

z/OS Introduction and Workshop

Data & Disk Storage



Unit objectives

After completing this unit, you should be able to:

- Describe data set naming rules
- Describe a partitioned data set
- Describe a sequential data set
- Describe a VSAM data set
- Describe a data set extent
- Describe role of the system catalog and user catalogs
- Describe role of VTOC
- Describe z/OS based Unix filesystems

What is a data set?

Commonly known as a file in unix or linux.

A data set is a collection of logically related data records stored on one disk storage volume or a set of volumes.

A data set can be:

- source program

- library of macros

- file of data records used by a processing program.

You can print a data set or display it on a terminal.

The logical record is the basic unit of information used by a program running on z/OS.

How data is stored in a z/OS system

Data is stored on a disk storage volume, magnetic tape, or optical media.

Programs and system utilities can store and retrieve records either directly or sequentially.

Programs and system utilities use disk volumes for storing data and executable programs, including the operating system itself, and for temporary working storage.

Program and system utilities can use one disk volume for many different data sets, and reallocate or reuse space on the volume.

Data management in z/OS

Data management involves the following tasks:
allocate, update, delete, monitor, migrate, backup,
recall, and recovery

Disk storage management is done either explicitly, through automated processes or through a combination of both.

DFSMS (Data Facility Storage Management Subsystem)
is a base component of the operating system and frequently used to automate storage management of data sets.

DASD: Use and terminology

Direct Access Storage Device (DASD) is another name for a disk volume.

DASD volumes are used for storing data and executable programs.

Data sets in a z/OS system are organized on DASD volumes.

A disk drive contains *cylinders*

Cylinders contain *tracks*

Tracks contain data *records*.



HDD



SSD

Data Sets – Common Types of z/OS Data Sets

Non-VSAM **

- SEQ **Sequential** collection of records referenced by a single data set name
- PDS **Partitioned** Data Set (aka PO – Partitioned Organization)
Consists of a directory and one or more member names
- PDS/E Partitioned Data Set Extended
Consists of a directory and one or more member names
Increased Functionality, Performance and Reduced Maintenance

VSAM

Increased efficiency and performance beyond non-VSAM

- KSDS Keyed Sequential Data Set
- ESDS Entry Sequential Data Set
- RRDS Relative Record Data Set
- LDS Linear Data Set

** BSAM and BPAM

Data Set – Disk Space Allocation

How space is specified:

explicitly (JCL, ALLOCATE, SVC99, IDCAMS)

implicitly (**DFSMS** – Automatic Class Selection, ACS routine)

Non VSAM Data Set characteristics:

Smallest amount of data to be processed is a *logical record*

Records can be grouped into *blocks*

VSAM Data Set characteristics:

Records are stored in *control intervals* (1 exception – LDS)

How Data Sets are Created on Disk Storage:

A Data Set is assigned disk space in chunks called *extents*

A *primary* extent is allocated when data set is created.

A *secondary* extent is created/allocated when primary extent is full

Data Set – (non VSAM) data storage attributes



Fixed records.

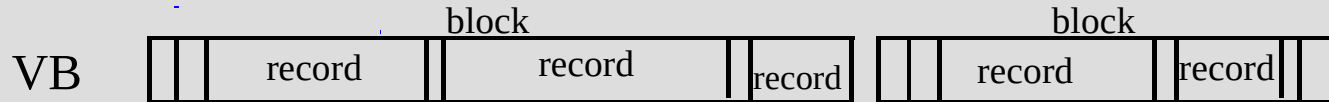


Fixed blocked records. $BLKSIZE = n * LRECL$



Variable records.

RDW



Variable blocked records. $BLKSIZE \geq 4 + n * \text{largest } LRECL$

BDW



Undefined records. No defined internal structure for access method.

Record and block descriptors words are each 4 bytes long

Data Set – PDS and PDS/E (non VSAM)

PDS data sets:

Simple and efficient way to organize related groups of sequential files.

PDS/E data sets:

Similar to a PDS, but advantages include:

Space reclaimed automatically when a member is deleted

Faster directory searches

Data Set Names - VSAM

VSAM data set is accessed by a VSAM virtual data set name called a '**cluster name**'.

VSAM cluster name is associated with 1 or more physical data set names.

VSAM ESDS cluster includes a physical **DATA** component data set name.

VSAM KSDS cluster includes a physical **DATA** component data set name and a physical **INDEX** component data set name and optionally a physical **ALTERNATE INDEX** component

Data Set – VSAM Virtual Storage Access Method

VSAM data sets are formatted differently than non-VSAM data sets.

VSAM data sets are collections of records, grouped into control intervals (CI) with one exception (LDS Linear Data Sets).

The control interval (CI) is a fixed area of storage space in which VSAM stores records.

The control intervals are grouped into contiguous areas of storage called control areas (CA).

To access VSAM data sets, VSAM access method is used.

Data Set – VSAM Virtual Storage Access Method

VSAM arranges records by an index key, by a relative byte address, or by a relative record number.

The following are the different types of VSAM data sets:

Key Sequence Data Set (KSDS)

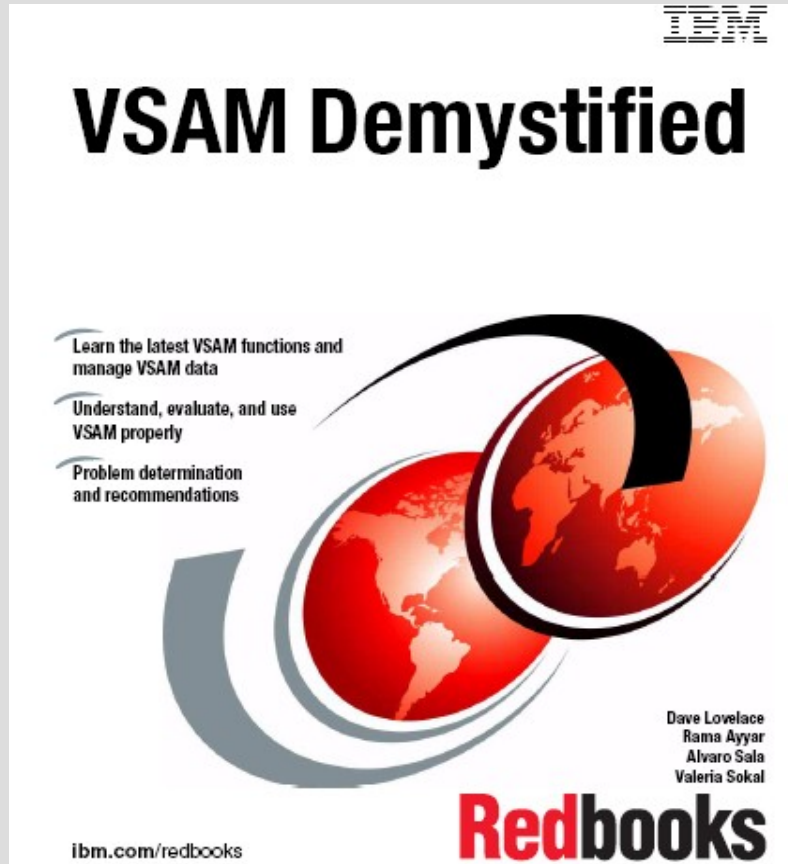
Entry Sequence Data Set (ESDS)

Relative Record Data Set (RRDS)

Linear Data Set (LDS)

A special system utility (**IDCAMS**) is used to define, delete, rename, and copy VSAM data sets.

How Data is Stored and Managed by VSAM



Data Set Names - (DSN)

Each cataloged data set must have an unique name

- Maximum **44** characters

Maximum of **22** name **segments**: level qualifier

- The first name in the left: high level qualifier (HLQ)
- The last name in the right: low level qualifier (LLQ)
- Level **qualifiers** are **separated by** a dot '.'

Each level qualifier:

- From 1 up to 8 characters
- The first must be alphabetical (A-Z) or special (@ # \$)
- The 7 remaining: alphabetical, national, numeric (0-9) or hyphen (-)
- Upper case only

Example: ZIBM000.JCL HLQ: ZIBM000 2 qualifiers

Data Set Names - Partitioned Data Set Member Names

Member name of partitioned data set (PDS)

8 character or less member names

First character: alphabetical (A-Z) or special (@ # \$)

7 remaining characters: alphabetical, special, numeric (0-9)

Data Set Names

```
Lab System
File Edit View Communication Actions Window Help
Menu Utilities Compilers Options Status Help
-----
ISPF Primary Option Menu
Option ==> 3.4
More: +
0 Settings Terminal and user parameters User ID . . : ZIBM030
1 View Display source data or listings Time . . . : 13:43
2 Edit Create or change source data Terminal . . : 3278
3 Utilities Perform utility functions Screen . . : 1
4 Foreground Interactive language processing Language . . : ENGLISH
5 Batch Submit job for language processing Appl ID . . : ISR
6 Command Enter TSO or Workstation commands TSO logon : SPFPROCE
7 Dialog Test Perform dialog testing TSO prefix: ZIBM030
8 LM Facility Library administrator functions System ID : S0W1
9 IBM Products IBM program development products MVS acct. : FB3
10 SCLM SW Configuration Library Manager Release . . : ISPF 5.6
11 Workplace ISPF Object/Action Workplace

----- Other Install Products -----
SD SDSF System Display and Search Facility
IP IPCS Inter Problem Control Facility
IS ISMF Inter Storage Management Facility
SM SMP/E SMP/E and CBIPO Dialogs
HC HCD HW Configuration Definition Dialog
R RACF Resource Access Control Facility
S DFSORT Data Facility Sort
OE OEDIT OpenEdition MVS Edit files
OB OBROWSE OpenEdition MVS Browse files
OS OSHELL OpenEdition MVS ISPF Shell

Enter X to Terminate using log/list defaults
MA a 04/017
Connected to remote server /host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList RefMode Utilities Help
Data Set List Utility
Option ==>
blank Display data set list          P Print data set list
V Display VTOC information           PV Print VTOC information
Enter one or both of the parameters below:
Dcname Level . . . zibm030
Volume serial . . .
Data set list options
Initial View . . . 1  1. Volume          Enter "/" to select option
                    2. Space           / Confirm Data Set Delete
                    3. Attrib          / Confirm Member Delete
                    4. Total           / Include Additional Qualifiers
                                   / Display Catalog Name
When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up,
an ISPF line command, the name of a TSO command, CLIST, or REXX exec, or
"=" to execute the previous command.
MA a 10/031
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript!
```

Data Set Names

Lab System

File Edit View Communication Actions Window Help

Menu Options View Utilities Compilers Help

DSLIST - Data Sets Matching ZIBM030

Command ==> _____ Scroll ==> PAGE

Row 1 of 9

Command - Enter "/" to select action Message Volume

ZIBM030		*ALIAS
ZIBM030.DATA		VPARC1
ZIBM030.EXEC		VPARC1
ZIBM030.ISPF.ISPPROF		VPMVSE
ZIBM030.JCL		VPARC1
ZIBM030.LOAD		VPARC1
ZIBM030.OUTPUT		VPARC1
ZIBM030.SOURCE		VPARC1
ZIBM030.SPFL0G1.LIST		VPMVSC

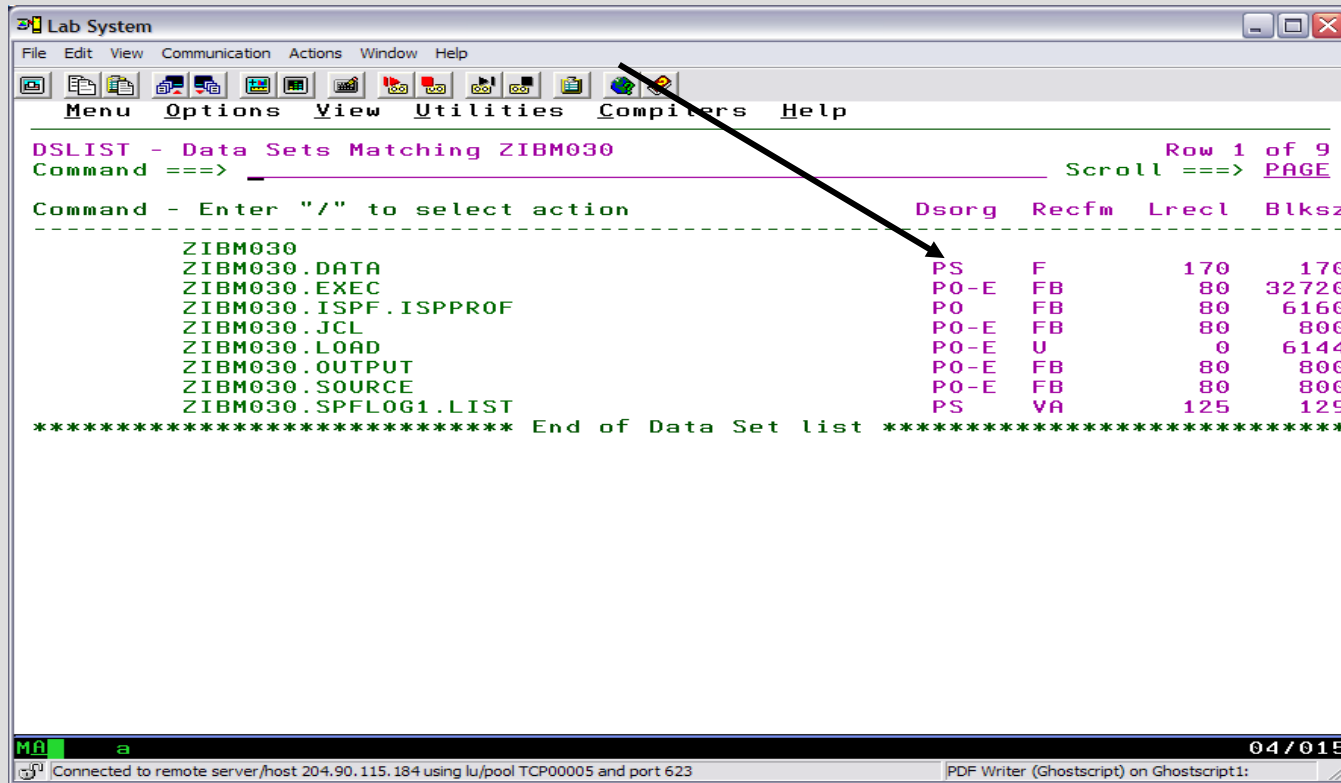
***** End of Data Set List *****

MA a 04/015

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PDF Writer (Ghostscript) on Ghostscript1:

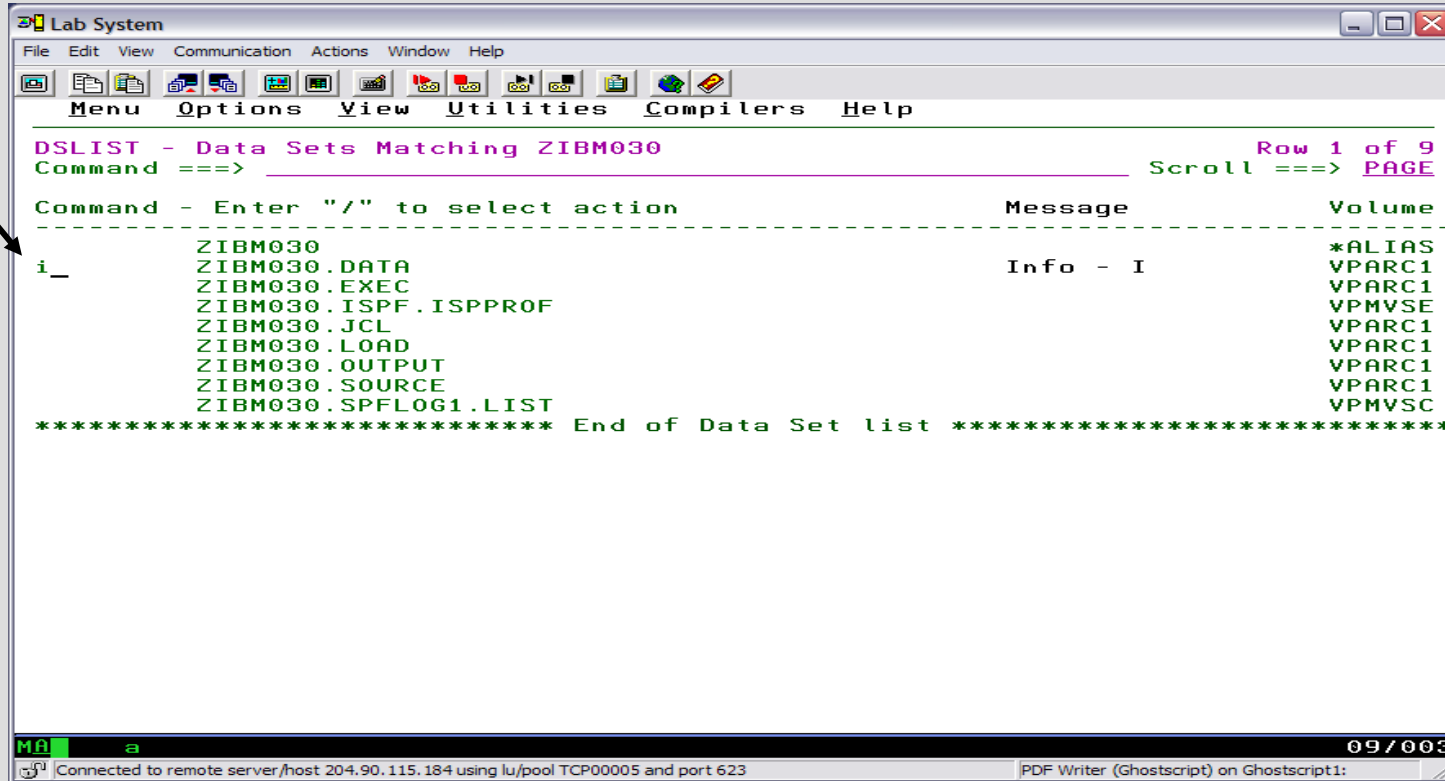
Data Set Names - Shift Right (F11)



```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Computers Help
DSLIST - Data Sets Matching ZIBM030 Row 1 of 9
Command ==> _____ Scroll ==> PAGE
Command - Enter "/" to select action
-----
ZIBM030
ZIBM030.DATA PS F 170 170
ZIBM030.EXEC P0-E FB 80 32720
ZIBM030.ISPF.ISPPROF P0 FB 80 6160
ZIBM030.JCL P0-E FB 80 800
ZIBM030.LOAD P0-E U 0 6144
ZIBM030.OUTPUT P0-E FB 80 800
ZIBM030.SOURCE P0-E FB 80 800
ZIBM030.SPFL0G1.LIST PS VA 125 129
***** End of Data Set list *****
```

04/015
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Data Set Names - Information

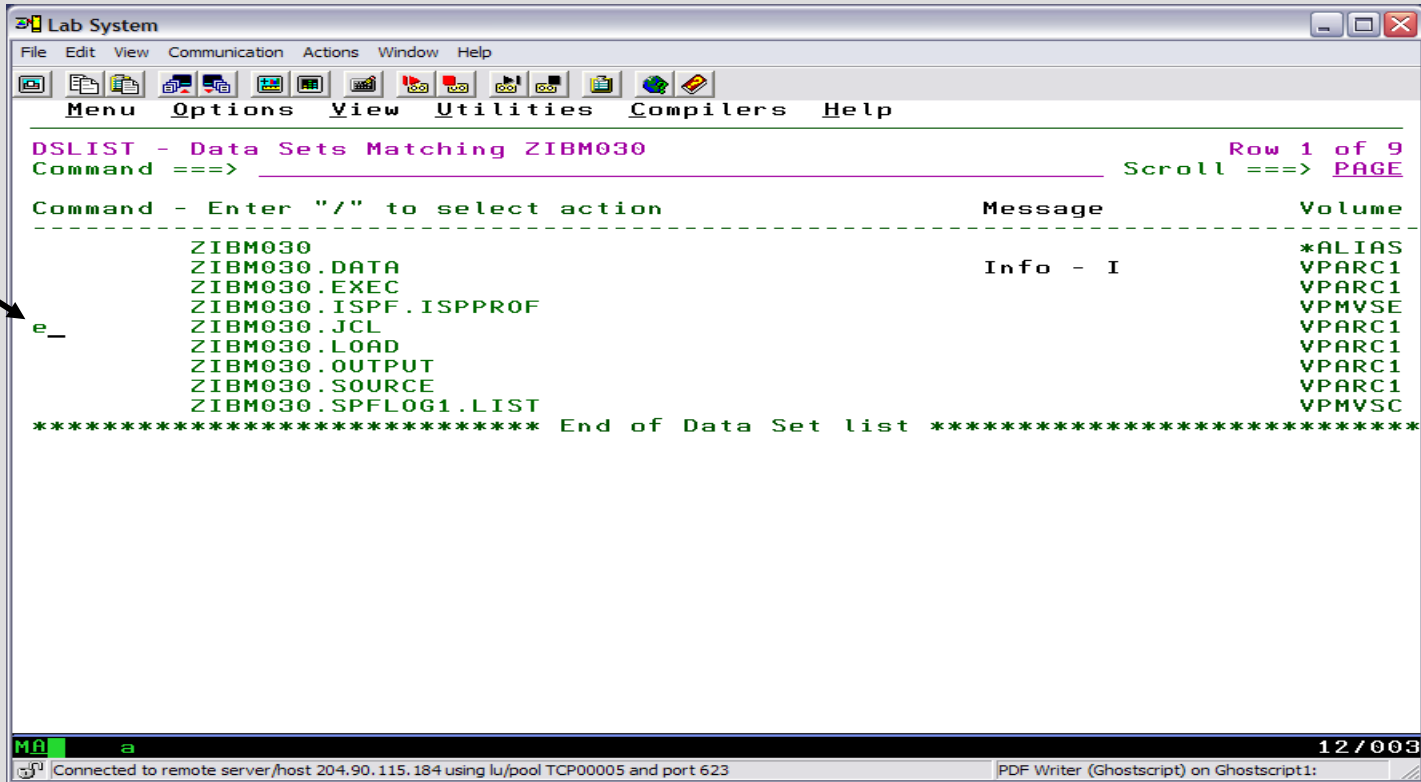


```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
DSSLIST - Data Sets Matching ZIBM030 Row 1 of 9
Command ==> Scroll ==> PAGE
Command - Enter "/" to select action Message Volume
-----
i_ ZIBM030 *ALIAS
ZIBM030.VPARC1 VPARC1
ZIBM030.EXEC VPARC1
ZIBM030.ISPF.ISPPROF VPMVSE
ZIBM030.JCL VPARC1
ZIBM030.LOAD VPARC1
ZIBM030.OUTPUT VPARC1
ZIBM030.SOURCE VPARC1
ZIBM030.SPFL0G1.LIST VPMVSC
***** End of Data Set list *****
M0 a 09/003
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623 PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names - Information

```
Lab System
File Edit View Communication Actions Window Help
Data Set Information
Command ==>
Data Set Name . . . : ZIBM030.DATA
General Data
Volume serial . . . : VPARC1
Device type . . . . : 3390
Organization . . . . : PS
Record format . . . . : F
Record length . . . . : 170
Block size . . . . . : 170
1st extent cylinders: 2
Secondary cylinders : 1
Current Allocation
Allocated cylinders : 2
Allocated extents . : 1
Current Utilization
Used cylinders . . . : 1
Used extents . . . . : 1
Creation date . . . . : 2007/03/24
Referenced date . . . : 2007/03/29
Expiration date . . . : ***None***
02/015
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names – Edit a Partitioned Data Set



```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
DSLIST - Data Sets Matching ZIBM030 Row 1 of 9
Command ==> Scroll ==> PAGE
Command - Enter "/" to select action Message Volume
-----
ZIBM030 *ALIAS
ZIBM030.DATA Info - I VPARC1
ZIBM030.EXEC VPARC1
ZIBM030.ISPF.ISPPROF VPMVSE
ZIBM030.JCL VPARC1
ZIBM030.LOAD VPARC1
ZIBM030.OUTPUT VPARC1
ZIBM030.SOURCE VPARC1
ZIBM030.SPFL0G1.LIST VPMVSC
***** End of Data Set list *****
e_
```

MA a 12/003

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Data Set Names – PDS members

```
Lab System
File Edit View Communication Actions Window Help
Menu Functions Confirm Utilities Help

EDIT ZIBM030.JCL Row 00001 of 00023
Command ==> Scroll ==> PAGE
Name Prompt Size Created Changed ID
-----
$README 118 2007/03/24 2007/03/24 17:29:51 IBMUSER
ALLOC 5 2007/03/24 2007/03/24 17:30:12 IBMUSER
ASMRUN
CBL0001J
CBL0002J
CBL0003J
CBL0004J
CBL0005J
CBL0006J
COBOLCL
COBRUN
CRUN
DB2TBLS
DEFVSAM 16 2007/03/24 2007/03/24 17:32:05 IBMUSER
S EDITTEST 4 2007/04/09 2007/04/09 14:34:54 ZIBM030
LOG1 20 2007/03/24 2007/03/24 17:32:25 IBMUSER
LOG2
LOG3 17 2007/03/24 2007/03/24 17:33:03 IBMUSER
LOG4
NETRPT 14 2007/03/24 2007/03/24 17:33:53 IBMUSER
SENDMSG 6 2007/03/24 2007/03/24 17:34:18 IBMUSER
SQL 35 2007/03/24 2007/03/24 17:34:34 IBMUSER
SQLJOB
**End**

MA a 20/003
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623 PDF Writer (Ghostscript) on Ghostscript1:
```


Data Set Names – Edit mode

```
Lab System
File Edit View Communication Actions Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT          ZIBM030.JCL(EDITTEST) - 01.01          Columns 00001 00072
Command ==> _                                     Scroll ==> CSR_
***** ***** Top of Data *****
==MSG> -Warning- The UNDO command is not available until you change
==MSG>         your edit profile using the command RECOVERY ON.
000330 123defghijklmnopqrstuvwxyz
000400     1234567890 `!@#%$&*()-=+_~|\{}|;:'",./<>?
000500 test line
000800 123defghijklmnopqrstuvwxyz
***** ***** Bottom of Data *****

MA a
04/015
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PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names – Disk Volume View

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList RefMode Utilities Help

Data Set List Utility

Option ==> _____

blank Display data set list          P Print data set list
V Display VTOC information           PV Print VTOC information

Enter one or both of the parameters below:
Dsname Level . . . _____
Volume serial . . . vparc1

Data set list options
Initial View . . . 1  1. Volume          Enter "/" to select option
                       2. Space           / Confirm Data Set Delete
                       3. Attrib         / Confirm Member Delete
                       4. Total          / Include Additional Qualifiers
                                       / Display Catalog Name

When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up,
an ISPF line command, the name of a TSO command, CLIST, or REXX exec, or
"=" to execute the previous command.

M0 a 10/024
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names – Disk Volume View

```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
DSLIST - Data Sets on volume VPARC1
Command ==> _
Row 1 of 181
Scroll ==> PAGE
Command - Enter "/" to select action
Message
-----
ACCOUNTS.DSNDBD.ACCOUNTS.ACCTTS.I0001.A001 VPARC1
ACCOUNTS.DSNDBD.ACCOUNTS.XCLIENT.I0001.A001 VPARC1
COUPLE.ATR.SVSCPLEX.ARCHIVE.A0000000.DATA VPARC1
COUPLE.ATR.SVSCPLEX.DELAYED.UR.A0000000.D VPARC1
COUPLE.ATR.SVSCPLEX.RESTART.A0000000.DATA VPARC1
COUPLE.ATR.SVSCPLEX.RESTART.SVSCPLEX.DATA VPARC1
COUPLE.ATR.SVSCPLEX.RM.DATA.SVSCPLEX.DATA VPARC1
DB2CHECK.WORK VPARC1
IBMUSER.DDIR.D VPARC1
IBMUSER.DDIR.I VPARC1
IBMUSER.ISPF.ISPPROF VPARC1
SYS1.VTOCIX.VPARC1 VPARC1
SYS1.VVDS.VVPARC1 VPARC1
ZIBM001.DATA VPARC1
ZIBM001.JCL VPARC1
ZIBM001.LOAD VPARC1
ZIBM001.OUTPUT VPARC1
ZIBM001.SOURCE VPARC1
ZIBM002.DATA VPARC1
ZIBM002.JCL VPARC1
ZIBM002.LOAD VPARC1
ZIBM002.OUTPUT VPARC1
ZIBM002.SOURCE VPARC1
ZIBM003.DATA VPARC1
ZIBM003.ISPF.ISPPROF VPARC1
MA a 04/015
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names – DSLIST Panel

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList RefMode Utilities Help

Data Set List Utility
Option ==> _____
blank Display data set list          P Print data set list
V Display VTOC information            PV Print VTOC information

Enter one or both of the parameters below:
Dsname Level . . . MVS
Volume serial . . . _____

Data set list options
Initial View . . . 1
1. Volume          Enter "/" to select option
2. Space           / Confirm Data Set Delete
3. Attrib          / Confirm Member Delete
4. Total           / Include Additional Qualifiers
                  / Display Catalog Name

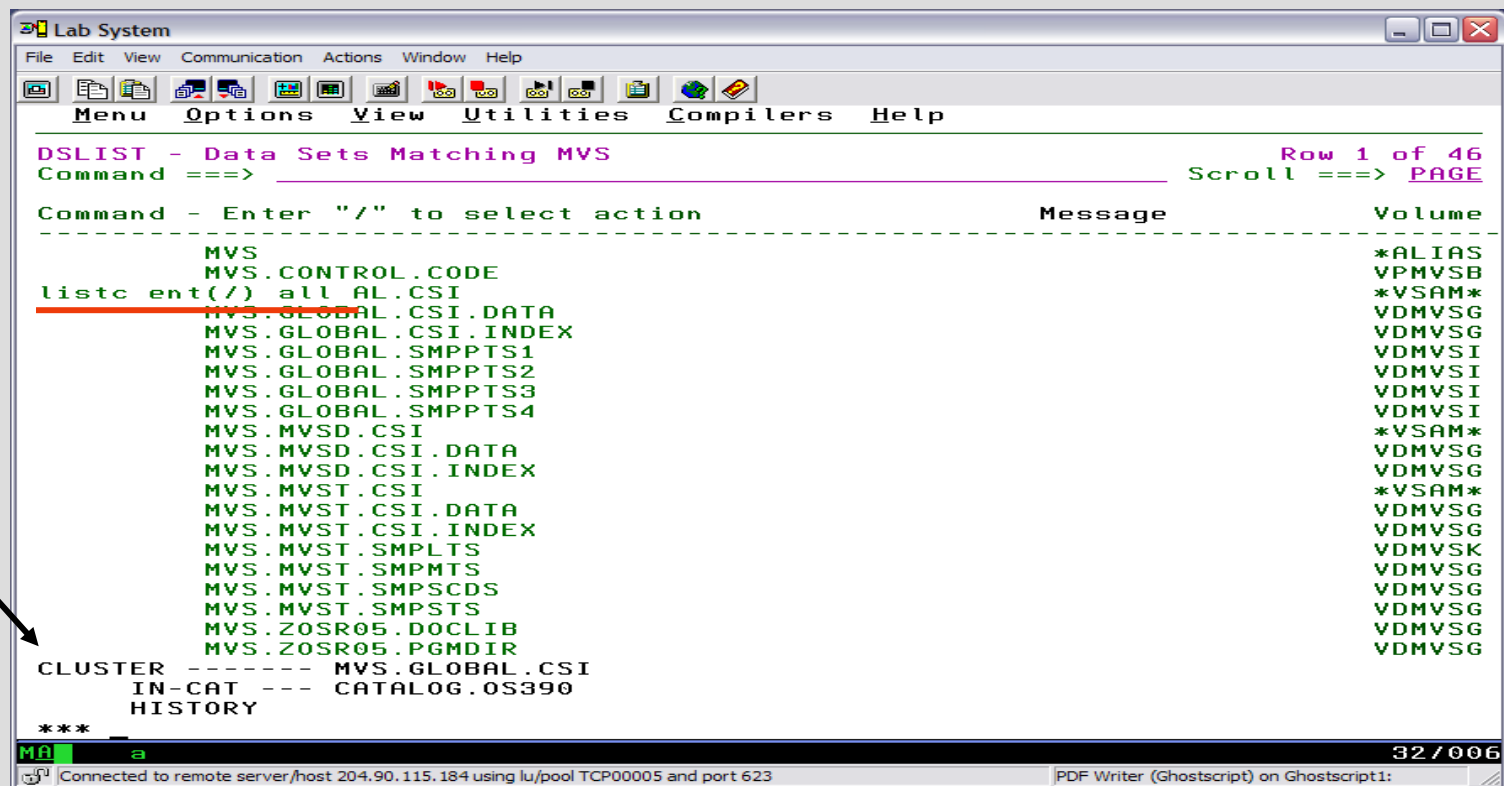
When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up,
an ISPF line command, the name of a TSO command, CLIST, or REXX exec, or
"=" to execute the previous command.

M  a 04/014
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PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names – DSLIST output

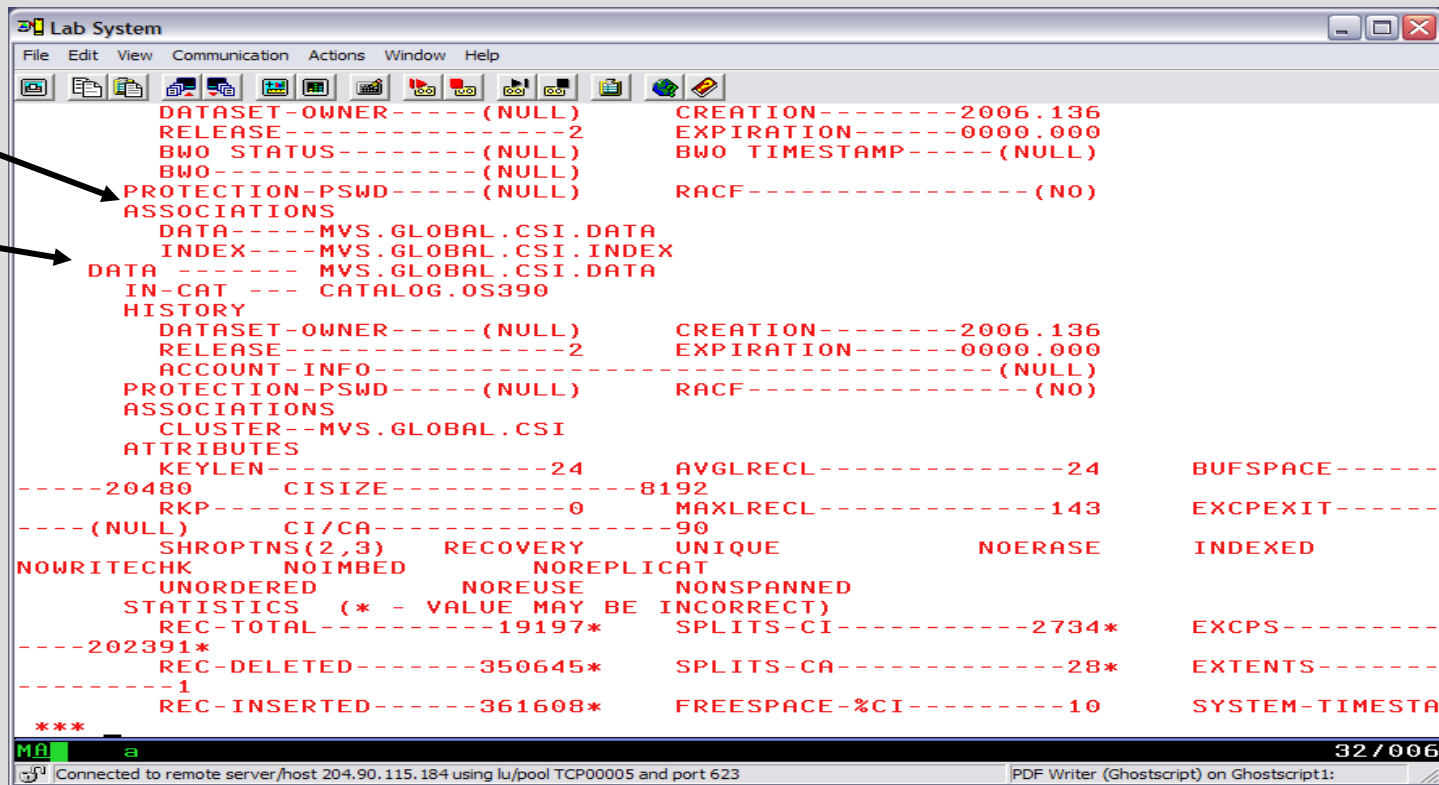
```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
DSLIST - Data Sets Matching MVS Row 1 of 46
Command ==> _____ Scroll ==> PAGE
Command - Enter "/" to select action Message Volume
-----
MVS *ALIAS
MVS.CONTROL.CODE VPMVSB
MVS.GLOBAL.CSI *VSAM*
MVS.GLOBAL.CSI.DATA VDMVSG
MVS.GLOBAL.CSI.INDEX VDMVSG
MVS.GLOBAL.SMPPTS1 VDMVSI
MVS.GLOBAL.SMPPTS2 VDMVSI
MVS.GLOBAL.SMPPTS3 VDMVSI
MVS.GLOBAL.SMPPTS4 VDMVSI
MVS.MVSD.CSI *VSAM*
MVS.MVSD.CSI.DATA VDMVSG
MVS.MVSD.CSI.INDEX VDMVSG
MVS.MVST.CSI *VSAM*
MVS.MVST.CSI.DATA VDMVSG
MVS.MVST.CSI.INDEX VDMVSG
MVS.MVST.SMPLTS VDMVSK
MVS.MVST.SMPMTS VDMVSG
MVS.MVST.SMPSCDS VDMVSG
MVS.MVST.SMPSTS VDMVSG
MVS.ZOSR05.DOCLIB VDMVSG
MVS.ZOSR05.PGMDIR VDMVSG
MVS.ZOSR05.PGMDIR.PDF VDMVSL
MVS.ZOSR05.RIMLIB VDMVSG
MVS.ZOSR06.A.SAMPJCL VDMVSL
MVS.ZOSR06.DOCLIB VDMVSG
MA a 10/002
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```

Data Set Names – LIST Catalog Entry (LISTC ENT)



```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
DSLIST - Data Sets Matching MVS Row 1 of 46
Command ==> Scroll ==> PAGE
Command - Enter "/" to select action Message Volume
-----
MVS *ALIAS
MVS.CONTROL.CODE VPMVSB
listc ent(/) all AL.CSI *VSAM*
MVS.GLOBAL.CSI.DATA VDMVSG
MVS.GLOBAL.CSI.INDEX VDMVSG
MVS.GLOBAL.SMPPTS1 VDMVSI
MVS.GLOBAL.SMPPTS2 VDMVSI
MVS.GLOBAL.SMPPTS3 VDMVSI
MVS.GLOBAL.SMPPTS4 VDMVSI
MVS.MVSD.CSI *VSAM*
MVS.MVSD.CSI.DATA VDMVSG
MVS.MVSD.CSI.INDEX VDMVSG
MVS.MVST.CSI *VSAM*
MVS.MVST.CSI.DATA VDMVSG
MVS.MVST.CSI.INDEX VDMVSG
MVS.MVST.SMPLTS VDMVSK
MVS.MVST.SMPMTS VDMVSG
MVS.MVST.SMPSCDS VDMVSG
MVS.MVST.SMPSTS VDMVSG
MVS.ZOSR05.DOCLIB VDMVSG
MVS.ZOSR05.PGMDIR VDMVSG
CLUSTER ----- MVS.GLOBAL.CSI
IN-CAT --- CATALOG.OS390
HISTORY
***
MA a 32/006
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623 PDF Writer (Ghostscript) on Ghostscript:
```

Data Set Names – VSAM Information

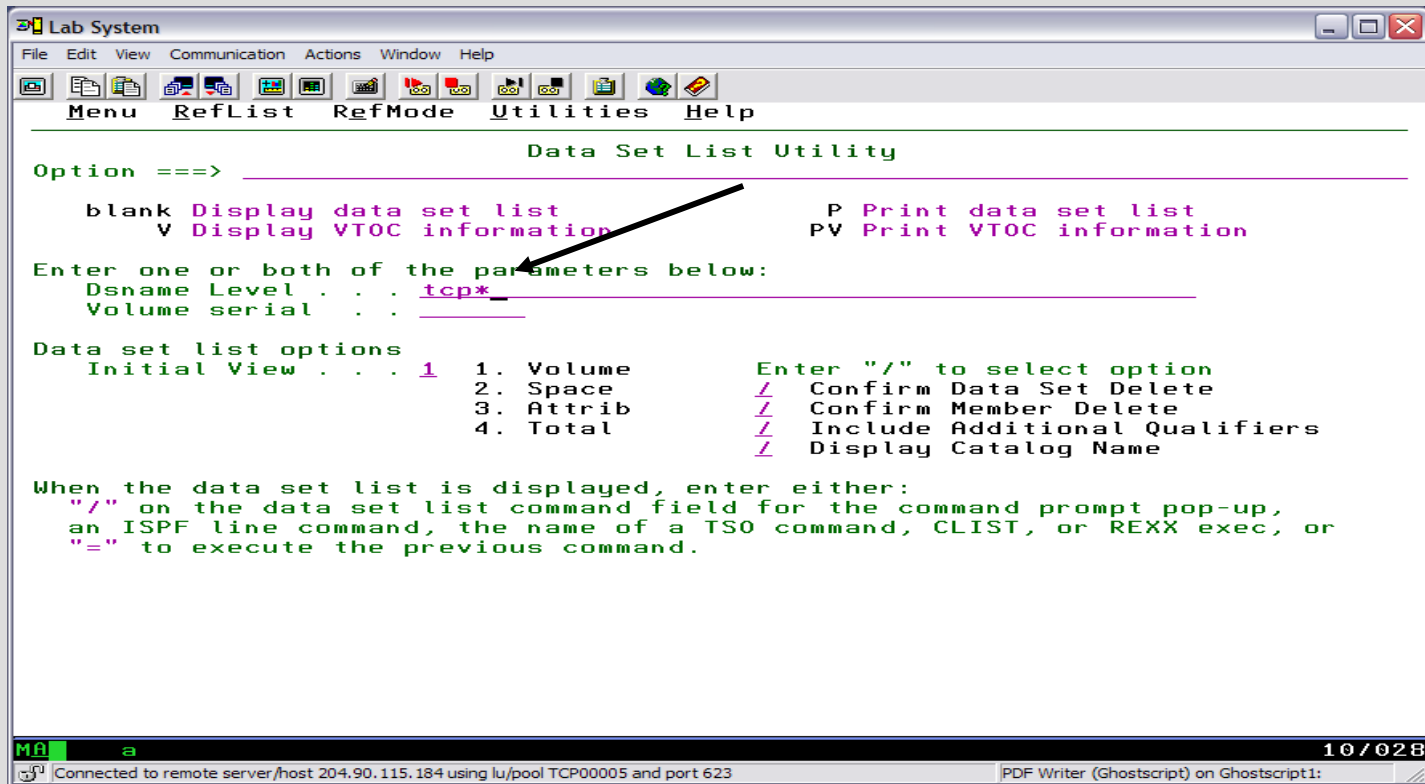


```
Lab System
File Edit View Communication Actions Window Help
[Icons]
DATASET-OWNER----- (NULL)      CREATION-----2006.136
RELEASE-----2          EXPIRATION-----0000.000
BWO STATUS----- (NULL)      BWO TIMESTAMP----- (NULL)
BWO----- (NULL)
PROTECTION-PSWD----- (NULL)   RACF----- (NO)
ASSOCIATIONS
  DATA-----MVS.GLOBAL.CSI.DATA
  INDEX-----MVS.GLOBAL.CSI.INDEX
DATA -----MVS.GLOBAL.CSI.DATA
IN-CAT --- CATALOG.OS390
HISTORY
  DATASET-OWNER----- (NULL)      CREATION-----2006.136
  RELEASE-----2          EXPIRATION-----0000.000
  ACCOUNT-INFO----- (NULL)
  PROTECTION-PSWD----- (NULL)   RACF----- (NO)
  ASSOCIATIONS
  CLUSTER--MVS.GLOBAL.CSI
ATTRIBUTES
  KEYLEN-----24          AVGLRECL-----24          BUFSPACE-----
-----20480          CISIZE-----8192
  RKP-----0          MAXLRECL-----143          EXCPEXIT-----
---- (NULL)          CI/CA-----90
  SHROPTNS(2,3)  RECOVERY  UNIQUE          NOERASE          INDEXED
NOWRITECHK  NOIMBED  NOREPLICAT
  UNORDERED          NOREUSE          NONSPANNED
  STATISTICS (* - VALUE MAY BE INCORRECT)
  REC-TOTAL-----19197*      SPLITS-CI-----2734*      EXCPS-----
-----202391*
  REC-DELETED-----350645*    SPLITS-CA-----28*      EXTENTS-----
-----1
  REC-INSERTED-----361608*    FREESPACE-%CI-----10    SYSTEM-TIMESTA
***
MA a 32/006
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PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names – VSAM Information

```
Lab System
File Edit View Communication Actions Window Help
MP:
A06B1A003' REC-UPDATED-----0*      FREESPACE-%CA-----5          X'C06D366
REC-RETRIEVED---14112505*      FREESPC-----45031424*
ALLOCATION
SPACE-TYPE-----CYLINDER      HI-A-RBA-----48660480
SPACE-PRI-----66            HI-U-RBA-----21381120
SPACE-SEC-----5
VOLUME
VOLSER-----VDMVSG            PHYREC-SIZE-----8192          HI-A-RBA-----
--48660480  EXTENT-NUMBER-----1
DEVTYPE-----X'3010200F'      PHYRECS/TRK-----6          HI-U-RBA-----
--21381120  EXTENT-TYPE-----X'00'
VOLFLAG-----PRIME            TRACKS/CA-----15
EXTENTS:
LOW-CCHH-----X'00EE0000'     LOW-RBA-----0              TRACKS-----
-----990
HIGH-CCHH----X'012F000E'      HIGH-RBA-----48660479
INDEX -----MVS.GLOBAL.CSI.INDEX
IN-CAT --- CATALOG.OS390
HISTORY
DATASET-OWNER----- (NULL)      CREATION-----2006.136
RELEASE-----2              EXPIRATION-----0000.000
PROTECTION-PSWD----- (NULL)    RACF----- (NO)
ASSOCIATIONS
CLUSTER--MVS.GLOBAL.CSI
ATTRIBUTES
KEYLEN-----24              AVGLRECL-----0              BUFSPACE-----
-----0  CISIZE-----4096
RKP-----0              MAXLRECL-----4089          EXCPEXIT-----
---- (NULL)  CI/CA-----12
***
MA a 32/006
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```


Data Set Names – DSLIST wildcards



```
Lab System
File Edit View Communication Actions Window Help
Menu RefList RefMode Utilities Help

Data Set List Utility
Option ==>
blank Display data set list          P Print data set list
V Display VTOC information           PV Print VTOC information

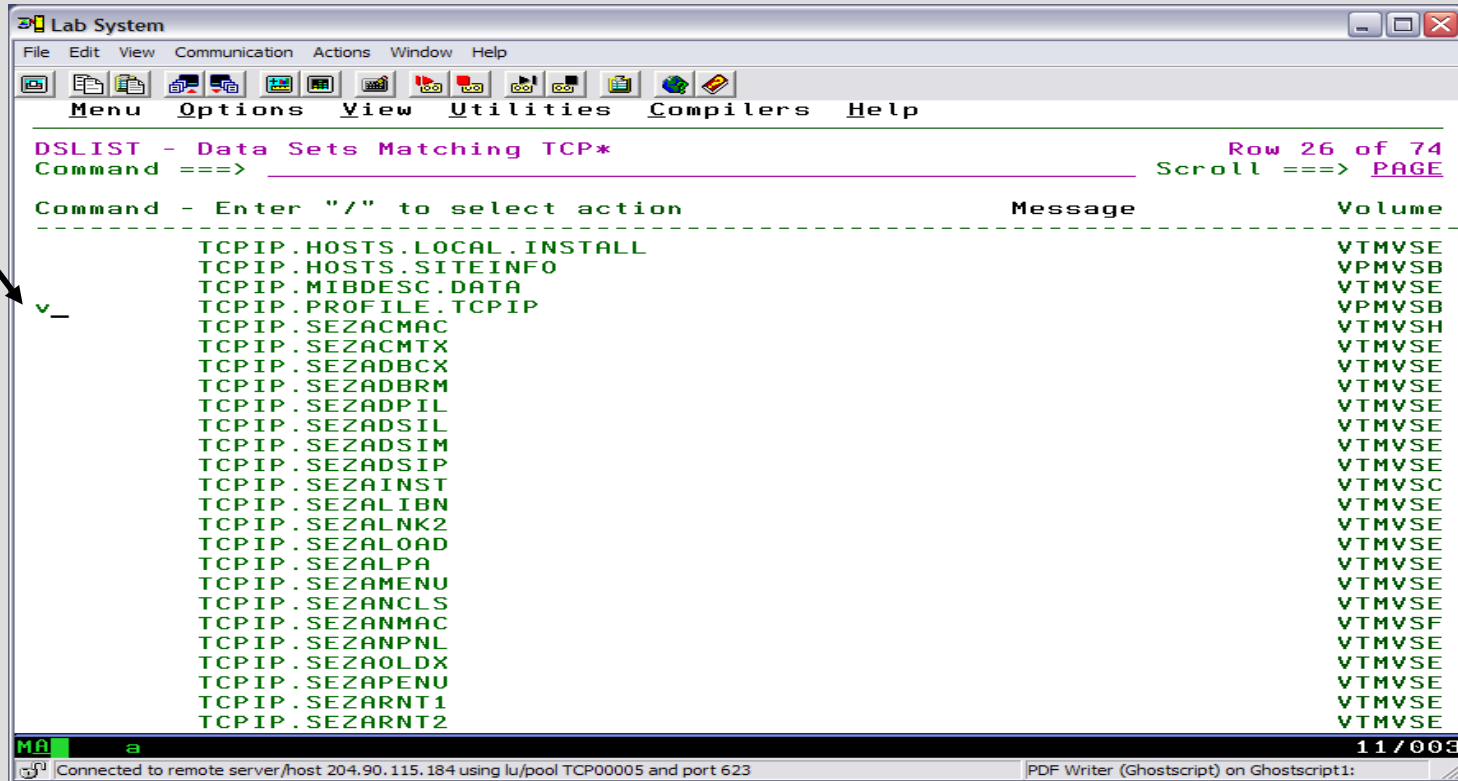
Enter one or both of the parameters below:
Dsname Level . . . tcp*
Volume serial . . .

Data set list options
Initial View . . . 1
1. Volume          Enter "/" to select option
2. Space           / Confirm Data Set Delete
3. Attrib         / Confirm Member Delete
4. Total          / Include Additional Qualifiers
                 / Display Catalog Name

When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up,
an ISPF line command, the name of a TSO command, CLIST, or REXX exec, or
"=" to execute the previous command.
```

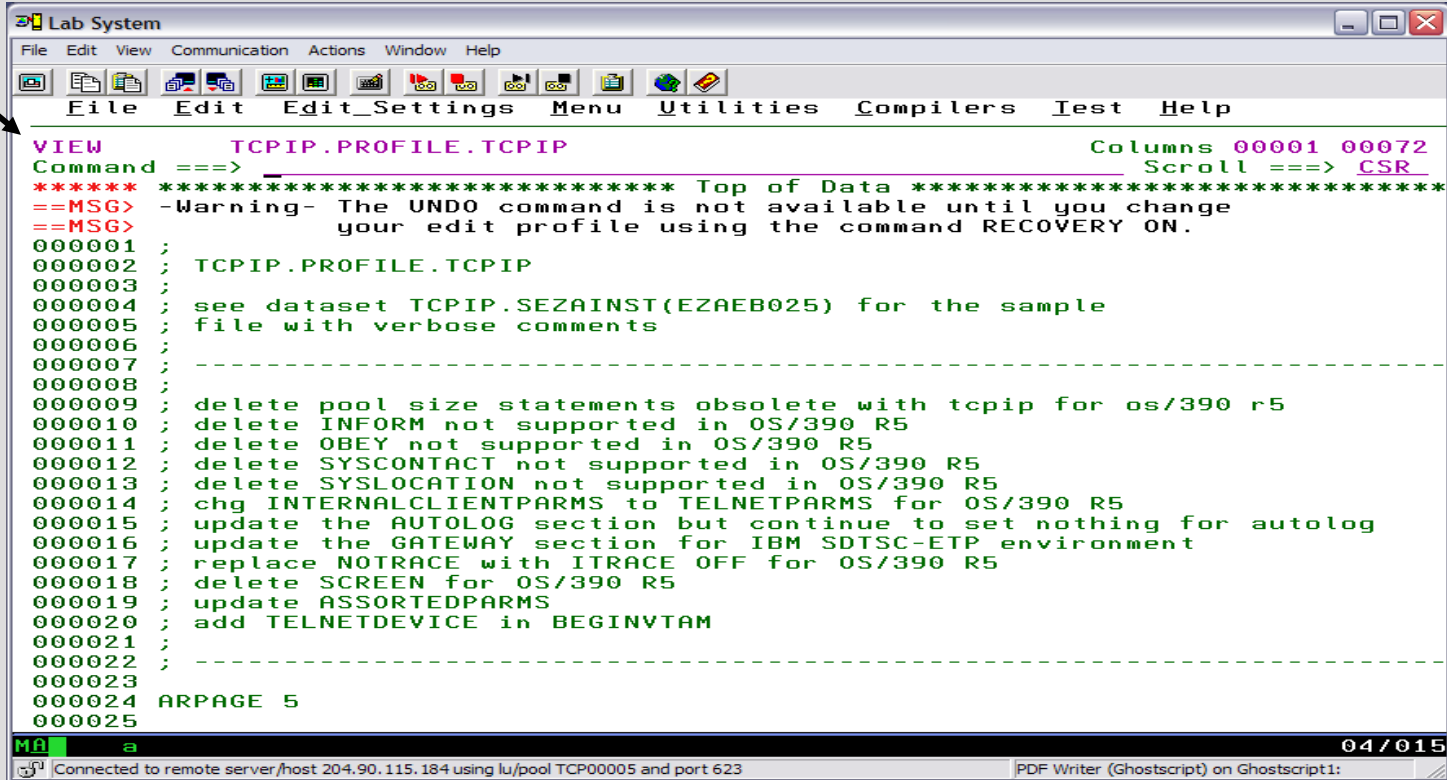
MA a 10/028
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

Data Set Names – View mode



```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
DSLIST - Data Sets Matching TCP* Row 26 of 74
Command ==> Scroll ==> PAGE
Command - Enter "/" to select action Message Volume
-----
TCPIP.HOSTS.LOCAL.INSTALL VTMVSE
TCPIP.HOSTS.SITEINFO VPMVSB
TCPIP.MIBDESC.DATA VTMVSE
v_ TCPIP.PROFILE.TCPIP VPMVSB
TCPIP.SEZACMAC VTMVSH
TCPIP.SEZACMTX VTMVSE
TCPIP.SEZADBCX VTMVSE
TCPIP.SEZADBRM VTMVSE
TCPIP.SEZADPIL VTMVSE
TCPIP.SEZADSIL VTMVSE
TCPIP.SEZADSIM VTMVSE
TCPIP.SEZADSIP VTMVSE
TCPIP.SEZAINST VTMVSC
TCPIP.SEZALIBN VTMVSE
TCPIP.SEZALNK2 VTMVSE
TCPIP.SEZALOAD VTMVSE
TCPIP.SEZALPA VTMVSE
TCPIP.SEZAMENU VTMVSE
TCPIP.SEZANCLS VTMVSE
TCPIP.SEZANMAC VTMVSF
TCPIP.SEZANPNL VTMVSE
TCPIP.SEZAOLDX VTMVSE
TCPIP.SEZAPENU VTMVSE
TCPIP.SEZARNT1 VTMVSE
TCPIP.SEZARNT2 VTMVSE
Mn a 11/003
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

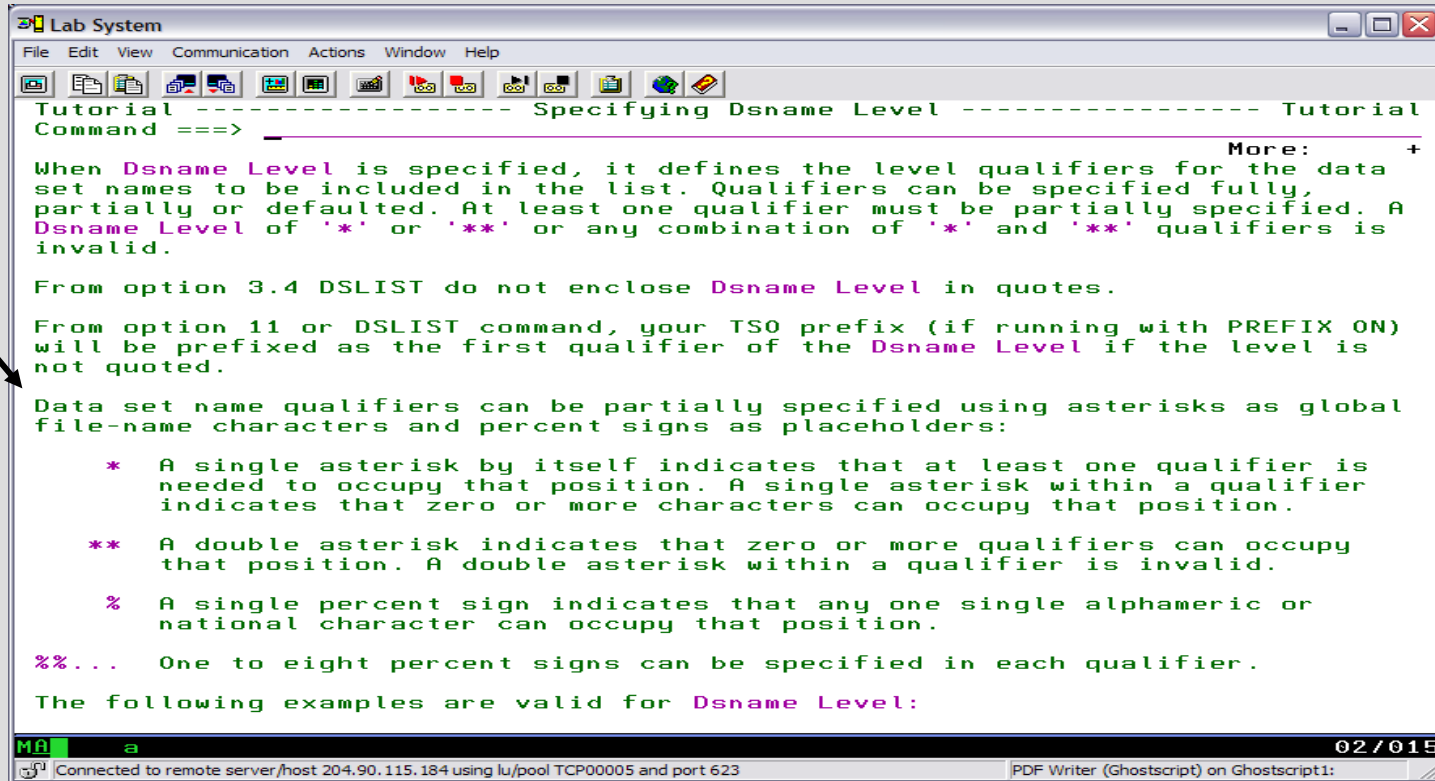
Data Set Names – View mode



```
Lab System
File Edit View Communication Actions Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW          TCPIP.PROFILE.TCPIP          Columns 00001 00072
Command ==>> _____ Scroll ==>> CSR
***** Top of Data *****
==MSG> -Warning- The UNDO command is not available until you change
==MSG>         your edit profile using the command RECOVERY ON.
000001 ;
000002 ; TCPIP.PROFILE.TCPIP
000003 ;
000004 ; see dataset TCPIP.SEZAINST(EZAEB025) for the sample
000005 ; file with verbose comments
000006 ;
000007 ; -----
000008 ;
000009 ; delete pool size statements obsolete with tcpip for os/390 r5
000010 ; delete INFORM not supported in OS/390 R5
000011 ; delete OBEY not supported in OS/390 R5
000012 ; delete SYSCONTACT not supported in OS/390 R5
000013 ; delete SYSLOCATION not supported in OS/390 R5
000014 ; chg INTERNALCLIENTPARMS to TELNETPARMS for OS/390 R5
000015 ; update the AUTOLOG section but continue to set nothing for autolog
000016 ; update the GATEWAY section for IBM SDTSC-ETP environment
000017 ; replace NOTRACE with ITRACE OFF for OS/390 R5
000018 ; delete SCREEN for OS/390 R5
000019 ; update ASSORTEDPARMS
000020 ; add TELNETDEVICE in BEGINVTAM
000021 ;
000022 ; -----
000023
000024 ARPAGE 5
000025

MA a 04/015
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Data Set Names – DSLIST wildcard help (F1)



```
Lab System
File Edit View Communication Actions Window Help
Tutorial ----- Specifying Dsname Level ----- Tutorial
Command ==> _____ More: +
When Dsname Level is specified, it defines the level qualifiers for the data
set names to be included in the list. Qualifiers can be specified fully,
partially or defaulted. At least one qualifier must be partially specified. A
Dsname Level of '*' or '**' or any combination of '*' and '**' qualifiers is
invalid.
From option 3.4 DSLIST do not enclose Dsname Level in quotes.
From option 11 or DSLIST command, your TSO prefix (if running with PREFIX ON)
will be prefixed as the first qualifier of the Dsname Level if the level is
not quoted.
Data set name qualifiers can be partially specified using asterisks as global
file-name characters and percent signs as placeholders:
* A single asterisk by itself indicates that at least one qualifier is
needed to occupy that position. A single asterisk within a qualifier
indicates that zero or more characters can occupy that position.
** A double asterisk indicates that zero or more qualifiers can occupy
that position. A double asterisk within a qualifier is invalid.
% A single percent sign indicates that any one single alphameric or
national character can occupy that position.
%%... One to eight percent signs can be specified in each qualifier.
The following examples are valid for Dsname Level:
```

MA a 02/015
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

Catalog and VTOC

z/OS uses a catalog and a volume table of contents (VTOC) on each DASD volume to manage the storage and placement of data sets.

A catalog is a data set used to store location information about other data sets.

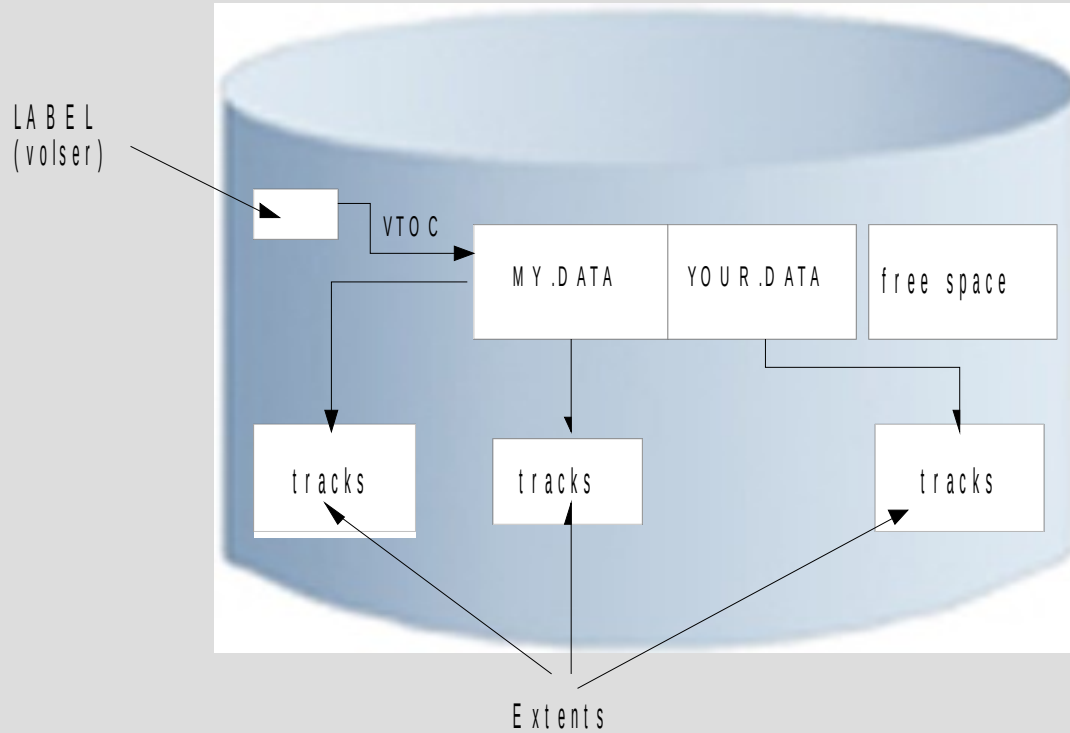
VTOC:

- Lists the data sets on a volume

- Lists the free space on the volume.

***Note:** Another special data set (VSAM Volume Data Set – VVDS) is stored on a disk volume which contains VSAM data sets. The VVDS entries include VSAM Volume Records (VVRs) to relate elements of a VSAM data set name.

VTOC (Volume Table of Contents)



Catalog - What is a z/OS Catalog?

A catalog is a VSAM data set with information about other data sets.

Catalog records associate a data set name with disk or tape volume.

Locating a data set requires:

- Data set name

- Volume name

- Unit (volume device type)

Typical z/OS system includes a master catalog and numerous user catalogs.

An 'alias' entry is defined in the master catalog to direct the master catalog to look into a specifically 'related' user catalog for the all data sets names beginning with that 'alias' (aka HLQ) as the first node of the data set name.

Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
  Display Filter View Print Options Help
-----
SDSF SYSLOG 4346.101 S0W1 S0W1 04/20/2007 0W 5012 COLUMNS 51 130
COMMAND INPUT ==> SCROLL ==> CSR
0090 F CATALOG,OPEN
0090 IEC351I CATALOG ADDRESS SPACE MODIFY COMMAND ACTIVE
0090 IEC348I ALLOCATED CATALOGS 328
0090 *CAS*****
0090 * FLAGS -VOLSER-USER-CATALOG NAME % *
0090 * Y-I--- VPMVSB 0001 CATALOG.USERAA 1 *
0090 * Y--A-- VPMVSB 0001 CATALOG.VOLCAT.VGENERAL 1 *
0090 * Y-I--- VPDFHB 0001 CATALOG.DFH310 1 *
0090 * Y-I--- VPMQ6A 0001 CATALOG.CSQ600 1 *
0090 * Y-I--- VPI91A 0001 CATALOG.IMS910 1 *
0090 * Y-I--- VPM53A 0001 CATALOG.CSQ531 1 *
0090 * Y-I--- VDJVAB 0001 CATALOG.JVA140 1 *
0090 * Y-I--- VDIGYC 0001 CATALOG.IGY320 1 *
0090 * Y-I--- VDIELC 0001 CATALOG.IEL320 1 *
0090 * Y-I--- VPD81A 0001 CATALOG.DSN810 1 *
0090 * Y-I--- VPMVSB 0001 CATALOG.MVS1 1 *
0090 * Y-I--- VDDITA 0001 CATALOG.DIT130 1 *
0090 * Y-I--- VPMVSB 0001 CATALOG.OMVS 1 *
0090 * Y-I--- VDEQAB 0001 CATALOG.EQA410 1 *
0090 * Y-I--- VPMVSB 0001 CATALOG.OS390 1 *
0090 * Y-I--- VPW60A 0001 CATALOG.WAS601 1 *
0090 * Y-I--- VPMVSB 0001 MASTERV.CATALOG 1 *
0090 *****
0090 * Y/N-ALLOCATED TO CAS, S-SMS, V-VLF, I-ISC, C-CLOSED, D-DELETED, *
0090 * R-SHARED, A-ATL, E-ECS SHARED, K-LOCKED *
0090 *CAS*****
0090 IEC352I CATALOG ADDRESS SPACE MODIFY COMMAND COMPLETED
*****
***** BOTTOM OF DATA *****
MA a 04/021
Connected to remote server/host 204.90.115.184 using lu/pool TCP00008 and port 623 PDF Writer (Ghostscript) on Ghostscript1:
```


Catalog Structure

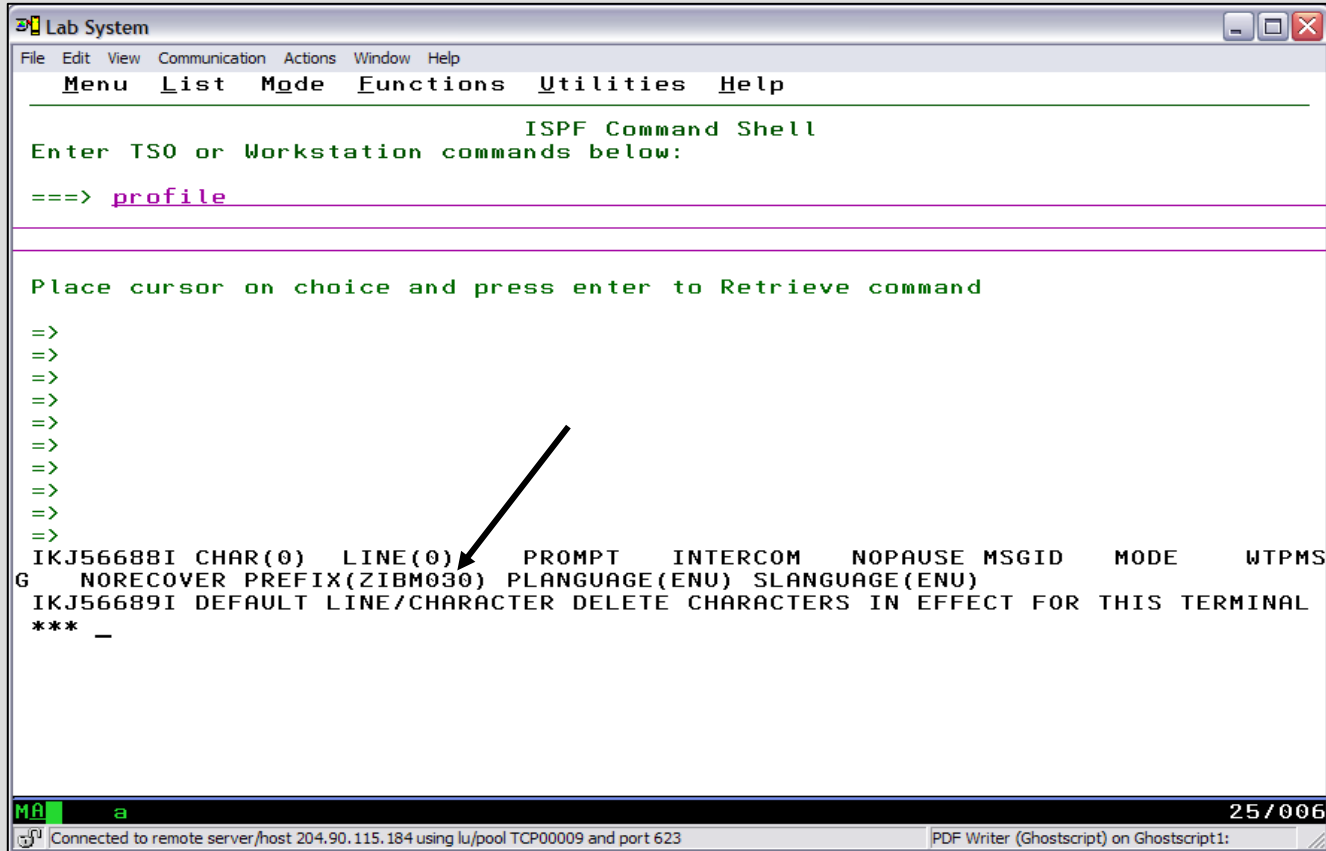
```
Lab System
File Edit View Communication Actions Window Help
Menu Utilities Compilers Options Status Help
-----
ISPF Primary Option Menu
Option ==> 6_
More: +
0 Settings Terminal and user parameters User ID . : ZIBM030
1 View Display source data or listings Time . . . : 11:20
2 Edit Create or change source data Terminal . : 3278
3 Utilities Perform utility functions Screen . . : 1
4 Foreground Interactive language processing Language . : ENGLISH
5 Batch Submit job for language processing Appl ID . : ISR
6 Command Enter TSO or Workstation commands TSO logon : SPFPROCE
7 Dialog Test Perform dialog testing TSO prefix: ZIBM030
8 LM Facility Library administrator functions System ID : S0W1
9 IBM Products IBM program development products MVS acct. : FB3
10 SCLM SW Configuration Library Manager Release . : ISPF 5.6
11 Workplace ISPF Object/Action Workplace

----- Other Install Products -----

SD SDSF System Display and Search Facility
IP IPCS Inter Problem Control Facility
IS ISMF Inter Storage Management Facility
SM SMP/E SMP/E and CBIPO Dialogs
HC HCD HW Configuration Definition Dialog
R RACF Resource Access Control Facility
S DFSORT Data Facility Sort
OE OEDIT OpenEdition MVS Edit files
OB OBROWSE OpenEdition MVS Browse files
OS OSHELL OpenEdition MVS ISPF Shell

Enter X to Terminate using log/list defaults
MA a 04/015
Connected to remote server /host 204.90.115.184 using lu/pool TCP00008 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure



```
Lab System
File Edit View Communication Actions Window Help
  Menu List Mode Functions Utilities Help
      ISPF Command Shell
Enter TSO or Workstation commands below:
===> profile

Place cursor on choice and press enter to Retrieve command

=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
IKJ56688I CHAR(0) LINE(0) PROMPT INTERCOM NOPAUSE MSGID MODE WTPMS
G NORECOVER PREFIX(ZIBM030) PLANGUAGE(ENU) SLANGUAGE(ENU)
IKJ56689I DEFAULT LINE/CHARACTER DELETE CHARACTERS IN EFFECT FOR THIS TERMINAL
*** _

MA a 25/006
Connected to remote server/host 204.90.115.184 using lu/pool TCP00009 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```


Catalog Structure – List Catalog Information

The screenshot shows a terminal window titled "Lab System" with a menu bar (File, Edit, View, Communication, Actions, Window, Help). The main area displays a list of catalog entries in red text:

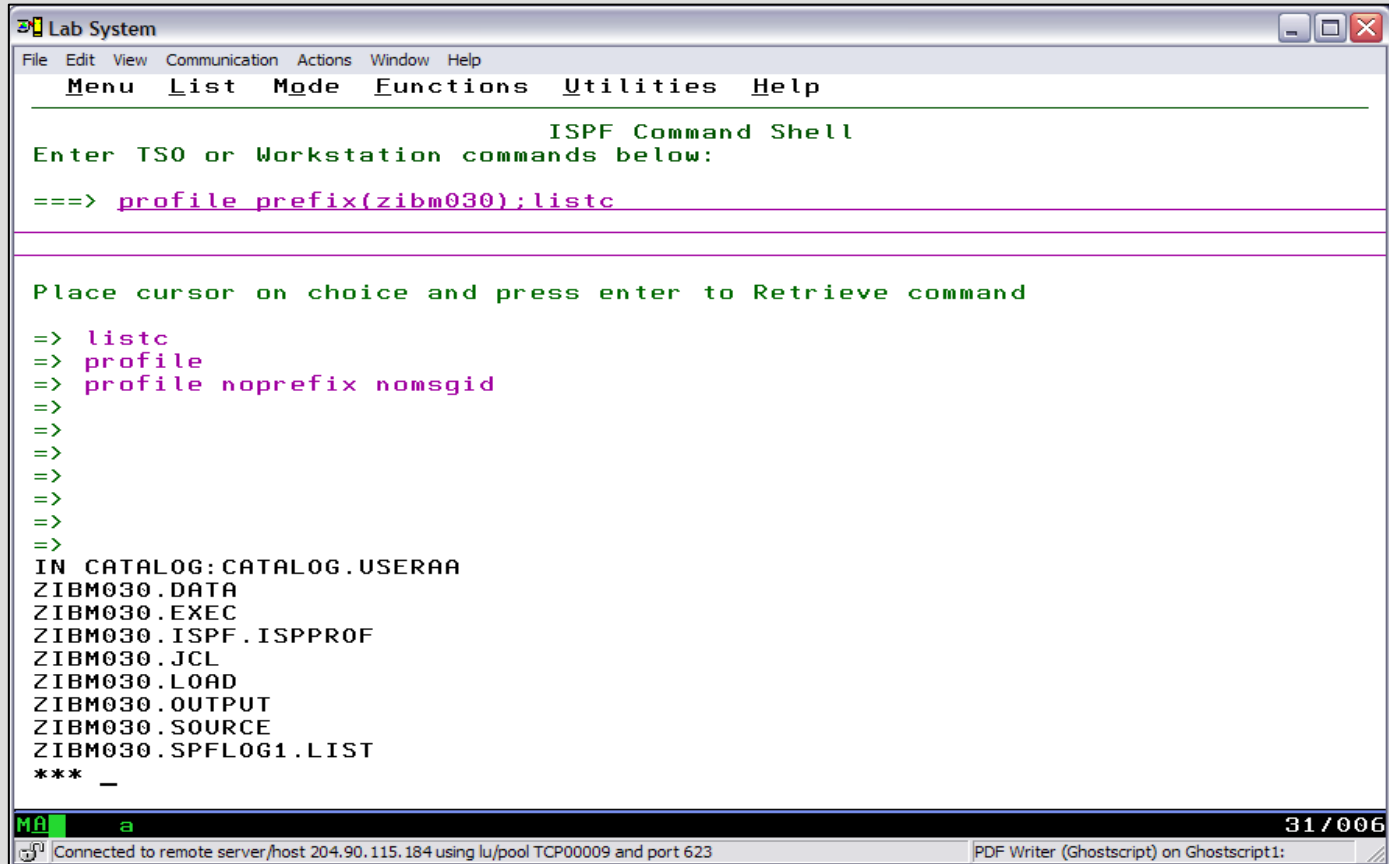
```
NONVSAM ----- AOP.AAOPMOD1
NONVSAM ----- AOP.AAOPPENU
NONVSAM ----- AOP.SAOPEXEC
NONVSAM ----- AOP.SAOPMENU
NONVSAM ----- AOP.SAOPPENU
ALIAS ----- API
ALIAS ----- ASU
ALIAS ----- BFS
ALIAS ----- BLIN
NONVSAM ----- BPA.ABPAHFS
NONVSAM ----- CALLLIBS.DUMMY
USERCATALOG --- CATALOG.CSQ520
USERCATALOG --- CATALOG.CSQ531
USERCATALOG --- CATALOG.CSQ600
USERCATALOG --- CATALOG.DFH310
USERCATALOG --- CATALOG.DIT130
USERCATALOG --- CATALOG.DSN810
USERCATALOG --- CATALOG.EQA410
USERCATALOG --- CATALOG.FAN140
USERCATALOG --- CATALOG.IEL320
USERCATALOG --- CATALOG.IGT320
USERCATALOG --- CATALOG.IMS910
USERCATALOG --- CATALOG.JVA140
USERCATALOG --- CATALOG.MVS1
USERCATALOG --- CATALOG.OMVS
USERCATALOG --- CATALOG.OS390
USERCATALOG --- CATALOG.USERAA
USERCATALOG --- CATALOG.VOLCAT.VGENERAL
USERCATALOG --- CATALOG.WAS601
USERCATALOG --- CATALOG.ZOS
ALIAS ----- CBC
***
```

Overlaid on the terminal is a control panel with the following buttons and options:

- PA1 (highlighted with a black arrow)
- PA2
- Clear
- Reset
- ErEOF
- Erlnp
- Attn
- SysRq
- Radio buttons for Pad 1 (selected) and Pad 2

At the bottom of the terminal window, there is a status bar showing "MA a" on the left, "32/006" on the right, and a connection message: "Connected to remote server/host 204.90.115.184 using lu/pool TCP00009 and port 623". A PDF Writer (Ghostscript) on Ghostscript1: is also visible in the bottom right corner.

Catalog Structure – List Catalog Information



```
Lab System
File Edit View Communication Actions Window Help
  Menu List Mode Functions Utilities Help
      ISPF Command Shell
Enter TSO or Workstation commands below:
===> profile prefix(zibm030):listc

Place cursor on choice and press enter to Retrieve command

=> listc
=> profile
=> profile noprefix nomsgid
=>
=>
=>
=>
=>
=>
=>
=>
IN CATALOG: CATALOG.USERAA
ZIBM030.DATA
ZIBM030.EXEC
ZIBM030.ISPF.ISPPROF
ZIBM030.JCL
ZIBM030.LOAD
ZIBM030.OUTPUT
ZIBM030.SOURCE
ZIBM030.SPFL0G1.LIST
*** _
```

MA a 31/006

Connected to remote server /host 204.90.115.184 using lu/pool TCP00009 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

Catalog Structure – List Catalog Information

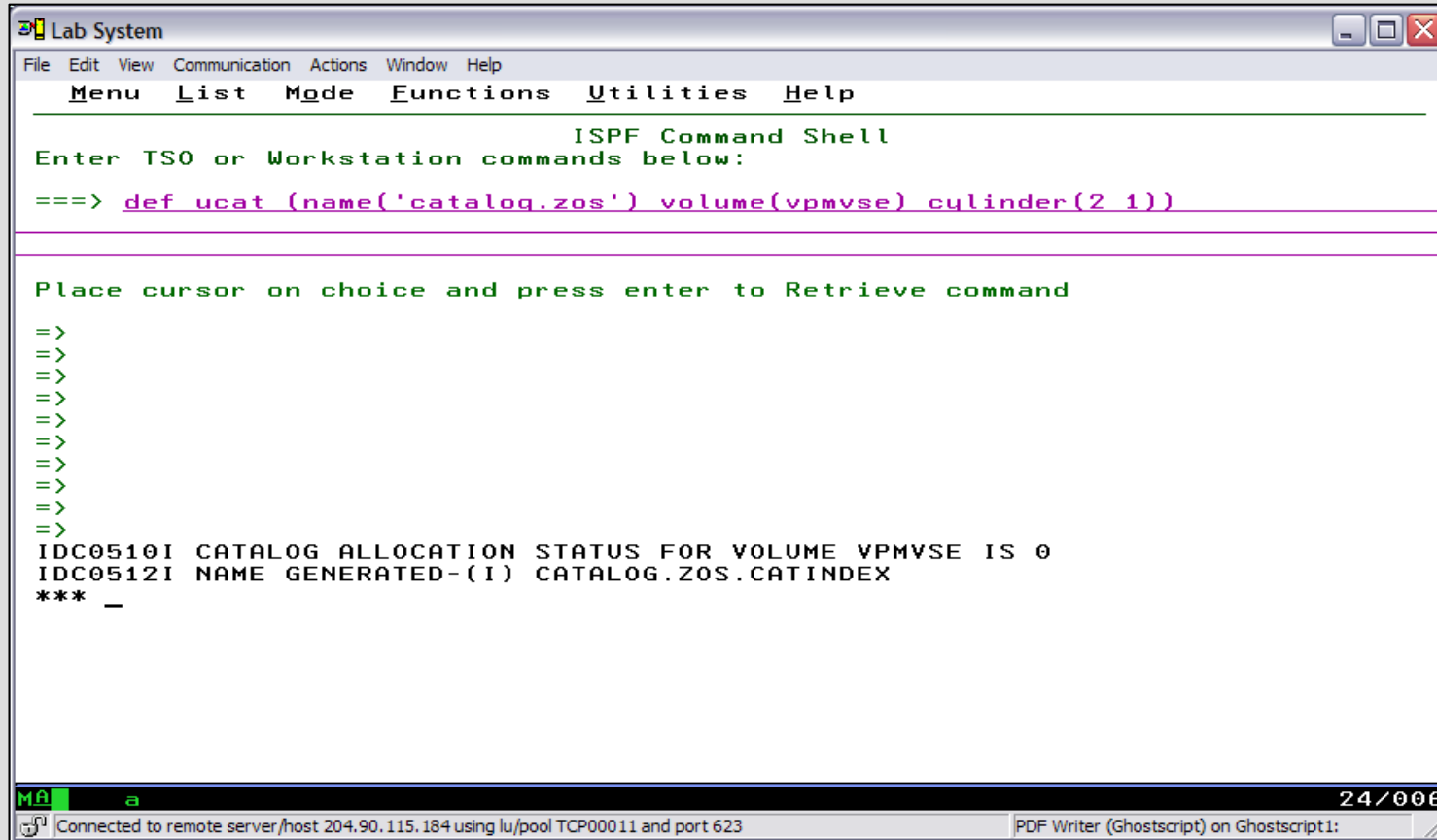
```
Lab System
File Edit View Communication Actions Window Help
  Menu List Mode Functions Utilities Help
      ISPF Command Shell
Enter TSO or Workstation commands below:
====> profile noprefix;listc alias all

Place cursor on choice and press enter to Retrieve command

=> listc alias all
=> listc
=> profile prefix(zibm030)
=> profile
=> profile noprefix nomsgid
=>
=>
=>
=>
ALIAS ----- ACCOUNTS
  HISTORY
  RELEASE-----2
  ASSOCIATIONS
  USERCAT--CATALOG.USERAA
ALIAS ----- API
  HISTORY
  RELEASE-----2
  ASSOCIATIONS
  USERCAT--CATALOG.OS390

***
MA a
32 / 006
Connected to remote server /host 204.90.115.184 using lu/pool TCP00009 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure – Define a User Catalog



The screenshot shows a terminal window titled "Lab System" with a menu bar (File, Edit, View, Communication, Actions, Window, Help) and a sub-menu (Menu, List, Mode, Functions, Utilities, Help). The terminal displays the following text:

```
ISPF Command Shell
Enter TSO or Workstation commands below:
===> def ucat (name('catalog.zos') volume(vpmvse) cylinder(2 1))

Place cursor on choice and press enter to Retrieve command

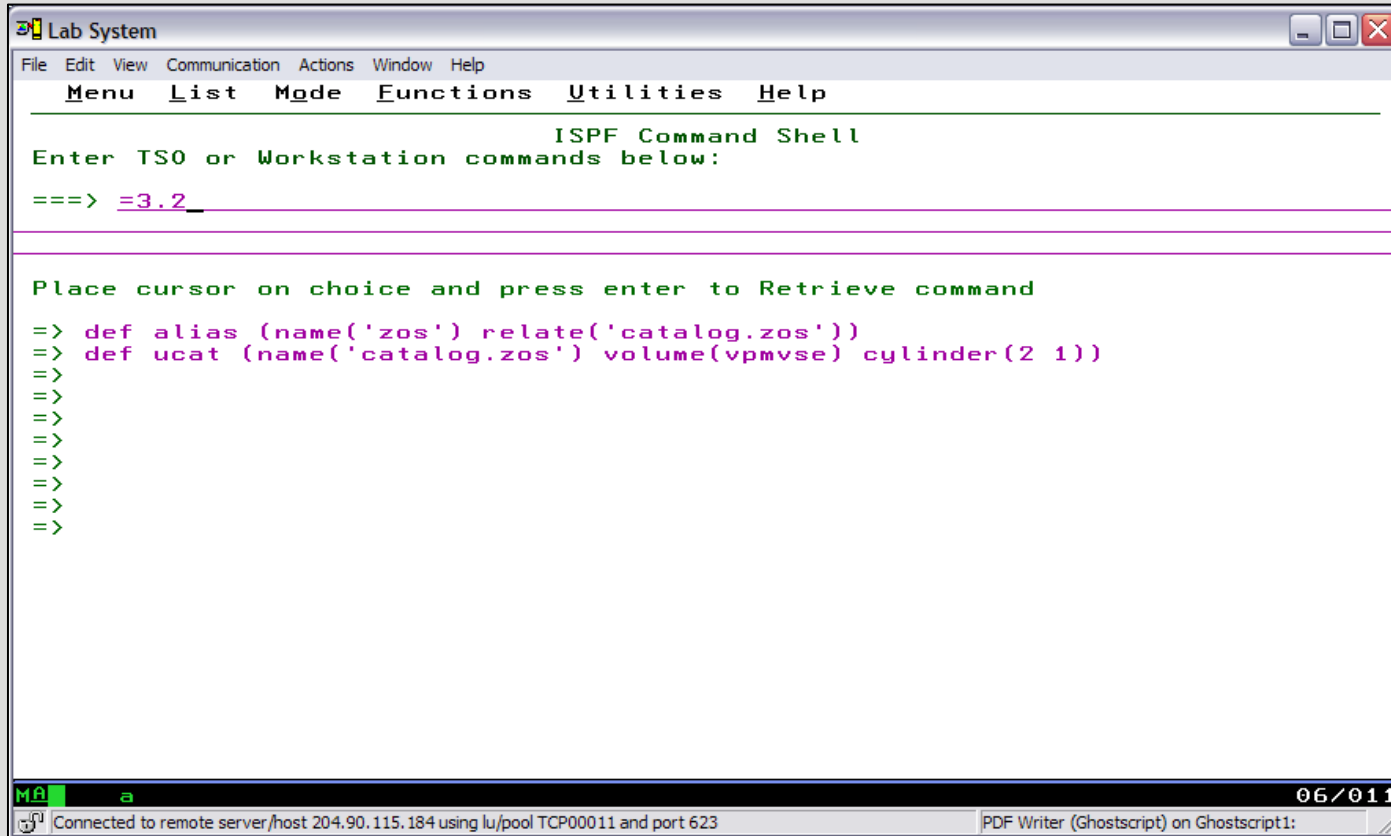
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
IDC0510I CATALOG ALLOCATION STATUS FOR VOLUME VPMVSE IS 0
IDC0512I NAME GENERATED-(I) CATALOG.ZOS.CATINDEX
*** _
```

At the bottom of the terminal, there is a status bar with the text "MA a" on the left, "24/006" on the right, and a connection status "Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623" on the left, and "PDF Writer (Ghostscript) on Ghostscript1:" on the right.

Catalog Structure – Define an Alias in Master Catalog

```
Lab System
File Edit View Communication Actions Window Help
  Menu List Mode Functions Utilities Help
ISPF Command Shell
Enter TSO or Workstation commands below:
==> def alias (name('zos') relate('catalog.zos'))_
Place cursor on choice and press enter to Retrieve command
=> def ucat (name('catalog.zos') volume(vpmvse) cylinder(2 1))
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
06/052
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```


Catalog Structure – ISPF Panel to Allocate Data Set



The screenshot shows a terminal window titled "Lab System" with a menu bar containing "File", "Edit", "View", "Communication", "Actions", "Window", and "Help". Below the menu bar, the text "ISPF Command Shell" is displayed, followed by "Enter TSO or Workstation commands below:". The user has entered the command "===> =3.2_". Below this, a prompt "Place cursor on choice and press enter to Retrieve command" is shown. The user has entered several commands: "=> def alias (name('zos') relate('catalog.zos'))", "=> def ucat (name('catalog.zos') volume(vpmvse) cylinder(2 1))", and several blank lines. The bottom status bar shows "MA a" on the left, "06/011" on the right, and a connection status "Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623" on the left, and "PDF Writer (Ghostscript) on Ghostscript1:" on the right.

```
Lab System
File Edit View Communication Actions Window Help
Menu List Mode Functions Utilities Help
ISPF Command Shell
Enter TSO or Workstation commands below:
===> =3.2_

Place cursor on choice and press enter to Retrieve command

=> def alias (name('zos') relate('catalog.zos'))
=> def ucat (name('catalog.zos') volume(vpmvse) cylinder(2 1))
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>
=>

MA a 06/011
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623 PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure – Allocate New Data Set

```
Lab System
File Edit View Communication Actions Window Help
  Menu RefList Utilities Help
-----
Option ==> a ← Data Set Utility
-----
  A Allocate new data set          C Catalog data set
  R Rename entire data set        U Uncatalog data set
  D Delete entire data set        S Short data set information
blank Data set information        V VSAM Utilities

ISPF Library:
Project . . . _____
Group . . . _____
Type . . . . _____

Enter "/" to select option
/ Confirm Data Set Delete

Other Partitioned, Sequential or VSAM Data Set:
Data Set Name . . . 'zos.test1 ←
Volume Serial . . . vparc1 _ (If not cataloged, required for option "C")

Data Set Password . . . (If password protected)

MA a 18/032
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure – Allocate New Data Set

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList Utilities Help

Allocate New Data Set

Command ==> _____

Data Set Name . . . . : ZOS.TEST1

Management class . . . . _____ (Blank for default management class)
Storage class . . . . _____ (Blank for default storage class)
Volume serial . . . . : VPARC1 (Blank for system default volume) **
Device type . . . . _____ (Generic unit or device address) **
Data class . . . . _____ (Blank for default data class)
Space units . . . . : CYLINDER (BLKS, TRKS, CYLS, KB, MB, BYTES
or RECORDS)
Average record unit _____ (M, K, or U)
Primary quantity . . . 1 _____ (In above units)
Secondary quantity _____ 1 _____ (In above units)
Directory blocks . . . _____ (Zero for sequential data set) *
Record format . . . . fb _____
Record length . . . . B0 _____
Block size . . . . _____
Data set name type : _____ (LIBRARY, HFS, PDS, or blank) *
Expiration date . . . _____ (YY/MM/DD, YYYY/MM/DD
YY.DDD, YYYY.DDD in Julian form
Enter "/" to select option DDDD for retention period in days
_ Allocate Multiple Volumes or blank)

( * Specifying LIBRARY may override zero directory block)
( ** Only one of these fields may be specified)
```

Catalog Structure – Allocate New Data Set

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList Utilities Help
Data Set Utility Data set allocated
Option ==> _
A Allocate new data set C Catalog data set
R Rename entire data set U Uncatalog data set
D Delete entire data set S Short data set information
blank Data set information V VSAM Utilities
ISPF Library:
Project . . . _____ Enter "/" to select option
Group . . . _____ / Confirm Data Set Delete
Type . . . . _____
Other Partitioned, Sequential or VSAM Data Set:
Data Set Name . . . 'ZOS.TEST1'
Volume Serial . . . VPARC1 (If not cataloged, required for option "C")
Data Set Password . . . (If password protected)
MA a 04/014
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList Utilities Help

Data Set Utility                               Data set allocated

Option ==> a

  A Allocate new data set                       C Catalog data set
  R Rename entire data set                     U Uncatalog data set
  D Delete entire data set                     S Short data set information
blank Data set information                     V VSAM Utilities

ISPF Library:
Project . . . _____ Enter "/" to select option
Group . . . _____ / Confirm Data Set Delete
Type . . . . _____

Other Partitioned, Sequential or VSAM Data Set:
Data Set Name . . . 'ZOS.TEST2'
Volume Serial . . . vpmvse (If not cataloged, required for option "C")

Data Set Password . . . (If password protected)

MA a 18/030
Connected to remote server /host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList Utilities Help

Allocate New Data Set

Command ==>

Data Set Name . . . : ZOS.TEST2

Management class . . . _____ (Blank for default management class)
Storage class . . . _____ (Blank for default storage class)
Volume serial . . . : VPMVSE (Blank for system default volume) **
Device type . . . _____ (Generic unit or device address) **
Data class . . . _____ (Blank for default data class)
Space units . . . : CYLINDER (BLKS, TRKS, CYLS, KB, MB, BYTES
or RECORDS)

Average record unit _____ (M, K, or U)
Primary quantity . . 1 _____ (In above units)
Secondary quantity . 1 _____ (In above units)
Directory blocks . . _____ (Zero for sequential data set) *
Record format . . . : FB _____
Record length . . . : 80 _____
Block size . . . _____
Data set name type : library _____ (LIBRARY, HFS, PDS, or blank) *
(YYYY/MM/DD, YYYY/MM/DD
YY.DDD, YYYY.DDD in Julian form
or blank)
Enter "/" to select option
_ Allocate Multiple Volumes

( * Specifying LIBRARY may override zero directory block)

( ** Only one of these fields may be specified)

M A a 22/032
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623 PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList Utilities Help
-----
Option ==> a                               Data Set Utility                               Data set allocated
-----
A Allocate new data set                     C Catalog data set
R Rename entire data set                   U Uncatalog data set
D Delete entire data set                   S Short data set information
blank Data set information                 V VSAM Utilities

ISPF Library:
Project . . . _____ Enter "/" to select option
Group . . . _____ / Confirm Data Set Delete
Type . . . . _____

Other Partitioned, Sequential or VSAM Data Set:
Data Set Name . . . 'ZOS.TEST3'
Volume Serial . . . VPMVSE (If not cataloged, required for option "C")

Data Set Password . . . (If password protected)

MA a 17/035
Connected to remote server /host 204.90.115.184 using lu/pool TCP00011 and port 623 PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
  Menu RefList Utilities Help
-----
Allocate New Data Set
Command ==> _____
Data Set Name . . . . : ZOS.TEST3
Management class . . . . _____ (Blank for default management class)
Storage class . . . . _____ (Blank for default storage class)
Volume serial . . . . : VPMVSE (Blank for system default volume) **
Device type . . . . _____ (Generic unit or device address) **
Data class . . . . _____ (Blank for default data class)
Space units . . . . : CYLINDER (BLKS, TRKS, CYLS, KB, MB, BYTES
                               or RECORDS)
Average record unit _____ (M, K, or U)
Primary quantity . . : 1 _____ (In above units)
Secondary quantity . : 1 _____ (In above units)
Directory blocks . . : 10 _____ (Zero for sequential data set) *
Record format . . . . : FB _____
Record length . . . . : 80 _____
Block size . . . . _____
Data set name type : pds _____ (LIBRARY, HFS, PDS, or blank) *
Expiration date . . . _____ (YY/MM/DD, YYYY/MM/DD
Enter "/" to select option YY.DDD, YYYY.DDD in Julian form
_ Allocate Multiple Volumes DDDD for retention period in days
                               or blank)
( * Specifying LIBRARY may override zero directory block)
( ** Only one of these fields may be specified)
MA a 22/032
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```


Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList RefMode Utilities Help

Data Set List Utility

Option ==>

blank Display data set list          P Print data set list
  V Display VTOC information          PV Print VTOC information

Enter one or both of the parameters below:
Dsname Level . . . zos
Volume serial . . .

Data set list options
Initial View . . . 1  1. Volume          Enter "/" to select option
                    2. Space           / Confirm Data Set Delete
                    3. Attrib          / Confirm Member Delete
                    4. Total           / Include Additional Qualifiers
                                   / Display Catalog Name

When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up,
an ISPF line command, the name of a TSO command, CLIST, or REXX exec, or
"=" to execute the previous command.
```

MA a 10/033

Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
  Menu Options View Utilities Compilers Help
DSLIST - Data Sets Matching ZOS
Command ===> _____ Scroll ===> PAGE
Row 1 of 4
Command - Enter "/" to select action      Message      Volume
-----
ZOS                                         *ALIAS
ZOS.TEST1                                  VPARC1
ZOS.TEST2                                  VPMVSE
ZOS.TEST3                                  VPMVSE
***** End of Data Set list *****
MA a
04/015
Connected to remote server /host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

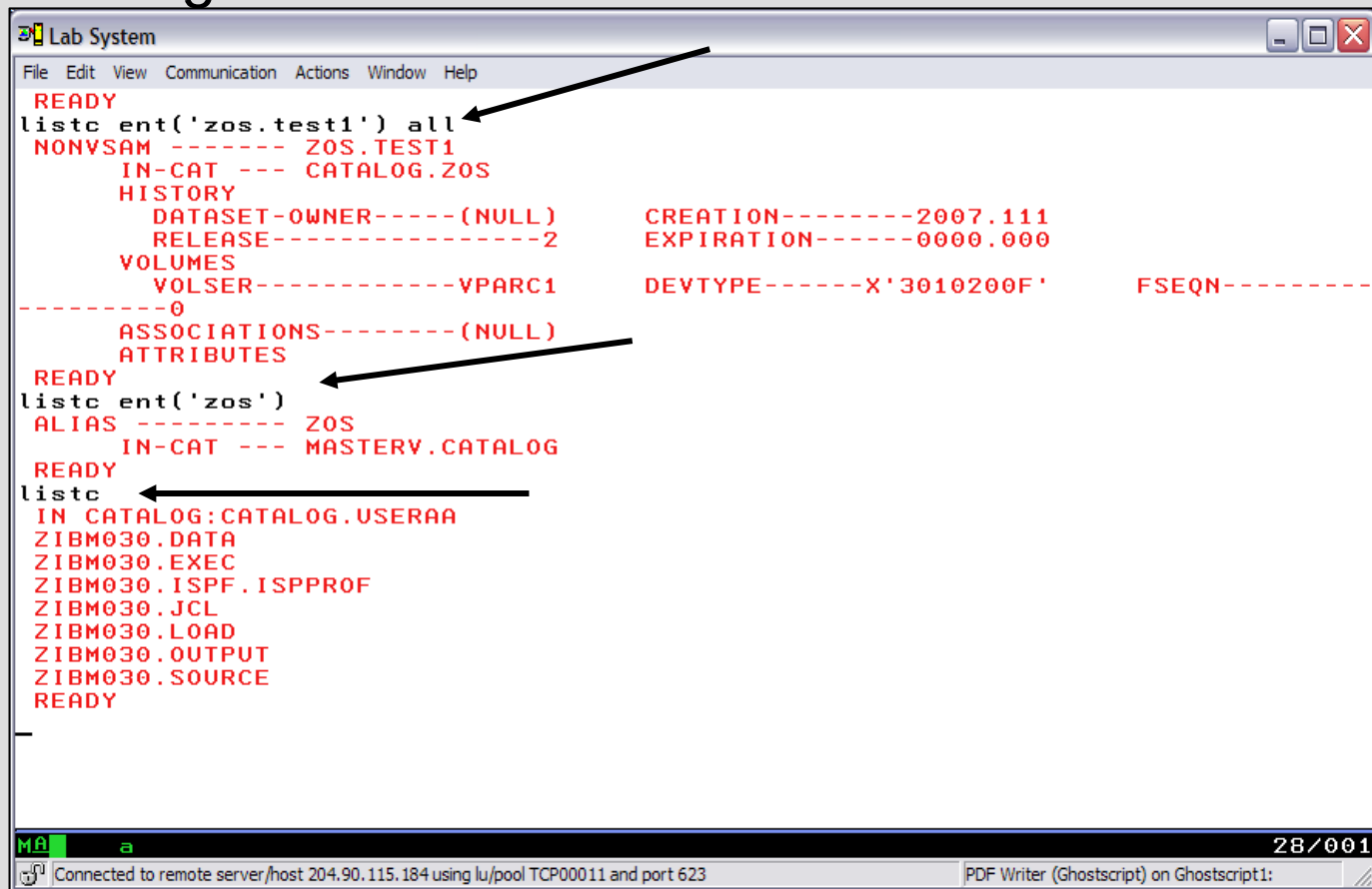
Catalog Structure

```
Lab System
File Edit View Communication Actions Window Help
Menu Options View Utilities Compilers Help
DSLIST - Data Sets Matching ZOS                               Row 1 of 4
Command ==> _____ Scroll ==> PAGE
Command - Enter "/" to select action                          Dsorg  Recfm  Lrecl  Blksz
-----
ZOS
ZOS.TEST1 ←
ZOS.TEST2
ZOS.TEST3
***** End of Data Set list *****
```

MA a 04/015

Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

Catalog Structure



```
Lab System
File Edit View Communication Actions Window Help
READY
listc ent('zos.test1') all
NONVSAM ----- ZOS.TEST1
IN-CAT --- CATALOG.ZOS
HISTORY
DATASET-OWNER-----(NULL)      CREATION-----2007.111
RELEASE-----2          EXPIRATION-----0000.000
VOLUMES
VOLSER-----VPARC1      DEVTYPE-----X'3010200F'    FSEQN-----
-----0
ASSOCIATIONS------(NULL)
ATTRIBUTES
READY
listc ent('zos')
ALIAS ----- ZOS
IN-CAT --- MASTERY.CATALOG
READY
listc
IN CATALOG:CATALOG.USERAA
ZIBM030.DATA
ZIBM030.EXEC
ZIBM030.ISPF.ISPPROF
ZIBM030.JCL
ZIBM030.LOAD
ZIBM030.OUTPUT
ZIBM030.SOURCE
READY
```

MA a 28/001

Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623

PDF Writer (Ghostscript) on Ghostscript1:

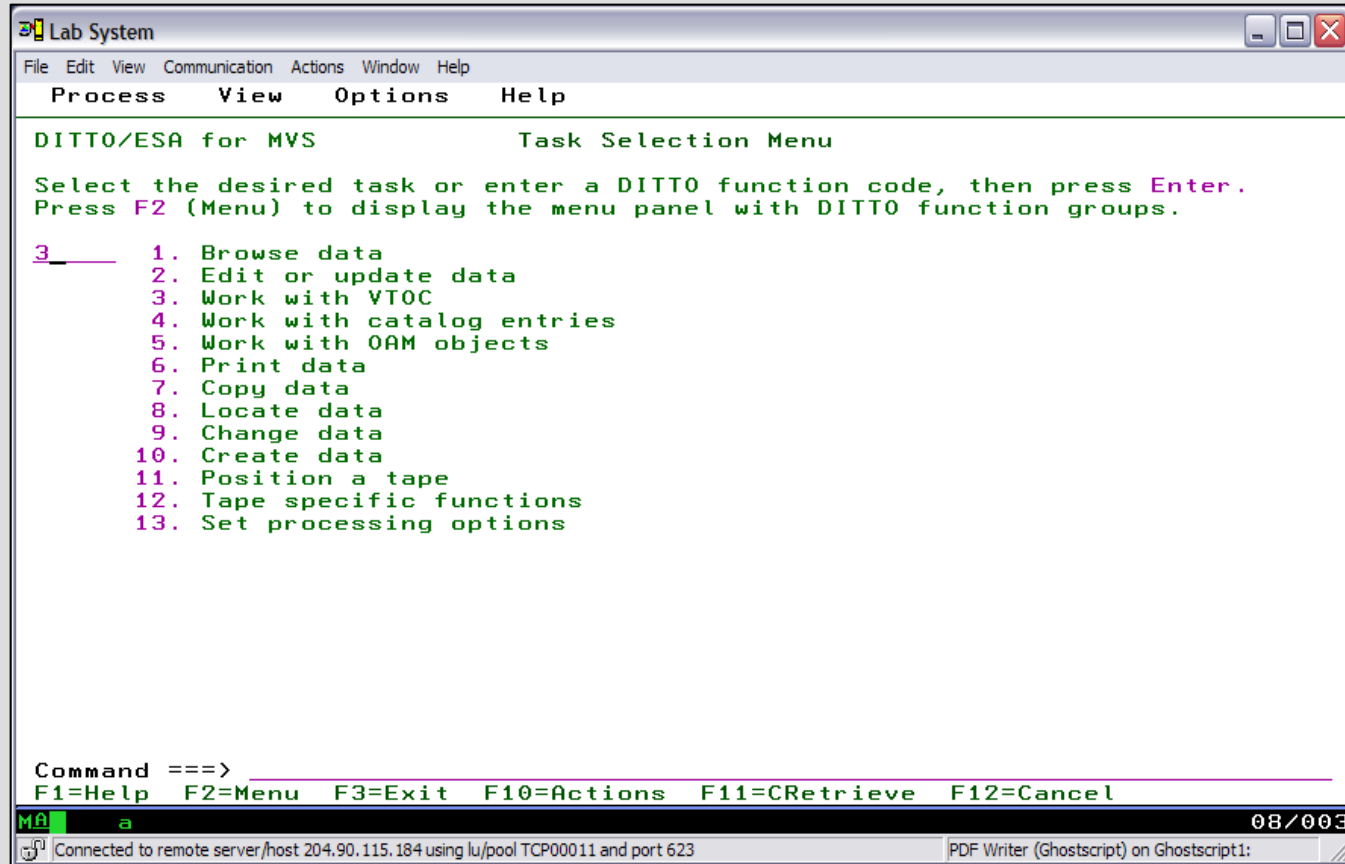
Catalog Structure – Using Ditto to View VTOC

```
Lab System
File Edit View Communication Actions Window Help
  Menu Utilities Compilers Options Status Help
-----
                ISPF Primary Option Menu
Option ==> tso profile noprefix;du
More: -
OB OBROWSE      OpenEdition MVS Browse files
OS OSHELL      OpenEdition MVS ISPF Shell
BR READ        BookManager READ/MVS
BB BUILD       BookManager BUILD/MVS
BI READ INDEX  BookManager Index Utility
DA DXT ADMIN   Invoke DXT Administrative Dialogs
DE DXT END USER Invoke DXT End User Dialogs
DU MVS/DITTO   MVS/DITTO Utility
IN INSPECT     INSPECT for C/370 and PL/I
D2 DB2I       Perform DB2 Interactive functions
DM DB2ADM     DB2 Admin Tool
PM DB2PM      DB2 Performance Monitor for DB2 V6
P7 DB2PE     DB2 Performance Expert for DB2 V7
P8 DB2PE     DB2 Performance Expert for DB2 V8
DC DB2DC     DATABASE Data Collection
MQ MQ        MQ 6.0.0 operations and control panels
QM QMF       Query Management Facility for DB2 V6
Q7 QMF       Query Management Facility for DB2 V7
Q8 QMF       Query Management Facility for DB2 V8
QT QMFTOOL   QMF Message Tool
CO CICS PD/MVS CICS PD/MVS Online Customization
CP CICS PD/MVS CICS Problem Determination/MVS
OP OPC/ESA   Operations Planning/Control/ESA
W WLM        Work Load Manager Administration
RS RRS       Resource Recovery Services

User ID . : ZIBM030
Time. . . : 21:10
Terminal. : 3278
Screen. . : 1
Language. : ENGLISH
Appl ID . : ISR
TSO logon : SPFPROCE
TSO prefix: ZIBM030
System ID : S0W1
MVS acct. : FB3
Release . : ISPF 5.6

Enter X to Terminate using log/list defaults
MA a
04/037
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure – Using Ditto to View VTOC



```
Lab System
File Edit View Communication Actions Window Help
Process View Options Help

DITTO/ESA for MVS          Task Selection Menu

Select the desired task or enter a DITTO function code, then press Enter.
Press F2 (Menu) to display the menu panel with DITTO function groups.

3_____ 1. Browse data
          2. Edit or update data
          3. Work with VTOC
          4. Work with catalog entries
          5. Work with OAM objects
          6. Print data
          7. Copy data
          8. Locate data
          9. Change data
         10. Create data
         11. Position a tape
         12. Tape specific functions
         13. Set processing options

Command ==> _____
F1=Help  F2=Menu  F3=Exit  F10=Actions  F11=CRetrieve  F12=Cancel

MÂ a 08/003
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure – Using Ditto to View VTOC

```
Lab System
File Edit View Communication Actions Window Help
Process View Options Help

DITTO/ESA for MVS          Task Selection Menu

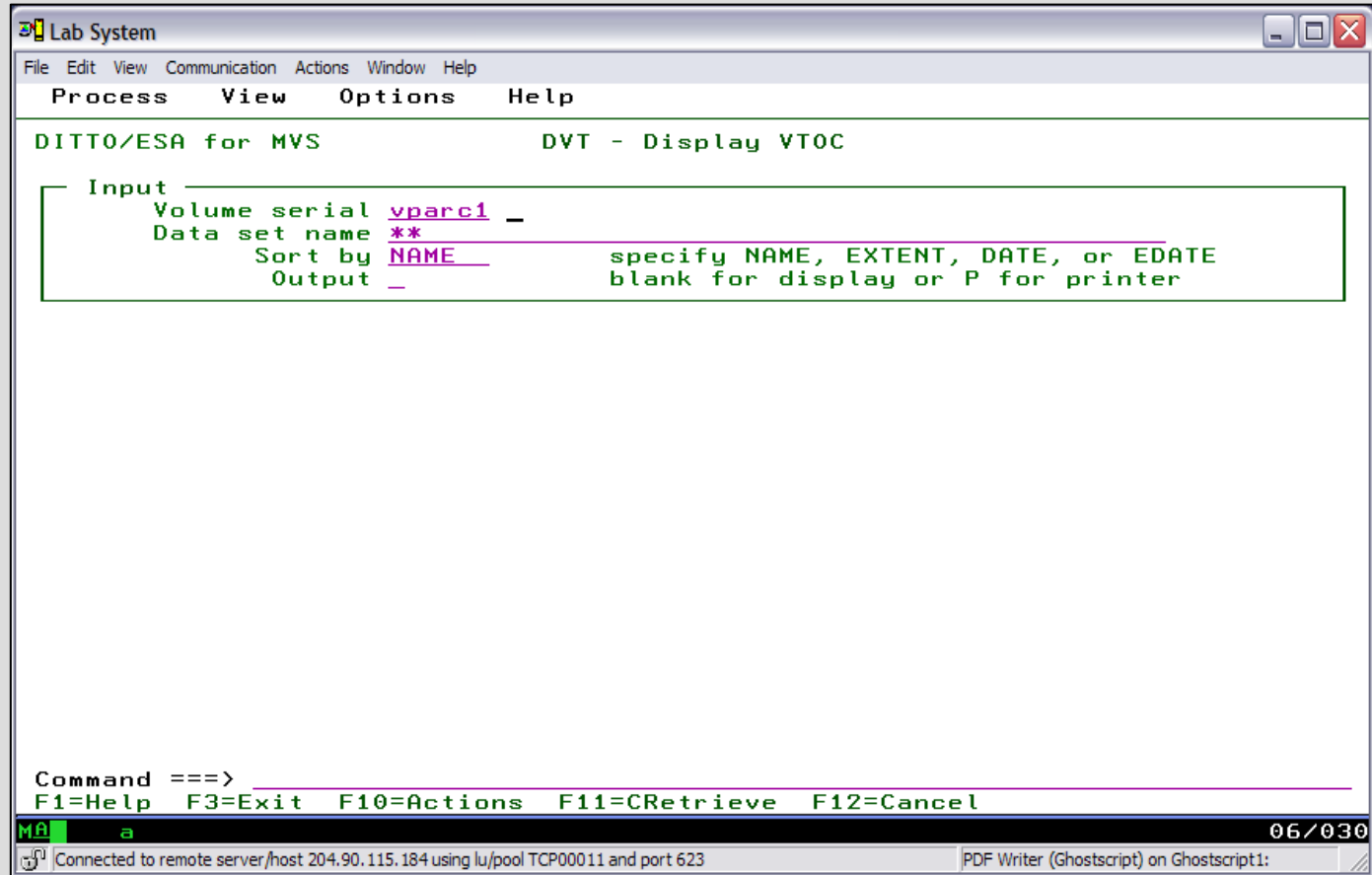
Select the desired task or enter a DITTO function code, then press Enter.
Press F2 (Menu) to display the menu panel with DITTO function groups.

3_____ 1. Browse data
          2. Edit or update data
          3. _____ VTOC Functions _____
          4.
          5. Select the desired function:
          6.
          7. 1_____ 1. List VTOC entries
          8.          2. Print VTOC entries
          9.          3. Show single data set extents
         10.
         11. F1=Help  F3=Exit  F12=Cancel
         12.
         13. Set processing options

Command ==>
F1=Help  F2=Menu  F3=Exit  F10=Actions  F11=CRetrieve  F12=Cancel

M& a 14/015
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Catalog Structure – Using Ditto to View VTOC



```
Lab System
File Edit View Communication Actions Window Help
Process View Options Help
DITTO/ESA for MVS          DVT - Display VTOC

Input
  Volume serial vparc1 _
  Data set name **
  Sort by NAME          specify NAME, EXTENT, DATE, or EDATE
  Output -              blank for display or P for printer

Command ==>
F1=Help  F3=Exit  F10=Actions  F11=CRetrieve  F12=Cancel

Mn a
06/030
Connected to remote server /host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```


Catalog Structure – Using Ditto to View VTOC

Lab System

File Edit View Communication Actions Window Help

Process View Options Help

DITTO/ESA for MVS DVT - Display VTOC Line 1 of 199

Unit 0D90 VOLSER VPARC1 3390 with 2000 cyls, 15 trks/cyl, 58786 bytes/trk

```

--- Data Set Name --- sorted by NAME ----- Ext
1...5...10...15...20...25...30...35...40.... seq
*** VTOC EXTENT ***
ACCOUNTS.DSNDBD.ACCOUNTS.ACCTTS.I0001.A001 0 246 3 246 3 3693,1
----- 1 246 5 246 5 3695,1
----- 2 246 6 246 6 3696,1
ACCOUNTS.DSNDBD.ACCOUNTS.XCLIENT.I0001.A001 0 246 4 246 4 3694,1
BAPPLIC.CATALOG.BACKUP.G0002V00 0 249 0 249 0 3735,1
COUPLE.ATR.SVSCPLEX.ARCHIVE.A0000000.DATA 0 39 0 55 14 585,255
COUPLE.ATR.SVSCPLEX.DELAYED.UR.A0000000.D 0 5 0 21 14 75,255
COUPLE.ATR.SVSCPLEX.RESTART.A0000000.DATA 0 22 0 38 14 330,255
COUPLE.ATR.SVSCPLEX.RESTART.SVSCPLEX.DATA 0 73 0 89 14 1095,255
COUPLE.ATR.SVSCPLEX.RM.DATA.SVSCPLEX.DATA 0 56 0 72 14 840,255
DB2CHECK.WORK 0 92 0 93 14 1380,30
IBMUSER.DDIR.D 0 258 0 260 14 3870,45
IBMUSER.DDIR.I 0 246 7 246 7 3697,1
IBMUSER.ISPF.ISPPROF 0 91 0 91 1 1365,2
----- 1 91 2 91 2 1367,1
----- 2 4 14 4 14 74,1
IBMUSER.ZOS.DATA 0 94 0 95 14 1410,30
IBMUSER.ZOS.SYSLOG 0 341 0 343 14 5115,45
SYS1.VTOCIX.VPARC1 0 1 0 1 13 15,14

```

Command ==> _____ Scroll PAGE

F1=Help F2=Browse F3=Exit F4=Process F5=RgtLeft F6=RFind F7=Bkwd F8=Fwd
F10=Actions F11=CRetrieve F12=Cancel

MA a 30/015

Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

Catalog Structure – Using ISPF Data Set List Utility

```
Lab System
File Edit View Communication Actions Window Help
Menu RefList RefMode Utilities Help

Data Set List Utility

Option ==> _

blank Display data set list          P Print data set list
  V Display VTOC information          PV Print VTOC information

Enter one or both of the parameters below:
Dsname Level . . .
Volume serial . . . VPARC1

Data set list options
Initial View . . . 1  1. Volume          Enter "/" to select option
                        2. Space           / Confirm Data Set Delete
                        3. Attrib          / Confirm Member Delete
                        4. Total           / Include Additional Qualifiers
                                           / Display Catalog Name

When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up,
an ISPF line command, the name of a TSO command, CLIST, or REXX exec, or
"=" to execute the previous command.
```

MA a 04/014

Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

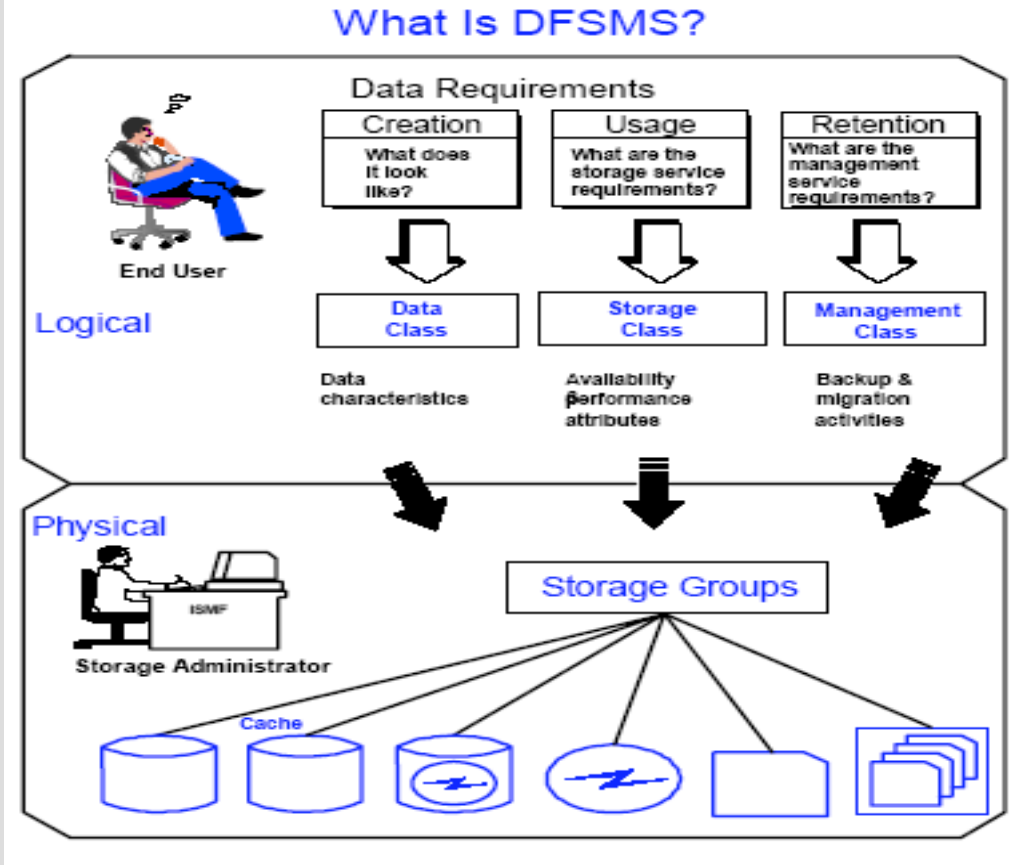
Catalog Structure – Using ISPF Data Set Utility

```
Lab System
File Edit View Communication Actions Window Help
  Menu Options View Utilities Compilers Help
DSLIST - Data Sets on volume VPARC1                      Row 1 of 184
Command ==> _____ Scroll ==> PAGE

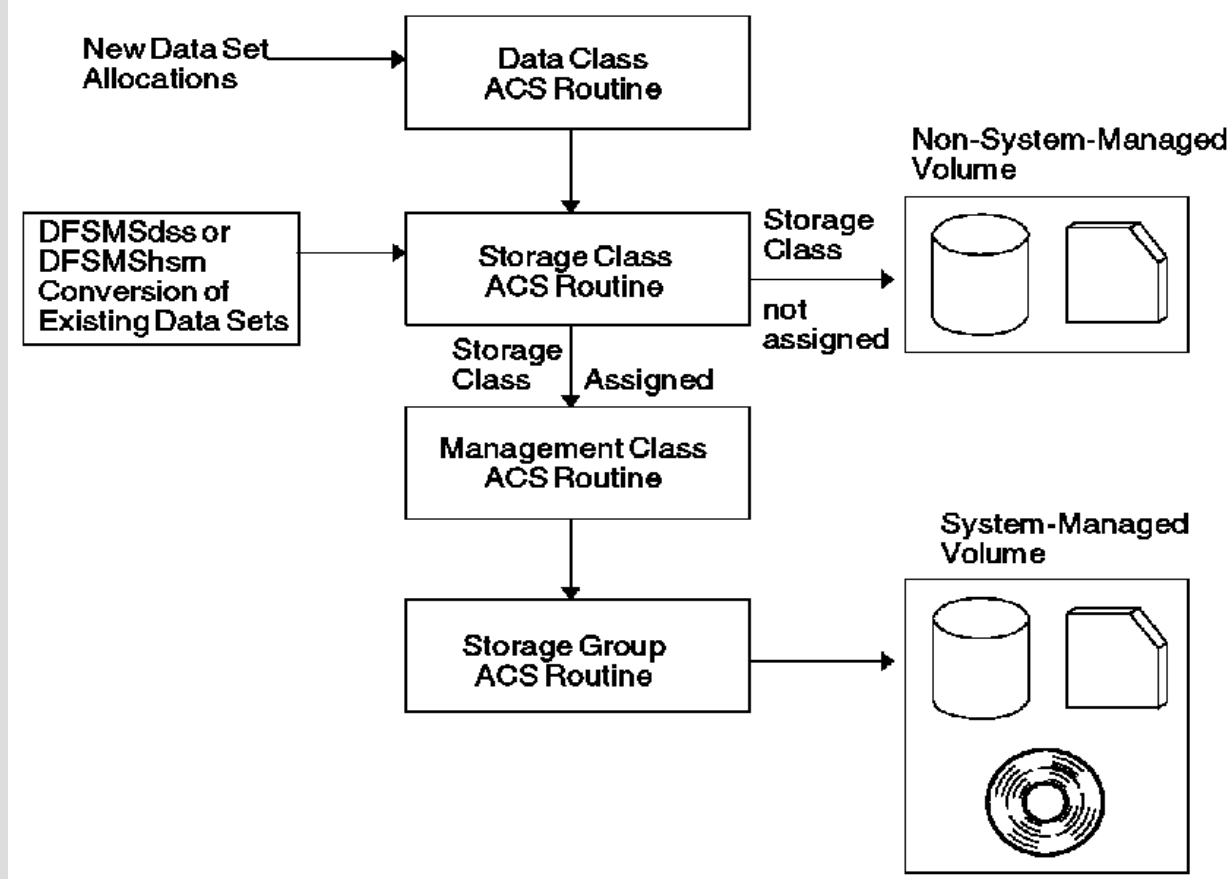
Command - Enter "/" to select action                    Message                    Volume
-----
ACCOUNTS.DSNDBD.ACCOUNTS.ACCTTS.I0001.A001            VPARC1
ACCOUNTS.DSNDBD.ACCOUNTS.XCLIENT.I0001.A001          VPARC1
BAPPLIC.CATALOG.BACKUP.G0002V00                     VPARC1
COUPLE.ATR.SVSCPLEX.ARCHIVE.A0000000.DATA            VPARC1
COUPLE.ATR.SVSCPLEX.DELAYED.UR.A0000000.D           VPARC1
COUPLE.ATR.SVSCPLEX.RESTART.A0000000.DATA           VPARC1
COUPLE.ATR.SVSCPLEX.RESTART.SVSCPLEX.DATA           VPARC1
COUPLE.ATR.SVSCPLEX.RM.DATA.SVSCPLEX.DATA           VPARC1
DB2CHECK.WORK                                         VPARC1
IBMUSER.DDIR.D                                        VPARC1
IBMUSER.DDIR.I                                        VPARC1
IBMUSER.ISPF.ISPPROF                                  VPARC1
IBMUSER.ZOS.DATA                                       VPARC1
IBMUSER.ZOS.SYSLOG                                     VPARC1
SYS1.VT0CIX.VPARC1                                    VPARC1
SYS1.VVDS.VVPARC1                                     VPARC1
ZIBM001.DATA                                           VPARC1
ZIBM001.JCL                                             VPARC1
ZIBM001.LOAD                                           VPARC1
ZIBM001.OUTPUT                                         VPARC1
ZIBM001.SOURCE                                         VPARC1
ZIBM002.DATA                                           VPARC1
ZIBM002.JCL                                             VPARC1
ZIBM002.LOAD                                           VPARC1
ZIBM002.OUTPUT                                         VPARC1

MA a 04/015
Connected to remote server/host 204.90.115.184 using lu/pool TCP00011 and port 623
PDF Writer (Ghostscript) on Ghostscript1:
```

Data Facility / Storage Management Subsystem (SMS)

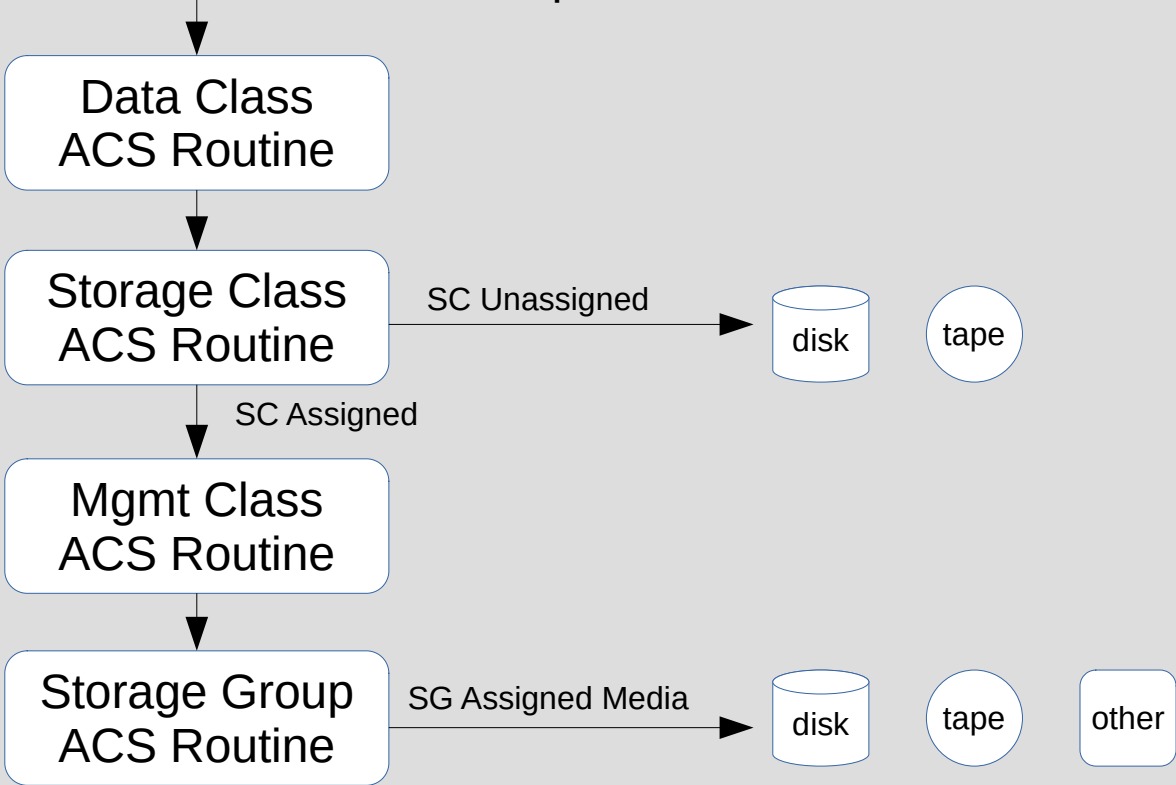


Data Facility / Storage Management Subsystem (SMS)



Data Facility / Storage Management Subsystem (SMS)

New data set allocation request



DFSMSdfp – Automatic Class Selection (ACS) Routine

Automatic Class Selection (ACS) Routine reads submitted JCL, modifies JCL based on coded criteria, then returns control to z/OS for allocation processing.

ACS Routine chronological processing

Data Class > Storage Class > Mgmt Class > Assign Storage Group (device media)

- | | |
|---------------------|--|
| 1) Data Class | assigned when coded criteria is matched |
| 2) Storage Class | assigned when coded criteria is matched |
| 3) Management Class | assigned when coded criteria is matched |
| 4) Storage Group | ACS routine directs allocation to use specific device resources based on assigned 'Class' criteria |

DFSMSdfp – Automatic Class Selection (ACS) Routine

What JCL DD operands influence the ACS routine?

JCL DD statement coded

- DATACLAS=, MGMTCLAS=, STORCLAS=
- The values would be created by DASD administrator

JCL DD statement DSN= and DISP=

where a data set name standard is established, then

ACS routine assigns JCL DD operands for new data set allocations based upon DSN=value

DFSMSdfp – Automatic Class Selection (ACS) Routine

Storage Class

The storage class contains the attributes that identify a storage service level to be used by SMS for storage of the data set. It replaces the storage attributes that are specified on the UNIT and VOLUME parameters for non-SMS-managed data sets.

Example Storage Class ACS Routine code syntax:

```
WHEN (&STORCLAS = 'value')  
    SET &STORGRP = 'value'
```

z/OS Data Facility – Using ISMF

** TSO DGTFMD01

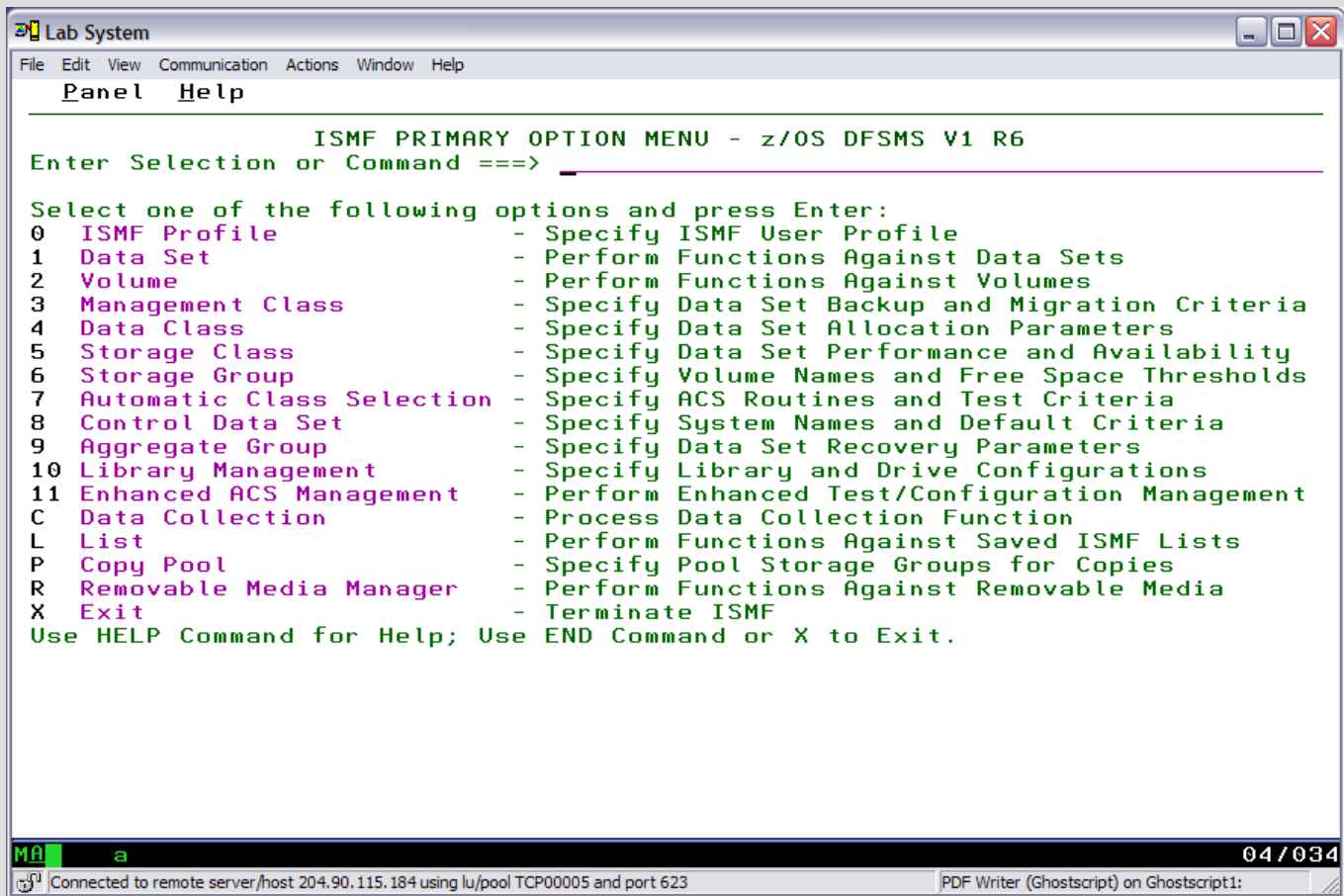
```
Lab System
File Edit View Communication Actions Window Help
Menu Utilities Compilers Options Status Help
-----
Option ==> is_ ISPF Primary Option Menu
More: +
0 Settings Terminal and user parameters User ID . : ZIBM030
1 View Display source data or listings Time. . . : 14:12
2 Edit Create or change source data Terminal. : 3278
3 Utilities Perform utility functions Screen. . : 1
4 Foreground Interactive language processing Language. : ENGLISH
5 Batch Submit job for language processing Appl ID . : ISR
6 Command Enter TSO or Workstation commands TSO logon : SPFPROCE
7 Dialog Test Perform dialog testing TSO prefix: ZIBM030
8 LM Facility Library administrator functions System ID : S0W1
9 IBM Products IBM program development products MVS acct. : FB3
10 SCLM SW Configuration Library Manager Release . : ISPF 5.6
11 Workplace ISPF Object/Action Workplace

----- Other Install Products -----

SD SDSF System Display and Search Facility
IP IPICS Inter Problem Control Facility
IS ISMF Inter Storage Management Facility
SM SMP/E SMP/E and CBIPO Dialogs
HC HCD HW Configuration Definition Dialog
R RACF Resource Access Control Facility
S DFSORT Data Facility Sort
OE OEDIT OpenEdition MVS Edit files
OB OBROWSE OpenEdition MVS Browse files
OS OSHELL OpenEdition MVS ISPF Shell

Enter X to Terminate using log/list defaults
MA a 04/016
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623
PDF Writer (Ghostscript) on Ghostscript1
```

z/OS Data Facility – Using ISMF



The screenshot shows a terminal window titled "Lab System" with a menu for the ISMF Primary Option Menu. The menu lists 11 numbered options and several lettered options, each with a brief description of its function. The terminal interface includes a menu bar (File, Edit, View, Communication, Actions, Window, Help) and a status bar at the bottom showing connection details and a page number (04/034).

```
Lab System
File Edit View Communication Actions Window Help
Panel Help

          ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R6
Enter Selection or Command ===> _____

Select one of the following options and press Enter:
0  ISMF Profile           - Specify ISMF User Profile
1  Data Set              - Perform Functions Against Data Sets
2  Volume                - Perform Functions Against Volumes
3  Management Class     - Specify Data Set Backup and Migration Criteria
4  Data Class            - Specify Data Set Allocation Parameters
5  Storage Class        - Specify Data Set Performance and Availability
6  Storage Group        - Specify Volume Names and Free Space Thresholds
7  Automatic Class Selection - Specify ACS Routines and Test Criteria
8  Control Data Set     - Specify System Names and Default Criteria
9  Aggregate Group      - Specify Data Set Recovery Parameters
10 Library Management   - Specify Library and Drive Configurations
11 Enhanced ACS Management - Perform Enhanced Test/Configuration Management
C  Data Collection      - Process Data Collection Function
L  List                 - Perform Functions Against Saved ISMF Lists
P  Copy Pool            - Specify Pool Storage Groups for Copies
R  Removable Media Manager - Perform Functions Against Removable Media
X  Exit                 - Terminate ISMF

Use HELP Command for Help; Use END Command or X to Exit.
```

MA a 04/034
Connected to remote server/host 204.90.115.184 using lu/pool TCP00005 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

z/OS Data Sets, Catalogs & VTOCs Documentation

DFSMS Bookshelf in z/OS Internet Library

Introduction

Using Data Sets

Implementing System Managed Storage

Managing Catalogs

DFSMSdfp Utilities

DFSMSdfp Advanced Services

Unit summary

Having completed this unit, you should be able to:

- Describe data set naming rules
- Describe a partitioned data set
- Describe a sequential data set
- Describe a VSAM data set
- Describe a data set extent
- Describe role of the system catalog and user catalogs
- Describe role of VTOC
- Describe z/OS based Unix filesystems

IBM