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Apple Workgroup Server 95: Folder Contains Many Files (6/93)

Article Created: 11 June 1993

TOPIC -----

Our UNIX file systems tend to have large directories. What happens to an Apple Workgroup Server (AWS) 95 when a folder containing 200 files is opened? What happens to the AWS 95 when a folder containing 1500 files is opened? What happens to the Macintosh client in both of these scenarios?

DISCUSSION -----

We tested the performance of the server opening a folder containing 300 files from a workstation. We tried this from a Macintosh IIfx and a Macintosh Quadra 950. In both cases, the first time we opened the folder it took about 20 seconds. Subsequent access to the same folder only took about 2-3 seconds.

We do not recommend large quantities of files to be stored in one single folder. This kind of organization will tend to run into limitations of some applications as well as some Finder limitations. Attempting to view large amounts of data in one window, something in the range of 500 - 1500 files will create very slow opening times and drop-out viewing problems. The specific number depends on RAM and computer.

This is a real world limitation imposed by the use of the List Manager in the SFGGetFile dialog box used for opening files. There's nothing wrong with the directory structure, nor is there anything wrong with the application. Here's a description of what's going on:

This limitation isn't specific to the AWS 95 System or System 7.x. The same limitation (with a slightly different variation) existed under System 6.0.x. The issue is that the SFGGetFile call, which generates the Open dialog box in almost every application, uses the List Manager to display the files in the file list of the dialog box. The List Manager has a 32K limit on the amount of data stored in a list. However, SFGGetFile uses a portion of that 32K for data other than the file names. So you end up with 64 bytes per file if you have the maximum file name size of 31 characters (plus 1 byte for the length byte). We arrived at this number empirically by writing a program that created files with the names:

"000abcdefghijklmnopqrstuvwxyab" to "999abcdefghijklmnopqrstuvwxyab"

A good approximation of how many files will display is 32,767 / (file name size + 32). This results in 682 for 16 character names and 819 for 8 character names.

The bottom line beyond all of these calculations is that this is a hard limit. There's no workaroud to display more data from a single folder within this dialog box. The list displays alphabetically, and the bottom of the list isn't displayed.

Also, as you increase the number of files in a folder, the performance at the Finder level decreases pretty dramatically. Although the Finder can handle these numbers of files, you'll see slowdowns in opening and closing windows. Another concern is the total number of files you're planning to have on a volume. There are very real limits on this as well, described in other articles posted in the Tech Info Library.

Another thing to keep in mind here is how many levels of nesting are going to be created within a folder.

"Inside Macintosh, Volume IV" states that there is no limit to the number of levels of subdirectories. Because of pathname limitations, it is not always possible to specify a file using its full pathname.

The maximum length of a pathname under the Finder - including the Volume and Folder - is 255 characters, including colons. For example:

InternalHD:Folder1:Folder2:Filename

This limitation has nothing to do with the Finder, it's a limitation of the file system.

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Keywords: <None>

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19960215 11:05:19.00

Tech Info Library Article Number: 12604