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LAD: IBM z/OS SDSF AS, DYNX, and PROC Options

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Introducing the AS, DYNX, and PROC enhancements

The IBM® z/OS® continuous delivery program introduces new functionality through the small programming enhancements (SPEs) for SDSF users to display storage utilization of address spaces, dynamic exits, and JES2 proclib information. The SPE is delivered through functional program temporary fixes (PTFs).

This Learn Adopt Deploy (LAD) IBM Redpaper™ publication describes the new AS, DYNX, and ENQ options that appear on the SDSF Primary Menu. This paper also includes information to help you meet the following goals:

- Learn about the new AS, DYNX, and PROC functionality
- Adopt the software into your environment
- Deploy and integrate AS, DYNX, and PROC updates into your operational environments

The Job Class (JC) panel also features changes that add a promotion rate column. These changes also are described in this paper.

New functionality

The new functionality personalizes system-related information for the SDSF user, as shown in Figure 1 on page 2.

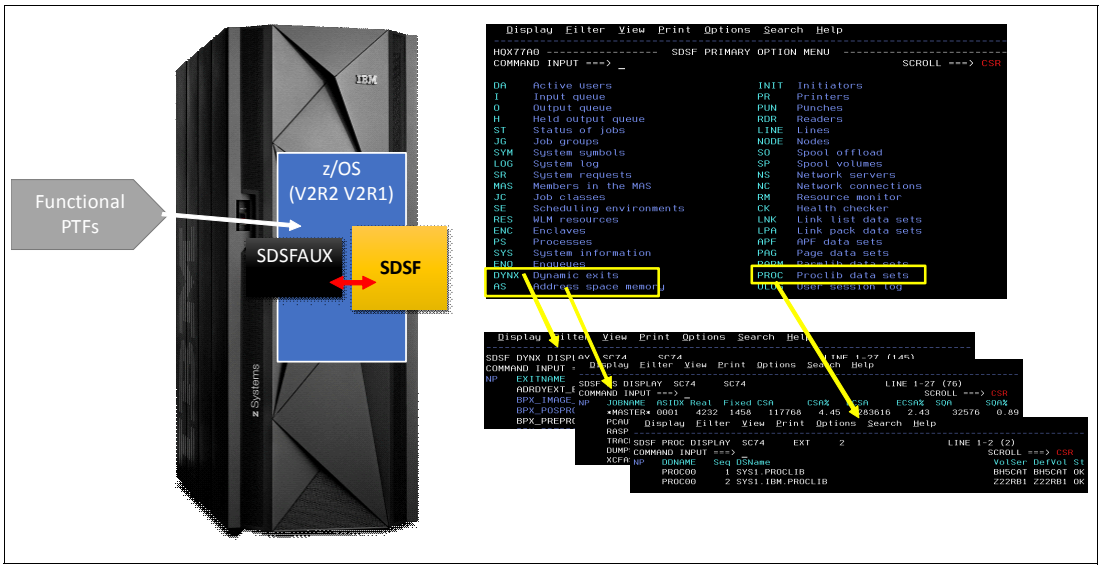


Figure 1 New SDSDF AS, DYNX, and PROC options and panels

New SDSF Primary Menu options

The following options were added to the SDSF Primary Menu:

- AS: Display address space memory

  The AS option appears on the SDSF Primary Option Menu. When selected, it issues the **`SDSF AS`** command and displays the storage utilization of address spaces in the sysplex. The displays are presented in a tabular form.

- DYNX: Display dynamic exits

  The DYNX option appears on the SDSF Primary Option Menu. When selected, it issues the **`SDSF DYNX`** command and displays the properties of dynamic exits that are defined to the system. The display is presented in a tabular form.

- PROC: Display PROCLIB data sets

  The PROC option appears on the SDSF Primary Option Menu. When selected, it issues the **`SDSF PROC`** command and displays the JES2 procedure library concatenation for the local JES2 member. The displays are presented in a tabular form.

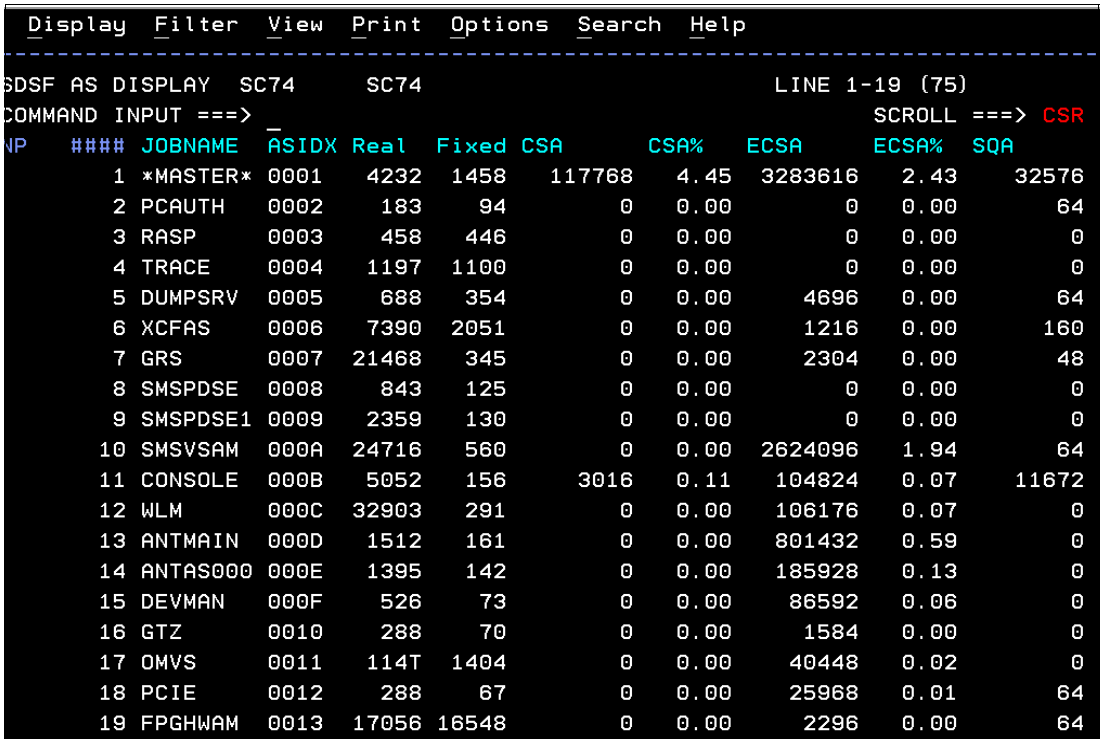
The new options are highlighted in Figure 2 on page 3.

Figure 2 SDSF new options

Note: The SDSF user must be authorized to use these commands.

AS option

The AS shows relevant information about all address spaces' utilization of CSA, ECSA, SQA, and ESQA memory at local system (as shown in Figure 3) or sysplex level by changing SYSNAME.



NP	####	JOBNAME	ASIDX	Real	Fixed	CSA	CSA%	ECSA	ECSA%	SQA
	1	*MASTER*	0001	4232	1458	117768	4.45	3283616	2.43	32576
	2	PCAUTH	0002	183	94	0	0.00	0	0.00	64
	3	RASP	0003	458	446	0	0.00	0	0.00	0
	4	TRACE	0004	1197	1100	0	0.00	0	0.00	0
	5	DUMPSRV	0005	688	354	0	0.00	4696	0.00	64
	6	XCFAS	0006	7390	2051	0	0.00	1216	0.00	160
	7	GRS	0007	21468	345	0	0.00	2304	0.00	48
	8	SMSPDSE	0008	843	125	0	0.00	0	0.00	0
	9	SMSPDSE1	0009	2359	130	0	0.00	0	0.00	0
	10	SMSVSAM	000A	24716	560	0	0.00	2624096	1.94	64
	11	CONSOLE	000B	5052	156	3016	0.11	104824	0.07	11672
	12	WLM	000C	32903	291	0	0.00	106176	0.07	0
	13	ANTMAIN	000D	1512	161	0	0.00	801432	0.59	0
	14	ANTAS000	000E	1395	142	0	0.00	185928	0.13	0
	15	DEVMAN	000F	526	73	0	0.00	86592	0.06	0
	16	GTZ	0010	288	70	0	0.00	1584	0.00	0
	17	OMVS	0011	114T	1404	0	0.00	40448	0.02	0
	18	PCIE	0012	288	67	0	0.00	25968	0.01	64
	19	FPGHWAM	0013	17056	16548	0	0.00	2296	0.00	64

Figure 3 AS display

You can use the **FILTER** command to get information about all address spaces' STC memory utilization, as shown in Example 1.

Example 1 Filter command on the AS display

```
FILTER TYPE EQ STC
```

The output is shown in Figure 4.

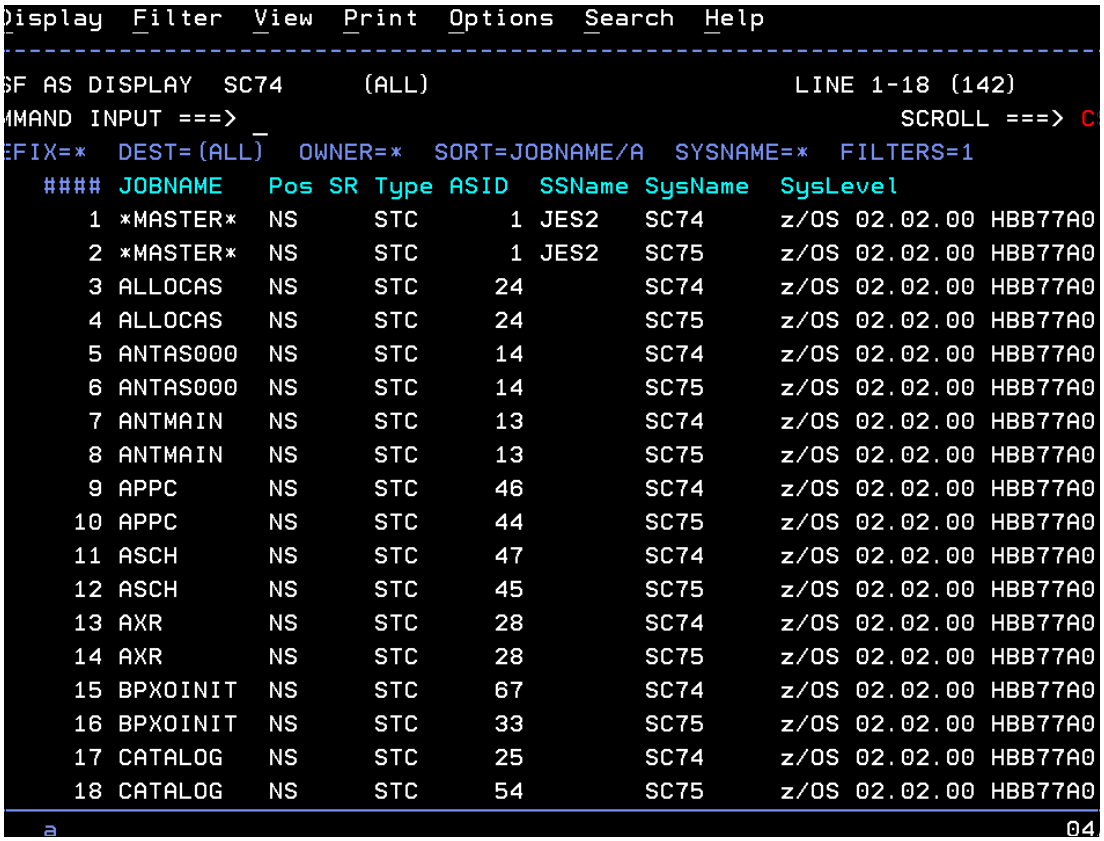


Figure 4 Filter command that is used for STC column

You can use the **SORT** command to identify address spaces that use large percentages of CSA, as shown in Example 2.

Example 2 SORT CSA command

```
SORT CSA D
```

The output is shown in Figure 5.

```
 Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
DSF AS DISPLAY  SC74     (ALL)                        LINE 1-18 (142)
OMMAND INPUT ===> _                                        SCROLL ===> CSR
REFIX=*  DEST=(ALL)  OWNER=*  SORT=CSA/D  SYSNAME=*  FILTERS=1
P   ####  JOBNAME  ASIDX Real  Fixed CSA      CSA%   ECSA     ECSA%  SQA
       1  *MASTER* 0001   4369  1515   117952   4.46  3283104   2.43    36672
       2  *MASTER* 0001   4232  1458   117768   4.45  3283616   2.43    32576
       3  RACF     0037    905    87    35632   1.34      736   0.00       64
       4  RACF     0035    905    87    35632   1.34      736   0.00       64
       5  NET      0025   3096   161    24328   0.92  2656936   1.96        0
       6  NET      0023   3106   160    24328   0.92  3171296   2.35        0
       7  JES2     0022   8303  1017    15376   0.58  1159784   0.85       64
       8  JES2     0022   8161  1017    15376   0.58  1161832   0.86       64
       9  TSO      004A    366    75     4832   0.18     2424   0.00        0
      10  D1L1DBM1 004F  57314  1858     4096   0.15   720152   0.53       64
      11  D1L2DBM1 002E  55618   826     4096   0.15   929048   0.68       64
      12  CONSOLE  000B   5069   158     3016   0.11   104824   0.07    11672
      13  CONSOLE  000B   4288   151     3016   0.11   104824   0.07    11672
      14  D1L1MSTR 0056   2052   214     1968   0.07  4385688   3.25       64
      15  D1L2MSTR 0051   2073   215     1968   0.07  4385688   3.25       64
      16  TSO      004A    369    75      656   0.02     2424   0.00        0
      17  AXR      001C    557    95      392   0.01    13128   0.00        0
      18  AXR      001C    556    93      392   0.01    13128   0.00        0
   a                                                                    04/02
```

Figure 5 Identifying high CSA users by using the SORT command

Depending on your window definition, you might have to navigate by using PF11 to see all columns that are available on the panel that is shown in Figure 5. The information that is provided by the **AS** option is listed in Table 1.

Table 1 Columns for the AS display

Column header	Description
#	Row number, which is displayed with **SET ROWNUM ON**
JOBNAME	Job name
ASIDX	Address space identifier in hexadecimal format
Real	Current utilization of real storage in frames
Fixed	Number of fixed real storage frames
CSA	CSA storage below the 16 MB line in bytes
CSA%	Percentage of CSA below the 16 MB line being used
ECSA	CSA storage above the 16 MB line in bytes
ECSA%	Percentage of CSA above the 16 MB line being used
SQA	SQA storage below the 16 MB line in bytes
SQA%	Percentage of SQA below the 16 MB line being used
ESQA	SQA storage above the 16 MB line in bytes
ESQA%	Percentage of SQA above the 16 MB line being used

Column header	Description
AUX	Non-VIO slots being used
MemLimit	Memory limit for 64-bit memory objects
MemObjNum	Number of memory objects for address space
MemObjUsed	Total allocated memory object size in MB
MemObjHWM	High water mark allocated to memory objects in MB
HVComNum	Number of high virtual common memory objects
HVComUsed	High virtual common memory size in MB
HVComHWM	High virtual common memory high-water mark in MB
ShrMONNum	Number of shared memory objects for address space
ShrMONUsed	Total size of shared memory objects in MB
ShrMONHWM	Shared memory objects high-water mark in MB
FixedB	Number of fixed frames below the 16 MB line
StepName	Step name
ProcStep	Procedure step name
JobID	JES Job ID or work ID
Owner	User ID of job creator
Pos	Address space position; for example, swapped in, swapped out, nonswappable, in transition
SR	Swap out reason code
Type	Job type (STC, TSU, JOB)
ASID	Address space identifier
SSName	Subsystem name
SysName	System name
SysLevel	Level of the operating system

AS line commands

From the SDSF AS panel, you can see which line commands are available by issuing the **SET ACTION ON** command. You can use **JM** (JobMemory) to display subpool usage within the address space and **JD** (Jobdevice) to display allocations, coupling facility (CF) connection usage, and TCP/IP connections for an address space. The JM option is shown in Figure 6.

```
  Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF AS DISPLAY  SC74     (ALL)                        LINE 1-17 (142)
COMMAND INPUT ===>                                       SCROLL ===> CS
PREFIX=*  DEST=(ALL)  OWNER=*  SORT=CSA/D  SYSNAME=*  FILTERS=1
ACTION=+-Extend,//-Block,%-RunExec,=-Repeat,JD-JobDevices,JM-JobMemory
NP   ####  JOBNAME   Pos SR Type ASID  SSName SysName  SysLevel
JM_     1  *MASTER*  NS     STC      1 JES2   SC75     z/OS 02.02.00 HBB77A0
        2  *MASTER*  NS     STC      1 JES2   SC74     z/OS 02.02.00 HBB77A0
        3  RACF      NS     STC     55 JES2   SC74     z/OS 02.02.00 HBB77A0
        4  RACF      NS     STC     53 JES2   SC75     z/OS 02.02.00 HBB77A0
  Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF JOB MEMORY  SC75     ASID 0001 *MASTER* STC06088  LINE 1-17 (41)
COMMAND INPUT ===> _                                     SCROLL ===> CS
PREFIX=*  DEST=(ALL)  OWNER=*  SYSNAME=*
ACTION=+-Extend,//-Block,%-RunExec,=-Repeat
NP   ####  TYPE           SP  Key Fix  FP   Total    Total-24 Total-31 Total-
       1  PRIVATE         0    0 NO   YES    128KB      60KB      68KB
       2  PRIVATE         1    0 NO   YES     12KB      12KB
       3  PRIVATE       132    4 NO   NO     504KB                504KB
       4  LSQA          205    0 DREF NO     1488KB               1488KB
       5  LSQA          215    0 DREF YES     172KB                172KB
       6  LSQA          225    0 YES  YES      80KB                 80KB
       7  SQA           226    0 YES  NO        256       256
       8  CSA           227    0 YES  YES        72                   72
       9  CSA           228    0 YES  NO      18608       192      18416
      10  CSA           228    5 YES  NO       2240                 2240
      11  PRIVATE       229    0 NO   YES    552KB       4KB      548KB
      12  PRIVATE       229    5 NO   YES    508KB                508KB
      13  PRIVATE       230    0 NO   NO     280KB      12KB      268KB
      14  PRIVATE       230    1 NO   NO     144KB       4KB      140KB
      15  PRIVATE       230    5 NO   NO     320KB       4KB      316KB
      16  CSA           231    0 NO   YES   1289KB       728     1289KB
      17  CSA           231    7 NO   YES      680                  680
MA    a                                                                  04/
```

Figure 6 JM line command and output

The JD option and output is shown in Figure 7.

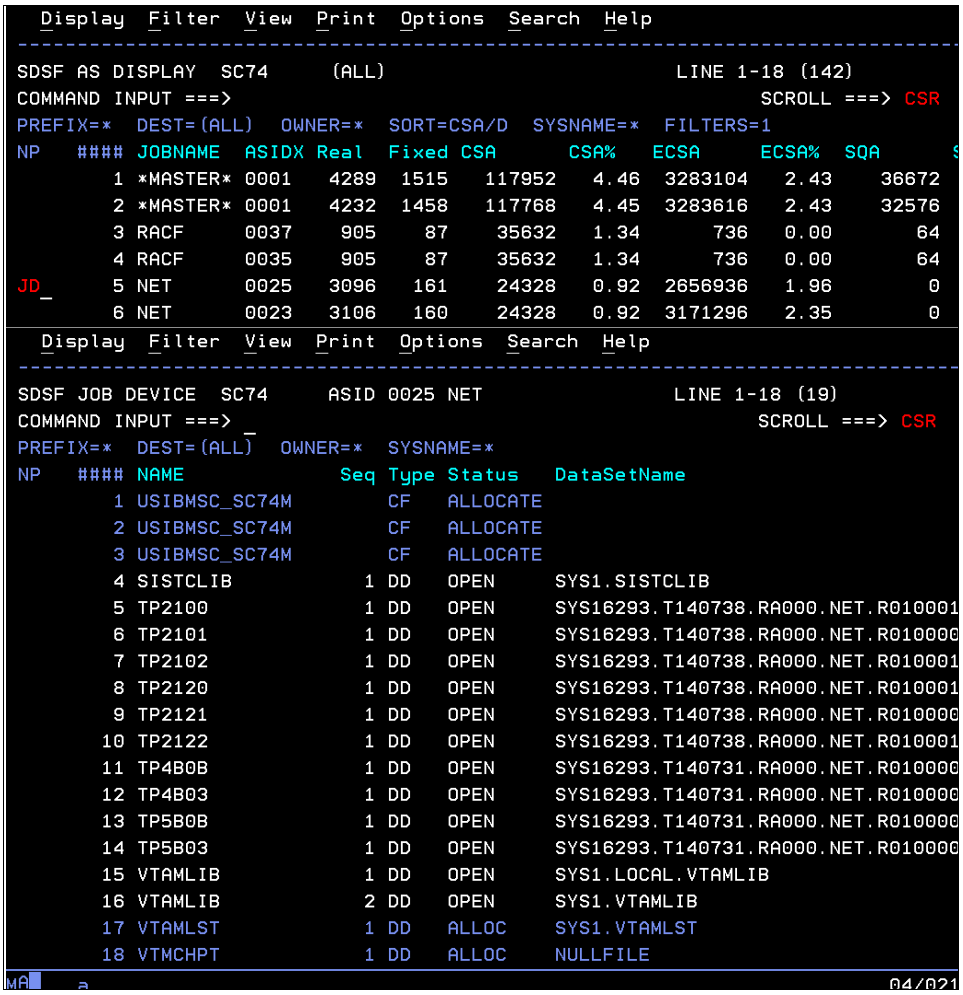


Figure 7 JD command and response

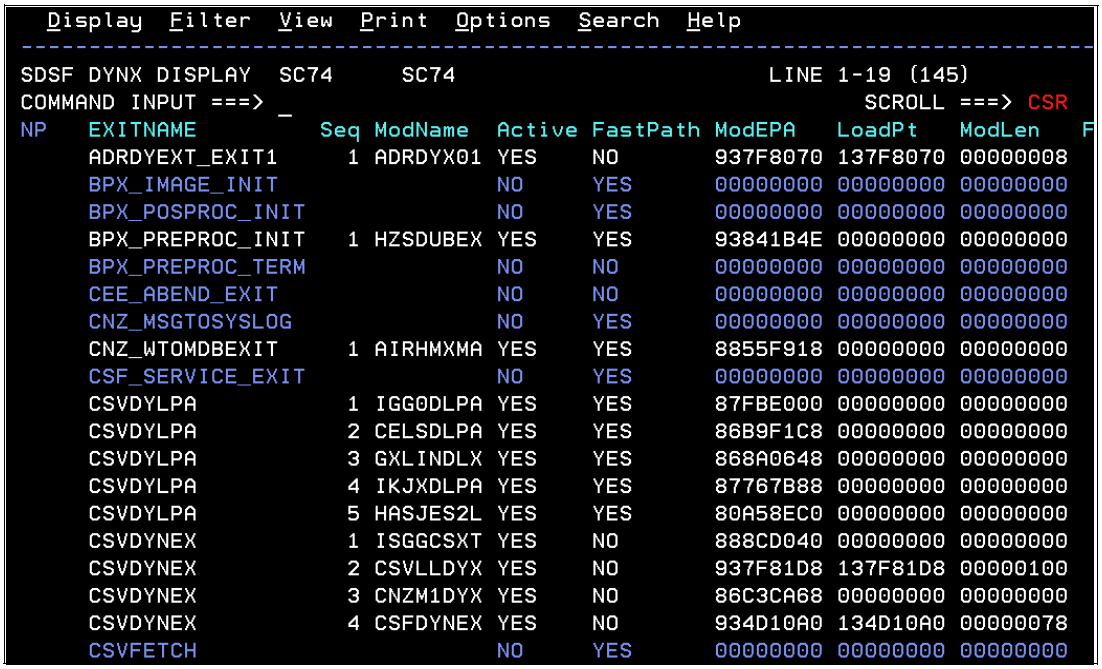
DYNX option

By using the new Dynamic Exit (DYNX) panel, authorized users can display the properties of dynamic exits that are defined to the systems across Sysplex. It offers a simple and fast way to show in one panel all of the dynamic exits in the sysplex, their status, and the modules that implement the exit. Users do not need to cross-check the dynamic exits and modules by manually issuing IBM MVS™ commands, as shown in the following example:

```
/D  PROG,MODNAME=module_name

/D  PROG,EXITNAME=exit_name,DIAG
```

When the DYNX option is selected, the display that is shown in Figure 8 opens.



```
  Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF DYNX DISPLAY  SC74     SC74                      LINE 1-19 (145)
COMMAND INPUT ===> _                                    SCROLL ===> CSR
NP   EXITNAME         Seq ModName  Active FastPath ModEPA   LoadPt   ModLen   F
     ADRDYEXT_EXIT1     1 ADRDYX01 YES    NO       937F8070 137F8070 00000008
     BPX_IMAGE_INIT                NO     YES      00000000 00000000 00000000
     BPX_POSPROC_INIT              NO     YES      00000000 00000000 00000000
     BPX_PREPROC_INIT   1 HZSDUBEX YES    YES      93841B4E 00000000 00000000
     BPX_PREPROC_TERM              NO     NO       00000000 00000000 00000000
     CEE_ABEND_EXIT                NO     NO       00000000 00000000 00000000
     CNZ_MSGTOSYSLOG               NO     YES      00000000 00000000 00000000
     CNZ_WTOMDBEXIT     1 AIRHMXMA YES    YES      8855F918 00000000 00000000
     CSF_SERVICE_EXIT              NO     YES      00000000 00000000 00000000
     CSVDYLPA           1 IGG0DLPA YES    YES      87FBE000 00000000 00000000
     CSVDYLPA           2 CELSDLPA YES    YES      86B9F1C8 00000000 00000000
     CSVDYLPA           3 GXLINDLX YES    YES      868A0648 00000000 00000000
     CSVDYLPA           4 IKJXDLPA YES    YES      87767B88 00000000 00000000
     CSVDYLPA           5 HASJES2L YES    YES      80A58EC0 00000000 00000000
     CSVDYNEX           1 ISGGCSXT YES    NO       888CD040 00000000 00000000
     CSVDYNEX           2 CSVLLDYX YES    NO       937F81D8 137F81D8 00000100
     CSVDYNEX           3 CNZM1DYX YES    NO       86C3CA68 00000000 00000000
     CSVDYNEX           4 CSFDYNEX YES    NO       934D10A0 134D10A0 00000078
     CSVFETCH                      NO     YES      00000000 00000000 00000000
```

Figure 8 DYNX display

The EXITNAME column displays the dynamic exit name. The module name and its state are displayed in the ModName and Active columns, which can help identify the state when troubleshooting is required.

More information is available by browsing to the right.

Two systems are in the sysplex in our controlled environment: SC74 and SC75. While logged on to SC74, the command option can be used to change to other systems to display the dynamic exits on that system, as shown in Example 3.

Example 3 Looking at another system in the Sysplex

```
SYSNAME SC75
```

Entering the command is shown in Figure 9.

```
 Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF DYNX DISPLAY  SC74     SC74                          TOO MANY PARMS
COMMAND INPUT ===> sysname sc75_                           SCROLL ===> CSR
NP    EXITNAME         Seq ModName  Active FastPath ModEPA   LoadPt   ModLen   F
      ADRDYEXT_EXIT1     1 ADRDYX01 YES    NO       937F8070 137F8070 00000008
      BPX_IMAGE_INIT       NO     YES    00000000 00000000 00000000
      BPX_POSPROC_INIT     NO     YES    00000000 00000000 00000000
      BPX_PREPROC_INIT   1 HZSDUBEX YES    YES      93841B4E 00000000 00000000
      BPX_PREPROC_TERM     NO     NO     00000000 00000000 00000000
      CEE_ABEND_EXIT       NO     NO     00000000 00000000 00000000
      CNZ_MSGTOSYSLOG      NO     YES    00000000 00000000 00000000
      CNZ_WTOMDBEXIT     1 AIRHMXMA YES    YES      8855F918 00000000 00000000
      CSF_SERVICE_EXIT     NO     YES    00000000 00000000 00000000
      CSVDYLPA           1 IGG0DLPA YES    YES      87FBE000 00000000 00000000
      CSVDYLPA           2 CELSDLPA YES    YES      86B9F1C8 00000000 00000000
      CSVDYLPA           3 GXLINDLX YES    YES      868A0648 00000000 00000000
      CSVDYLPA           4 IKJXDLPA YES    YES      87767B88 00000000 00000000
      CSVDYLPA           5 HASJES2L YES    YES      80A58EC0 00000000 00000000
      CSVDYNEX           1 ISGGCSXT YES    NO       888CD040 00000000 00000000
      CSVDYNEX           2 CSVLLDYX YES    NO       937F81D8 137F81D8 00000100
      CSVDYNEX           3 CNZM1DYX YES    NO       86C3CA68 00000000 00000000
      CSVDYNEX           4 CSFDYNEX YES    NO       934D10A0 134D10A0 00000078
      CSVFETCH             NO     YES    00000000 00000000 00000000
```

Figure 9 SYSNAME command

The output of the command is shown in Figure 10.

```
 Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF DYNX DISPLAY  SC74     SC75   System displayed  LINE 1-19 (145)
COMMAND INPUT ===> _                                       SCROLL ===> CSR
NP    EXITNAME         Seq ModName  Active FastPath ModEPA   LoadPt   ModLen   F
      ADRDYEXT_EXIT1     1 ADRDYX01 YES    NO       937F8070 137F8070 00000008
      BPX_IMAGE_INIT       NO     YES    00000000 00000000 00000000
      BPX_POSPROC_INIT     NO     YES    00000000 00000000 00000000
      BPX_PREPROC_INIT   1 HZSDUBEX YES    YES      93841B4E 00000000 00000000
      BPX_PREPROC_TERM     NO     NO     00000000 00000000 00000000
      CEE_ABEND_EXIT       NO     NO     00000000 00000000 00000000
      CNZ_MSGTOSYSLOG      NO     YES    00000000 00000000 00000000
      CNZ_WTOMDBEXIT     1 AIRHMXMA YES    YES      8855F918 00000000 00000000
      CSF_SERVICE_EXIT     NO     YES    00000000 00000000 00000000
      CSVDYLPA           1 IGG0DLPA YES    YES      87FBE000 00000000 00000000
      CSVDYLPA           2 CELSDLPA YES    YES      86B9F1C8 00000000 00000000
      CSVDYLPA           3 GXLINDLX YES    YES      868A0648 00000000 00000000
      CSVDYLPA           4 IKJXDLPA YES    YES      87767B88 00000000 00000000
      CSVDYLPA           5 HASJES2L YES    YES      80A46EC0 00000000 00000000
      CSVDYNEX           1 ISGGCSXT YES    NO       888CD040 00000000 00000000
      CSVDYNEX           2 CSVLLDYX YES    NO       937F81D8 137F81D8 00000100
      CSVDYNEX           3 CNZM1DYX YES    NO       86C3CA68 00000000 00000000
      CSVDYNEX           4 CSFDYNEX YES    NO       92EE6008 12EE6008 00000078
      CSVFETCH             NO     YES    00000000 00000000 00000000
```

System logged on

Figure 10 SYSNAME command output

You might choose to filter the information by entering the **FILTER** command with wildcard characters to display the exits and modules of a particular dynamic exit, as shown in Example 4.

Example 4 Filter on the DYNX

```
FILTER EXITNAME *SYSJES2*
```

Entering the command is shown in Figure 11.

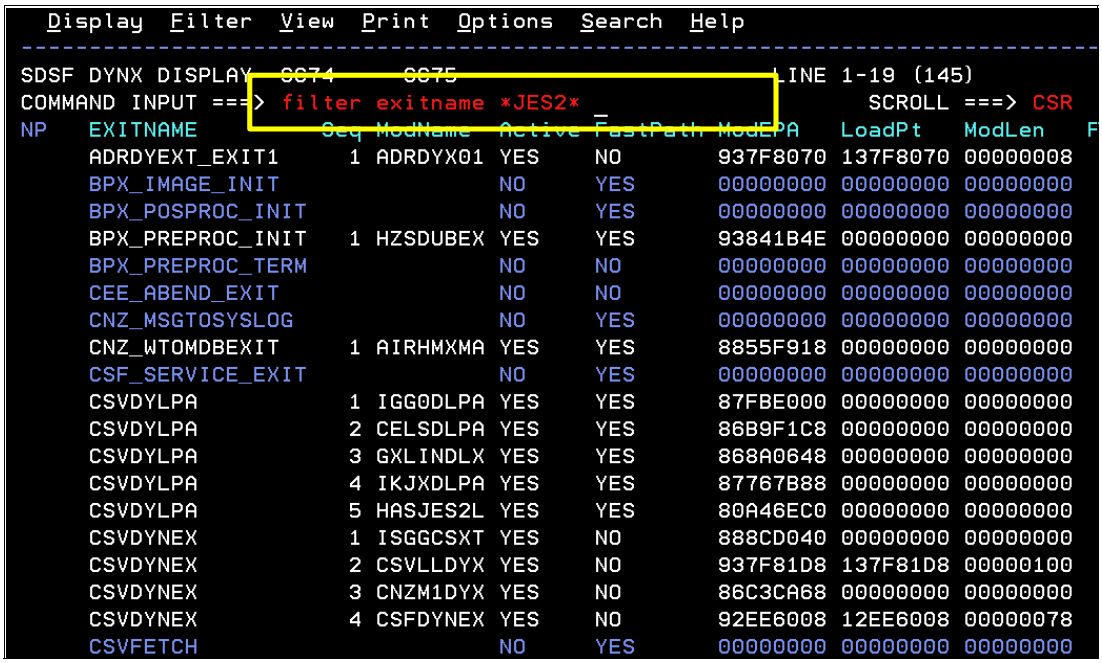


Figure 11 Entering the Filter command

The output of the command is shown in Figure 12.

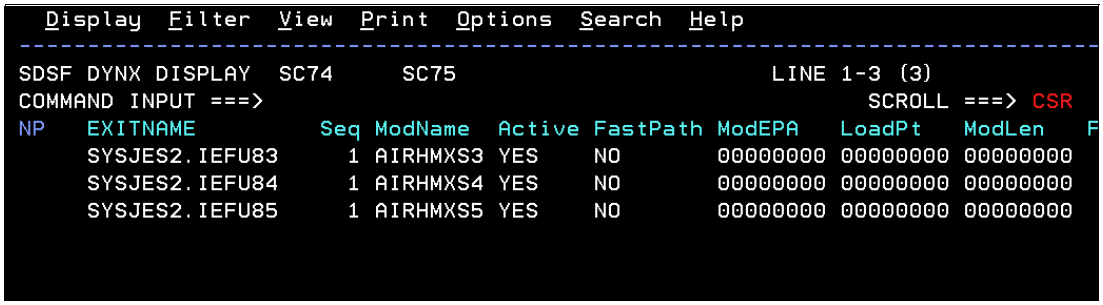


Figure 12 Output from the Filter command for SYSJES2

You can use PF11 (depending on your PFK settings) to move to the right in the panel to see the rest of the display. The column titles and their descriptions are listed in Table 2.

Table 2 DYNX columns

Column header	Description
#	Row number, displayed with **SET ROWNUM ON**
EXITNAME	Dynamic exit name
Seq	Sequence number for module list
ModName	Module name implementing exit
Active	Exit active (YES or NO)
FastPath	Exit fastpath option (Yes or No)
Module EPA	Module entry point address

Column header	Description
LoadPt	Module load point address if available
ModLen	Module length if available
FiltSTok	Address space STOKEN for which exit is to get control
NumAbend	Number of abends before exit inactivated
ConAbend	Consecutive abend option ► YES: Consecutive abends before inactivation ► NO: Cumulative abends before inactivation
SeqMax	Maximum module sequence number
Sysname	System name
SysLevel	Current level of operating system

DYNX line commands

If you want to see which line commands are available, you can issue the **SET ACTION ON** command from the SDSF DYNX panel to show the available line commands for that panel.

For example, you can issue the **DD** command next to the exit name to display the diagnostic information for that dynamic exit. If you enter the DD line command against the HZSADDCHECK exit, the following MVS system command is generated and issued:

```
RO SC75,D PROG,EXIT,EX=HZSADDCHECK,DIAG
```

The DD line command that is entered against an exit is shown in Figure 13.

```
  Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF DYNX DISPLAY  SC74     SC75                      LINE 6-23 (145)
COMMAND INPUT ===>                                     SCROLL ===> CSR
NP   EXITNAME         Seq ModName  Active FastPath ModEPA   LoadPt   ModLen   F
     CEE_ABEND_EXIT                NO     NO       00000000 00000000 00000000
     CNZ_MSGTOSYSLOG               NO     YES      00000000 00000000 00000000
     CNZ_WTOMDBEXIT     1 AIRHMXMA YES    YES      8855F918 00000000 00000000
     CSF_SERVICE_EXIT              NO     YES      00000000 00000000 00000000
     CSVDYLPA           1 IGG0DLPA YES    YES      87FBE000 00000000 00000000
     CSVDYLPA           2 CELSDLPA YES    YES      86B9F1C8 00000000 00000000
     CSVDYLPA           3 GXLINDLX YES    YES      868A0648 00000000 00000000
     CSVDYLPA           4 IKJXDLPA YES    YES      87767B88 00000000 00000000
     CSVDYLPA           5 HASJES2L YES    YES      80A46EC0 00000000 00000000
     CSVDYNEX           1 ISGGCSXT YES    NO       888CD040 00000000 00000000
     CSVDYNEX           2 CSVLLDYX YES    NO       937F81D8 137F81D8 00000100
     CSVDYNEX           3 CNZM1DYX YES    NO       86C3CA68 00000000 00000000
     CSVDYNEX           4 CSFDYNEX YES    NO       92EE6008 12EE6008 00000078
     CSVFETCH                      NO     YES      00000000 00000000 00000000
     CSVLLIX1                      NO     YES      00000000 00000000 00000000
     CSVLLIX2                      NO     YES      00000000 00000000 00000000
     HASP.$EXIT0                   NO     YES      00000000 00000000 00000000
dd_  HZSADDCHECK        1 IARHCADC YES    NO       931BB0A0 131BB0A0 00000678
```

Figure 13 The dd line command

The output from the **DD** command is shown in Figure 14.

```
 Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF DYNX DISPLAY  SC74     SC75                          18 RESPONSES NOT SHOWN
COMMAND INPUT ===> _                                        SCROLL ===> CSR
RESPONSE=SC75
 CSV464I 12.26.32 PROG,EXIT DISPLAY 416
 EXIT HZSADDCHECK
 MODULE    STATE EPADDR    LOADPT    LENGTH    JOBNAME   PARAM
 IARHCADC    A   931BB0A0  131BB0A0  00000678  *
 IGVHCADC    A   93181178  13181178  000009E0  *
 ILRHCADC    A   9317D840  1317D840  000006C0  *
 IEATCADC    A   932BC030  132BC030  000001C0  *
 IEAVTSHI    A   9317D088  1317D088  000007B8  *
 ADYHCADC    A   931BE208  131BE208  00000368  *
 BLWHCADC    A   930B8868  130B8868  00000270  *
 IXCHCADC    A   92054828  12054828  000027D8  *
 ISGHCADC    A   930B80C0  130B80C0  000007A8  *
 CSVHCADC    A   92EE9168  12EE9168  000005E0  *
 IGWHCPD1    A   9333F000  1333F000  00000168  *
 IFGHCOC1    A   932D6320  132D6320  00000168  *
 IEFHCADC    A   92EE65E8  12EE65E8  000007B8  *
 CNZHCADC    A   92053110  12053110  00000EF0  *
 IDAHCADD    A   92EE6310  12EE6310  000002D8  *
```

Figure 14 Output display from the dd command

The DYNX panel provides a simple, easy, and integrated way for operations and system programmers to identify the exit entry point address, load point address of the exit routine module, and other diagnostic information for a specific exit or all dynamic exits in the systems.

Within this panel, you can perform the following tasks:

- Display dynamic exit
- Display all dynamic exits
- Display all implicitly defined dynamic exits
- Display dynamic exit with diagnostic information
- Filter and sort data for better view

PROC option

The PROC option displays procedure libraries that are used by JES for the local member only. This option is available on SDSF V2.2 only with systems running JES2.

If you select the PROC option, the display that is shown in Figure 15 opens.

```
 Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF PROC DISPLAY  SC74     EXT     2                 LINE 1-2 (2)
COMMAND INPUT ===>                                    SCROLL ===> CSR
NP    DDNAME   Seq DSName                              VolSer DefVol St
      PROC00     1 SYS1.PROCLIB                         BH5CAT BH5CAT OK
      PROC00     2 SYS1.IBM.PROCLIB                     Z22RB1 Z22RB1 OK
```

Figure 15 PROC option display

You can use the **SRCH** command to search for a member on PROCLIB data sets, as shown in Figure 16.

Figure 16 Search for JES2 member in PROCLIB concatenation

The output from the search is shown in Figure 17. The **SB** (browse) or **SE** (edit) line commands can be used to browse or edit this proc.

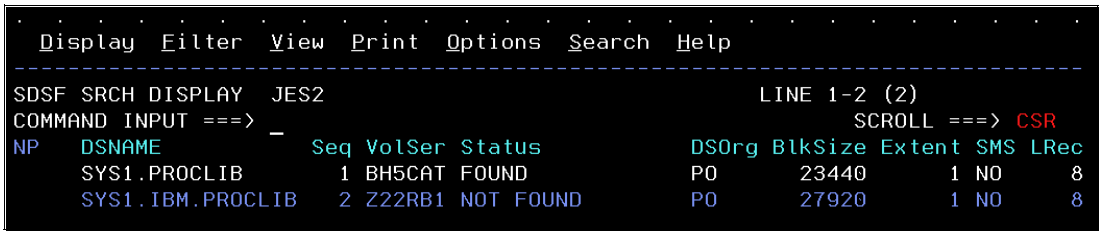


Figure 17 Output from JES2 search

You can use PF11 (depending on your PFK settings) to move to the right in the panel to see the rest of the display. The column titles and their descriptions are listed in Table 3.

Table 3 PROC display columns

Column Heading	Description
#	Row number, displayed with the **SET ROWNUM ON**
DDNAME	DDName of the data set in the list
Seq	Sequence number
DSName	Data set name
VolSer	Volume serial
DefVol	Defined volume serial
Status	Data set status
TSO	Proclib used for TSO (Yes or NO)
STC	Proclib used for Started Task (Yes or No)
Static	Static allocation (Yes or No)
BlkSize	Block size for data set
Extent	Number of data set extents
SMS	SMS indicator (Yes if SMS-managed)
LRecL	Logical record length for the data set
DSOrg	Data set organization
RecFm	Record format for the data set

Column Heading	Description
CrDate	Data set creation date
RefDate	Data set last referenced date
SeqMax	Maximum sequence number for Proclib

PROC line commands

From the SDSF PROC panel, you can see which line commands are available by issuing the **SET ACTION ON** command.

Users can use **D** (Display PROCLIB) and **DD** (Display proclib in debug mode) to display proclib information with or without debug mode.

The output form a **DD** line command on the SYS1.PROCLIB data set is shown in Figure 18.

```
 Display  Filter  View  Print  Options  Search  Help
------------------------------------------------------------------------------
SDSF PROC DISPLAY  SC74     EXT     2                  COMMAND ISSUED
COMMAND INPUT ===> _                                      SCROLL ===> CSR
RESPONSE=SC74
 $HASP319 PROCLIB(PROC00)
 $HASP319 PROCLIB(PROC00)     STATIC PROCLIB,USECOUNT=10,
 $HASP319                     DDNAME=PROC00,
 $HASP319                     CREATED=(2016.293,14:07:31.018891),
 $HASP319                     DD(1)=(DSNAME=SYS1.PROCLIB,
 $HASP319                     VOLSER=BH5CAT,UNIT=SYSALLDA),
 $HASP319                     DD(2)=(DSNAME=SYS1.IBM.PROCLIB,
 $HASP319                     VOLSER=Z22RB1,UNIT=SYSALLDA)
```

Figure 18 DD command output

JC option updates

JC is updated to show the promotion rate column, which is provided with the **STARTBY** function in JES2.

Several new functions were introduced in z/OS V2.2 with which the JCL writers can have more control over when and how jobs are scheduled for execution. These new functions are provided through the new SCHEDULE JCL statement.

By using the STARTBY keyword in the SCHEDULE statement, the JCL writers can specify an approximate future job start time. The JES2 system manages prioritizing the job in such a way that the job is near the top of the relevant job class or service class queue by the target time.

The JES2 watches the progress of a job with the STARTBY target through the relevant job class or service class queue. If the JES2 system decides that a job is unlikely to meet the target time, the job's priority is increased and moved up its job queue. This moving process is known as *promotion*.

A rate of job's promotion can be managed on a job class basis by using a new JOBCLASS statement attribute PROMO_RATE that decides how aggressively the job can be moved up the job queue. If the job class has PROMO_RATE equal to 0 (which is the default value), the STARTBY function is disabled for that job class, and no jobs in this job class are promoted. If the job class has PROMO_RATE greater than 0, it indicates how many positions a job in this job class can be moved up in a single promotion cycle (in 1-minute intervals) in the job queue.

The PROMO_RATE can be changed at any time by issuing the following JES2 command:

```
/$T JOBCLASS(class_name),PROMO_RATE=3
```

Through the JC in SDSF, the PROMO_RATE value for specific job classes can be displayed, as shown in Figure 19.

```
 Display  Filter  View  Print  Options  Search  Help
-------------------------------------------------------------------------------
SDSF JOB CLASS DISPLAY ALL CLASSES                      LINE 1-18 (44)
COMMAND INPUT ===> _                                    SCROLL ===> CSR
NP   CLASS    og       XBMProc  DupJob JobRC  Active SysSym   DsEnqShr PromoR
     A        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     B        PIN)              NO     LASTRC YES    DISALLOW ALLOW
     C        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     CLASS1   PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     CLASS2   PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     CLASS3   PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     CLASS4   PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     CLASS5   PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     D        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     E        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     F        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     G        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     H        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     I        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     J        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     K        PIN)              NO     MAXRC  YES    ALLOW    ALLOW
     L        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
     M        PIN)              NO     MAXRC  YES    DISALLOW ALLOW
```

Figure 19 JC PROMO_RATE column display

Installation and considerations

The enhancements are available through functional PTFs, as listed in Table 4. Check the software status before installing the PTFs to ensure that you have the latest maintenance.

Table 4 PTF information

	z/OS V2R2	z/OS V2R1	z/OS V1.13
FMIDS	HQX77A0	HQX7790	HQX7780
Toleration and coexistence	UI90060	UI90059	UI90058
AS, DYNX, PROC, and JC updates	UI41032	PTF UI41034, UI41033	Not applicable

Note: The **PROC** function is available for z/OS V2R2 only.

The z/OS V1.13 PTFs are toleration only. The new enhancements are not available for versions earlier than z/OS V2.1; however, these fixes allow the V1.13 to share the ISFPRMxx with systems that have the new functions installed and active.

SDSFAUX address space

SDSFAUX is another address space that was introduced by using a previous SPE, which is required to explore these new SDSF options. For more information about SDSF enhancements, see the following publications:

- *LAD: z/OS SDSFAUX*, REDP-5337:

  http://www.redbooks.ibm.com/abstracts/redp5337.html

- *LAD: z/OS SDSFAUX*, REDP-5358:

  http://www.redbooks.ibm.com/abstracts/redp5358.html

In addition, check the current Preventive Service Planning (PSP) buckets to ensure that you have the most updated information.

If you did not install SDSFAUX, see *SDSF Operation and Customization,* SA23-2274.

If you have SDSFAUX and the prerequisite maintenance applied and you are installing SDSF enhancements, check the current DOC information and your own local procedures and standards.

Note: Ensure that the appropriate security is in place for authorized access according to your local security policy and guidelines.

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