



z/OS Introduction and Workshop

Unix System Services

Unit Objectives

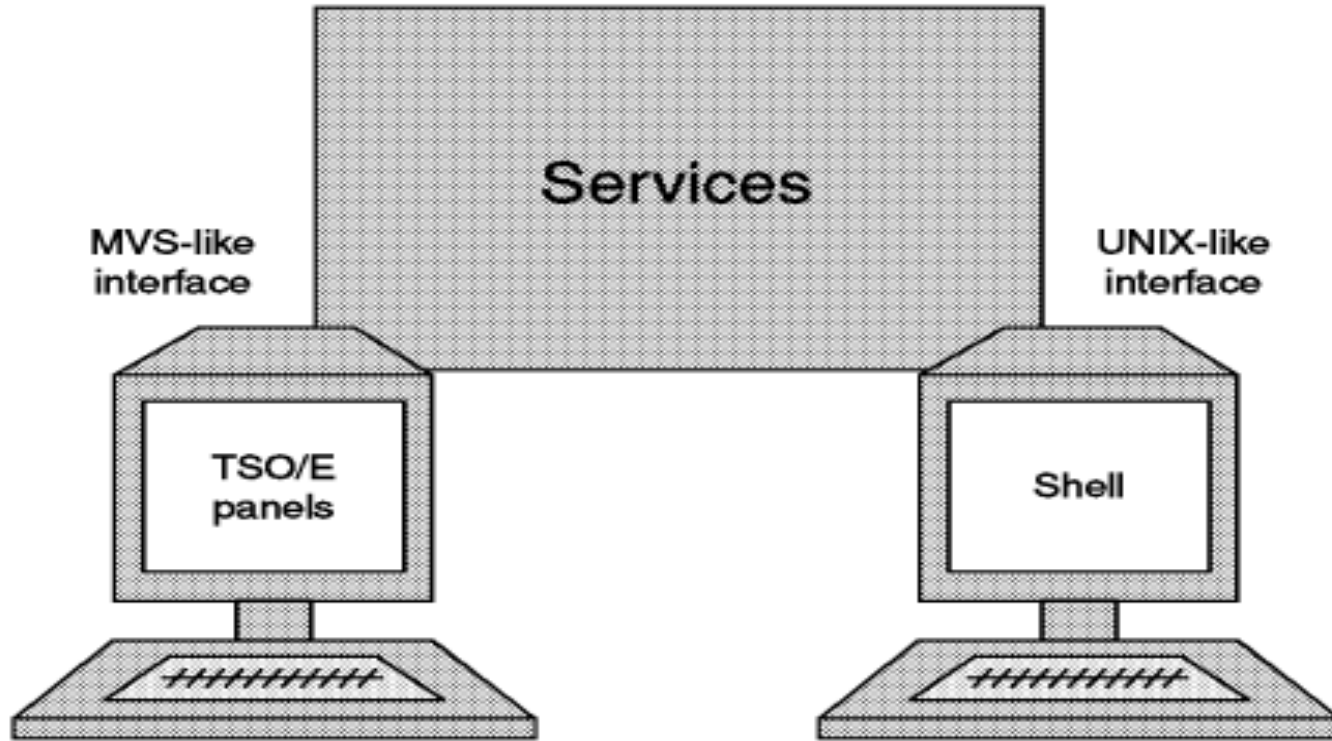
After completing this unit, you should be able to:

- Understand Unix System Services is a base 'element'
- Understand z/OS uses both MVS and Unix simultaneously
- Understand z/OS is an open operating system capable of web enabling all applications
- Understand z/OS differences between MVS data sets and Unix files
- Understand executable programs can be stored in MVS data sets or Unix files
- Understand data can be stored in MVS data sets or Unix files
- Understand z/OS programs can simultaneously access MVS data sets and Unix files
- Recognize the Unix System Services 3 character component identifier

Unix System Services - Comparisons

<u>MVS Environment</u>	<u>Activity</u>	<u>Shell Environment</u>
CLIST & REXX (TSO)	Programming for Everyday Tasks	Shell Scripts & REXX
ISPF	Editing	ed, vi
SDSF	Job Control	ps, jobs, kill
Submit Job (TSO)	Background Job	Command &
Compilers, LINK	Programming	c89, make, ar
TSO Test Inspect	Debugging	dbx
DFSMSshm ISPF	Data Management	tar, cpio, pax

Unix System Services – ISHELL, OMVS, TELNET, SSH



Unix System Services

z/OS UNIX System Services is tightly integrated into the operating system and a key element of IBM open and distributed computing strategy.

WebSphere Application Server, CICS, IMS, Java Runtime, Tuxedo, DB2, WebSphere MQ, SAP R/3, Lotus Domino, and Oracle Web Server all use z/OS UNIX.

z/OS UNIX applications can communicate with DB2, CICS, IMS, and WebSphere MQ.

z/OS UNIX is built for the enterprise where you can prioritize workloads for high performance when running with a mixed workload.

z/OS UNIX has a hierarchical file system familiar to UNIX users.

Applications can work with data in both UNIX hierarchical file systems and traditional MVS data sets

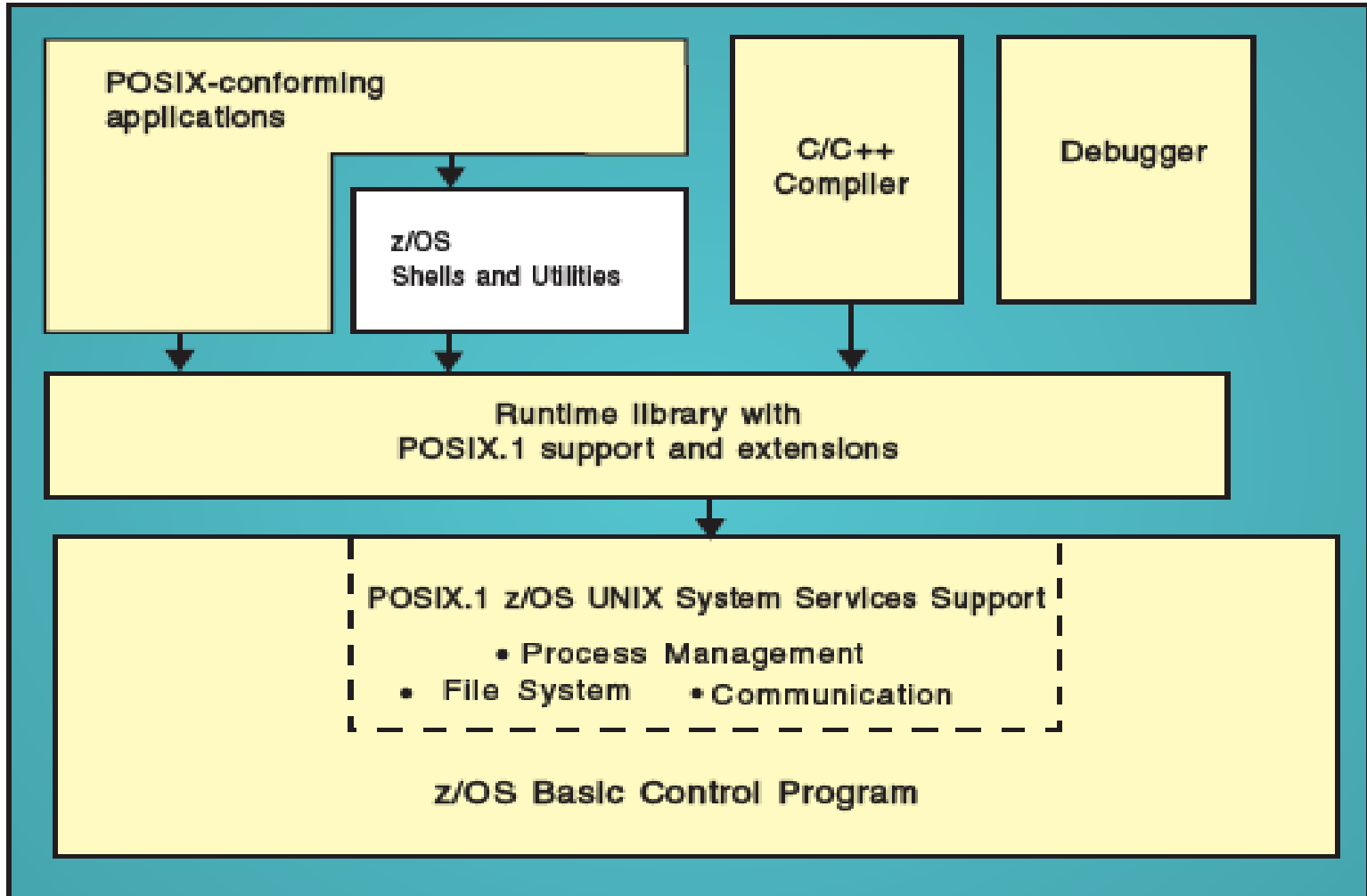
Unix System Services - tightly integrated within z/OS BCP

The kernel is part of the BCP element of z/OS; it sends instructions to the processor, schedules work, manages I/O, and tracks processes, open files, and shared memory, among other things. Other parts of the operating system or applications request the kernel's services using assembler callable services (called syscalls). No work gets done in z/OS UNIX without involving the kernel.

A common misconception is that application programmers have a choice of either running UNIX programs that use UNIX services and file systems or running MVS programs that use MVS services and MVS data sets. You do not have to choose between z/OS UNIX and MVS.

There is no wall between UNIX and MVS and there are no "sides"; you do not run "on the UNIX side" or "the MVS side". z/OS is a powerful blend of UNIX System Services and MVS.

Unix System Services



UNIX System Services – File Systems

z/OS UNIX System Services (z/OS UNIX) allows z/OS to access UNIX files.

A z/OS UNIX file system is hierarchical and byte-oriented.

Files in the UNIX file system are sequential files and are accessed as byte streams.

UNIX files and traditional z/OS data sets can reside on the same DASD volume.

Unix System Services – File Systems

A physical file system (PFS) controls access to data.

PFSs receive and act upon requests to read and write files that they control.
The format of these requests is defined by the PFS interface.

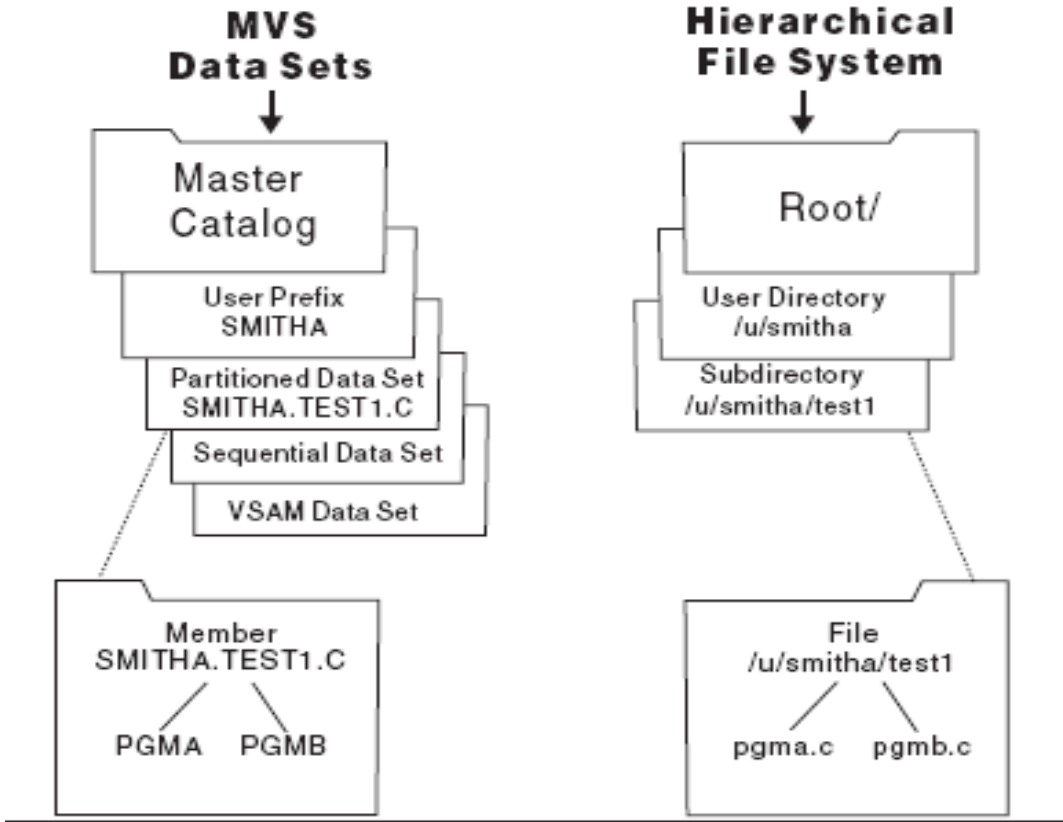
PFSs include pipes, sockets, the Network File System client, and the following UNIX file systems:

- HFS - Hierarchical File System (special data set type HFS)

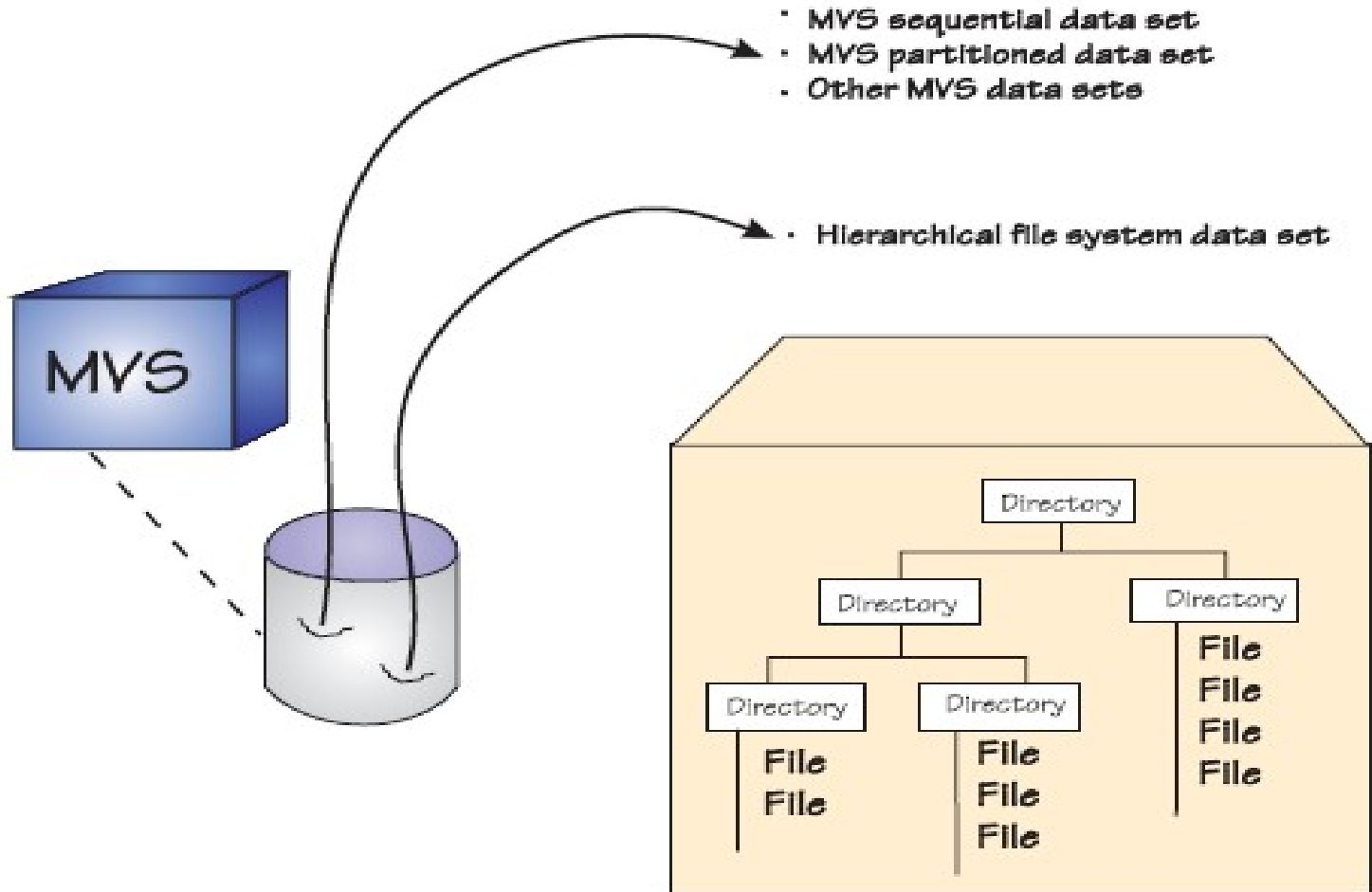
- zFS - zSeries File System (VSAM formatted by utility to be unix file system)

- TFS - Temporary File System

Unix System Services – File Systems



Unix System Services – File Systems



JCL to create Unix filesystem

```
//DEFINE      EXEC PGM=IDCAMS
//SYSPRINT    DD SYSOUT=*
//SYSIN       DD *
    DEFINE CLUSTER(NAME(ZOS.UNIX.USER) LINEAR -
    SHAREOPTIONS(2) VOLUMES(VPWRKC) CYL(3000))
// IF RC = 0 THEN
//FORMAT      EXEC PGM=IOEAGFMT,REGION=0M,
// PARM=('-aggregate ZOS.UNIX.USER -compat')
//SYSPRINT    DD SYSOUT=*
//STDOUT     DD SYSOUT=*
//STDERR      DD SYSOUT=*
//SYSUDUMP    DD DUMMY
//CEEDUMP     DD DUMMY
// ELSE
// ENDIF
```

JCL to mount Unix filesystem

```
//MOUNT      EXEC PGM=IKJEFT01
//SYSPRINT   DD SYSOUT=*
//SYSTSPRT   DD SYSOUT=*
//SYSTEM     DD DUMMY
//SYSTSIN    DD *
    MKDIR '/u/zos/zfs'
    MOUNT FILESYSTEM('ZOS.UNIX.USER') -
        TYPE(ZFS) MODE(RDWR) -
        MOUNTPOINT('/u/zos/zfs')
/*
```

Unix System Services – Data Sets with Unix Filesystems

```

Class - svscmvx
File Edit View Communication Actions Window Help
  Menu Options View Utilities Compilers Help
DSLIST - Data Sets Matching OMVS                               Row 1 of 26
Command ==> _____ Scroll ==> PAGE
Command - Enter "/" to select action
-----Dsorg Recfm Lrecl Blksz-----
OMVS
OMVS.SVSCPLEX.ROOT
OMVS.SVSCPLEX.ROOT.ZFS           VS
OMVS.SVSCPLEX.ROOT.ZFS.DATA     VS   ?   ?   ?
OMVS.S0W1.DEV
OMVS.S0W1.DEV.ZFS               VS
OMVS.S0W1.DEV.ZFS.DATA         VS   ?   ?   ?
OMVS.S0W1.ETC
OMVS.S0W1.ETC.ZFS              VS
OMVS.S0W1.ETC.ZFS.DATA         VS   ?   ?   ?
OMVS.S0W1.HFS
OMVS.S0W1.SYSTEM.ZFS           VS
OMVS.S0W1.SYSTEM.ZFS.DATA     VS   ?   ?   ?
OMVS.S0W1.TMP                   HFS   U   0   0
OMVS.S0W1.VAR
OMVS.S0W1.VAR.ZFS              VS
OMVS.S0W1.VAR.ZFS.DATA         VS   ?   ?   ?
OMVS.S0W1.VARWBEM
OMVS.S0W1.VARWBEM.ZFS          VS
OMVS.S0W1.VARWBEM.ZFS.DATA     VS   ?   ?   ?
OMVS.USERS                       HFS   U   0   0
OMVS.USR.MAIL                     HFS   U   0   0
OMVS.VERSYSB.VERSION.HFS        HFS   U   0   0
OMVS.VERSYSB.VERSION.ZFS        VS
OMVS.VERSYSB.VERSION.ZFS.DATA   VS   ?   ?   ?
  
```

MA a

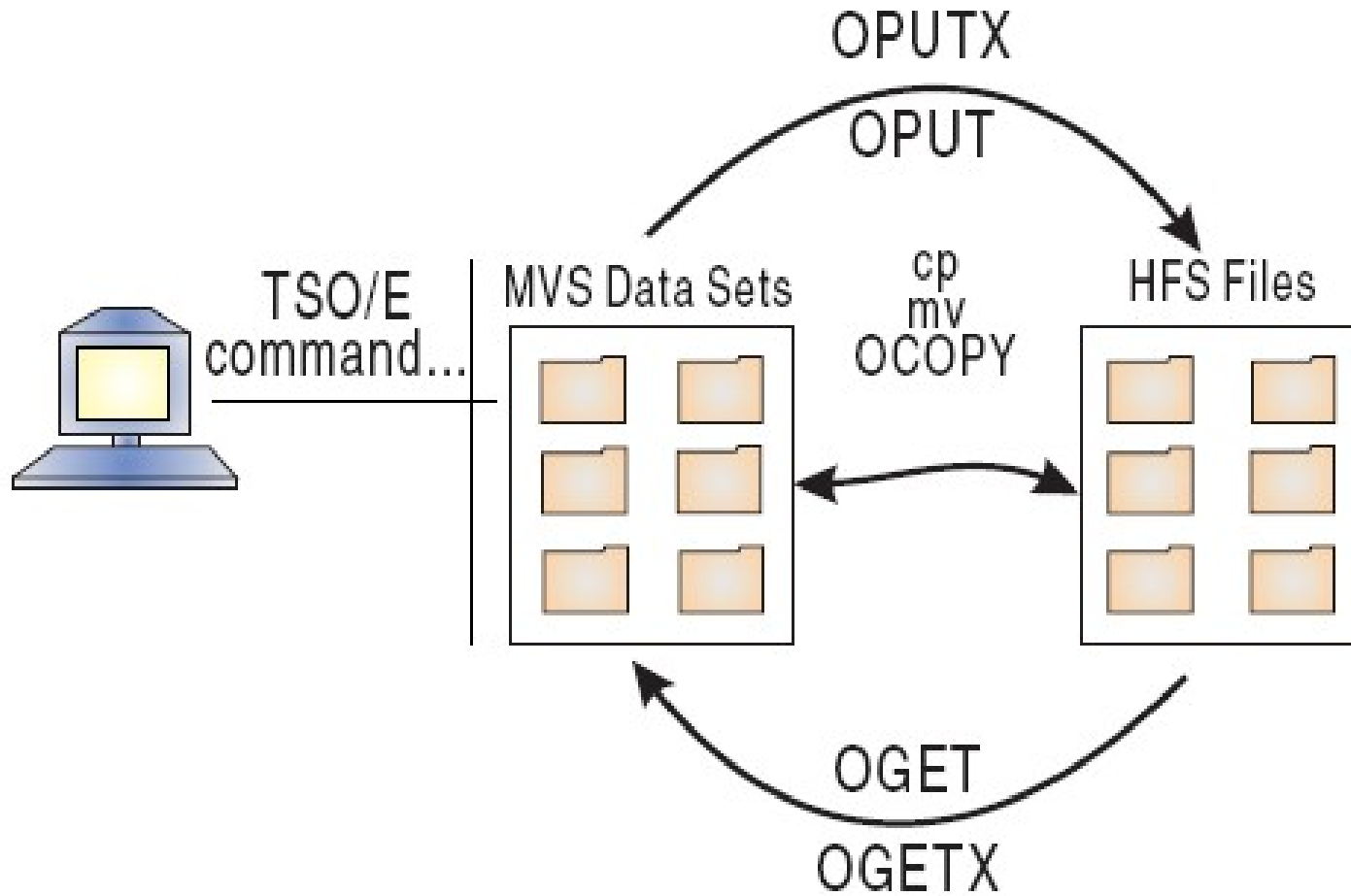
Connected to remote server/host 204.90.115.184 using lu/pool TCP00014 and port 623

Unix System Services – D OMVS,F display mounted files

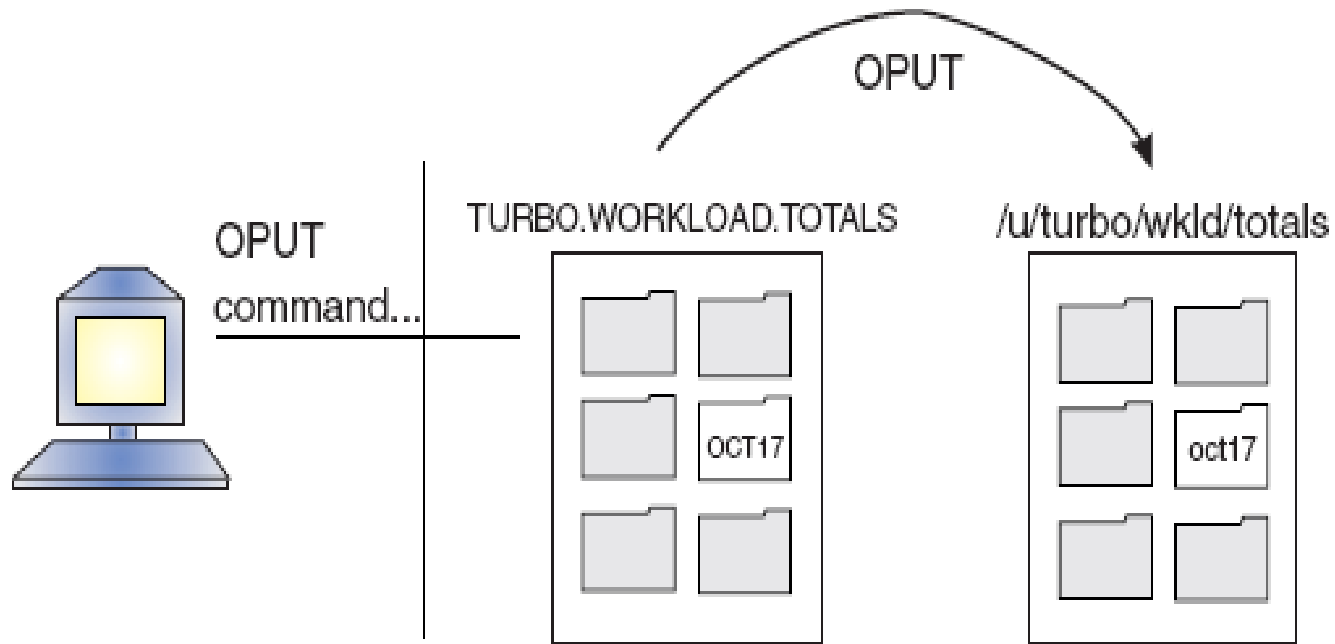
```

Class - svscmvx
File Edit View Communication Actions Window Help
  Display Filter View Print Options Help
-----
SDSF SYSLOG      546.102 SOW1 SOW1 02/23/2008 0W      714      COLUMNS 51 130
COMMAND INPUT ==> -
                                SCROLL ==> CSR
0290 D OMVS,F
0090 BPX0045I 10.14.59 DISPLAY OMVS 459
0090 OMVS      000E ACTIVE          OMVS=(OM,FS,SV,MS,61,65)
0090 TYPENAME  DEVICE -----STATUS----- MODE MOUNTED LATCHES
0090 ZFS       50 ACTIVE              READ  02/17/2008 L=62
0090      NAME=DFH320.ZFS
0090      PATH=/VERYSYB/usr/lpp/cicsts/cicsts32
0090      AGGREGATE NAME=DFH320.ZFS
0090      OWNER=SOW1      AUTOMOVE=Y CLIENT=N
0090 ZFS       48 ACTIVE              READ  02/17/2008 L=60
0090      NAME=WAS610.SIWZFS
0090      PATH=/VERYSYB/usr/lpp/zWebSphere_OM
0090      AGGREGATE NAME=WAS610.SIWZFS
0090      OWNER=SOW1      AUTOMOVE=Y CLIENT=N
0090 ZFS       47 ACTIVE              READ  02/17/2008 L=59
0090      NAME=WAS610.SBBOZFS
0090      PATH=/VERYSYB/usr/lpp/zWebSphere
0090      AGGREGATE NAME=WAS610.SBBOZFS
0090      OWNER=SOW1      AUTOMOVE=Y CLIENT=N
0090 ZFS       42 ACTIVE              READ  02/17/2008 L=54
0090      NAME=ESB601.SBSBZFS
0090      PATH=/VERYSYB/usr/lpp/zWESB
0090      AGGREGATE NAME=ESB601.SBSBZFS
0090      OWNER=SOW1      AUTOMOVE=Y CLIENT=N
0090 ZFS       41 ACTIVE              READ  02/17/2008 L=53
0090      NAME=WPS601.SBPZZFS
0090      PATH=/VERYSYB/usr/lpp/zWPS
0090      AGGREGATE NAME=WPS601.SBPZZFS
Mâ a
Connected to remote server/host 204.90.115.184 using lu/pool TCP00014 and port 623
  
```

Unix System Services – MVS Data Sets <> Unix Files



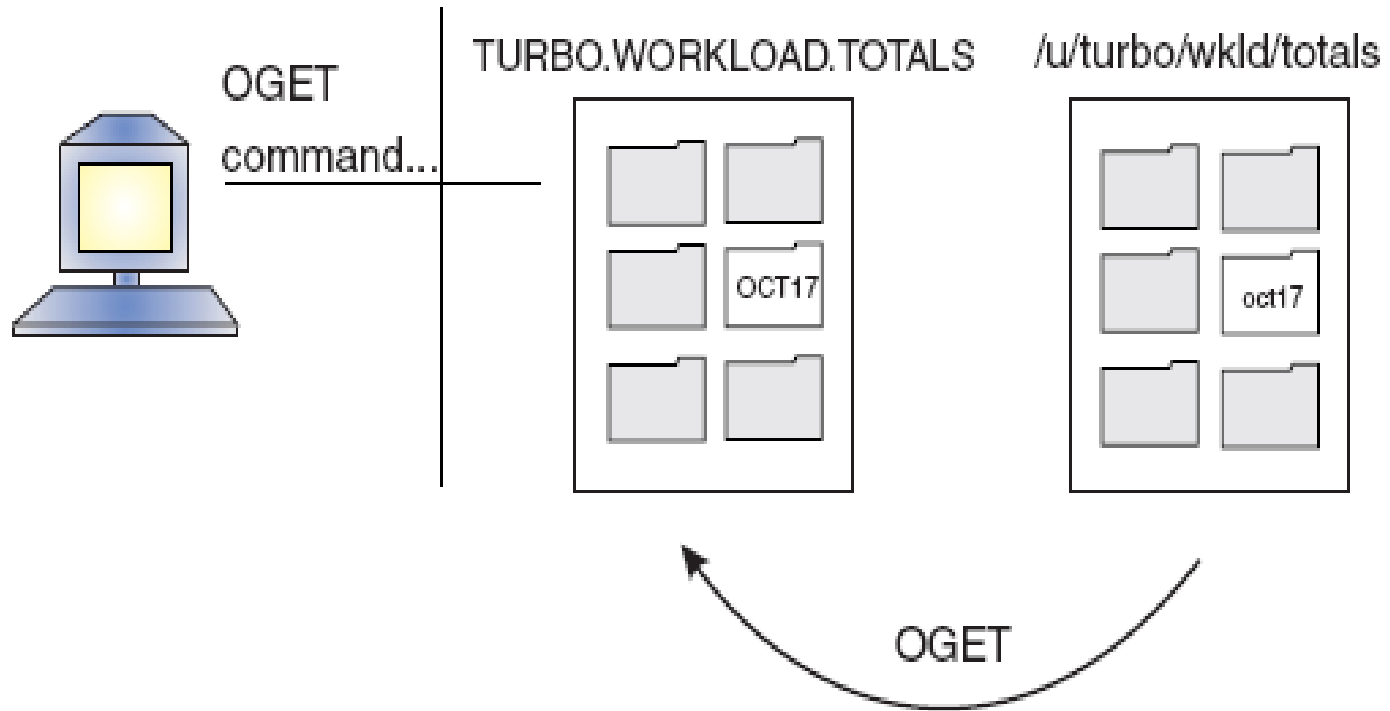
Unix System Services – MVS Data Sets <> Unix Files



If the user ID TURBO wants to copy a member of a PDSE into a file, TURBO enters the following TSO/E OPUT command:

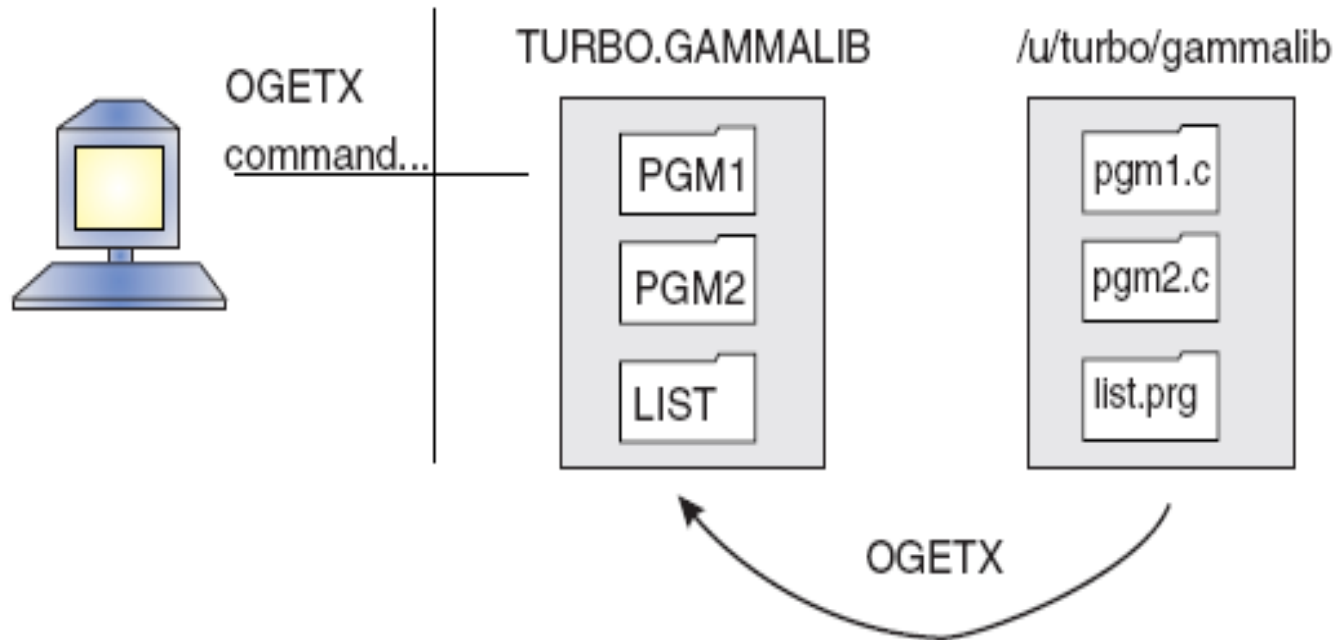
```
OPUT WORKLOAD.TOTALS(OCT17) '/u/turbo/wkld/totals/oct17' TEXT CONVERT(YES)
```

Unix System Services – MVS Data Sets <> Unix Files



If a person with the user ID TURBO enters the following command:
`OGET '/u/turbo/wkld/totals/oct17' WORKLOAD.TOTALS(OCT17) CONVERT(YES)`

Unix System Services – MVS Data Sets <> Unix Files



User TURBO wants to copy the directory `/u/turbo/gammlib` into the partitioned data set `TURBO.GAMMALIB`. He issues the command:

```
OGETX /u/turbo/gammlib GAMMALIB LC SUFFIX
```

Unix System Services – Unix Process display using SDSF

```

Class - svscmvx
File Edit View Communication Actions Window Help
  Display Filter View Print Options Help
-----
SDSF PROCESS DISPLAY S0W1      ALL      LINE 1-13 (13)
COMMAND INPUT ==> ps_          SCROLL ==> CSR
PREFIX=*  DEST=(ALL)  OWNER=*  SYSNAME=
NP  JOBNAME  JobID      Status      Owner      State  CPU-Time
BPXOINIT          FILE SYS KERNEL WAIT  OMVSKERN  MF      4.52
INETD1  STC00563 SWAPPED,FILE SYS KERNEL WAIT  TCPIP     1FI     0.01
TN3270  STC00565 RUNNING      TCPIP     1R      221.04
TN3270  STC00565 RUNNING      TCPIP     1R      221.04
TN3270  STC00565 RUNNING      TCPIP     MR      221.04
TCPIP   STC00564 RUNNING      TCPIP     MR      422.84
FTPERVE STC00559 SWAPPED,FILE SYS KERNEL WAIT  TCPIP     1FI     7.61
CEA     FILE SYS KERNEL WAIT  STCOPER   1F      0.03
TCPIP   STC00564 FILE SYS KERNEL WAIT  TCPIP     1F      422.84
TN3270  STC00565 RUNNING      TCPIP     1R      221.04
CICSTS32 STC00629 RUNNING      STCOPER   1R      16.99
CICSTS32 STC00629 RUNNING      STCOPER   1R      16.99
DB9GDIST STC00628 FILE SYS KERNEL WAIT  STCOPER   MF      0.25
  
```

Mâ a

Connected to remote server/host 204.90.115.184 using lu/pool TCP00014 and port 623

Unix System Services – unix command output

```

Class - svscmvx
File Edit View Communication Actions Window Help
IBMUSER:/u/ibmuser: >ps -ef
  UID          PID          PPID    C    STIME TTY          TIME CMD
OMVSKERN         1             0    -   Feb 17 ?           0:04 BPXPINPR
OMVSKERN    16842754             1    -   Feb 17 ?           0:00 CEAPSRVR
OMVSKERN    16842755             1    -   Feb 17 ?           7:04 EZACFALG
OMVSKERN    16842757             1    -   Feb 17 ?           3:42 EZBTZMST
OMVSKERN         65542             1    -   Feb 17 ?           0:00 /usr/sbin/inetd
OMVSKERN         65543             1    -   Feb 17 ?           3:42 EZBTTSSL
OMVSKERN         65544             1    -   Feb 17 ?           3:42 EZBTMCTL
OMVSKERN         65545             1    -   Feb 17 ?           3:42 EZBTMST
OMVSKERN         65546             1    -   Feb 17 ?           7:04 EZBTCPIP
OMVSKERN         65547             1    -   Feb 17 ?           0:07 FTPD
OMVSKERN    83951754             1    -  13:33:51 ?           0:00 DSNVEUS3
OMVSKERN    50397323             1    -  13:38:48 ?           0:17 DFHKETCB
OMVSKERN    33620108             1    -  13:38:42 ?           0:17 DFHSIP
OMVSKERN         65710             1    -  10:48:25 ?           0:00 OMVS
OMVSKERN         65711             65710 -  10:48:26 tty0000 0:00 -sh
OMVSKERN    50397360             65711 -  10:48:44 tty0000 0:00 ps -ef
IBMUSER:/u/ibmuser: >uname -ia
z/OS S0W1 09.00 01 2094
IBMUSER:/u/ibmuser: >who -a
Name      ST Line          Time          Idle          PID Hostname / Exit
.         .  system boot    Feb 17 16:59
.         .  run-level 03.19.00 Feb 17 16:59
IBMUSER   +  tty0000        Feb 23 10:48          .          65711
.         .  tty0001        Feb 22 19:15  15:34 67174544 term=0  exit=0

IBMUSER:/u/ibmuser: >
==> man c89_

ESC=φ    1=Help      2=SubCmd    3=HlpRetrn  4=Top        5=Bottom    6=TS0
          7=BackScr   8=Scroll    9=NextSess 10=Refresh   11=FwdRetr  12=Retrieve

MA      b
Connected to remote server/host 204.90.115.184 using lu/pool TCP00015 and p
  
```

← Unix processes

← System info

← User activity

← Manual pages c compiler

RUNNING

z/OS Unix shell

```

Class - svscmvx
File Edit View Communication Actions Window Help
IBMUSER:/u/ibmuser: >env
MAIL=/usr/mail/IBMUSER
_BPX_TERMPATH=OMVS
PATH=/bin:/u/Java14_31/J1.4/bin:.
SHELL=/bin/sh
PS1=$LOGNAME:$PWD: >
COLUMNS=80
_=/bin/env
LOGNAME=IBMUSER
STEPLIB=none
LANG=C
LIBPATH=/lib:/usr/lib:/u/Java14_31/J1.4/bin:.
TERM=dumb
HOME=/u/ibmuser
LINES=28
TZ=CST6CDT
MANPATH=/usr/man/%L
NLSPATH=/usr/lib/nls/msg/%L/%N
IBMUSER:/u/ibmuser: >

===> man c89_

ESC=␣    1=Help      2=SubCmd    3=HlpRetrn  4=Top       5=Bottom    6=TSO      RUNNING
          7=BackScr   8=Scroll   9=NextSess 10=Refresh  11=FwdRetr  12=Retrieve
Mâ      b
Connected to remote server/host 204.90.115.184 using lu/pool TCP00002 and p

```

z/OS Unix shell

```

Class - svscmvx
File Edit View Communication Actions Window Help
c89 -- Compiler invocation using host environment variables

Format

c89 | cc | c++ | cxx [-+CcEFfg0pqrsvv0123]
      [-D name[=value]]... [-U name]...
      [-e function] [-u function]...
      [-W phase,option[,option]...]...
      [-o outfile]
      [-I directory]... [-L directory]...
      [file.C]... [file.i]... [file.c]... [file.s]...
      [file.o]... [file.x]... [file.p]... [file.l]... [-l libname]
...

Notes:

1. The I option signifies an uppercase i, not a lowercase L.

2. The c99 command is only supported by the xlc utility. See "xlc --
   Compiler invocation using a customizable configuration file" in
   topic XLC for more information.

Description

c89 and cc compile, assemble, and link-edit C programs; cxx/c++ does the
(Page 1)
===> -

ESC=¢      1=Help      2=SubCmd      3=HlpRetrn   4=Top        5=Bottom     6=TSO
           7=BackScr   8=Scroll     9=NextSess  10=Refresh   11=FwdRetr   12=Retrieve

MÅ b
Connected to remote server/host 204.90.115.184 using lu/pool TCP00001 and p
  
```

z/OS Unix shell

```

Class - svscmvx
File Edit View Communication Actions Window Help
same for C++ programs.

- c89 should be used when compiling C programs that are written
  according to Standard C.

- cc should be used when compiling C programs that are written according
  to Common Usage C.

- cxx/c++ must be used when compiling C++ programs. Prior to z/OS V1R2,
  the C++ compiler supported the Draft Proposal International Standard
  for Information Systems -- Programming Language C++ (X3J16). As of
  z/OS V1R7, the C++ compiler supports the Programming languages - C++
  (ISO/IEC 14882:2003(E)) standard, as well as the Programming languages
  - C++ (ISO/IEC 14882:1998) standard. c++ can compile both C++ and C
  programs, and can also be invoked by the name cxx (all references to
  c++ throughout this document apply to both names).

c89, cc, and c++ call other programs for each step of the compilation,
assemble and link-editing phases. The list below contains the following:
the step name, the name of the document that describes the program you use
for that step and the document that describes any messages issued by that
program, and prefixes to those messages:

+-----+
| Table 3. Reference documentation for programs invoked by c89, cc, and |
| c++ commands |
+-----+
(Page 2)
===> -
ESC=¢    1=Help      2=SubCmd    3=HlpRetrn  4=Top      5=Bottom   6=TSO      INPUT
          7=BackScr  8=Scroll   9=NextSess 10=Refresh 11=FwdRetr 12=Retrieve

M# b
Connected to remote server/host 204.90.115.184 using lu/pool TCP00001 and p
  
```


z/OS Unix shell

```

Class - svscmvx
File Edit View Communication Actions Window Help
IBMUSER:/u/ibmuser: >java -version
java version "1.4.2"
Java(TM) 2 Runtime Environment, Standard Edition (build 1.4.2)
Classic VM (build 1.4.2, J2RE 1.4.2 IBM z/OS Persistent Reusable VM build cm142-
20080122 (SR10) (JIT enabled: jitc))
IBMUSER:/u/ibmuser: >javac -help
Usage: javac <options> <source files>
where possible options include:
  -g                Generate all debugging info
  -g:none           Generate no debugging info
  -g:{lines,vars,source} Generate only some debugging info
  -nowarn           Generate no warnings
  -verbose          Output messages about what the compiler is doing
  -deprecation      Output source locations where deprecated APIs are used
  -classpath <path> Specify where to find user class files
  -sourcepath <path> Specify where to find input source files
  -bootclasspath <path> Override location of bootstrap class files
  -extdirs <dirs>    Override location of installed extensions
  -d <directory>    Specify where to place generated class files
  -encoding <encoding> Specify character encoding used by source files
  -source <release> Provide source compatibility with specified release
  -target <release> Generate class files for specific VM version
  -help             Print a synopsis of standard options

IBMUSER:/u/ibmuser: >

===> _
RUNNING
ESC=¢   1=Help   2=SubCmd   3=HlpRetrn  4=Top   5=Bottom  6=TSO
        7=BackScr 8=Scroll  9=NextSess 10=Refresh 11=FwdRetr 12=Retrieve
Mâ b
Connected to remote server/host 204.90.115.184 using lu/pool TCP00002 and p

```

Unix System Services – unix ls command output

```

Lab System
File Edit View Communication Actions Window Help
IBM
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(C) Copyright Mortice Kern Systems, Inc., 1985, 1996.
(C) Copyright Software Development Group, University of Waterloo, 1989.

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you have mail in /usr/mail/ZIBM030.
ZIBM030:/u/zibm030: >cd /web/httpd1/pub
ZIBM030:/web/httpd1/pub: >ls -alEW
total 48
drwxrwxrwx  fff---          2 OMVSKERN IPGROUP      8192 Mar 29 10:50 .
drwxrwxrwx  fff---          3 OMVSKERN IPGROUP      8192 Mar 19 17:31 ..
-rwxrwxrwx  fff--- --s-     1 OMVSKERN IPGROUP      2621 Mar 19 17:31 Frntpage.html
-rw-r--r--  fff--- --s-     1 ZIBM006  IPGROUP         52 Mar 29 10:39 test.html
ZIBM030:/web/httpd1/pub: >

====> _
ESC=^  1=Help      2=SubCmd    3=HlpRetrn  4=Top        5=Bottom    6=TSO      INPUT
        7=BackScr   8=Scroll   9=NextSess 10=Refresh   11=FwdRetr  12=Retrieve

MA a 29/007
Connected to remote server /host 204.90.115.184 using lu/pool TCP00021 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

```

Unix System Services – D OMVS,A=ALL

```

Lab System
File Edit View Communication Actions Window Help
  Display Filter View Print Options Help
-----
SDSF SYSLOG 4346.102 SOW1 SOW1 04/27/2007 0W 1722 COLUMNS 51 130
COMMAND INPUT ==> - SCROLL ==> CSR
0290 D OMVS,A=ALL
0090 BPX0040I 11.01.18 DISPLAY OMVS 748
0090 OMVS 000D ACTIVE OMVS=(OM,VN,60,MS,64)
0090 USER JOBNAME ASID PID PPID STATE START CT_SECS
0090 OMVSKERN BPX0INIT 001B 1 0 MF---- 14.11.21 5.957
0090 LATCHWAITPID= 0 CMD=BPXPINPR
0090 SERVER=Init Process AF= 0 MF=00000 TYPE=FILE
0090 TCPIP TCPIP 002F 33619970 1 MR---B 14.12.31 572.541
0090 LATCHWAITPID= 0 CMD=EZBTCPIP
0090 TCPIP INETD1 001E 16842755 1 1FI--- 14.12.28 .016
0090 LATCHWAITPID= 0 CMD=/usr/sbin/inetd
0090 TCPIP TCPIP 002F 50397188 1 1R---B 14.12.35 572.541
0090 LATCHWAITPID= 0 CMD=EZBTSSL
0090 TCPIP TCPIP 002F 65541 1 1R---B 14.12.35 572.541
0090 LATCHWAITPID= 0 CMD=EZBTMCTL
0090 TCPIP TCPIP 002F 65542 1 1F---B 14.12.35 572.541
0090 LATCHWAITPID= 0 CMD=EZACFALG
0090 TCPIP TCPIP 002F 65543 1 1F---B 14.12.36 572.541
0090 LATCHWAITPID= 0 CMD=EZASASUB
0090 TCPIP TCPIP 002F 65544 1 MR---B 14.12.38 572.541
0090 LATCHWAITPID= 0 CMD=EZBTMST
0090 STCOPER DB8GDIST 0039 33619977 1 MF---B 09.50.15 .082
0090 LATCHWAITPID= 0 CMD=DSNVEUS3
0090 TCPIP FTPSERVE 0020 65546 1 1FI--- 14.12.47 .109
0090 LATCHWAITPID= 0 CMD=FTPD
***** BOTTOM OF DATA *****
MA a 04/021
Connected to remote server/host 204.90.115.184 using lu/pool TCP00021 and port 623 PDF Writer (Ghostscript) on Ghostscript1:

```

Unix System Services – MVS base component

Class - svscmvx

File Edit View Communication Actions Window Help

Display Filter View Print Options Help

SDSF DA S0W1 S0W1 PAG 0 CPU 18 LINE 14-39 (53)
 COMMAND INPUT ==> SCROLL ==> CSR
 PREFIX=* DEST=(ALL) OWNER=* SYSNAME=

NP	JOBNAME	CPU%	ASID	ASIDX	EXCP-Cnt	CPU-Time	SR	Status	SysName	SPag	SCP
	OMVS	0.08	14	000E	2199	20.13			S0W1	0	
	IEFSCHAS	0.00	16	0010	63	0.01			S0W1	0	
	JESXCF	0.04	17	0011	1479	13.53			S0W1	0	
	ALLOCAS	0.00	18	0012	72	0.03			S0W1	0	
	IOSAS	0.07	19	0013	504	16.11			S0W1	0	
	IXGLOGR	0.05	20	0014	173	12.40			S0W1	0	
	SMS	0.17	21	0015	600720	43.88			S0W1	0	
	AXR	0.00	22	0016	458	0.06			S0W1	0	
	CEA	0.00	23	0017	249	0.03			S0W1	0	
	SMF	0.03	24	0018	523	6.77			S0W1	0	
	LLA	0.00	25	0019	17085	1.86			S0W1	0	
	JES2MON	2.62	27	001B	0	645.05			S0W1	0	
	JES2	0.43	28	001C	458922	113.48			S0W1	0	
	VLF	0.01	29	001D	412	3.12			S0W1	0	
	VMCF	0.01	30	001E	25	1.21			S0W1	0	
	SDSF	0.00	31	001F	388	0.04			S0W1	0	
	EPWFFST	0.02	32	0020	1998	4.78			S0W1	0	
	DB9GIRLM	0.96	33	0021	53	39.70			S0W1	0	
	BPX0INIT	0.02	34	0022	14	4.57	DW		S0W1	0	
	VTAM	0.08	35	0023	5158	20.21			S0W1	0	
	FTPSEVE	0.00	36	0024	33937	7.61	LW PROT		S0W1	0	
	INETD1	0.00	37	0025	167	0.01	LW PROT		S0W1	0	
	OAM	0.00	38	0026	632	0.03			S0W1	0	
	RACF	0.01	39	0027	788	3.02			S0W1	0	
	CATALOG	0.51	40	0028	5977	132.91			S0W1	0	
	ZFS	0.92	41	0029	336669	62.14			S0W1	0	

MA b

Connected to remote server/host 204.90.115.184 using lu/pool TCP00015 and p

Unix System Services – Initialization Parameters

```

Class - svscmvx
File Edit View Communication Actions Window Help
  Display Filter View Print Options Help
-----
SDSF SYSLOG      546.102 SOW1 SOW1 02/23/2008 0W      1021      COLUMNS 51 130
COMMAND INPUT ==>
                                SCROLL ==> CSR
0290 D OMVS,OPTIONS -
0090 BPX0043I 10.20.51 DISPLAY OMVS 467
0090 OMVS      000E ACTIVE          OMVS=(OM,FS,SV,MS,61,65)
0090 CURRENT UNIX CONFIGURATION SETTINGS:
0090 MAXPROCSYS      =          200      MAXPROCUSER      =          100
0090 MAXFILEPROC     =          10000    MAXFILESIZE      =      NOLIMIT
0090 MAXCPUPTIME     = 2147483647      MAXUIDS          =          200
0090 MAXPTYS         =          256
0090 MAXMMAPAREA    =          40960    MAXASSIZE        = 2147483647
0090 MAXTHREADS     =          10000    MAXTHREADTASKS  =          5000
0090 MAXCORESIZE    = 2147483647      MAXSHAREPAGES   =      524288
0090 IPCMSGQBYTES   = 2147483647      IPCMSGQNUM      =          10000
0090 IPCMSGNIDS     =          500      IPCSEMNUM       =          500
0090 IPCSEMNOPTS    =          25      IPCSEMNSEMS     =          1000
0090 IPCSHMPAGES    =          25600    IPCSHMNIDS      =          500
0090 IPCSHMSEGS     =          200      IPCSHMSPAGES    =      262144
0090 SUPERUSER      = OMVSKERN        FORKCOPY         =      COW
0090 STEPLIBLIST    =
0090 USERIDALIASTABLE=
0090 PRIORITYPG VALUES: NONE
0090 PRIORITYGOAL VALUES: NONE
0090 MAXQUEUEDSIGS  =          1000    SHRLIBRGNSIZE   =      67108864
0090 SHRLIBMAXPAGES =          4096      VERSION         =      VERSYSB
0090 SYSCALL COUNTS = NO          TTYGROUP        =      TTY
0090 SYSPLEX        = YES          BRML SERVER     =      N/A
0090 LIMMSG         = NONE         AUTOCVT         =      OFF
0090 RESOLVER PROC  = DEFAULT
0090 AUTHPGMLIST    = NONE
MA a
Connected to remote server/host 204.90.115.184 using lu/pool TCP00014 and port 623
  
```

Unix System Services – SYSLOG Messages

BPXF013I FILE SYSTEM OMVS.SVSCPLEX.ROOT

BPXF013I FILE SYSTEM

BPXF203I DOMAIN AF_INET WAS SUCCESSFULLY ACTIVATED.

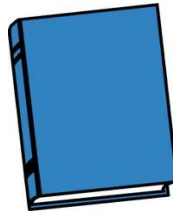
BPXF203I DOMAIN AF_UNIX WAS SUCCESSFULLY ACTIVATED.

BPXF224I THE RESOLVER_PROC, RESOLVER, IS BEING STARTED.

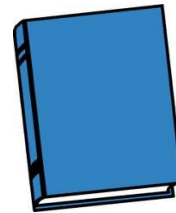
BPXI004I OMVS INITIALIZATION COMPLETE

Unix System Service Manuals

z/OS Unix System Services Bookshelf
Command Reference
User's Guide
Programming Tools



MVS Bookshelf
Initialization and Tuning Reference (BPXPRMxx)



Unit Summary

Having completed this unit, you should be able to:

- ✓ Understand Unix System Services is a base 'element'
- ✓ Understand z/OS uses both MVS and Unix simultaneously
- ✓ Understand z/OS is an open operating system capable of web enabling all applications
- ✓ Understand z/OS differences between MVS data sets and Unix files
- ✓ Understand executable programs can be stored in MVS data sets or Unix files
- ✓ Understand data can be stored in MVS data sets or Unix files
- ✓ Understand z/OS programs can simultaneously access MVS data sets and Unix files
- ✓ Recognize the Unix System Services 3 character component identifier