

# New Technical Notes

Macintosh



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Developer Support

## AppleShare Q&As

Networking

M.NW.AppleShare.Q&As

Revised by: Developer Support Center

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Written by: Developer Support Center

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This Technical Note contains a collection of Q&As relating to a specific topic—questions you've sent the Developer Support Center (DSC) along with answers from the DSC engineers. While DSC engineers have checked the Q&A content for accuracy, the Q&A Technical Notes don't have the editing and organization of other Technical Notes. The Q&A function is to get new technical information and updates to you quickly, saving the polish for when the information migrates into reference manuals.

Q&As are now included with Technical Notes to make access to technical updates easier for you. If you have comments or suggestions about Q&A content or distribution, please let us know by sending an AppleLink to DEVFEEDBACK. Apple Partners may send technical questions about Q&A content to DEVSUPPORT for resolution.

|New Q&As and Q&As revised this month are marked with a bar in the side margin.

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### Maximum volumes for file sharing

Written: 3/9/92

Last reviewed: 8/1/92

In the past I've been able to file share more volumes off my Macintosh SCSI storage devices than I can with System 7. Now I get an alert saying: "One or more items could not be shared because not all volumes are available for file sharing." Please advise as to what the problem might be.

Macintosh File Sharing will only prepare for sharing the first 10 volumes it sees (it enumerates the volume list with PBHGetVInfo). The volumes you can't share will usually be the ones mounted last. The reason you used to be able to share another set of volumes probably has to do with some change you've made (like changing the boot volume or a volume's SCSI ID number).

So, you've just hit the limits of File Sharing. The solution to your problem is to use AppleShare 3.0 - it will share up to 50 volumes. File Sharing wasn't intended to be the end-

all in file servers; it was designed for individuals who want to occasionally share files with a small number of other users. Here are some limits to File Sharing which you should note:

- The number of users & groups in the Users & Groups Data File is limited to 100 total. (The limit with AppleShare 3.0 is 8192 total.)

- The number of users that can be logged in at one time is 10 (this doesn't count the owner of the system, one remote connection is always reserved for the owner of the system). (The limit with AppleShare 3.0 is 120.)
- The number of share points available for regular users is 10. (The limit with AppleShare 3.0 is 50.)
- The number of sharable volumes (what the owner sees when they login remotely and what can be shared or partially shared) is 10. (The limit with AppleShare 3.0 is 50.)

AppleShare 3.0 also supports many other user (for example, server messages), security, and developer features (server control calls and the server event mechanism) not supported by Macintosh File Sharing.

### **AppleShare user limit**

Written: 11/16/90

Last reviewed: 12/19/90

What is the maximum number of users that can be logged in to any one AppleShare file server? What can we do to increase the limit? Will upgrading to AppleTalk Phase II help? Is there an upgrade to the AppleShare 2.0.1 software?

—

AppleShare currently has a limit of 50 simultaneous users. This is a limitation in the software and is not related to AppleTalk. Changing from AppleTalk Phase I to Phase II will not change anything. The next version of AppleShare might raise this limitation. We do not have any projected dates for a release of the next version of AppleShare. You may want to periodically check with APDA for any update or new release.

### **Maximum number of users supported by AppleShare for each CPU**

Written: 5/3/89

Last reviewed: 11/21/90

What is the maximum number of users supported by AppleShare? Does this number change based on the type of CPU being used for the server?

—

The following chart lists some current AppleShare limits (AppleShare 1.1, 2.0, and 2.01) which are based upon the chosen server platform and memory configuration. The limits which otherwise might be present on a workstation are still in effect, and are not affected by the workstation being logged into an AppleShare server. These limits will change in the future.

Server machine is Macintosh Plus, SE, or II with one MB:

Number of users: 25  
Number of locked ranges: 1000  
Number of open files: 80  
Number of volumes: 16

Server machine is Macintosh II with more than one MB:

Number of users: 50  
Number of locked ranges: 2000  
Number of open files: 160

Number of volumes: 16

X-Ref:

Macintosh Technical Note "AppleShare 1.1 and 2.0 Limits"

### **Macintosh file system active ranges**

Written: 3/18/91

Last reviewed: 6/7/91

How many active ranges can a Macintosh application have on a shared file? If the answer is more than one, is the limit per application or per machine? If two ranges overlap, are they joined into one range? Can an application nest ranges? For example, if an application's user performs an action that forces a record to be locked and later the application locks the full range of the file, does the initial record lock disappear?

—

The only way to determine the limit is to hit the limit and get a NoMoreLocks error. The number of range locks supported is a limit of the server platform, and that limit is shared by all users of the server (at least it is with Apple's AppleShare server software). With Apple's server-based version of AppleShare, approximately 40 locks per user are allowed (for example, if the server allows 25 users, there are 1000 locked ranges total; if the server allows 50 users, there are 2000 locked ranges total; and with File Sharing running under System 7.0, approximately 20 locks are allowed per user). Other vendors may allow more or fewer locked ranges on their implementations of an AppleTalk Filing Protocol (AFP) server. Notice that the numbers given are per user, not per application. It's assumed that a user probably won't need more than a few locks at a time on a single file.

You cannot have range locks that overlap. You'll get a RangeOverlap error from AFP. All the rules for range locking can be found in the AFP chapter of Inside AppleTalk (page 13-56). Additional information on AppleShare limits is available in the Dev Tech Answers library on AppleLink and on the Developer CD Series disc.

The Macintosh Technical Note "Lock, Unlock the Range" covers several important details about PBLockRange and PBUnlockRange that are not in Inside Macintosh.

### **AppleShare open file limit**

Written: 10/8/91

Last reviewed: 10/8/91

On an AppleShare 2.0 File Server platform, the only application that can access files outside of the Server Folder (i.e., the System Folder) is the file server application. AppleShare Foreground applications (described in the Macintosh Tech Note "AppleShare Foreground Applications" are the only other applications that should be running on a server and they can

only access files inside the Server Folder. All file forks (referred to as files from here on) opened by remote AppleShare workstations are opened by the File Server application.

The File Server application will open a file only one time. All access to that file from any number of workstations will use the single access path the File Server has opened. Only when all workstations have closed the file does the File Server really close the file on the server. So, that means only one FCB is used on the server per open file, even if 50 users have shared access to that file.

The File Server application handles all access control to an open file using the AppleTalk Filing Protocol (AFP) deny-mode permission model. The only reason a user won't be able to open an access path to a file on a server is if another user has opened that file with a deny-mode that conflicts with the second user's request, or the user does not have the access rights needed to open files in the file's parent directory or directory ancestors. The AFP deny-mode permission model is described briefly in Inside Macintosh Volume V, File Manager Extensions In a Shared Environment, and in detail in the AppleTalk Filing Protocol chapter of Inside AppleTalk.

As noted in the Macintosh Tech Note "AppleShare 1.1 and 2.0 Limits," the maximum number of open file forks on an AppleShare 2.0 server is either 80 on a 1-MB MC68000 server platform, or 160 on an server platform with more than 1MB and a MC68020 or greater processor. That figure includes the number of files kept open by the system and the file server application. If an AppleShare Foreground application is running on the server (for example, the AppleShare Print Server), then any files it may have open count against the maximum, too. The same can be said for open desk accessories. This Tech Note currently doesn't say anything about those files counting towards the limit. If the 160 (or 80) file limit is a problem, you can use the "Up Your FCBs" INIT to bump the number of available up to the maximum (342) allowed by the File Manager. "Up Your FCBs" can be found on AppleLink in the Developer Support:Developer Technical Support:Hacks folder.

### **Software-selecting an AppleShare volume**

Written: 10/23/90

Last reviewed: 2/20/91

Is there any source code available for mounting/unmounting AppleShare volumes?

—

There are actually a couple of ways to select an AppleShare volume. You could use the 'Choose' tool in MPW that accomplishes this, or you can do it with aliases under System 7. Other than the MPW tool, there is no other supported way of doing this under pre-7.0 systems; there are no current 'hooks' to allow easy mounting of AppleShare volumes programmatically. It gets pretty nasty trying to figure out everything that is necessary to accomplish this, which is why people here pretty much stay away from this as well. Also, some low-level stuff may be proprietary, which is why the tool is supplied for developers. 'Choose' is described in the MPW docs. It should be pretty straightforward to use.

### **2.0.1 PBHGetDirAccess and PutDirAccess restrictions**

Written: 12/5/90

Last reviewed: 1/16/91

If a volume is connected to an AppleShare server, but is not an AppleShare volume, will the PBHGetDirAccess (and PutDirAccess) function work on it? Can an INIT on the server make

these calls?

—

For AppleShare 2.0.1, the INIT cannot make these calls on non-file server volumes. In future versions, the PBHGetDirAccess and PutDirAccess calls can safely be made on all volumes connected.

## **Server Move & Rename folder**



Written: 12/5/90  
Last reviewed: 1/16/91

A folder is created in the Server Folder called "...Move & Rename." What is this and what are its contents? Should it be backed up? Are there any other temporary folders and files that might need to be backed up?

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It's the "\$01\$02\$03Move & Rename" folder that AppleShare 2.0.1 and future versions create for the two-step process of moving and renaming a file or a folder, a feature that is not provided via HFS. It should be backed up, but in general will not contain anything. (It has something in it only for a brief instant and only if the server has IBM PCs or some other computer that uses this call. Macintosh systems don't.) It needs to be backed up for 2.0.1 so that the folder is there if the server is restored. (Otherwise, Admin will have to be run to create a new one, a somewhat disconcerting action to perform after completely restoring a file server.)

### **How to tell if application's running on a server**

Written: 12/5/90  
Last reviewed: 1/16/91

What is the best way to determine if a Macintosh application is running on a server?

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For 2.0.1 you can test the longword at \$B50. If it is 0 or -1, the server is not running. If it isn't—i.e., it's a real address—then the server is either starting up, or is running. There might be a hook available in future versions of AppleShare which your process can hook into.

### **Detecting Appletalk being closed down by user**

Written: 12/12/90  
Last reviewed: 1/17/90

How do I detect that a user has closed down my AppleTalk connection (by turning AppleTalk off from the Chooser or by changing network connections from the Network control panel)?

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The AppleTalk Transition Queue provides a means to determine when the AppleTalk drivers change status or when they might be closed in the very near future. The Transition Queue informs its clients (everyone who has asked to be added to the queue) each time the state of the .MPP driver changes state (opened or closed) or is about to change state.

The AppleTalk Transition Queue is documented in Inside Macintosh VI, Chapter 32 (The

AppleTalk Manager) and is also documented in the Macintosh AppleTalk Connections Programmer's Guide, Chapter 3 ("Calls to the LAP Manager"), available from APDA.

**Purpose of AppleShare SP file**

Written: 3/14/91

Last reviewed: 4/29/91

What is the file “AppleShare SP” and what does it do? The AppleShare File Server seems to run without it, and it reduces the alert sound to just a beep even when the server is not running on that computer. Is the file really needed?

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You do need the AppleShare SP INIT on your file server. The AppleShare SP (Small Patch) INIT is designed to correct a minor incompatibility between AppleShare 2.0x and the Sound Manager. The INIT forces the Macintosh to use the “Simple Beep” sound at all times. System 7.0 file sharing and future versions of AppleShare do not need the INIT.

### **Macintosh EOF in an AppleShare environment**

Written: 3/18/91

Last reviewed: 6/10/91

I ran into the following when updating the logical end of file (EOF) of a shared file: Application A and Application B have access to a file under AppleShare. Each is using fsRdWrShPerm. When Application A changes the logical EOF, Application B doesn't seem to notice that EOF has changed until Application B calls GetEOF. Is there a better way to make Application B aware of the change of logical EOF?

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You've made a correct assumption that the correct way to keep track of EOF in an AppleShare environment is to ask for it. When you open a file, the AppleShare workstation code translates the Macintosh operating system Open call to the AFP (AppleTalk Filing Protocol) FPOpenFork call, and sets the bits in the bitmap parameter to current length of the fork opened (in the case of Open, the data fork). It then uses THAT as the EOF for future operations unless it gets an update from the server. Because the server does not constantly update everyone who has the file open, you have to ask to find if another user (or application) has made a change. Just remember that using GetEOF will only get you the EOF at that instant in time. Someone else sharing the file could change EOF right after you check it.

The PBLockRange function can be used by an AppleShare aware application to prevent another user from appending data to a shared file while you are appending data. For example:

```
paramBlock.ioRefNum := myFileRef;
err := PBGetEOF(@paramBlock, FALSE); {get the current EOF}
{check for errors in a real application}

oldEOF := paramBlock.ioMisc; {save the current EOF}
paramBlock.ioReqCount := -1; {$FFFFFFFF}
paramBlock.ioPosMode := fsFromStart;
paramBlock.ioPosOffset := oldEOF; {start range lock at current EOF}
err := PCLockRange(@paramBlock, FALSE); {and lock the rest of the fork}
{check for errors in a real application}

{now you can append data to the file}

paramBlock.ioRefNum := myFileRef;
```

```
paramBlock.ioReqCount := -1; {$FFFFFFFF}
paramBlock.ioPosMode := fsFromStart;
paramBlock.ioPosOffset := oldEOF;
err := PCUnlockRange(@paramBlock, FALSE); {unlock the locked range}
{check for errors in a real application}
```

PBLockRange can also be used when you need to truncate a shared file. Locking the portion of the file you're about to truncate prevents another user from using that portion during the truncation process. For example:

```
paramBlock.ioRefNum := myFileRef;
paramBlock.ioReqCount := -1; {$FFFFFFFF}
paramBlock.ioPosMode := fsFromStart;
paramBlock.ioPosOffset := theNewEOF; {start lock at truncation point}
err := PCLockRange(@paramBlock, FALSE); {and lock the rest of the fork}
{check for errors in a real application}

paramBlock.ioMisc:= theNewEOF;
err := PBSetEOF(@paramBlock, FALSE); {set the new EOF (truncate the file)}
{check for errors in a real application}

paramBlock.ioReqCount := -1; {$FFFFFFFF}
paramBlock.ioPosMode := fsFromStart;
paramBlock.ioPosOffset := theNewEOF;
err := PCUnlockRange(@paramBlock, FALSE); {unlock the locked range}
{check for errors in a real application}
```

The entire fork can be locked with:

```
paramBlock.ioRefNum := myFileRef;
paramBlock.ioReqCount := -1; {$FFFFFFFF}
paramBlock.ioPosMode := fsFromStart;
paramBlock.ioPosOffset := 0; {lock from the beginning}
err := PCLockRange(@paramBlock, FALSE); {lock the whole fork}
{check for errors in a real application}

{do your thing}

paramBlock.ioRefNum := myFileRef;
paramBlock.ioReqCount := -1; {$FFFFFFFF}
paramBlock.ioPosMode := fsFromStart;
paramBlock.ioPosOffset := 0; {unlock from the beginning}
err := PCUnlockRange(@paramBlock, FALSE); {unlock the whole fork}
{check for errors in a real application}
```

## Macintosh AppleShare versus FileShare capabilities

Written: 4/3/91

Last reviewed: 6/21/91

We are using the FileShare capabilities of Macintosh systems with System 7.0 to make them mini file servers. Where can information that details the features of both AppleShare and FileShare be found? We are considering using only FileShare in the office if it is capable of providing most of what AppleShare provides.

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Information on file sharing can be found in the System 7 Personal Upgrade Kit and in Inside Macintosh, Volume VI, on your Developer CD Series disc. The maximum number of concurrent connections allowed on a Macintosh using file sharing is 10. The performance of an AppleShare file server (the standard kind of server) is approximately 25% better than a similar configuration of Macintosh computers acting as a file sharing server.

## System 7 and AppleTalk Internet Router

Written: 9/17/91

Last reviewed: 11/25/91

We've tried to run the Apple Internet Router with our System 7 File Sharing servers. There does not appear to be support for multiple networks. Is there some solution to this?

—

The AppleTalk Internet Router and System 7 are compatible, with two exceptions: virtual memory and 32-bit addressing. You need to drag-install it instead of using the Installer. The Installer script on the router disk will put the parts of the router in the wrong place. Here are the steps to drag-install the router:

1) Drag the files Router, LocalTalk (Built-in), and LocalTalk (Modem) from the System Folder on the "AppleTalk Internet Router" disk to the closed System Folder on the disk where you want to install. System 7 will automatically put the Router file in the System Folder, and put the LocalTalk (Built-in) and LocalTalk (Modem) files in the Extensions folder in the System folder.

2) Under System 7, open the System file on the "AppleTalk Internet Router" disk (double-click on the System file). A window will open showing the desk accessories, fonts, and sounds that are part of that System file. Drag the "Router" desk accessory from that window to the closed System Folder on the disk where you want to install. System 7 will automatically put the "Router" desk accessory in the Apple Menu Items folder in the System folder.

3) Reboot.

That's all there is to it.

X-Ref:

"System 7: Installing Internet Router 2.0," AppleLink Tech Info Library

### **TMGetTermEnviron envVersTooBig error**

Written: 9/17/91

Last reviewed: 9/17/91

A call made to TMGetTermEnviron returns -5502 or envVersTooBig. The call is made with a good terminal handle started from your TTY tool. What's wrong? How do I fix it?

—

When you call TMGetTermEnviron, the TermEnvironRec that you hand it a pointer, to must have initialized the version field with curTermEnvRecVers. The following will work properly:

```
void getTEnviron(TermHandle aTerm)
{ ...
```

```
TermEnvironRec tEnv;
TMErr err;
...
tEnv.version = curTermEnvRecVers;
err = TMGetTermEnvirons(aTerm, &tEnv);
/* check for errors, do whatever... */
...
}
```

This is consistent with most other Macintosh “get environment” calls such as SysEnvirons, and is documented (somewhat unclearly) at the top of page 113 in “Inside the Macintosh Communications Toolbox.”

## **Modifying a server volume's backup date-time from a workstation**

Written: 12/5/91

Last reviewed: 1/27/92

How can I change the backup date of a remote AppleShare volume? When I get the volume information with PBHGetVInfo (followed by a PBFlushVol), change the backup date field, and call PBSetVInfo, the date is changed in my local copy of the volume information, but when I unmount and remount the AppleShare volume, the original backup date is still there.

On an AppleTalk Filing Protocol (AFP) file server, two of the volume date-time values, the volume creation date-time and the volume modification date-time, are managed solely by the server and can't be changed by workstations. The third volume date-time value, the volume backup date-time, can be set by a workstation with only one AFP call, `afpSetVolParms`. However, the File Manager, through the Macintosh AppleShare external file system, does not give an application a way to make the `afpSetVolParms` call. That leaves only one way you can change a server volume's backup date-time from a workstation: you'll have to use the AppleTalk .XPP driver to access the server directly.

Using the .XPP driver to change the backup date-time involves these steps:

- Open the .XPP driver and get the driver reference number.
- Use the `afpLogin` variant of `AFPCommand` to start a session and login to the server. If the "Randnum Exchange" or "2-Way Randnum Exchange" user authentication methods are used, you will receive an `AuthContinue` error (-5001) from the `afpLogin` call and you'll have to follow up the `afpLogin` call with an `afpLoginCont` call (through `AFPCommand` again) to finish the login sequence.
- Once you're logged into the server, you need make an `afpGetSrvrParms` call to get a list of volumes and to find out if the volume you're interested in has a password associated with it.
- Then you need to call `afpOpenVol` with the volume name (and password if there is one). You can have `afpOpenVol` give you the volume's current backup date-time and other volume information if you set the appropriate bits in the `bitmap` parameter passed to `afpOpenVol`.
- Now that you're logged into the server and have the volume opened, you can make an `afpSetVolParms` call to change the backup date-time.
- After changing backup date-time, you need to close the volume with `afpCloseVol`, and then logoff the server with `afpLogout`.

The .XPP driver's AFP commands are described in *Inside Macintosh Volume V* in the AppleTalk chapter (pages V-524 through V-550). For a description of the AFP calls, user



authentication methods, and other AFP information, you need to look in the AppleTalk Filing Protocol chapter of Inside AppleTalk. If you decide you want to really use the .XPP driver as described above and want to use the 2-Way Random Exchange user authentication method supported by System 7 File Sharing and AppleShare 3.0, contact DTS for a preliminary version of the AFP 2.1 specification that describes that new authentication method.

## **AppleShare Print Server 3.0 and AppleTalk Self-Send**

Written: 2/28/92  
Last reviewed: 2/28/92

When I issue a PAPWrite from my application to the AppleShare Print Server 3.0 running on the same Macintosh, PAPWrite locks up in a tight loop. If I send to a LaserWriter or the AppleShare Print Server 3.0 running on a different Macintosh system, all works well. The LaserWriter Font Utility 7.0 behaves the same as my application: it works if the spooler is remote and locks up if the spooler is local.

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You're probably calling PAPWrite and then not giving up any system time needed by the print server to process the data you sent to it. That just doesn't work in the self-send environment. For example, the following won't work:

```
PAPWrite(refNum, writeBuff, dataSize, eof, compState);  
WHILE compState = 1 DO  
    ; { do nothing -- wait for PAPWrite to complete }
```

What your application should do is drop back into its event loop after making the PAPWrite call and then poll compState to see when the PAPWrite completes. By calling WaitNextEvent from your event loop, your application gives the print server application the time it needs to receive and process the data you sent to it.

The LaserWriter Font Utility wasn't designed to work with print servers and will exhibit the same problem your application is experiencing.

## System 6 & 7 Chooser AppleShare differences

Written: 2/28/92  
Last reviewed: 2/28/92

What's the limit on the number of servers displayable in the Chooser as well as the maximum number of AppleShare mount points per server? Are the System 7 limits the same as for System 6?

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Most System 6 Chooser limitations have been eliminated with the System 7 Chooser. Here's how each version operates:

### System 6 Chooser:

The 6.0 Chooser's LookupName call to find AppleTalk entities is made asynchronously where retBuffPtr points to a 512-byte buffer and maxToGet = 32 (this is the 32-device limit per device type you may have heard of). The important thing to note here is the return buffer size (512 bytes). For example, if you are looking for AppleShare servers in your own zone (the "\*" zone), the number of overhead bytes per NBP tuple returned will be 16 (5 for the entity address, 10 for the string "AFPServer", and 2 for the string "\*"). If there were 20 servers in your zone, 340 bytes of the 512-byte buffer are used \*before\* you start counting the space used by the server names. That leaves 172 bytes for the names or around 8 characters per name (1 length byte plus 8 characters). If the average server name is longer than that, there won't be enough room to collect all of the NBP replies and one or more

servers won't show up in the list.

Once a server is selected and the user is authenticated, the AppleShare 2.0 RDEV uses `afpGetSrvrParms` to ask for the list of server volumes. The AppleShare 2.0 RDEV uses a 512-byte buffer for the replies. After the overhead used by the AppleTalk protocol headers, that's enough room for around 16 volumes with full-sized names; more if the names aren't full-sized.

### System 7 Chooser:

The System 7.0 Chooser fixes the problem with the NBP buffer completely. It dynamically sizes the NBP `LookupName` return buffer. So, if `numGotten => maxToGet`, it will make the return buffer larger and increase the value of `maxToGet`. The System 7.0 Chooser starts with `retBuffSize=1024` and `maxToGet=256`.

The AppleShare 7.0 and 3.0 RDEVs increased the size of the `afpGetSrvrParms` reply buffer to 1728 bytes. That's still not big enough to get 255 volumes (the AFP limit) with full-sized names. However, it is big enough for 50 volumes with full-sized names, the maximum number of volumes supported by AppleShare 3.0.

### Server and workstation clock times

Written: 2/25/92

Last reviewed: 4/22/92

If I hook up two Macintosh computers over LocalTalk, turn on Personal File Share, mount one computer's volume on the other, and make changes to files on each machine, the Get Info mod dates are not adjusted. In my case, machine A's clock said 10:20 and machine B's said 10:30. From machine B, I made a change to a file on machine A. Then, still on machine B, I did a Get Info on that machine A file. Its mod date said 10:20. I then instantly made a change to a file (from machine B still) on machine B and did a Get Info on it and its mod date was 10:30. In other words, the mod dates were not adjusted and reflected the time of the machine each file was located on. Am I misinterpreting something?

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The way the workstation computes the server time is not quite as straightforward as is documented in *Inside AppleTalk*, 2nd edition, page 13-21. When a workstation logs onto a server (File Share or AppleShare), the difference between the workstation's clock and the server's clock (`s-w`) is computed. All subsequent server date/time values as seen by the workstation are computed by adding this difference (`s-w`) to the server data/time (`workstation time = server time + (s-w)`).

However, it looks as if the Macintosh workstation also uses the following algorithm to compute the adjusted server time:

- if the offset (`s-w`) is 15 minutes or less, report the server time as is
- if the offset (`s-w`) is greater than 15 minutes, compute the offset rounded up to the nearest

30 minute interval.

For example, let's say you have two machines, A & B. B logs onto A. B then goes and modifies a file on A. Listed below are the clock times that the modification took place, and in the rightmost column is the mod. time that B would see for the modified file on A.

A time	B time	mod. time as seen by B
-----	-----	-----
11:09	11:22	11:09
11:04	11:20	11:34
4:34	7:14	7:05

11:22

11:53

11:52

In the first example, the difference (s-w) is (11:22 - 11:09) = 13 minutes. Since 13 is less than 15 minutes, B sees the server time as is. In the second example, (s-w) is (11:20 - 11:04) = 16 minutes which is greater than 15 minutes so compute the offset to the nearest 30 minute interval (30-16) = 14, and 11:20 + 14 = 11:34. In the third example, (s-w) is (7:14 - 4:34) = 2:40 which is greater than 15 minutes so compute the offset to the nearest 30 minute interval (30-40) = -10, and 7:14 - 10 = 7:05. In the last example, (s-w) is (11:53-11:22) = 31 minutes so compute the offset to the nearest 30 minute interval 30 - 31 = -1, and 11:53 -1 = 11:52.

You are probably asking why the 15-minute cushion and why round to the nearest 30-minute interval? Possibly it's an attempt to approximate a modification time somewhere in between the workstation and server times.

## AppleShare PC 2.0 changes

Written: 11/17/89

Last reviewed: 11/21/90

### What are the new changes to AppleShare PC 2.0?

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AppleShare PC 2.0 was designed to affect developers in a MINIMAL way, so there were some very MINOR changes to the way programmers interact with AppleShare PC 2.0.

- The Int60 mechanism no longer exists; now far calls to the code are made.
- DS:BX no longer contains the parameter block pointer; ES:BX does.
- Commands 4, 5, 6, and 7 are no longer supported.
- The Open Data-Link Interface (ODI) was used and adhered to in the design of AppleShare PC 2.0.
- Compat.com was created and included to make all previous applications useable and compatible with AppleShare PC 2.0.

If your application uses any of these older methods (as outlined in the “LocalTalk PC Card and Driver Preliminary Notes”), compat.com “translates” the interface to one which AppleShare 2.0 is able to use (that is, put DS:BX into ES:BX, make a far call to the code, and call different commands which replace commands 4,5,6 and 7).

ODI, which was co-developed with Novell, makes it possible for many different cards with different drivers to be usable by different upper-layer protocols. If there are ODI drivers for a given TokenRing/Ethernet/LocalTalk card, AppleShare PC 2.0 will work over TokenTalk/EtherTalk/LocalTalk. Currently, there are several drivers provided with AppleShare PC 2.0: IBM TokenRing drivers (IBM TokenRing cards—short, long and MCA), two Ethernet drivers (EtherLink MC Adapter card, and EtherLink II card), and the LocalTalk PC card driver. For more information about ODI, and/or becoming an ODI developer, contact Scott Lemon at Novell.

To use the AppleTalk protocol stack (included as part of AppleShare PC 2.0), you need to reference the “LocalTalk PC Card and Driver Preliminary Notes” (August 3, 1987). These notes detail the AppleTalk stack and the PC interfaces to the stack. The “LocalTalk PC Card and Driver Preliminary Notes” document is available through APDA (Order #M7055).

## **AppleShare PC 2.0 supports EtherTalk and TokenTalk**

Written: 11/17/89

Last reviewed: 11/21/90

Does AppleShare PC support EtherTalk? TokenTalk?

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AppleShare PC v2.0 supports both EtherTalk and TokenTalk. Cards that work include:

- 3Com's EtherLink and EtherLink/MC Ethernet cards
- IBM's TokenRing cards (long, short and MCA)
- DayStar Digital's LocalTalk board

### **Accessing the Server Folder on the AppleShare file server**

Written: 6/29/90

Last reviewed: 11/21/90

I am trying to access the Server Folder on AppleShare file server from my program. I have tried AFP (AppleTalk Filing Protocol) calls `OpenDir` and `EnumerateCatalog`, but they cannot access the Server Folder. Is there another method to access a Server Folder?

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No. Access to the Server Folder of an AppleShare server is not possible except during local maintenance of the AppleShare server. It is then only accessible through the Finder while the AppleShare server application is not running.

### **PBCatSearch on AppleShare volumes**

Written: 3/11/92

Last reviewed: 5/21/92

PBCatSearch acts differently on a local hard disk than on an AppleShare volume. Say, after a couple of successful PBCatSearch operations on a volume, the user modifies the directory by duplicating, renaming, or removing a file. An error is returned, and (theoretically), the search can continue. If you do this on a local hard disk, everything is cool. After making the change, the next PBCatSearch call returns `-1304 (catChangedErr)`, but subsequent calls return `noErr` and continue to find files. However, if you run this on an AppleShare 3.0 volume, the first call after the change returns `-5037 (afpCatalogChanged)`, but all following calls continue to return that error, and "find" the same file that was found on the last good attempt. So what gives?

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The `afpCatSearch` AFP call does not map exactly to the File Manager's PBCatSearch call. This isn't uncommon in File Manager to AFP translations because AFP calls are designed to be more general so they can be implemented on platforms other than the Macintosh. In some



cases, AFP keeps more information than the Macintosh requires (for example, ProDOS file type mapping information for Apple II systems and short names for DOS workstations) and in other cases Macintosh specific information is “generated” by the Macintosh workstation software (for example, allocation block sizes in the Volume Control Block). Here are specific differences I’ve found between PBCatSearch and afpCatSearch:

- afpCatSearch and the AppleShare workstation implementation of PBCatSearch do not use ioSearchTime. The AppleShare 3.0 server searches for up to 1 second or 4 matches maximum and then returns to the workstation with whatever matches (0-4) are found within areas of the

disk that user has access to. The AppleShare workstation keeps asking for the number of matches requested minus the total matches returned until it gets the number requested, or the server returns an error.

- AFP 2.1 does not support both physical and logical fork lengths. If a PBCatSearch call uses fork lengths, the upper bound (in the afpCatSearch Spec2 field which comes from the ioSearchInfo2 record) becomes the maximum of the logical and physical lengths and the lower bound (in the afpCatSearch Spec1 field which comes from the ioSearchInfo1 record) becomes the minimum of the logical and physical lengths.
- AFP 2.1 does not support the fsSBNegate ioSearchBits bit. If a PBCatSearch call uses fsSBNegate, that bit will be ignored by the AppleShare workstation and server and you'll get back exactly the opposite of what you expected. This is an unfortunate omission from AFP 2.1. Because it is implemented this way in at least two shipping servers, the fsSBNegate cannot be added without a revision to the AFP specification.
- The File Manager PBCatSearch call doesn't return any matches when a catChangedErr occurs. However, it does return an updated ioCatPosition record which can be used to make another PBCatSearch call (this may result in your search either missing a few entries or getting a few duplicate matches). afpCatSearch does not work that way. afpCatSearch only returns AFP reply data (which includes the ioCatPosition record) if the FPErr is noErr or afpEofError. The current ioCatPosition record is not returned to the workstation if any other error occurs. So, if an afpCatalogChanged error occurs, the ioCatPosition record is not returned to the workstation and the workstation returns ioCatPosition to the caller of PBCatSearch unchanged. Since the ioCatPosition record is still invalid, calling PBCatSearch again with the same invalid ioCatPosition record will just return the afpCatalogChanged error again. The conclusion from this explanation is that you can continue a search if PBCatSearch returns a result of noErr or catChangedErr. The search completed if PBCatSearch returns a result of eofErr. All other results from PBCatSearch (including afpCatalogChanged) indicate that you must restart the search from the beginning by clearing the initialize field of the ioCatPosition record.

### **AppleShare Prep file and boot-mounting volumes**

Written: 8/25/92

Last reviewed: 9/15/92

I have selected AppleShare volumes to mount at system startup by checking the volumes in the Chooser list. If I'm on a nonextended network and I call an extended network via AppleTalk Remote Access and log into a remote server via the Chooser and Appleshare, an error alert will say "The AppleShare Prep file needed some minor repairs. Some AppleShare startup information may be lost" and all the information about my local nonextended network will be cleared out of the AppleShare Prep file, so I loose all my login IDs and passwords for my local servers. The same thing happens going back the other way (extended to nonextended). Why is this happening?

There are several problems you can run into when you connect two networks (and that's what you're doing when you use AppleTalk Remote Access when you're already connected to a network). The problems are usually the result of duplicate names or duplicate node numbers.

The "boot mount list" (BML) kept in the AppleShare Prep file stores the location of volumes that you want mounted at boot time. Part of that location is the zone name. If you create entries to the BML when you aren't on an extended network (that is, when you have no zones), the

zone name stored in the BML is “\*” (“\*” is AppleTalk’s shorthand for “this zone”). If you create entries to the BML when you are on an extended network (that is, when you have zones), then the zone name stored in the BML is the zone name of the server.

The boot mount code checks the validity of the BML when the system starts up, and the Choose checks the validity of the BML when it’s opened. If there are no zones, then entries with zone names other than “\*” are cleared out and an alert saying “The AppleShare Prep file needed some minor repairs. Some AppleShare startup information may be lost” is displayed because those entries aren’t valid. If there are zones, then entries with zone names of “\*” are cleared out and the alert is displayed because the “\*” zone name isn’t a reliable way to save the zone location of a server on an extended network. The “\*” zone isn’t reliable for storing the zone name because a workstation can easily be moved from zone to zone, keeping the same NBP object and NBP type names. This is especially true with AppleTalk phase 2, which supports multiple zones on a single network (for example, multiple zones on the same piece of Ethernet cable).

The work-around for boot-mounting volumes is to create alias files to the file servers you want to mount at boot time and then drop those alias files into the Startup folder inside your System Folder. The only drawback to this is aliases don’t save the user’s password. If you need boot-mounted volumes without the password dialog, you’ll have to use guest access.