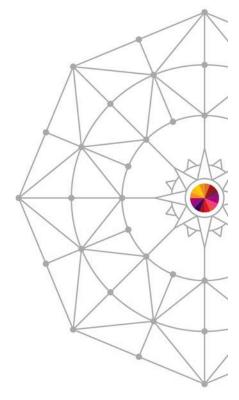


Finding your Way – The z/VM Website, Documentation and Other Hints for the New User

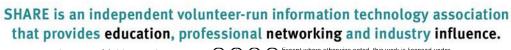
Bill Bitner z/VM Development Client Focus and Care bitnerb@us.ibm.com





Session 15730

SHARE August 2014







Trademarks

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

 IBM*
 System z10*
 System z196

 IBM Logo*
 Tivoli*
 System z114

 DB2*
 z10 BC
 System zEC12

Dynamic Infrastructure* z9*
GDPS* z/OS*
HiperSockets z/VM*
Parallel Sysplex* z/VSE
RACF* zEnterprise*

System z*

The following are trademarks or registered trademarks of other companies.

OpenSolaris, 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.

INFINIBAND, InfiniBand Trade Association and the INFINIBAND design marks are trademarks and/or service marks of the INFINIBAND Trade Association.

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.

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

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

^{*} Registered trademarks of IBM Corporation



Notice Regarding Specialty Engines (e.g., zIIPs, zAAPs and IFLs):

Any information contained in this document regarding Specialty Engines ("SEs") and SE eligible workloads provides only general descriptions of the types and portions of workloads that are eligible for execution on Specialty Engines (e.g., zIIPs, zAAPs, and IFLs). IBM authorizes customers to use IBM SE only to execute the processing of Eligible Workloads of specific Programs expressly authorized by IBM as specified in the "Authorized Use Table for IBM Machines" provided at www.ibm.com/systems/support/machine warranties/machine code/aut.html ("AUT").

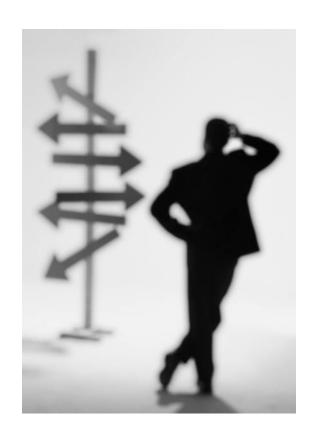
No other workload processing is authorized for execution on an SE.

IBM offers SEs at a lower price than General Processors/Central Processors because customers are authorized to use SEs only to process certain types and/or amounts of workloads as specified by IBM in the AUT.



Information

- Where to start?
- What to believe?
- Is it current?
- Too much information?
- Who can I ask?





The z/VM Library

- z/VM 6.3 bookshelf contains 103 books!
 - ~60 Books for base z/VM Product
 - ~25 Books for priced features of z/VM
 - ~18 Books for related or z/OS topics
- Key Books for new people to z/VM:
 - z/VM General Information manual, GC24-6193
 - z/VM Getting Started with Linux on System z, SC24-6194
 - z/VM Installation Guide, GC24-6246
 - z/VM CP Planning and Administration, SC24-6178
 - z/VM Connectivity, SC24-6174
 - z/VM CMS Primer, SC24-6172
- Book suffix numbers increased when book updated, not release level
 - z/VM V6R3 CP Planning and Administration, SC24-6178-05
 - z/VM V6R3 CMS Primer, SC24-6172-00



z/VM General Information manual

- Often referred to as the "GIM"
- One of the first books updated and made available for a new release or enhancements in service stream
 - Example: SPE (Small Programming Enhancements) for High Performance
 FICON and HiperSockets Bridge in March 2012 resulted in an update version being created
- Key Content:
 - Overview of z/VM and Value (a little marketing)
 - What has changed in the most current release
 - Requirements
 - Appendices on Support Levels
 - IBM Servers supported by z/VM
 - IBM Operating systems supported as guests of z/VM
 - IBM Devices supported

GC24-6193



z/VM Getting Started with Linux on System z

- Sometimes abbreviated "GSWI"
- More about z/VM than about Linux, but written with Linux as the primary workload for z/VM
 - Meant as a bridge between the simple installation process and the 100 books in the library with several pointers to other books in the library for more details
 - Significant updates for z/VM 6.2, SSI Clustering, and Live Guest Relocation
- Key Content:
 - Planning for Linux usage
 - Configuring DirMaint (Directory Maintenance Feature)
 - Configuring TCP/IP
 - Cloning of Linux guests

SC24-6194



z/VM Installation Guide

- Often known simply as the "Install Guide"
- Key Content:
 - Step by Step details on installation of z/VM
 - Preinstalled licensed products and features
 - Performance Toolkit, DirMaint, etc.
- GC24-6246



z/VM CP Planning and Administration

- Also known as "CP P&A" or "Planning and Admin"
 - Note, there is also a CMS version of the book
- Key Content:
 - Details behind planning and configuring a z/VM system
 - Formulae for
 - Memory required
 - Disk page space
 - Dump space
 - Details behind User Directory (where virtual machines are defined)
- Not just a book for "first time install/configuration"
 - z/VM systems are dynamic and may grow revisit for paging space and other considerations

SC24-6178



z/VM Connectivity

- Connectivity book is good book and often overlooked
- Key content:
 - All about z/VM virtual networks
 - Virtual Switches
 - Guest LANs
 - Other communication protocols or functions in z/VM
 - Advanced Program-to-Program Communications (APPC)
 - Inter-System Facility for Communications (ISFC) backbone of SSI clustering

SC24-6174



z/VM CMS Primer

- Primer walks through getting started with CMS
- Key content:
 - Logging on and off of z/VM
 - CMS minidisk file system and SFS (Shared File System) background
 - Editing files using XEDIT
 - Managing files and several productivity aids included in CMS for this
 - Like other platforms, there is often more than one way to do things.
- Content you can probably skip when you read for first time:
 - Printing from CMS
 - NAMES files

■ SC24-6172



z/VM Internet Library

http://www.ibm.com/vm/library

- Includes:
 - z/VM Knowledge Center
 - Useful when unsure which book or for searching tasks
 - z/VM Information Center (being replaced by z/VM Knowledge Center)
 - z/VM BookManager-format bookshelf for z/VM 6.2 and earlier
 - Useful when you know the book you need
 - z/VM PDF bookshelf
 - Useful for when you know the book you need and prefer PDFs
 - z/VM Program Directories
 - z/VM data areas and control blocks
 - z/VM monitor records
 - Select IBM Redbooks®
 - White papers and other documents



z/VM Internet library

	IBM Systems > System z > z/VM >	
z/VM	z/VM Internet Library	Other links
News	Internet Library. z/VM product information • z/VM V6.3 Information Center (June 2014) • z/VM V6.3 PDF files (June 2014) • z/VM in IBM Knowledge Center V6.3 V6.2 V5.4 • z/VM bookshelf V6.2 V6.1 V5.4 V5.3 V5.2 V5.1 V4.4 V3.1 • z/VM V6.3 Collection (SK5T-7054-06) is available as a downloadable zip file from the IBM Publications Center	IBM mainframe literature
About z/VM		" IBM Knowledge Center
Events calendar		Access IBM product documentation.
Products and features		** IBM Publications Center
Downloads		View or download IBM
Technical resources		publications.
Library		"Download free Adobe
How to buy		Reader for PDF files.
Install		Looking for hardware pubs? Try Resource Lin
Service		" Glossaries of IBM
Education		Terminology
Site map		
Site search		
Printer-friendly		
Notify me		
Contact z/VM	Linux on IBM System z documentation	
	IBM Knowledge Center developerWorks	
Related links	IBM Redbooks publications	
- Resource Link	Redbooks publications for z/VM Redbooks publications home page	
Resources for IBM		
Business Partners Resources for	White papers, consultant reports, performance reports	
ivesources for	z/VM Performance Report	

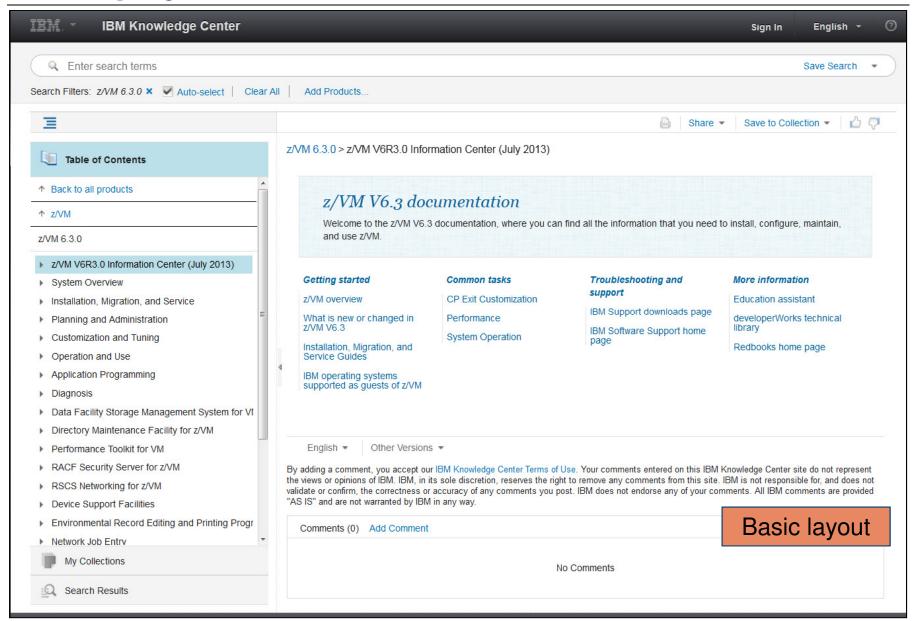


IBM Knowledge Center

- Follow on from the IBM Information Center (many require you to "sign in").
 - Additional social aspects:
 - Comments
 - "Likes"
 - Sharing
 - "My Collections" able to create set of links to document sections that are helpful
 - Saving searches
- Other Advantages (carried forward from Information Center) compared to straight PDFs or traditional web searching
 - Up to date
 - Searching (Web based search engines often give too much)
 - Printing
- Different than Information Center
 - Does not include control blocks and monitor records
 - Printing subtopics

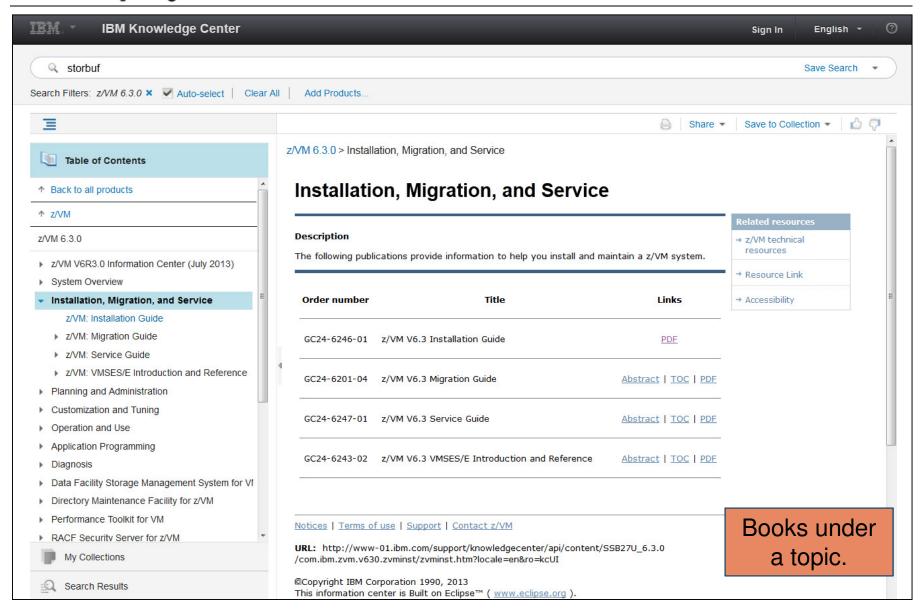
SmarterComputing



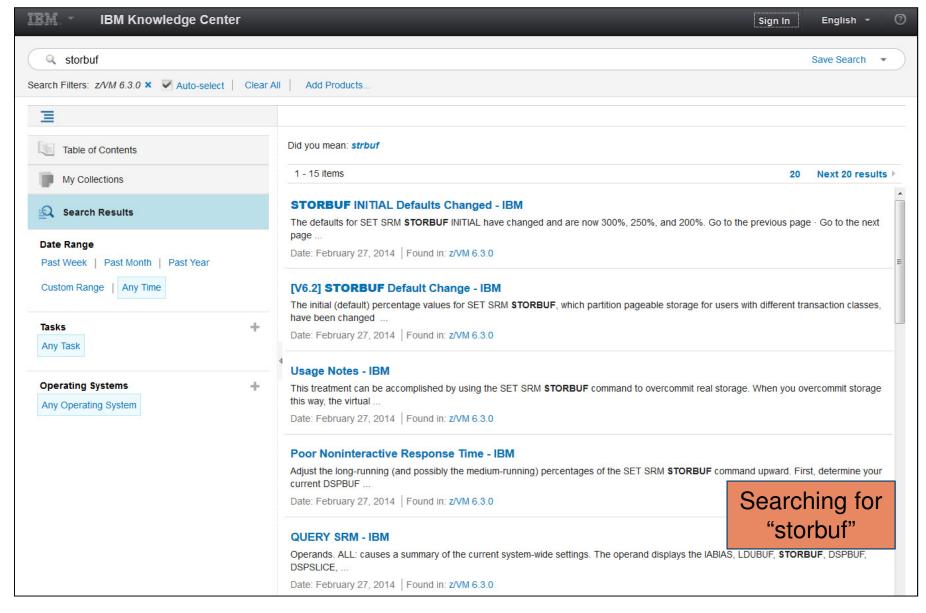


SmarterComputing



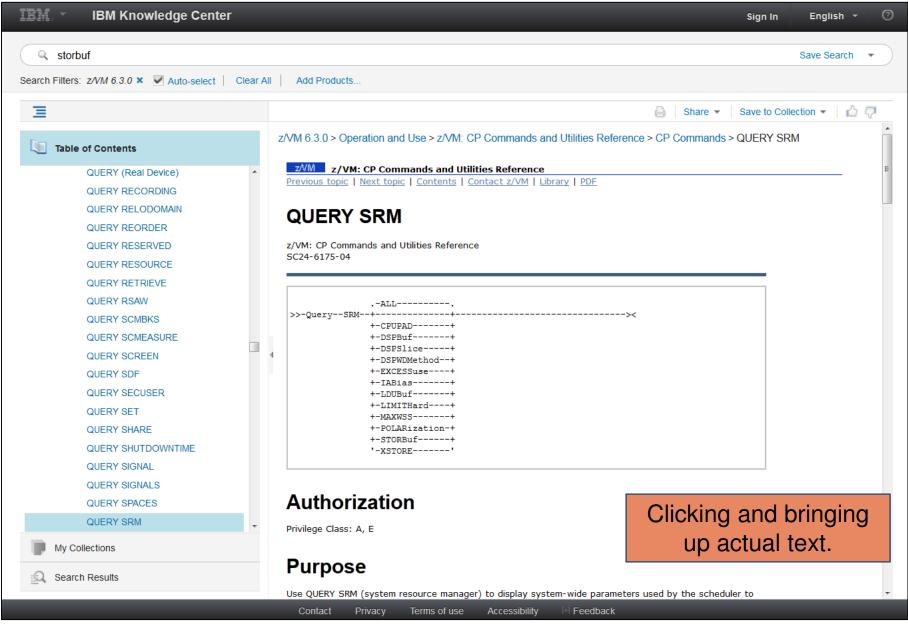






SmarterComputing

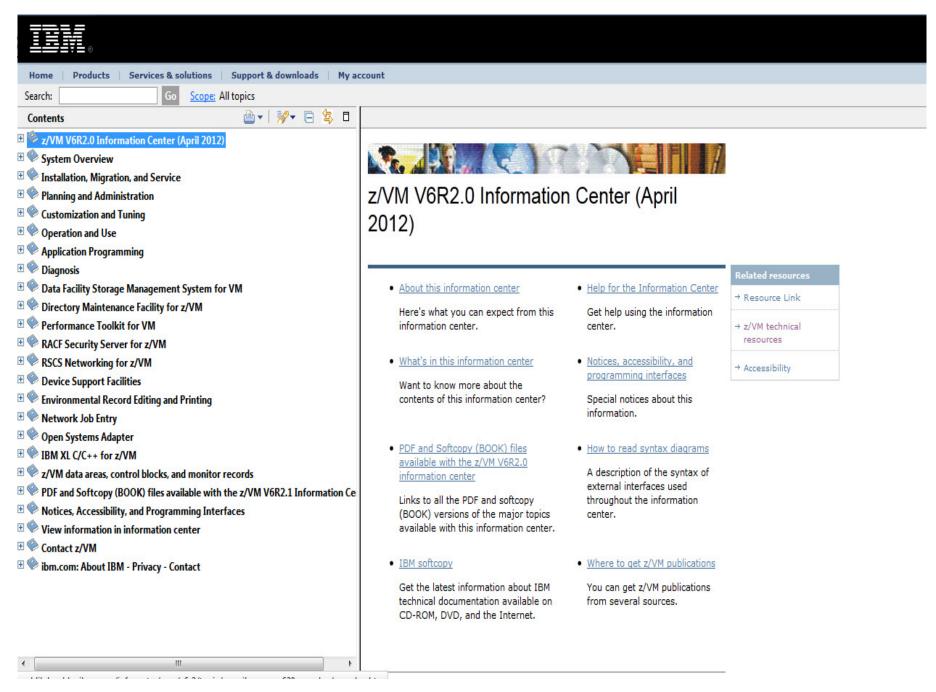






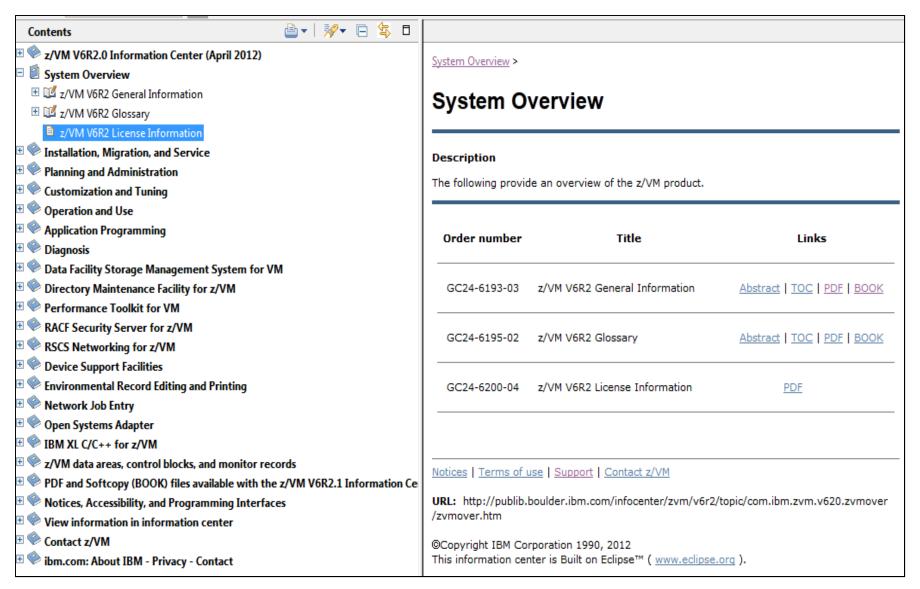
z/VM Information Center

- Provides the product documentation for a single z/VM release
- z/VM Information Center available:
 - On web
 - Downloadable zip
 - Or DVD for z/VM 6.2 and earlier
- Content is same as PDF formats
- Advantages:
 - Up to date
 - Searching (Web based search engines often give too much)
 - Printing topics and subtopics
 - More than just the publications (control blocks, monitor records, etc.)



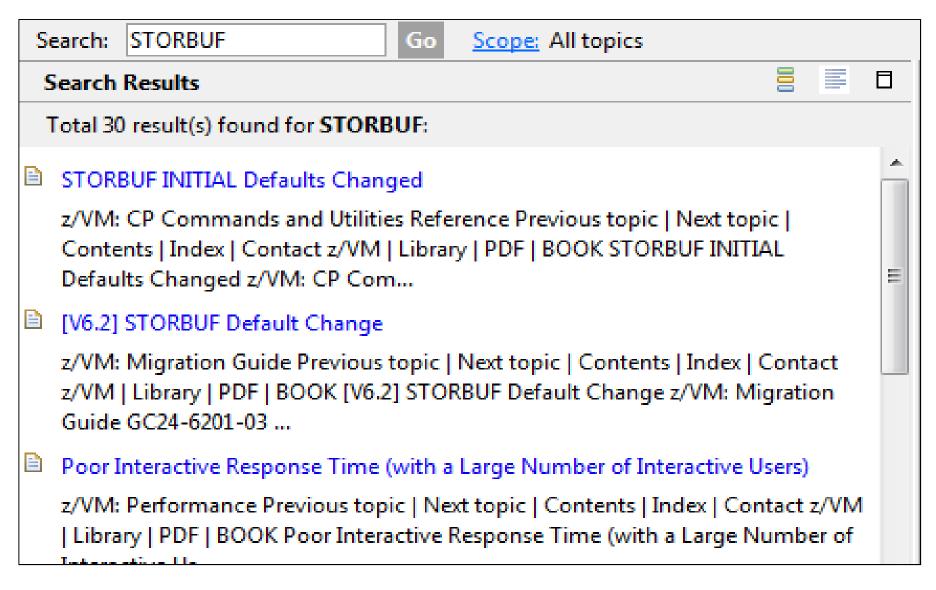


Showing Books in a Topic



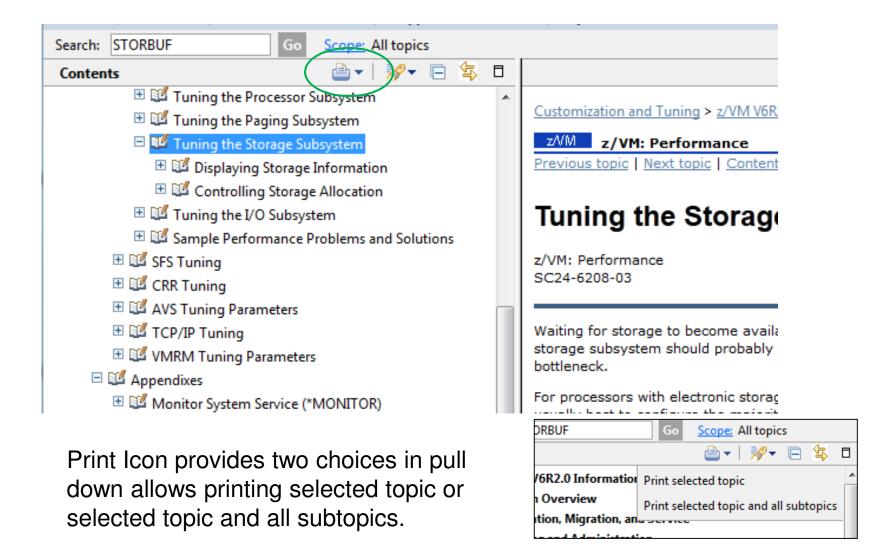


Searching





Information Center Printing





Redbooks

- Redbooks result of collaborative residency work with IBMers and others
- Redpieces smaller documents
- Great source of information
 - Practical
 - Hands on
 - Combines different products
 - Usage based instead of reference based



Also available – Redbook mobile app and e-book readers





- Use some caution
 - Not all Redbooks are updated as often as needed
 - Can show a possible solution, but might not be best case in all scenarios



A Few Redbooks and Pointers



- Redbooks home page: http://www.redbooks.ibm.com/
- List of z/VM related Redbooks: http://www.vm.ibm.com/pubs/redbooks/
- Bill's Favorites:
 - Linux on IBM System z: Performance Measurement and Tuning http://www.redbooks.ibm.com/abstracts/sg246926.html?Open
 - The Virtualization Cookbook for IBM z/VM 6.3, RHEL 6.4, and SLES SP3 http://www.redbooks.ibm.com/abstracts/sg248147.html?Open
 - Practical Migration to Linux on System z
 http://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg247727.ht
 ml?Open
 - An Introduction to z/VM Single System Image and Live Guest Relocation http://www.redbooks.ibm.com/abstracts/sg248006.html?Open
 - Using z/VM 6.2 Single System Image and Live Guest Relocation http://www.redbooks.ibm.com/abstracts/sg248039.html?Open



z/VM Home Page

- www.vm.ibm.com = www.ibm.com/vm
- Running on z/VM!
- Moving to new IBM format and look



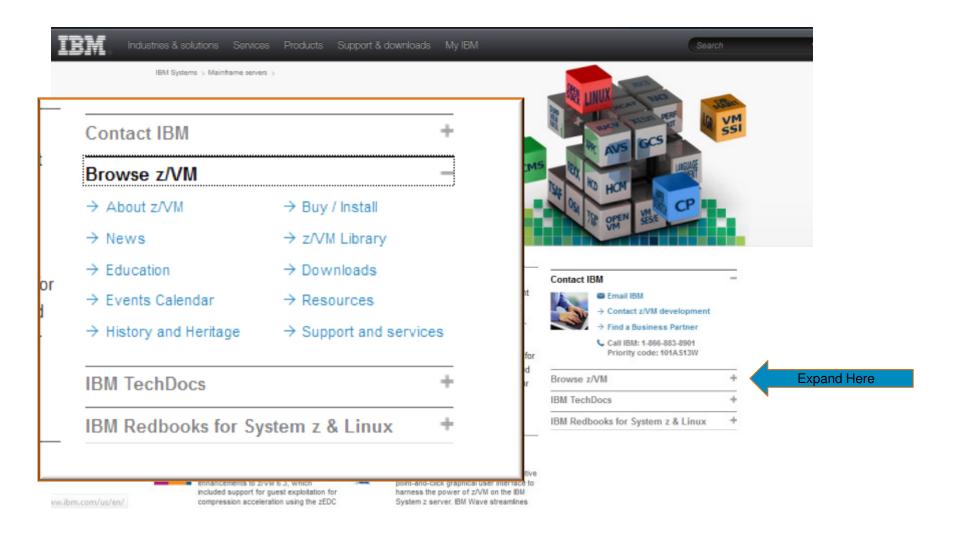
New Look



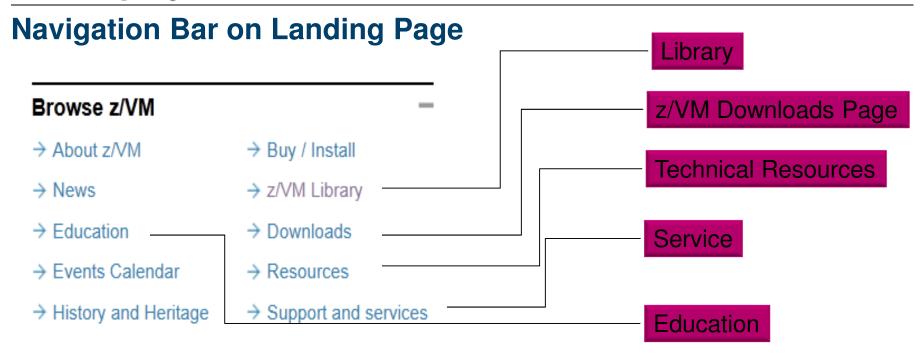
Old Look

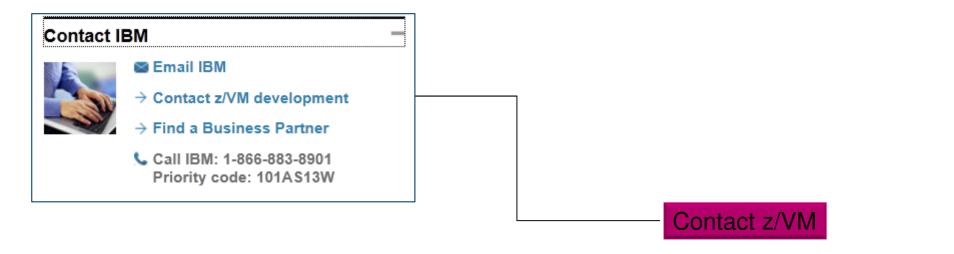


z/VM Home Page – Navigation Bar



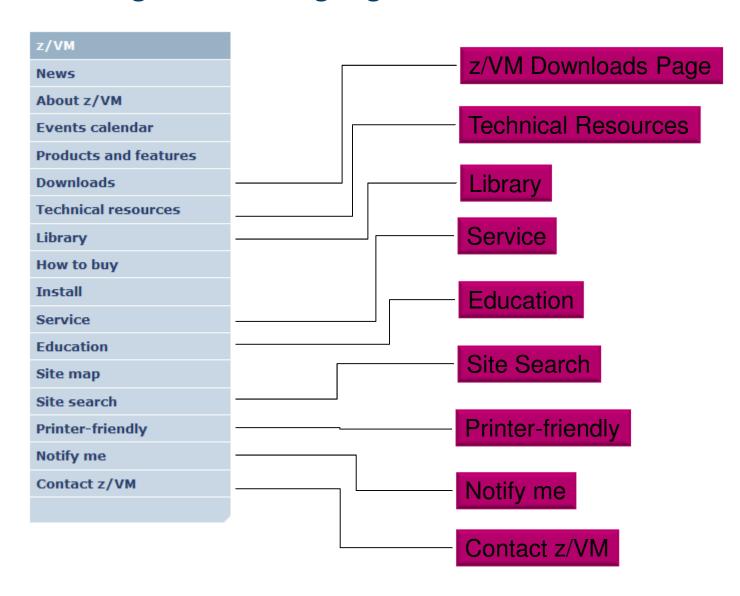








Left Navigation Bar Highlights





z/VM Technical Resources Page

- Collection of links:
 - Information on each release of z/VM
 - Information on the VM Community
 - Order and upgrade information
 - Networking, Security, Performance, Systems Management, etc. subsystem pages
 - Guest Operating Systems
 - Application Development



z/VM Service Page

- Important Service news
- Links to program directories and other important information
 - "Program Directories" are documents intended for the system programmer responsible for program installation, covering such topics as: Support, Installation, and Service.
- Links to other IBM service related pages
 - PSP (Preventive Service Planning) Buckets: definitive source for what service you need to support devices, processors, z/VM
 - IBM Support Portal

Link to Red Alert Page



z/VM Service Red Alert Page

- This page documents critical service information, examples:
 - APARs that are important though the abstract might not be obvious as to why you would need it.
 - Problems related to different factors (e.g. millicode change and unrelated z/VM feature)
 - Potential high-impact problems where APAR or PTF may not be available yet.
- Low number of red alerts, ~ 1 to 3 per year
- Highly recommend you subscribe for notification of changes to this page.



z/VM Education Page

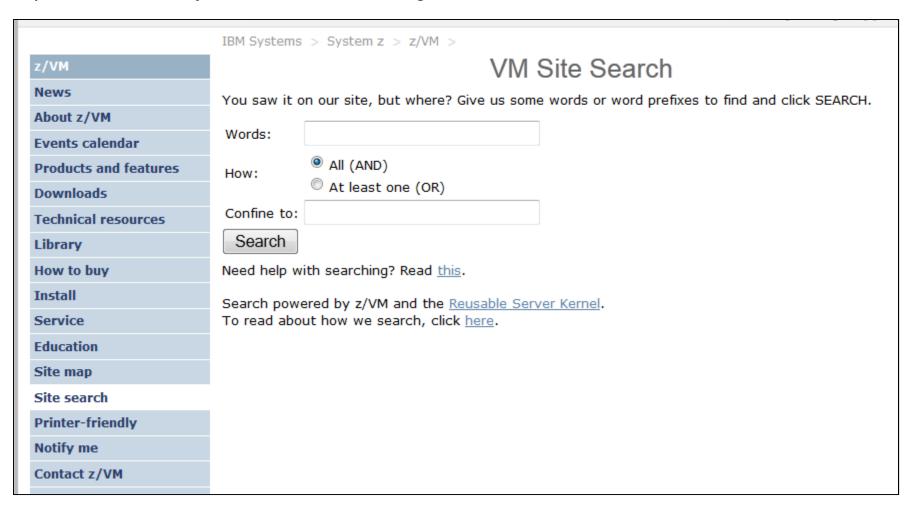
- Live Virtual Classes
 - Timely Webcasts on key topics
 - Linux and z/VM
 - Replays available
- Pointers to formal IBM courses
- Some Online Tutorials





z/VM Home Page Site Search

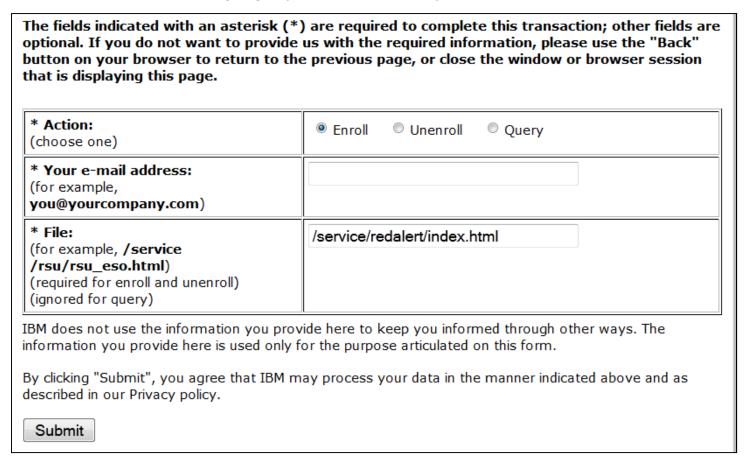
- Located on left navigation bar is link for "Site Search"
- Special search for just the z/VM Home Page





z/VM Home Page Change Notification

- Allows you to get an email for an update to any page on the z/VM Home pages
- Privacy policy applies
- File: should be filled in if clicked on page you want, but you can over-ride it





Other Web Pages

- Linux on System z Portal
 - http://www.ibm.com/systems/z/os/linux/
- IBM System z You Tube Channel
 - http://www.youtube.com/user/IBMSystemZ
- ISV Products for Linux on z/VM
 - http://www.ibm.com/systems/z/solutions/isv/linuxproduct.html
- Melinda Varian's History of VM Community
 - http://www.leeandmelindavarian.com/Melinda/index.html
- Excellent White Paper on Virtualization by Solitaire International
 - http://public.dhe.ibm.com/common/ssi/ecm/en/zsl03192usen/ZSL03192USEN.
 PDF
- White Papers from IBM on Linux and z/VM
 - http://www-03.ibm.com/support/techdocs/atsmastr.nsf/Web/WP-ByProduct?OpenDocument&Start=1&Count=1000&Expand=11



World Wide Events and Local User Groups

- ★ z/VM Events: http://www.vm.ibm.com/events/
- ★ Local User Groups around the world: http://www.vm.ibm.com/events/usergrps.html



37



Mailing Lists

- There are two very helpful mailing lists:
 - IBMVM
 - LINUX-390
- Experts available 24 x 365



- Can subscribe to get each message as an email or daily digest form
 - Average about 25 messages a day
- Recommend subscribing even if you do not have a question!
- People all over world available to help answer questions
- For information and instructions to subscribe, see http://www.vm.ibm.com/techinfo/listserv.html





z/VM Help

- CMS HELP command is part of the z/VM system
- Provides information on:
 - Common tasks
 - Commands from various components and features
 - Is usually the same information as the Command Reference Book
 - Glossary (Terminology)
 - Messages
 - Macros and Routines
- Updated with service
- Menu driven

39 © 2014 IBM Corporation



HELP

_ D X **■** B - GDLVM7 - [43 x 80] HELP TASKS Task Help Information line 1 of 40 (c) Copyright IBM Corporation 1990, 2013 z/VM HELP, main panel The help panels listed below provide information about various z/VM functions, topics, and tasks. To view a help panel, move the cursor to any character of the name or description and press the ENTER key or the PF1 key. HELP - z/VM HELP Facility topics - z/VM help menus MENUS TASKS - Basic z/VM tasks AVS - AVS commands CMS - CMS commands CP - CP commands DIRMAINT - DirMaint commands DIRMAINT - DirMaint topics DUMPS - Dump commands, subcommands, and utilities DYNIO - Dunamic I/O tasks GLOSSARY - Definitions of terms - Language Environment commands LIBRARY - z/VM bibliography MACROS - CMS assembler macros (menu) - Assembler macros and functions (types) MACROS MESSAGES - Messages and codes - OpenExtensions services and APIs OPEN PERFKIT - Performance Toolkit topics PIPE - CMS Pipelines stages and subcommands PIPE - CMS Pipelines tasks OUERYSET - QUERY and SET commands and subcommands ROUTINES - CMS callable services (menu) ROUTINES - CMS routines (tupes) - RSCS Networking commands and link parameters RSCS STATEMTS - REXX, EXEC 2, and EXEC statements SUBCMDS - Subcommand groups, such as XEDIT TCPIP - TCP/IP commands 2= Top 3= Quit PF1= Help 4= Return 5= Clocate 6= ? PF7= Backward 8= Forward 9= PFkeys 10= 11= 12= Cursor ====> Macro-read 1 File мА 42/007



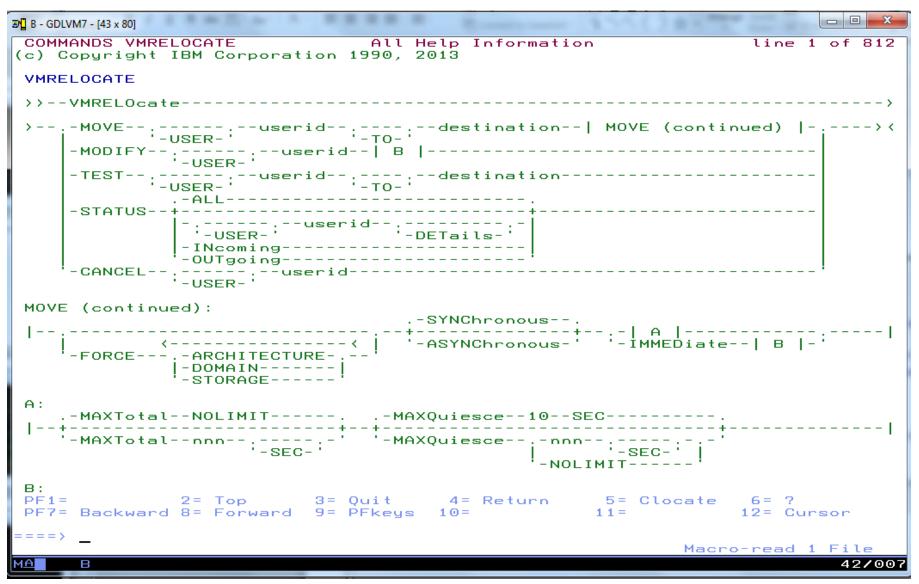
HELP for a Command

- Following may be included:
 - Command syntax diagram (aka Railroad Tracks)
 - Authorization e.g. privilege command required
 - Purpose brief description
 - Operands description of each operand on the command
 - Options description of each option
 - Usage Notes
 - Examples
 - Responses
 - Messages
- Some commands may have so many operands or options that they are presented as part of a menu or with "related" information
 - Example: HELP CPSET
 - Example: HELP MONITOR MENU

41 © 2014 IBM Corporation



HELP VMRELOCATE





Example of related information: HELP MONITOR

■ B - GDLVM7 - [43 x 80] COMMANDS MONITOR All Help Information line 1 of 177 (c) Copyright IBM Corporation 1990, 2013 MONITOR Purpose Use the MONITOR commands to control the selection, collection, and reporting of data from the host sustem: o MONITOR EVENT controls monitoring of event data o MONITOR SAMPLE controls monitoring of sample data o MONITOR START starts both event and sample monitoring o MONITOR STOP stops all monitoring. For information on the individual MONITOR command operands, press PF11. Usage Notes (General for MONITOR) MONITOR commands can be run from virtual machines with the A/E privilege. In order to avoid conflict among the commands, the administrator should be aware of the virtual machines that have the privilege to run the monitor commands. 2 . MONITOR START can be issued before or after a user connects to *MONITOR. If the MONITOR START command is issued before any connection to *MONITOR, monitor recording goes into a pending state until a user connects to *MONITOR. The following must be done before the monitor recording gets activated: o A saved segment must be defined and saved for the monitor o An application program running in a virtual machine must load the monitor saved segment and connect to the *MONITOR CP system service o A MONITOR START command must be issued. З. Both the event and sample profiles can be changed after monitoring has PF1= 5= Clocate 2= Top 3= Ouit 4= Return PF7= Backward 8= Forward 9= PFkeus 10= 11= Related 12= Cursor ====> Macro-read 1 File мА 42/007 В



Results from F11 on HELP MONITOR

```
№ B - GDLVM7 - [43 x 80]
 COMMANDS MONITOR
                             Related Help Information
                                                                    line 1 of 20
 (c) Copyright IBM Corporation 1990, 2013
  Related Information
  For information on each MONITOR operand,
  place the cursor under the topic of your choice
  and press ENTER or the PF1 key.
            - Control monitoring of event data
  MONITOR
  EVENT
  MONITOR
            - Control monitoring of sample data
  SAMPLE
  MONITOR
            - Start both event and sample monitoring
  START
  MONITOR
            - Stop all monitoring
  STOP
* * * End of File * * *
                                                    5= Clocate 6= ?
 PF1= Help
               2= Top
                      3= Quit
                                      4= Return
 PF7= Backward 8= Forward 9= PFkeus 10= Morehelp 11=
                                                                 12= Cursor
===>
                                                             Macro-read 1 File
MΑ
      В
                                                                           42/007
```



Other Uses of HELP

- HELP TASKS TASK
 - List of common tasks (e.g. "Create or change files")
- HFI P SYNTAX
 - Explains how to read syntax diagrams
- HELP GLOSSARY or HELP GLOSSARY term
 - Brings up glossary list and goes to term if available
- HELP message
 - Looks up message and provides information on it
 - Example: HELP HCP1810I
- HELP HCPnnnnW
 - Provides Help on CP wait state number nnnn



HELP HCP1810I

№ B - GDLVM7 - [43 x 80]

HCP1810I The variations of this message are explained below.

-userid: Current storage use guest_footprint exceeds available capacity on destination destination_resource by difference

-userid: Current storage use exceeds capacity on destination

Explanation: The current storage footprint of this virtual machine exceeds the current available storage resources (central storage, expanded storage, and auxiliary storage) on the destination system. Allowing such a virtual machine to relocate could result in a system abend. The current storage footprint includes the pageable and non-pageable CP storage required to virtualize the guest, in addition to all storage currently used in its base address space and for all of its virtual disks. If values are specified for the current storage footprint of the virtual machine and the current available resource of the destination system, please be aware that these values are transient and should be considered subject to change.

System Action: The relocation is terminated with no further action. The virtual machine continues to run on the source system.

User Response: Take steps on the destination system to reduce the system load or increase paging capacity. Alternatively, you could relocate this virtual machine to a different system with adequate capacity in the SSI cluster.

* * * End of File * * *

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

====>

Macro-read 1 File



Summary

- Lots of information is available
- Never be afraid to ask for help
 - IBMVM Mailing List
 - Your local IBM team
 - bitnerb@us.ibm.com

Your assignment for after session:
☐ Subscribe to Red Alert Page

- ☐ Subscribe to IBMVM and Linux-390 Mailing Lists
- ☐ Introduce yourself on the Mailing Lists
- ☐ Bookmark <u>www.vm.ibm.com</u>
- Bookmark the z/VM Information Center
- ☐ Read first few chapters of the CMS Primer
- ☐ Send Bill Bitner an email to tell him what topic you have trouble understanding and would like IBM to work on a small tutorial or video or other aid to learning



Please remember to do an evaluation.

Session 15730

Thanks!







Bill's Cheat Sheet Version 1.1

Processor	Model
z900	2064
z800	2066
z990	2084
z890	2086
z9 EC	2094
z9 BC	2096
z10 EC	2097
z10 BC	2098
z196	2817
z114	2818
zEC12	2827
zBC12	2828
zPDT	1090

z/VM Release	Supported LCPUs	Supported Cstore	Supported Xstore
z/VM V6R3	32	1024GB	128GB
z/VM V6R2	32	256GB	128GB
z/VM V6R1	32	256GB	128GB
z/VM V5R4	32	256GB	128GB

Psuedo Name	Name	Cylinders	Space	Dev Type Value
3390-3	3390-3	3339	2.3GB	0A
3390-9	3390-9	10017	6.9GB	0C
3390-A	3390-A	>64K		0E

z/VM Release	CMS Level
z/VM V6R3	27
z/VM V6R2	26
z/VM V6R1	25
z/VM V5R4	24

Conversions

1 Page = 4KB = 4096 Bytes

1 MB = 256 pages

1 GB = 262144 pages

180 4 KB blocks per 3390 Cylinder

1 FullWord = 4 Bytes

1 KB Kilobyte = 1024 Bytes

1 GB Gigabyte = 1024 Megabyte

1 TB Terabyte = 1024 Gigabyte

1 EB Exabyte = 1024 Terabyte

Time

1 millisecond = 0.001 seconds (10**-3)

1 microsecond = 0.000001 seconds $(10^{**}-6)$

1 nanosecond = 0.00000001 seconds (10**-9)

1 microsecond = 4096 TOD clock units

64 Bit TOD clock --> bit 51 = 1 microsecond