Supported File and File System Sizes for HFS and JFS

Executive Summary

Beginning with HP-UX 10.01, the supported sizes for files and file systems on HP-UX have gradually increased. This white paper summarizes the supported sizes for HP-UX 10.01 through HP-UX 11i v3 (B.11.31).

Hierarchical File System (HFS) Supported Sizes

Table 1 lists the maximum file and file system sizes that HFS supports.

Note: Although it is possible to create files or file systems larger than these documented limits, HP does not support such files and file systems, and the results of using them may be unpredictable.

HP-UX Release	Maximum Supported File Size	Maximum Supported File System Size
10.01	2 GB	4 GB
10.10	2 GB	128 GB
10.20*	128 GB	128 GB
11.00*	128 GB	128 GB
11i V1*	128 GB	128 GB
11i V1.6	128 GB	128 GB
11i V2	128 GB	128 GB
11i V3	128 GB	128 GB

Table1: HFS Supported File and File System Sizes

On the HP-UX 10.20, 11.00, and 11i V1 releases, you can exceed the 128 GB limit to 256 GB, but HP does not support it.

JFS (VxFS) Supported Sizes

Table 2 lists the maximum file and file system sizes that the Journaled File System (JFS) supports. JFS is also known as the VERITAS File System (VxFS).

Note: Although it may be possible to create files or file systems larger than these documented limits, HP does not support such files and file systems, and the results of using them may be unpredictable.

Table 2: JFS (VxFS) Supported File and File System Sizes

HP-UX Release	JFS Version	Disk Layout Version	Maximum Supported File Size	Maximum Supported File System Size
10.01	JFS 2.0	Version 2[1]	2 GB	4 GB
10.10	JFS 2.0	Version 2[1]	2 GB	128 GB
10.20	JFS 3.0	Version 2	2 GB	128 GB
10.20	JFS 3.0	Version 3[1]	128 GB	128 GB
11.00	JFS 3.1	Version 2	2 GB	128 GB
11.00[2]	JFS 3.1	Version 3[1]	1 TB	1 TB
11.00	JFS 3.3	Version 2	2 GB	128 GB
11.00	JFS 3.3	Version 3[1]	1 TB	1 TB
11.00	JFS 3.3	Version 4	1 TB	1 TB
11i V1	JFS 3.3	Version 2	2 GB	128 GB
11i V1	JFS 3.3	Version 3	2 TB	2 TB
11i V1	JFS 3.3	Version 4[1]	2 TB	2 TB
11i V1.5	JFS 3.3	Version 4[1]	2 TB	2 TB
11i V1	JFS 3.5	Version 4[1]	2 TB	2 TB
11i V1.6	JFS 3.5	Version 4	2 TB	2 TB
11iV2	JFS 3.5	Version 4[1]	2 TB	2 TB
11i V2[3],[4]	JFS 3.5	Version 5	2 TB	32 TB
11i V2	JFS 4.1	Version 5	2 TB	40 TB[5,6]
11i V2	JFS 5.0	Version 7	2 TB	40 TB[5,6]
11i V3	JFS 4.1	Version 5	16 TB	32 TB[5]
11i V3	JFS 5.0	Version 7	16 TB	72 TB[5,6,7,8]
11i V3	JFS 5.0.1	Version 7	16 TB	72 TB[5,7,8.9]

1 This version includes default disk layouts for particular HP-UX releases.
2 If you are extending or creating file systems beyond 128 GB, then you need PHKL_22719 to avoid mount problems.
3 With VxVM 3.5 only (not LVM) and OnLineJFS license for greater than 2 TB file system.
4 The HP-UX 11i V2 (B.11.23) September 2004 release is required to use file systems greater than16 TB.
5 Creation of greater than 2TB and lesser than 32TB file system requires OnlinejFS license.
6 Creation of greater than 32TB file system requires SMO (Storage Management for Oracle) or SG-SMS (Service Guard Storage Management Suite) License.
7 40TB file system is supported on both VxVM and LVM.
8 HP has tested JFS 5.0 and JFS 5.0.1 on HP-UX 11i V3 with file systems upto 72TB (without mirroring). Support for upto 256TB is available by contacting your HP representative.
9 OnlineJFS license on HP-UX 11iV3 JFS 5.0.1 enables file system upto 256TB

HP-UX 10.01 Compatibility Issues

The following sections discuss the compatibility issues with the HP-UX 10.01 operating system, and are relevant to HP-UX 10.01 versions and not applicable for HP-UX 11i v2 and 11i v3.

Following are the topics covered in this section:

- Large File System Compatibility Issues
- Large Files with Memory Mapping
- Issues Related to File System Block Size for Large File System (> 4 TB)
- Related Patches

Large File System (> 2 TB) Compatibility Issues

Following are the large file system compatibility issues:

- The ustat system call returns information about a mounted file system.
- The statfs function returns status information for a mounted file system.
- The statvfs function returns information about a mounted file system.

There is a compatibility issue involving old binaries that still use ustat, the various forms of statfs (fstatfs, statfsdev, fstatfsdev), and the various forms of the 32-bit flavor of statvfs (fstatvfs, statvfsdev, fstatfsdev). When these old binaries are exposed to a truly large file system, these calls return an EOVERFLOW error that the binaries were not exposed to earlier. In some cases, this may be interpreted as a file being absent (some libraries and commands search for the -1 result but not the u.uerror) or draw other incorrect conclusions. The command and library code provided by HP have been updated to use the 64-bit flavor of statvfs, therefore, rebuilt binaries must not have this problem. System administrators must take precautionary measures while setting up their file systems so that these issues do not occur. These old binaries must be run against data that resides on smaller file systems, rather than on new and huge data that will overflow the various 32-bit status fields.

Large Files with Memory Mapping Issues

Use of large files in conjunction with memory mapping (through the mmap system call) requires large amounts of swap space to be configured in the system for the mmap system call to perform. For example, if a 1 TB file is memory mapped by an application, the system must contain 8 to16 GB of swap space.

Issues Related to File System Block Size for Large File System (> 4 TB)

Large file systems (> 4 TB) require certain block size requirements. For example, to create a file system that is larger than 16 TB, a file system block size of 8 KB is required. You can obtain more information on the file system block size requirements in the mkfs_vxfs(1m) manpage.

Related JFS Patches

Beginning with HP-UX 10.20, HP has introduced several patches to prevent the creation or extension of JFS file systems beyond the supported maximum size.

Following are the patches for HP-UX 10.20,:

- PHCO_23035 s700_800 10.20 extendfs_vxfs(1M) cumulative patch
- PHCO_23036 s700_800 10.20 fsadm_vxfs(1M) cumulative patch
- PHCO_23037 s700_800 10.20 mkfs_vxfs(1M) cumulative patch

For the latest information about available patches, see the IT Resource Center:

1. Go to the ITRC Web site: http://itrc.hp.com.

   You must register with the ITRC to search the patch database. The registration if free of cost.

2. Click Patch Database to search for patches. Select the OS version and enter the keyword JFS to get a list of JFS patches.

Related Information

For more information on HP-UX operating system, see the documentation available at the HP Technical Documentation Web site:
http://www.docs.hp.com

HP-UX Release 10.20 and later and HP-UX Release 11.00 and later (in both 32 and 64-bit configurations) on all HP 9000 computers are Open Group UNIX 95 branded products.

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