



Getting the Most Out of Portable Home Directories

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About Us

Michael Harvey

Ventura County Star

Senior Systems Administrator

Reviews editor, MacTech Magazine

Greg Neagle

Disney Animation Studios

Senior Systems Engineer

MacEnterprise.org steering committee member

What is a Portable Home Directory?

Combines features of:

- Local home directory
- Network home directory

What is a Portable Home Directory?

Local home directory

- User data on the local hard drive
- Works on or off the network
- Not easily accessible from other computers
- Hard to backup and protect



What is a Portable Home Directory?

Network home directory

- User data on a network share
- If the machine goes off the network, the home is not accessible
- Accessible from other computers
- Easily backed up and protected



What is a Portable Home Directory?

Portable home directory

- User data on local drive
- Synchronized with a network share
- Accessible from other computers
- Easily backed up and protected



What is a Portable Home Directory?

Mobile accounts with Portable Home Directories:

- Locally cache temporary files
- Can create less network traffic than network accounts
- Can be managed like network accounts

What is a Portable Home Directory?

Mobile accounts with Portable Home Directories:

- Allow users to access their accounts and files when disconnected from the network
- Allow users to recover their data if their computers are lost or damaged

What is a Portable Home Directory?

Mobile accounts with Portable Home Directories:

- Can negatively impact server performance
- Can confuse users due to incomplete synchronization
- Can cause login and logout delays
- Do not eliminate the need for backups!



What are PHDs good for?



Laptop users

- They're not always on the network, so network homes are no good
- Purely local homes are hard to back up
- PHDs can be a best-of-both-worlds



What are PHDs good for?



Desktop users

- On a slow WAN link - network homes too slow
- heavy users of certain apps that have undesirable behaviors on network homes (one rhymes with Padobe Rotoshop)



Deployment Scenarios

Directory Service type

Network
Home
type

	Open Directory	Active Directory	Golden Triangle	LDAP	NIS
AFP	✓	✓	✓	✓	
SMB		✓	✓	✓	
NFS	✓			✓	✓



Managing Portable Home Directories



Managing PHDs

- Creation
- Synchronization
- Include/Exclude lists
- Managing without MCX



Creating a mobile account/portable home directory



Creating a mobile account

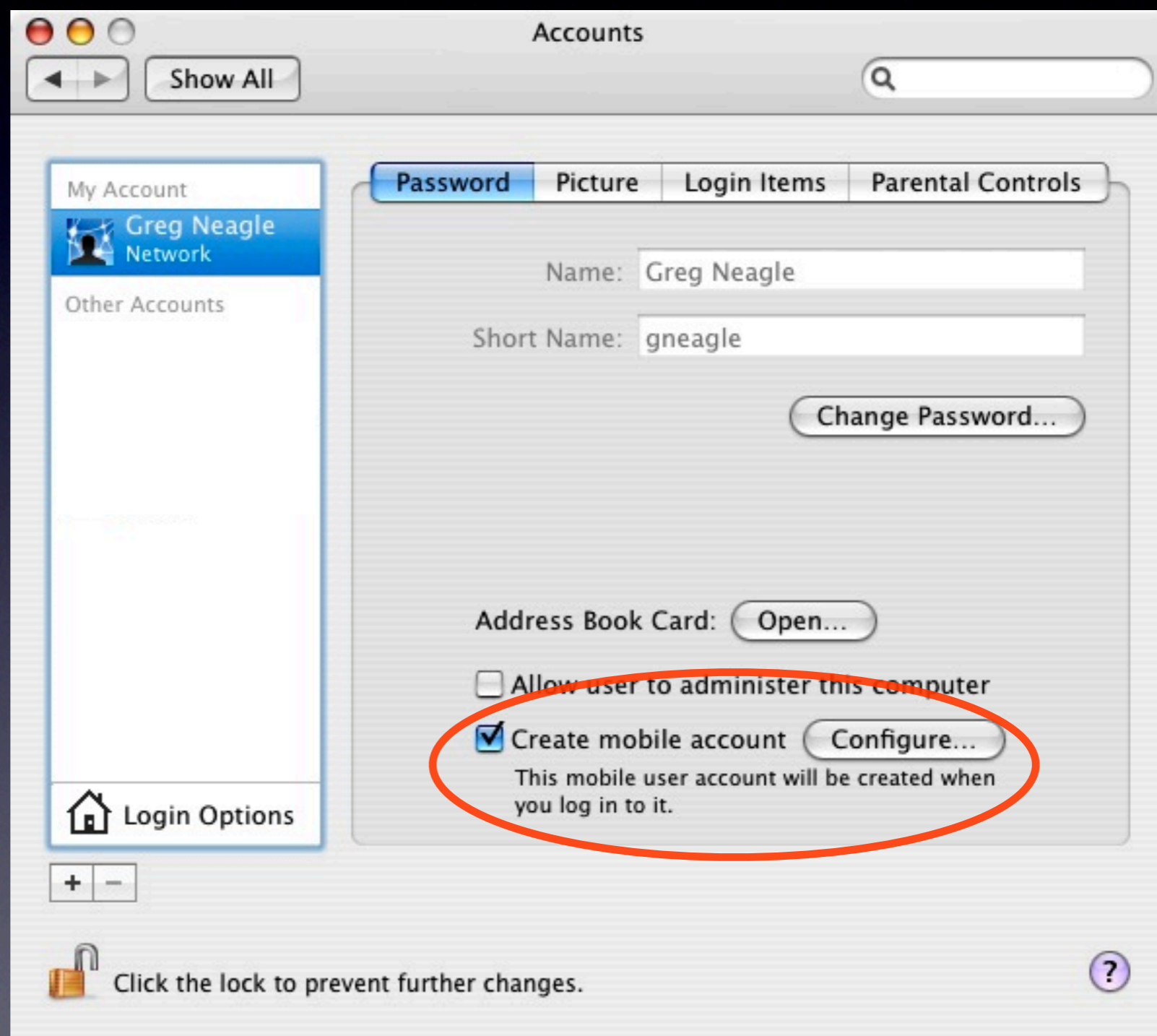
- Accounts pane of System Preferences
- Workgroup Manager/MCX
- via a script



Creating a mobile account

- Accounts pane of System Preferences

user is prompted at next login



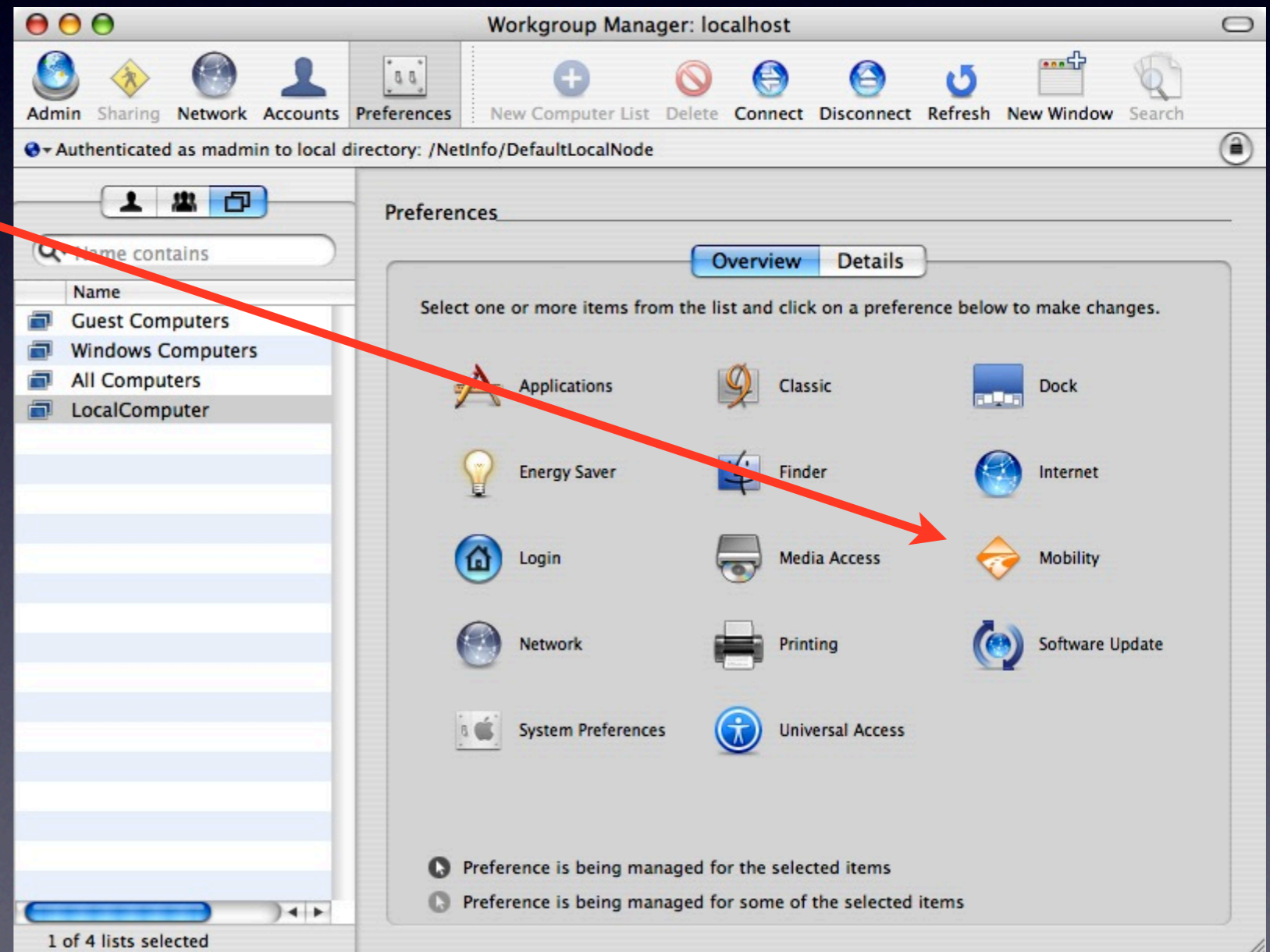


Creating a mobile account

- Workgroup Manager / MCX

- Preferences: Mobility

- Manage by user, group, or computer list





Creating a mobile account

- via a script:

```
sudo defaults write /Library/Preferences/  
com.apple.loginwindow mobileAccountActions  
'{ usershortname = { archiveDeletedHome = 0;  
createAtLogin = 1; deleteAtLogout = 0;  
deleteHomeWithAccount = 0; }; }'
```
- Does the same thing as checking “Create mobile account”
in Accounts pane
- also...

```
sudo /System/Library/CoreServices/mcxd.app/  
Contents/Resources/MCXCacher -U usershortname
```



Synchronization



Synchronization

- Synchronization types
 - Login/Logout sync
 - Background sync
 - Manual sync



Synchronization

- Login/Logout sync
 - by default, certain parts of ~/Library
 - controlled by defaults keys:
 - syncedPrefFolders
 - excludedPrefItems
 - No user interface to customize



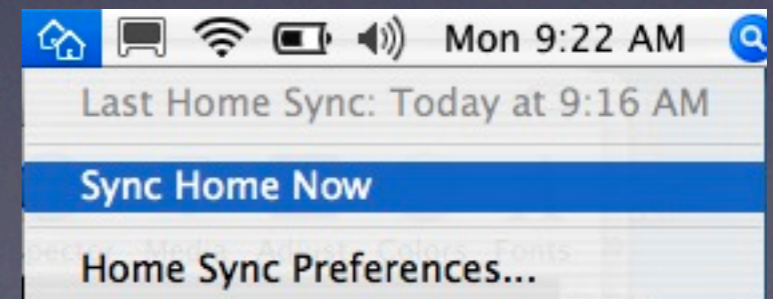
Synchronization

- Background sync
 - by default, most of the home folder, except ~/Library
 - controlled by defaults keys:
 - syncedFolders
 - excludedItems
 - syncPeriodSeconds
 - default is 1200 seconds (20 minutes)
 - min is 5 mins, max is 60 mins



Synchronization

- Manual sync
 - same items as Background sync
 - initiate from HomeSync menu
 - Background and manual sync may be customized by user via Home Sync Preferences....





Include/Exclude lists



Include/Exclude lists

- `/System/Library/CoreServices/mcxd.app/Contents/Resources/CinchDefaults.plist`
- `~/Library/Preferences/com.apple.homeSync.plist`
- MCX (Workgroup Manager)



Include/Exclude lists

CinchDefaults.plist keys

- `excludedAlways` - can't be overridden
 - `excludedItems`
 - `excludedPrefItems`
 - `syncedFolders`
 - `syncedPrefFolders`
- } these defaults can be overridden by MCX or user's `com.apple.homeSync.plist`



Include/Exclude lists

CinchDefaults.plist keys

```
excludedAlways = (  
    {comparison = fullPath; value = "~/Library/Mirrors"; },  
    {comparison = fullPath; value = "~/Library/Logs/  
MirrorAgent.log"; },  
    {  
        comparison = fullPath;  
        value = "~/Library/Preferences/com.apple.homeSync.plist";  
    },  
    {comparison = fullPath; value = "~/.mcxlc"; },  
    {comparison = fullPath; value = "~/.Spotlight-V100"; },  
    {comparison = fullPath; value = "~/.TemporaryItems"; },  
    {comparison = fullPath; value = "~/.Cleanup At Startup"; },  
    {comparison = startsWith; value = ".afpDeleted"; }  
);
```



Include/Exclude lists

`com.apple.homeSync.plist` keys

- `excludedItems`
- `excludedPrefItems`
- `syncedFolders`
- `syncedPrefFolders`
- `syncPeriodSeconds`

} can be overridden by
or merged with MCX



Include/Exclude lists

<u>com.apple.homeSync.plist</u>	<u>Workgroup Manager</u>
	Background Sync
syncedFolders	Synchronize in the background
excludedItems	Skip items that match any...
	Login & Logout Sync
syncedPrefsFolders	Synchronize at login and logout
excludedPrefsItems	Skip items that match any...



Include/Exclude lists

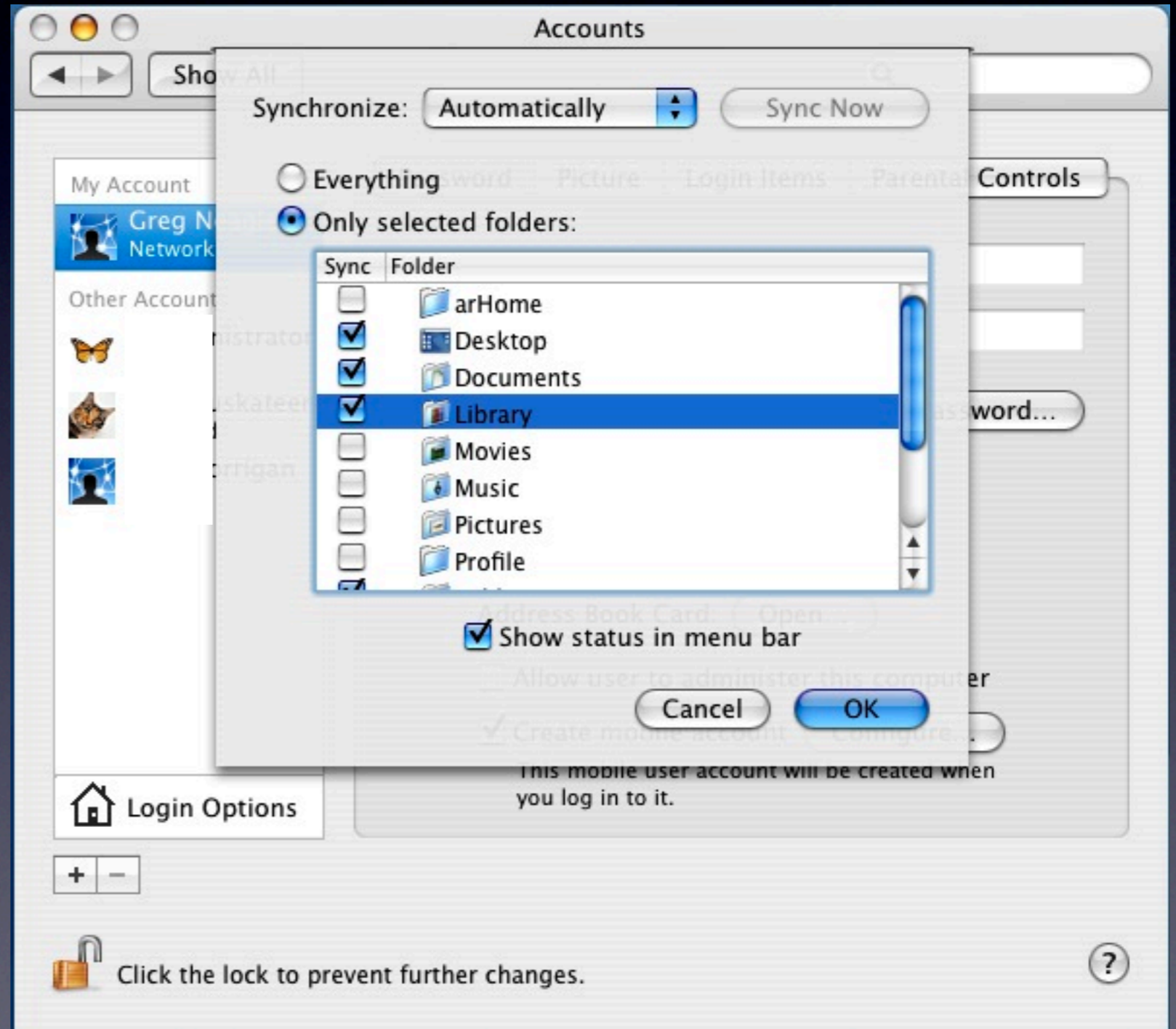
<u>com.apple.homeSync.plist</u> <u>comparison</u>	<u>Workgroup Manager</u> <u>Match</u>
startsWith	Starts with
endsWith	Ends with
contains	Name contains
is	Name is
partialPath	Partial Path
fullPath	Full Path



Include/Exclude lists

Users can elect to sync “everything” in their home, or just certain top-level folders

```
periodicSyncOn = 1;  
showLibraryFolder = 1;  
syncedFolders = (  
    {path = "~/Desktop";},  
    {path = "~/Documents";},  
    {path = "~/Public";},  
    {path = "~/Sites";}  
);  
syncedPrefFolders = ({path = "~/Library";});
```

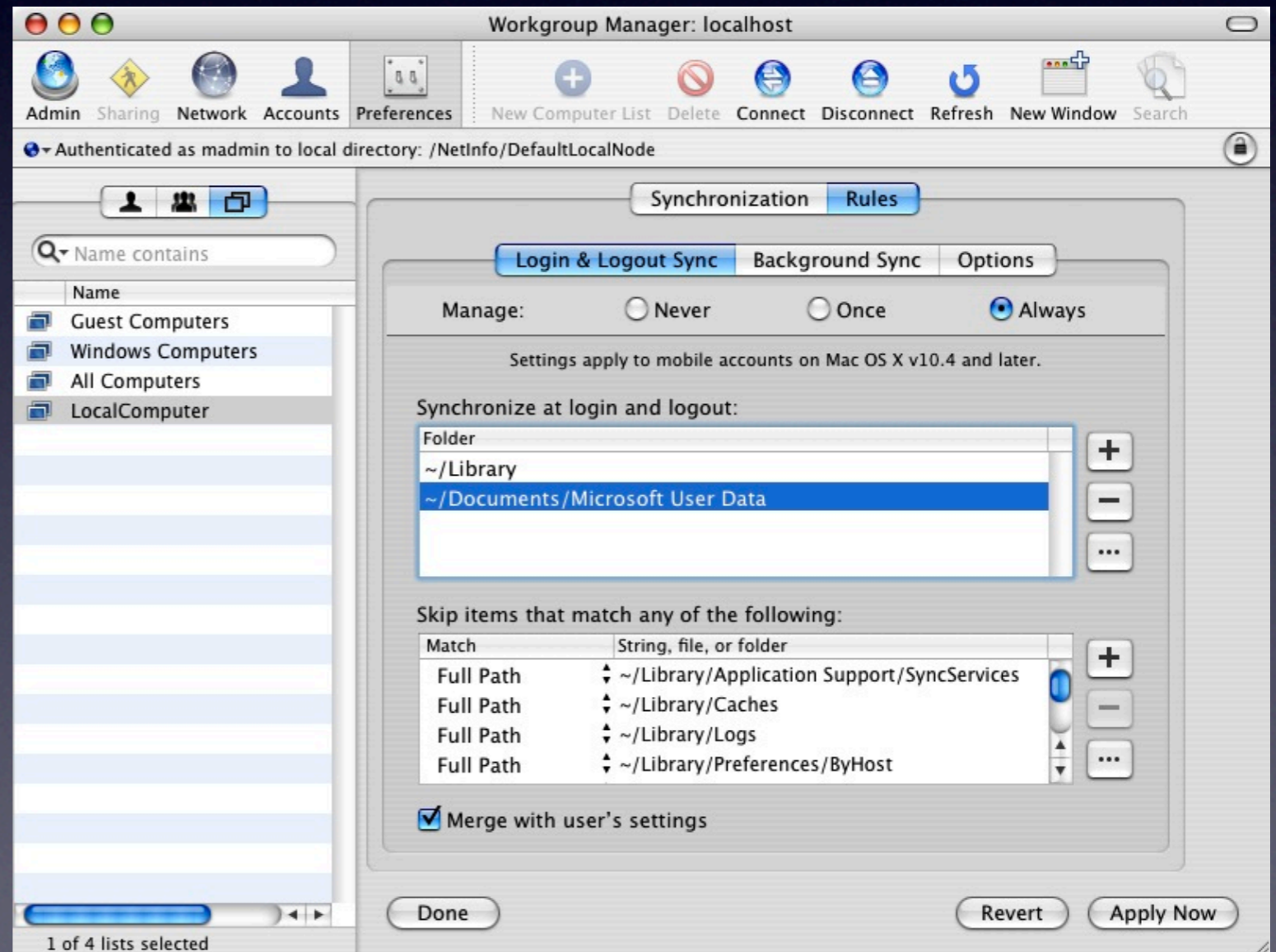




Include/Exclude lists

Workgroup Manager

- Login & Logout Sync
- Background Sync
- Options





Include/Exclude lists

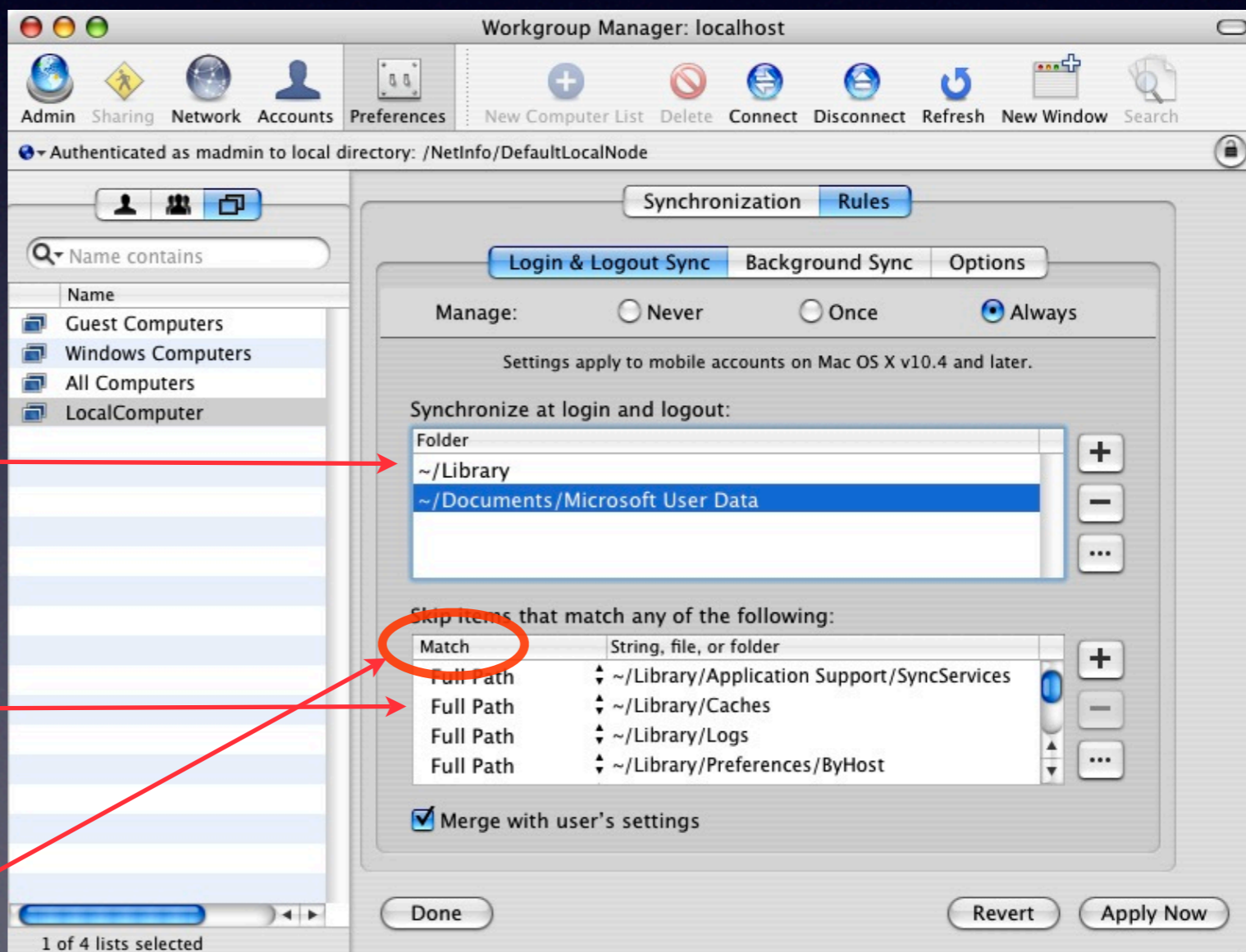
Workgroup Manager (MCX)

Login & Logout Sync

corresponds to
syncedPrefsFolders
defaults key

corresponds to
excludedPrefsItems
defaults key

Match type caveats





Include/Exclude lists

Workgroup Manager (MCX)

Background & Manual Sync

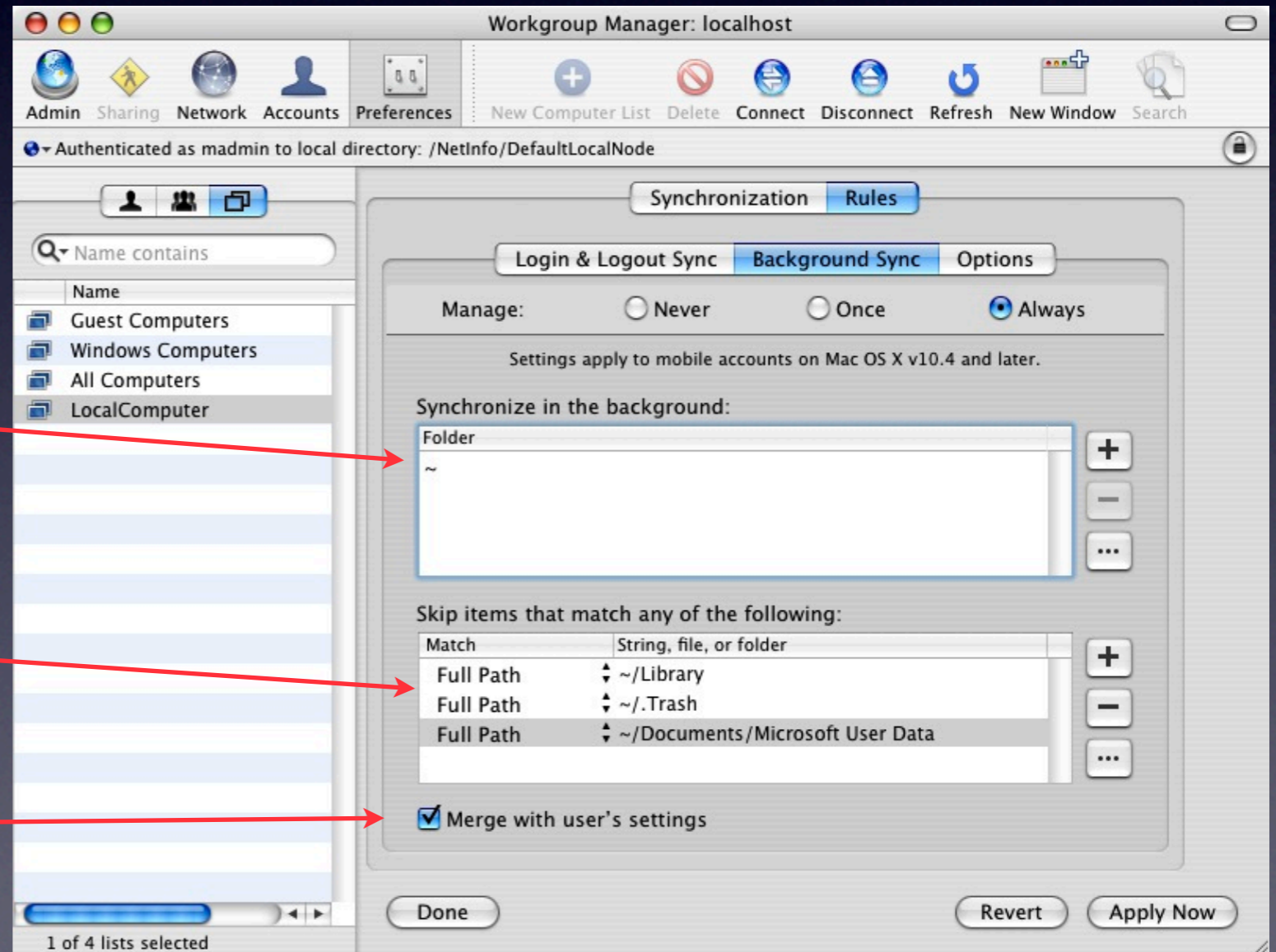
corresponds to
syncedFolders

defaults key

corresponds to
excludedItems

defaults key

turn this off to prevent
user customization with
the Accounts pane





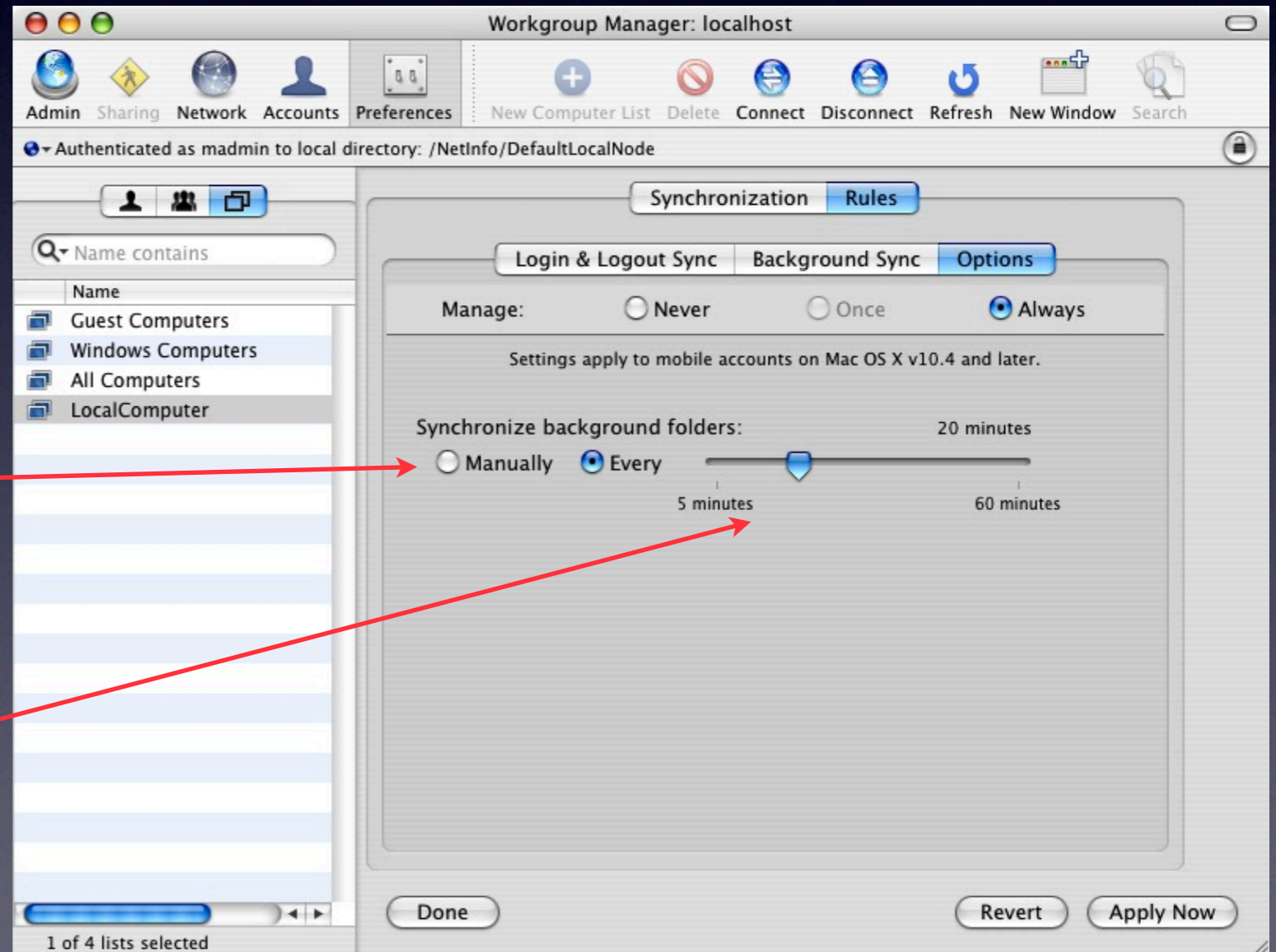
Include/Exclude lists

Workgroup Manager (MCX)

Options

corresponds to
periodicSyncOn
defaults key

corresponds to
syncPeriodSeconds
defaults key





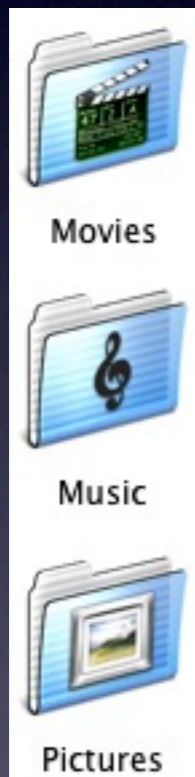
Include/Exclude lists

Changes to consider



Include/Exclude lists

Top-level folders:



excludedItems

```
{comparison = fullPath; value = "~/Movies"; },  
{comparison = fullPath; value = "~/Music"; },  
{comparison = fullPath; value = "~/Pictures"; },
```

(user education is *critical* here - if you exclude these, users must realize the implications)



Include/Exclude lists

Mail.app:

excludedPrefItems

```
{comparison = startsWith; value = "Exchange-"; }
```

- Excludes local copies of Exchange messages in Mail.app's cache
- compare the default exclusions for IMAP and mac.com:

```
{comparison = startsWith; value = "IMAP-"; },  
{comparison = startsWith; value = "Mac-"; },
```





Include/Exclude lists

Microsoft Entourage

- Stores everything in one big file in
~/Documents/Microsoft User Data/
- The Entourage DB shouldn't be
synced while it's open





Include/Exclude lists

Microsoft Entourage

- Add {comparison = fullPath;
value = "~/Documents/Microsoft User Data";}
to excludedItems
- Add {path = "~/Documents/Microsoft User Data";}
to syncedPrefFolders
- Add {comparison = fullPath;
value = "~/Documents/Microsoft User Data/
Entourage Temp";}
to excludedPrefItems





Include/Exclude lists

Microsoft Entourage

Syncing the Entourage DB only at login/logout prevents file corruption issues, but makes logins and logouts take longer





Include/Exclude lists

Norton Anti-Virus

excludedItems

```
{comparison = fullPath; value = "~/NAVMac800QSFile"; },  
{comparison = fullPath; value = "~/SymAVQSFile"; }
```

(Excludes files generated by
Norton Anti-Virus scanning)





Managing PHDs

- Without MCX

directly manage each user's

`~/Library/Preferences/com/apple.homeSync.plist`

a good job for a login item



PHD Issues



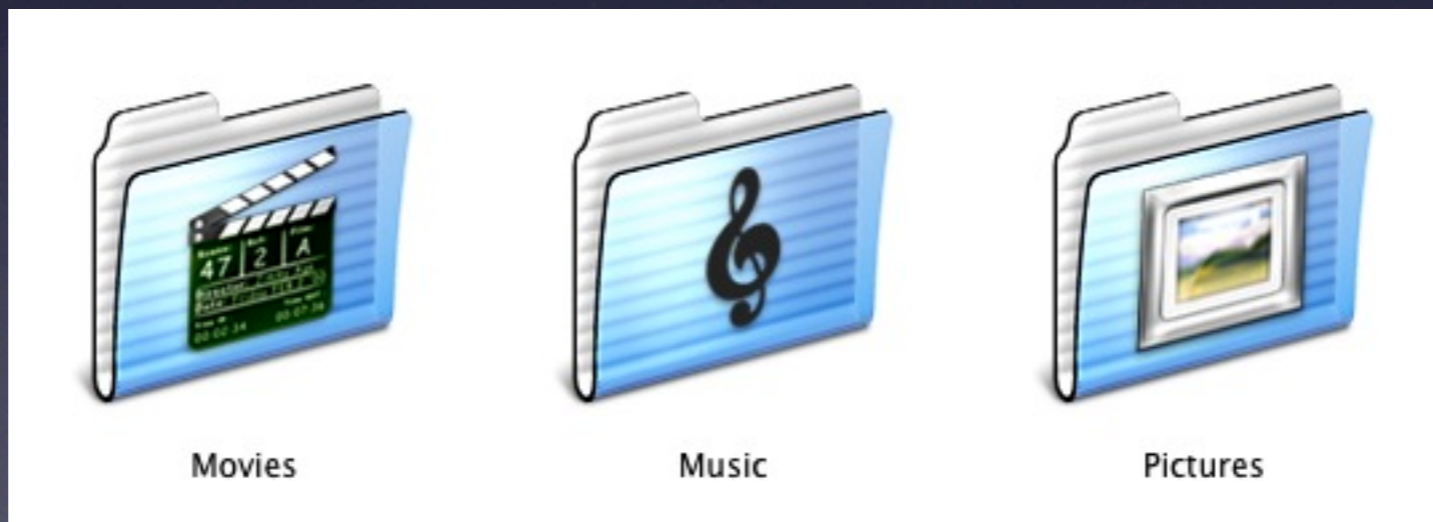
PHD Issues

- Space mismatch!
- Available space for local home $>$ available space for network home



PHD Issues

- Space mismatch strategies
- Exclude “big” folders:





PHD Issues

- Space mismatch strategies
 - Communicate network home quotas





PHD Issues

- Network filesystem has different features

NFS homes allow two files with differing case:

~/apple.jpg

~/APPLE.jpg



PHD Issues

- Items in home not readable by home's owner

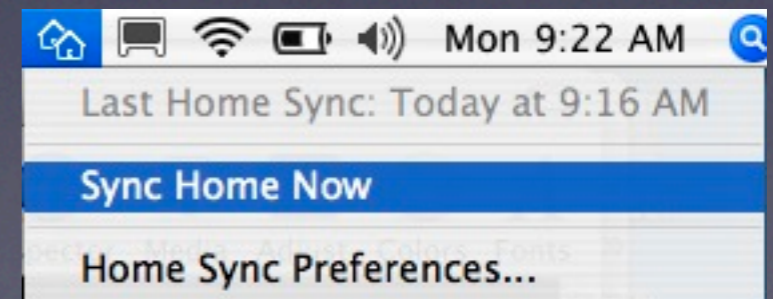
```
drw----- 8 root staff 272 Oct 23 12:47 .Spotlight-V100/
```



PHD Issues

- Background sync delay
with multiple machines

Workaround: do a manual sync





PHD Issues

- Files accessed on multiple computers

Users can easily stomp on their own files



PHD Issues

- Synchronization: Local or Network?

Need to teach users the difference, and encourage single log on whenever possible.



Your network home has changed since your last synchronization. Please select the location of your latest files.

If you are not sure, choose Sync Later and backup your most important files before synchronizing again.

Network Home

Local Home

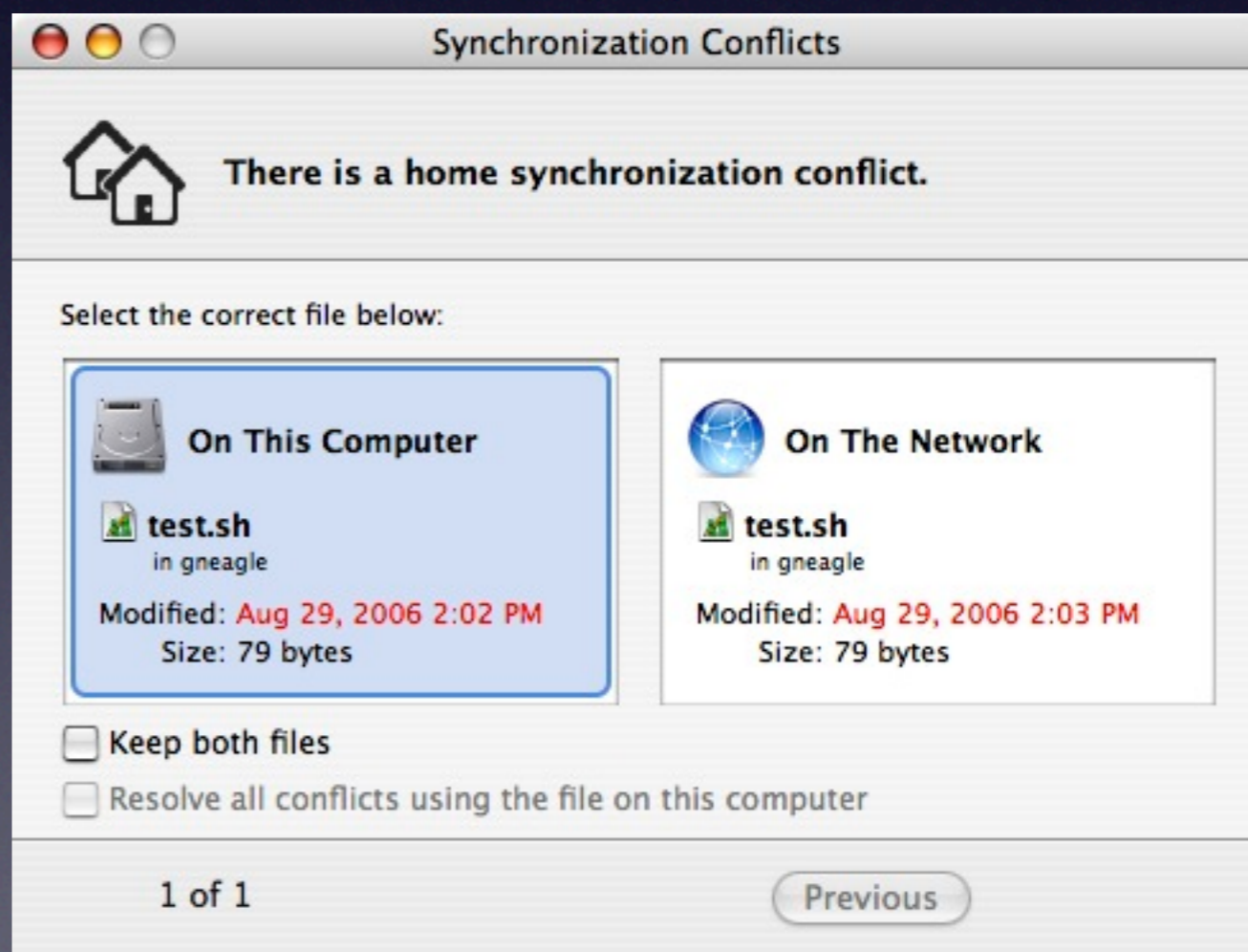
Sync Later



PHD Issues

- Synchronization conflict alerts

Users can be confused





PHD Issues

- **Synchronization conflict alerts**

com.apple.homeSync keys to suppress these:

loginConflictResolution

who wins login/logout conflicts

values (integer):

0 = show conflict dialog

1 = local home wins

2 = network home wins

DANGER: this may also affect the first time sync



PHD Issues

- Synchronization conflict alerts

com.apple.homeSync keys to suppress these:

periodicConflictResolution

who wins background/Sync Now conflicts

values (integer):

0 = show conflict dialog

1 = local home wins

2 = network home wins

DANGER: this may also affect the first time sync



PHD Issues

- Synchronization error alerts

com.apple.homeSync keys to suppress these:

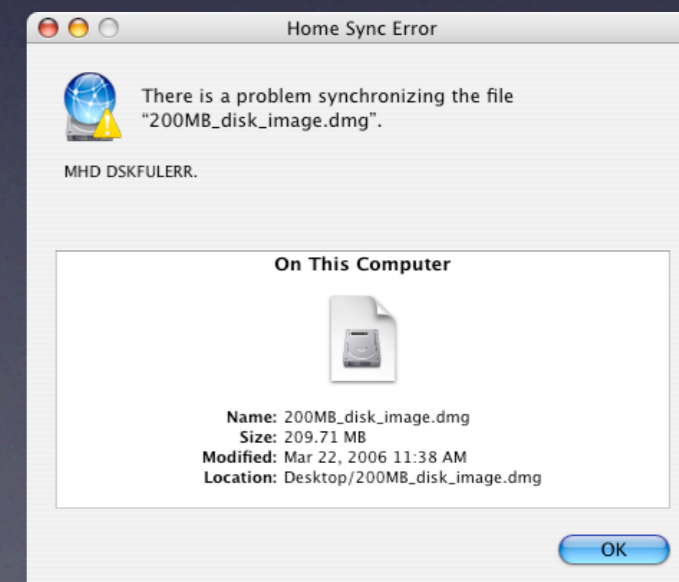
loginSuppressErrors

suppress login/logout sync error messages

values (boolean):

true = suppress error dialogs

false = show error dialogs





PHD Issues

- Synchronization error alerts

com.apple.homeSync keys to suppress these:

periodicSuppressErrors

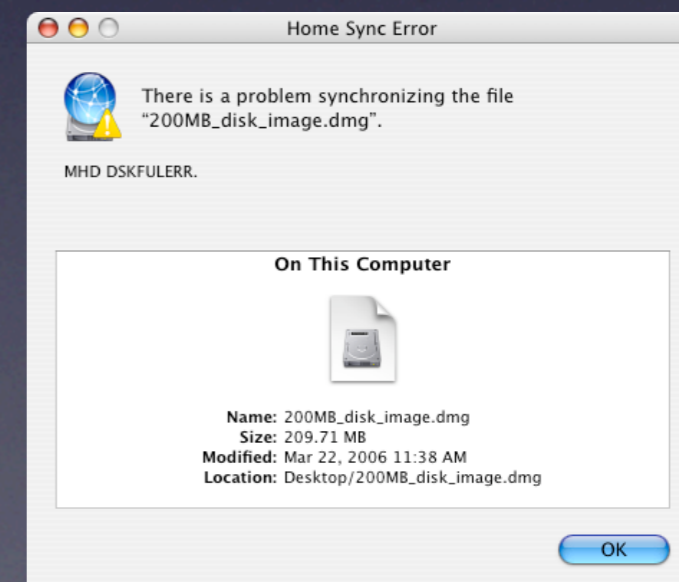
suppress background sync/Sync Now error

messages

values (boolean):

true = suppress error dialogs

false = show error dialogs





PHD Issues

Disabling Synchronization Alerts:

Beware!



Troubleshooting



Troubleshooting

- `~/Library/Logs/MirrorAgent.log`
- Increase level of detail with defaults write com.apple.MirrorAgent debugOutput x (where x is 1-4)
- Sync decision trees:
defaults write com.apple.MirrorAgent printTrees 1
This generates a *lot* of data, but can be very instructive



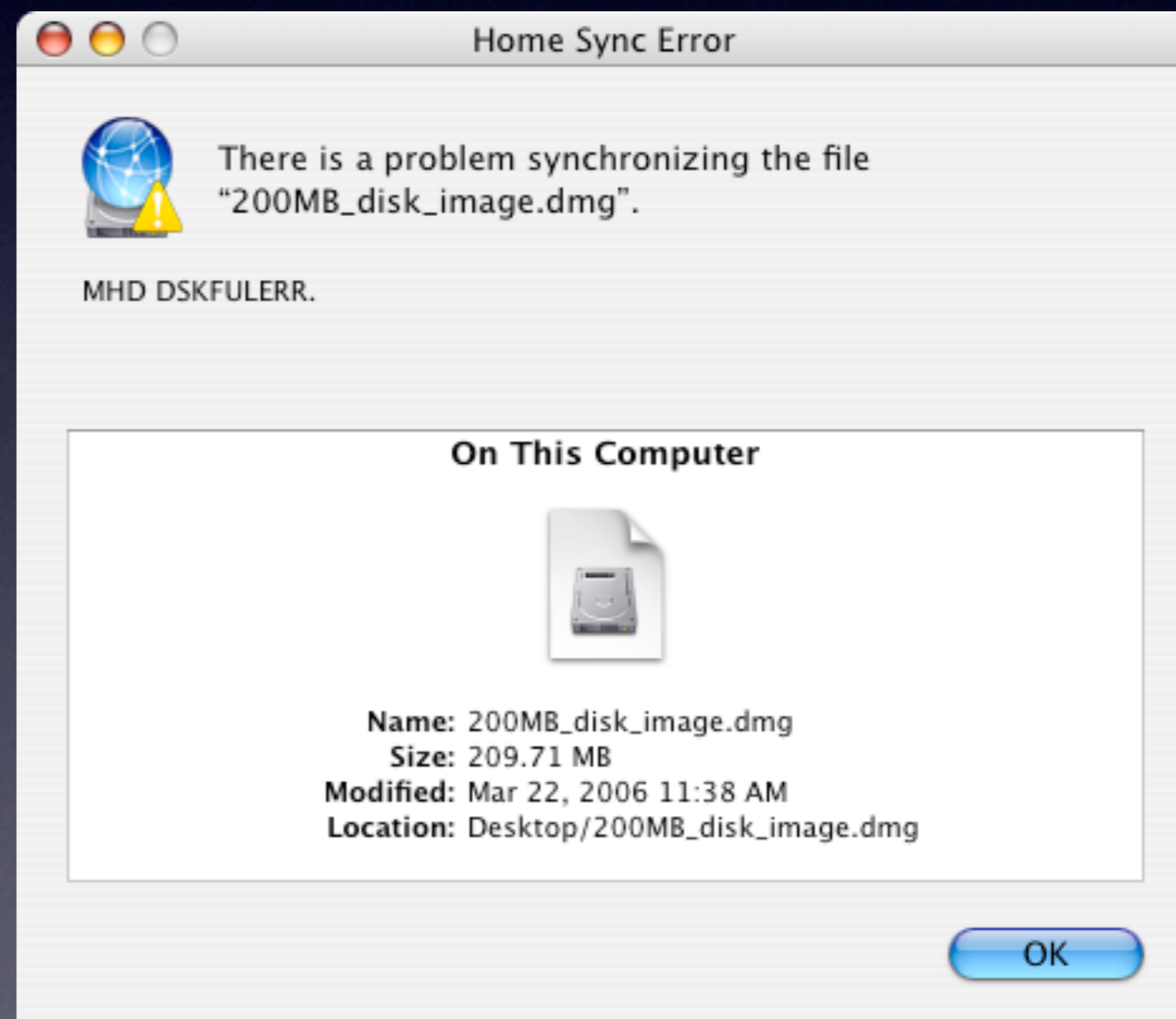
Troubleshooting

Some common errors

MHD DSKFULERR

almost
human-readable!

Mobile Home
Directory
Disk Full Error -
your network home
is full!





Troubleshooting

Some common errors

MHD DSKFULERR - it looks even worse in the log:

```
Wed Mar 22 11:38:29.636 2006 *** Syncing "HomeSync_Mirror"  
Wed Mar 22 11:38:37 2006: /SourceCache/MirrorAgent-99.8.1/FileSync-99.8.1/Agent/  
Engine/whatis.m,261 err -5000 (iterateref)  
copyCallback: got error -1425 at stage 3.  
Wed Mar 22 11:39:50 2006: /SourceCache/MirrorAgent-99.8.1/FileSync-99.8.1/Agent/  
Engine/syncio.m,759 err -1425 (cpfile)  
Wed Mar 22 11:39:50 2006: /SourceCache/MirrorAgent-99.8.1/FileSync-99.8.1/Agent/  
Engine/syncio.m,68 err -1425 (syncjobaddobj)  
*** Exception -1425 logged for "Desktop/200MB_disk_image.dmg" ***  
-1425 FAIL ADDED --> Desktop/200MB_disk_image.dmg
```



Troubleshooting

Some common errors

```
Tue Sep 19 12:50:35 2006: /SourceCache/MirrorAgent-99.9.3/  
FileSync-99.9.3/Agent/Engine/SyncJob.m,830 err =  
kSFFilenameDiffersByCase 37459 (-[SyncFileInfo  
reverifyFileOrFolderNode]) *** Exception 37459 logged for  
".alias" ***
```

Network home contains both

- .Alias

- .alias

- local HFS+ disk can't have both items in the same folder.



Troubleshooting

Some common errors

```
Mon Sep 25 11:12:12 2006: /SourceCache/MirrorAgent-99.9.3/  
FileSync-99.9.3/Agent/Engine/mirrordb.m,193 err -39 (getmirrordb)
```

Error -39 is unexpected end-of-file on the mirrordb, so it looks like the Mirror database is damaged. You'll need to delete the Mirror database and start fresh.



Troubleshooting

Deleting the Mirror database

Brute force method:

- Make sure the PHD user is logged out
- `sudo rm -rf /Users/shortusername/Library/Mirrors`

This will also delete any .Mac sync mirrors.

A more careful method would edit the contents of `/Users/shortusername/Library/Mirrors/mirrors.plist`, removing the dict with name “HomeSync_Mirror” and the “here” and “there” `djmirror.db` files...

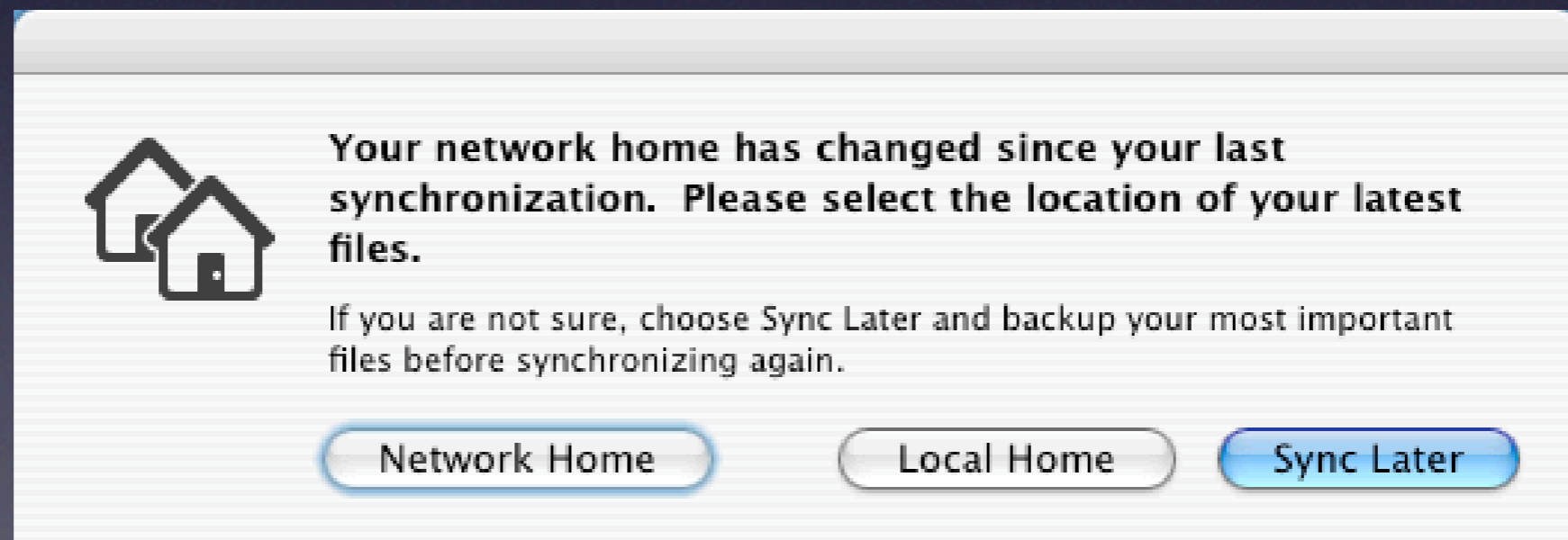
This is an exercise left for the reader.



Troubleshooting

Deleting the Mirror database

Once the HomeSync mirror database is removed, when the user logs in again, they'll see a dialog:



Choose carefully!



Troubleshooting

Worst case scenario:

Syncing won't, and you have no time.

1. Make sure the user has anything saved out of their account they need.
2. Copy off any prefs (Mail) from Library.
3. Log in as local admin, go into the Accounts prefs pane, and delete the account.

The account will recreate on next log in with version from Network.



Case Studies



Disney Animation Studios

- Directory Service
 - OpenLDAP / RHDS
 - No OpenDirectory or MCX
- Network Homes
 - NFS - on NetApp filers
- Special tools
 - makeMobileUser script
 - homeSyncCompositor script
 - HomeSync Preferences.app



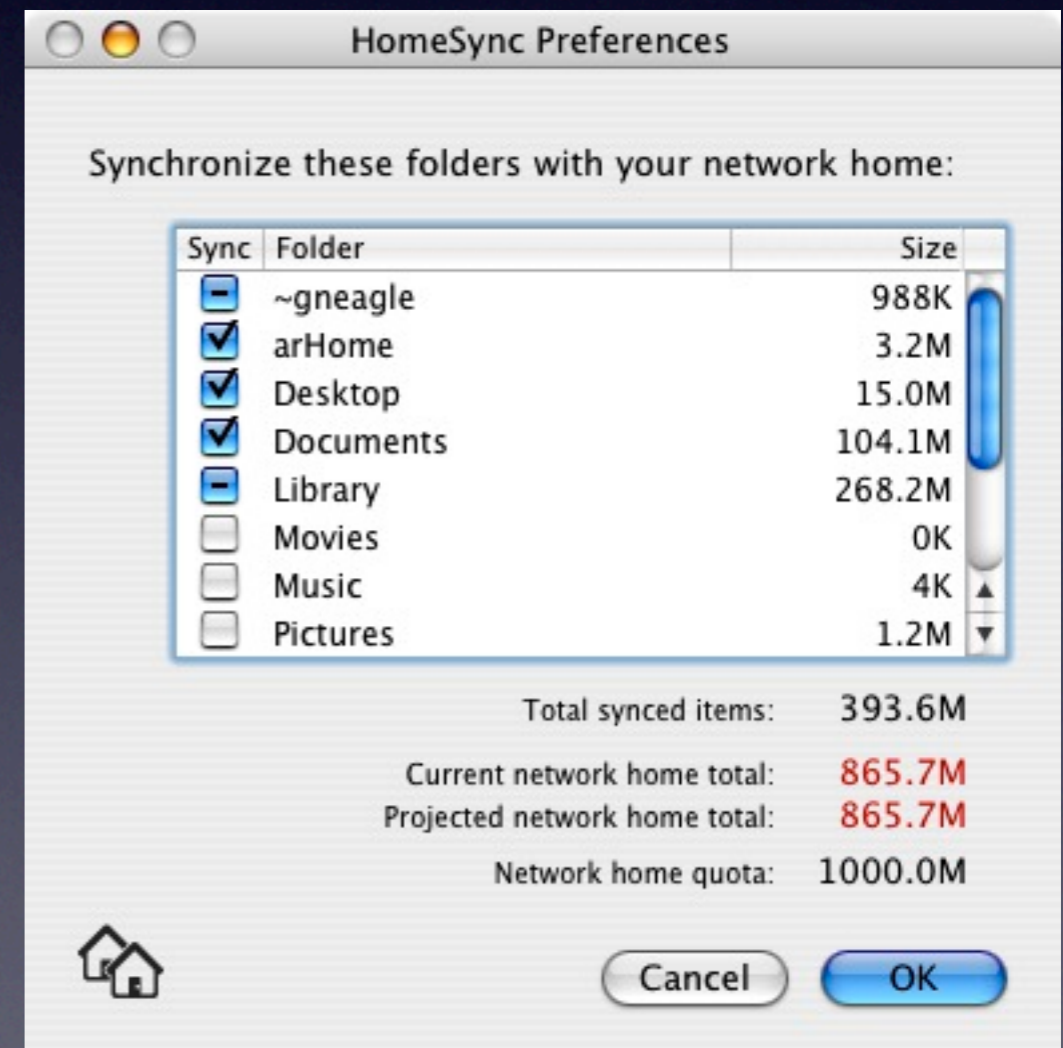


Disney Animation Studios

- HomeSync Preferences.app

Used in our environment;
gives users some additional
feedback so they don't
exceed network quota

Allows users to exclude
only top-level folders in
their home





Ventura County Star

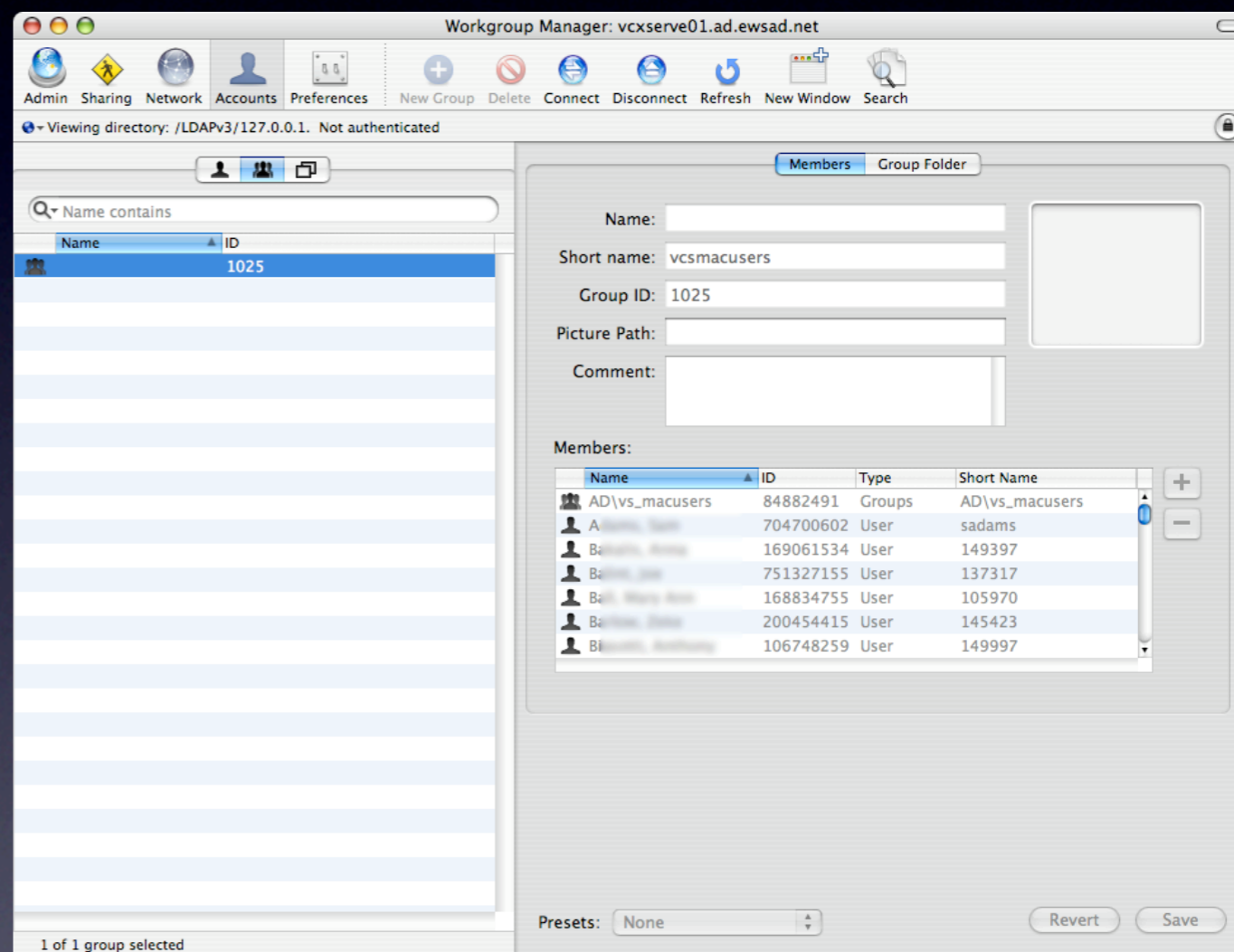
- Directory Service
 - AD-OD Integration (Golden Triangle)
- Portable Home Directories
 - AFP homes on XServe G5
- Special tools
 - Workgroup Manager
(not very special)





Ventura County Star

- Workgroup Manager
 - Preferences are set via User Groups.
 - AD Groups nested within OD Groups (plus user accounts).
 - Client computers are static, built from image.
 - To do: Customize network view via computer groups.





Additional Resources



Additional resources

- [http://images.apple.com/server/pdfs/
User_Management_Admin_v10.4B.pdf](http://images.apple.com/server/pdfs/User_Management_Admin_v10.4B.pdf)
Apple Documentation
- [http://managingosx.wordpress.com/2006/03/15/
portable-home-directories-without-open-directory/](http://managingosx.wordpress.com/2006/03/15/portable-home-directories-without-open-directory/)
Greg's articles on how he got PHDs up and running at
Disney Animation Studios
- <http://discussions.apple.com/forum.jspa?forumID=714>
Apple Discussions Forum - Portable Home
Directories



Additional resources

- <http://www.afp548.com/article.php?story=20051202151540574&query=ad-od%2Bintegration>
AD-OD Integration white paper (do a search for that from the afp548 home page)
- <http://www.afp548.com/forum/index.php>
Search for AD-OD Integration (lots of good tips hidden in there.)
- http://prowiki.isc-csg.upenn.edu:16080/index.php/Workgroup_Management_without_a_server
using MCX without an Open Directory server



Q&A / Discussion