

z/OS V1R13

z/OS UNIX: Enhance DOMVS,W

Overview

- Problem Statement / Need Addressed
 - File latch contention isn't displayed in its own table like file system latch contention. File latch activity will currently only show up in the other waiters table. This makes it hard to correlate the waiters and holders causing file latch contention. The file latch holder isn't necessarily displayed either unless it is waiting on something else.
 - On a live system, the information displayed on the D OMVS,W command can include many waiters. There is currently no way to limit the output being displayed. A filtering option is needed on the command to view only what is needed
- Solution
 - D OMVS,W display has been enhanced to include a table for file latch activity. This table is similar to the existing one for file system latches and also displays the USER, ASID and TCB of the holder or waiter, whether the latch is held exclusive or shared, the AGE and so on.
 - A set of filtering options have been added to the command in order to limit what gets displayed.
- Benefit / Value
 - Easier to identify and debug file latch contention.
 - Easily limit the amount of data being displayed to help in problem determination.

Usage and invocation

- DISPLAY OMVS,WAITERS – system command

```
BPXO063I 16.22.32 DISPLAY OMVS 586
OMVS 000E ACTIVE OMVS=(2W,DN)
MOUNT LATCH ACTIVITY: NONE
```

```
FILE SYSTEM LATCH ACTIVITY:
  USER ASID TCB SHR/EXCL AGE
-----
```

Latch 14 FILE SYSTEM: ZOS113.VAR.ZFS

HOLDER(S):

```
TC0 0028 008E6D90 EXCL 00.00.15
  TIME: 2011/02/08 16.22.17
```

IS DOING: Running

WAITER(S):

```
TC0 0029 008E6D90 SHR 00.00.07
  TIME: 2011/02/08 16.22.24
```

FILE LATCH ACTIVITY:

```
  USER ASID TCB SHR/EXCL AGE
-----
```

LATCH 66 LSET 01 TYPE REGFILE DEVNO 2 INO 204

FILE: myfile

FILE SYSTEM: ZOS113.ETC.ZFS

HOLDER(S):

```
TC0 0026 008E6D90 EXCL 00.00.56
  TIME: 2011/02/08 16.21.36
```

IS DOING: ZFS MKDirCall

WAITER(S):

```
TC0 0027 008E6D90 SHR 00.00.53
  TIME: 2011/02/08 16.21.38
```

OTHER WAITING THREADS:

```
  USER ASID TCB PID AGE
-----
```

```
CEA 0016 008E2D90 16777218 00.06.51
  TIME: 2011/02/08 16.15.40
```

IS DOING: Osi Wait

- DEVNO - indicates the device number (decimal) of the file system in which the file resides
- INO - indicates the inode number (decimal) of the file
- LSET - indicates the latch set identifier. File latches are created in the SYS.BPX.A000.FSLIT.FILESYS.LSN.XX latch set where XX corresponds to LSET.
- TYPE - indicates the type of file (DIR, CHARSPEC, REGFILE, FIFO)
- FILE - indicates the name of the file (if known).
 - The name can be up to 16 characters long (truncated on the left).

- FILE SYSTEM - indicates the file system that owns the file.
- Note: CINET sockets use the same latch set as files. This display will not show any sockets.
- DISPLAY OMVS,WAITERS – filtering
 - LATCHES | L- this will only display the latch activity tables. These include the mount, file system and file latch activity tables. The cross system messages and other waiters tables will be suppressed.
 - MESSAGES | M- this will only display the sent and received cross system messages table. The mount latch, file system latch, file latch and other waiters tables will be suppressed. This option is only valid in a shared file system environment.
 - OTHER | O- this will only display the other waiters table. The mount latch, file system latch, file latch and cross system messages tables will be suppressed.
 - AGE | A - this will only display waiters that have been waiting for more than five minutes. A table will be displayed if there are waiters that meet the criteria.
 - SPECIAL | S- this will allow special files to be displayed in the other waiters table that are otherwise filtered out. These are: character special files, pipes and sockets. This option will be allowed by itself, with the A option or when the O option has also been specified.
- Filtering Examples:
 - D OMVS,W,L,O – display only the latch and other waiters tables
 - D OMVS,W,A – display any activity in any of the tables where we have been waiting for more than five minutes
 - D OMVS,W,L,A – display only activity in the latch tables that have been waiting for more than five minutes
 - D OMVS,W,S – display any waiters in all tables and allow other waiters table to also include waiters on character special files, sockets and pipes
 - D OMVS,W,O,S – display only waiters in the other waiters table and also include waiters on character special files, sockets and pipes

- Filtering Example: D OMVS,W,O

```
BPXO063I 16.22.32 DISPLAY OMVS 586
OMVS 000E ACTIVE      OMVS=(2W,DN)
OTHER WAITING THREADS:
  USER  ASID  TCB      PID      AGE
-----
CEA    0016  008E2D90  16777218  00.06.51
TIME: 2011/02/08 16.15.40
IS DOING: Osi Wait
```

- Data from D OMVS,W can be obtained programmatically using BPXEKDA and the BPXZODMV mapping
 - New filters: Set the following filters in ODMVINBYTE2 when ODMVWAITERS has been set in ODMVINBYTEM3
 - ODMVWLATCHES EQU X'80' D OMVS,W,LATCHES
 - ODMVWMESSAGES EQU X'40' D OMVS,W,MESSAGES
 - ODMVWOTHER EQU X'20' D OMVS,W,OTHER
 - ODMVWAGE EQU X'10' D OMVS,W,AGE
 - ODMVWSPECIAL EQU X'08' D OMVS,W,SPECIAL
 - Output data mapped by ODMVDWHEADER and ODMVDWELEMENT

Interactions and dependencies

- Software Dependencies
 - None
- Hardware Dependencies
 - None
- Exploiters
 - None

Migration and coexistence considerations

- None

Installation

- None

Session Summary

- The DISPLAY OMVS,WAITERS system command received some enhancements:
 - File latch contention is now displayed in a new table
 - Filtering options have been added to limit the amount of data being displayed

Appendix - References

- SA22-7633-21 z/OS V1R13.0 MVS System Messages, Vol 3 (ASB-BPX)
- SA22-7627-26 z/OS V1R13.0 MVS System Commands
- GA22-7588-16 z/OS V1R13.0 MVS Diagnosis: Reference
- SA22-7609-12 z/OS V1R13.0 MVS Authorized Assembler Services Reference ALE-DYN
- z/OS V1R13.0 MVS Data Areas Volume 1 (ABEP-DDRCOM)