

•The UNIX System Services element of z/OS is a UNIX operating environment, implemented within the z/OS operating system. It is also known as **z/OS UNIX**.

•An HFS data set is an MVS data set that contains a POSIX-compliant hierarchical file system, which is a collection of files and directories organized in a ladder-type structure that can be accessed using the z/OS UNIX System Services (USS).

•The file systems within HFS data sets have a tree structure based on a root directory with various subdirectories with files contained within directories.

- The files within an HFS data set are identified by their path and file names.

•By establishing the **shared file system**

environment, sysplex users can access data throughout the file hierarchy from any system in the sysplex.

- The best way to describe the benefit of this function is by comparing what was the file system sharing capability prior to the introduction of shared file system support with the capability that exists now.

- Consider a sysplex that consists of two systems, SY1 and SY2:

> Users logged onto SY1 can write to the directories on SY1. For users on SY1 to make a change to file systems mounted on SY2's /u directory, they would have to log onto SY2.

> The system programmer who makes configuration changes for the sysplex needs to change the entries in the **/etc** file systems for SY1 and SY2, so to make the changes for both systems, the system programmer must log onto each system.

•With shared file system support, all file systems that are **mounted** by a system participating in a shared file system are available to all participating systems.

- In other words, once a file system is mounted by a participating system, that file system is accessible by any other participating system. **NOTE:** It is not possible to mount a file system so that it is restricted to just one of those systems.

- Consider a sysplex that consists of two systems, SY1 and SY2:

> A user logged onto any system can make changes to file systems mounted on /u, and those changes are visible to all systems.  
> The system programmer who manages maintenance for the sysplex can change entries in both **/etc** file systems from either system.

**NOTE:** mount point - The directory provided to the z/OS operation system to access the physical file structure associated to that file organization. [ File Systems can be mounted and unmounted as required ]

•The term **participating group** is used to identify those systems that belong to the same SYSPX XCF sysplex group and have followed the required installation and migration activities to participate in a shared file system.

- There is also greater availability of data in case of system outage, and a greater flexibility for data placement and the ability for a single BPXPRMxx member to define all the file systems in the sysplex.

**NOTE:** The sysplex root is used by the system to redirect addressing to other directories and is very small mounted as read/write.

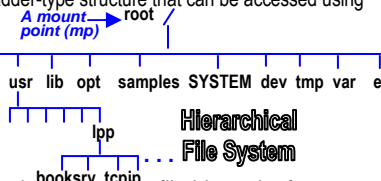
•Shared file systems whether HFS or zFS can be created via BPXISYSR or BPXISYZR respectively located in SYS1.SAMPLIB.

**NOTE:** \$VERSION - In a sysplex is the new name for the root file system containing system code and binaries. IBM delivers only one version root, but you may define more as you add new system and maintenance levels. The \$VERSION file system has the same purpose as the root file system in a non-sysplex world.

This illustration is displaying the contents of **SYS1.PARMLIB** and the member **BPXPRMxx** where all file systems are defined.

A key parameter would be **SYSPLEX(NO)** which is the default. If (YES) is specified that file system is a member of the **participating group** of shared file systems.

The **couple data set (CDS)** contains the sysplex-wide mount table and information about all participating systems, and all mounted file systems in the sysplex. To allocate and format a CDS, customize and invoke the BPXISCDs sample job in SYS1.SAMPLIB.



# CheatSheet

## #51 zTidBits

### z10 Shared File Systems

Only one sysplex root file system is allowed for all systems participating in a shared file system

HFS was introduced by Apple in Sept 1985 specifically to support Apple's first hard disk drive for the Mac.

A symbolic link is a file that contains the pathname for another file; that pathname can be relative or absolute.

•When setting up a shared file system in a sysplex, do not assume that with shared file systems, two systems can share a common file system for **/etc**, **/tmp**, **/var**, and **/dev** which is not the case.

- Even with shared file systems, each system must have specific file systems for each of these mount points.  
- The file systems are then mounted under the system-specific file system.  
- With shared file system support, one system can access system-specific file systems on another system. **NOTE:** The existing security model remains the same. For example, while logged onto SY2, you can gain read-write access to SY1's **/tmp** by specifying **/SY1/tmp/**.

•You should also be aware that when SYSPLEX(YES) is specified, each FILESYSTYPE in use within the participating group must be defined for all systems participating in a shared file system.

•As illustrated previously, the easiest way to accomplish this is to create a single BPXPRMxx member that contains file system information for each system participating in a shared file system.

- If the customer decides to define a BPXPRMxx member for each system, the FILESYSTYPE statements must be identical on each system.

•The sysplex root is a file system that is used as the sysplex-wide root.  
- No files or code reside in the sysplex root file system.  
- It consists of directories and symbolic links only, and hence the size of the data set representing the sysplex root is very small.

- The sysplex root provides access to all directories.  
- Each system in a sysplex can access directories through the **symbolic links** provided.  
- Essentially, the sysplex root provides redirection to the appropriate directories.

•Before you mount the sysplex root as read-only, customers should first define their version root and system-specific file system and mount them.

- Mounting the sysplex root file system as read-only prevents accidental corruption or full-file system problems with the sysplex root, both of which might require a sysplex IPL to recover.

- If a new directory needs to be added to the sysplex root file system, customers can do the following tasks without disrupting the availability of the file system:

1. Use the TSO UNMOUNT command to remount the read-only file system to read/write mode.
2. Create the new directories.
3. Remount the file system in read-only mode.

•IBM supplies the version file system in ServerPac. CBPDO users obtain the version file system by following directions in the Program Directory.

- There is one version file system for each set of systems participating in a shared file system and who are at the same release level (that is, using the same SYSPLEX volume).

> As an example, each version file system denotes a different level of the system or a different service level.

> In other words, if customer has 10 systems participating in a shared file system, and 5 of those systems are at Release 9 and the other 5 are at Release 9A, then you'll have one version file system for the Release 9 systems and one for the Release 9A systems.

> Basically, you will have as many version file systems for the participating systems as you have different levels running.

```

Session A - [24 x 80]
File Edit Edit Settings Menu Utilities Compilers Test Help
DNET855  SYS1.PARMLIB(BPXPRMFS) - 01.99          Column# 00001 00072
***** Top of Data *****
000100  /* ***** Top of Data ***** */
000200  /* BPXPRMFS - File System Mounts */
000300  /* DEMONVS/DEMOMVS2/DEMOMVS3 sysplex */
000400  /* ***** Top of Data ***** */
000500  /* ***** Top of Data ***** */
000600  /* ***** Top of Data ***** */
000700  /* IBM DCE */
000800  /* ***** Top of Data ***** */
000900  MOUNT FILESYSTEM('DCE HFS')
001000  TYPE(HFS) MODE(ROMR)
001100  MOUNTPOINT('/$VERSION/usr/lpp/dce')
001200  /* ***** Top of Data ***** */
001300  /* ***** Top of Data ***** */
001400  /* IBM BFS */
001500  /* ***** Top of Data ***** */
001600  MOUNT FILESYSTEM('BFS LOCAL_HFS')
001700  TYPE(HFS) MODE(ROMR)
001800  MOUNTPOINT('/$VERSION/usr/lpp/dfs/local')
001900  /* ***** Top of Data ***** */
Command ===>

```

**\$VERSION** - Allows multiple releases and service levels of the binaries to coexist and participate in a shared file system  
**nnnn** is a qualifier to represent a level of the version file system.

The most appropriate values for **nnnn** are the name of the SMP/E target zone, &SYSR1, or another qualifier meaningful to the system programmer.

A directory with the value **nnnn** specified on **VERSION** will be dynamically created at system initialization under the sysplex root and will be used as a mount point for the version file system.

```

Session C - [24 x 80]
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(P27)KETTNER:/u/kettner(128):pwd
/u/kettner
(P27)KETTNER:/u/kettner(129):cd /
(P27)KETTNER:/(130):ls
ASVSNAME  ASVS02          TSYSRR          Ingram    opt      tmp
$VERSION  PIRSA1          TSus           java     out     u
          PIRSB1          WebSphere     java2    out_log  usr
J2PJVM    PIRSA1          bin           javatst  pax      var
Jinsight  PWRSB1          cicsis        kms      samples  was3B
P20       PIRSA1          dbz           krb5name  sol     websphere
P21       PYRESB          dev           lib       stacksLog workspace
P26       PYRSA1          etc           local    temp     zWPS
(P27)     PYRSB1          ftssuser      mqsi     test
P28       SERVICE      ik            netdata  testtai
(P27)KETTNER:/(131):>
====

ESC=< 1=Help      2=SubCmd      3=HlpRetrn   4=Top      5=Bottom    6=TSO
      7=BackScr   8=Scroll     9=NextSess  10=Refresh  11=FwdRetr  12=Retrieve

```