2

- `net rpc join` and `net ads join` implement all join code in the “net” binary monolithically
- Configuration must always have been set appropriately before the join
- 3rd party applications could just do upcalls to the “net” binary, and in case of error, parse stdout return
- We wanted to change this and provide something better

New in Samba 3.2

- Bugfixes (joining Windows 2008)
- Internal library libnetjoin
- Shared library offering a “NetJoinDomain” call
- Ability to join with an empty configuration file
- Ability to join remotely
- Ability to be joined remotely
- Example gtk GUI for joining

Joining with an (almost) empty smb.conf

- Samba 3.2 has a new `libsmbconf` internal interface
- Provides read/write access for storing Samba configuration in the local samba registry
- Frontend Samba: `net conf`
- Frontend Windows: `regedit.exe`
- Based on this `libsmbconf`, libnetjoin can join a client with a minimal smb.conf file:

```
[global]
        config backend = registry
```

Live Demo

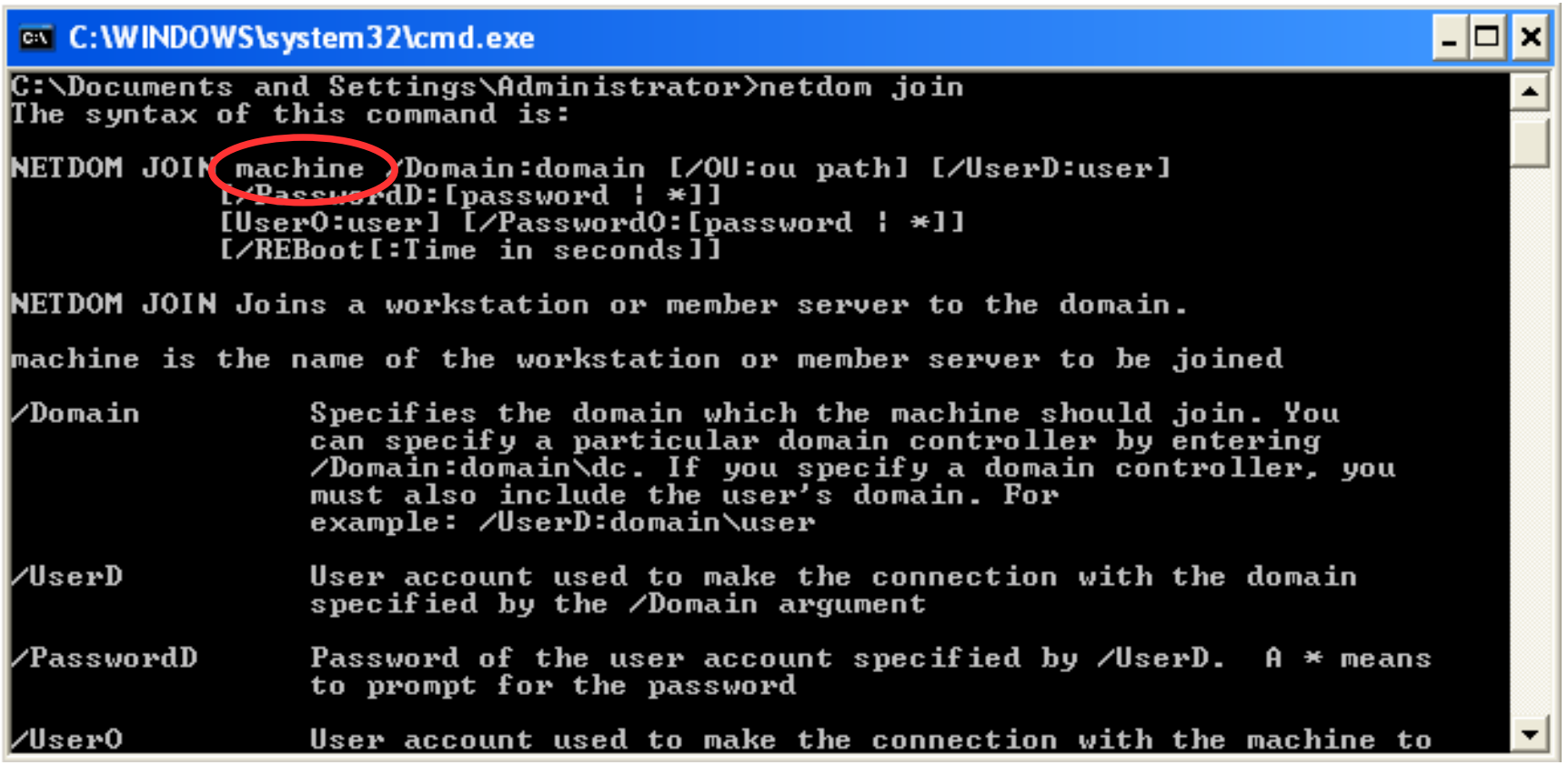
net ads join
&
“config backend = registry”

Joining and Unjoining on Windows ?

- Joining using the gui
- Joining using the command line “netdom join”

The Windows netdom join tool

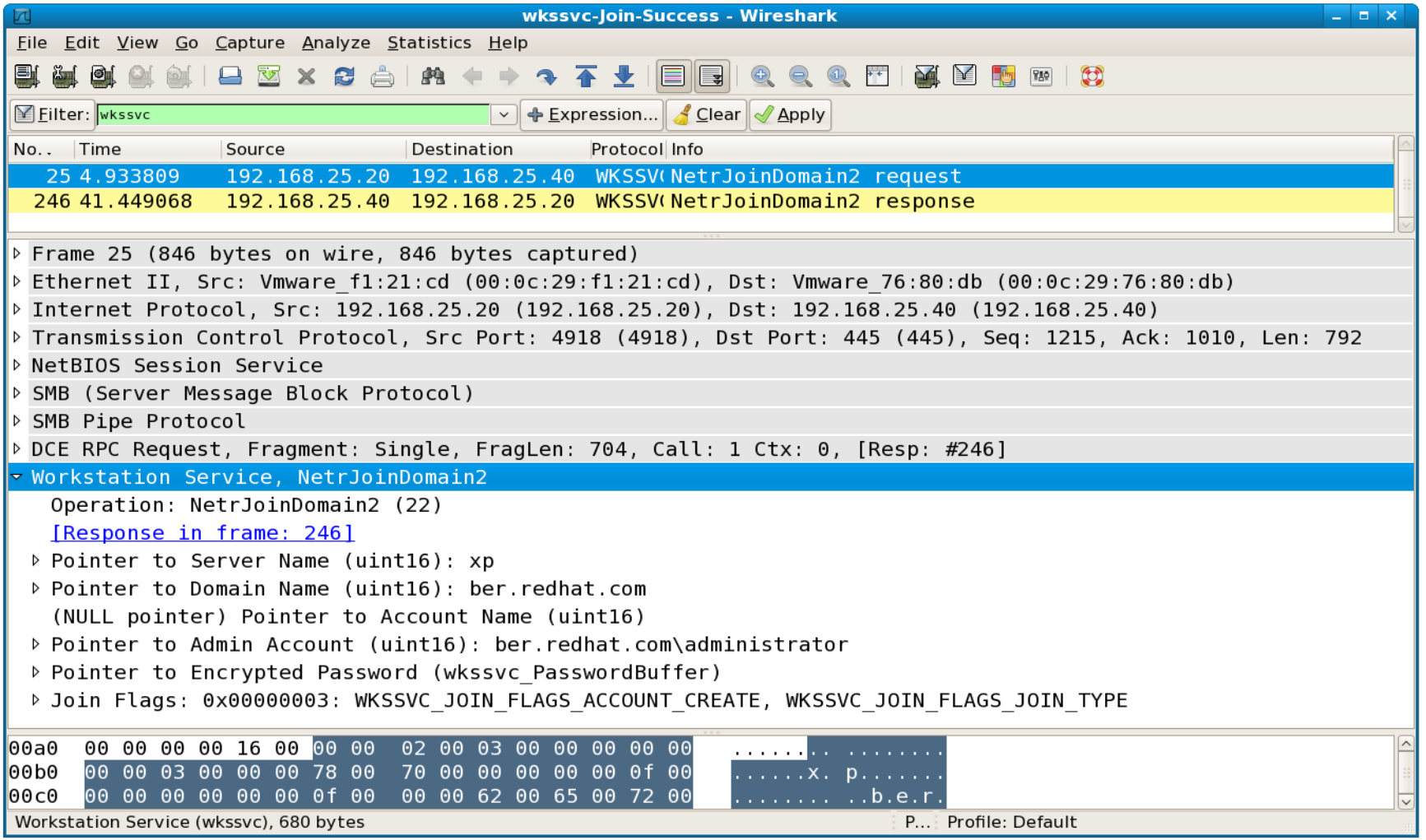
- Windows can join the local or a ***remote*** host to a domain



The Windows netdom join tool

- Connects to remote computer using current or given credentials
- Opens the remote Workstation Service Named Pipe (WKSSVC)
- Calls NetrJoinDomain2 which transports another set of domain credentials which are used by the remote computer to join the domain
- Also allows to specify Account OU to be joined to
- Once the remote computer receives this request, it gets very active

“netdom join” calls NetrJoinDomain2



A Cryptographical Challenge

- Domain account credentials were encrypted in an unknown, undocumented format
- Analyzed buffer using Samba4 smbtorture
- After some weeks of experiments, smbtorture was able to join XP into Windows 2003 remotely
- Needed to find a good home for this feature long-term
- On Windows, NetApi32.lib provides a NetJoinDomain call
- Plan: Start a `libnetapi.so` library to support this call on Linux
- All crypto is done in the library, caller has a simple API

NetJoinDomain

- Defined in netapi.h
- Does anything required to join the local or a remote computer into a domain
- Admin credentials are given in clear, NetJoinDomain takes care of encryption details
- Header:

```
NET_API_STATUS NetJoinDomain(const char * server /* [in] */,
                             const char * domain /* [in] [ref] */,
                             const char * account_ou /* [in] */,
                             const char * account /* [in] */,
                             const char * password /* [in] */,
                             uint32_t join_flags /* [in] */);
```

NetJoinDomain remote, local: netdomjoin

- **`netdomjoin` in lib/netapi/examples directory**

```
Usage: netdomjoin hostname
     --ou=ACCOUNT_OU                 Account ou
     --domain=DOMAIN                 Domain name (required)
     --userd=USERNAME                Domain admin account
     --passwordd=PASSWORD            Domain admin password

Help options:
     -?, --help                      Show this help message
     --usage                         Display brief usage message

Common samba netapi example options:
     -U, --user=USERNAME             Username used for connection
     -p, --password=PASSWORD         Password used for connection
     -d, --debuglevel=DEBUGLEVEL     Debuglevel
     -k, --kerberos                  Use Kerberos
```

NetJoinDomain remote, local: net

- **Sub command of `net`: `net dom join`**

```
usage: net dom join <domain=DOMAIN> <ou=OU> <account=ACCOUNT>
<password=PASSWORD> <reboot>
```

NetJoinDomain local uses libnetjoin

- Needed to abstract all join calls of “net ads join” to make them available outside of the net binary
- Started internal library libnetjoin
- NetJoinDomain calls libnetjoin when server_name is NULL.
- libnetjoin uses IDL for the join and unjoin context

Libnetjoin - input

```
libnet_JoinCtx: struct libnet_JoinCtx
        in: struct libnet_JoinCtx
             dc_name                  : 'w2k3dc-rhber'
             machine_name             : 'MTHELENA'
             domain_name              : *
                  domain_name             : 'BER.REDHAT.COM'
             account_ou               : NULL
             admin_account            : 'administrator'
             admin_password           : 'password'
             machine_password         : NULL
             join_flags               : 0x00000023 (35)
                  0: WKSSVC_JOIN_FLAGS_JOIN_WITH_NEW_NAME
                  0: WKSSVC_JOIN_FLAGS_JOIN_DC_ACCOUNT
                  0: WKSSVC_JOIN_FLAGS_DEFER_SPN
                  0: WKSSVC_JOIN_FLAGS_MACHINE_PWD_PASSED
                  0: WKSSVC_JOIN_FLAGS_JOIN_UNSECURE
                  1: WKSSVC_JOIN_FLAGS_DOMAIN_JOIN_IF_JOINED
                  0: WKSSVC_JOIN_FLAGS_WIN9X_UPGRADE
                  0: WKSSVC_JOIN_FLAGS_ACCOUNT_DELETE
                  1: WKSSVC_JOIN_FLAGS_ACCOUNT_CREATE
                  1: WKSSVC_JOIN_FLAGS_JOIN_TYPE
             os_version               : NULL
             os_name                  : NULL
             create_upn               : 0x00 (0)
             upn                      : NULL
             modify_config            : 0x00 (0)
             ads                      : NULL
             debug                    : 0x01 (1)
             secure_channel_type      : SEC_CHAN_WKSTA (2)
```

Libnetjoin - output

```
libnet_JoinCtx: struct libnet_JoinCtx
        out: struct libnet_JoinCtx
             account_name             : NULL
             netbios_domain_name      : 'BER'
             dns_domain_name          : 'ber.redhat.com'
             dn                       :
                  'CN=mthelena,CN=Computers,DC=ber,DC=redhat,DC=com'
             domain_sid               : *
                  domain_sid              : S-1-5-21-1800104011-1129049609-1243822444
             modified_config          : 0x00 (0)
             error_string             : NULL
             domain_is_ad             : 0x01 (1)
             result                   : WERR_OK
```

NetrJoinDomain2 server support

- Samba 3.2 has also initial support for remote join and unjoin server side
- NetrJoinDomain2 server uses libnetjoin
- Admin credentials are needed
- Only members of the Domain Admin and Local Administrators group can call this
- Probably needs more post-processing
- Needs be transaction based

Live Demo

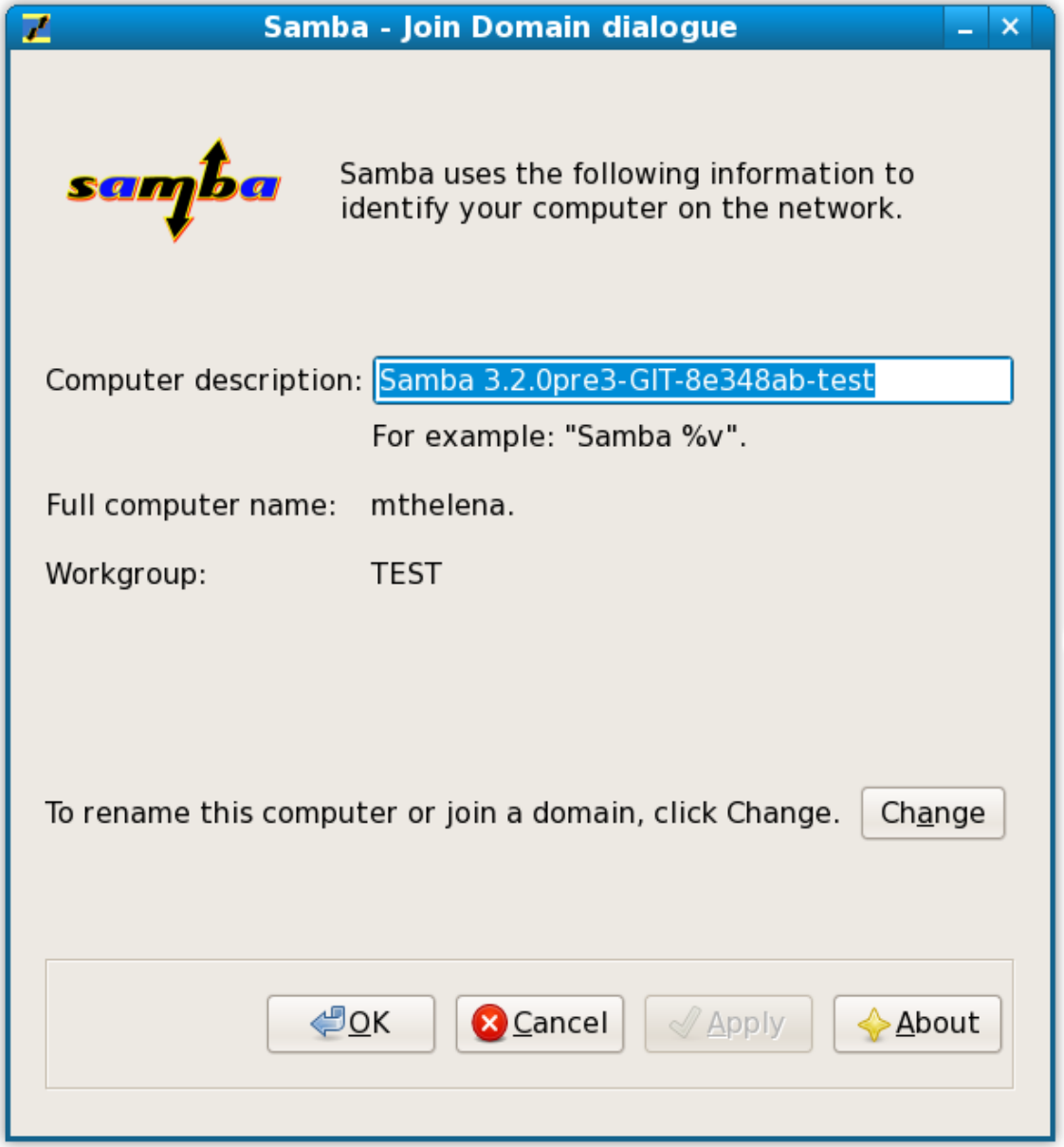
Samba joins XP to W2K3
XP joins Samba to W2K3

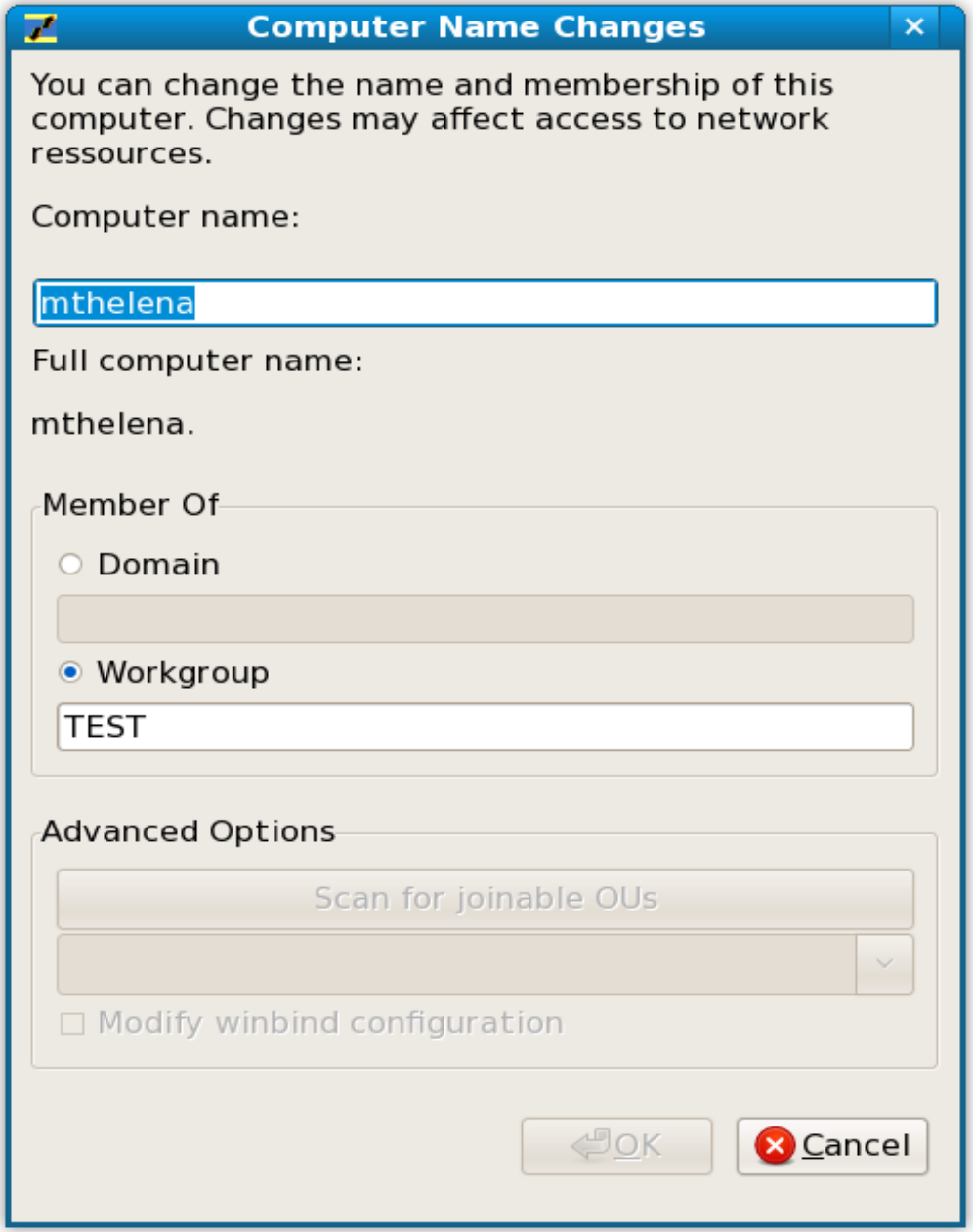
Grow your own...

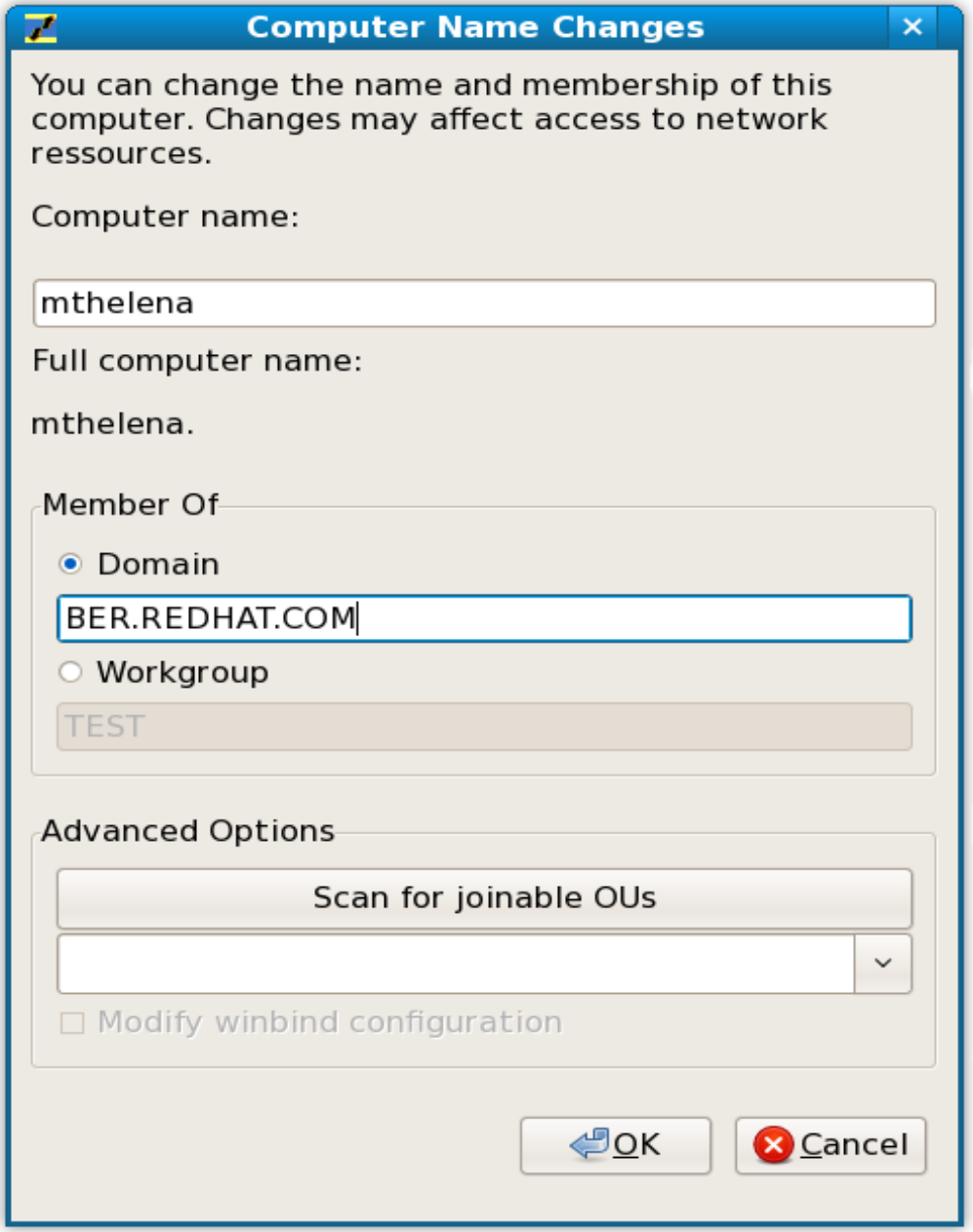
- We have abstracted the local join in libnetjoin
- We have abstracted the join in libnetapi
- Now new applications can be written by anyone to join computers into domains
- One proof of concept experiment was to offer a Windows-like interface for joining a workstation into a domain
- gtk domainjoin gui in `lib/netapi/examples`:
  - `netdomjoin-gui`

Live Demo

netdomjoin-gui


Samba - Join Domain dialogue
Samba uses the following information to identify your computer on the network.
Computer description:
Samba 3.2.0pre3-GIT-8e348ab-test
For example: "Samba %v".
Full computer name:
mthelena.
Workgroup:
TEST
To rename this computer or join a domain, click Change.
Change
OK
Cancel
Apply
About


Computer Name Changes
You can change the name and membership of this computer. Changes may affect access to network ressources.
Computer name:
mthelena
Full computer name:
mthelena.
Member Of
Domain
Workgroup
TEST
Advanced Options
Scan for joinable OUs
Modify winbind configuration
OK
Cancel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Workgroup
TEST
Advanced Options
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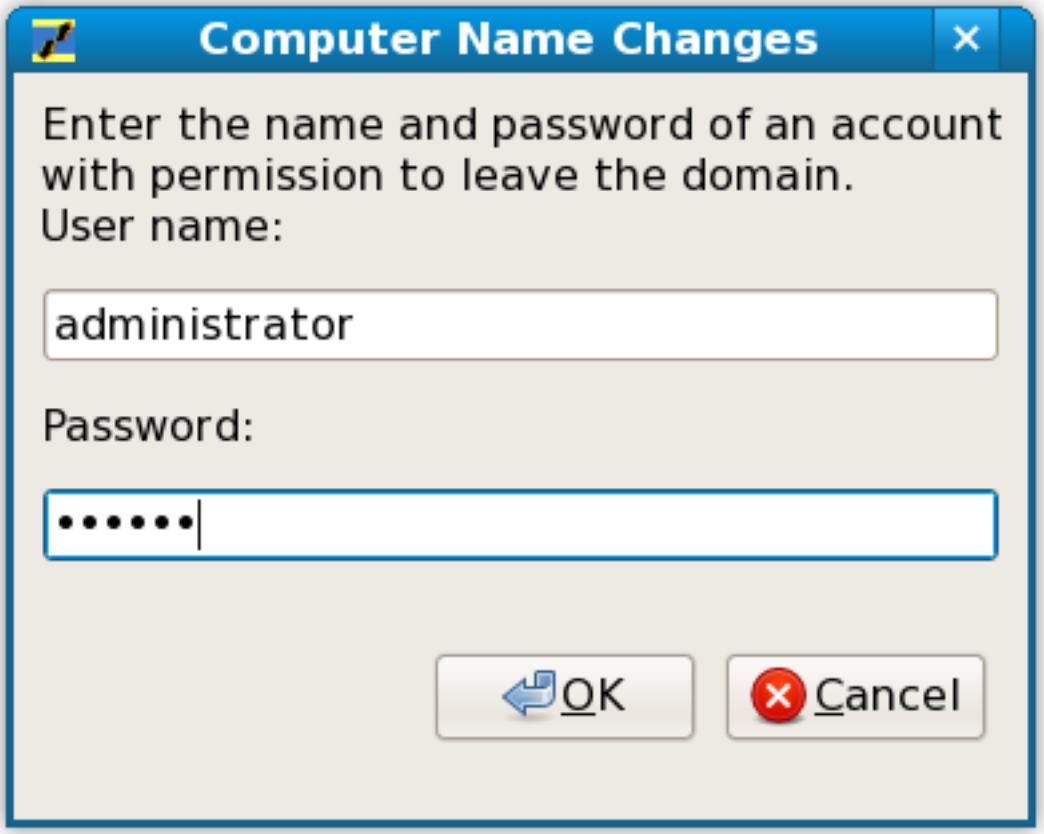
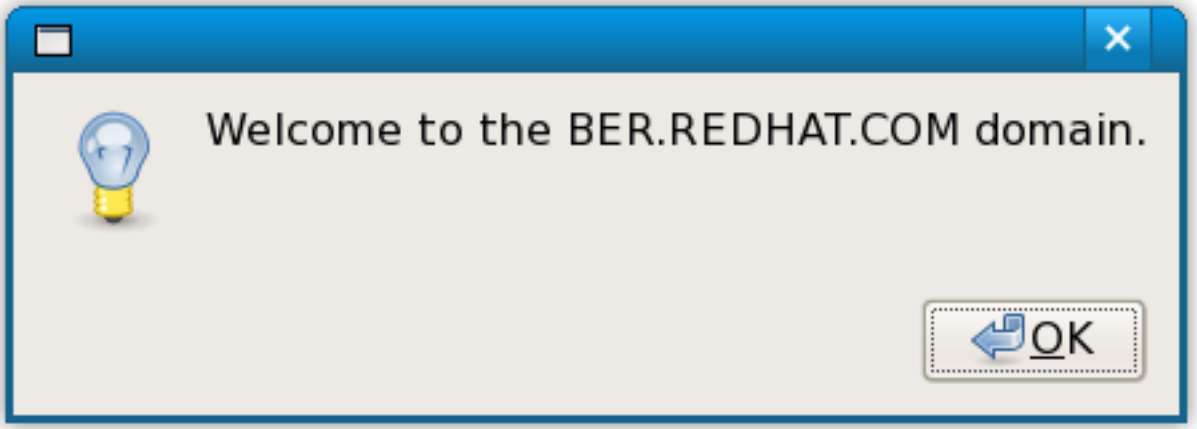
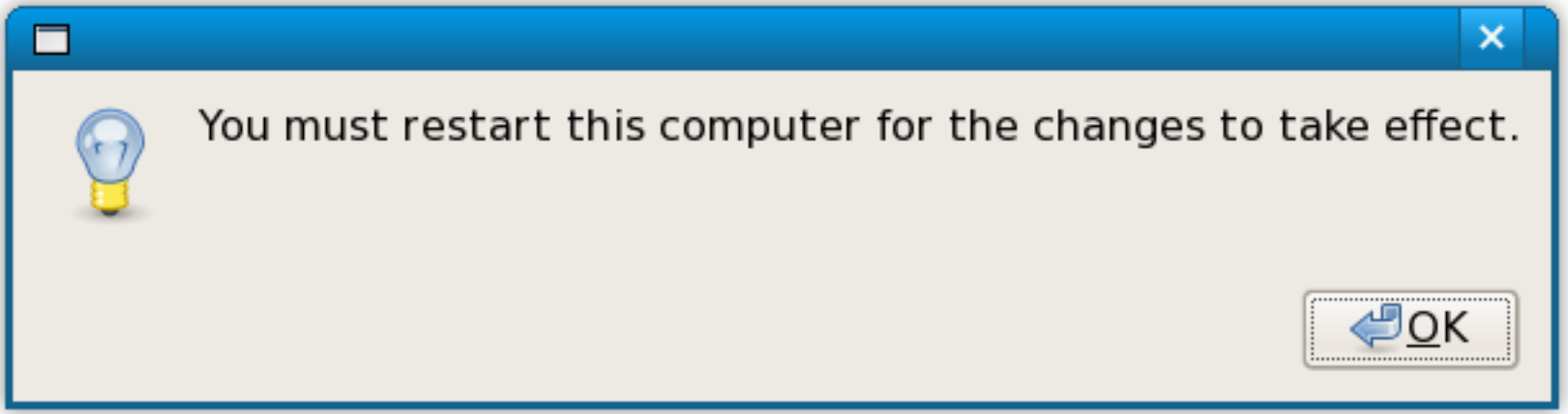
OK
Cancel


Computer Name Changes
Enter the name and password of an account with permission to leave the domain.
User name:
administrator
Password:
OK
Cancel


Welcome to the BER.REDHAT.COM domain.
OK


You must restart this computer for the changes to take effect.
OK

What's next:

- libnetjoin:
  - joining using vendor extensions (plugin/script that vendors use to integrate with local system management frameworks)
  - hostname, krb5, ntp, winbind/idmap, nsswitch, pam configuration
  - remote “unsecure” join
- libsmbconf:
  - write support for smb.conf backend in libsmbconf
- libnetapi:
  - make the library less heavyweight
  - python bindings
- start an internal libnet

Day 2

libnetapi

libnetapi

- Modeled after the windows equivalent NetApi32.lib
- Initially created only to support NetJoinDomain
- Wrapped around new Samba4 IDL based rpc client calls
- NetApi calls distinguish local or remote execution based on the first argument (usually `server_name`)
- Various examples available under `lib/netapi/examples`

Implemented calls in libnetapi

- NetJoinDomain
- NetUnjoinDomain
- NetGetJoinInformation
- NetGetJoinableOUs
- NetServerGetInfo
- NetServerSetInfo
- NetGetDCName
- NetGetAnyDCName
- DsGetDcName
- NetUserAdd
- NetUserDel
- NetUserEnum
- NetQueryDisplayInformation

Example: DsGetDCName

- Returns information about a DC for a specific domain
- Example in lib/netapi/examples/dsgetdc/dsgetdc.c

```
Usage: dsgetdc hostname domain
  Help options:
      -?, --help                            Show this help message
      --usage                               Display brief usage message

  Common samba netapi example options:
      -U, --user=USERNAME                   Username used for
  connection
      -p, --password=PASSWORD               Password used for
  connection
      -d, --debuglevel=DEBUGLEVEL           Debuglevel
      -k, --kerberos                        Use Kerberos
```

DsGetDCName examples

- **lib/netapi/examples/bin/dsgetdc w2k3dc-rhber nt4dom -U administrator**
  Password:
  domain NT4DOM has name: \\NT4-PDC
- **lib/netapi/examples/bin/dsgetdc w2k3dc-rhber ber.redhat.com -U administrator**
  Password:
  domain ber.redhat.com has name: \\w2k3dc-rhber.ber.redhat.com

Example: NetUserAdd

- Creates user accounts on the remote server, following the exactly same pattern as Windows would do
- Example in lib/netapi/examples/user/user_add.c

```
Usage: user_add hostname username password
  Help options:
      -?, --help                            Show this help message
      --usage                               Display brief usage message

  Common samba netapi example options:
      -U, --user=USERNAME                   Username used for
  connection
      -p, --password=PASSWORD               Password used for
  connection
      -d, --debuglevel=DEBUGLEVEL           Debuglevel
      -k, --kerberos                        Use Kerberos
```

Example: NetUserDel

- Deletes user accounts from remote servers, following the exactly same pattern as Windows would do
- Example in lib/netapi/examples/user/user_del.c

```
Usage: user_del hostname username
  Help options:
      -?, --help                            Show this help message
      --usage                               Display brief usage message

  Common samba netapi example options:
      -U, --user=USERNAME                   Username used for
  connection
      -p, --password=PASSWORD               Password used for
  connection
      -d, --debuglevel=DEBUGLEVEL           Debuglevel
      -k, --kerberos                        Use Kerberos
```

Future of account management

- Once we have added the missing calls, someone can start on a User Manager gui
- We still need to solve how to execute the account management calls locally
- One idea is to start a local RPC server on the fly (when running as root)

Group Policy

Why bother with Group Policy ?

- Primary motivation: `winbind` enables AD integration but has no support for Group Policy
- There are many Group Policy engines for Unix around – just none of them is open source
- Samba / `winbind` has all technology on board to do that itself
- Plan: provide a group policy framework based on Samba with an open architecture
- Main obstacle: there is no – established - centralized configuration framework on Unix
- But Samba has a registry

Why bother with Group Policy ?

- Triggered by winbindd offline feature
- `cached logon count`
- That integer value describes how many logons are cached locally.
- On Windows “0” disables the feature of caching logons locally.
- On Windows it is stored in the registry at:
  `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon\CachedLogonsCount`
- In Samba this value is hard-coded in winbind
- On Windows, Group Policy modifies this registry key

Learning Group Policy

- We wanted to understand how this works
- Analyzed network traffic between XP workstation and Windows 2003 Domain Controller:
  - Kerberos calls for authentication
  - LDAP calls for receiving the list of Group Policies
  - SMB calls for downloading policy files
  - => Nothing Samba couldn't do as well
- A Group Policy Object consists of:
  - Group Policy Container (gpc)
  - Group Policy Template (gpt)

Group Policy Container (LDAP)

```
CN={00F0991D-
DCBF-4A7A-9723-3F7D3977FDB8},CN=Policies,CN=System,DC=ber,DC=redhat,DC=com
-----------------------------------------------------------------------------
cn: {00F0991D-DCBF-4A7A-9723-3F7D3977FDB8}
displayName: gd new privs
distinguishedName: CN={00F0991D-
DCBF-4A7A-9723-3F7D3977FDB8},CN=Policies,CN=System,DC=ber,DC=redhat,DC=com
flags: 0 (0x00000000)
     - GPFLAGS_ALL_DISABLED (0x00000003)
     X GPFLAGS_ALL_ENABLED (0x00000000)
     - GPFLAGS_MACHINE_SETTINGS_DISABLED (0x00000002)
     - GPFLAGS_USER_SETTINGS_DISABLED (0x00000001)
gPCFileSysPath: \\ber.redhat.com\SysVol\ber.redhat.com\Policies\{00F0991D-
DCBF-4A7A-9723-3F7D3977FDB8}
gPCFunctionalityVersion: 2
gPCMachineExtensionNames: [{827D319E-6EAC-11D2-4EA-00C04F79F83A}{803E14A0-B4FB-11D0-
A0D0-00A0C90F574B}]
name: {00F0991D-DCBF-4A7A-9723-3F7D3977FDB8}
objectCategory: CN=Group-Policy-
Container,CN=Schema,CN=Configuration,DC=ber,DC=redhat,DC=com
objectClass: container
objectClass: groupPolicyContainer
objectClass: top
objectGUID: a3d552f1-491f-4219-8aa9-85c71a9505d5
showInAdvancedViewOnly: TRUE
versionNumber: 11
whenChanged: Mon Apr 14 00:45:21 2008 (20080413224521.0Z)
whenCreated: Sun Apr 13 14:34:38 2008 (20080413123438.0Z)
```

Group Policy Link on Domain (LDAP)

- **DC=ber,DC=redhat,DC=com**

```
----------------------------------------------------------------------------
creationTime: Thu Jun  7 17:15:31 2007 (128257029314062500)
dc: ber
distinguishedName: DC=ber,DC=redhat,DC=com
gPLink: [LDAP://cn={00F0991D-
DCBF-4A7A-9723-3F7D3977FDB8},cn=policies,cn=system,DC=ber,DC=redhat,DC=com;0]
[LDAP://cn={537D6625-EE33-4252-BB40-
E8AF8C48152F},cn=policies,cn=system,DC=ber,DC=redhat,DC=com;0]
[LDAP://CN={31B2F340-016D-11D2-945F-00C04FB984F9},CN=Policies,CN=System,DC=ber,DC=re
dhat,DC=com;0][LDAP://cn={E5C3D7F3-9392-4443-
AC45-4EBDA1D8219B},cn=policies,cn=system,DC=ber,DC=redhat,DC=com;0]
```

Group Policy Template (CIFS)

- **Replicated SYSVOL share on the Windows DC Fileserver**
- `ber.redhat.com/Policies/{31B2F340-016D-11D2-945F-00C04FB984F9}`
- ```
  ./USER
  ./USER/Microsoft
  ./USER/Microsoft/RemoteInstall
  ./USER/Microsoft/RemoteInstall/oscfilter.ini
  ./GPT.INI
  ./Adm
  ./Adm/wuau.adm
  ./Adm/inetres.adm
  ./Adm/system.adm
  ./Adm/wmplayer.adm
  ./Adm/conf.adm
  ./Adm/admfiles.ini
  ./MACHINE
  ./MACHINE/Scripts
  ./MACHINE/Scripts/Startup
  ./MACHINE/Scripts/Shutdown
  ./MACHINE/Microsoft
  ./MACHINE/Microsoft/Windows NT
  ./MACHINE/Microsoft/Windows NT/SecEdit
  ./MACHINE/Microsoft/Windows NT/SecEdit/GptTmpl.inf
  ./MACHINE/Registry.pol
  ```
  ```

Windows Group Policy Client

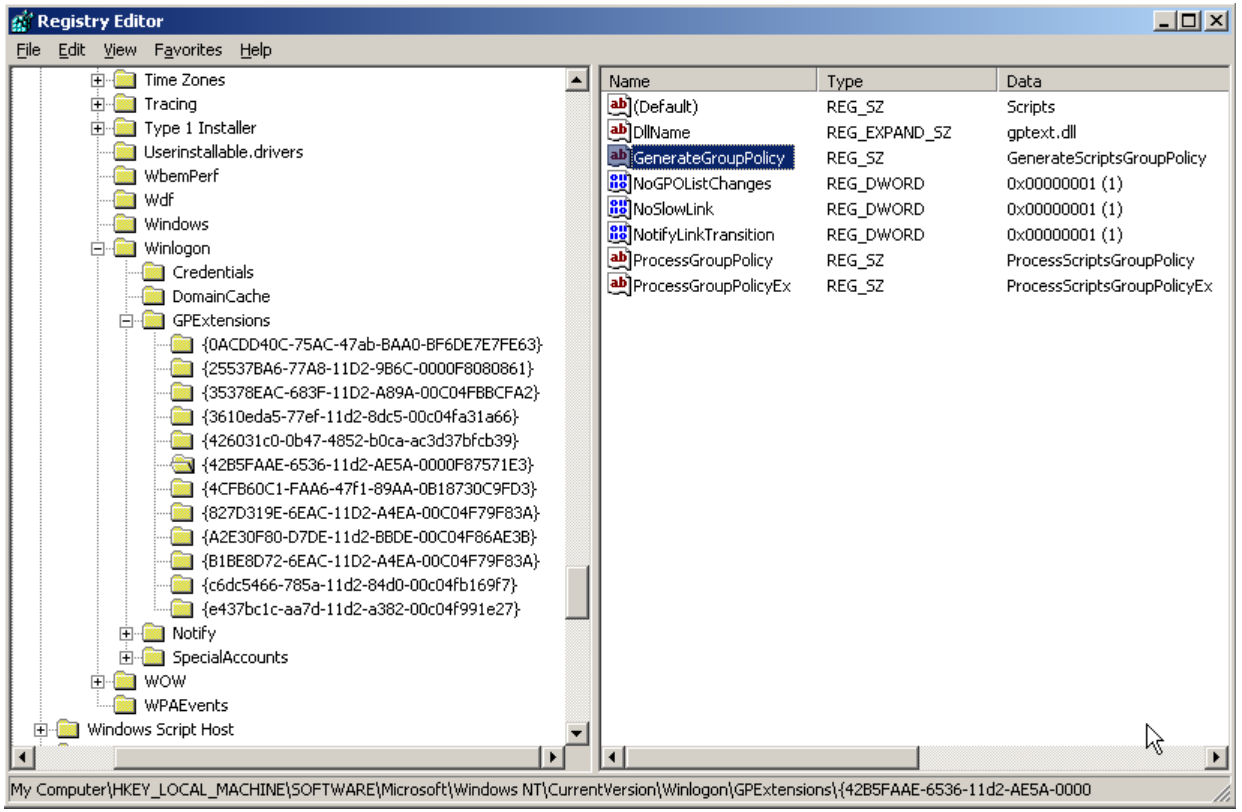
- Winlogon process does call the Group Policy client
- Group Policy client authenticates to LDAP, retrieves list of Group Policy objects
- Client loads Client Side Extensions to process the Group Policy Object list

Windows Group Policy CSEs

- Group Policy assigns specific sets of policy to Client Side Extensions (CSEs)
- There are CSEs for:
  - Registry settings
  - Disc Quota
  - Folder Redirection
  - Internet Explorer Branding
  - Scripts
  - Security
  - Wireless Group Policy
  - and many, many more.

Windows Group Policy CSEs

- Client side extensions on a Windows 2003 Domain controller



How to implement GPOs in Samba?

- We can identify policy and download it
- How can we process it?
- On Windows almost anything is stored in the registry
- Monitored Windows XP registry changes after manipulating Group Policies on the Domain Controller
- Analyzed processing information which is stored in the registry
- Started libgpo internal library to identify list of Group Policies for a workstation/user

Samba Group Policy components

- `libgpo/`
  - `ads_get_gpo_list()` => **looks into LDAP, stores registry**
  - `check_refresh_gpo_list()` => **connects sysvol, gets policy**
  - `gpo_process_gpo_list()` => **calls extensions**
- `net ads gpo` **commands**
  - `net ads gpo refresh`

    Does retrieve the list of GPOs in LDAP, and downloads policy from SYSVOL
  - `net ads gpo apply`

    Does call the client side extensions and processes the Group Policy list

Samba Group Policy components

- `winbind` async group policy child (with `smbcontrol` signaling, `winbind` queries)
  - `winbind` is processing Group Policy for the machine account
  - `winbind` is also processing user-based Group Policy when using `pam_winbind`
- Client side extensions modular API: `gpext`

Samba Client side extensions: gpext

- Stored below `/usr/lib{64}/samba/gpext`
- Will automatically register by GUID in local Samba registry below:

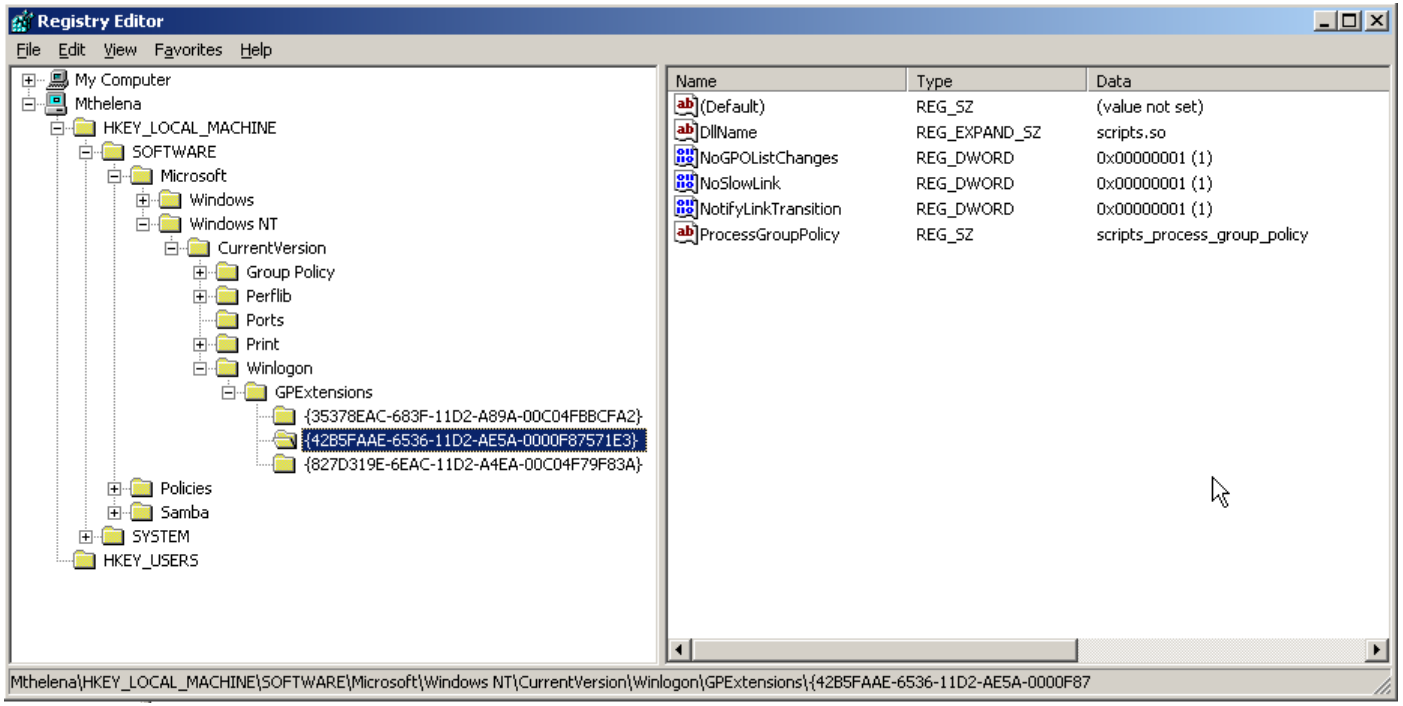
  `HKLM\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\GPExtensions`

- CSE module configuration stored in registry itself:
  - DllName, ProcessGroupPolicy, NoMachinePolicy, NoUserPolicy, NoSlowLink, NoBackgroundPolicy, NoGPOListChanges, PerUserLocalSettings, RequiresSuccessfulRegistry, EnableAsynchronousProcessing, ExtensionDebugLevel

Client side extensions: Existing modules

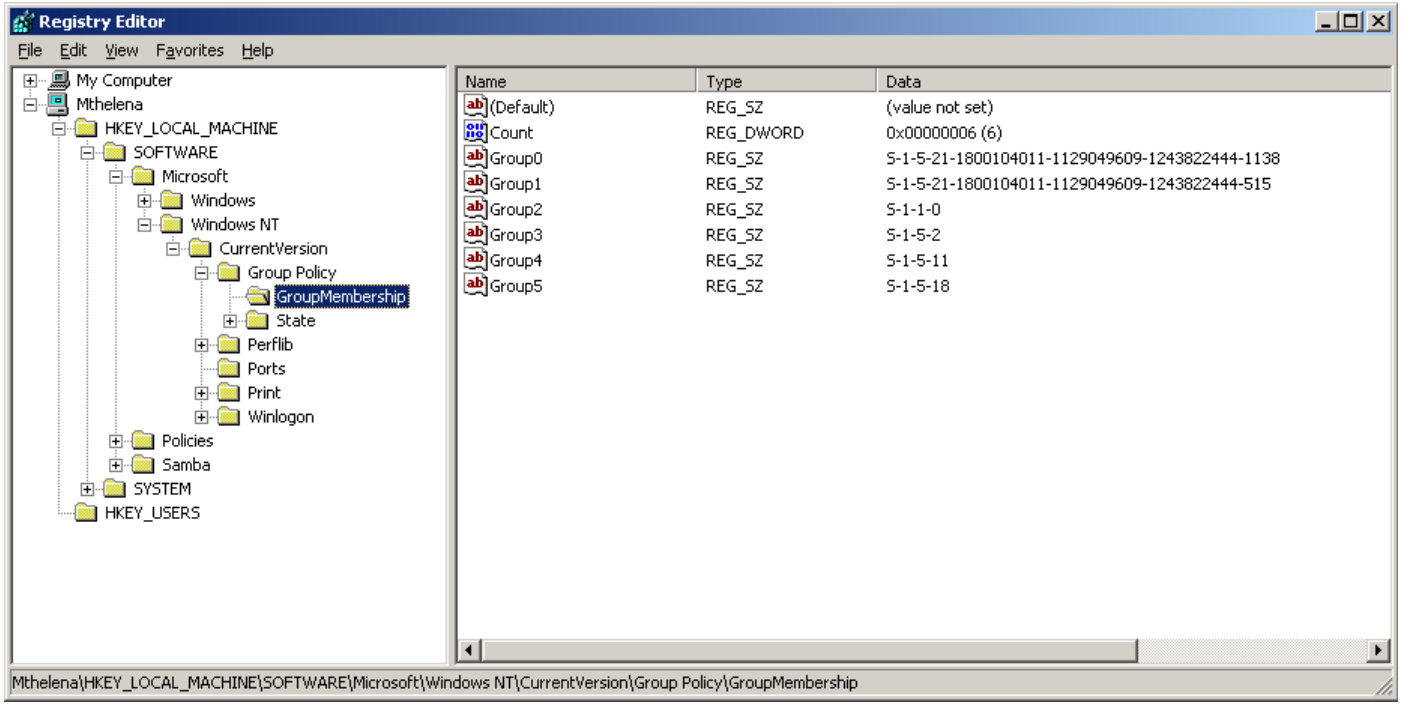
- `registry.so {35378EAC-683F-11D2-A89A-00C04FBBCFA2}`
  - parses PReg files (`Registry.pol`)
  - applies them to local Samba registry
- `security.so {827D319E-6EAC-11D2-A4EA-00C04F79F83A}`
  - parses ini files (`GptTmpl.inf`)
  - applies them to the local Samba registry (under `HKLM\SOFTWARE\Samba\Group Policy`)
- `scripts.so {42B5FAAE-6536-11D2-AE5A-0000F87571E3}`
  - parses ini files (`scripts.ini`)
  - applies the script info to the local Samba registry

Samba registry: GPExtensions



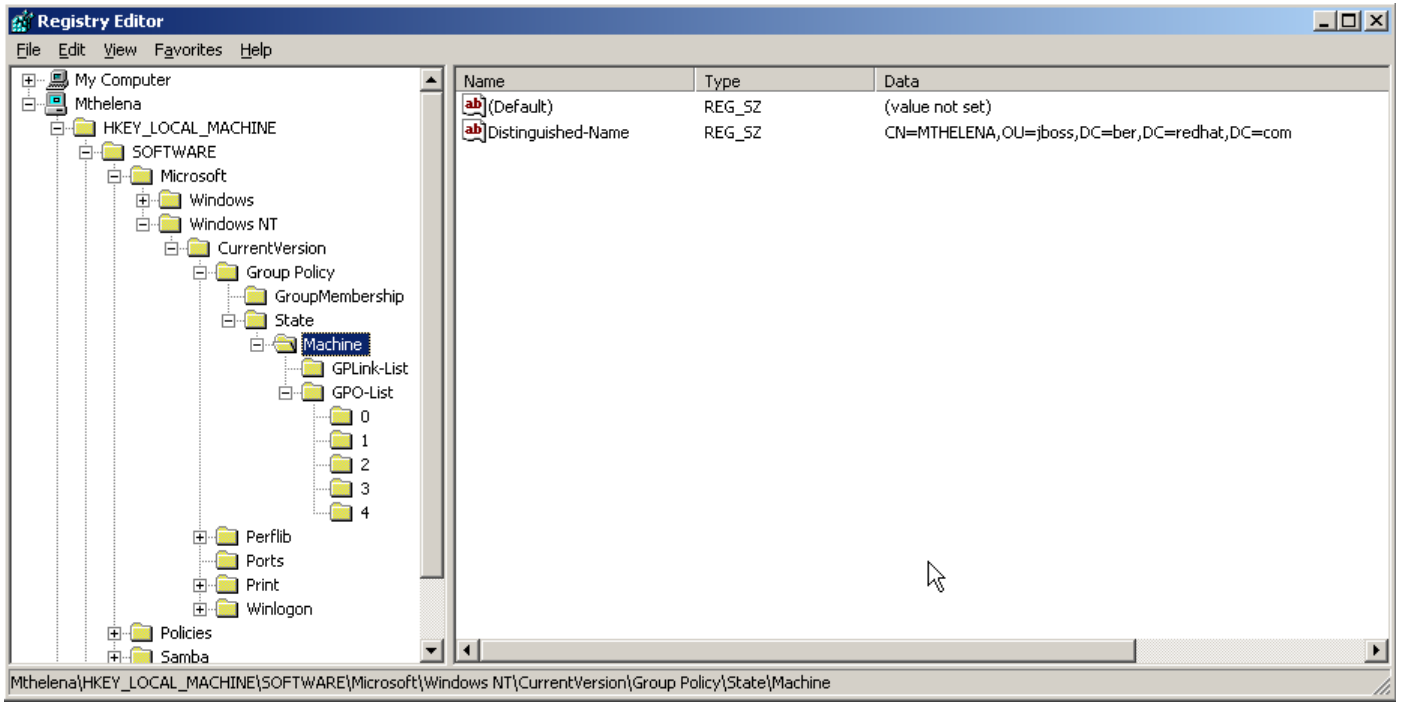
- **The three implemented Samba Group Policy Extensions viewed via regedit**

Samba registry: Group Policy State



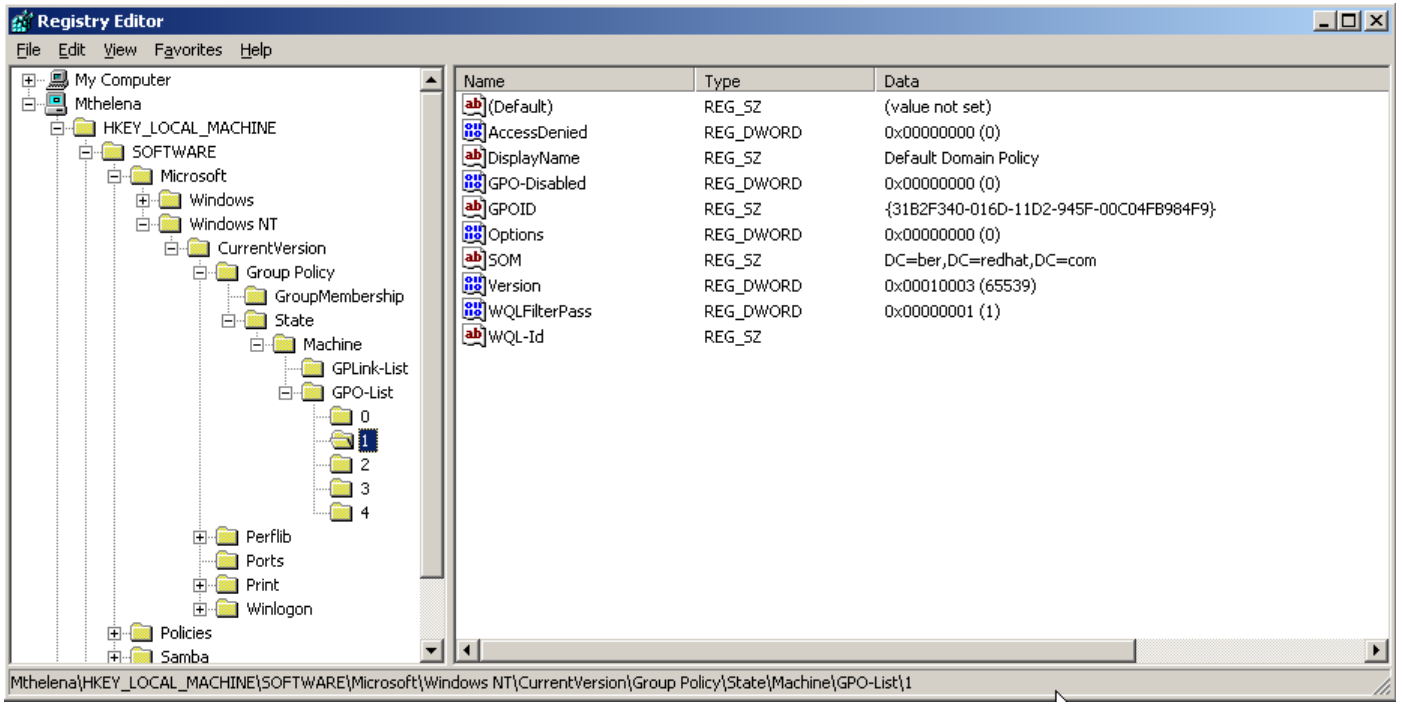
- **Group Policy stores current GroupMembership in order to identify Policy changes based on membership**

Samba registry: Group Policy State



- **Samba also stores the Distinguished Name in the State registry object**

Samba registry: Group Policy State



- **Finally, the current list of Group Policies is stored in an ordered list in the registry**

Samba Group Policy support

- Certainly not all of Group Policy can be applied and enforced
- Samba will support everything it needs and can support
- Security Settings
  - Security Options
  - Rights
- And possibly:
  - Logon/Logoff Scripts
  - Auditing Settings

Group Policy examples:

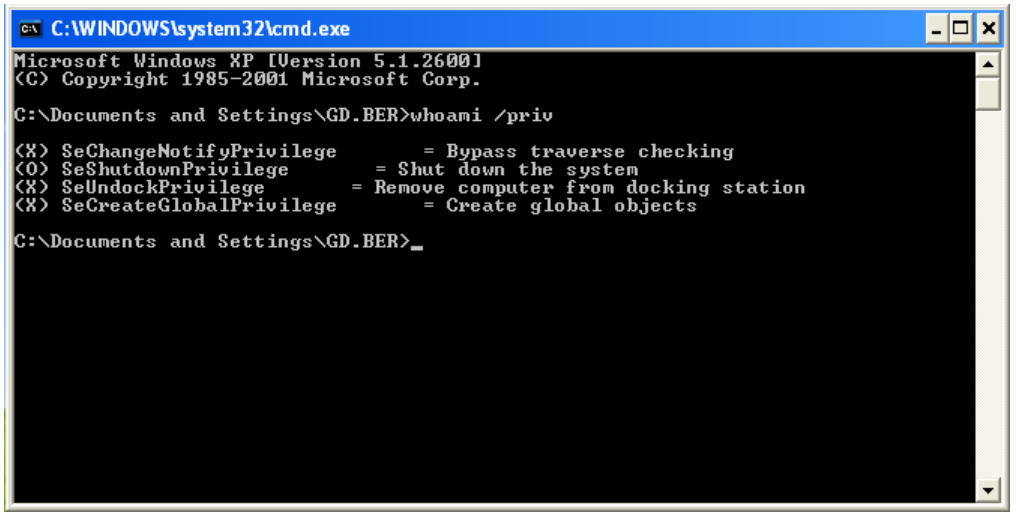
- Deploy granting of user rights to one user
- Setting SMB server signing policy to one machine
- Using Administrative Templates for Unix Settings

Distributing Privileges with Group Policy

- User privileges always have a local scope
- In Samba they are stored in account_pol.tdb
- In Active Directory, user privileges are deployed using Group Policy
- Example: Grant `SeTakeOwnershipPrivilege` to BER\gd

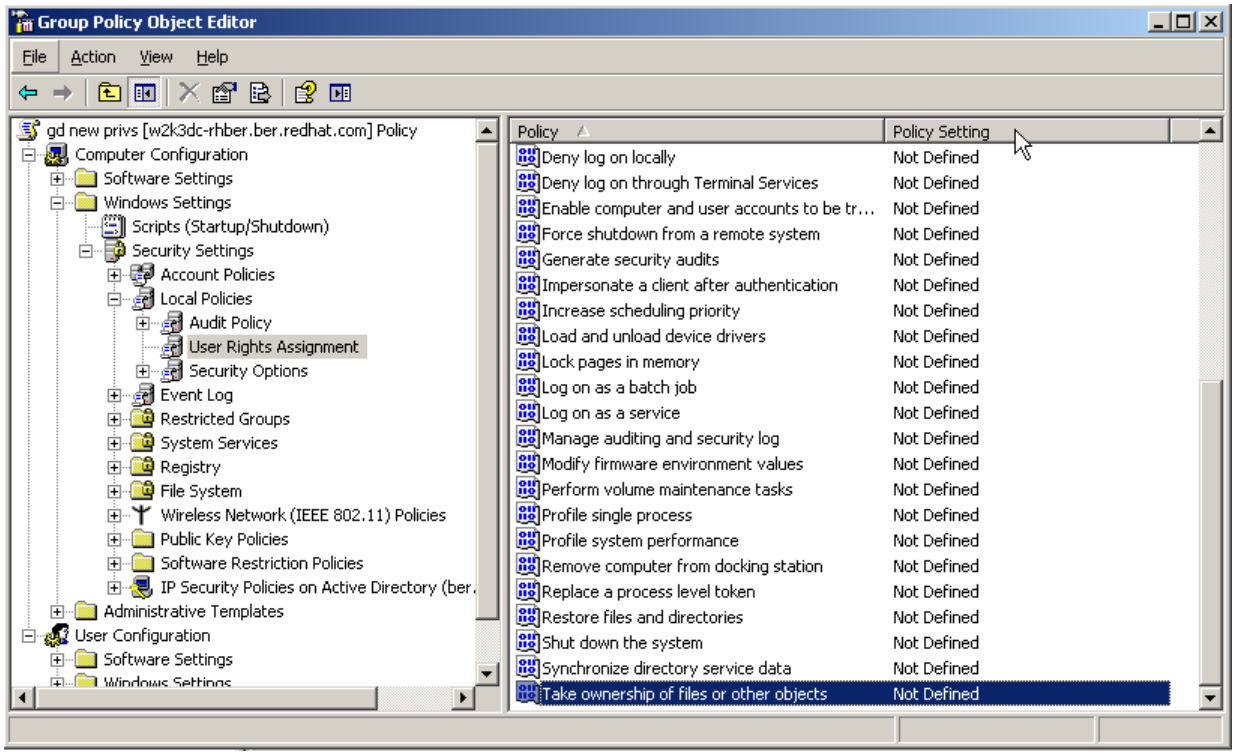
Distributing Privileges with Group Policy

- Logging into Windows XP as BER\gd
- `whoami /priv` does show a total of 4 Privileges
- Take Ownership Privilege is not included



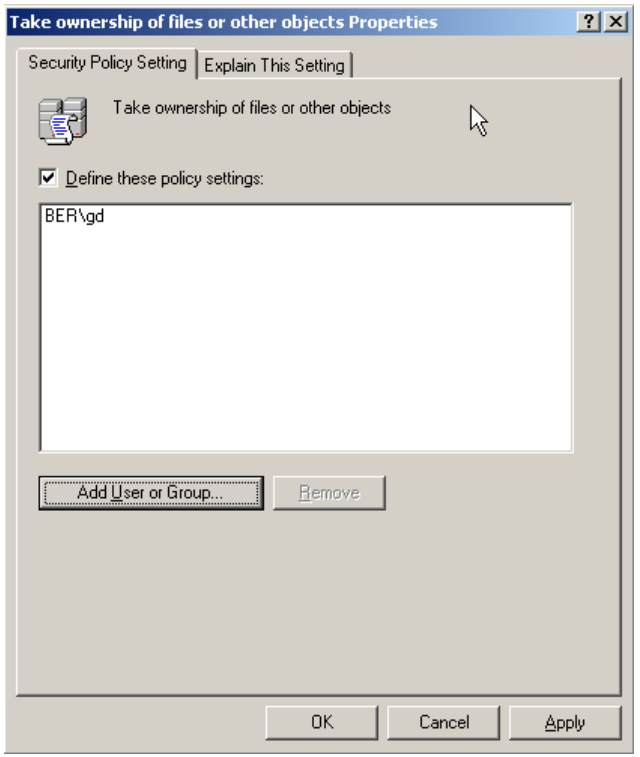
Distributing Privileges with Group Policy

- Open Group Policy Editor / Group Policy Management Console



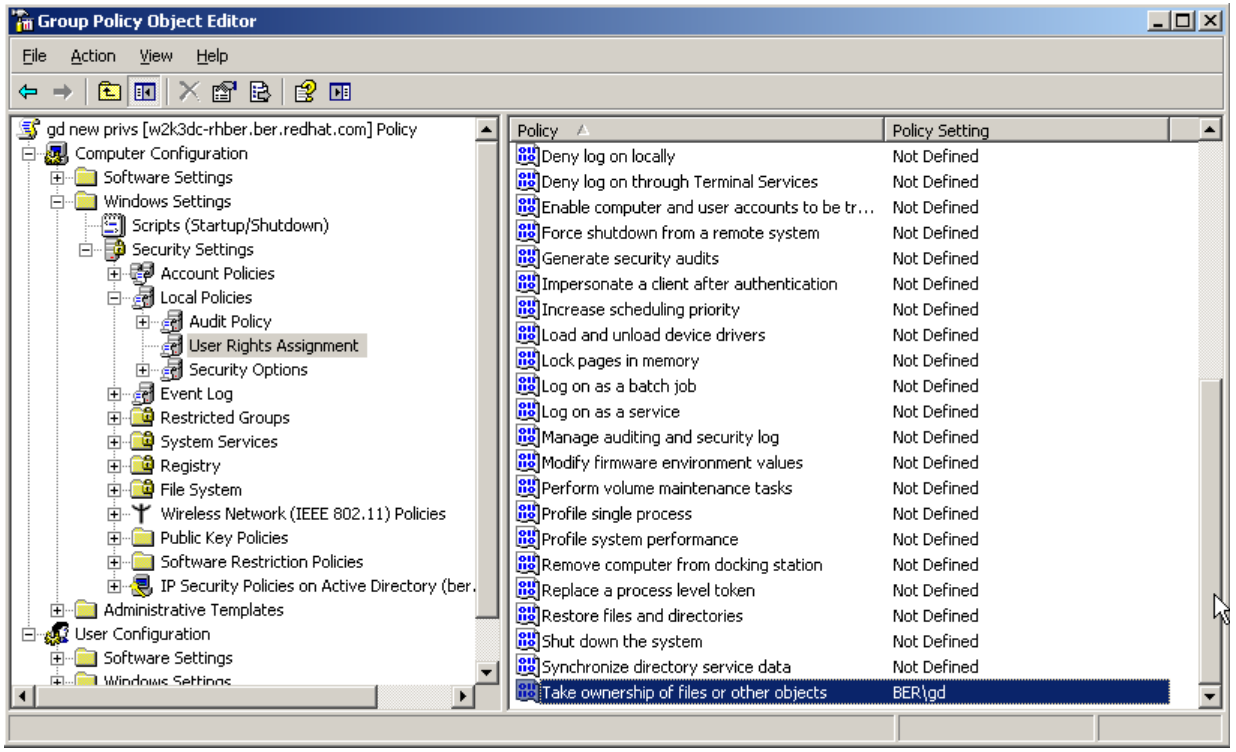
Distributing Privileges with Group Policy

- **Assign “Take Ownership of files” to one user**



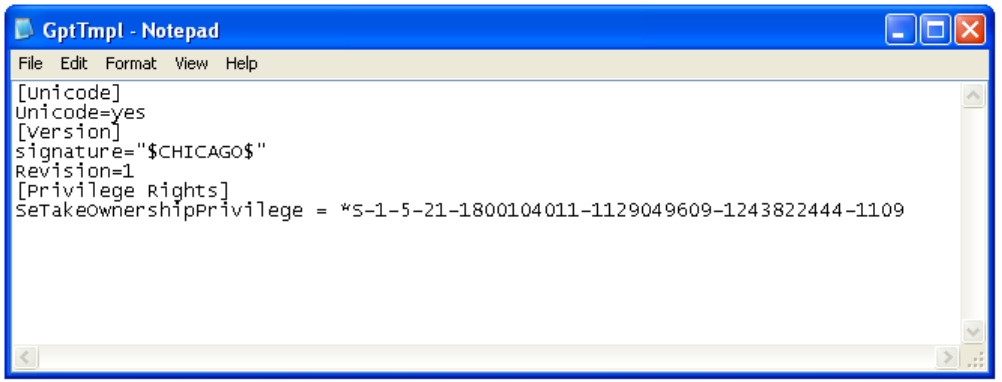
Distributing Privileges with Group Policy

- **Refreshed view:**



Distributing Privileges with Group Policy

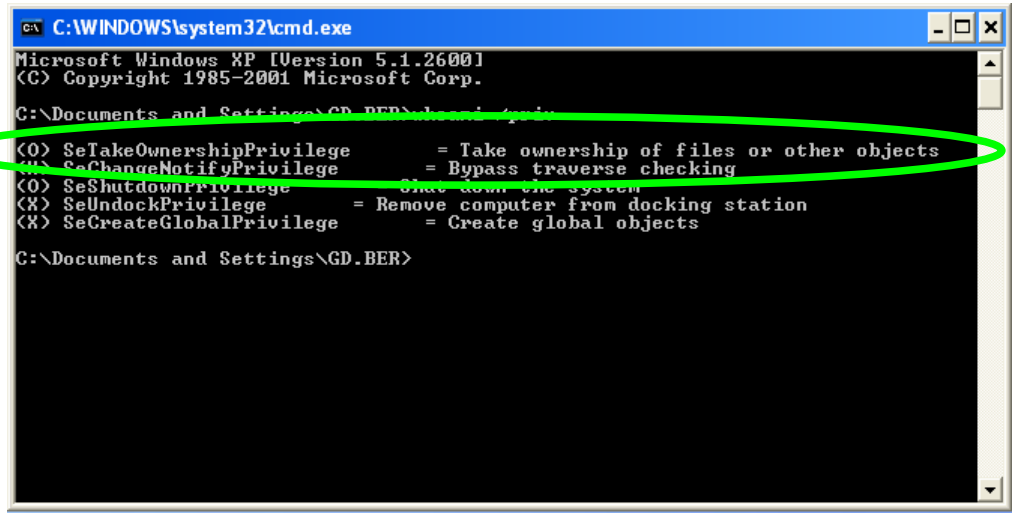
- File generated on the Domain Controller's SYSVOL share:
- `\\mydc\sysvol\policies\ber.redhat.com\{00F0991D-DCBF-4A7A-9723-3F7D3977FDB8}\Machine\Microsoft\Windows NT\SecEdit\GptTmpl.inf`



- The SID is the SID of BER\gd

Distributing Privileges with Group Policy

- Re-login into Windows XP as BER\gd
- `whoami /priv` now shows 5 User Rights including the newly applied User Right
- the "(O)" indicates it was retrieved via Group Policy



Distributing Privileges with Group Policy

- When BER\gd connects remotely to the Samba server, smbd inspects the internal privilege store to see if there are any privileges to grant for that user
- In a next step, smbd inspects the local registry for any extra privileges to apply for that user
- From the Samba smbd log, when user BER\gd connects:

```
[2008/04/13 15:08:38, 10] registry/reg_backend_db.c:regdb_fetch_values(850)
     regdb_fetch_values: Looking for value of key
   [HKLM\SOFTWARE\Samba\Group Policy\State\Machine\Privilege Rights]

[2008/04/13 15:08:38, 10] lib/privileges_gp.c:gp_get_privileges(136)
     gp_get_privileges: no sids for priv: SeTakeOwnershipPrivilege
   Privilege set:
       SE_PRIV  0x0 0x0 0x0 0x0
```

Distributing Privileges with Group Policy

- Samba needs to get aware of the new policy:

```
net ads gpo refresh -P mthelena$

   machine: 'mthelena$' has dn:
   'CN=MTHELENA,OU=jboss,DC=ber,DC=redhat,DC=com'

   * fetching token finished
   * fetching GPO List finished
   * refreshing Group Policy Data finished
   * storing GPO list to registry finished
   * re-reading GPO list from registry finished
```

- Identifies Group Policy Objects for workstation “mthelena$”, downloads policy to $LOCKDIR/gpo_cache
- Stores state information in the registry

Distributing Privileges with Group Policy

- **Finally, Samba needs to apply the new policy:**

```
net ads gpo apply -P mthelena$ -v

machine: 'mthelena$' has dn:
   'CN=MTHELENA,OU=jboss,DC=ber,DC=redhat,DC=com'

[2008/04/13 15:16:46,  0] libgpo/gpext/gpext.c:debug_gpext_header(653)
   security_process_group_policy
       gpo:           {00F0991D-DCBF-4A7A-9723-3F7D3977FDB8}
                      (gd new privs)
       cse extension: 827D319E-6EAC-11D2-A4EA-00C04F79F83A (Security)
       gplink:        DC=ber,DC=redhat,DC=com
       snapin:        803E14A0-B4FB-11D0-A0D0-00A0C90F574B
                      (Security Settings)
       flags:         0x00000041
                      GPO_INFO_FLAG_VERBOSE GPO_INFO_FLAG_MACHINE

[2008/04/13 15:16:46,  0] libgpo/gpo_reg.c:dump_reg_val(792)
   dump_reg_val: STORE 'SeTakeOwnershipPrivilege' '(null)' REG_SZ:
   *S-1-5-21-1800104011-1129049609-1243822444-1109 (length: 47)
```

Distributing Privileges with Group Policy

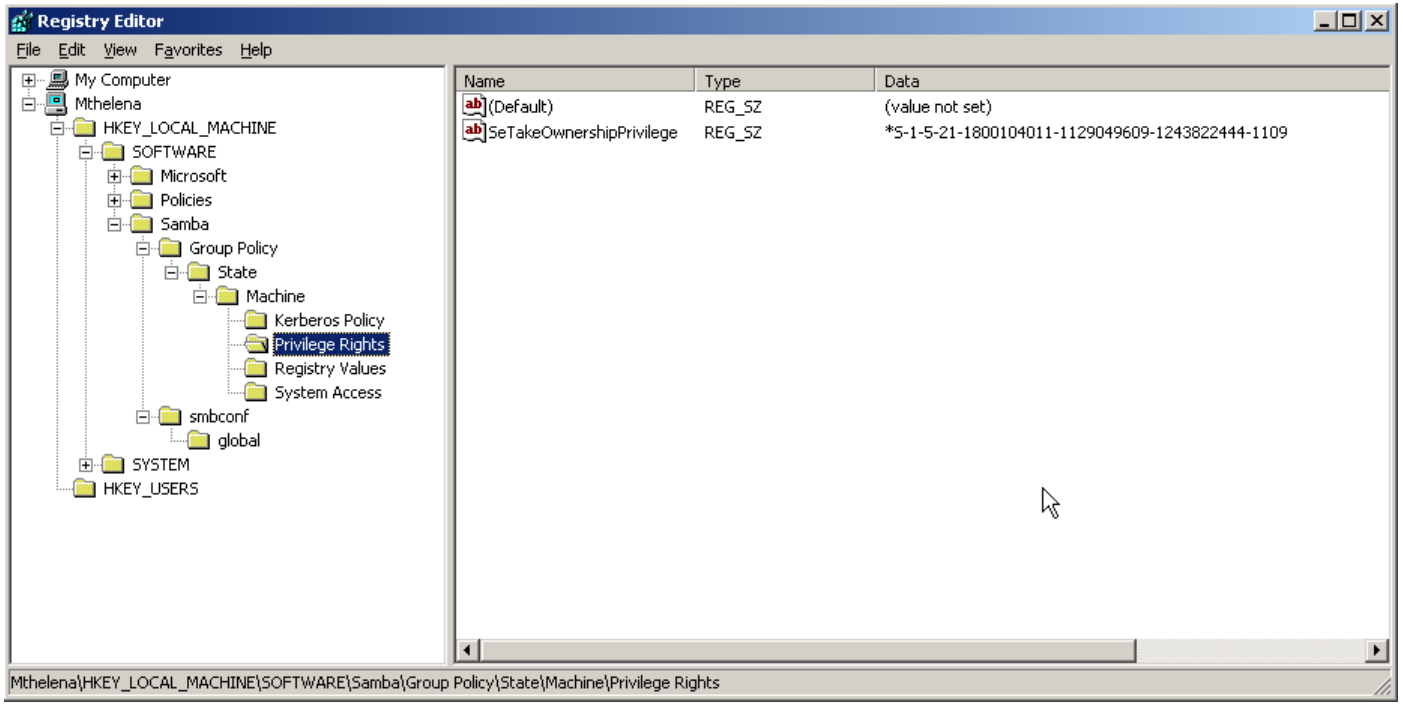
- BER\gd connects again to Samba server
- smbd reinspects the Samba registry and looks for new privileges
- smbd will grant the Ownership privilege to BER\gd:

```
[2008/04/13 15:27:43,  1] lib/privileges_gp.c:gp_get_privileges(149)

  gp_get_privileges: granting priv 'SeTakeOwnershipPrivilege' to sid
   S-1-5-21-1800104011-1129049609-1243822444-1109

  Privilege set:
   SE_PRIV  0x800 0x0 0x0 0x0
```

Distributing Privileges with Group Policy

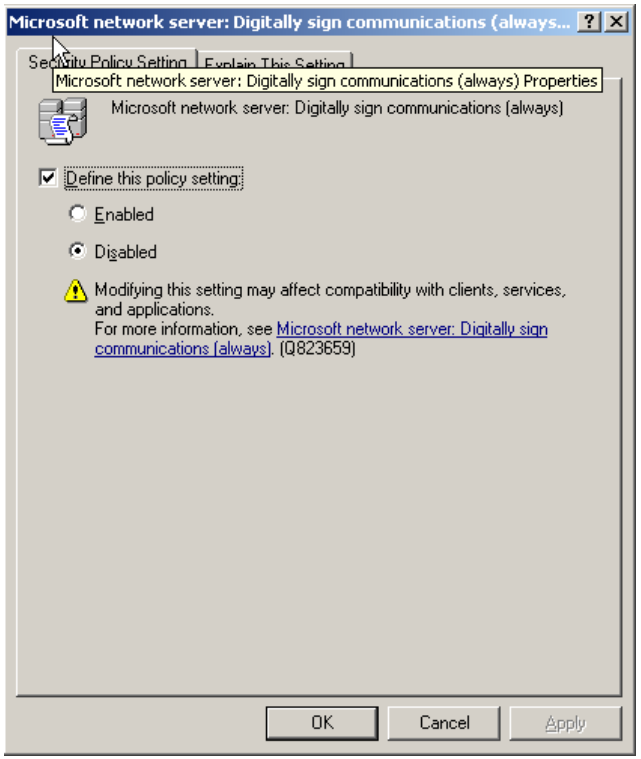


- View on Samba's GPO Privilege Rights Location

SMB Server signing via Group Policy

- SMB server signing enforced in a Windows domain
- Samba is joined to such a domain
- After join no-one in the domain can access Samba's Fileserver as long as an admin manually sets `server signing = yes` in smb.conf
- On Windows, the mandatory server signing is distributed via Group Policy:
- Computer Configuration/Windows Settings/Security Settings/Local Policies/Security Options/Microsoft Network Server: Digitally sign communications (always)
- Samba should transparently follow this policy using its own Policy engine

SMB Server signing via Group Policy



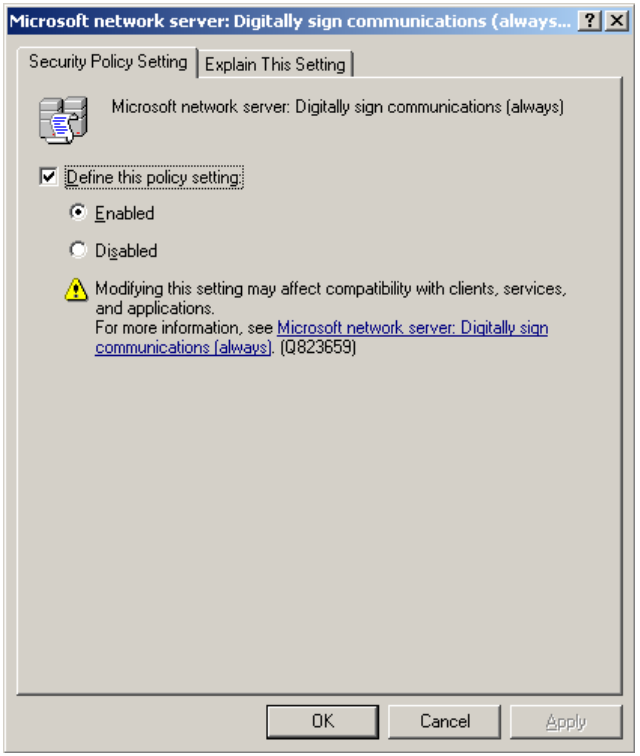
- **SMB signing disabled**

SMB Server signing via Group Policy

- **Initial Samba configuration:**
- **net conf list**

```
[global]
        workgroup = BER
        security = ads
        realm = ber.redhat.com
        server signing = no
```

SMB Server signing via Group Policy



- **SMB signing enabled**

SMB Server signing via Group Policy

- Samba refreshes and applies Policy:
- `net ads gpo refresh mthelena$ -P`
- `net ads gpo apply mthelena$ -P`
- `net conf list`

```
[global]
        workgroup = BER
        security = ads
        realm = ber.redhat.com
        server signing = yes
```

Group Policy and libsmbconf

- Currently only works when using registry configuration backend
- For most of Security Options, the Group Policy engine should feed Samba's internal configuration
- Today libsmbconf can only write into the registry

Thank you for your attention!