# WebSphere for z/OS Operations using SDSF

## Abstract

SDSF is an excellent operational interface for managing WebSphere Application Servers on z/OS for JES2 installations.   New functions in SDSF for z/OS Release 2 make it even more productive, as described in this "BP".

## Recommendation

SDSF (with occasional use of system commands) has all the functions you need to operate a WebSphere runtime environment on z/OS.

### Starting the Runtime Servers

- The required z/OS functions and subsystems must first be started.  Here is a typical sequence:
    1. WLM, RACF, RGS and Logger are automatically started during the IPL process.
    2. JES, RRS, VTAM, RMF, APPC and your system automation are usually started by the COMMANDxx member of PARMLIB.
    3. TSO, TCPIP (along with the FTP, Telnet, and Inet daemons) and DB2 are usually started by your system automation product.
    4. LDAP, the HTTP server, WebSphere daemon, and the WebSphere application servers are also started  by your automation product in a production environment.
- In a testing environment, the WebSphere daemon and application servers are often started manually. Most operators & systems programers use the MVS Extended capabilities in SDSF panel and type '/s servername' or '/s servername.instancename' on the command line.
- For normal operation, most operators use the SDSF LOG (System Log) panel to see the response from their MVS commands, and the DA (Display Active) panel to monitor the WebSphere address spaces.

### Stopping Servers

- You can stop individual server instances with the MVS 'P' command.  Type '/p server-instance-name' on the command line.
- You can stop all the runtime servers just by stopping the daemon who will stop the rest.
- Occasionally some, address spaces will not come down so you must cancel them.  You can  use the 'K' or 'Z' action character (new with z/OS Rel. 2):
    - Type 'K' next to a server address space to cancel it with the 'A=' option.
      e.g., 'C  TSIVP2C.TSIVP2A1,A=020F'
    - If it still doesn't cancel, type'Z'next to a server address space to force it.
      e.g., 'FORCE TSIVP2C.TSIVP2C,A=0063'

### Recycling or Restarting Servers

- Occasionally, you may need to change the settings for a server.  After making your temporary updates to the current.env (or trace.settings) file, you must restart the control region or server regions for the change to take effect.  If ARM is active, you can cancel with ARMRESTART. For server regions, you can just cancel them with the SDSF 'K' action character and WLM will restart them.

### Monitoring WebSphere Activity

- Use the **DA** (display active) command to get a good view of your server address spaces.
    - Use the 'PREfix' or other filters to limit the rows displayed to the WebSphere runtime servers. (This assumes you have a naming convention that will allow you to filter on certain columns in the jobname.)
    - Use the 'ARRange' command or pull-down to put interesting columns on the first panel.
    - Sort on JobName (instead of JobID or CPU%) to keep the rows from jumping around.

    Here is an example:

```
Display  Filter  View  Print  Options  Help
-----------------------------------------------------------
SDSF DA SYSD  SYSD       PAG    0 SIO    74 CPU  54/ 55  LINE 1-11
COMMAND INPUT ===>
PREFIX=TS*  DEST=(ALL)  OWNER=*  SORT=JOBNAME/A  SYSNAME=SYSD
ACTION=//-Block,=-Repeat,+-Extend,?-JDS,A-Release,C-Cancel,D-Display,
ACTION=E-Restart,H-Hold,K-SysCancel,L-List,P-Purge,Q-Outdesc,R-Reset,
ACTION=S-Browse,W-Spin,X-Print,Z-SysForce
NP JOBNAME   StepName JobID     CPU% ECPU%  SIO CPUTime ECPUtime Real
   TSCWTRC   TSCWTRC            0.00  0.00  0.0    0.15     0.15  192
   TSDEMNC   TSDEMNC  STC01730  1.71  0.00  0.0   11.55    11.55  248
   TSINTFC   TSINTFA1 STC01733  0.00  0.00  0.0    1.74     1.74  113
   TSIVP2C   TSIVP2C  STC01797  0.01  0.01  4.1    1.81     1.81 5473
   TSIVP2S   TSIVP2S  STC01798 10.05  9.31 41.5   36.80   102.81  30T
   TSNAMGC   TSNAMGA1 STC01732  0.00  0.00  0.0    1.84     1.84  292
   TSNAMGS   TSNAMGS  STC01782  0.32  1.06 61.3    1.27     8.32  151
   TSSMGTC   TSSMGTA1 STC01731  0.00  0.00  0.0   24.12    24.12 1485
   TSSMGTS   TSSMGTS  STC01745  5.92  5.84 4670    8.16    11.76 1311
```

- **Enclaves** panel (enter 'enc' to display - new with z/OS Rel. 2)
  - 'PREfix' does not filter rows, but you can use 'Filter' to limit the display to specific service classes, RptClasses.
  - Use 'ARRange' to put the interesting columns on the first panel.
  - Sort on 'Status' to keep active enclaves at the top.

  Here is an example:

```
 Display  Filter  View  Print  Options  Help
 ----------------------------------------------------------------
 SDSF ENCLAVE DISPLAY  SYSD      ALL                      LINE 1-10
 PREFIX=TS*  DEST=(ALL)  OWNER=*  SORT=Status/A  SYSNAME=SYSD
 ACTION=//-Block,=-Repeat,+-Extend,I-Info,M-Match
 NP  TOKEN          SSType Status   SrvClass RptClass  CPU-Time
     240000142B     CB     ACTIVE   CBSLOW   RTSIVP2       2.65
     2800001441     CB     ACTIVE   CBSLOW   RTSIVP2       0.01
     2000001449     CB     INACTIVE CBSLOW   RTSIVP2       0.00
     2C00001446     CB     INACTIVE CBSLOW   RTSIVP2       0.00
     3000001448     CB     INACTIVE CBSLOW   RTSIVP2       0.00
     3400001443     CB     INACTIVE CBSLOW   RTSIVP2       0.00
     3800001447     CB     INACTIVE CBSLOW   RTSIVP2       0.00
```

- **Unix Systems Services Processes** (enter 'ps' to display - new with z/OS Rel. 2)
  - Use the 'PREfix' or other filters to limit the rows displayed to the WebSphere runtime servers.
  - Use the 'ARRange' to place interesting columns on the first panel.
  - Sort on JobName to keep rows from jumping around

  Here is an example:

```
 SDSF PROCESS DISPLAY  SYSD      ALL                      LINE 1-9
 COMMAND INPUT ===>
 PREFIX=TS*  DEST=(ALL)  OWNER=*  SORT=JOBNAME/A  SYSNAME=SYSD
 ACTION=//-Block,=-Repeat,+-Extend,C-Cancel,D-Display
 NP  JOBNAME      PID ASIDX CPU-Time St-Time  State Status
     TSDEMNC  67240145  020E    1.70  8:11:52 HR    RUNNING
     TSINTFC  67240155  0205    0.75  8:12:35 HR    RUNNING
     TSIVP2C  67240176  0063    3.35 11:59:33 HR    RUNNING
     TSIVP2S  67240213  01EE   17.17 15:22:57 HR    RUNNING
     TSNAMGC  84017355  020C    0.88  8:12:17 HR    RUNNING
     TSNAMGS  16908555  0061    1.27 14:13:42 HR    RUNNING
     TSSMGTC  84017359  020D    7.37  8:11:59 HR    RUNNING
     TSSMGTS  50462986  0062    3.34 14:03:02 HR    RUNNING
```

### Displaying Output
Occasionally things will go wrong and you have to do look at the output (job log, system messages, and SYSPRINT files) to see what happened.
- The ST (Job Status) and H (Hold) panels are useful for browsing the output of servers that are no longer active if you do not purge the output.  We recommend setting 'OUTDISP=(HOLD,HOLD)' in the JES2 parms for these started tasks so you can examine or print the output for debugging purposes.
- You will find that using the '?' line command on individual jobs will allow you to browse specific SYSOUT datasets, making it easier to navigate the specific output files.

### Mixed case MVS Commands:
With OS/390 Release 10, you can enter mixed-case command parameters on the SDSF command line.   You must enter the command through the pop-up under ISPF, and enclose the command parameters in quotes. Otherwise, the command and all parameters get folded either by SDSF or Consoles.   (Type '/+' on the command line to get the pop-up.)

## Alternatives

Other techniques for operating WebSphere Application Servers that could be considered:

- JES3 installations can use (E)JES from Phoenix Software International, although the same functions may not be supported.  (SDSF only runs on JES2.)

- The WebSphere for z/OS Systems Management Operations End User Interface provides a subset of the functions described here, but is a workstation tool that requires the basic WebSphere systems servers to be up and operational.  At the present time, it does not display the application work requests for servers and server instances.

- MVS extended consoles could be used with MVS "line commands", but the tabular displays would not be available.

## Resources

For assistance with SDSF operations, see the SDSF help panels, or the "SDSF Summary Card" at
http://www.ibm.com/servers/eserver/zseries/zos/sdsf/sdsfdown.html

The WebSphere Application Server for z/OS Systems Management Operations End User Interface is documented in the "Operations and Administration" guide at
http://www.ibm.com/software/webservers/appserv/zos_os390/library.html

OS/390 and z/OS publications are available from the following web site:
- http://www.ibm.com/servers/s390/os390/bkserv/
- http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

Here are four of the most useful books in the libraries:
- z/OS SDSF Operation and Customization
- z/OS MVS Planning: Operations
- z/OS MVS System Commands
- z/OS MVS Setting Up a Sysplex

(E)JES information is available at http://www.phoenixsoftware.com/index.htm