

KnapSac Usage Notes

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Backup/Restore of a VMS System Disk (VAX)

This document describes how to backup and restore a VAX VMS system disk using KnapSac.

In this approach KnapSac is used to create an image save of the system disk and place it in a self-restoring pacset on a local disk other than the system disk.

In order to restore the system disk from the self-restoring pacset, VMS is booted from a minimum VMS system that has been created on an alternate disk. After the minimum VMS system is booted the self-restoring pacset is run to restore the system disk.

VAX System Disk Backup/Restore Scenario

1. Create a minimum bootable VMS system on the alternate disk. This is accomplished by copying the SYS1 directory tree from the VMS distribution CD to the alternate disk using the Backup utility, then using the Writeboot utility to make the alternate disk bootable.
2. Use KnapSac to perform an image save of the system disk and place it in a self-restoring pacset on the alternate disk. KnapSac Version 2.3-0 and later includes a special qualifier (/system) which creates a self-restoring pacset on a local VMS disk instead of a Windows disk.
3. If the system disk fails it can be restored by booting the minimum VMS system from the alternate disk and choosing the DCL commands option to get to the \$\$\$ prompt.
4. After the minimum VMS system is booted, define a foreign command for the pacset created in step 2 above and run the pacset to restore the system disk. The system disk can then be booted.

Following is a detailed example of the complete scenario showing the exact commands necessary to save and restore the VAX system disk using KnapSac.

Detailed Example of VAX System Disk Backup/Restore

A VAX computer has the following disks:

DUA0:	System disk
DUA1:	User disk
DUA3:	CD-ROM

This example shows how to

- a. Build a bootable minimum VMS system on the user disk DUA1:
- b. Use KnapSac to perform an image backup of the system disk DUA0: and store it in the pacset DUA0IMG.PAC in the directory DUA1:[KSBACKUP].
- c. Boot the minimum VMS system from DUA1:.
- d. Use KnapSac to restore the system disk DUA0: from the pacset that was stored on the user disk DUA1:.

Creating a bootable minimum VMS system

The VAX VMS distribution CD contains two bootable roots. SYS0 is booted to run Standalone Backup and SYS1 is booted to run a minimum VMS system. Some CD drives cannot boot from SYS1 without errors, such as indicating the drive is write locked, but the minimum system can be placed on an alternate disk and made bootable simply by copying the SYS1 directory tree to the alternate disk and running the WRITEBOOT utility to create the boot block. Following are the commands to copy the SYS1 directory tree from a CD in DUA3: to alternate disk DUA1:

```

$ mount/over=id dua3::                ; mount the distribution CD
MOUNT-I-WRITELOCK, volume is writelocked
MOUNT-I-MOUNTED, VAXVMS072 mounted on   __JENIFR$DUA3:
$ backup dua3:[sys1...]*.* dua1:[*...]   ; use backup to copy the SYS1 tree
$ run sys$system:writeboot              ; run writeboot to set the bootblock
Target system device (and boot file if not VMB.EXE): dua1:[sys1.sysexe]vmb.exe
Enter VBN of boot file code (default is 1) :
Enter load address of primary bootstrap in HEX (default is 200):
$

```

In configurations where several VAX computers need to have the minimum VMS system installed, a saveset can be created for the SYS1 directory tree and then copied to the target VAX computers. The SYS1 directory tree can be restored from the saveset and

then the WRITEBOOT utility used to create the boot block.

This approach can also be used in cases where a VAX computer does not have a working CD drive. The saveset can be copied to the VAX from another VMS system.

Following are the commands for creating and restoring the SYS1 saveset.

```
$ mount /over=id dua3: ; mount the distribution CD
$ backup dua3:[sys1...]*.* minsys1.bck/save ; command to create saveset
```

```
$ backup minsys1.bck/save dua1:[*...] ; command to restore saveset
```

Creating the KnapSac self-restoring pacset of the system disk

KnapSac Version 2.3-0 provides the /system qualifier to create a self-restoring pacset on a local disk instead of creating a pacset on a Windows disk. An image save of the system disk can be accomplished by using the /system qualifier combined with the /image qualifier.

```
$ create/directory dua1:[ksbackup] ; create a directory to store the saveset
$ knapSac dua0: dua1:[ksbackup]dua0img.pac/system/image ; save the system image
%KNAPSAC-I-VERSION, KnapSac VAX Version 2.3-0 Level D starting on 6-SEP-2012 12
:36:20.45
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSCOMMON.SYSEXE]QMAN$MASTER.DAT;
1 is open by another user
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSCOMMON.SYSEXE]SYS$QUEUE_ MANAGE
R.QMAN$JOURNAL;1 is open by another user
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSCOMMON.SYSEXE]SYS$QUEUE_ MANAGE
R.QMAN$QUEUES;1 is open by another user
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSCOMMON.SYSEXE]VMS$OBJECTS.DAT;
1 is open by another user
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSCOMMON.SYSMGR]SECURITY.AUDIT$J
OURNAL;1 is open by another user
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSCOMMON.SYSMGR]VMS$AUDIT_SERVER
.DAT;1 is open by another user
%KNAPSAC-I-NOBACKUP, [SYS0.SYSEXE]ERRORLOG.DMP;1 marked NOBACKUP, data not saved
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSEXE]NET$PROXY.DAT;1 is open by
another user
%KNAPSAC-I-NOBACKUP, [SYS0.SYSEXE]PAGEFILE.SYS;1 marked NOBACKUP, data not saved
%KNAPSAC-I-NOBACKUP, [SYS0.SYSEXE]SWAPFILE.SYS;1 marked NOBACKUP, data not saved
%KNAPSAC-I-NOBACKUP, [SYS0.SYSEXE]SYSDUMP.DMP;1 marked NOBACKUP, data not saved
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSMGR]ACCOUNTNG.DAT;1 is open by
another user
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSMGR]DNS$ADVER_ERROR.LOG;31 is
open by another user
%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSMGR]LAN$ACP.LOG;51 is open by
another user
```

%KNAPSAC-I-ACCONFLICT, Access conflict - [SYS0.SYSMGR]OPERATOR.LOG;54 is open by another user
%KNAPSAC-I-LOST_FILES, Processing lost files at 12:45:55.83
%KNAPSAC-I-FILE, Created DUA1:[KSBACKUP]DUA0IMG.PAC;1 at 12:45:56.18 from DUA0:

KnapSac Statistics

Elapsed Time: 00:09:35.90 CPU Time: 0:09:32.91
Buffered I/O: 6661 Direct I/O: 14299
Virtual Memory Used: 1536 Page Faults: 1037

374573 blocks (2507 input files) compressed to 205121 blocks

169452 blocks saved (45.2 percent reduction)
\$

Booting the Minimum VMS System

The minimum VMS system is booted by specifying the SYS1 root on the boot command. From the >>> prompt issue the following command:

>>> Boot /R5:10000000 DUA1

-DUA1

%SYSBOOT-I-SYSBOOT Mapping the SYSDUMP.DMP on the System Disk
%SYSBOOT-W-SYSBOOT Can not map SYSDUMP.DMP on the System Disk
%SYSBOOT-W-SYSBOOT Can not map PAGEFILE.SYS on the System Disk
OpenVMS (TM) VAX Version X72T Major version id = 1 Minor version id = 0

%SYSINIT-E, %SYSINIT, error opening system dump file, status = 00000910
%SYSINIT, primary PAGEFILE.SYS not found; system initialization continuing
%SYSINIT, no dump file - error log buffers not saved
\$! Copyright (c) 1998 Digital Equipment Corporation. All rights reserved.
\$set noverify

Installing required known files...

Configuring devices...

System time is: 6-AUG-2012 12:47:22.47

Enter Yes to the next question to leave the system time unchanged
(the system clock continues to run unaffected)

Enter No to set a new system time

Enter ? to redisplay the time

* Is this correct? (Y/N/?) y

You can execute DCL commands and procedures for various "standalone" tasks, such as backing up the system disk.

Please choose one of the following:

- 1) Execute DCL commands and procedures
- 2) Shut down this system

Enter CHOICE or "?" to repeat menu: (Y/N/?)1

WARNING --

The normal VMS startup procedure has not executed.
Some commands and utilities will not work as documented.

Enter DCL commands -- Enter "LOGOUT" when done.
When you enter "LOGOUT" a logout message will be displayed,
and you will be returned to the menu.

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Restoring the system disk from the KnapSac pacset

After the minimum VMS system is booted, the KnapSac pacset which contains the system disk image is used to restore the system disk. The steps to restore the system disk from the pacset consist of a) defining the pacset as a foreign command, b) initializing the target system disk, c) mounting the target disk /foreign, and d) executing the pacset using the /image qualifier to restore the disk.

After the restore completes, logout of the VMS system and shutdown the computer to the >>> prompt. Then the restored system disk can be booted.

```
$$$ kspacset := $dua1:[ksbackup]dua0img.pac          ; define the foreign command
$$$
$$$ init dua0: system                               ; initialize the target disk
$$$
$$$ mou/foreign dua0:                               ; mount the target disk /foreign
%MOUNT-I-MOUNTED, SYSTEM      mounted on _DUA0:
$$$
$$$ kspacset restore dua0: /image                   ; run the pacset to restore the system disk
%KNAPSAC-I-VERSION, KnapSac VAX Version 2.3-0 Level D starting on 6-AUG-2012 12 :59:51.63
```

KnapSac Statistics

Elapsed Time:	00:06:12.70	CPU Time:	0:06:08.95
Buffered I/O:	1	Direct I/O:	13664
Virtual Memory Used:	512	Page Faults:	332

\$\$\$ logout

Process SYSTEM_1 logged out at 6-AUG-2012 13:10:07.73

You can execute DCL commands and procedures for various "standalone" tasks, such as backing up the system disk.

Please choose one of the following:

- 1) Execute DCL commands and procedures
- 2) Shut down this system

Enter CHOICE or "?" to repeat menu: (1/2/?) 2

SYSTEM SHUTDOWN COMPLETE - use console to halt system

!

! Now Boot the restored system disk

!

>>>b dua0

(BOOT/R5:0 DUA0

2..

-DUA0

1..0..

%SYSBOOT-I-SYSBOOT Mapping the SYSDUMP.DMP on the System Disk

%SYSBOOT-I-SYSBOOT SYSDUMP.DMP on System Disk successfully mapped

%SYSBOOT-I-SYSBOOT Mapping PAGEFILE.SYS on the System Disk

%SYSBOOT-I-SYSBOOT SAVEDUMP parameter not set to protect the PAGEFILE.SYS

OpenVMS (TM) VAX Version V7.2 Major version id = 1 Minor version id = 0

%DECnet-I-LOADED, network base image loaded, version = 05.0B.00

\$! Copyright (c) 1998 Digital Equipment Corporation. All rights reserved.

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Welcome to OpenVMS VAX V7.2

Username: system

Password:

Welcome to OpenVMS (TM) VAX Operating System, Version V7.2 on node JENIFR

Last interactive login on Thursday, 6-SEP-2012 13:15

Last non-interactive login on Tuesday, 21-AUG-2012 17:10

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