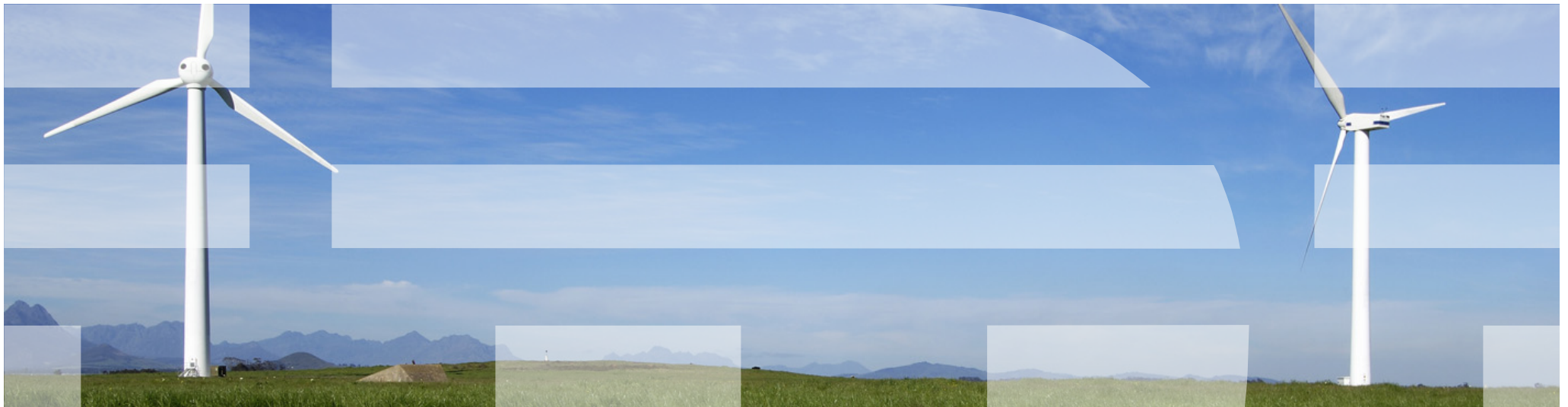


The Basics of Using z/VM

Miguel Delapaz
z/VM Development



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Agenda

- Overview
 - Virtual Machines
 - Some z/VM Concepts and Terminology
 - CMS

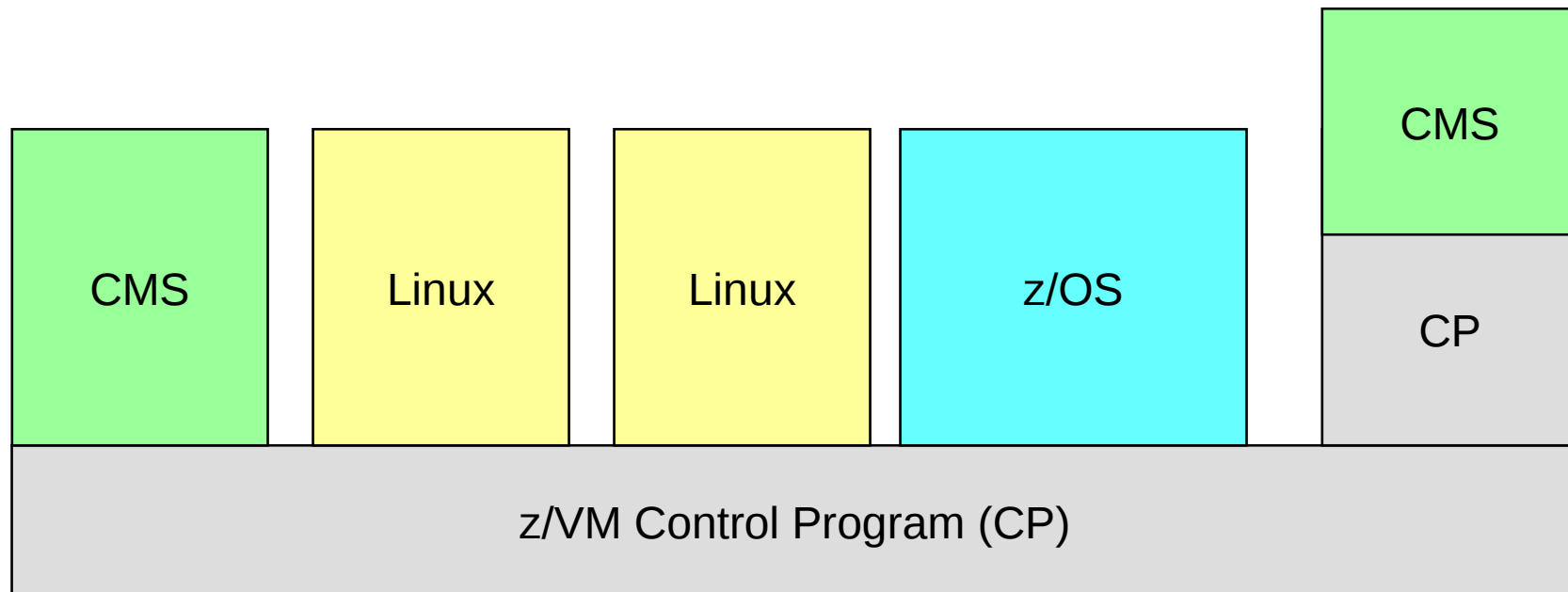
- Using CMS
 - Commands
 - CMS File System
 - The User Directory
 - XEDIT
 - Tailoring your environment

- Example screens

- For more information ...

Overview - Virtual Machines

- z/VM contains two basic parts:
 - CP - Control Program (the Hypervisor)
 - The guest running under z/VM
 - CMS, z/OS, Linux, VSE, another CP ...



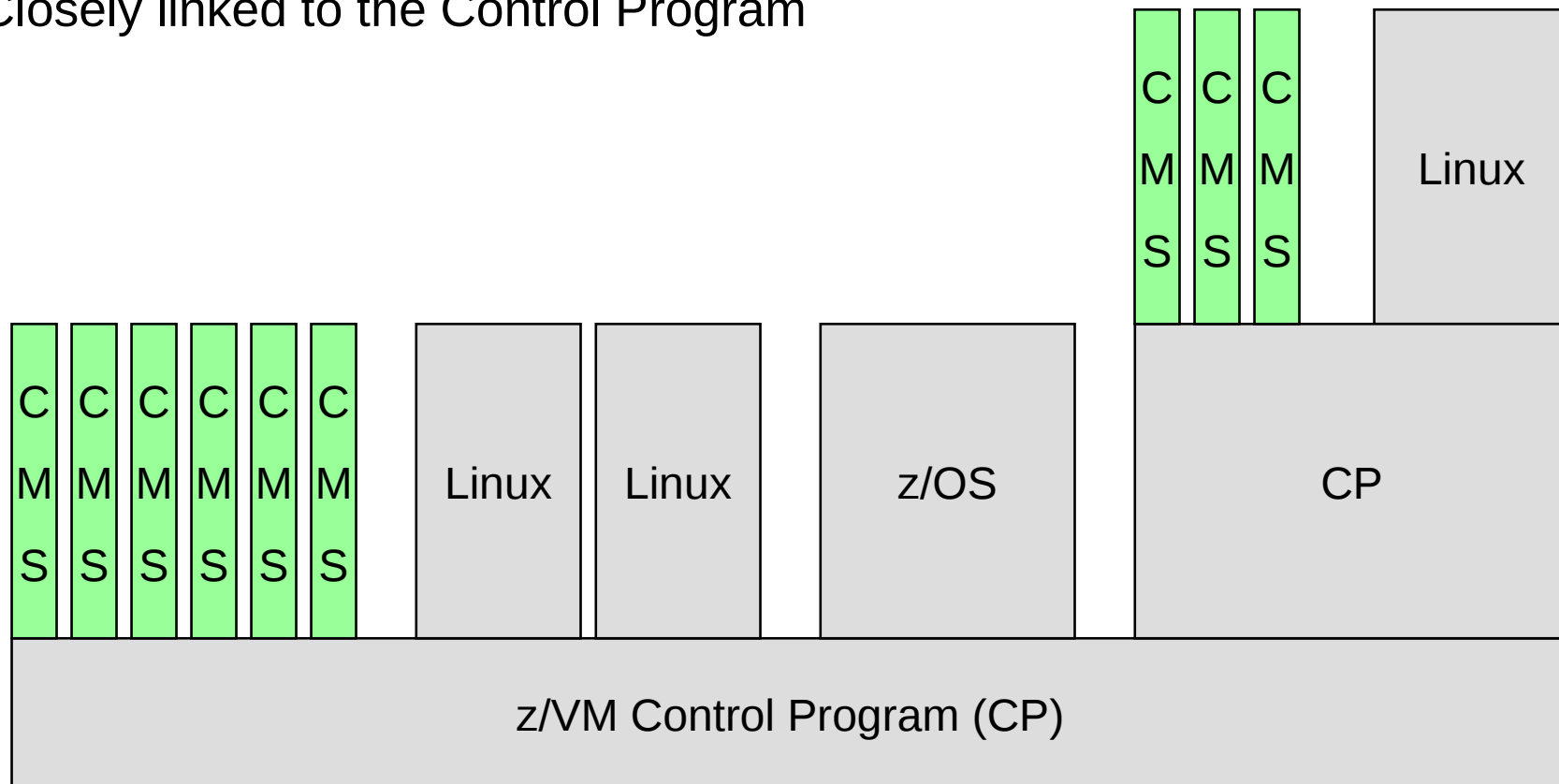
Overview - Terminology

- In z/VM:
 - **Guest**: a system that is operating in a virtual machine; also called a user or userid.
 - **Running under VM**: running a system as a guest of z/VM
 - **Running on VM**: running a system as a guest of z/VM
 - **Running second level**: running a system as a guest of z/VM which is itself a guest of another user

Intel, System p, etc.	System z
Memory	Storage
Disk, storage	DASD (Direct Access Storage Device)
Processor	Processor, CPU, Engine, IFL, IOP, SAP, CP, PU, zAAP, zIIP
Computer	CEC

Overview - CMS

- CMS: Conversational Monitor System
 - An operating system that can run as a guest of VM
 - Closely linked to the Control Program



Overview - CMS

- CMS: Conversational Monitor System
- An interactive user interface that runs under the control of CP
- Provides an application programming and execution environment
 - Commands
 - EXECs (scripts) and pipelines
 - Text editing
 - Compilers
 - User programs
- Many tools available for this environment
 - Productivity Aids
 - REXX
 - Vendor programs

Overview - CMS

- **User-friendly**
 - English-like, extensible command language
 - Easy-to-use file system
 - Single-user orientation

- **Cooperates well with CP**
 - Commands to exploit CP function and devices
 - Exploits virtual machine concepts
 - Commands can be automatically passed to CP:
 - If not found in CMS, or directly by issuing #CP command
 - Shared CMS Nucleus, DCSS (Discontiguous Saved Segment)

Overview - CMS

CMS supports multiple internal environments:

- CMS
 - IPL CMS or Begin, run Profile Exec
 - Linemode or Fullscreen mode

- XEDIT Environment
 - XEDIT *fn ft fm*, run Profile Xedit
 - CMS Subset mode

- Unix-like
 - Open Extensions (Posix Shell & Utilities) *
 - Byte File System, Network File System

- z/OS-like or VSE-like
 - OS Simulation* * not a full duplication of function
 - DOS Simulation*

Overview - CMS

To establish a z/VM session ...

- z/VM Logo Screen
 - One at a time - 3270 emulation (for example, PComm)
 - LOGON ... here -> move a signon to another session
 - LOGON ... by ... -> signon using another password

- Using CP to control the Virtual Machine
 - #CP IPL CMS - restart your entire CMS session
 - PROFILE EXEC exec runs to customize your session

 - #CP LOGOFF - logon xxx - sign off/on

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
z/VM ONLINE

                Use Of This System Is For
                IBM Management Approved Purposes Only

=====  =====  =====  =====
=====  =====  =====  =====
   ===   ===     ===     =====  =====
   ===   =====  =====  =====
   ===   =====  ===  =====  ===
   ===   ===     ===     ===  =====  ===
=====  =====  =====  ===  =====
=====  =====  =====  =  =====

                For help call the Customer Service Center:
                888-IBM-HELP
                VTAM Customers: To exit screen, enter VMEXIT

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
USERID   ==>
PASSWORD ==> _
COMMAND  ==>

                                         RUNNING  GDLVM7
MA      b                                         DOC ↓  21/016
Connected to remote server/host gdlvm7.pok.ibm.com using port 23
  
```

```
Session B - [24 x 80]
File Edit View Communication Actions Window Help
[Toolbar icons]

Enter one of the following commands:

LOGON userid           (Example: LOGON VMUSER1)
DIAL userid            (Example: DIAL VMUSER2)
LOGOFF

CP READ GDLVM7
MA b DOC ↓ 23/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23
```

Overview - CMS Execution Modes

- **Status appears at the bottom right of screen**
 - **CP Read** (CP is waiting for a command)
 - **VM Read** (CMS is waiting for a command)
 - **Running** (Ready for cmds or working on some)
 - **More...** (More info than can fit on the screen)
 - 50 seconds then beep then 10 seconds
 - Determine setting: Query Term
 - Page without waiting: Term More 0 0
 - **Holding** (Waiting for you to clear the screen)
 - **Not Accepted** (Too many commands in buffer; wait for executing command to complete)

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
[Icons]

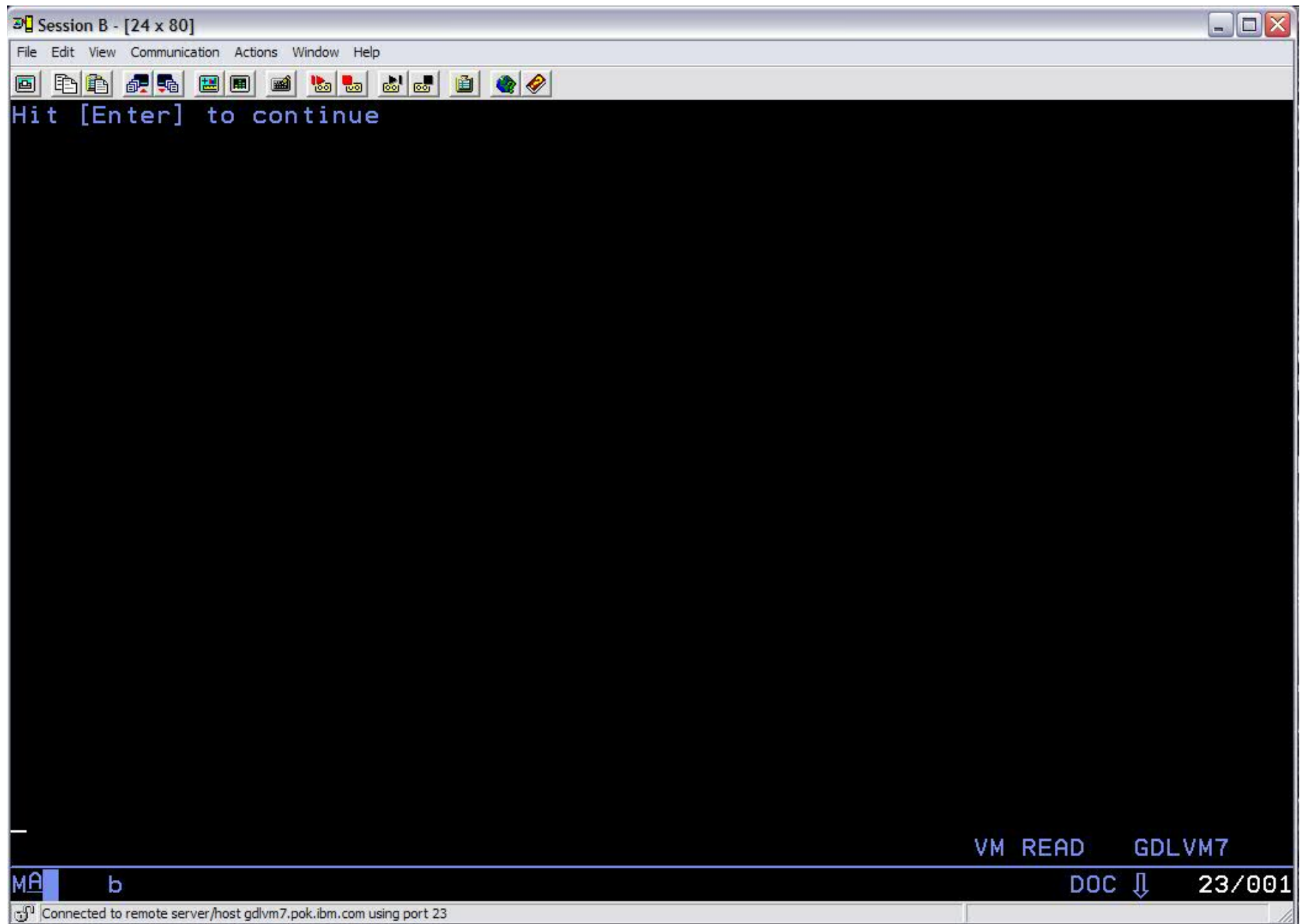
Enter one of the following commands:

    LOGON userid                (Example: LOGON VMUSER1)
    DIAL userid                 (Example: DIAL VMUSER2)
    LOGOFF
l hugen2

Enter your password,
or
To change your password, enter: ccc/nnn/nnn
    where ccc = current password, and nnn = new password

    ICH70001I HUGEN2    LAST ACCESS AT 07:59:00 ON THURSDAY, JUNE 10, 2010
z/VM Version 5 Release 4.0, Service Level 1001 (64-bit),
built on IBM Virtualization Technology
There is no logmsg data
FILES: 0006 RDR,    NO PRT,    NO PUN
LOGON AT 10:03:16 EDT THURSDAY 06/17/10
z/VM V5.4.0    2010-04-07 15:56
*****
*    Data classified as IBM CONFIDENTIAL may be processed on this system.    *
_
HOLDING    GDLVM7
MA b DOC ↓ 23/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```




```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
HUGEN2 AT GDLVM7 VIA RSCS 06/17/10 10:03:58 EDT THURSDAY
CP LEVEL:
z/VM Version 5 Release 4.0, service level 1001 (64-bit)
Generated at 04/14/10 15:11:35 EDT
IPL at 04/17/10 10:05:57 EDT
CMS LEVEL:
z/VM Version 5 Release 4.0
STORAGE = 32M
Adjunct Status: UNAVAILABLE
FILES: 0006 RDR, 0001 PRT, NO PUN
Ready; T=0.07/0.09 10:03:58

RUNNING GDLVM7
MA b DOC ↓ 23/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

CMS Commands

- Handles a system of files: (create, modify, debug)
- Many language processors/compiler can run under CMS
- Commands are blank-delimited
- Input accepted in ANY case
 - CMS will automatically uppercase and pass to command parser

CMS Commands

- General syntax:
Command name [operand(s)...] [(options.... [])]
- Examples:
copy Profile Exec A = = C
LISTFILE (Date
Rdrlist
- SET DOS ON command simulates a VSE (DOS) environment

CMS Commands

- Command Search Order -- when a command is entered, CMS has to locate it
 - Search for an EXEC with the specified command name
 - EXECs in storage
 - Command name with Filetype EXEC on accessed disk or directory (A-Z)
 - Search for translation or synonym
 - Search for a module with the specified command name
 - Nucleus extension, transient area, nucleus resident, on accessed disk/directory
- If Command not found in CMS, it will be passed to CP for execution unless SET IMPCP is OFF (Implied CP)

CMS Commands

- Immediate Commands
 - Can be entered while another command is running
 - Interrupts the running command and executes immediately
 - 10 system immediate commands:
HB, HI, HO, HT, HX, RT, RO, SO, TE, TS

Tip: HX is the equivalent of ^C or ^X in other operating systems

- Users can define their own immediate commands
 - IMMCMD Macro from an Assembler program
 - IMMCMD Command from an EXEC
 - IMMCMD option on NUCXLOAD command

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
HUGEN2 AT GDLVM7 VIA RSCS 06/17/10 10:03:58 EDT THURSDAY
CP LEVEL:
z/VM Version 5 Release 4.0, service level 1001 (64-bit)
Generated at 04/14/10 15:11:35 EDT
IPL at 04/17/10 10:05:57 EDT
CMS LEVEL:
z/VM Version 5 Release 4.0
STORAGE = 32M
Adjunct Status: UNAVAILABLE
FILES: 0006 RDR, 0001 PRT, NO PUN
Ready; T=0.07/0.09 10:03:58

filelist * * a_

RUNNING GDLVM7
MA b DOC ↓ 23/015
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
[Icons]
HUGEN2 FILELIST A0 V 169 Trunc=169 Size=25 Line=1 Col=1 Alt=0
Cmd  Filename  Filetype  Fm  Format  Lrecl  Records  Blocks  Date  Time
-----
RACF      DATA      A1  V      75      1        1  6/17/10 10:03:38
HUGEN2    NETLOG     A0  V      108     5        1  5/18/10 6:20:35
TEMP      FILE       A1  F      132    188      7  5/18/10 6:20:34
PROFILE   EXEC       A2  V      50      58       1  5/18/10 4:48:19
TDISK     EXEC       A1  V      28      7        1  5/18/10 4:47:21
PROFILE   XEDIT     A1  V      72     14       1  4/29/10 13:26:01
PROF2     XEDIT     A1  V      72     58       1  4/29/10 13:24:05
GSKMAN02  FMT-TRC   A1  F     1024    417     105  2/08/10 14:48:44
IUCVCHAT  ASSEMBLE  A1  F      80     369      8  11/05/09 14:59:28
LASTING   GLOBALV   A1  V     271     86       1  10/06/09 13:09:00
PFDISP    EXEC      A0  V      72     17       1  10/06/09 1:03:00
PFSET     EXEC      A1  V      42     17       1  10/06/09 1:02:51
HUGEN2    SYNONYM   A1  F      80     17       1  10/06/09 0:58:25
HUGEN2    DIRECT    A1  V      80     19       1  10/06/09 0:41:58
FOREVER   EXEC      A1  V      51      5       1  10/06/09 0:32:50
THENEWS   ForView   A1  F      68      1       1  9/30/09 9:34:31
PROFILE   PITS      A1  F      80      1       1  4/15/09 12:17:47

1= Help      2= Refresh  3= Quit    4= Sort(type)  5= Sort(date)  6= Sort(size)
7= Backward  8= Forward  9= FL /n  10=           11= XEDIT/LIST 12= Cursor

====>

X E D I T  1 File
MA b DOC ↓ 03/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23
  
```

Session B - [24 x 80]

File Edit View Communication Actions Window Help

HUGEN2 RDRLIST A0 V 164 Trunc=164 Size=6 Line=1 Col=1 Alt=0

Cmd	Filename	Filetype	Class	User	at Node	Hold	Records	Date	Time
	SSL540	VMARC	PUN A	HUGENBRU	GDLVM7	NONE	3074	2/18	10:47:11
	VMSSL	CODEREV	PUN A	HUGENBRU	GDLVM7	NONE	90	2/18	10:47:58
	GSKSSL	GSK-ENTS	PUN A	HUGENBRU	GDLVM7	NONE	175	2/18	10:47:58
	SSL-ESP	SETUP	PUN A	HUGENBRU	GDLVM7	NONE	133	2/18	10:47:58
	(none)	(none)	CON T	HUGEN2	GDLVM7	NONE	67	5/18	4:49:05
	(none)	(none)	CON T	HUGEN2	GDLVM7	NONE	27	6/10	7:59:02

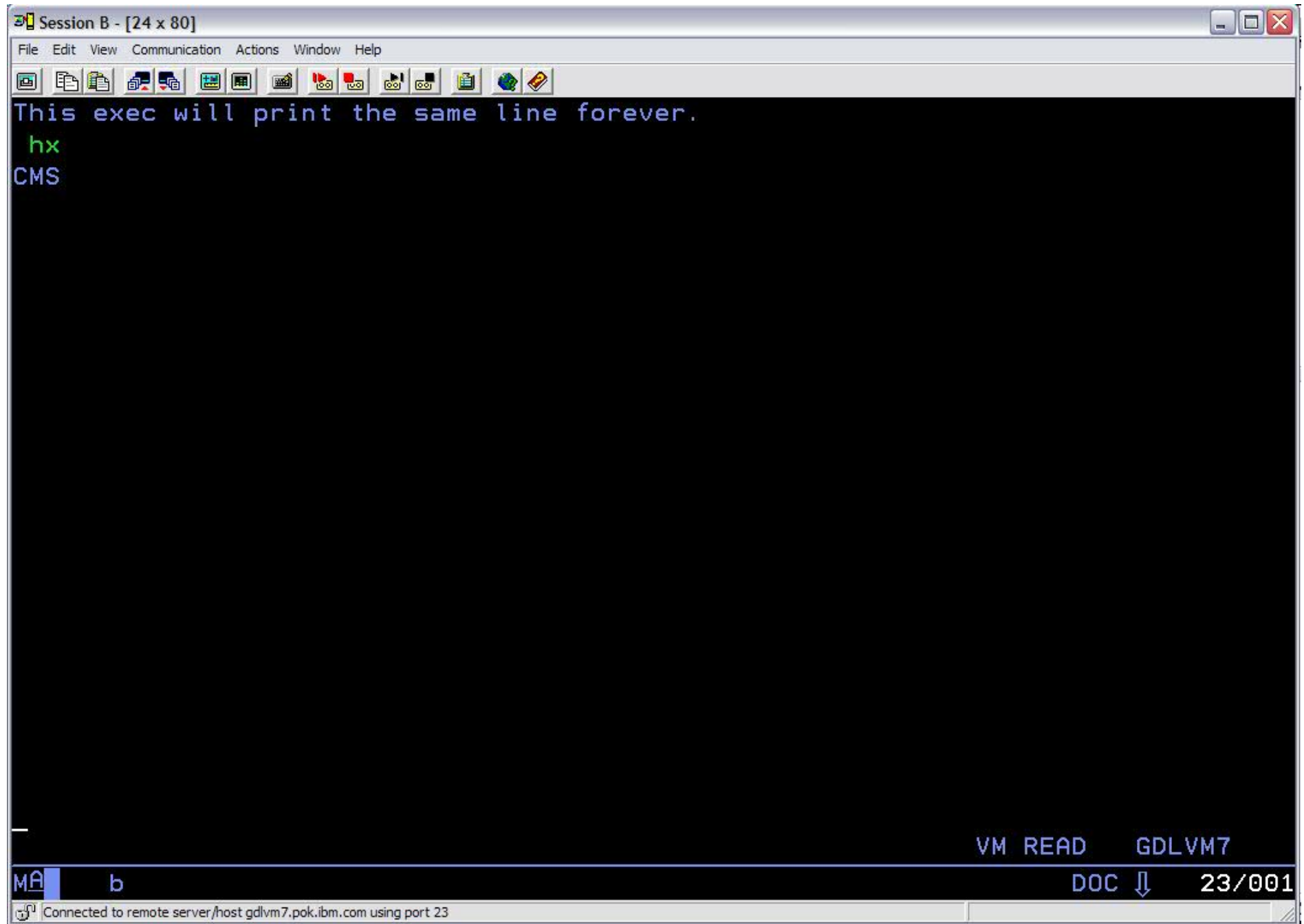
1= Help 2= Refresh 3= Quit 4= Sort(type) 5= Sort(date) 6= Sort(user)
 7= Backward 8= Forward 9= Receive 10= 11= Peek 12= Cursor

====>

X E D I T 1 File

MA b DOC ↓ 03/001

Connected to remote server/host gdlvm7.pok.ibm.com using port 23



Session B - [24 x 80]

File Edit View Communication Actions Window Help

This exec will print the same line forever.

hx

CMS

b

Ready; T=0.01/0.01 10:08:18

MA b

RUNNING GDLVM7

DOC ↓ 23/001

Connected to remote server/host gdlvm7.pok.ibm.com using port 23

CMS File System

- CMS files are unique and generally cannot be read or written by other operating systems

- Files are named using a file identifier (file ID) consisting of 3 fields:
 - File name (FN)
 - File type (FT)
 - File mode (FM) or Directory name (dirname)
 - file mode letter A-Z where minidisk or directory resides, established by ACCESS command
 - file mode number 0-6 assigned when file is created or renamed (default = 1), used to identify or operate on a subset of files

CMS File System

- Files can be stored in several ways:
 - On Minidisks (fn ft fm)
 - Standard file modes: A - user's disk, S - system disk, Y/S - installed programs
 - In an SFS (Shared File System) filespace: (GPLSRV2:HUGENBRU.REXX.)
 - On the BFS (Byte File System) (/home/userid/...)
 - hierarchical file structure
 - In NFS (Network File System)

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
This exec will print the same line forever.
hx
CMS
b
Ready; T=0.01/0.01 10:08:18
q disk
LABEL  VDEV  M  STAT  CYL  TYPE  BLKSZ  FILES  BLKS USED-(%)  BLKS LEFT  BLK TOTAL
HUG191 191  A  R/W   100 3390 4096    25    172-01    17828    18000
TCP592 592  B  R/O   154 3390 4096   1024   11505-42   16215    27720
BWHDSK 292  D  R/W    1 3390 4096    0      7-04     173     180
GPL1A1 1A1  F  R/O   100 3390 4096   792   14339-80   3661    18000
IUOGEN 19A  P  R/O   400 3390 4096  4899   56082-78  15918   72000
TOOLSU 121  Q  R/O   250 3390 4096  3382   22048-49  22952   45000
WWTST  120  R  R/O    75 3390 4096   143    1179-09   12321   13500
CMS24  190  S  R/O   130 3390 4096   701   19880-85   3520   23400
USNBOB 19F  V  R/O   100 3390 4096   544    3774-21   14226   18000
WWBOBX 19B  X  R/O   300 3390 4096  4368   40624-75  13376   54000
YDISK  19E  Y/S R/O   400 3390 4096  1700   60617-84  11383   72000
Ready; T=0.01/0.01 10:08:46

RUNNING  GDLVM7
MA b DOC ↓ 23/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
HUGEN2  DIRLIST  A0  V 319  Trunc=319  Size=2  Line=1  Col=1  Alt=0
Cmd  Fm Directory Name
-  GPLSRV2:HUGENBRU.REXX
-  GPLSRV2:HUGENBRU.SSL

1= Help      2= Refresh  3= Quit    4= Sort(fm)  5= Sort(dir)  6= Auth
7= Backward  8= Forward  9=         10=          11= Filelist  12= Cursor

====>

X E D I T  1 File
MA  b DOC ↓ 03/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

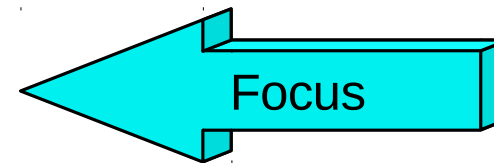
```

The Virtual Machine

- You're logged onto a VM, but where did it come from?
- What defines it? What can it do?
- The USER DIRECTORY is the answer for all of these
 - Defines all the virtual machines on a system
 - Controls access to minidisks
 - Controls what commands a user can issue

Sample User Directory

USER HUGEN2 NOTMYPWD 32M 32M G
ACCOUNT SYSTEMS
MACH XA
IPL CMS



CONSOLE 009 3215
SPOOL 00C 2540 READER *
SPOOL 00D 2540 PUNCH A
SPOOL 00E 1403 A

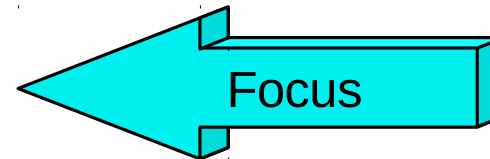
LINK MAINT 0190 0190 RR * CMS system disk
LINK MAINT 019E 019E RR * Product code disk
MDISK 191 3390 1535 001 610RES MR READ WRITE MULTIPLE

Sample User Directory

USER HUGEN2 NOTMYPWD 32M 32M G
ACCOUNT SYSTEMS
MACH XA
IPL CMS

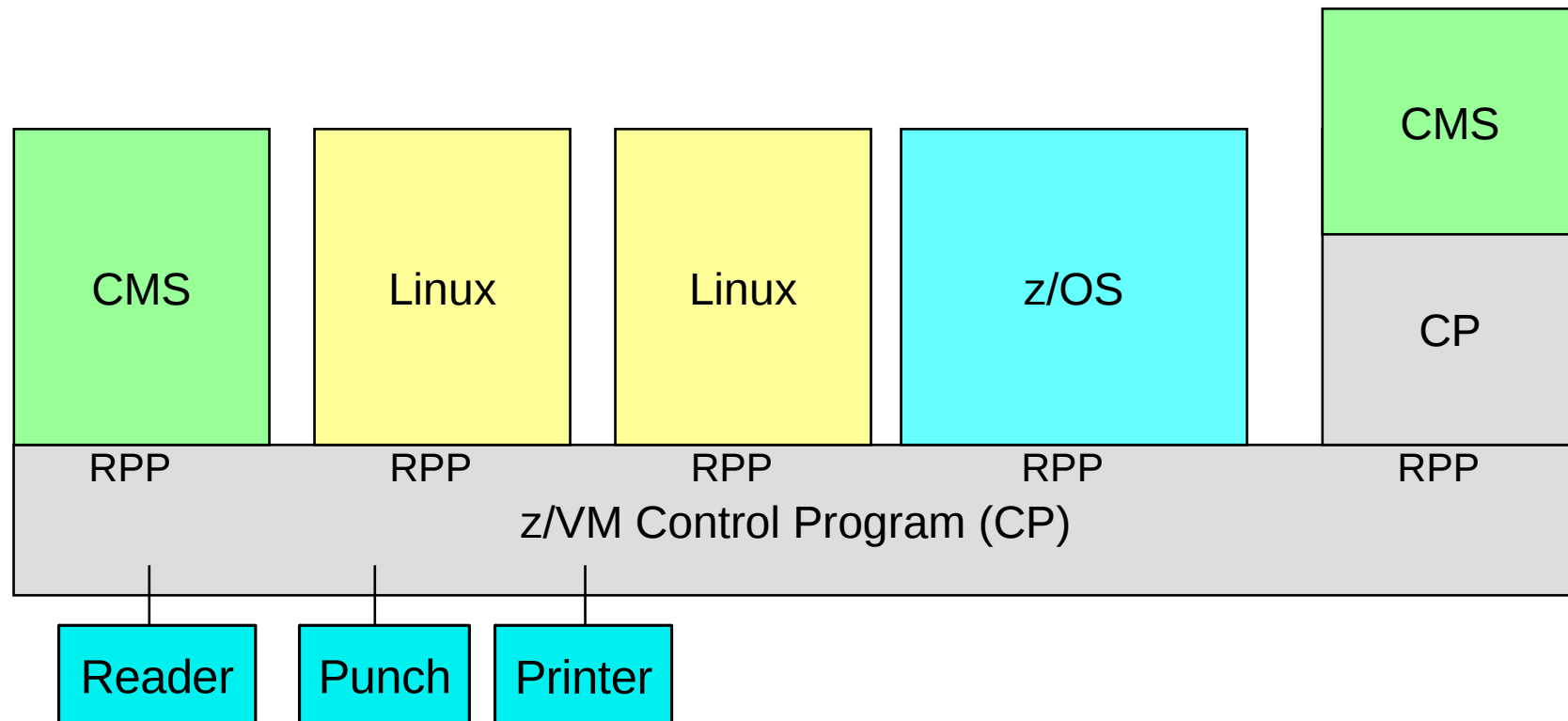
CONSOLE 009 3215
SPOOL 00C 2540 READER *
SPOOL 00D 2540 PUNCH A
SPOOL 00E 1403 A

LINK MAINT 0190 0190 RR * CMS system disk
LINK MAINT 019E 019E RR * Product code disk
MDISK 191 3390 1535 001 610RES MR READ WRITE MULTIPLE



Sample User Directory

- Spool Devices:
Reader, Printer, Punch

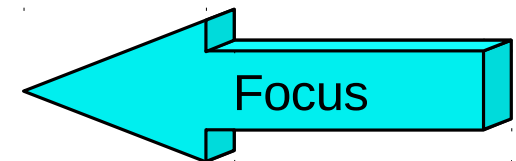


Sample User Directory

USER HUGEN2 NOTMYPWD 32M 32M G
ACCOUNT SYSTEMS
MACH XA
IPL CMS

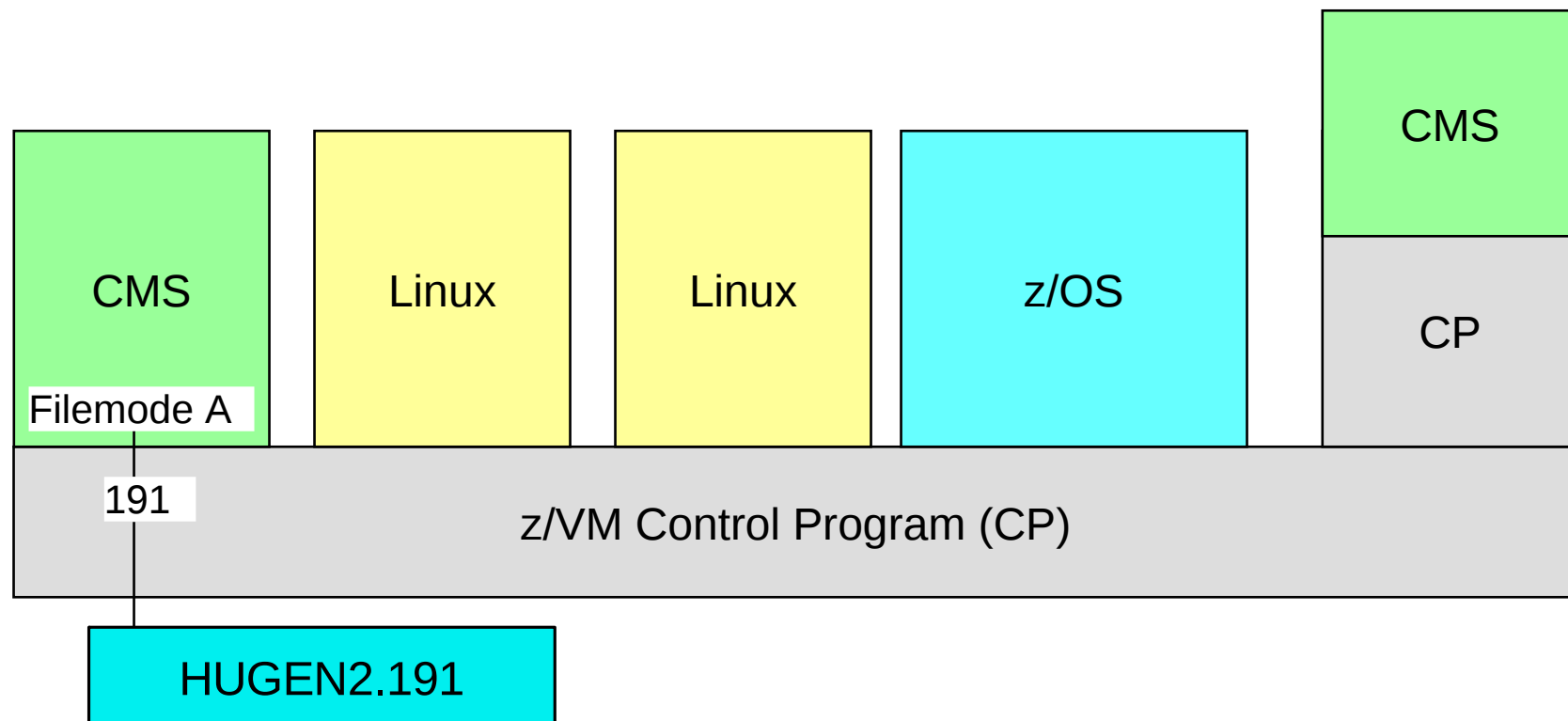
CONSOLE 009 3215
SPOOL 00C 2540 READER *
SPOOL 00D 2540 PUNCH A
SPOOL 00E 1403 A

LINK MAINT 0190 0190 RR * CMS system disk
LINK MAINT 019E 019E RR * Product code disk
MDISK 191 3390 1535 001 610RES MR READ WRITE MULTIPLE



Sample User Directory

- CMS User, Link 191 minidisk, Access as A



File System - Minidisks

- A location on real DASD which has been allocated for storage of a user's files

- Three (3) types of minidisks:
 - Permanent
 - last across sessions (logons); defined in directory

 - Temporary (T-disks)
 - are destroyed at logoff
 - use CP DEFINE command or attach by operator

 - Virtual disks in storage (V-disks)
 - temporary simulations of minidisks in system storage
 - not allocated on real DASD; avoids I/O overhead

File System - Minidisk Commands

- CP DEFINE, CP LINK, CMS ACCESS
 - Defines a virtual device or virtual disk in storage
 - DEFINE T3390 as 291 cyl 10
 - Link to other user's minidisks to share files
 - LINK HUGENBRU 191 391 rr
 - Once linked, a disk can be accessed
 - ACCESS 391 C
- **FORMAT**
 - **Minidisks must be formatted before using the first time**
 - FORMAT 291 C

File System - Minidisk Commands

- **RELEASE, CP DETACH**
 - Release frees an accessed disk
 - Release C
 - Detach removes the device from your VM configuration
 - Detach 291 -or- Release c (detach

- **CP QUERY DASD**
 - Shows what you have linked; displays status

- **Q ACCESSED, Q DISK, Q SEARCH**
 - Shows various status information for accessed disks/directories

- **LISTFILE, FILELIST**
 - Lists the files on an accessed minidisk or directory


```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
q accessed
Mode Stat Files Vdev Label/Directory
A R/W 25 191 HUG191
B R/O 1024 592 TCP592
D R/W 0 292 BWHDSK
F R/O 792 1A1 GPL1A1
P R/O 4899 19A IUOGEN
Q R/O 3382 121 TOOLSU
R R/O 143 120 WWTEST
S R/O 701 190 CMS24
V R/O 544 19F USNBOB
X R/O 4368 19B WWBOBX
Y/S R/O 1700 19E YDISK
Ready; T=0.01/0.01 10:12:03
release d
Ready; T=0.01/0.01 10:12:06
detach 292
DASD 0292 DETACHED
Ready; T=0.01/0.01 10:12:09

RUNNING GDLVM7
MA b DOC ↓ 23/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
q disk
LABEL  VDEV M  STAT  CYL TYPE BLKSZ  FILES  BLKS USED-(%)  BLKS LEFT  BLK TOTAL
HUG191 191  A   R/W   100 3390 4096    25      172-01    17828    18000
TCP592 592  B   R/O   154 3390 4096   1024    11505-42  16215    27720
GPL1A1 1A1  F   R/O   100 3390 4096    792    14339-80   3661    18000
IUOGEN 19A  P   R/O   400 3390 4096   4899    56082-78  15918    72000
TOOLSU 121  Q   R/O   250 3390 4096   3382    22048-49  22952    45000
WVTEST 120  R   R/O    75 3390 4096    143     1179-09   12321    13500
CMS24  190  S   R/O   130 3390 4096    701    19880-85   3520    23400
USNBOB 19F  V   R/O   100 3390 4096    544     3774-21  14226    18000
WVBOBX 19B  X   R/O   300 3390 4096   4368    40624-75  13376    54000
YDISK  19E  Y/S R/O   400 3390 4096   1700    60617-84  11383    72000
Ready; T=0.01/0.01 10:12:41
vdisk
DASD 0021 DEFINED
DMSFOR603R FORMAT will erase all files on disk C(021). Do you wish to continue?
Enter 1 (YES) or 0 (NO).
DMSFOR605R Enter disk label:
DMSFOR733I Formatting disk C
DMSFOR732I 100000 FB-512 blocks formatted on C(021)
Ready; T=0.01/0.01 10:12:44
RUNNING  GDLVM7
MA b DOC ↓ 23/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

Session B - [24 x 80]

File Edit View Communication Actions Window Help

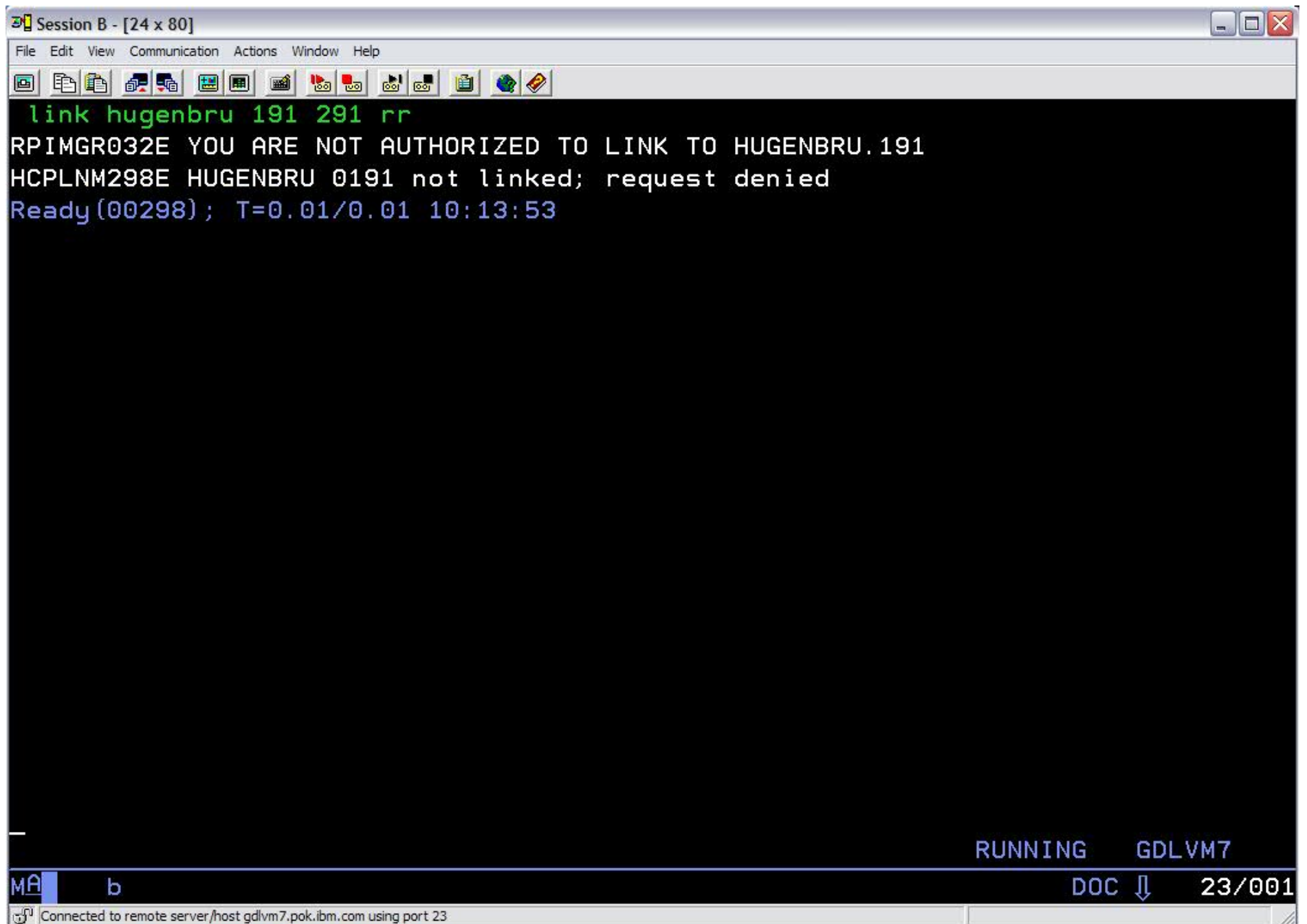
LABEL	VDEV	M	STAT	CYL	TYPE	BLKSZ	FILES	BLKS USED-(%)	BLKS LEFT	BLK TOTAL
HUG191	191	A	R/W	100	3390	4096	25	172-01	17828	18000
TCP592	592	B	R/O	154	3390	4096	1024	11505-42	16215	27720
TMPBWH	021	C	R/W	FB	9336	4096	0	6-00	12494	12500
GPL1A1	1A1	F	R/O	100	3390	4096	792	14339-80	3661	18000
IUOGEN	19A	P	R/O	400	3390	4096	4899	56082-78	15918	72000
TOOLSU	121	Q	R/O	250	3390	4096	3382	22048-49	22952	45000
WWTEST	120	R	R/O	75	3390	4096	143	1179-09	12321	13500
CMS24	190	S	R/O	130	3390	4096	701	19880-85	3520	23400
USNBOB	19F	V	R/O	100	3390	4096	544	3774-21	14226	18000
WWBOBX	19B	X	R/O	300	3390	4096	4368	40624-75	13376	54000
YDISK	19E	Y/S	R/O	400	3390	4096	1700	60617-84	11383	72000

Ready; T=0.01/0.01 10:13:21

RUNNING GDLVM7

MA b DOC ↓ 23/001

Connected to remote server/host gdlvm7.pok.ibm.com using port 23



The screenshot shows a terminal window with a menu bar (File, Edit, View, Communication, Actions, Window, Help) and a toolbar. The terminal text is as follows:

```
link hugenbru 191 291 rr
RPIMGR032E YOU ARE NOT AUTHORIZED TO LINK TO HUGENBRU.191
HCPLNM298E HUGENBRU 0191 not linked; request denied
Ready(00298); T=0.01/0.01 10:13:53
```

At the bottom of the terminal, there is a status bar with the text "RUNNING GDLVM7" and "DOC ↓ 23/001". The left side of the status bar shows "MA" and "b". A footer at the very bottom of the window reads "Connected to remote server/host gdlvm7.pok.ibm.com using port 23".

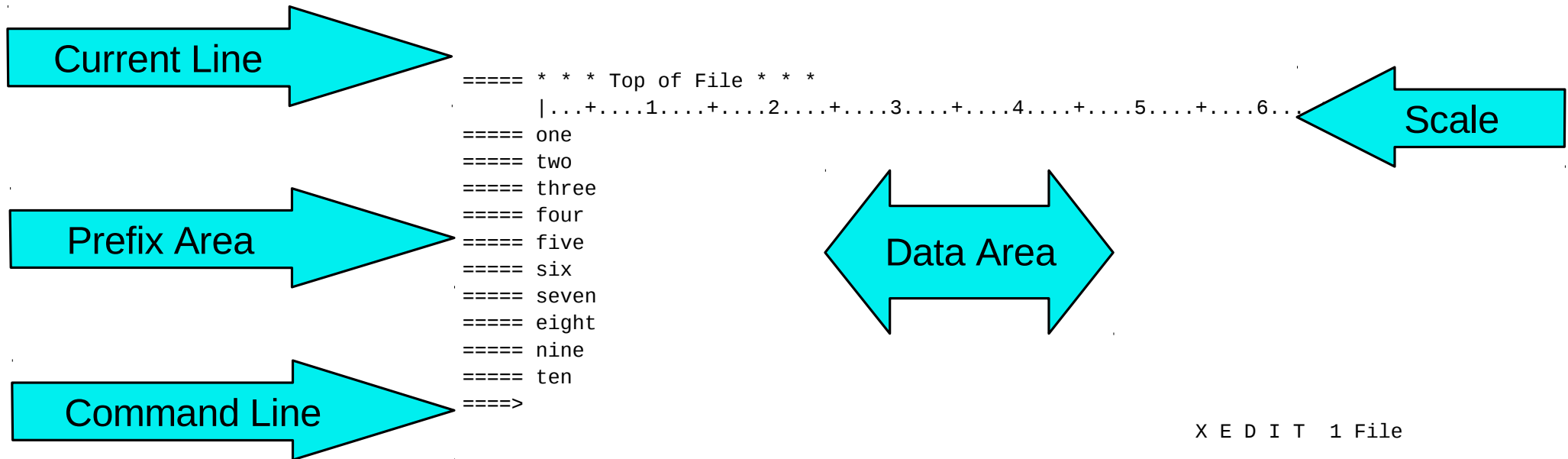
Developing Programs

- Creating and Compiling
 - Use **XEDIT** to create the program like any other file
 - Filetype indicates name of programming language you are using
 - Assemble, Fortran, C, Cobol, PLI, Pascal, REXX, etc.
 - Invoke the compiler by typing compiler name followed by File name of the program
 - LISTING and TEXT files are produced
example: ASSEMBLE ASM1 result: ASM1 LISTING
ASM1 TEXT

XEDIT

- Command: Xedit fn ft fm
- Each line is a record
- Screen Layout:

```
TEST      FILE      A1  F 80  Trunc=80 Size=45 Line=0 Col=1 Alt=0
```



XEDIT

- Prefix Commands (subset)
 - m, mm mm - move
 - c, cc cc - copy
 - f - following
 - p - preceding
 - a - add
 - si - sequential insert
 - d, dd dd - delete
 - ", "" "" - repeat

XEDIT

- Command-line commands
 - screen format
 - change /xxx/yyyy/ * *
 - /zzz/ (find zzz in text)
 - all /zzz/ (find all zzz at once)

- Exiting the program
 - QQuit - leave and doesn't save changes
 - SAVE - doesn't leave, but does save changes
 - FILE - leave and save changes

XEDIT

- Write your own XEDIT commands
 - Name: yourcmd XEDIT
 - Write using REXX
 - Can use Pipelines

XEDIT

- PROFILE XEDIT runs when XEDIT is invoked
- Sample: PROFILE XEDIT

```
/* PROFILE XEDIT */  
'SET VERIFY OFF 1 72'  
'SET NUMBER ON'  
'SET PREFIX NULL'  
'SET CASE MIXED IGNORE'  
'SET CURLINE ON 4'  
'SET SCALE OFF'  
'SET AUTOSAVE 1'
```

- Note: Xedit is very tailorable!

Session B - [24 x 80]

File Edit View Communication Actions Window Help

HUGEN2 FILELIST A0 V 169 Trunc=169 Size=3 Line=1 Col=1 Alt=0

Cmd	Filename	Filetype	Fm	Format	Lrecl	Records	Blocks	Date	Time
	PROFILE	XEDIT	A1	V	72	14	1	4/29/10	13:26:01
	PROFILE	XEDIT	V1	V	70	26	1	4/26/07	18:20:45
	PROFILE	XEDIT	P1	V	76	138	3	8/01/94	14:06:40

1= Help 2= Refresh 3= Quit 4= Sort(type) 5= Sort(date) 6= Sort(size)
 7= Backward 8= Forward 9= FL /n 10= Share 11= XEDIT/LIST 12= Cursor

====>

X E D I T 1 File

MA b DOC ↓ 03/001

Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
PROFILE XEDIT A1 V 255 Trunc=255 Size=14 Line=0 Col=1 Alt=0

0 * * * Top of File * * *
1 /* PROFILE XEDIT */
2 'SET VERIFY OFF 1 72'
3 'SET NUMBER ON'
4 'SET PREFIX ON LEFT' /* Place prefix area at left side of screen */
5 'SET PREFIX NULL'
6 'SET NULLS ON'
7 'SET CASE MIXED IGNORE'
8 'SET CURLINE ON 4'
9 'SET SCALE OFF'
10 'SET AUTOSAVE 1'
11
12 'SET COLOR PREFIX BLUE' /* To make Pref area distinct from filearea */
13 'SET COLOR ARROW WHITE' /* Color of command line arrow is white */
14 'SET COLOR FILEAREA GREEN' /* To ensure filearea is diff from prefix */
15 * * * End of File * * *

====> _

XEDIT 1 File
MA b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
PROFILE XEDIT A1 V 255 Trunc=255 Size=14 Line=0 Col=1 Alt=0
*** Top of File ***
1 /* PROFILE XEDIT */
2 'SET VERIFY OFF 1 72'
3 'SET NUMBER ON'
4 'SET PREFIX ON LEFT' /* Place prefix area at left side of screen */
5 'SET PREFIX NULL'
6 'SET NULLS ON'
7 'SET CASE MIXED IGNORE'
8 'SET CURLINE ON 4'
9 'SET SCALE OFF'
10 'SET AUTOSAVE 1'
11
12 'SET COLOR PREFIX BLUE'/* To make Pref area distinct from filearea */
13 'SET COLOR ARROW WHITE'/* Color of command line arrow is white */
14 'SET COLOR FILEAREA GREEN'/* To ensure filearea is diff from prefix */
15 *** End of File ***
=> _
XEDIT 1 File
MA b DOC 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

Current Line

Prefix Area

Command Line

No Scale

Data Area

XEDIT

- ISPF prefixes - PROFILE XEDIT

```
/* to mimic ISPF          */  
'SET PREFIX SYNONYM B P  '  
'SET PREFIX SYNONYM A F  '  
'SET PREFIX SYNONYM R "  '  
'SET PREFIX SYNONYM RR ""'
```

REXX and EXECs

- Scripting language useful for writing productivity tools
 - Available on z/OS, Linux, Unix, Windows ...

- Quick notes on REXX:
 - /* always starts with a comment */
 - Filetypes: EXEC (most common), EXEC2, REXX
 - Contains Variables and Stemmed Arrays
 - Stores Strings and Numbers as strings
 - Has 'flow control'
 - do and do...while
 - If...then, else, select
 - Allows Functions and Procedures
 - Allows for Pipelines
 - Issues CP/CMS commands (in quotes)

REXX and EXECs

- PROFILE EXEC runs when you sign on
- Contains all the tailoring and configuration desired for this virtual machine
- Can also issue commands at start-up


```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
PROFILE EXEC A2 V 130 Trunc=130 Size=55 Line=0 Col=1 Alt=0

0 * * * Top of File * * *
1 /* profile exec for HUGEN2 at GDLVM7 */
2
3 Signal on NOVALUE
4
5 'SYNONYM HUGEN2 SYNONYM A'
6
7 'spool console to * start'
8 'CP SCREEN CPOUT WHITE '
9 'CP SCREEN VMOUT BLUE '
10 'CP SCREEN INREDISP GREEN '
11 'CP SET LINEDIT ON'
12 'CP SET RETRIEVE MAX'
13 'CP TERM HILIGHT ON'
14 'CP SET EMSG ON'
15 'globalv init'
16
17 'EXEC PFSET'
18
====> _
X E D I T 1 File
MA b DOC ↓ 23/007
Connected to remote server /host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
PROFILE EXEC A2 V 130 Trunc=130 Size=36 Line=19 Col=1 Alt=0

18 EXEC RAC PWQ /* query password expiration */
19 EXEC BRACKET
20
21 say 'Hit [Enter] to continue'
22 pull .
23 VMFCLEAR
24 /* */
25 /* Start-Up User Information */
26 /* */
27 ID
28 say 'CP LEVEL:'
29 Q CPLEVEL
30 say 'CMS LEVEL:'
31 Q CMSREL
32 Q V STOR
33 say 'Adjunct Status: ' adjstatus
34
35 CP QUERY FILES
36 Exit
37 * * * End of File * * *

====>
_

X E D I T 1 File
MA b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
HUGEN2  SYNONYM  A1  F 80  Trunc=80  Size=10  Line=0  Col=1  Alt=0

0  * * * Top of File * * *
1  BROWSE  BR      2
2  COPYFILE COPY    4
3  DISCARD DIS     3
4  ERASE   ER      2
5  FILELIST FILEL   1
6  FILELIST LS ← 2
7  RDRLIST RL      2
8  RENAME  MV ← 2
9  SENDFILE SF     2
10 SENDRDR SENDR   5
11 * * * End of File * * *

====> _

X E D I T  1 File
MA  b          DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
TDISK EXEC A1 V 130 Trunc=130 Size=7 Line=0 Col=1 Alt=0

0 * * * Top of File * * *
1 /* creates a tdisk */
2
3 'DEFINE T3390 AS 0292 CYL 1'
4
5 queue '1'
6 queue 'BWHDSK'
7 'FORMAT 0292 D'
8 * * * End of File * * *

====> _
XEDIT 1 File
MA b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
FOREVER EXEC A1 V 130 Trunc=130 Size=4 Line=0 Col=1 Alt=0

0 * * * Top of File * * *
1 /* */
2 do forever
3   say 'This exec will print the same line forever.'
4 end
5 * * * End of File * * *

====>

XEDIT 1 File
MA b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

Debugging

- Record your console
 - spool console to * start (to start recording)
 - ... (do work here)
 - spool console stop close (punch console to reader)
 - query reader all (to get the spool id)
 - rdrlist
 - peek {spool id} (for *
 - receive {spool id} fn ft fm (to look at the console)
(to save console in a file)

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
Ready; T=0.01/0.01 10:18:21
  SPOOL CONSOLE STOP CLOSE
RDR FILE 0079 SENT FROM HUGEN2   CON WAS 0079 RECS 0151 CPY   001 T NOHOLD NOKEEP
Ready; T=0.01/0.01 10:18:32

RUNNING   GDLVM7
MA b DOC ↓ 23/001
Connected to remote server/host gdlvm7.pok.ibm.com using port 23
  
```

Session B - [24 x 80]

File Edit View Communication Actions Window Help

HUGEN2 RDRLIST A0 V 164 Trunc=164 Size=7 Line=1 Col=1 Alt=0

Cmd	Filename	Filetype	Class	User	at	Node	Hold	Records	Date	Time
	SSL540	VMARC	PUN A	HUGENBRU		GDLVM7	NONE	3074	2/18	10:47:11
	VMSSL	CODEREV	PUN A	HUGENBRU		GDLVM7	NONE	90	2/18	10:47:58
	GSKSSL	GSK-ENTS	PUN A	HUGENBRU		GDLVM7	NONE	175	2/18	10:47:58
	SSL-ESP	SETUP	PUN A	HUGENBRU		GDLVM7	NONE	133	2/18	10:47:58
	(none)	(none)	CON T	HUGEN2		GDLVM7	NONE	67	5/18	4:49:05
	(none)	(none)	CON T	HUGEN2		GDLVM7	NONE	27	6/10	7:59:02
	(none)	(none)	CON T	HUGEN2		GDLVM7	NONE	151	6/17	10:03:37

1= Help 2= Refresh 3= Quit 4= Sort(type) 5= Sort(date) 6= Sort(user)
 7= Backward 8= Forward 9= Receive 10= 11= Peek 12= Cursor

====>

X E D I T 1 File

MA b DOC ↓ 09/001

Connected to remote server/host gdlvm7.pok.ibm.com using port 23


```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
0079      PEEK      A0  V 133  Trunc=133 Size=151 Line=48 Col=1 Alt=0
File (none) (none) from HUGEN2 at GDLVM7 Format is CONSOLE.
This exec will print the same line forever.
This exec will print the same line forever.
This exec will print the same line forever.
hx
CMS
b
Ready; T=0.01/0.01 10:08:18
q disk
LABEL  VDEV M  STAT  CYL TYPE BLKSZ  FILES  BLKS USED-(%)  BLKS LEFT  B
HUG191 191  A   R/W   100 3390 4096    25    172-01    17828
TCP592 592  B   R/O   154 3390 4096   1024   11505-42   16215
BWHDSK 292  D   R/W     1 3390 4096     0     7-04     173
GPL1A1 1A1  F   R/O   100 3390 4096    792   14339-80   3661
IUOGEN 19A  P   R/O   400 3390 4096   4899   56082-78  15918
TOOLSU 121  Q   R/O   250 3390 4096   3382   22048-49  22952
WVTEST 120  R   R/O    75 3390 4096    143   1179-09  12321
CMS24  190  S   R/O   130 3390 4096    701   19880-85  3520
1= Help      2= Add line  3= Quit      4= Tab       5= Clocate   6= ?/Change
7= Backward  8= Forward  9= Receive  10= Rgtright 11= Spltjoin 12= Cursor

====>
_

X E D I T  1 File
MA  b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
0079      PEEK      A0  V 133  Trunc=133  Size=151  Line=136  Col=1  Alt=0
File (none) (none) from HUGEN2 at GDLVM7 Format is CONSOLE.
CMS24  190  S    R/O    130 3390 4096      701      19880-85      3520
USNBOB 19F  V    R/O    100 3390 4096      544      3774-21      14226
WVBOBX 19B  X    R/O    300 3390 4096     4368     40624-75     13376
YDISK  19E  Y/S  R/O    400 3390 4096     1700     60617-84     11383
Ready; T=0.01/0.01 10:13:21
link hugenbru 191 291 rr
RPIMGR032E YOU ARE NOT AUTHORIZED TO LINK TO HUGENBRU.191
HCPLNM298E HUGENBRU 0191 not linked; request denied
Ready(00298); T=0.01/0.01 10:13:53
filel profile xedit *
Ready; T=0.01/0.01 10:15:44
filel profile exec *
Ready; T=0.01/0.01 10:17:12
filel * exec a
Ready; T=0.01/0.01 10:18:21
SPOOL CONSOLE STOP CLOSE
* * * End of File * * *
1= Help      2= Add line  3= Quit      4= Tab       5= Clocate   6= ?/Change
7= Backward  8= Forward  9= Receive  10= Rgtright 11= Spltjoin 12= Cursor

====>
_

X E D I T  1 File
MA b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

Debugging

- Tracing

- trace i r12345.10
 - trace instructions @ location 12345 for x'10' bytes
- display g (display general registers)
- d t12345.20 (display translated storage for x20)
- b (begin execution)
- trace end (end tracing)

- Dumps

- VMDUMP
- VM Dump Tool

HELP!

- HELP Facility
 - HELP command
 - HELP msg DMSxxxE
 - CP Link MAINT 19D 19D rr
 - link for HELP disk

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
[Icons]
COMMANDS LINK Brief Help Information line 1 of 11

LINK

The LINK command lets you look at another person's files.

FORMAT: LINK userid vdev1 vdev2 mode password

EXAMPLE: To link to Pat's 191 disk as your 196 disk, enter:

link pat 191 196 rr share

PF1= All      2= Top      3= Quit      4= Return    5= Clocate   6= ?
PF7= Backward 8= Forward  9= PFkeys   10=          11=          12= Cursor

====> _
Macro-read 1 File
MA b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23

```

```
Session B - [24 x 80]
File Edit View Communication Actions Window Help
[Icons]
COMMANDS LINK All Help Information line 1 of 608
(c) Copyright IBM Corporation 1990, 2008

LINK

                                .-RR---.
>>--LINK-- .----- .--userid- .--vdev1-- .----- .--vdev2-- +-----+----->
           '-TO-'   '-*-----'   '-AS-'   '-mode-'

>----->
|                                     (1) |
|-----|---password-----|
|'-PASS=-'|

Note:
(1) The password operand is not accepted if password suppression is active.

Authorization

PF1= Brief    2= Top      3= Quit    4= Return    5= Clocate    6= ?
PF7= Backward 8= Forward  9= PFkeys 10=         11=          12= Cursor

====>
_

Macro-read 1 File
MA b DOC ↓ 23/007
Connected to remote server/host gdlvm7.pok.ibm.com using port 23
```

Further Reference

- **Speaker:** Miguel Delapaz
 - E-mail: migueld@us.ibm.com

- **Web sites:**
 - <http://www.vm.ibm.com/> -- zVM on the Web
 - <http://www.vm.ibm.com/library> -- the online zVM Library
 - <http://www.vm.ibm.com/education> -- presentations, classes and information

- **Via mailing lists:**
 - IBMTCP-L@VM.MARIST.EDU
 - IBMVM@LISTSERV.UARK.EDU
 - LINUX-390@VM.MARIST.EDU

- Thank you for listening!