

Lab # 2: CMS Commands (solutions)

In this lab exercise, a list of actions and questions follows each task. This lab has been designed to reinforce concepts mentioned in the CMS module. We will be talking (at a high level) about specific commands and what they do in z/VM. The only limitation at this point is that every student is a Class G user (G is for general rather than privileged).

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As a quick review, CMS provides an end user with an interactive interface for z/VM. You use CMS to edit and run execs or programs, and to modify your CMS virtual machine environment and your z/VM system. CMS will be our primary interface.

1) HELP command:

First, let's take a look at the HELP command. The HELP command is a useful tool when you are not sure of the format or operands of a CMS command or really want to see a menu of what commands are available. So, after you log on to your z/VM system, you can begin entering commands. Let's try the CMS HELP command first.

Here is a list of commands: Test each command and indicate whether it is valid or not.

| | |
|--------------------|------------------|
| → help CMS | valid |
| → help all | not valid |
| → help | valid |
| → help help | valid |

1a) When you type in **help CMS**, list a few of the menu panel help options (denoted with an *) and the task panel option (denoted with an :).

Answer: ***XEDIT, *WINDOW, *BORDER.....:HELP**

What would you do to quit or exit help?

Answer: **Press the PF3 Key or type 'quit'**

Using the PF7 and PF8 keys, you can page up and page down to see the complete list of CMS commands that HELP is offering to you. To get help on a specific CMS command you can move the cursor over the command and press the **Enter** key. Note the ascending right to left order of the command names.

1c) What is the very last command in the list, ascending left to right and top to bottom?

Answer: **NOTE**

2) QUERY Command:

Within the HELP CMS menu, use the PF keys (if the command is not on the screen) to scroll to find the QUERY command. Move the cursor to that command and double left click on it, or you can move the cursor to the menu label or command of interest and press **Enter**. The detailed help provides the syntax diagram we explained earlier, a description or purpose, the authorization required to use the command, and the various operands you may use with the QUERY command, as well as the error messages associated with the command. To get out of the help screen, just look at the PF key commands below. The **PF3** key is used to Quit from your current location back to the Menu Help Information screen. When you are in this HELP screen, find the *PIPE menu panel (the asterisk indicates there is a set of menu options for the command.) Select the *PIPE menu help by moving your cursor to *PIPE and double-clicking with the left mouse button.

2a) When you are in the *PIPE help area, notice the following:

- a) The syntax diagram, the description, and the usage notes
- b) The subcommands and stages used with PIPE
- c) An area where you can enter PIPE commands
- d) Some useful examples for using PIPES

Now, find your way out of the HELP command area and get back to the Ready prompt. If you know what command you need help on (for example, the QUERY command), you can type **help query** and press **Enter** in CMS, rather than typing **help cms** and then finding the QUERY command in the list. Enter the following:

→ **help query**

2b) Did this take you where you thought you were going to go? (Y/N) yes

Some commands have abbreviations or short names. For QUERY, the abbreviation is **q**. Enter:

→ **help q**

2c) Did this take you where you thought you were going to go? (Y/N) Yes

Next, enter the following command:

→ **query disk**

or

→ **q disk**

The output should be similar to what you see below:

Ready; T=0.01/0.01 14:29:14

query disk

| <u>LABEL</u> | <u>VDEV</u> | <u>M</u> | <u>STAT</u> | <u>CYL</u> | <u>TYPE</u> | <u>BLKSZ</u> | <u>FILES</u> | <u>BLKS</u> <u>USED-(%)</u> | <u>BLKS</u> <u>LEFT</u> | <u>BLK</u> <u>TOTAL</u> |
|--------------|-------------|----------|-------------|------------|-------------|--------------|--------------|--------------------------------|----------------------------|----------------------------|
| - | DIR | A | R/W | - | - | 4096 | 3 | - | - | - |
| MARIST | 19F | B/B | R/O | 30 | 3390 | 4096 | 418 | 2586-48 | 2814 | 5400 |
| GDDM32 | 319 | P/P | R/O | 40 | 3390 | 4096 | 555 | 6686-93 | 514 | 7200 |
| MNT190 | 190 | S | R/O | 100 | 3390 | 4096 | 692 | 14299-79 | 3701 | 18000 |

```

MNT19E 19E Y/S R/O 200 3390 4096 1231 27471-76 8529 36000
MNT19D 19D Z/Z R/O 146 3390 4096 703 22733-87 3547 26280
Ready; T=0.01/0.01 14:29:44

```

After processing the QUERY DISK command, we return to the Ready prompt. The QUERY DISK command returns some valuable information.. We can see this user has 5 minidisks accessed plus an SFS (Shared File System segment) as mode A (the DIR under VDEV tells us it is an SFS). We can see the minidisk labels, their virtual device addresses (for example, 19F, 319, ... their access modes (shown by M), their status (Read/Write and Read/Only), their allocated size, the type of DASD, the blocksize, the number of files allocated on the minidisk, and usage information.

3) Minidisks:

Minidisks are z/VM's way of virtualizing DASD volumes by logically partitioning the disks. Just as you can divide a PC hard drive into multiple physical partitions and then add logical drives, using z/VM you can create multiple minidisks on a mainframe disk volume. A minidisk in z/VM could be considered analogous to a logical drive on a PC.

In the previous **query disk** command, the output accessed 5 minidisks. Look back a bit to note the third field reported. It was the symbol M, which represents the *file mode*. The order in which the file mode is displayed is the order of the minidisks search access, which is very important. CMS uses the access order as its search order. CMS searches for executables or files across the minidisks based on the ascending alphabetical access order or file mode.

3a) Which minidisk or area is searched first if CMS is looking for a file?

Answer: **A**

3b) Which minidisk is searched second, if the file is not found in the first area searched?

Answer: **B**

4) ACCESS and RELEASE commands:

You can change this access order and add disks to your access list with the ACCESS command. Let's query disk again to see what we have.

→ **query disk**

4a) List the minidisk labels, virtual device addresses and their access modes.

Answer:

```

LABEL VDEV M STAT
DSWT 191 A R/W
TCM592 192 D R/O
MNT190 190 S R/O
MNT19E 19E Y/S R/O

```

Use the following command to see which minidisks are ATTACHED to your virtual machine. Not all disks are necessarily accessed by your virtual machine. How might we know what is attached? Issue the following command:

→ query dasd

4b) List the minidisk VOLUME allocation names that match the Volume Devices displayed with QUERY DISK and write down the defined name for each. An example is shown below. Complete the list. (q disk and q dasd).

Answer: MNT190 190 S R/O 100 3390 4096 694 15028-83 2972 18000

| LABEL | VDEV | M | STAT | CYL | TYPE | BLKSZ | FILES | BLKS USED-(%) | BLKS LEFT | BLK TOTAL |
|--------|------|-----|------|-----|------|-------|-------|---------------|-----------|-----------|
| DSWT | 191 | A | R/W | 50 | 3390 | 4096 | 3 | 12-01 | 8988 | 9000 |
| TCM592 | 192 | D | R/O | 70 | 3390 | 4096 | 904 | 10186-81 | 2414 | 12600 |
| MNT190 | 190 | S | R/O | 100 | 3390 | 4096 | 694 | 15028-83 | 2972 | 18000 |
| MNT19E | 19E | Y/S | R/O | 250 | 3390 | 4096 | 1021 | 28254-63 | 16746 | 45000 |

q dasd

| | | | | | | | |
|-----------|------|--------|-----|-----|-------------|------|-------------------|
| DASD 0190 | 3390 | UV101B | R/O | 107 | CYL ON DASD | 101B | SUBCHANNEL = 0005 |
| DASD 0191 | 3390 | TM111A | R/W | 50 | CYL ON DASD | 111A | SUBCHANNEL = 0000 |
| DASD 0192 | 3390 | UV101F | R/O | 70 | CYL ON DASD | 101F | SUBCHANNEL = 0006 |
| DASD 019D | 3390 | UV101E | R/O | 146 | CYL ON DASD | 101E | SUBCHANNEL = 0007 |
| DASD 019E | 3390 | UV101E | R/O | 250 | CYL ON DASD | 101E | SUBCHANNEL = 0008 |
| DASD 0401 | 3390 | UV101E | R/O | 146 | CYL ON DASD | 101E | SUBCHANNEL = 0009 |
| DASD 0402 | 3390 | UV101E | R/O | 146 | CYL ON DASD | 101E | SUBCHANNEL = 000A |

Before, we change the search order of our mode D disk, we must release it. Then let's check to see if the access list and the attached lists are the same.

→ release 192

→ query disk

→ query dasd

4c) Explain what occurred when you used the RELEASE command. What is different (look for 192 in each output, q disk and q dasd.)

| LABEL | VDEV | M | STAT | CYL | TYPE | BLKSZ | FILES | BLKS USED-(%) | BLKS LEFT | BLK TOTAL |
|--------|------|-----|------|-----|------|-------|-------|---------------|-----------|-----------|
| DSWT | 191 | A | R/W | 50 | 3390 | 4096 | 3 | 12-01 | 8988 | 9000 |
| MNT190 | 190 | S | R/O | 100 | 3390 | 4096 | 694 | 15028-83 | 2972 | 18000 |
| MNT19E | 19E | Y/S | R/O | 250 | 3390 | 4096 | 1021 | 28254-63 | 16746 | 45000 |

q dasd

| | | | | | | | |
|-----------|------|--------|-----|-----|-------------|------|-------------------|
| DASD 0190 | 3390 | UV101B | R/O | 107 | CYL ON DASD | 101B | SUBCHANNEL = 0005 |
| DASD 0191 | 3390 | TM111A | R/W | 50 | CYL ON DASD | 111A | SUBCHANNEL = 0000 |
| DASD 0192 | 3390 | UV101F | R/O | 70 | CYL ON DASD | 101F | SUBCHANNEL = 0006 |
| DASD 019D | 3390 | UV101E | R/O | 146 | CYL ON DASD | 101E | SUBCHANNEL = 0007 |
| DASD 019E | 3390 | UV101E | R/O | 250 | CYL ON DASD | 101E | SUBCHANNEL = 0008 |
| DASD 0401 | 3390 | UV101E | R/O | 146 | CYL ON DASD | 101E | SUBCHANNEL = 0009 |
| DASD 0402 | 3390 | UV101E | R/O | 146 | CYL ON DASD | 101E | SUBCHANNEL = 000A |

(192 is no longer listed in the Access list but it is still on the list of the attached DASD volumes)

Now, access disk 19F, listed under D, and change it to file mode T:

```
→ access 192 t
→ query disk
```

This command accesses the 19F disk to file mode T.

4d) Enter the commands needed to place 19F back to mode D.

Answer: release 192, gggggg**acc 192 D**

5) FILELIST command:

Use the help facility to find the complete description of the CMS FILELIST command. Please read the command description. When you are done reading, try the following commands:

```
→ filelist * * *
```

Files on CMS minidisks are saved using three pieces of information as part of their name: File name, File type, File mode; as explained in the first lab exercise. When you are done looking at what this command can do, go to the ready prompt.

Let's try a simple exercise to learn a little more about CMS. Return to the Ready prompt if you are not already there. Now, you will create your own exec. Enter the following command:

```
→ xedit new exec a
```

We are going to create a rather simple exec, which is called NEW EXEC, on the "A" disk. When the Xedit session opens type **i** on the command line to enter input mode; then enter the following (your first REXX exec):

```
→ /*      */
→ Say 'hi from the a-disk'
```

File your changes by pressing **Enter** to leave input mode and typing **file** on the command line to file your changes. You could also type **save** on the command line and then **qq** to quit from the file.

Next run your new exec:

```
→ new
```

5a) What is displayed on your screen?

Answer: **hi from the a-disk**

Next enter:

```
→ filel new * a
```

The FILEL command output places your cursor next to NEW EXEC A, enabling you to enter line commands. Type the following on the line to copy NEW EXEC C to your "A" disk:

```
→ copy / new2 = a
→ copy / new3 = =
```

When you type in these commands, they will overstrike what is there. Don't get too excited and type in other stuff. After doing the copies, hit PF2 for refresh. What happened?

What is the difference before and after the refresh? Something to think about, but the exact explanation of the tasks is described on the next page.

By typing **copy /** you're telling CMS to copy "this file" (the one on the FILEL command output line where you're typing). **new2 =** tells CMS to create a new file with the filename of "NEW2", the same filetype and the default filemode (usually a), and copy it to the disk you have accessed as file mode "A". The **=** is like a variable substitution, the EXEC (file type) is substituted from the original file while giving it the **new2** or **new3** name. The **= =** allows both the filetype and filemode to be substituted. If you were to type it completely out it would look like the following: **copy new exec a new2 exec a**

Press **Enter** to perform the copy operation.

Return to the ready prompt and enter the following command to verify the copy command was effective:

```
→ filel * exec a
```

5b) What do you see when this command is executed?

(You should see three files named NEW EXEC, NEW2 EXEC and NEW3 EXEC on your A-disk.)

You can use the asterisk as a wildcard for searching.

```
→ filel n* * a
```

5c) What do you see when this command is executed?:

(You should see the same three files, NEW, NEW2 and NEW3 on your A-disk.)

If you want to try something a little broader, try:

```
→ filel n* * *
```

5d) Describe what you get when this command is executed:

Answer: **(all files in the search order that have a filename beginning with n).**

Edit the file **new2 exec a** and change the text that is written to say **hi from the a-disk this is NEW2**, file your changes, and return to your Ready prompt.

Execute the new2 exec again by entering:

→ **new2**

You should see **hi from the a-disk this is NEW2.**

From the CMS Ready prompt, type the command:

→ **discard new2 exec a**

5d) What happened? You got an error message and it told you where you could use DISCARD.

Now type **file1 new* exec** and press **Enter**.

On the line containing NEW2 EXEC enter DISCARD:

→ **discard**

5e) What is now displayed on that line? Answer: **NEW2 EXEC A1 has been discarded**

Press PF2 to refresh after the discard and exit from filelist.

5f) Try to run NEW2. What happened and did you expect it to happen? (Y/N)

Answer: **Unknown CP/CMS command**

5g) Now from the Ready prompt, type **erase new3 exec** and then try running NEW3. What happened and why?

Answer: **Unknown CP/CMS command**

You have just used two frightening and powerful commands. DISCARD and ERASE. Do not use without adult supervision!!!

This is the end of Lab #2, z/VM and CMS commands.

Addendum

Each virtual machine can own one or more minidisks which may be shared between them. Use the CP command LINK with the appropriate mode to make the minidisk available.

The syntax is LINK Name-of-the-owner VDEV VDEV-on-my-machine MODE.

The available modes are:

READ, WRITE, MULTIPLE, STABLE and EXCLUSIVE

The minidisk's are password protected and usually only as Read Only disk accessible.

From the CMS Ready prompt, type the command:

→ **link provider 191 1191 RR**

ENTER READ PASSWORD:

```
/* hint: it's named
'provider' ;-) */
```

DASD 1191 LINKED R/O; R/W BY PROVIDER

To use the minidisk 191 from the user *provider* - first we have to ACCESS the disk determining the mode where mode is a 'free' letter from A-Z. So check the free letters using the command *q disk*.
Attention – there are some special modes:

| | |
|----------------------------------|--|
| 191 – A | Private disk similar to the home directory of Linux |
| 192 – D (if you've a 192er disk) | Expansion of the A-minidisk |
| 190 – S | System minidisk of CSM similar to the root directory of Linux |
| 19E – Y | Expansion of the System-minidisk similar to /usr/bin, /usr/sbin within Linux |

```
→ access 1191 E
E (1191) R/O
```

List the minidisk labels, virtual device addresses and their access modes and list the minidisk VOLUME allocation names that match the Volume Devices. Remember the both commands?

Answer: **q disk**

Answer: **q dasd**

q disk

| LABEL | VDEV | M | STAT | CYL | TYPE | BLKSZ | FILES | BLKS USED-(%) | BLKS LEFT | BLK TOTAL |
|-------|------|---|------|-----|------|-------|-------|---------------|-----------|-----------|
|-------|------|---|------|-----|------|-------|-------|---------------|-----------|-----------|

| | | | | | | | | | | |
|--------|------|-----|-----|-----|------|------|------|----------|-------|-------|
| DSWT | 191 | A | R/W | 50 | 3390 | 4096 | 5 | 14-01 | 8986 | 9000 |
| TCM592 | 192 | D | R/O | 70 | 3390 | 4096 | 904 | 10186-81 | 2414 | 12600 |
| PRO191 | 1191 | E | R/O | 50 | 3390 | 4096 | 3 | 12-01 | 8988 | 9000 |
| MNT190 | 190 | S | R/O | 100 | 3390 | 4096 | 694 | 15028-83 | 2972 | 18000 |
| MNT19E | 19E | Y/S | R/O | 250 | 3390 | 4096 | 1021 | 28254-63 | 16746 | 45000 |

Ready; T=0.01/0.01 13:00:06

q dasd

| | | | | | |
|-----------|------|--------|-----|-----------------|------------------------|
| DASD 0190 | 3390 | UV101B | R/O | 107 CYL ON DASD | 101B SUBCHANNEL = 0005 |
| DASD 0191 | 3390 | TM111A | R/W | 50 CYL ON DASD | 111A SUBCHANNEL = 0000 |
| DASD 0192 | 3390 | UV101F | R/O | 70 CYL ON DASD | 101F SUBCHANNEL = 0006 |
| DASD 019D | 3390 | UV101E | R/O | 146 CYL ON DASD | 101E SUBCHANNEL = 0007 |
| DASD 019E | 3390 | UV101E | R/O | 250 CYL ON DASD | 101E SUBCHANNEL = 0008 |
| DASD 0401 | 3390 | UV101E | R/O | 146 CYL ON DASD | 101E SUBCHANNEL = 0009 |
| DASD 0402 | 3390 | UV101E | R/O | 146 CYL ON DASD | 101E SUBCHANNEL = 000A |
| DASD 1191 | 3390 | TM111A | R/O | 50 CYL ON DASD | 111A SUBCHANNEL = 000B |

What's the label of the provider's 191's minidisk? Answer: **PRO191**

First list the files from the provider's 191er minidisk:

```
→ f * * e
```

| Cmd | Filename | Filetype | Fm | Format | Lrecl | Records | Blocks | Date | Time |
|-----|----------|----------|----|--------|-------|---------|--------|---------|----------|
| | PROFILE | XEDIT | E1 | V | 72 | 189 | 2 | 7/26/12 | 14:12:27 |
| | SYN | SYNONYM | E1 | F | 80 | 2 | 1 | 7/26/12 | 14:06:55 |

PROFILE EXEC E1 V 31 14 1 7/26/12 14:03:59

Then copy the files from the provider's 191er minidisk to your A-disk. Which commands do you use?

1) **copy * * e = = a (repl**

or

| 2) Cmd | Filename | Filetype | Fm Format | Lrecl | Records | Blocks | Date |
|----------------|----------------|--------------|-------------|-----------|------------|-------------------------|-------------------------|
| copy / | = = aE | XEDIT | E1 V | 72 | 189 | 2 | 7/26/12 14:12:27 |
| SYN | SYNONYM | E1 F | 80 | 2 | 1 | 7/26/12 14:06:55 | |
| PROFILE | EXEC | E1 V | 31 | 14 | 1 | 7/26/12 14:03:59 | |

How many Profile files do have meanwhile? Which command do you use?

Answer: **f profile * *** **that means then 4**

If you d'like to remove the the minidisk of the user provider release and detach it!

→ rel E (det
DASD 1191 DETACHED

Now you couldn't see the mentioned minidisk neither with q disk nor with q dasd.

We copied three files regarding the customization of your environment. Log out and login again to work with some advantages.

PROFILE EXEC, PROFILE XEDIT and SYN SYNONYM

Back again? First let's show the fileslist on our A-Minidisk....just type **f** instead of filel
Not bad, isn't it? We need the file SYN SYNONYM and the PROFILE EXEC.

| Cmd | Filename | Filetype | Fm Format | Lrecl | Records | Blocks | Date | Time |
|---------------|----------|----------|-----------|-------|---------|--------|------------------|------|
| browse | PROFILE | EXEC | A1 V | 31 | 14 | 1 | 7/30/12 15:20:47 | |
| | PROFILE | XEDIT | A1 V | 72 | 189 | 2 | 7/30/12 13:06:26 | |
| | SYN | SYNONYM | A1 F | 80 | 2 | 1 | 7/30/12 13:06:26 | |
| | LASTING | GLOBALV | A1 V | 38 | 3 | 1 | 7/30/12 12:46:04 | |
| | DSWT | NETLOG | A0 V | 79 | 1 | 1 | 7/30/12 12:45:19 | |

For just viewing a file type **browse** to do that. The color of the font changes to blue and white. Leave it with **quit**.

==>

```
/* **** */
/*  MAINT PROFILE EXEC  */
/* **** */
```

ADDRESS COMMAND

```
'SYNONYM SYN'
'CP TERMINAL MODE VM'
'CP SPOOL CONSOLE * START'
'CP SET PF11 RETRIEVE FORWARD'
'CP SET PF12 RETRIEVE BACKWARD'
'CP SET PF23 RETRIEVE FORWARD'
'CP SET PF24 RETRIEVE BACKWARD'
'SET FILEPOOL VMSYS:'
'SET LDRTBLS 25'
* * * End of File * * *
```

ADDRESS COMMAND

This implies basic CMS CMSCALL command resolution. To call an exec, prefix the command with the word EXEC; to send a command to CP, use the prefix CP.

SYNONYM SYN

Reads the defined aliases and activate them.

CP TERMINAL MODE VM

controls the attention environment. If you specify CP, one or more attentions force your virtual machine into the CP environment. If you specify VM, one or more attentions are reflected to your virtual machine. VM is the default for all users except the primary system operator.

To prevent losing server console output, you might want to consider spooling the server's console to the user ID of the secondary user. Add the following to the server's PROFILE EXEC:

```
CP SPOOL CONSOLE START TO secondid
```

CP SET PFX

Defines the PF Keys (Programmable Function Key). For example press the PF12 key to get the last command you typed in.

Use the SET LDRTBLS command to define the initial number of pages of storage to be used for loader tables.

Try to define an alias using SYNONYM

Regarding the shortcut of FILEL we need the entry 'SYNONYM SYN' within this file.

We have to determine the abbreviation in the file SYN SYNONYM. For example you could insert this line:

```
BROWSE    BR
```

After saving and leaving the file with 'file', activate the new synoym:

→ *synonym syn synonym a*

and try it. To see the synonyms make an appropriate query:

→ *q synonym user*

SYSTEM USER SHORTEST

COMMAND SYNONYM FORM (IF ANY)

FILELIST F

FILELIST FU

BROWSE BR

ERASE LOESCH

XEDIT TOUCH

This is the end of Lab #2, z/VM and CMS commands.