FECM Framework Profiles for Windows, Linux and Mac (22/07/2011)

Home Area Limitations and Conditions

- *NEW* Shift of LDAP Schema mappings from Microsoft SFU (Initial CSSE Concept) to Unix / Linux RFC 2307 mapping as indicated by Tom.
- *NEW* Due to space consideration changes. Non ECM Students may not be provisioned with a home area automatically (On Creation script with Tom for Window, On Creation Script with Ashley for Linux assuming home Area Unix is either blank or populated)
- *NEW* All ECM students will be provisioned with a roaming profile but the user home area quota will be dependent on the active enrolment of FECM endorsed units (Max 1GB Win, Max 200MB Linux which may be increase depending on uptake)
- *NEW* Actual Group name for home area path is all to be changed to lowercase to avoid case sensitivity file system problems (Concurred by Tom)
- *NEW* All students home remote will be partitioned by their student number (ie the last digit of their student number). This will improve manageability and allows the ability to distribute the IO load down the line.
- *NEW* For Linux / Unix Pam mounting of home area is now done by the Group Information. No longer sourced from the Primary Group but from Secondary Group Information as Tom specified. Shifting the lookup from primary to secondary group changes the membership from implied membership to explicit lookup of membership.
- Security of Home Area (Some Network Areas within the Faculty is basically non secure), only viable option is CIFS / SMB. NFS3 has no user Authentication, NFS4 is still WIP.
- Linux home underlying file system needs sym link support or applications creating sockets will fail ie gnome, kde (You cannot use a native Windows CIFS Server, has to me a Samba CIFS server with linux file system ie ext3)
- All client system has to bind to the ECM domain (Which is Pheme Sync’ed which can be either be accessed natively by Windows or via LDAP (ie by using the Unix Attribute). Note the baseline lookup of Unix attributes is done via LDAP or LDAPs but the authentication method can be done via Kerberos (Like Windows), LDAPs or LDAP. Worst Case scenario with any Unix System is LDAPs.
- Linux is binding via LDAP and mounting home areas via pam_mount (Kerberos primary if it fails drops to ldap. Its all done in the PAM stack)
- Windows will bind Natively with Windows and be using roaming profiles (For at least students) where home areas is accessed via CIFS. (It either all or nothing if planning to join the ECM domain for profiles. This could be problematic for Maths ie they don’t use roaming profiles and they host units outside FECM which may not be in the AD?)
- Mac only has really one option which is joining the AD where their profile and home area is mapped to whatever is set in the AD profile Tab for User for Home Folder (ie Connect H:\ To: \servername\share\username). Can’t use it via LDAP, it will bind but there is no integrated mechanism to configure and mount the CIFS home area.

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- Linux and Macs cannot follow DFS Shares (It how they connect which is point to point, windows has referrals which doesn’t work with the Mac / Linux implementation)
- *NEW* The new Mac OS aka “Lion” is supposed to support DFS but as it is a dot zero release and the short time frame. We must assume the worst case ie no DFS support.
- Originally the plan was to have one common area, but Cam has insisted that the Windows area be CIFS / NTFS. So he is happy to have dual home areas as long access to the areas is easy and transparent.

These were my initial concerns but if I missed something out. Please let me know but I believe these are the crucial conditions which will dictate functionality
Physical Storage and Servers Outcome

The outcome is we will have at least two VM machine servers (Basically a Linux and Windows Server which just does disk serving where the space is provisioned by the SANs which Michael will provide.

I’ve already generated two base VMs (Apocalypse and Longshot) which have been generated though VMware Workstation. The VMDKs are version 6.5 - 7.x compatible so it should be ESX4.x compatible. It should be on the ECM network with thin provisioned disks.

It is currently hosted on a ESX Cluster somewhere in SESE I believe for Load balancing and interfaced into the SANs for storage.

Home Areas Name Space Partitioning *New*

Decision has been made to further partition the home layout areas where previously was a flat area to CSSE name space layout dictated by the last digit of their login (The assumption was the last digit should allow even distribution with student, staff and visitor based on number logins)

Ie Current Prototype

//servername/{share}/{username} (Windows Style home Area)

/home/domain/{share}/{username} (Linux Style mount point where home area is mounted)

To

//servername/{share}{X}/{username} (Windows Style home Area)

/home/domain/{share}{X}/{username} (Linux Style mount point where home area is mounted)

Where

Servername = FQDN CNAME indicative of Share type.

X = Where X is the last digit of their login name (It should be evenly spread amongst the volume). So X can be a number from 0 to 9 or x (x is a “catch all” for login ie not using their staff or student numbers ie such as demo and external accounts)

Username = Pheme credentials (ie Staff, Student, Visitor Number) else local Domain created account

Share = Share type which will staff, students, visitors and others (Details further down about this)
The Initial Concept was to be this

//servername/{share}/{X}/{username} (Windows Style home Area)

/home/domain/{share}/{X}/{username} (Linux Style mount point where home area is mounted)

But this is effectively a DFS share ie what happens if you want to host {X} on the same machine but on different data stores ie

//servername/students/1/{username}

//servername/students/2/{username}

You have to share from the root area which is “students” effectively forcing the share to be from same share point before going to the sub shares “1” and “2”. The only way to do is by using a DFS ie sub mount one of the folders to another data share.

The only way to get the partitioning information and distributed share information is to amalgamate the two sections of information into a share.

Just because we can’t use DFS, we can still get “like DFS” characteristics for all Operating System you just need to partition the namespace.

1. Improve Manageability (We can work on sections of the shares without taking out the whole entire share unlike a flat naming space with no partitioning.
2. IO Performance / Expansion (We can relocate and distribute the local and network IO load by relocating shares to different servers or SANS by changing CNAMEs once the share has been migrated)
3. Multiple points, so one point of failure doesn’t affect all users (Assuming we get multiple data store points for home share)
Home Area Share and Server CNAME

I believe this is the important section but I have yet to see what decisions are made to regards to final population of the AD which is the most crucial section (I’ve had informal talks with Laurie and Tom about this)

Linux Disk Server: longshot.ecm.uwa.edu.au
Windows Disk Server: apocalypse.ecm.uwa.edu.au

Now we shouldn’t be accessing the machines with their direct names in terms of the Active Directory population for areas just in case there are role changes or role changes on the server. So they should be accessed via their Canonical Name although they may point to same machine.

This allows the splitting up of Shares to different servers or storage areas down the track for whatever reasons ie IO load distribution without affecting or modifying AD existing user profile entries.

In saying I’ve taken a look at the AD, the main currents groups are Staff, Students and Visitors but as with my previous Document I would propose a group called “Others” (Which are not entirely related to above such as external booking accounts etc).

The decision has been made that all Students will be given a roaming profile (Previously we were going to separate ECM and NonECM students. Where NonECM students would occupy their own share and be given a mandatory profile or a crippled roaming profile). So all students will be treated almost the same except for the size of their home area as this will be dictated if they enrolled in a FECM endorsed unit.

So the proposed groups which will define the shares are staff, students, visitors and others. (Tom has concurred Capitals in Naming of groups for Filesystem access could pose a problem hence they are all lowercase)

Typically the Share Access for the User Root Area is

\cname-server-role.ecm.uwa.edu.au\{group}{X}\{username\}

All workstation will be accessing the home areas via CIFS so will be in the form above for all platforms (Note SMB2/CIFS on Win2008r2 needs to be patched to enable via CNAME access)

Where \{group\} = staff, students, visitors and others
Where \{X\} = 0,1,2,3,4,5,6,7,8,9 (Indicative of the last digit of their pheme login or x (x is catch all)
Where \{username\} = Your logon ID (Staff, Student or Visitor Number else a ID not based on Pheme)
Where Effectively the share type is Share = \{group\}\{X\} on a Windows Server

Where CNAME of server is named after the share/group and OS system type which will be in the form

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{group}[X]-(Operating Share Type).ecm.uwa.edu.au

CNAME of the server is just following the share name and OS type of share.

Where {group} = staff, students, visitors and others
Where {Operating Share Type} = window, linux, mac
Where {X} = 0,1,2,3,4,5,6,7,8,9 (Indicative of the last digit of their pheme login or x (x is catch all)
Where Effectively the share type is Share = {group}{X} on a Windows Server

Ie for staff and windows share home area with 00019485 as their login would be
\staff5-window.ecm.uwa.edu.au\staff5\00019485

Ie similarly for Students linux share home area with 00020401 as their login would be
\students1-linux.ecm.uwa.edu.au\00020401

(Yes the above syntax for user home area provided by Samba Disk server is mapped directly to the username)

Ie for a Non Pheme account which is classified as others ie fecmdemo their login would be
\othersx-window.ecm.uwa.edu.au\othersx\fecmdemo (For Windows)
\othersx-linux.ecm.uwa.edu.au\fecmdemo (For Linux)

(Again yes the above syntax for user home area provided by Samba Disk server is mapped directly to the username)

Remember these are just the CNAME which points to an actual server ie at the moment there is only one Windows Home Disk Server called apocalyse.ecm.uwa.edu.au which is serving out all the home areas for Windows machine thus

\staff{X}-window.ecm.uwa.edu.au\staff{X}\{username} -> \apocalyse.ecm.uwa.edu.au\staff{X}\{username}
\students{X}-window.ecm.uwa.edu.au\students{X}\{username} -> \apocalyse.ecm.uwa.edu.au\students{X}\{username}

Where {X} = 0,1,2,3,4,5,6,7,8,9 (Indicative of the last digit of their pheme login or x (x is catch all)

But this can be swapped ie if the load is high for both student and staff home areas on the one server we can just change the CNAME to point to a different server once the data is replicated. Ie change CNAME studentswindow.ecm.uwa.edu.au -> cable.ecm.uwa.edu.au

\staff{X}-window.ecm.uwa.edu.au\staff{x}\{username} -> \apocalyse.ecm.uwa.edu.au\staff{X}\{username} 
\students{X}-window.ecm.uwa.edu.au\student{x}\{username} -> \cable.ecm.uwa.edu.au\students{X}\{username}

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So effectively we have physically separated the disk server between staff and Windows shares but you could refine this even further by making each share type a different server or network data store ie

Student Areas for People with Username Ending with 1 (where X=1 username ends in 1)
\students1-window.ecm.uwa.edu.au\students1\{username} -> \cable.ecm.uwa.edu.au\students1\{username}

Student Areas for People with Username Ending with 2 (where X=2 username ends in 2)
\students2-window.ecm.uwa.edu.au\students2\{username} -> \sabretooth.ecm.uwa.edu.au\students2\{username}

Student Areas for People with Username Ending with 3 (where X=3 username ends in 3)
\students3-window.ecm.uwa.edu.au\students3\{username} -> \omega.ecm.uwa.edu.au\students3\{username}

This makes each the share or home area a physically different server or storage unit.

Instead of modifying each individual user attributes about their home areas and profile. This is applicable for all three system Windows, Mac and Linux as they will all access their home areas via CIFS (I consider Mac home Areas as subset of either Windows or Linux as it just mapped to the home folder variable in the profile tab)

**AD Profile Information Population**

In the AD there are two main tab which basically controls the user profile login which are the Profile tab which controls essentially the Windows login home area if any (Mac joining via the AD uses Home Folder variable) and the Unix Attributes tab.

At the moment we have several groups ie staff, students, visitors and others but we are only concerned at the moment with population of the Students in the AD.

“visitors” and “others” are created per special usage which really can’t be automatically populated. But in regards to “staff” I believe existing staff users on ECM domain are using local profile (I also believe Cam said he didn’t want roaming profiles for staff?) so you can’t just do a blanket change to enable Roaming profiles which can mess existing setup (I’ll leave that for someone else, this also means if home network drive is not specifically mapped they can’t use Macs either)

So basically we have to **cater for all Students within UWA but will be applying different quota** based on if they are enrolled in FECM endorsed units or not (This may be revised such that NonEcm students may not get a home area and get a mandatory profile?)
AD Profile Information Population – Specifically Windows

As I’ve mentioned in the earlier document there are basically two options or the Windows options for enabling roaming profile which are.

1. One Roaming profile which fits all (Has effectively been discard as Departments have clashing programs in the hive registry let alone Faculties)
2. Separate Roaming Profiles for images (Profiles are separated by an embedded variable on the workstation which is sourced for the profile path but common folders like Desktop, My Documents, Favourites ie sourced from the same redirected folder)

I’ve spoken to Tom and Laurie informally but as long as Laurie signs off it should be fine.

Laurie has pointed out it doesn’t make sense in using option one as distinctly, there are minimally two images (CIV/MECH/SESE vs CSSE/EECE/MATH). It makes more sense to have two roaming profiles (Ie appdata and profile seperate) but with redirection for common folders (ie Desktop, Favourites, Documents etc)

Now for an ECM Student the profile path would have to be this (Only Students within ECM will get provisional storage space on the ECM Servers)

User Profile
Profile = %soe_ver%\profile
Logon script = student_user.cmd

Home Folder
Connect = H: To: %soe_ver%

Where
%soe_ver% = civil.mech.sese or csse.eece.math (Laurie conventions) which is Workstation Set System variable defining which profile area it will store and read from (You include numerous profiles by defining the workstation variable and populating the user home area with it)

X = Is the last digit of their login name (It should be evenly spread amongst the volume). So X can be a number from 0 to 9 or x (x is a “catch all” for login ie not using their staff or student numbers ie such as demo and external accounts)

So in essence the Roaming Profile and Application Data is Workstation / Image specific but redirection of Common Folders ie Desktop, My Documents, Favourites etc is retained by using Group policy to do folder redirections to a common point for both profiles to maintain consistency and reduce the overall size of the roaming profile (Laurie has a GPO test setup doing this, but template profiles need to be generated for per %soe_ver% workstation image)

Friendly Reminder the User Profile area definitions is only used by Windows, so it can be DFS but Home Folder section cannot be a DFS Share as the Mac uses this section as their home area.

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Access to the Linux and Mac areas it should be able to access via mapped drives either on the login scripts or even shortcut on the desktops to the servers.

All Students belonging to the ECM Faculty should be placed in the AD group “students” (It was already there) so if a policy needs to applied it can be applied to the group. The student should be also placed in their respective Share point group (ie students(X))

For example student 00012341 should be added to the AD group “Students” and “Students1” group in the AD. (Ie you might want to apply a policy to the entire users sitting the students1 Share in the AD ie such as disabling login which then you can migrate the Data, change the CNAME to point to the new share and then re-enable logins for users sitting in the students1 Share)

Mac Profiles

For the Mac the only choice really will be doing “Join the Mac with Active Directory” it uses the AD Profile Tab specifically Home Folder section in the AD (Don’t have to read rest for the Mac unless you want justification)

User Profile
Profile = {Doesn’t Care}
Logon script = {Doesn’t Care}

Home Folder
Connect = H: To: \students{X}-window.ecm.uwa.edu.au\students{X}\{username} (We are Using this for ECM)
Connect = H: To: \students{X}-linux.ecm.uwa.edu.au\{username} (Alternative Mapping using a Linux)

In saying that, only students who have a mapped and valid home folder will be able to login into the Macs.

The Mac will write all its login and profile information to what is set for the Home Folder, which is the user root area (There doesn’t seem to be a way around it)

This shouldn’t pose a problem as the worst things is overlapping of Linux and Mac area especially if the root area of each system has the same startup shell files ie .bashrc.

If a Windows Server is used there should be no overlapping of files, but with a Linux there is also the possibility but I should be able to force the Linux system to write their files in a sub folder, instead of the user root home folder by doing some fancy mappings.

Mac uses SAMBA which does not follow Distributed File System (DFS). So you cannot specify a DFS share for Home Area. Apart from that, you shouldn’t need to add anything specific for the Macs to work with the AD but you do have to do some voodoo magic for the Mac to work every time you reboot (Yes I am serious about this).

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Linux Profiles

The schema proposed earlier documents is based on Microsoft Service for UNIX (Microsoft SFU) but as the populating of the AD is done by Tom it has been switched to Unix RFC 2307 schema. From a Pam Mount view it shouldn’t make a difference as long as it can source group information (Either Primary or Secondary Groups) to do pam mount rules to mount the right server and share.

There are differences in the SFU and the Unix RFC 2307 schema that Tom is employing which I have attached at the end as a disclaimer.

The user lookup information for the MSFU and RFC 2307 are essentially the same but the fundamental difference is the group member operation. Short story is using the SFU, the group membership is maintained separately between Windows and Unix. Whereas the RFC 2307 implementation sources the Unix / Linux group membership from the windows group membership information thus there is only one master list.

To enable Unix/Linux login, its best to examine the Unix Attributes Tab in the Users Account as a reference which needs to be populated (This will be greyed out as we not using SFU compliant mapped variable but it will shows you want essential values needs to be populated for Unix / Linux )

NIS Domain: Blank (Set to ECM if you want to enable or edit it with SFU to provide NIS / YP services via the AD GUI but if left blank the SFU attributes are disabled from being edited)

UID: XXXXXXXX (Unique Number ID has to above 1000, Needs to be populated for all Linux Users)

Login Shell: /bin/sh (Has to be a valid shell that installed on the linux workstation ie bash)

Home Directory: /home/ecm/[group][X]/(username) (Physical mount point of the User home area, it shouldn’t be /home/username as that’s typically that is a local user login home area convention. It should be sitting in some sort of sub mount point ie below /home/ecm)

Primary Group Name / GID: XXXXXXXX (Number ID which has to map to an existing Group which is RFC 2307 Unix Enabled ie “all user” groups ie Students, Staff, Visitors and Others)

At the moment the proposed groups are staff, students, visitors, and others where their GID Number is (It not hard set as of yet as I just placed the GID numbers in).

Before I proceed to this is what is seen from a user lookup information on a linux system is always in this format

Username:*password*:uid:gid (Primary GID):Comment ie FirstName Surname:mount point on local machine:shell

Ie from a linux system looking at my user “mrtest”

[root@civic ecm]# getent passwd |grep -i mrtest

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Traditionally the filesystem ie users home area are already pre-mounted on the machine ie NFS (Which is system and not user aware). So if the net end point was compromised the user would have access to the entire mounted filesystem. This is why CIFS / SMB is used, as it is a user authenticated aware network file access protocol. In saying that how does the system know which server to mount the share from?

It would fine if we had a flat file system, ie all students sits on one server and on a single share but we are using CNAMES and different shares because we are partitioning the naming space by the last digit of their username ie

\servername\students3\00073813 -> /home/ecm/students3/38273813
\servername\students8\00031238 -> /home/ecm/students8/31231238

So how would you deal with the area storage for students ending with “3” and “8” are hosted on different servers.

The answer to that question is the system simply has no idea what so ever. So you have to embed the information into one of the user accessible variables to source where the server is. Realistically you can only embed the information in the UID and GID (Primary or Secondary) by linking certain values and ranges to certain servers

The information will be embedded into their GID (Secondary GID information rather than their Primary GID as with Tom request as it is cleaner)

For example student “00073813” I would set

NIS Domain: Blank
UID: XXXXXXXX
Login Shell: /bin/sh
Home Directory: /home/ecm/students3/00073813 (Physical mount point)
Primary Group Name / GID: 1000 (Group lookup maps Straight to all student group “Students”)

And also add “00073813” to a secondary unix group “Student3”

Similarly for student “00031238” I would set

NIS Domain: ECM
UID: XXXXXXXX
Login Shell: /bin/sh
Home Directory: /home/ecm/students8/00031238 (Physical mount point)
Primary Group Name / GID: 1000 (Group lookup maps Straight to all student group “Students”)

And also add “00031238” to a secondary unix group “Student8”
The only thing that I have found which is actively being maintained which allows auto mounting of CIFS area with custom rules is Pam Mount. Thus Effectively the rule set I would write from the secondary GID information is

If your primary Secondary GID is Student3 then do this
\students3-window.ecm.uwa.edu.au\student3\{username}\ -> /home/ecm/students3/00073813

And similarly if your primary GID is Student8
\students8-window.ecm.uwa.edu.au\student8\{username}\ -> /home/ecm/students8/00031238

So the only way is embed information is by assigning certain values or ranges to UID or GID (Primary or Secondary GID) to give a hint to the system where you write rules to do the mounting of CIFS /SMB area upon logon.

Where x is the last digit number of their login if pheme base else they call into the catch all group for that volume share
(The last email I received from Tom is the group share path name is all lowercase to avoid filesystem case sensitivity)

For Students Groups
If X=0 Students0 = 1000000
If X=1 Students1 = 1000001
If X=2 Students2 = 1000002
If X=3 Students3 = 1000003
If X=4 Students4 = 1000004
If X=5 Students5 = 1000005
If X=6 Students6 = 1000006
If X=7 Students7 = 1000007
If X=8 Students8 = 1000008
If X=9 Students9 = 1000009
Catch all X=x Studentsx = 1000010

For Visitors Groups
If X=0 Visitors0 = 2000000
If X=1 Visitors1 = 2000001
If X=2 Visitors2 = 2000002
If X=3 Visitors3 = 2000003
If X=4 Visitors4 = 2000004
If X=5 Visitors5 = 2000005
If X=6 Visitors6 = 2000006
If X=7 Visitors7 = 2000007
If X=8 Visitors8 = 2000008
If X=9 Visitors9 = 2000009
Catch all X=x Visitorsx = 2000010

For Others Groups
If X=0 Others0 = 3000000
If X=1 Others1 = 3000001
If X=2 Others2 = 3000002
If X=3 Others3 = 3000003
If X=4 Others4 = 3000004
If X=5 Others5 = 3000005
If X=6 Others6 = 3000006
If X=7 Others7 = 3000007
If X=8 Others8 = 3000008
If X=9 Others9 = 3000009
Catch all X=x Othersx = 3000010

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For Staff Groups
If X=0 Staff0 = 5000000
If X=1 Staff1 = 5000001
If X=2 Staff2 = 5000002
If X=3 Staff3 = 5000003
If X=4 Staff4 = 5000004
If X=5 Staff5 = 5000005
If X=6 Staff6 = 5000006
If X=7 Staff7 = 5000007
If X=8 Staff8 = 5000008
If X=9 Staff9 = 5000009
Catch all X=x Staffx = 5000010

(There is some sort of logic to it, I had initially had a Research group for the four million range but they are already classified as Staff in the existing AD. As I believe it was populated this way as there was no way to distinguish between Researchers and Staff)

All we are concerned at the moment is just Students and Staff as the other groups are provisioned manually I believe. But there is no harm in provisioning all the Unix attributes for Staff and Students.

Generation of the “Unix Attributes” are all common, except for the Home Directory and the Primary Group Name / GID section where it is dependent on their last digit of their username

Now that I have explained the importance of the assignment of the GID, we can talk about the “Home Directory” Variable (The group in their share path name are all lowercase to avoid case sensitivity file system problems)

Home Directory: /home/ecm/{group}{X}/(login)

Where again
{group} = staff, students (Which are the same as The Windows Group Name)
{X} = Where X is the last digit of their login name (It should be evenly spread amongst the volume). So X can be a number from 0 to 9 or x (x is a “catch all” for login ie not using their staff or student numbers but still sitting in a certain group share)

ie for a Student with login 12345678 belonging to secondary group “Students8”
Home Directory: /home/ecm/students8/12345678

ie for a Staff with login 19875678 belonging to secondary group “Staff8”
Home Directory: /home/ecm/staff8/19875678

The mapping of home actual remote network Samba disk home area to the actual mount point ie “Home Directory” mount point area will be done on the workstation based on embedded information in their GID (In this case it is done via the secondardy GID) as explained earlier.

To cater for multiple flavours of Unix profile (As long as it supports Pam_mount which is actively maintained). A Linux Distro specific sub folder in the user samba home area will be mounted as their root home area for the user on the local workstation ie
\{group\}{X}-linux.ecm.uwa.edu.au\{username\} --> ecm.fc14 (Root profile Area for Fedora Core 14 Linux)
\-> ecm.flavor (Different Flavours of Linux)

And under these flavors of Linux profile there will be a stub directory ie “ecm.win” where I will do a sub mount of their home windows area.

\{group\}{X}-linux.ecm.uwa.edu.au\{login\}\ecm.linux.fc14 -> /home/ecm/{group}{X}/{username}

\{group\}{X}-window.ecm.uwa.edu.au\{group}{x}\{login\} -> /home/ecm/{group}{X}/{username}/ecm.win

So as far as the user is concerned it just a directory which contains all their Windows Home Area contents contained in a sub folder.
Disclaimer

The original concept was based around the Microsoft SFU built in component which provides a NIS / YP services to Unix. In saying that the NIS / YP schema provided by SFU is based on the RFC 2307 but it does not mean we access it via NIS / YP services as we are doing the mappings via LDAP and authentication via Kerberos (We are just using the SFU for its Schema and handy built in AD interface).

What are the difference with the Microsoft SFU schema and the current implementation proposed by Tom which I shall generally refer it to as to “RFC 2307” schema from now on. It has mainly to do with group information mapping, the user mapping between the two is consistent.

Traditionally the Unix / Linux group mappings with the SFU are keep separate thus the membership list of the same group for Linux and Windows are separate independent list.

Whereas the current RFC 2307 schema sources the Linux / Unix group information from the AD membership group thus there is effectively one list. Which is smart as it cuts down the overhead in administrating two membership list.

But it is a double edge sword, when doing this.

Thus for each group if Linux/Unix enabled, by default by AD group membership you are part of group you are explicitly listed as a member. This is fine for small to medium size groups, but what happens if the membership list is significant (ie the “all” group membership list referring to Students, Staff etc). If it has to do a lookup for a group like this multiplied by serveral machines which you get the general idea.

So how does SFU handle this, as I mentioned the SFU you have to maintain the members for Unix in its own separate list. But that kind of list is listed explicitly just like the RFC 2307 with AD group membership. The difference is that the SFU allows implied membership of a group without explicitly being listed which is determined by your primary GID (The primary GID is meant to allocate to large groups without explicit being listed to reduce the hit to the Directory Service for lookups).

Look for user entry
ashley@gp02:~:924> getent passwd |grep –i ashley

My User Entry in the Directory Service which I can see I’m group 1110
ashley:*:1272:1110:Ashley:/home/staff/ashley:/bin/zsh

Search the group key for staff which I know is 1110, notice it doesn’t explicitly list me
ashley@gp02:~:925> getent group staff
staff:*:1110:

Check my groups, yes I am part of the staff group although not being explicitly listed
ashley@gp02:~:926> groups
staff sysadmin

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The only other thing that I noticed that is different for the group membership, is use of “nested groups”. With the SFU using the Unix Attributes Tab, I believe you can only add existing SFU compliant Linux / Unix users and not groups. But as the RFC 2307 implementation that is in place is based on AD group membership, can have nested groups (Groups within Groups). This may cause the look up of groups to fail if it can’t resolve the nested groups. That’s just me I never could get nested groups to work reliably except in Windows AD for Windows Client.
Appendix A – pam_mount.xml

Current pam_mount configuration using secondary group information to do CIFS

For Linux it does a double pam mount for each user as Cam wants the Windows profile area to be NTFS whereas Linux workstations cannot use NTFS CIFS served area as their home area as it doesn’t support sym-links.

So the Primary mount is the CIFS mount from a Linux server so they physically log in via via the console then do a sub pam mount underneath to access their Windows Area where logically it looks like a folder with all their Windows contents from a user perspective.

<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE pam_mount SYSTEM "pam_mount.conf.xml.dtd">
<!-- See pam_mount.conf(5) for a description. -->
<pam_mount>
  <!-- debug should come before everything else, since this file is still processed in a single pass from top-to-bottom -->
  <debug enable="0" />

  <!-- Volume definitions -->
  <!-- If Accessing CIFS on 2008r2 will fail, you need to apply SMB2.0 FIX -->

  <volume sgrp="Studentsx" fstype="cifs"
    server="studentsx-linux.ecm.uwa.edu.au"
    path="%(USER)/ecm.linux"
    mountpoint="/home/ecm/studentsx/%(USER)"
    options="workgroup=ECM"
  />

  <volume sgrp="Studentsx" fstype="cifs"
    server="studentsx-window.ecm.uwa.edu.au"
    path="studentsx/%(USER)"
    mountpoint="/home/ecm/studentsx/%(USER)/ecm.window"
    options="workgroup=ECM"
  />

  <volume sgrp="Students0" fstype="cifs"
    server="students0-linux.ecm.uwa.edu.au"
    path="%(USER)/ecm.linux"
  />

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mountpoint="/home/ecm/students0/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students0" fstype="cifs"
server="students0-window.ecm.uwa.edu.au"
path="/home/ecm/students0/%(USER)/ecm.window"
mountpoint="/home/ecm/students0/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students1" fstype="cifs"
server="students1-linux.ecm.uwa.edu.au"
path="%USER)/ecm.linux"
mountpoint="/home/ecm/students1/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students1" fstype="cifs"
server="students1-window.ecm.uwa.edu.au"
path="/home/ecm/students1/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students2" fstype="cifs"
server="students2-linux.ecm.uwa.edu.au"
path="%USER)/ecm.linux"
mountpoint="/home/ecm/students2/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students2" fstype="cifs"
server="students2-window.ecm.uwa.edu.au"
path="/home/ecm/students2/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students3" fstype="cifs"
server="students3-linux.ecm.uwa.edu.au"
path="%USER)/ecm.linux"
mountpoint="/home/ecm/students3/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students3" fstype="cifs"
server="students3-window.ecm.uwa.edu.au"

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<volume sgrp="Students3" fstype="cifs"
server="students3-linux.ecm.uwa.edu.au"
path="students3/%(USER)"
mountpoint="/home/ecm/students3/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students4" fstype="cifs"
server="students4-linux.ecm.uwa.edu.au"
path="/home/ecm/students4/%(USER)"
mountpoint="/home/ecm/students4/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students4" fstype="cifs"
server="students4-window.ecm.uwa.edu.au"
path="/home/ecm/students4/%(USER)"
mountpoint="/home/ecm/students4/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students5" fstype="cifs"
server="students5-linux.ecm.uwa.edu.au"
path="/home/ecm/students5/%(USER)"
mountpoint="/home/ecm/students5/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students5" fstype="cifs"
server="students5-window.ecm.uwa.edu.au"
path="/home/ecm/students5/%(USER)"
mountpoint="/home/ecm/students5/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students6" fstype="cifs"
server="students6-linux.ecm.uwa.edu.au"
path="/home/ecm/students6/%(USER)"
mountpoint="/home/ecm/students6/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students6" fstype="cifs"
server="students6-window.ecm.uwa.edu.au"
path="/home/ecm/students6/%(USER)"
mountpoint="/home/ecm/students6/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students7" fstype="cifs"
server="students7-linux.ecm.uwa.edu.au"
path="/home/ecm/students7/%(USER)"
mountpoint="/home/ecm/students7/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students7" fstype="cifs"
server="students7-window.ecm.uwa.edu.au"
path="/home/ecm/students7/%(USER)"
mountpoint="/home/ecm/students7/%(USER)/ecm.window"
options="workgroup=ECM"
/>

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<volume sgrp="Students7" fstype="cifs"
server="students7-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/students7/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students7" fstype="cifs"
server="students7-window.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/students7/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students8" fstype="cifs"
server="students8-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/students8/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students8" fstype="cifs"
server="students8-window.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/students8/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Students9" fstype="cifs"
server="students9-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/students9/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Students9" fstype="cifs"
server="students9-window.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/students9/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Staffx" fstype="cifs"
server="staffx-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staffx/%(USER)"
options="workgroup=ECM"
/>

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<volume sgrp="Staffx" fstype="cifs"
server="staffx-window.ecm.uwa.edu.au"
path="staffx/%(USER)"
mountpoint="/home/ecm/staffx/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Staff0" fstype="cifs"
server="staff0-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staff0/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Staff0" fstype="cifs"
server="staff0-window.ecm.uwa.edu.au"
path="staff0/%(USER)"
mountpoint="/home/ecm/staff0/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Staff1" fstype="cifs"
server="staff1-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staff1/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Staff1" fstype="cifs"
server="staff1-window.ecm.uwa.edu.au"
path="staff1/%(USER)"
mountpoint="/home/ecm/staff1/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Staff2" fstype="cifs"
server="staff2-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staff2/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Staff2" fstype="cifs"
server="staff2-window.ecm.uwa.edu.au"
path="staff2/%(USER)"
mountpoint="/home/ecm/staff2/%(USER)/ecm.window"
options="workgroup=ECM"
/>

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<volume sgrp="Staff3" fstype="cifs"
server="staff3-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staff3/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Staff3" fstype="cifs"
server="staff3-window.ecm.uwa.edu.au"
path="staff3/%(USER)"
mountpoint="/home/ecm/staff3/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Staff4" fstype="cifs"
server="staff4-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staff4/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Staff4" fstype="cifs"
server="staff4-window.ecm.uwa.edu.au"
path="staff4/%(USER)"
mountpoint="/home/ecm/staff4/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Staff5" fstype="cifs"
server="staff5-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staff5/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Staff5" fstype="cifs"
server="staff5-window.ecm.uwa.edu.au"
path="staff5/%(USER)"
mountpoint="/home/ecm/staff5/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Staff6" fstype="cifs"
server="staff6-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/staff6/%(USER)"
options="workgroup=ECM"
>

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<volume sgrp="Visitorsx" fstype="cifs"
server="visitorsx-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/visitorsx/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitorsx" fstype="cifs"
server="visitorsx-window.ecm.uwa.edu.au"
path="visitorsx/%(USER)"
mountpoint="/home/ecm/visitorsx/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Visitors0" fstype="cifs"
server="visitors0-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/visitors0/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitors0" fstype="cifs"
server="visitors0-window.ecm.uwa.edu.au"
path="visitors0/%(USER)"
mountpoint="/home/ecm/visitors0/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Visitors1" fstype="cifs"
server="visitors1-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/visitors1/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitors1" fstype="cifs"
server="visitors1-window.ecm.uwa.edu.au"
path="visitors1/%(USER)"
mountpoint="/home/ecm/visitors1/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Visitors2" fstype="cifs"
server="visitors2-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"

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mountpoint="/home/ecm/visitors2/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitors2" fstype="cifs"
server="visitors2-window.ecm.uwa.edu.au"
path="visitors2/%(USER)"
mountpoint="/home/ecm/visitors2/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Visitors3" fstype="cifs"
server="visitors3-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/visitors3/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitors3" fstype="cifs"
server="visitors3-window.ecm.uwa.edu.au"
path="visitors3/%(USER)"
mountpoint="/home/ecm/visitors3/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Visitors4" fstype="cifs"
server="visitors4-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/visitors4/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitors4" fstype="cifs"
server="visitors4-window.ecm.uwa.edu.au"
path="visitors4/%(USER)"
mountpoint="/home/ecm/visitors4/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Visitors5" fstype="cifs"
server="visitors5-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/visitors5/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitors5" fstype="cifs"
server="visitors5-window.ecm.uwa.edu.au"

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path="visitors5/%(USER)"
mountpoint="/home/ecm/visitors5/%(USER)/ecm.window"
options="workgroup=ECM"
 />

<volume sgrp="Visitors6" fstype="cifs"
server="visitors6-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/visitors6/%(USER)"
options="workgroup=ECM"
 />

<volume sgrp="Visitors6" fstype="cifs"
server="visitors6-window.ecm.uwa.edu.au"
path="visitors6/%(USER)"
mountpoint="/home/ecm/visitors6/%(USER)/ecm.window"
options="workgroup=ECM"
 />

<volume sgrp="Visitors7" fstype="cifs"
server="visitors7-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/visitors7/%(USER)"
options="workgroup=ECM"
 />

<volume sgrp="Visitors7" fstype="cifs"
server="visitors7-window.ecm.uwa.edu.au"
path="visitors7/%(USER)"
mountpoint="/home/ecm/visitors7/%(USER)/ecm.window"
options="workgroup=ECM"
 />

<volume sgrp="Visitors8" fstype="cifs"
server="visitors8-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/visitors8/%(USER)"
options="workgroup=ECM"
 />

<volume sgrp="Visitors8" fstype="cifs"
server="visitors8-window.ecm.uwa.edu.au"
path="visitors8/%(USER)"
mountpoint="/home/ecm/visitors8/%(USER)/ecm.window"
options="workgroup=ECM"
 />

<volume sgrp="Visitors9" fstype="cifs"

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server="visitors9-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/visitors9/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Visitors9" fstype="cifs"
server="visitors9-window.ecm.uwa.edu.au"
path="visitors9/%(USER)"
mountpoint="/home/ecm/visitors9/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Othersx" fstype="cifs"
server="othersx-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/othersx/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Othersx" fstype="cifs"
server="othersx-window.ecm.uwa.edu.au"
path="othersx/%(USER)"
mountpoint="/home/ecm/othersx/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Others0" fstype="cifs"
server="others0-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/others0/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Others0" fstype="cifs"
server="others0-window.ecm.uwa.edu.au"
path="others0/%(USER)"
mountpoint="/home/ecm/others0/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Others1" fstype="cifs"
server="others1-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/others1/%(USER)"
options="workgroup=ECM"
/>
<volume sgrp="Others1" fstype="cifs"
server="others1-window.ecm.uwa.edu.au"
path="others1/%(USER)"
mountpoint="/home/ecm/others1/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Others2" fstype="cifs"
server="others2-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/others2/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Others2" fstype="cifs"
server="others2-window.ecm.uwa.edu.au"
path="others2/%(USER)"
mountpoint="/home/ecm/others2/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Others3" fstype="cifs"
server="others3-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/others3/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Others3" fstype="cifs"
server="others3-window.ecm.uwa.edu.au"
path="others3/%(USER)"
mountpoint="/home/ecm/others3/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Others4" fstype="cifs"
server="others4-linux.ecm.uwa.edu.au"
path="%USER%/ecm.linux"
mountpoint="/home/ecm/others4/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Others4" fstype="cifs"
server="others4-window.ecm.uwa.edu.au"
path="others4/%(USER)"
mountpoint="/home/ecm/others4/%(USER)/ecm.window"
options="workgroup=ECM"
/>

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<volume sgrp="Others5" fstype="cifs"
server="others5-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/others5/%(USER)"
options="workgroup=ECM"
/> 

<volume sgrp="Others5" fstype="cifs"
server="others5-window.ecm.uwa.edu.au"
path="others5/%(USER)"
mountpoint="/home/ecm/others5/%(USER)/ecm.window"
options="workgroup=ECM"
/> 

<volume sgrp="Others6" fstype="cifs"
server="others6-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/others6/%(USER)"
options="workgroup=ECM"
/> 

<volume sgrp="Others6" fstype="cifs"
server="others6-window.ecm.uwa.edu.au"
path="others6/%(USER)"
mountpoint="/home/ecm/others6/%(USER)/ecm.window"
options="workgroup=ECM"
/> 

<volume sgrp="Others7" fstype="cifs"
server="others7-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/others7/%(USER)"
options="workgroup=ECM"
/> 

<volume sgrp="Others7" fstype="cifs"
server="others7-window.ecm.uwa.edu.au"
path="others7/%(USER)"
mountpoint="/home/ecm/others7/%(USER)/ecm.window"
options="workgroup=ECM"
/> 

<volume sgrp="Others8" fstype="cifs"
server="others8-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/others8/%(USER)"
options="workgroup=ECM"
>

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<volume sgrp="Others8" fstype="cifs"
server="others8-window.ecm.uwa.edu.au"
path="others8/%(USER)"
mountpoint="/home/ecm/others8/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<volume sgrp="Others9" fstype="cifs"
server="others9-linux.ecm.uwa.edu.au"
path="%(USER)/ecm.linux"
mountpoint="/home/ecm/others9/%(USER)"
options="workgroup=ECM"
/>

<volume sgrp="Others9" fstype="cifs"
server="others9-window.ecm.uwa.edu.au"
path="others9/%(USER)"
mountpoint="/home/ecm/others9/%(USER)/ecm.window"
options="workgroup=ECM"
/>

<!-- pam_mount parameters: General tunables -->

<!--
<luserconf name=".pam_mount.conf.xml" />
-->

<!-- Note that commenting out mntoptions will give you the defaults. You will need to explicitly initialize it with the empty string to reset the defaults to nothing. -->
<mntoptions allow="nosuid,nodev,loop,encryption,fsck,nonempty,allow_root,allow_other" />

<mntoptions deny="suid,dev" />
<mntoptions allow="*" />
<mntoptions deny="*" />

<!-- pam_mount parameters: Volume-related -->

<logout wait="0" hup="0" term="0" kill="0" />

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<mkmountpoint enable="1" remove="true" />

</pam_mount>