



CMS Administration Boot Camp

by

Dave Jones
"THINK ... Penguins!"

2014 VM Workshop
June 26 -28, 2014

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States, other countries, or both.

Not all common law marks used by IBM are listed on this page. Failure of a mark to appear does not mean that IBM does not use the mark nor does it mean that the product is not actively marketed or is not significant within its relevant market.

Those trademarks followed by ® are registered trademarks of IBM in the United States; all others are trademarks or common law marks of IBM in the United States.

For a complete list of IBM Trademarks, see www.ibm.com/legal/copytrade.shtml:

AS/400®, e business (logo)®, DBE, ESCO, eServer, FICON, IBM®, IBM (logo)®, ISeries®, MVS, OS/390®, pSeries®, RS/6000®, S/30, VM/ESA®, VSE/ESA, WebSphere®, xSeries®, z/OS®, zSeries®, z/VM®, System I, System I5, System p, System p5, System x, System z, System z9®, BladeCenter®

The following are trademarks or registered trademarks of other companies.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel

Corporation or its subsidiaries in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency, which is now part of the Office of Government Commerce.

*** All other products may be trademarks or registered trademarks of their respective companies.**

Abstract

This session will cover a number of the important topics that new users should know about the CMS environment in order to be able to avoid trouble, get out of trouble, and stay out of trouble. The session will cover such topics as:

- CMS overview

- Most used CMS commands

- CMS file system

- CMS search order

- Setting up PROFILES

- Where to get very useful tools

- What's an RSU and a PTF?

- The IBMVM and Linux-390 lists.

If time permits, we'll also take time to address any CMS related issues brought up by the attendees.

Agenda

- CMS Overview
 - brief history
 - philosophy
- CMS file systems
 - "Classic" EDF
 - SFS
- CMS search order
 - First, EXECs then MODULES.....
- Setting up PROFILES
 - SYSPROF, PROFILE EXEC, PROFILE XEDIT
- Where to get very useful tools
- What's an RSU, APAR and a PTF?
- Ordering Service
- Doing local mods to CMS
- How to find hard to locate IBM documents
- The IBMVM and Linux-390 lists.

CMS Overview

CMS:

An interactive, light-weight, single user operating system that runs under the control of CP

Provides an application programming and execution environment

Supports a low-overhead, multitasking environment for running applications

Has many tools available, including CMS Pipelines, Xedit, and Rexx and user contributed utilities

CMS Overview

CMS:

Developed in the mid to late 1960s, first for S/360 and then for S/370 hardware

Was known as Cambridge Monitor System, later renamed Conversational Monitor System

First official release, with support, was with VM/370 on August 2, 1972

Source code for CMS was available

CMS Overview

CMS design principals:

Be robust and resilient

Be easy to learn

Be easy to use, with simple , easy to remember
command names and syntax

Exploit shared hardware and software resources, e.g.
shared CMS nucleus and DCSS

High performance

CMS File System

CMS files:

have either fixed or variable record length and are sequential only

maximum record length is 32760

are identified by a fileid

fileid has three fields:

file name, (FN) -- 1 to 8 characters long

file type, (FT) -- also 1 to 8 characters long

file mode, (FM) or Directory name (dirname), if file is stored in a SFS

CMS File System

CMS files:

the FN and FT are set by the file's creator

the FM has two parts:

- 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

a file's FN, FT and FM are separated by one (or more) blanks when used in a CMS command

CMS File System

CMS files:

are stored either on:

- a mindisk

- a Shared File System (SFS) directory

 - like `VMSYSU:DAVE.EXAMPLE`.

- on the BFS (Byte File System) (`/home/userid/...`)

 - a Unix/Linux like hierarchical file structure

- in NFS (Network File System)

CMS Search Order

When a command is entered by a user, CMS has to locate it...this is called CMS command resolution.

User enters <command> on console and hits enter.

First, CMS searches for a file named <command> EXEC on all accessed minidisks, SFS directories, and EXECs in storage. If found, it is run.

If not found, CMS searches the translation and synonym settings for the specified command name. If found, search for an EXEC with the valid translation or synonym.

CMS Search Order

If the translation or synonym search fails, then search for the specified command name in:

nucleus extension

transient area

nucleus resident

or for a file with the specified command name and file type of MODULE on accessed disks and SFS directories

If not found, CMS searches the translation and synonym settings for the specified command name with the MODULE file type

If all CMS searches fail, then pass the command to CP

Setting Up PROFILES

Important CMS configuration and tailoring files:

`SYSPROF EXEC` -- system wide tailoring of the CMS environment

`PROFILE EXEC` -- individual user tailoring of their CMS environment

`PROFILE XEDIT` -- tailoring of the Xedit session

Other CMS applications (e.g., `SHOW`) also use profile files to set initial configuration values

Setting Up PROFILES -- SYSPROF

SYSPROF EXEC:

Processes the parameters passed on the IPL command

Displays the CMS system identification (system ID)

Issues the initial console read

Handles the first command entered at this read

Accesses either the top directory in the default file pool
(if defined) or the 191 minidisk as file mode A

Executes the PROFILE EXEC if the user has one

Performs other system wide initialization functions

Setting Up PROFILES -- PROFILE EXEC

PROFILE EXEC:

Allows a CMS user to tailor their CMS environment, much like `.profile` does in Unix

Is executed each time CMS is IPL-ed

Resides on the 191 minidisk, with file mode A

Contains CMS and CP commands to access minidisks, set PF keys, or even run another operating system like zLinux

Can be prevented from executing by the `access` (`noprof` command, issued at IPL time

Setting Up **PROFILES** -- **PROFILE XEDIT**

PROFILE XEDIT:

Contains Xedit commands to customize the Xedit environment

Is executed each time Xedit is runs

Different Xedit settings (margins, case, scale line, etc.) based on the file's name, file type or file mode

My PROFILE EXEC

```
/* the standard user start-up */
'nucxload show (system'
/* make the cms vscreen hold up to 1000 lines of output */
'vscreen define cms 1000 81 2 4 '
/* set up cms fullscreen mode */
'set fullscreen on'
'set location message off'
'set logfile message off'
/* translate some keyboard characters to other, more useful ones */
'set input { ad'
'set input } bd'
'term hil on'
/* spool the console output */
'cp spool con start'
'cp set emsg on' /* receive emsgs - yes */
'cp set smsg on' /* receive smsgs - yes */
'set language ameng (add ari user'
'set ldrtbls 20'
'set filepool vmsysu:'
'set charmode on'
'set text on'
/* define some cms fullscreen mode pf keys */
'set cmspf 04 filelist noecho filelist * * a'
'set cmspf 05 infolist noecho infolist * * a'
'set cmspf 12 phone_msg noecho phonem'
'set cmspf 07 backward noecho #wm window backward = 1 '
'set cmspf 08 forward noecho #wm window forward = 1 '
'set cmspf 10 left noecho #wm window left = 10'
'set cmspf 11 right noecho #wm window right = 10'
'set cmspf 14 pop_msg echo #wm window show message '
'set cmspf 15 push_msg echo #wm window hide message '
'ottoscr cms (install scroll 5 color yellow'
/* set up some pf keys to be used in */
/* line at a time (non-fullscreen) mode */
'cp set pf5 immed exec filelist'
'cp set pf7 ret back'
'cp set pf8 ret for'
'cp set pf3 immed set fullscreen on'
exit
```

My PROFILE XEDIT

```
/* A SIMPLE REXX - XEDIT START-UP PROFILE */  
'set cmdline top'  
'SET CASE MIXED IGNORE'  
'set location xedit off'  
'set verify 1 72'  
'set nulls on'  
'Set Autosave 10'  
/*'set pf7 macro mypf7'*/  
/*'set pf8 macro mypf8'*/  
'set pf7 page b'  
'set pf8 page f'  
'set scale off'  
'set pf16 chewspit'  
'set pf17 delblank'  
'set pf18 eol'  
'set pf19 inshere'  
'set pf20 movehere'  
'set pf23 word copyrep'  
'set curline on 14'  
'extract /ftype/'  
'set num on'  
'set msgline on -1'
```

Useful (and free) Tools

z/VM has a long history of encouraging users to share their favorite tools and there are a number of VM software tools repositories available:

IBM VM download page:

<http://www.vm.ibm.com/download/packages/>

Fran Hensler's VM & VSE Download Page

<http://zvm.sru.edu/~DOWNLOAD/>

Sine Nomine Associates

<http://download.sinenomine.net/>

Useful (and free) Tools

List of essential tools to have on hand:

TRACK

SHOW

XCOL for Xedit

Latest version of CMS Pipelines from:

<http://vm.marist.edu/~pipeline/>

and VMARC to unpack the other tools

What's an RSU, APAR and PTF?

RSU - recommended service upgrade

APAR - authorized program analysis report. A request for correction of a defect in a supported release of a program supplied by IBM; a bug in IBM code

PTF - program temporary fix. a package containing individual or multiple fixes that is made available to all licensed customers; code that fixes an APAR

For example:

APAR VM65403 is fixed by PTF UM34192

Is a PTF on my system? Ask VM/SES-E

```
service cp status UM34192
VMFUTL2767I Reading VMFINS DEFAULTS B for additional options
VMFSRV2195I SERVICE CP STATUS UM34192
VMFSRV2760I SERVICE processing started
VMFUTL2204I Linking PMAINT 41D with link mode RR
VMFSRV1226I CP (6VMCPR30%CP) PTF UM34192 status:
VMFSRV1226I     RECEIVED   04/27/14 12:45:16
VMFSRV1226I     APPLIED    03/21/14 15:19:11
VMFSRV1226I     BUILT      04/27/14 12:48:29
VMFSRV1226I     PUT2PROD   04/27/14 13:31:34 ZVM63GA1
VMFSRV2760I SERVICE processing completed successfully
Ready; T=2.95/3.32 19:05:56
```

Ordering Service

Do this:

www.vm.ibm.comservice

IBM Shopz

(log in to Shopz....)

create new software orders

select correct IBM customer number

click on z/VM - Service Individual PTFs

select either Individual PTFs by PTF number or Individual PTFs by APAR number

select "Do not use a report for this order"

enter APAR or PTF number in entry box

select "Preferred media -- Internet"

verify delivery options

review order and submit

IBM will send you an e-mail on your order's status and when it is ready to be downloaded

LOCALMOD

Always use the VM/SES-E LOCALMOD method for modifying IBM supplied configuration files, like `DMSSISVR NAMES` and `DMSSICNF COPY`. This will prevent later IBM maintenance from possibly over writing your changes without warning

The following slides demonstrates the process for updating the `DMSSISVR NAMES` file. The steps are:

```
localmod cms DMSSISVR NAMES  
service cms build  
put2prod
```

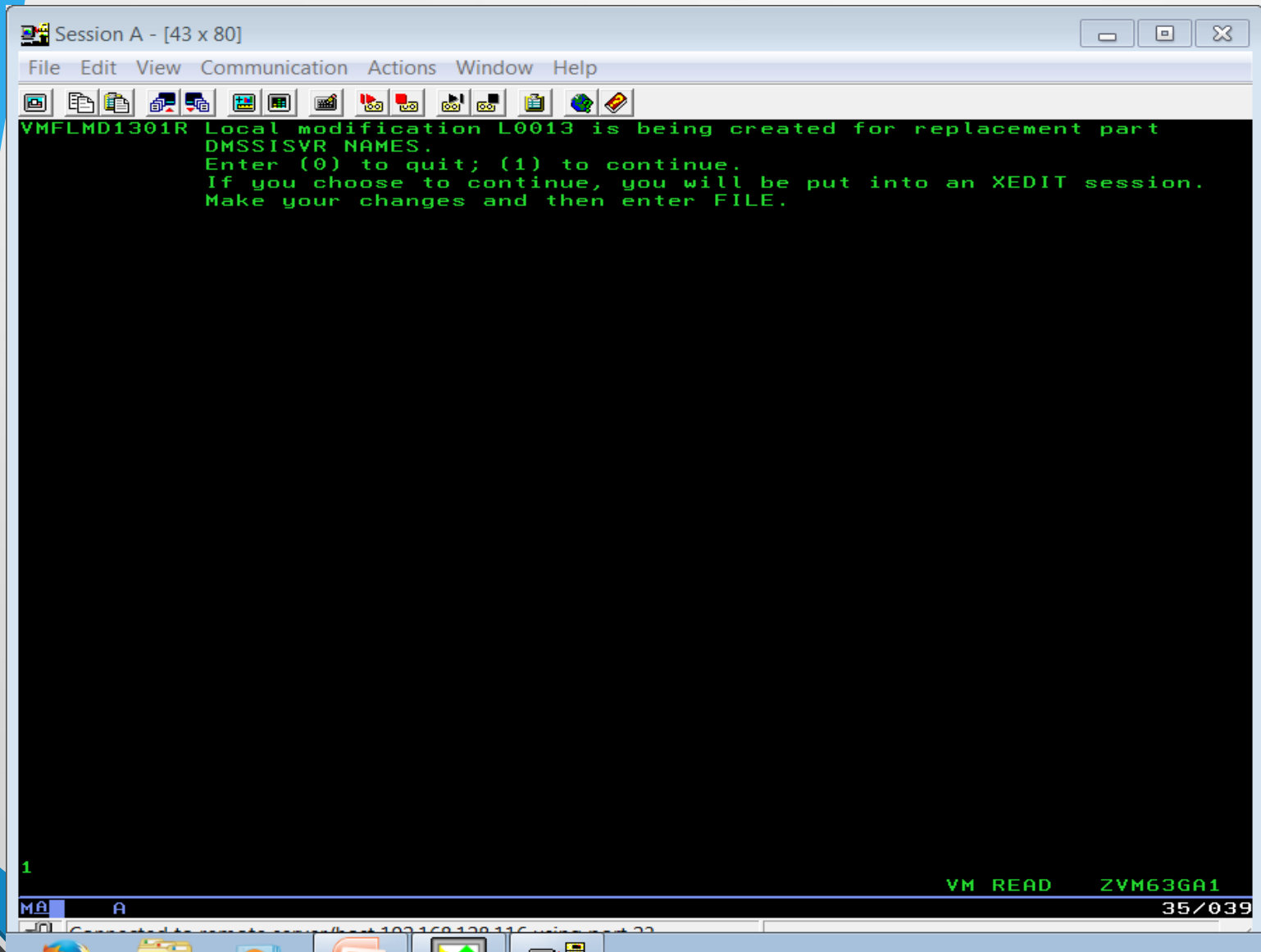

LOCALMOD

The image shows a terminal window titled "Session A - [43 x 80]". The window has a menu bar with "File", "Edit", "View", "Communication", "Actions", "Window", and "Help". Below the menu bar is a toolbar with various icons. The main area of the terminal displays the following text in green on a black background:

```
LOGON MAINT630
z/VM Version 6 Release 3.0, Service Level 1401 (64-bit),
built on IBM Virtualization Technology
There is no logmsg data
FILES: 0040 RDR,    NO PRT,    NO PUN
LOGON AT 13:48:03 CDT TUESDAY 06/24/14
z/VM V6.3.0      2014-04-27 12:48
Ready; T=0.04/0.05 13:48:03
```

At the bottom of the terminal, there is a status bar with the text "localmod cms DMSSISVR NAMES" on the left, "RUNNING ZVM63GA1" on the right, and "42/014" at the bottom right corner. The window is set against a background with blue and grey geometric shapes.

LOCALMOD



LOCALMOD

```
Session A - [43 x 80]
File Edit View Communication Actions Window Help
DMSSISVR NAML0013 E1 V 80 Trunc=80 Size=162 Line=0 Col=1 Alt=0
00000 * * * Top of File * * *
00001 *****
00002 * A000000-999999 New for z/VM Version 5 Release 3 @VRHFZJH
00003 *****
00004 *
00005 * Licensed Materials - Property of IBM
00006 * This product contains "Restricted Materials of IBM"
00007 * 5741-A07 (C) Copyright IBM Corp. - 2007, 2013
00008 * All rights reserved.
00009 * US Government Users Restricted Rights -
00010 * Use, duplication or disclosure restricted by GSA ADP Schedule
00011 * Contract with IBM Corp.
00012 * See IBM Copyright Instructions.
00013 *
00014 *****
00015 *
00016 * File Name: DMSSISVR NAMES
00017 *
00018 * Description: Request and Worker Server Configuration File
00019 *
00020 * Status: z/VM Version 6, Release 3.0
00021 *
00022 * Change Activity:
00023 *
00024 * @VRHFZJH - New for z/VM 5.3.0
00025 * @U5980G3 - Update to match SMAPI 6.3
00026 * @U7192SC - Comment out deprecated servers
00027 *****
00028 *
00029 * Server Entries are of the form:
00030 * :server.server_name
00031 * :type.{REQUEST or WORKER or DMGR or VCTRL or MG}
00032 * :protocol.{AF_INET | AF_IUCV | AF_INET6 | AF_SCLP | AF_EVNT
00033 * | AF_MGMT } - type.REQUEST only
00034 * :address.ip_address - type.REQUEST & protocol.AF_INET only
00035 * :port.port_num - type.REQUEST & protocol.AF_INET only
00036 * :short.{YES or NO} - type.WORK | GUARD | PMM | DBS
00037 * | PSTK | DMPH(if more than 2 short
00038 * servers the second will be ignored)
00039 *****
====>
MA A 43/007
```

LOCALMOD

```
Session A - [43 x 80]
File Edit View Communication Actions Window Help
DMSSISVR NAML0013 E1 V 80 Trunc=80 Size=162 Line=117 Col=1 Alt=3
00117 :type.WORKER
00118 :short.DBS
00119
00120 * Default SMAPI TCP/IP stack
00121 :server.DTCSMAPI
00122 :type.WORKER
00123 :short.PSTK
00124 :address.10.60.100.100
00125
00126 * Node server for xcat
00127 :server.ZHCP
00128 :type.XCAT
00129 :subtype.NODE
00130
00131 * Management server for xcat
00132 :server.XCAT
00133 :type.XCAT
00134 :subtype.MGR
00135
00136 * Dump Handler
00137 * :server.OPERATNS
00138 * :type.WORKER
00139 * :short.DMPH
00140
00141 *****
00142 *** The following machines are only available in ensembles.***
00143 *****
00144
00145 * Default Management Network Server
00146 * :server.VSMREQIM
00147 * :type.REQUEST
00148 * :protocol.AF_MGMT
00149 * :address.INADDR_ANY
00150 * :port.44446
00151
00152 * Primary Vswitch Controller
00153 * :server.DTCENS1
00154 * :type.VCTRL
00155
00156 * Backup Vswitch Controller
====> file
```

LOCALMOD

```
Session A - [43 x 80]
File Edit View Communication Actions Window Help
VMFREP2760I VMFREPL processing started
VMFREP2509I The version vector table 6VMCMS30 VVTLCL E will be updated for the
part DMSSISVR NAM
VMFREP2760I VMFREPL processing completed successfully
VMFLMD2760I LOCALMOD processing completed successfully
Ready; T=7.16/7.83 14:00:27

service cms build
RUNNING ZVM63GA1
42/019
```

LOCALMOD

```
Session A - [43 x 80]
File Edit View Communication Actions Window Help
[Icons]
VMFUTL2205I DELTA J R/W 3D2 MNT3D2
VMFUTL2205I BUILD7 K R/W 493 MNT493
VMFUTL2205I BUILD6 L R/W 490 MNT490
VMFUTL2205I BUILD10 M R/W 550 PMT550
VMFUTL2205I BUILD0 N R/W 49E MNT49E
VMFUTL2205I BUILD8 O R/W 400 MNT400
VMFUTL2205I BUILDA P R/W 890 MNT890
VMFUTL2205I BUILD4 Q R/W 49D MNT49D
VMFUTL2205I BUILDN Q R/W 49D MNT49D
VMFUTL2205I BASE2 R R/W 3B2 MNT3B2
VMFUTL2205I ----- A R/W 191 MNT191
VMFUTL2205I ----- B R/W 5E6 MNT5E6
VMFUTL2205I ----- C R/W 2CC MNT2CC
VMFUTL2205I ----- D R/W 51D MNT51D
VMFUTL2205I ----- S R/O 190 MNT190
VMFUTL2205I ----- Y/S R/O 19E MNT19E
VMFUTL2205I ----- Z R/W 41D PMT41D
VMFSET2760I VMFSETUP processing completed successfully
VMFSRV1233I The following products have been serviced.
VMFSRV1233I CMS
VMFSRV2760I SERVICE processing completed successfully
Ready; T=35.61/37.79 14:03:01
CMS

put2prod_

RUNNING ZVM63GA1
MA A 42/009
```

LOCALMOD

```
Session A - [43 x 80]
File Edit View Communication Actions Window Help
VMFUTL2205I BUILD6 L R/W 490 MNT490
VMFUTL2205I BUILD10 M R/W 550 PMT550
VMFUTL2205I BUILD0 N R/W 49E MNT49E
VMFUTL2205I BUILD8 O R/W 400 MNT400
VMFUTL2205I BUILDA P R/W 890 MNT890
VMFUTL2205I BUILD4 Q R/W 49D MNT49D
VMFUTL2205I BUILDN Q R/W 49D MNT49D
VMFUTL2205I BASE2 R R/W 3B2 MNT3B2
VMFUTL2205I ----- A R/W 191 MNT191
VMFUTL2205I ----- B R/W 5E6 MNT5E6
VMFUTL2205I ----- C R/W 2CC MNT2CC
VMFUTL2205I ----- D R/W 51D MNT51D
VMFUTL2205I ----- S R/O 190 MNT190
VMFUTL2205I ----- Y/S R/O 19E MNT19E
VMFUTL2205I ----- Z R/W 41D PMT41D
VMFSET2760I VMFSETUP processing completed successfully
VMFMRD2760I VMFMRDSK processing started
VMFMRD1937I Merge of APPLY started
VMFMRD1938I Merging APPLY 3A4 to 3A2
VMFMRD2065I APPLY 3A2 is now 4 percent full
VMFMRD1938I Merging APPLY 3A6 to 3A4
VMFMRD2065I APPLY 3A4 is now 2 percent full
VMFMRD1939I Merge of APPLY completed
VMFMRD2760I VMFMRDSK processing completed successfully
VMFSET2760I VMFSETUP processing started for DETACH ALL
VMFSET2760I VMFSETUP processing completed successfully
VMFP2P2760I PUT2PROD processing started for COPYPART
VMFP2P2204I Linking MAINT 193 as 0193 with link mode M
DASD 0193 LINKED R/W; R/O BY 24 USERS
DMSACP726I 493 K released
VMFP2P1231I Copying files from MAINT630 493 to MAINT 193
VMFP2P1233I The following products have been put into production. Recycle the
appropriate servers.
VMFP2P1233I CMS
VMFP2P1239I CMS was serviced. Re-IPL CMS in all virtual machines running CMS to
use the new service.
VMFP2P2760I PUT2PROD processing completed successfully
Ready; T=6.22/7.11 14:04:08
RUNNING ZVM63GA1
MA A 42/001
```

How to find hard to locate IBM documents

Go to www.ibm.com

Search for Publications

go to the IBM Publications Center

Choose your Country

Choose Search for Publications

Example:

Enter "SCRIPT MATHEMATICAL" in search field and click on GO. That will give you the page for DCF: SCRIPT Mathematical Formula Formatter User's Guide (S544-3306-00). From there it can be downloaded or a hard copy ordered.

The IBMVM and Linux-390 Lists

Get stuck with a problem? These technical resources are available:

IBMVM: This IBM z/VM Discussion list is an ideal place to ask a question of your VM peers. Subscribers include VM customers, vendors, consultants, and IBMers, including z/VM Developers. For more details on how to join the list, see http://www.vm.ibm.com/techinfo/listserv.html#Section_0.1

Linux-390 focuses on Linux on System z including Linux on z/VM. for more details on how to join the list, see http://www.vm.ibm.com/techinfo/listserv.html#Section_0.2

Both lists have searchable archives

Take a look to see if your problem hasn't been solved already....



Information Technology Company LLC
HQ in Falls Church, VA
Service Offices in Houston, TX; Raleigh, NC;
and Atlanta, GA
800-994-9441 / 703-237-7370
www.p390.com