Customization and Use of z/VM Dirmaint

Rich Smrcina
Velocity Software, Inc
VM Workshop – July, 2011
SHARE Summer Orlando – August, 2011

SHARE Session 9885 – August 8, 2011
Agenda

• What is Dirmaint?
• Dirmaint Advantages
• Finishing the Install
• Set Up Configuration Files
• Command Entry
• Common Tasks
What is Dirmaint?

- Pre-installed, priced, optional feature of z/VM
- CMS application that manages the directory
- Provides multiple interfaces
  - Primarily a command interface
  - Full screen – field entry
  - Program driven
    - REXX
    - SMAPI
Dirmaint Advantages

- **Installed and Maintained with z/VM**
  - RSU service delivered and installed with service stream

- **Most commands to maintain the directory mimic regular directory statements**

- **Completing the install is simple and well documented**

- **Automated disk allocation eliminates costly mistakes**
  - Not using a current diskmap +
  - Allocating a minidisk = potential disaster
Finishing Dirmaint install

- A few steps remaining before full use
- Chapter 4 in “z/VM: Getting Started With Linux on System z”
  - Enable Dirmaint
  - Change service machine passwords
  - Set up configuration files *
  - Import current user directory
  - Put Dirmaint into production
  - Start Dirmaint
Set up Configuration Files

- Three types of primary configuration files
- **CONFIGxx DATADVH**
  - Configuration control keyword parameters
- **AUTHFOR CONTROL**
  - User command authorization
- **EXTENT CONTROL**
  - Minidisk allocation/boundaries
Set up Configuration Files

- **CONFIGxx DATADVH**
  - Dirmaint configuration override file(s)
  - xx=one or two EBCDIC characters
  - Processed in reverse EBCDIC sequence
    - Numbers before letters, 99-0 (zero-blank), Z9-AA
    - Standard CMS filemode search used across minidisks
  - CONFIG DATADVH is processed last
    - The default list of all keyword values
    - Should not ever be modified, always use an override
  - Contains keyword values controlling the function of Dirmaint
Set up Configuration Files

- **AUTHFOR CONTROL**
  - Contains a list of IDs that can issue Dirmaint commands for other IDs and the privileges available to them
    - EG: USERA can issue commands against the directory of USERB
  - Resides as a file under Dirmaint's control
  - Maintained by AUTHFOR and DROPFOR commands

```
*TARGETI  ORIGUSER  ORIGNODE  CMDL  CMDSETS
ALL      MAINT    *        140A  ADGHMOPS
ALL      MAINT    *        150A  ADGHMOPS
```
Set up Configuration Files

• **AUTHFOR CONTROL**
  - Adding/Removing user authorizations
  - Via command
    - Dirmaint AUTHFOR and DROPFOR
  - Editing the file
    - Get a copy from Dirmaint
    - Use XEDIT to modify the file
    - Send it back to Dirmaint
    - Load the new version of the file into memory
Set up Configuration Files

• **EXTENT CONTROL**
  
  – Controls minidisk allocations
  
  – Divided into a number of sections
    
    • REGIONS
    
    • GROUPS
    
    • EXCLUDE
    
    • AUTOBLOCK
    
    • DEFAULTS
  
  – Regions and Groups will be discussed in detail
EXTENT CONTROL

- REGIONS
- Defines an area on a disk device that is used for minidisk allocation
- Can be one or more parts of a volume
- Typically a full volume

:REGIONS.

<table>
<thead>
<tr>
<th>RegionId</th>
<th>VolSer</th>
<th>RegStart</th>
<th>RegEnd</th>
<th>Dev-Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM5RES</td>
<td>VM5RES</td>
<td>0</td>
<td>END</td>
<td>3390-03</td>
<td></td>
</tr>
<tr>
<td>VM5W01</td>
<td>VM5W01</td>
<td>0</td>
<td>END</td>
<td>3390-03</td>
<td></td>
</tr>
<tr>
<td>VM5W02</td>
<td>VM5W02</td>
<td>0</td>
<td>END</td>
<td>3390-03</td>
<td></td>
</tr>
<tr>
<td>VM5WK1</td>
<td>VM5WK1</td>
<td>0</td>
<td>END</td>
<td>3390-03</td>
<td></td>
</tr>
<tr>
<td>VM5WK2</td>
<td>VM5WK2</td>
<td>0</td>
<td>END</td>
<td>3390-03</td>
<td></td>
</tr>
</tbody>
</table>

:END.
Set up Configuration Files

- **EXTENT CONTROL**
  - **GROUPS**
  - Collection of one or more regions
  - Forms a pool of disk space from which to allocate
  - Allocations can be first to last or rotating

```plaintext
:GROUPS.
  *GroupName RegionList
  VMSYSTM    (ALLOCATE ROTATING)
  VMSYSTM    VM5RES VM5W01 VM5W02
  LNXDSK1    (ALLOCATE ROTATING)
  LNXDSK1    VM5WK1 VM5WK2
:END.
```
Set up Configuration Files

- **EXTENT CONTROL**
  - **EXCLUDE** – Defines which minidisks are excluded from extent checking
  - **AUTOBLOCK** – Specifies device architecture values for each type of DASD
    - Taken from AUTOBLK DATADVH
  - **DEFAULTS** – Device capacity table
    - Taken from DEFAULTS DATADVH
Set up Configuration Files

- **EXTENT CONTROL**

```sql
:EXCLUDE.
* USERID ADDRESS
MAINT 012*
SYSDUMP1 012*
:END.

:AUTOBLOCK.
* IBM supplied defaults are contained in the
* The following are customer overrides and suppliments.
* 
* DASDType BlockSize Blocks/Unit Alloc_Unit Architecture
:END.

:DEFAULTS.
* IBM supplied defaults are contained in the
* The following are customer overrides and suppliments.
* 
* DASDType Max-Size
:END.
```

<table>
<thead>
<tr>
<th>DASDType</th>
<th>BlockSize</th>
<th>Blocks/Unit</th>
<th>Alloc_Unit</th>
<th>Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>3390</td>
<td>512</td>
<td>735</td>
<td>1</td>
<td>CKD</td>
</tr>
<tr>
<td>3390</td>
<td>1024</td>
<td>495</td>
<td>1</td>
<td>CKD</td>
</tr>
<tr>
<td>3390</td>
<td>2048</td>
<td>315</td>
<td>1</td>
<td>CKD</td>
</tr>
<tr>
<td>3390</td>
<td>4096</td>
<td>180</td>
<td>1</td>
<td>CKD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DASDType</th>
<th>Max-Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>3390-01</td>
<td>1113</td>
</tr>
<tr>
<td>3390-02</td>
<td>2226</td>
</tr>
<tr>
<td>3390-03</td>
<td>3339</td>
</tr>
<tr>
<td>3390-09</td>
<td>10017</td>
</tr>
<tr>
<td>3390-084</td>
<td>1084</td>
</tr>
<tr>
<td>3390-151</td>
<td>2226</td>
</tr>
<tr>
<td>3390-153</td>
<td>4365</td>
</tr>
<tr>
<td>3390-455</td>
<td>455</td>
</tr>
<tr>
<td>3390-568</td>
<td>1568</td>
</tr>
<tr>
<td>3390-32K</td>
<td>32760</td>
</tr>
<tr>
<td>3390-64K</td>
<td>65520</td>
</tr>
<tr>
<td>3390</td>
<td>1113</td>
</tr>
</tbody>
</table>
Finish Install

- Import USER DIRECT
  - Copy directory from MAINT
- Put into production
- Bring up Dirmaint
  - DVHBEGIN
- Disconnect from Dirmaint
- Logon to MAINT
• **Commands invoked using the DIRM EXEC**

• **First parameters can be a modifier**
  
  • TOsys | TOnode – route command to another VM network node
  
  • ASuser – when user with TO, issue command AS this user
  
  • BYuser – issue command with auth of this user (like LOGONBY)
  
  • FORuser – command affects named user (most common)
  
  • ATsys | ATnode – route command to a node in a multi-system cluster
  
  • If no modifier is used, command is invoked for the current user at *

• **Remainder is a Dirmaint command**
Dirmaint Command Entry

- **Dirmaint commands are similar to most directory equivalents**

<table>
<thead>
<tr>
<th>Command 1</th>
<th>Command 2</th>
<th>Command 3</th>
<th>Command 4</th>
<th>Command 5</th>
<th>Command 6</th>
<th>Command 7</th>
<th>Command 8</th>
<th>Command 9</th>
<th>Command 10</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>DVHAMENG</em></td>
<td>CHVaddr</td>
<td>DLink</td>
<td>IOPriori</td>
<td>NOTAPE</td>
<td>Qry</td>
<td>SHUTDOWN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>DVHUCENG</em></td>
<td>CLAss</td>
<td>DMDisk</td>
<td>IPL</td>
<td>OFFline</td>
<td>QUERY</td>
<td>SPECIAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>UDVH</em></td>
<td>CLEANUP</td>
<td>DROPBy</td>
<td>IUCV</td>
<td>ONLINE</td>
<td>REPLACE</td>
<td>SPOOL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>CLONEDisk</td>
<td>DROPFor</td>
<td>Link</td>
<td>OPTION</td>
<td>REVIEW</td>
<td>STAG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>:ADVH</td>
<td>CMDisk</td>
<td>DROPScif</td>
<td>LOADDEV</td>
<td>PAValias</td>
<td>RLDCode</td>
<td>STATus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>:HELP</td>
<td>CMS</td>
<td>DSECuser</td>
<td>LOCK</td>
<td>POOL</td>
<td>RLDData</td>
<td>STDEVopt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCOUNT</td>
<td>COMMAND</td>
<td>DUMP</td>
<td>LOGmsg</td>
<td>POSIXFSRo</td>
<td>RLDExt</td>
<td>Storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACIgroup</td>
<td>CONsole</td>
<td>D8ONECMD</td>
<td>LOGONBY</td>
<td>POSIXGLIIs</td>
<td>RMDisk</td>
<td>SUBscribe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACNTAdd</td>
<td>CP</td>
<td>ELink</td>
<td>MACHINE</td>
<td>POSIXGRou</td>
<td>SATEllite</td>
<td>SUPGLIST</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACNTDel</td>
<td>CPU</td>
<td>ENable</td>
<td>MAIL</td>
<td>POSIXINFO</td>
<td>SCAN</td>
<td>SYSaffin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add</td>
<td>CRYPTO</td>
<td>EXECDrop</td>
<td>MAXSPool</td>
<td>POSIXIUPg</td>
<td>ASCreen</td>
<td>Term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMDisk</td>
<td>DASDOPT</td>
<td>EXECLoad</td>
<td>MAXstoraq</td>
<td>POSIXIXWDi</td>
<td>SECuser</td>
<td>TESTpw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPCpass</td>
<td>DATamove</td>
<td>EXTNchk</td>
<td>MAXstore</td>
<td>POSIXOPT</td>
<td>SEND</td>
<td>TMDisk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTHORy</td>
<td>DATEFoma</td>
<td>FILE</td>
<td>MDAUDit</td>
<td>PRIORity</td>
<td>SETAcnt</td>
<td>UNLock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTHFor</td>
<td>DEDicate</td>
<td>FReExt</td>
<td>MDisk</td>
<td>PRIOSet</td>
<td>SETClass</td>
<td>USEDext</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTHLink</td>
<td>DEFAULTs</td>
<td>Get</td>
<td>MDPW</td>
<td>PRIVclass</td>
<td>SETCPU</td>
<td>USER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTHScif</td>
<td>DEFINESTa</td>
<td>GETCONsol</td>
<td>MINIOPT</td>
<td>PURGE</td>
<td>SETMach</td>
<td>USERTMAP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTOlog</td>
<td>DIRECT</td>
<td>GLOBALOpt</td>
<td>MMDisk</td>
<td>PW</td>
<td>SETOptn</td>
<td>USEROPt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BACKUP</td>
<td>DIRECTORY</td>
<td>GLOBALv</td>
<td>NAMESave</td>
<td>PW?</td>
<td>SETPriori</td>
<td>WORKUNIT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BATCH</td>
<td>DIREEDIT</td>
<td>HELP</td>
<td>NEEDPASS</td>
<td>PWGen</td>
<td>SETpw</td>
<td>XAUtilog</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHECK</td>
<td>DIRMAP</td>
<td>HISTORY</td>
<td>NEWS</td>
<td>PWMON</td>
<td>SETSTAG</td>
<td>XCONfig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHKsum</td>
<td>DISABLE</td>
<td>INCLUDE</td>
<td>NICDEF</td>
<td>QLog</td>
<td>SHARE</td>
<td>XSTORE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHngid</td>
<td>DISTrib</td>
<td>INVEn</td>
<td>NOPdata</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dirmaint Command Entry

• All directory entries now managed by Dirmaint
  • Commands must be used to perform directory maintenance
  • Changes are put online immediately
  • Individual directory entries can be modified
    - GET/REPLACE
  • Wildcards can be used to affect matching virtual machines
    - MULTIUSER prefix option, MULTIUSER_VERIFICATION_EXIT
  • Changes can be batched
    - Multiple commands in a file, invoked with one execution
**Command verification**

```
dirm for sysadmin get nolock
DVHXMT1181R Enter the current logon password of SYSADMIN at RKS2LV for DVHXMT1181R authentication. It will not be displayed on the DVHXMT1181R terminal. To exit without processing the command, just DVHXMT1181R press ENTER.

DVHXMT1191I Your GET request has been sent for processing.
```

**If the user is not authorized to use Dirmaint**

```
DVHREQ2283E Userid SYSADMIN at RKS2LV is not authorized to issue the GET DVHREQ2283E command for SYSADMIN at *.
```
Dirmaint Authorization

• Changing authorization

• Dirmaint AUTHFOR command

  DIRM FOR ALL AUTHFOR SYSADMIN FROM * CMDLEVEL 140A CMDSET ADGHMOPS
  DIRM FOR ALL AUTHFOR SYSADMIN FROM * CMDLEVEL 150A CMDSET ADGHMOPS

• Or by editing the file
  – Get a copy from Dirmaint
    DIRM SEND AUTHFOR CONTROL
  – Use XEDIT to modify the file
  – Send it back to Dirmaint
    DIRM FILE AUTHFOR CONTROL
  – Load the new version of the file into memory
    DIRM RLDCODE
Dirmaint Command Entry

• Password required for each Dirmaint command entered

```
dirm needpass no
DVHXTMT1181R Enter the current logon password of SYSADMIN at RKS2LV for
DVHXTMT1181R authentication. It will not be displayed on the
DVHXTMT1181R terminal. To exit without processing the command, just
DVHXTMT1181R press ENTER.

DVHXTMT1191I Your NEEDPASS request has been sent for processing.
Ready; T=0.04/0.05 13:08:57
DVHREQ2288I Your USEROPTN request for SYSADMIN at * has been accepted.
DVHBIU3450I The source for directory entry SYSADMIN has been updated.
DVHBIU3456I Object directory update is not required for this source
DVHBIU3456I update.
DVHREQ2289I Your USEROPTN request for SYSADMIN at * has completed;
DVHREQ2289I with RC = 0.
```

• Dirmaint commands now execute without intervention
• **Commands typically return data in the RDR**

```
  dirm for sysmaint get nolock

  DVHXTM1191I Your GET request has been sent for processing.
  Ready; T=0.03/0.03 13:06:51
  DVHREQ2288I Your GET request for SYSMAINT at * has been accepted.
  DVHGET3305I Entry SYSMAINT sent, no lock attempt was made.
  RDR FILE 0002 SENT FROM DIRMAINT PUN WAS 0354 RECS 0016 CPY 001 A NOHOLD NOKEEP
  DVHREQ2289I Your GET request for SYSMAINT at * has completed; with RC
  DVHREQ2289I = 0.
```

• **Use PEEK/RECEIVE to look at the directory**
**Commands typically return data in the RDR**

```plaintext
0002 PEEK A0 V 80 Trunc=80 Size=12 Line=0 Col=1 Alt=0
File SYSMAINT DIRECT from DIRMAINT at RKS2LV Format is NETDATA.
* * * Top of File * * *
USER SYSMAINT SYSMAINT 32M 32M ABCDEFG
  INCLUDE IBMDFLT
  AUTOLOG AUTOLOG1 OP1 MAINT
ACCOUNT 1 SYSPROG
  MACH ESA
  IPL 190
  LINK MAINT 123 123 RR
  LINK MAINT 191 192 RR
*
*******************************************************************************
*DVHOPT LNK0 LOG1 RCM1 SMS0 NPW1 LNGAMENG PWC20110223 CRC*
* * End of File * * *
```

**Use PEEK**

```
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rghtleft 11= Spltjoin 12= Cursor

====>
```
Dirmaint Command Entry

- Another way to see a directory entry

  dirm for sysmaint review
  DVHXMT1191I Your REVIEW request has been sent for processing.
  Ready; T=0.02/0.03 14:18:18
  DVHREQ2288I Your REVIEW request for SYSMAINT at * has been accepted.
  RDR FILE 0004 SENT FROM DIRMAINT PUN WAS 0356 RECS 0034 CPY 001 A NOHOLD NOKEEP
  DVHREQ2289I Your REVIEW request for SYSMAINT at * has completed; with RC
  DVHREQ2289I = 0.

- PEEK the RDR file
Dirmaint Command Entry

- **Another way to see a directory entry**

  dirm for sysmaint review

  DVHXMT1191I Your REVIEW request has been sent for processing.

  Ready; T=0.02/0.03 14:18:18

  DVHREQ2288I Your REVIEW request for SYSMAINT at * has been accepted.

  RDR FILE 0004 SENT FROM DIRMAINT PUN WAS 0356 RECS 0034 CPY 001 A NOHOLD NOKEEP

  DVHREQ2289I Your REVIEW request for SYSMAINT at * has completed; with RC = 0.

- **PEEK the RDR file**

  DVHRXV3355I The following records are included from profile: IBMDFLT

  PROFILE IBMDFLT
  
  SPOOL 000C 2540 READER *
  
  SPOOL 000D 2540 PUNCH A
  
  SPOOL 000E 1403 A
  
  CONSOLE 009 3215 T
  
  LINK MAINT 0190 0190 RR
  
  LINK MAINT 019D 019D RR
  
  LINK MAINT 019E 019E RR
  
  LINK MAINT 0402 0402 RR
  
  LINK MAINT 0401 0401 RR
  
  LINK MAINT 0405 0405 RR

  *

  ******************************

  *DVHOPT LNK0 LOG1 RCM1 SMS0 NPW1 LNGAMENG PWC20110223 CRCe*

  DVHRXV3355I The preceding records are included from profile: IBMDFLT

  AUTOLOG AUTOLOG1 OP1 MAINT

  ACCOUNT 1 SYSPROG

  MACH ESA
  
  IPL 190
  
  LINK MAINT 123 123 MR
  
  LINK MAINT 191 192 RR

  *

  ******************************

  *

  *DVHOPT LNK0 LOG1 RCM1 SMS0 NPW1 LNGAMENG PWC20110223 CRCe*

  DVHREV3356I The following are your user option settings:

  DVHREV3356I Links DISABLED Logging ON RcvMsg ON Smsg OFF NeedPW ON

  DVHREV3356I Lang AMENG
A Few Common Dirmaint Tasks

- Changing Storage
- Adding/Removing a LINK
- Creating a disk map
- Adding a Minidisk
- Adding Logonby entries
- Changing users password
The STORAGE command can be used to query or change a STORAGE value on the USER statement.

**dirm for sysadmin storage ?**
DVHXT1191I Your STORAGE request has been sent for processing.
Ready; T=0.02/0.03 20:06:57

DVHREQ2288I Your STORAGE request for SYSADMIN at * has been accepted.
DVHSTO3207I SYSADMIN currently has a maxstorage value of 16M and a
default storage value of 16M.
DVHREQ2289I Your STORAGE request for SYSADMIN at * has completed; with
RC = 0.

**dirm for sysadmin storage 24m**
DVHXT1191I Your STORAGE request has been sent for processing.
Ready; T=0.02/0.03 20:11:07

DVHREQ2288I Your STORAGE request for SYSADMIN at * has been accepted.
DVHSTO3213E Your current maximum storage size is 16M, your requested
amount was 24M. Your request can not be satisfied.
DVHREQ2289E Your STORAGE request for SYSADMIN at * has failed; with RC =
3213.
Changing Storage

- **Must change the MAXSTORE value before the STORAGE value**

```
dirm for sysadmin maxstor 24m
DVHXMT1191I Your MAXSTORE request has been sent for processing.
Ready; T=0.02/0.03 20:18:01
DVHREQ2288I Your MAXSTORE request for SYSADMIN at * has been accepted.
DVHBIU3450I The source for directory entry SYSADMIN has been updated.
DVHBIU3423I The next ONLINE will take place via Diagnose 84.
DVHBIU3428I Changes made to directory entry SYSADMIN have been placed
DVHBIU3428I online.
DVHREQ2289I Your MAXSTORE request for SYSADMIN at * has completed;
DVHREQ2289I with RC = 0.
```

```
dirm for sysadmin storage 24m
DVHXMT1191I Your STORAGE request has been sent for processing.
Ready; T=0.02/0.03 20:20:41
DVHREQ2288I Your STORAGE request for SYSADMIN at * has been accepted.
DVHBIU3450I The source for directory entry SYSADMIN has been updated.
DVHBIU3423I The next ONLINE will take place via Diagnose 84.
DVHBIU3428I Changes made to directory entry SYSADMIN have been placed
DVHBIU3428I online.
DVHREQ2289I Your STORAGE request for SYSADMIN at * has completed; with
DVHREQ2289I RC = 0.
```
Changing Storage

- Check the change with the STORAGE and GET commands

```
dirm for sysadmin storage ?
DVHXMT1191I Your STORAGE request has been sent for processing.
Ready; T=0.02/0.03 20:27:43
  DVHREQ2288I Your STORAGE request for SYSADMIN at * has been accepted.
  DVHSTO3207I SYSADMIN currently has a maxstorage value of 24M and a
  DVHSTO3207I default storage value of 24M.
  DVHREQ2289I Your STORAGE request for SYSADMIN at * has completed; with
  DVHREQ2289I RC = 0.

dirm for sysadmin get nolock

USER SYSADMIN SYSADMIN 24M 24M G
  ACCOUNT SYSTEMS
  IPL CMS
  MACH ESA
  CONSOLE 0009 3215
  SPOOL 000C 2540 READER *
```
Add/Remove a LINK

• **Specify the LINK command exactly as it is in the directory when adding a LINK**

```
dirm for sysadmin link maint 193 193 rr
DVHXT1191I Your LINK request has been sent for processing.
Ready; T=0.02/0.03 20:48:58

DVHREQ2288I Your LINK request for SYSADMIN at * has been accepted.
DVHBIU3450I The source for directory entry SYSADMIN has been updated.
DVHBIU3424I The next ONLINE will take place immediately.
DVHBIU3428I Changes made to directory entry SYSADMIN have been placed
DVHBIU3428I online.
DVHREQ2289I Your LINK request for SYSADMIN at * has completed; with RC =
DVHREQ2289I 0.
```
• Specify the LINK command exactly as it is in the directory when adding a LINK

```
dirm for sysadmin link maint 193 193 rr
DVHXMT1191I Your LINK request has been sent for processing.
Ready; T=0.02/0.03 20:48:58
DVHREQ2288I Your LINK request has been accepted.
DVHBIU3450I The source for directory entry SYSADMIN has been updated.
DVHBIU3424I The next ONLINE will take place immediately.
DVHBIU3428I Changes made to directory entry SYSADMIN have been placed online.
DVHREQ2289I Your LINK request for SYSADMIN at * has completed; with RC = 0.
```

```
USER SYSADMIN SYSADMIN 24M 24M G
   ACCOUNT SYSTEMS
   IPL CMS
   MACH ESA
   CONSOLE 0009 3215
   SPOOL 000C 2540 READER *
   SPOOL 000D 2540 PUNCH A
   SPOOL 000E 1403 A
   LINK MAINT 0190 0190 RR * CMS SYSTEM DISK
   LINK MAINT 019E 019E RR * PRODUCT CODE DISK
   LINK 5VMRAC40 029E 029E RR
   LINK 5VMRAC40 0505 0505 RR
   LINK 5VMRAC40 0191 0192 RR
   LINK RACFVM 0305 0305 RR
   LINK MAINT 0193 0193 RR
   MDISK 0191 3390 2149 001 FM5RES MR READ WRITE MULTIPLE
```
Add/Remove a LINK

- No change LINK command
- Any change to the LINK requires it to be deleted and re-added
- Specify DELETE for the link mode to remove the link

```
dirm for sysadmin link maint 193 193 delete
DVHXMT1191I Your LINK request has been sent for processing.
Ready; T=0.02/0.03 21:31:34
DVHREQ2288I Your LINK request for SYSADMIN at * has been accepted.
DVHBIU3450I The source for directory entry SYSADMIN has been updated.
DVHBIU3424I The next ONLINE will take place immediately.
DVHBIU3428I Changes made to directory entry SYSADMIN have been placed
DVHBIU3428I online.
DVHREQ2289I Your LINK request for SYSADMIN at * has completed; with RC =
DVHREQ2289I 0.
```
Creating a Disk Map

- Traditionally used as a way to find available space
  - With the DISKMAP EXEC
- Dirmaint provides a set of commands to produce information related to disk usage
  - DIRM DIRMAP
  - DIRM FREEEXT
  - DIRM USEDEXT
Creating a Disk Map

**DIRM DIRMAP**

- By itself returns a RDR file that contains a map of each minidisk allocated on each volume on the system
- Additional options
  - link map
  - gap file
  - eliminate excluded extents
  - sorting by device type
Creating a Disk Map

- **DIRM** DIRMAP
  - By itself returns a RDR file that contains a map of each minidisk allocated on each volume on the system
  - Additional options
    - link map
    - gap file
    - eliminate excluded extents
    - sorting by device type

---

<table>
<thead>
<tr>
<th>Disk</th>
<th>Volume</th>
<th>$ALLOC$</th>
<th>Start Sector</th>
<th>End Sector</th>
<th>Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM5WK1</td>
<td>3390</td>
<td>$ALLOC$</td>
<td>0A04</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0191</td>
<td>1</td>
<td>166</td>
<td>205</td>
<td>40</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0307</td>
<td>2</td>
<td>206</td>
<td>210</td>
<td>5</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0302</td>
<td>3</td>
<td>211</td>
<td>225</td>
<td>15</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0301</td>
<td>4</td>
<td>226</td>
<td>235</td>
<td>10</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0303</td>
<td>5</td>
<td>236</td>
<td>250</td>
<td>15</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0304</td>
<td>6</td>
<td>251</td>
<td>255</td>
<td>5</td>
</tr>
<tr>
<td>RSSERV1</td>
<td>0191</td>
<td>7</td>
<td>256</td>
<td>499</td>
<td>244</td>
</tr>
<tr>
<td>RSSERV1</td>
<td>0302</td>
<td>8</td>
<td>500</td>
<td>569</td>
<td>70</td>
</tr>
<tr>
<td>RSSERV1</td>
<td>0301</td>
<td>9</td>
<td>585</td>
<td>644</td>
<td>60</td>
</tr>
<tr>
<td>RSSERV1</td>
<td>0303</td>
<td>10</td>
<td>645</td>
<td>659</td>
<td>15</td>
</tr>
<tr>
<td>RSSERV1</td>
<td>0304</td>
<td>11</td>
<td>660</td>
<td>709</td>
<td>50</td>
</tr>
<tr>
<td>RSSERV1</td>
<td>0305</td>
<td>12</td>
<td>710</td>
<td>1709</td>
<td>1000</td>
</tr>
<tr>
<td>MAINT</td>
<td>0500</td>
<td>13</td>
<td>1710</td>
<td>2509</td>
<td>800</td>
</tr>
<tr>
<td>ZPRO</td>
<td>0391</td>
<td>14</td>
<td>2510</td>
<td>2514</td>
<td>5</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0305</td>
<td>15</td>
<td>2515</td>
<td>3014</td>
<td>500</td>
</tr>
<tr>
<td>$END$</td>
<td>0A04</td>
<td>16</td>
<td>3015</td>
<td>3338</td>
<td>324</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Disk</th>
<th>Volume</th>
<th>$ALLOC$</th>
<th>Start Sector</th>
<th>End Sector</th>
<th>Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM5WK2</td>
<td>3390</td>
<td>$ALLOC$</td>
<td>0A05</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>RSSERV1</td>
<td>0306</td>
<td>1</td>
<td>1</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>SFSZVPS</td>
<td>0306</td>
<td>2</td>
<td>1001</td>
<td>1500</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1501</td>
<td>3338</td>
<td>1838</td>
</tr>
<tr>
<td>$END$</td>
<td>0A05</td>
<td>3</td>
<td>3339</td>
<td>3339</td>
<td>1</td>
</tr>
</tbody>
</table>
Adding a Minidisk

• Can still perform manual allocation with Dirmaint
  – Defeats one of the major benefits
• Automatic allocation will look for open disk space
  – Based on volumes/regions defined in EXTENT CONTROL
  – Proper volume sizing is important
• To add a minidisk with automatic allocation
  
  DIRM FOR SYSADMIN AMDISK 199 X AUTOG 20 VMSYSTM MR PW RADM WADM MADM
Adding a Minidisk

- Can still perform manual allocation with Dirmaint.

- Automatic allocation will look for open disk space based on volumes/regions defined in EXTENT CONTROL.
  Proper volume sizing is important.

- To add a minidisk with automatic allocation:
  
  ```
  dirm for sysadmin amdisk 199 x autog 20 vmsystm mr pw radm wadm madm
  DVHXMT1191I Your AMDISK request has been sent for processing.
  ```
  
  ```
  Ready; T=0.02/0.03 08:06:08
  DVHREQ2288I Your AMDISK request for SYSADMIN at * has been accepted.
  DVHSCU3541I Work unit 27080609 has been built and queued for processing.
  DVHSHN3541I Processing work unit 27080609 as MAINT from RKS2LV,
  DVHSHN3541I notifying MAINT at RKS2LV, request 200 for SYSADMIN sysaffin
  DVHSHN3541I *; to: AMDISK 0199 XXXX AUTOG 20 VMSYSTM MR PWS XXXX XXXX
  DVHSHN3541I XXXX
  DVHBIU3450I The source for directory entry SYSADMIN has been updated.
  DVHDRC3428I Changes made to directory entry SYSADMIN have just been
  DVHDRC3428I placed online.
  DVHSHN3430I AMDISK operation for SYSADMIN address 0199 has finished
  DVHSHN3430I (WUCF 27080609).
  DVHREQ2289I Your AMDISK request for SYSADMIN at * has completed; with RC
  DVHREQ2289I = 0.
  ```
## Adding a Minidisk

### From EXTENT CONTROL

<table>
<thead>
<tr>
<th>VMSYSTM</th>
<th>(ALLOCATE ROTATING)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMSYSTM</td>
<td>VM5RES VM5W01 VM5W02</td>
</tr>
</tbody>
</table>

- Minidisk confirmed with DIRMAP

<table>
<thead>
<tr>
<th></th>
<th>VM5PG1 3390 $PAGE$ 0A03 *</th>
<th>0</th>
<th>1113</th>
<th>1114</th>
</tr>
</thead>
<tbody>
<tr>
<td>.PAGE.</td>
<td>0127 *</td>
<td>1</td>
<td>3338</td>
<td>3338</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>VM5RES 3390 $ALLOC$ 0A01 *</th>
<th>0</th>
<th>0</th>
<th>1</th>
<th>Overlap</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINT</td>
<td>0123 *</td>
<td>0</td>
<td>3338</td>
<td>3339</td>
<td>Overlap</td>
</tr>
<tr>
<td>SYSDUMP1</td>
<td>0123 *</td>
<td>0</td>
<td>3338</td>
<td>3339</td>
<td>Overlap</td>
</tr>
<tr>
<td>.DRCT.</td>
<td>0123 *</td>
<td>1</td>
<td>20</td>
<td>20</td>
<td>Overlap</td>
</tr>
<tr>
<td>$DIRECT$</td>
<td>0A04 *</td>
<td>1</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>$SYSCKP$</td>
<td>0A06 *</td>
<td>21</td>
<td>29</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>$SYSWRM$</td>
<td>0A07 *</td>
<td>30</td>
<td>38</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>MAINT</td>
<td>0CF1 *</td>
<td>39</td>
<td>158</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>MAINT</td>
<td>0CF2 *</td>
<td>159</td>
<td>278</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>MAINT 049B *</th>
<th>899</th>
<th>1298</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINT</td>
<td>051D *</td>
<td>1299</td>
<td>1324</td>
<td>26</td>
</tr>
<tr>
<td><strong>SYSADMIN</strong></td>
<td>0199 *</td>
<td>1325</td>
<td>1344</td>
<td>20</td>
</tr>
<tr>
<td>MAINT</td>
<td>0990 *</td>
<td>1925</td>
<td>1984</td>
<td>60</td>
</tr>
</tbody>
</table>
• This method has one huge problem
  – Parameter overload!
• An easier way is to start the command:

  DIRM FOR SYSADMIN AMDISK
Adding a Minidisk

- This method has one huge problem – Parameter overload!
- An easier way is to start the command:

```plaintext
DIRM FOR SYSADMIN AMDISK
```

To add a new minidisk to a user definition, fill in the following:

- Minidisk Address ===> 199
- Device Type ===> 3390

Fill in one of the following rows:

- Explicit Start ===> Size ===> Volser ===> 
- AUTOV Size ===> Volser ===> 
- VBLK Blksize ===> Blocks ===> Volser ===> 
- AUTOG Size ===> Volser ===> 
- GBLK Blksize ===> Blocks ===> Grpname ===> VMSYSTM 
- AUTOR Size ===> Region ===> 
- RBLK Blksize ===> Blocks ===> Region ===> 
- T-DISK Size ===> 
- TBLK Blksize ===> Blocks ===> 
- V-DISK Size ===> 
- VDBS Blksize ===> Blocks ===> 
- DEVNO Real Device Number ===> 

Optionally fill in:

- Link Mode ===> MR
- BLKSIZE LABEL ===>
- PWS Read ===> Write ===> Multi ===> (passwords)

---

Copyright 2011 Velocity Software, Inc. All Rights Reserved. Other products and company names mentioned herein may be trademarks of their respective companies.
Adding a Minidisk

• Regardless of the method chosen
  – Directory is updated
  – Minidisk can be optionally formatted
• Regardless of the method chosen:
  – Directory is updated
  – Minidisk can be optionally formatted

```
USER SYSADMIN SYSADMIN 24M 24M G
ACCOUNT SYSTEMS
IPL CMS
MACH ESA
CONSOLE 0009 3215
SPOOL 000C 2540 READER *
SPOOL 000D 2540 PUNCH A
SPOOL 000E 1403 A
LINK MAINT 0190 0190 RR * CMS SYSTEM DISK
LINK MAINT 019E 019E RR * PRODUCT CODE DISK
LINK 5VMRAC40 029E 029E RR
LINK 5VMRAC40 0505 0505 RR
LINK 5VMRAC40 0191 0192 RR
LINK RACFVM 0305 0305 RR
MDISK 0191 3390 2149 001 VM5RES MR READ WRITE MULTIPLE
*
***********************************************************************
*
MDISK 0199 3390 1325 20 VM5RES MR RADM WADM MADM
```
• LOGONBY is different than other commands
  – Values specified are ADDed or DELETEed from the LOGONBY statement
  – Use '?' to see current LOGONBY setting

```plaintext
DIRM FOR SYSADMIN LOGONBY ADD USER1
DIRM FOR SYSADMIN LOGONBY ADD USER2
```

```
USER SYSADMIN SYSADMIN 24M 24M G
  ACCOUNT SYSTEMS
  IPL CMS
  MACH ESA
  LOGONBY USER1 USER2
  CONSOLE 0009 3215
  SPOOL 000C 2540 READER *
```
Changing User's Password

- **Change another user's logon password**
  
  `dirm for tcpmaint pw tcpboss`

- **Users can also change their own password**
  
  `dirm pw tcpboss1`

- **Both take effect immediately**
Changing User's Password

- **Change another user's logon password**

  
  ```
  dirm for tcpmaint pw tcpboss
  DVHXMT1191I Your PW request has been sent for processing.
  
  Ready; T=0.03/0.03 14:39:33
  DVHREQ2288I Your PW request for TCPMAINT at * has been accepted.
  DVHBIU3450I The source for directory entry TCPMAINT has been updated.
  DVHBIU3423I The next ONLINE will take place via Diagnose 84.
  DVHBIU3428I Changes made to directory entry TCPMAINT have been placed
  DVHBIU3428I online.
  DVHREQ2289I Your PW request for TCPMAINT at * has completed; with RC =
  DVHREQ2289I 0.
  ```
Changing User's Password

• **Change another user's logon password**

  dirm pw tcpboss1
  DVHXMT1181R Enter the current logon password of TCPMAINT at RKS2LV for
  DVHXMT1181R authentication. It will not be displayed on the
  DVHXMT1181R terminal. To exit without processing the command, just
  DVHXMT1181R press ENTER.

  DVHXMT1191I Your PW request has been sent for processing.
  Ready; T=0.04/0.04 14:47:15
  DVHREQ2288I Your PW request for TCPMAINT at * has been accepted.
  DVHBIU3450I The source for directory entry TCPMAINT has been updated.
  DVHBIU3423I The next ONLINE will take place via Diagnose 84.
  DVHBIU3428I Changes made to directory entry TCPMAINT have been placed
  DVHBIU3428I online.
  DVHREQ2289I Your PW request for TCPMAINT at * has completed; with RC =
  DVHREQ2289I 0.
References

- z/VM V6R1 Directory Maintenance Facility Commands Reference – SC24-6188
- z/VM V6R1 Directory Maintenance Facility Tailoring and Administration Guide – SC24-6190
- z/VM Getting Started With Linux on System z - SC24-6194
Rich Smrcina
Velocity Software, Inc
rich@velocitysoftware.com
650-964-8867
414-491-6001