Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries. For a complete list of IBM Trademarks, see www.ibm.com/legal/copytrade.shtml: AS/400, DB2, e-business logo, ESCON, eServer, FICON, IBM, IBM Logo, iSeries, MVS, OS/390, pSeries, RS/6000, S/390, System z9, VM/ESA, VSE/ESA, WebSphere, xSeries, z/OS, zSeries, z/VM.

The following are trademarks or registered trademarks of other companies

Java and all Java-related trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries.

LINUX is a registered trademark of Linux Torvalds in the United States and other countries.

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

Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.

SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.

Intel is a registered trademark of Intel Corporation.

* 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.

References in this document to IBM products or services do not imply that IBM intends to make them available in every country.

Any proposed use of claims in this presentation outside of the United States must be reviewed by local IBM country counsel prior to such use.

The information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.
Disclaimer

The information contained in this document is not intended to be an assertion of future action by IBM. The use of this information or the implementation of any of these techniques is a customer responsibility and depends on the customer's ability to evaluate and integrate them into the operational environment. While each item may have been reviewed by IBM for accuracy in a specific situation, there is no guarantee that the same or similar results will be obtained elsewhere. Customers attempting to adopt these techniques to their own environment do so at their own risk.

In this presentation, any references made to an IBM licensed program are not intended to state or imply that only IBM's licensed program may be used; any functionally equivalent program may be used instead.

Any performance data contained in this presentation was determined in a controlled environment and, therefore, the results which may be obtained in other operating environments may vary significantly. Users of this presentation should verify the applicable data for their specific environment.

It is possible that this material may contain reference to, or information about, IBM products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming or services in your country.

Any feedback that you give IBM regarding this presentation will be treated as non-confidential information. IBM reserves the right to use this information in any form.
Topics

- The Basics
- Using the Stand Alone Program Loader
- Defining and Modifying the System Configuration
  - Configuration File Statements and CP Commands
- Logos
- More Configuration File Statements
Configuring z/VM: The Basics
CP Configurability

Change system-wide definitions and defaults without IPL
- timezone
- system operator
- log messages
- security features
- paging and spooling areas
- command privilege classes
- CP Exits and extensions to CP such as user Diagnose codes

Change definitions without rebuilding the system
- Checkpoint and Warmstart locations and size
- Size of CP Trace Table

Add new devices without an IPL
- no need to update configuration files
Dynamic I/O Configuration

Modify the hardware I/O definitions (IOCDS) without an outage

- Add, change, delete
  - CHPID
  - CNTLUNIT
  - IODEVICE
- Manage I/O definitions for all LPARs on a processor
- Commands based on hardware requirements

Modify the software view of I/O definitions

- Reset I/O control blocks
  - Devices that do not support Sense commands
  - Clear control blocks of devices with errors
CP Configurability - The Big Picture

1. Set up IPL Volume
   - SALIPL Utility writes Stand Alone Program Loader to IPL Volume

2. IPL CP
   - SAPL locates the CP MODULE and loads it into memory to begin running

3. IPL CP (cont.)
   - CP locates the SYSTEM CONFIG file and processes the configuration information

540RES

SAPL

PARM Disk (MAINT's CF1)
- CP MODULE
- Configuration Files
  - SYSTEM CONFIG
  - LOGO CONFIG
- LOGO Files
The PARM Disk

A CMS-formatted disk that CP uses during initialization

- Default PARM disks:
  - MAINT CF1 (Primary)
  - MAINT CF2 (Test)
  - MAINT CF3 (Backup)

Usually on the IPL volume

- Multiple PARM extents may be defined on the IPL and other volumes
- IPLPARMS may be used to locate the PARM disk by
  - Address of device containing PARM disk
  - Cylinder offset
  - Number of PARM extent

Contains

- System and logo configuration files
- CP module to be IPLed (usually)
The PARM Disk...

- *PARM disks may be accessed by CP after IPL*
  - CP_ACCESS statement in system configuration file
  - CPACCESS command
  - CPRELEASE command releases disk accessed by CP

- *Files may be cached by CP to reduce I/O to parm disk*
  - CPCACHE command for specific files
  - List in file CPCACHE FILES
    - Read into storage when parm disk is CPACCESSed
    - Sample:
      
      ```
      * CONFIG
      * LOGMS*
      * LOGO
      INPTAREA DEFAULT
      ```
Changing Files on a CPACCESSed Disk

To change files on a CPACCESSed disk:

1. QUERY CPDISKS
   - Determine what mode CP is accessing the disk
2. CPRELEASE fm
   - Release the disk from CP
3. LINK/ACCESS the disk in R/W mode
4. Update files as required
   - Logo Files
   - Configuration Files
5. RELEASE/DETACH disk
6. LINK to disk in R/O mode
7. CPACCESS owner vdev fm mode
   - CP will read updated files
Using the Stand Alone Program Loader
Stand Alone Program Loader (SAPL)

Loads CP module from IPL disk

- Can be used to load programs other than your default CP module
  - DDR Stand-alone DDR
  - DIRECTXA Stand-alone DIRECTXA
  - ICKSADSF Stand-alone ICKDSF

Allows you to specify or modify

- IPL information
  - CP module location (minidisk extent or offset)
  - CP MODULE name

- IPL parameters
  - Console address
  - PARM disk location
  - System configuration filename and filetype
  - Whether to PROMPT for date/time and warm/cold start
  - Amount of available real memory to be used by CP
SALIPL Utility

*Writes SAPL to cylinder zero of IPL volume (default)*
- Starting on block 5 of FBA volume

*Saves default IPL information and parameters*
- CP load module name
- Location of CMS minidisk containing load module

*Up to 4 lines of operator instructions may be specified*
SALIPL Utility...

Default SALIPL command (issued during z/VM installation):

```plaintext
salipl 123 (extent 1 origin 2000
```

A more interesting example:

```plaintext
salipl 123 (extent 1 module cpnew comments ? iplparms fn=syszvm
HCPSAL6803I ENTER UP TO 4 LINES OF COMMENTS
Use the CPNEW module to IPL the newest release of z/VM

HCPSAL6798I VOLUME ID IS 540RES
HCPSAL6797I MINIDISK VOLID AT OFFSET 5 IS IPLDSK
Ready;
```
SAPL Panel

- May be displayed using LOADPARM option
- Allows all saved SAPL settings to be changed

**IPL 123 LOADPARM 0009**

```
STAND ALONE PROGRAM LOADER: z/VM VERSION 5 RELEASE 4.0

DEVICE NUMBER: 0123   MINIDISK OFFSET: 00000000   EXTENT: 1

MODULE NAME: CPNEW   LOAD ORIGIN: 2000

-----------------------------------IPL PARAMETERS-----------------------------------

fn=syszvm

```

```
Use the CPNEW module to IPL the newest release of z/VM

-----------------------------------COMMENTS-----------------------------------

9= FILELIST   10= LOAD   11=_TOGGLE EXTENT/OFFSET
```
### SAPL Filelist Example

<table>
<thead>
<tr>
<th>FILENAME</th>
<th>TYPE</th>
<th>FORMAT</th>
<th>LRECL</th>
<th>RECORDS</th>
<th>BLOCKS</th>
<th>DATE</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSZVM</td>
<td>CONFIG</td>
<td>F</td>
<td>80</td>
<td>206</td>
<td>5</td>
<td>2009/02/22</td>
<td>11:32:03</td>
</tr>
<tr>
<td>SYSTEM</td>
<td>CONFIG</td>
<td>F</td>
<td>80</td>
<td>206</td>
<td>5</td>
<td>2009/02/21</td>
<td>23:37:01</td>
</tr>
<tr>
<td>CPNEW</td>
<td>SMALLMAP</td>
<td>V</td>
<td>39</td>
<td>2286</td>
<td>23</td>
<td>2009/02/21</td>
<td>23:19:10</td>
</tr>
<tr>
<td>CPNEW</td>
<td>MODULE</td>
<td>V</td>
<td>65535</td>
<td>222</td>
<td>3533</td>
<td>2009/02/21</td>
<td>23:19:10</td>
</tr>
<tr>
<td>CPLOAD</td>
<td>MODULE</td>
<td>V</td>
<td>65535</td>
<td>222</td>
<td>3533</td>
<td>2009/02/21</td>
<td>23:18:52</td>
</tr>
<tr>
<td>CPLOAD</td>
<td>SMALLMAP</td>
<td>V</td>
<td>39</td>
<td>2286</td>
<td>23</td>
<td>2009/02/21</td>
<td>23:18:45</td>
</tr>
<tr>
<td>LASTING</td>
<td>GLOBALV</td>
<td>V</td>
<td>22</td>
<td>4</td>
<td>1</td>
<td>2009/02/21</td>
<td>23:18:30</td>
</tr>
<tr>
<td>SYSNOCSE</td>
<td>CONFIG</td>
<td>F</td>
<td>80</td>
<td>207</td>
<td>5</td>
<td>2007/02/04</td>
<td>12:47:29</td>
</tr>
<tr>
<td>INPTAREA</td>
<td>SAMPLE</td>
<td>F</td>
<td>78</td>
<td>6</td>
<td>1</td>
<td>2005/06/17</td>
<td>16:28:42</td>
</tr>
<tr>
<td>LOGO</td>
<td>CONFIG</td>
<td>F</td>
<td>80</td>
<td>35</td>
<td>1</td>
<td>2005/06/17</td>
<td>16:28:33</td>
</tr>
<tr>
<td>ONMESS</td>
<td>SHARE</td>
<td>F</td>
<td>78</td>
<td>1</td>
<td>1</td>
<td>2004/02/06</td>
<td>15:15:06</td>
</tr>
<tr>
<td>ONMESS</td>
<td>LOGO</td>
<td>F</td>
<td>78</td>
<td>1</td>
<td>1</td>
<td>2004/02/06</td>
<td>15:15:06</td>
</tr>
<tr>
<td>ONMESS</td>
<td>SAMPLE</td>
<td>F</td>
<td>78</td>
<td>1</td>
<td>1</td>
<td>2004/02/04</td>
<td>14:11:54</td>
</tr>
<tr>
<td>JAF1RDEV</td>
<td>CONFIG</td>
<td>F</td>
<td>80</td>
<td>76</td>
<td>2</td>
<td>2003/06/10</td>
<td>14:29:23</td>
</tr>
<tr>
<td>JAF1CSE</td>
<td>CONFIG</td>
<td>F</td>
<td>80</td>
<td>36</td>
<td>1</td>
<td>2002/12/05</td>
<td>11:11:39</td>
</tr>
<tr>
<td>MINIMUM</td>
<td>LOGO</td>
<td>F</td>
<td>78</td>
<td>16</td>
<td>1</td>
<td>2001/08/17</td>
<td>15:26:04</td>
</tr>
<tr>
<td>PRINTSEP</td>
<td>LOGO</td>
<td>F</td>
<td>49</td>
<td>16</td>
<td>1</td>
<td>2001/08/17</td>
<td>15:25:49</td>
</tr>
</tbody>
</table>

3=QUIT  4=sort(TYPE)  5=sort(date)  6=sort(name)  7=back  8=forward  11=select
IPLing z/VM from a SCSI Disk

SCSI disks emulated as 9336 Model 20 FBA DASD
  ▶ Larger emulated sizes supported (up to 381 GB)

All disks containing IPL information must be on same WWPN and LUN
  ▶ IPL (FCP) Device (where SAPL is)
  ▶ SYSRES disk (where CP module is)
  ▶ Parm Disk (where system configuration file is)

SAPL contains small SCSI device driver
  ▶ Loads CP module from SCSI disk

CP uses SCSI device driver to
  ▶ Initialize PARM disk
  ▶ Read system configuration file
IPLing z/VM from a SCSI Disk...

- **SAPL is loaded by the machine loader**
- **SCSI-specific parameters specified on Hardware Management Console**
IPLing z/VM from a SCSI Disk...

"PDVOL= addr" IPL parameter is required

- Defines emulated FBA address of SCSI IPL Device to CP
- Should **NOT** match address of any real devices
  - Error message; real device is ignored by CP
- May be specified on SALIPL command or SAPL panel

```plaintext
salipl 123 (extent 1 module cpnew comments ? iplparms fn=syszvm pdvol=555
```

<table>
<thead>
<tr>
<th>STAND ALONE PROGRAM LOADER: z/VM VERSION 5 RELEASE 4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEVICE NUMBER: 0123 MINIDISK OFFSET: 00000000 EXTENT: 1</td>
</tr>
<tr>
<td>MODULE NAME: CPNEW LOAD ORIGIN: 2000</td>
</tr>
</tbody>
</table>

```
fn=syszvm pdvol=555
```
Defining and Modifying the System Configuration
The System Configuration File

*CMS file which resides on the PARM disk*
- Default name/type is SYSTEM CONFIG

*Defines characteristics of z/VM system at IPL time*
- System definition parameters
- Device definitions when:
  - Characteristics other than defaults need to be defined for specific device(s)
  - A device does not respond to sense ID commands
  - Handling of a specific device at IPL time is other than default
The System Configuration File...

Defines system-wide options

- which devices to bring online at IPL time
- which timezone to select
- whether to autolog special user IDs
- whether to automatically do a specified type of IPL
- system owned disk volumes
  - CP
  - User
- etc...
CPSYNTAX Utility

Checks syntax of system configuration file statements

- Includes imbedded files if on the same disk as base file

Does not check configuration logic or integrity

Consists of 2 files

- CPSYNTAX EXEC
- CPSYNCHK MODULE

Recommend ALWAYS running after changing configuration file

- Remove errors that may keep your system from completing IPL
Dynamically Changing Your CP Configuration

- **CP commands change characteristics defined by configuration file statements**
  - DEFINE/QUERY
    - CPOWNED
    - (spooling device)
    - TIMEZONE
  - SET/QUERY
    - LAN
    - PROMPT
    - RDEVICE
    - EDEVICE
    - TIMEZONE
    - RETRIEVE
    - VSWITCH
  - START/DRAIN DASD
Configuration Statements and CP Commands
RDEVICE Statement

Tell CP what kind of devices are at specific addresses

- Unit Record
  - Printers, Card punches/readers
- Communication controllers and line adapters
- DASD
- Graphic display devices
- Special devices
- Tape units
- Unsupported devices

Use:

- To define characteristics of specific devices
  - Alter default characteristics
- When devices can't be sensed
SET RDEVICE Command

Modify an active system's definition of specific device(s)

- Add devices to configuration
- Remove devices from configuration
- Modify definition of specific device(s)
- Change the type of device at a specific address

Devices must be varied offline before they can be changed
Changing a CP Command Definition

**MODIFY COMMAND / CMD Statement**

- Change privilege class(es) of a command
- Change entry point that processes a command
- Suppress responses for ATTACH, DETACH, GIVE commands

<table>
<thead>
<tr>
<th>Command</th>
<th>LOCATE</th>
<th>Status: Enabled</th>
<th>Not Silent</th>
<th>IBM Class: C</th>
<th>PrivClasses: G</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMDBK Address: 00E9C6B0</td>
<td>Entry Point: HCPCFDLO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>LOCATE</th>
<th>Status: Enabled</th>
<th>Not Silent</th>
<th>IBM Class: E</th>
<th>PrivClasses: E</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMDBK Address: 00E9C720</td>
<td>Entry Point: HCPCFDLO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MODIFY COMMAND / CMD Command**

- Change same attributes of CP commands on active system
Privilege Classes

A user's privilege class(es) are defined in the directory

USER OPERATOR U 32M 2047M ABCDEG
USER U1 U 32M 32M G

User is given directory privilege classes at LOGON

QUERY PRIVCLASS OPERATOR
Privilege classes for user OPERATOR
    Currently: ABCDEG
    Directory: ABCDEG
The privilege classes are not locked against changes.

QUERY PRIVCLASS U1
Privilege classes for user U1
    Currently: G
    Directory: G
The privilege classes are not locked against changes.
Privilege Classes...

**SET PRIVCLASS command can be used to change a logged on user's privilege classes**

- **Self** (Any privilege class)
  - Can set to privilege classes allowed in directory

- **Others** (Privilege class C)
  - Can set any privilege classes

```plaintext
SET PRIVCLASS OPERATOR -E
Privilege classes for user OPERATOR
   Currently: ABCDG
   Directory: ABCDEG
The privilege classes are not locked against changes.

SET PRIVCLASS U1 +CD
Privilege classes for user U1
   Currently: CDG
   Directory: G
The privilege classes are not locked against changes.
```

Requires **SET_PRIVCLASS to be enabled on FEATURES statement in system configuration file**
Modifying Commands and Privilege Classes - Example

Modify **SHUTDOWN and FORCE commands to limit usage**

- Requires privilege class A

```
MODIFY COMMAND SHUTDOWN PRIVCLASS Z

MODIFY COMMAND FORCE PRIVCLASS Z

Q CPCMDMS SHUTDOWN
 Command: SHUTDOWN
 Status: Enabled Not Silent
 IBM Class: A PrivClasses: Z
 CMDBK Address: 00E9DFA0 Entry Point: HCPSHUTD

Command: ------------
 Status: Enabled Not Silent
 IBM Class: A PrivClasses: A
 CMDBK Address: 01169A88 Entry Point: HCPUSOFL

Q CPCMDMS FORCE
 Command: FORCE
 Status: Enabled Not Silent
 IBM Class: A PrivClasses: Z
 CMDBK Address: 00E9BF40 Entry Point: HCPUSOFL

Command: ------------
 Status: Enabled Not Silent
 IBM Class: A PrivClasses: A
 CMDBK Address: 01169768 Entry Point: HCPUSOFL
```
Modifying Commands and Privilege Classes - Example...

Allow only user OPERZ to issue SHUTDOWN and FORCE when needed

From user OPERZ:

QUERY PRIVCLASS
Privilege classes for user OPERZ
Currently: AG
Directory: AG
The privilege classes are not locked against changes.

FORCE U1
Unknown CP/CMS command

From user with Class C privilege:

SET PRIVCLASS OPERZ +Z
Privilege classes for user OPERZ
Currently: AGZ
Directory: AG
The privilege classes are not locked against changes.

From user OPERZ:

FORCE U1
USER DSC LOGOFF AS U1 USERS = 2 FORCED BY OPERZ
Defining Disk Areas for CP System Use

**CP_OWNed statement**
- Define disk areas that contain system areas
  - Page, Spool, TDISK, DRCT
- Up to 255 slots may be defined
- RESERVED slots should be defined
  - Allow volumes to be added dynamically
  - **HINT:** Gaps in specified slot numbers result in RESERVED slots

Default CP-Owned statements for z/VM 5.4.0

```
CP_Owned   Slot   1  540RES
CP_Owned   Slot   2  540SPL
CP_Owned   Slot   3  540PAG
CP_Owned   Slot   4  540W01
CP_Owned   Slot   5  540W02
CP_Owned   Slot   6  540W03
CP_Owned   Slot   7  RESERVED
CP_Owned   Slot   8  RESERVED
                            ...
CP_Owned   Slot  20  RESERVED
```

**DEFINE CPOWNed command**
- Define new entries or change existing entries in CP-Owned list
Stop and Start use of CP-Owned Space

**DRAIN/START (Disk) statements and commands**
- Stop and start the following on CP-owned disk volumes:
  - writing pages
  - allowing links to minidisks
  - allocating spool space
  - allocating TDisk space

Specify by
- rdev
- rdev range
- volid

Existing data and allocations remain on DRAINed volumes
DRAIN/START (Disk) Statements...Examples

**Example #1 - Have CP:**
- Stop all operations on all DASD between X'0700' and X'07FF',
- Allow users to link to minidisks on DASD X'0700', and
- Ensure that CP can write pages to the CP-owned paging pack (SYSPG1)

```
Drain  DASD  0700-07ff     All
Start  DASD  0700          Links
Start  Volid  SYSPG1     Page
```

**Example #2 - Have CP start allowing:**
- All new operations on all DASD between X'0700' and X'07FF',
- SPOOLing on DASD at real device number X'0800'
- Paging on volume SYSPG1 (previously defined on a CP_OWNED statement)

```
Start  DASD  0700-07ff     All
Start  DASD  0800          Spool
Start  Volid  SYSPG1     Page
```
Dynamically Adding a CP Owned Volume

1. Define reserved slots in CP_Owned list in config file

| CP_Owned | Slot | 1 | JF1RES |
| CP_Owned | Slot | 2 | SPOOL0 |
| CP_Owned | Slot | 3 | MDSP0  |
| CP_Owned | Slot | 4 | RESERVED |
| CP_Owned | Slot | 5 | RESERVED |

2. Query CP_Owned list for available slots

```
query cpowned

Slot  Vol-ID  Rdev  type   Status
1     JF1RES  0A40   Own    Online and attached
2     SPOOL0  0780   Own    Online and attached
3     MDSP0   0880   Own    Online and attached
4     ------   ----   ----   Reserved
5     ------   ----   ----   Reserved
```
Dynamically Adding a CP Owned Volume..

3. Replace a reserved entry in the config file with the new volume
   - For next IPL
     
     | CP_Owned | Slot | Volume  |
     |-----------|------|---------|
     | CP_Owned  | 1    | JF1RES  |
     | CP_Owned  | 2    | SPOOL0  |
     | CP_Owned  | 3    | MDSP0   |
     | CP_Owned  | 4    | NEWVOL  |
     | CP_Owned  | 5    | RESERVED|

4. CPFMTXA to format and allocate new volume

5. Define new volume to active system
   - (in same slot as config file)
     
     define cpowned slot 4 newvol

6. Attach new volume to system
   
   att 980 system

<table>
<thead>
<tr>
<th>Slot</th>
<th>Vol-ID</th>
<th>Rdev</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>JF1RES</td>
<td>0A40</td>
<td>Own</td>
<td>Online and attached</td>
</tr>
<tr>
<td>2</td>
<td>SPOOL0</td>
<td>0780</td>
<td>Own</td>
<td>Online and attached</td>
</tr>
<tr>
<td>3</td>
<td>MDSP0</td>
<td>0880</td>
<td>Own</td>
<td>Online and attached</td>
</tr>
<tr>
<td>4</td>
<td>NEWVOL</td>
<td>0980</td>
<td>Own</td>
<td>Online and attached</td>
</tr>
<tr>
<td>5</td>
<td>------</td>
<td>----</td>
<td>-----</td>
<td>Reserved</td>
</tr>
</tbody>
</table>
Dynamically Deleting a CP Owned Volume...

1. Stop all CP activity on the volume
   
   ```
   drain volid newvol all
   ```

2. Determine when volume is no longer being used
   
   ```
   q alloc NEWVOL
   
   DASD 0980 NEWVOL  3380 CKD-CKD (UNITS IN CYLINDERS)
   TDISK TOTAL=000500 INUSE=000000 AVAIL=000000, DR
   PAGE TOTAL=000500 INUSE=000000 AVAIL=000000, DR
   SPOOL TOTAL=000500 INUSE=000000 AVAIL=000005, DR
   DRCT TOTAL=000025 INUSE=000000 AVAIL=000000
   ```

3. Detach volume from system and vary offline
   
   ```
   det 980 system
   vary offline 980
   ```

<table>
<thead>
<tr>
<th>Slot</th>
<th>Vol-ID</th>
<th>Rdev</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>JF1RES</td>
<td>0A40</td>
<td>Own</td>
<td>Online and attached</td>
</tr>
<tr>
<td>2</td>
<td>SPOOL0</td>
<td>0780</td>
<td>Own</td>
<td>Online and attached</td>
</tr>
<tr>
<td>3</td>
<td>MDSP0</td>
<td>0880</td>
<td>Own</td>
<td>Online and attached</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>----</td>
<td>Own</td>
<td>Offline</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>----</td>
<td>-----</td>
<td>Reserved</td>
</tr>
</tbody>
</table>
Removing Spool File Data from a DRAINed Volume

1. **Issue DRAIN DASD command to stop new allocations**

2. **Use SPFPACK from VM Download Library to locate spool files which have information on the volume**

3. **Dump those files to tape and purge from system**
   - SPXTAPE DUMP with PURGE option

4. **Reload files from tape; space will be allocated on non-DRAINed volumes**
   - SPXTAPE LOAD
Defining and Modifying Guest LANs

**DEFINE LAN statement**
- Creates a persistent Guest LAN segment at IPL time
  - Owner can be system or a user

**MODIFY LAN statement**
- Modify some characteristics of an existing guest LAN

**DEFINE LAN command**
- Add a guest LAN to a running system
  - Transient (default) or persistent

**SET LAN command**
- Modify some characteristics of an existing guest LAN

**Example:**

DEFINE LAN JFLAN1 Ownerid SYSTEM Maxconn 100 Accounting OFF

q lan details
LAN SYSTEM JFLAN1 Type: HIPERS Connected: 0 Maxconn: 100
PERSISTENT UNRESTRICTED IP MFS: 16384 Accounting: OFF
IPTimeout: 5
Defining and Modifying Virtual Switches

**DEFINE VSWITCH statement**
- Creates a CP system owned switch (z/VM Virtual Switch) at IPL

**MODIFY VSWITCH statement**
- Modify some characteristics of a previously defined virtual switch

**DEFINE VSWITCH command**
- Add a virtual switch to a running system

**SET VSWITCH command**
- Modify some characteristics of an existing virtual switch

**Example:**

```
DEFINE VSWITCH JFSW1 RDEV FD00

q vswitch details

VSWITCH SYSTEM JFSW1       Type: VSWITCH Connected: 0          Maxconn: INFINITE
  PERSISTENT RESTRICTED NONROUTER Accounting: OFF
VLAN Unaware
  MAC address: 02-00-00-00-00-01
State: Defined
  IPTimeout: 5          QueueStorage: 8
  RDEV: FD00.P00       Controller: NONE
```
Defining and Changing Timezones

**TimeZone_Definition statements**
- Tell CP how to set the local time relative to the hardware clock

**DEFINE TIMEZONE command**
- Define new timezone or change existing timezone definition

**TimeZone_Boundary statements**
- Tell CP which previously defined TimeZone should be active at IPL.
  - Must be at least one boundary with a date/time prior to the IPL time or CP will default to the hardware clock date/time
  - Does not cause the time zone of a running system to be changed

**SET TIMEZONE command**
- Change a running system's active time zone definition and offset
Defining and Changing Timezones...Example

**Configuration File statements**

TimeZone_Definition EST West 05.00.00  
TimeZone_Definition EDT West 04.00.00

Timezone_boundary on 2008-03-09 at 02:00:00 to EDT  
Timezone_boundary on 2008-11-02 at 02:00:00 to EST  
Timezone_boundary on 2009-03-08 at 02:00:00 to EDT  
Timezone_boundary on 2009-11-01 at 02:00:00 to EST

**Changing timezone on an active system**

```
q time
TIME IS 12:40:06 EST  SUNDAY 02/22/09
CONNECT= 00:32:45 VIRTCPU= 000:00.03 TOTCPU= 000:00.06

set timezone edt
HCPTZN6759I The time zone has changed to EDT.

q time
TIME IS 13:40:18 EDT  SUNDAY 02/22/09
CONNECT= 00:32:57 VIRTCPU= 000:00.03 TOTCPU= 000:00.06
```
Logos
Logo Configuration Files

**LOGO CONFIG (default name/type)**
- Specify information about logos for terminals and printers
- Specify text for status area of terminals

**Logos may be selected based on criteria**
- Screen size
- Device address
- The ID of the virtual machine creating a logical device.
- The ID of the VTAM service machine (VSM) managing a terminal session

**You can alter:**
- The format of the input area for user IDs, passwords, and commands
- The contents of the online message at the top of the screen
- The contents of the status areas, such as CP READ, VM READ, and so forth.
Logo Configuration File: Example

/*******************************************************************************
*                  Logo Configuration File                                */
/*******************************************************************************

*----------------------------*           *  Status Area Definition    *           *----------------------------*
Choose_Logo Default          LOCAL   LOGO
Choose_Logo Local            LOCAL   LOGO
Choose_Logo Ldev             LDEV     LOGO
Choose_Logo VSM_VMid         VTAM     SNA  LOGO
Choose_Logo Print_Separator  PRINTSEP LOGO
Choose_Logo Minimum          DEFAULT LOGO
Input_Area  INPTAREA         SAMPLE

*----------------------------*           *  Online Message Definition    *           *----------------------------*
Online_Message ONMESS LOGO

*----------------------------------------*           *  Logo Definitions    *           *----------------------------------------*

© 2009 IBM Corporation
Logo Files

*Logo files can be updated dynamically*

- Located on a CPACCESSed PARM disk
- CPACCESS the disk to cause CP to re-read the files
- Changes activated with CP commands
  - `CP REFRESH LOGOINFO filename CONFIG`
  - `CP REFRESH LOGOVSM user-id`

*DRAWLOGO tool supplied to help in drawing LOGO files*

- Located on MAINT 2C2 disk
  - `DRAWLOGO SAMPEXEC`
  - `X$DRWL$X SAMPXEDI`
Changing Logo Information

THIS IS JAFI's z/VM TEST LOGO SYSTEM

built on IBM Virtualization Technology

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
USERID ===> 
PASSWORD ===> 
COMMAND ===> RUNNING  JOHN1
cprelease a
16:25:28 CPRELEASE request for disk A scheduled.
16:25:28 HCPZAC6730I CPRELEASE request for disk A completed.

link maint 1000 1000 mr u
acc 1000 z

x logo config z
    Status  VM_Read       'VM READ '   ,
           CP_Read       'CP READ '   ,
           Running       'GLIDING '   ,
    Online_Message     ONMESS SHARE

rel z (det
16:29:17 DASD 1000 DETACHED

cpaccess maint 1000 a
16:29:23 CPACCESS request for mode A scheduled.
16:29:23 HCPZAC6732I CPACCESS request for MAINT's 1000 in mode A complete

cp refresh logoinfo logo config
New Logo

THIS IS JAFI's Z/VM SHARE SYSTEM

ZZZZZZ / VVV MM MMM MMM
ZZ / VVV MMM MMM
ZZZ / VVV MMM MMM
ZZ / VVV MMM MMM
VVMM

built on IBM Virtualization Technology

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

GLIDING JOHNI
More Configuration File Statements
Conditional Statements/Imbeds

Conditional Statements are based on System_Identifier labels

```
System_Identifier 2064 012345 MYVM1
System_Identifier_Default     MYVM2

MYVM1: Operator_Consoles    0C00 0C01
MYVM2: Operator_Consoles    1C00 1C01

MYVM1: MYVM2: Features ,
       Enable ,
       Auto_Warm_IPL
```

Imbeds allow statements to be included from other files

- Useful for sections common to multiple systems
- Command privilege class modification
- User diagnose
DEVICES Statement

Tell CP how to handle specified devices at initialization

- Accept
- Allow dynamic changes
- Initialize at IPL
- Measure subchannels
- Assign tape drive to system
- Use sense ID information to define device
- Share dasd between operating systems
- Throttle I/O rate
Consoles Statement

*Operator_Consoles* tell CP where to try to display IPL messages

- Console addresses
  - Integrated 3270 Console (SYSTEM_3270)
  - Locally attached 3270-type displays
  - System Console (SYSTEM_CONSOLE)
- Must have 3270 to display SAPL screen
  - Enter device number in LOADPARM on processor console
- If no devices in the list are functional, IPL Wait State 1010

*Emergency_Message_Consoles* tell CP where to display critical messages such as ABEND and RESTART

- Include most IPL consoles (*except* SYSTEM_3270)
- Also include System Programmer consoles

**Example:**

```
MYVM1:  Operator_Consoles            SYSTEM_3270  0C00  0E00
MYVM1:  Emergency_Message_Consoles   0C00  0E00  1234

MYVM2:  Operator_Consoles            0D00  0F00
MYVM2:  Emergency_Message_Consoles   0D00  0F00  1235
```
FEATURES Statement

Set system attributes at system initialization time

- IPL Attributes
  - AUTO_WARM_IPL
  - PROMPT...
    - AFTER_RESTART
    - AFTER_SHUTDOWN_REIPL
    - AFTER_POWERoff

- Authorize users system-wide to use certain functions
  - SET_DYNamic_i/o, SET_DYNamic_io
  - SET_DEVICES
  - SET_PRIVclass
FEATURES Statement...

Tell CP whether, and how, to activate certain system functions

- CPCHECKING
  - ABEND
  - VMSTOP

- CLEAR_TDdisk at initialization

- LOGMSG_FROM_File
  - SHOW_ACCount Yes/No
  - SHOW_ACIgroup Yes/No
  - SHOW_Userid Yes/No

- NEW_DEVICES_initialized_when_added

- THROTTLE_ALL
FEATURES Statement...

Misc. system and user functions

- Number of MAXusers (or NOLimit)
- PASSWORDS_ON_CMDS
  - AUTOLog Yes/No
  - LINK Yes/No
  - LOGon Yes/No
- Number of RETRieve buffers per user
  - DEFault
  - MAXimum
- VDISK/VDSK installation default limits
  - Syslim
  - Userlim
  - Infinite
FEATURES Statement...Automatic IPL

**AUTO_IPL features**
- AUTO_IPL
- AUTO_IPL_AFTER_RESTART
- AUTO_IPL_AFTER_SHUTDOWN_REIPL

**All types of IPL may be specified for each AUTO_IPL feature**
- CLEAN
- COLD
- FORCE
- WARM

**IPL Options may also be specified**
- NOENABLE
- DRAIN
- NOAUTOLOG
- NODIRECT
FEATURES Statement...Misc.

*IPL_MESSAGES*
- tell CP whether or not to display IPL messages or prompts

*DISCONNECT_TIMEOUT*
- `nnnnnn`
  - Sets interval between a forced disconnect and its logoff to specified number of minutes
- `OFF`
  - Disables automatic logoff
Summary
Summary

VM's configurability support allows changes to be made while system remains up and running

- No source code changes
- No compiles/assemblies
- Re-IPL not necessary in most cases

Additional information:

- z/VM CP Planning and Administration
- z/VM Dynamic I/O Configuration Planning and Administration
- z/VM CP Command and Utility Reference
- z/VM System Operation
- z/VM CP Exit Customization