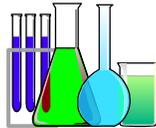


**z/OS Version V1R5**

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# **z/OS UNIX Systems Services Update**

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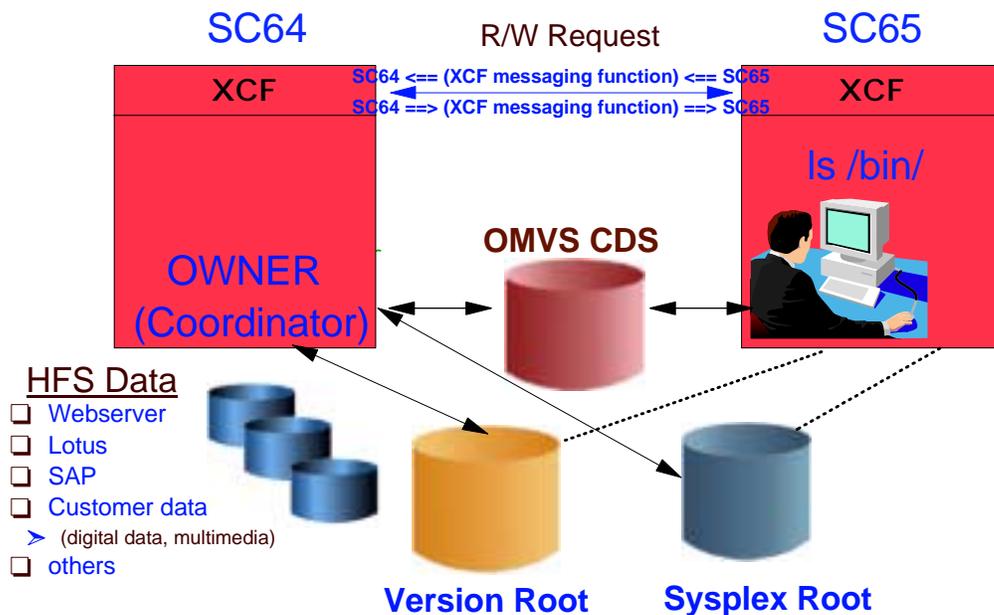
## **z/OS UNIX Update Agenda**

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- ❑ **Shared file systems in a sysplex**
  - Remount for shared HFS environment
  - UNIX System Services can wait-state a system when an incompatible software level is identified in the Shared HFS group
  - Symlink symbolics
- ❑ **Enhancement for BPXPRMxx parmlib z/OS V1R5**
  - Parmlib mounts can fail if the mountpoint does not exist
  - Parmlib mounts can fail if the data set or aggregate to be mounted does not exist
- ❑ **Allocating SWA above the line**

## Accessing Shared Sysplex File Systems



## Remount for Shared HFS



- With Remount for Shared HFS you can:
  - Apply service to a R/O File System without unmounting the file system and mounting it R/W
- Advantages:
  - Applications reading from a R/O file system can continue to do so without disruption while the file system is remounted as R/W, and subsequently remounted to R/O
- Main use of remount is to switch a R/O file system to R/W for maintenance
- SMF recording on the unmount portion of the remount
  - This occurs on each system in the Shared HFS group
  - Remount = subtype 6

## Remount Coexistence

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- ❑ All systems in the Shared HFS group must be running at V1R5 or higher or on V1R4 with APAR:
  - V1R4 OA02584
- ❑ If one or more systems is incompatible, the new function is not supported and the old behavior is exhibited:
  - Retval = -1
  - Errno = EINVAL
  - ErrnoJr = JrNotSupInSysplex

```
ROGERS @ SC47: />bpjmttext 058804A5  
BPXFSUMT 12/02/02
```

```
JrNotSupInSysplex: Remount is not supported in sysplex. Unmount drain is tried  
as unmount normal, but if it cannot complete, an error is returned.
```

```
Action: Remount can be replaced with unmount followed by mount. Unmount drain  
can be replaced by looping on unmount normal until it successfully completes.
```

## Using Remount Function

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- ❑ From the BPX1UMT callable service using the MtmRemount flag
- ❑ From the TSO using: unmount filesystem(fsname)  
remount(rdwr|read)
- ❑ From the shell using new options on chmount command:
  - -r to switch mounted file system to R/O mode
  - -w to switch mounted file system to R/W mode
- ❑ From the ISHELL mount table display under file systems

# Remount R/O File System to R/W



Work with Mounted File Systems

Select one or more file systems with / or action codes.

U=Unmount A=Attributes M=Modify R=Reset unmount or quiesce

File system name	Status	Row 254 of 331
OMVS.SC66.WEB.CICS6	Available	
OMVS.SC66.WMQI.PROD.HFS	Available	
OMVS.SC66.WMQI.VAR.HFS	Available	
OMVS.SC67.ETC	Available	
OMVS.SC67.VAR	Available	
OMVS.SC69.ADSM.LOGS	Available	
OMVS.SC69.ETC	Available	
OMVS.SC69.IMSV7.HFS	Available	
OMVS.SC69.TOOLS	Available	
OMVS.SC69.VAR	Available	
OMVS.SC69.WSAA111.BUILD.HFS	Available	
OMVS.WSC206.BUILD.HFS	Available	
OMVS.ZOSR02.Z02RA1.ROOT	Available	
OMVS.ZOSR02.Z02RD1.ROOT	Available	
OMVS.ZOSR03.Z03RE1.ROOT	Available	
OMVS.ZOSR04.Z04RA1.ROOT	Available	
OMVS.ZOSR04.Z04RC1.ROOT	Available	
OMVS.ZOSR04.Z04RD1.ROOT	Available	
m OMVSZ13.RL000006.OMVS.ROOT	Available	
OMVSZ14.RL000006.OMVS.ROOT	Available	
OS390CB.Z15CB01.BUILD.ETC	Available	
OS390CB.Z15CB01.BUILD.ROOT	Available	
OS390CB.Z15CB01.BUILD.VAR	Available	
OS390R10.OMVS.ETC	Available	

Command ==>

F1=Help F3=Exit F4=Name F5=Retrieve F6=Keyshelp F7=Backward  
F8=Forward F11=Command F12=Cancel

# Change File System from R/O to R/W



Work with Mounted File Systems

S  
U

Select the attribute to change

Select the attribute to change:

1. Change mount mode to R/W
2. Change Owning system from SC47
3. Change automove attribute...

New owning system \_\_\_\_\_

OMVS.SC69.TOOLS	Available
OMVS.SC69.VAR	Available
OMVS.SC69.WSAA111.BUILD.HFS	Available
OMVS.WSC206.BUILD.HFS	Available
OMVS.ZOSR02.Z02RA1.ROOT	Available
OMVS.ZOSR02.Z02RD1.ROOT	Available
OMVS.ZOSR03.Z03RE1.ROOT	Available
OMVS.ZOSR04.Z04RA1.ROOT	Available
OMVS.ZOSR04.Z04RC1.ROOT	Available
OMVS.ZOSR04.Z04RD1.ROOT	Available
m OMVSZ13.RL000006.OMVS.ROOT	Available
OMVSZ14.RL000006.OMVS.ROOT	Available
OS390CB.Z15CB01.BUILD.ETC	Available
OS390CB.Z15CB01.BUILD.ROOT	Available
OS390CB.Z15CB01.BUILD.VAR	Available

Command ==>

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## zFS Remount Considerations

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- ❑ zFS Compatibility Mode Aggregates
  - If both the primary file system and its clone are mounted, remount will fail because we cannot detach the aggregate
    - EINVAL, JrAggregateErr
- ❑ zFS Multiple File System Aggregates
  - If the aggregate is attached R/O then file systems in it can only be mounted R/O and remount to R/W will result in a zFS error

## Avoid Wait-state in Shared HFS

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- ❑ UNIX System Services can wait-state on a system with incompatible software level
  - Behavior of USS is modified to perform:
    - F OMVS,SHUTDOWN to disable USS
    - NOTE: This command was introduced in z/OS V1R3
  - Avoids disabling the whole system

## Symlink use of System Symbols

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- ❑ Need to specify mountpoints such that they resolve on systems based on system symbols, which may or may not be different between systems
  - Support is added to allow use of static system symbols in symlinks with an identifier indicating substitution is necessary in the resolution of the symlink
  - With Remount for Shared HFS, you can be able to embed static system symbols in a symlink
    - Allows for unique pathname resolution based on the value of the system symbol on a particular system
    - Great for mountpoints that you want to share with a subset of systems in the Shared HFS group
    - Based on sysres symbol &SYSR1.
- ❑ Symlink contents must begin with \$SYSSYMA/ or \$SYSSYMR/ followed by a system symbol

## Using Symlink Symbolics

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- ❑ \$SYSSYMA indicates link contents are meant to be ABSOLUTE
  - On SC63 - &SYSR1. has the value of OSV315
    - If /mydir/resdir is a symlink -> \$SYSSYMA/&SYSR1./resdir
    - /mydir/resdir resolves to: /OSV315/resdir
  - On SC64 - &SYSR1. has the value of OSV31B
    - /mydir/resdir resolves to: /OSV31B/resdir

## Using Symlink Symbolics

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- ❑ **\$SYSSYMR** indicates link contents are meant to be **RELATIVE**
  - On SC63 - **&SYSR1.** has the value of **OSV315**
    - If **/mydir/resdir** is a symlink -> **\$SYSSYMR/&SYSR1./resdir**
    - **/mydir/resdir** resolves to: **/mydir/OSV315/resdir**
  - On SC64 - **&SYSR1.** has the value of **OSV31B** then
    - **/mydir/resdir** resolves to: **/mydir/OSV31B/resdir**

## BPXPRMxx Parmlib Enhancement (1.5)

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- ❑ Parmlib mounts can fail if the mountpoint does not exist
- ❑ Support is added to the BPXPRMxx parmlib member to allow specifying directories to be created during parmlib processing
  - Supported during UNIX System Services initialization
- ❑ **New MKDIR( ) keyword for parmlib member**
  - Specify one or more directory entries to be created in the file system associated with the keyword, or in another file system already mounted
- ❑ **If sharing parmlib members between Shared HFS members this keyword should be omitted unless all are running at V1R5 or above**

## Examples of MKDIR Use in BPXPRMxx

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### ROOT

FILESYSTEM('fsroot')  
TYPE(type\_name)  
MODE(access)  
PARM('parameter')  
SETUID|NOSETUID  
AUTOMOVE | NOAUTOMOVE  
TAG(NOTEXT | TEXT,ccsid)  
**MKDIR('pnfs1')**

### MOUNT

FILESYSTEM('fs1')  
MOUNTPOINT('/**pnfs1**')  
TYPE(type\_name)  
MODE(access)  
PARM('parameter')  
SETUID / NOSETUID  
SECURITY | NOSECURITY  
AUTOMOVE | NOAUTOMOVE  
AUTOMOVE(Ind,S1,...Sn)  
TAG(NOTEXT|TEXT,ccsid)  
**MKDIR('pnfs2')**  
**MKDIR('pnfs3')**

## MKDIR Support

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- Permissions are set to 755, (rw x r-x r-x)
- Not to be used with file systems that mount asynchronously, like NFSC (NFS Client)
- MKDIR failures will have no effect on the mount which they are associated with but can affect subsequent mounts if it is part of the intended mountpoint
- BPXPRMxx sample was updated with new MKDIR keyword (SYS1.SAMPLIB)
- Error messages sent to log file

## **Mount Failures if Data Set does not exist**

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- ❑ SETOMVS SYNTAXCHECK is enhanced to identify parmlib statements whose data set or compatibility mode aggregate does not exist
  - Prevents parmlib errors during initialization

## **Allocating SWA above the Line**

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- ❑ SWA control blocks for USS address space are allocated below the 16 megabyte line causing storage constraints when very large numbers of file systems are mounted
- ❑ New BPXPARMxx parmlib keyword to control from where the SWA control blocks are allocated
  - New BPXPRMxx keyword SWA(ABOVE | BELOW)
  - D OMVS,O displays the setting
  - Only available when starting OMVS during system initialization