SAP HANA Backup Guide
(for Ivy-Bridge Model)

Version 1.3
2015 / 07 / 17

NEC SAP Global Competence Center
## Version history

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Revision contents</th>
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<tr>
<td>1.0</td>
<td>2014/08/07</td>
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<tr>
<td>1.1</td>
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<td>Added procedure for 2TB appliance</td>
</tr>
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Introduction

Purpose
This manual describes the acquisition of the initial backup after finishing the installation of SAP HANA.

Prerequisites
・This procedure manual is created based on the SPS08 (revision 80).

Scope
・SAP HANA single model appliance
・OS is RHEL 6.5 or RHEL 6.6

Reference documents
・SAP HANA Technical Operations Manual (TOM)
・SAP HANA Database Administration Guide

The above documents are available the latest version from the following site, be sure to check
http://help.sap.com/hana_appliance
# 1. Planning

## 1.1 SAP HANA data allocation

This chapter describes the disk and filesystem layout.

### 1.1.1 Appliances up to 1TB

All data except those on devices "/dev/sda4" and "/dev/sda5" in the following table will be included with the backup.

<table>
<thead>
<tr>
<th>HWRAID</th>
<th>Size</th>
<th>Device</th>
<th>Partition name</th>
<th>Filesystem</th>
<th>Size</th>
<th>Usage</th>
<th>Mount point</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID5</td>
<td>650GB</td>
<td>/dev/sda</td>
<td>/dev/sda1</td>
<td>vfat</td>
<td>1GB</td>
<td>uEFI</td>
<td>/boot/efi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda2</td>
<td>ext4</td>
<td>1GB</td>
<td>Boot</td>
<td>/boot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda3</td>
<td>ext3</td>
<td>300GB</td>
<td>OS/AP</td>
<td>/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda4</td>
<td>swap</td>
<td>50GB</td>
<td>SWAP</td>
<td>(swap)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda5</td>
<td>ext3</td>
<td>298GB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4TB</td>
<td>/dev/sdb</td>
<td>/dev/sdb1</td>
<td>xfs</td>
<td>4TB</td>
<td>Data</td>
<td>/hana/disk</td>
</tr>
<tr>
<td></td>
<td>1TB</td>
<td>/dev/sdc</td>
<td>/dev/sdc1</td>
<td>xfs</td>
<td>1TB</td>
<td>Log</td>
<td>/hana/log</td>
</tr>
</tbody>
</table>

### 1.1.2 2TB appliance

All data except those on devices "/dev/sda3" and "/dev/sda4" in the following table will be included with the backup.

<table>
<thead>
<tr>
<th>HW RAID</th>
<th>Size</th>
<th>Device</th>
<th>Partition name</th>
<th>Filesystem</th>
<th>Size</th>
<th>Usage</th>
<th>Mount point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal disks</td>
<td>6</td>
<td>1800GB</td>
<td>/dev/sda</td>
<td>/dev/sda1</td>
<td>vfat</td>
<td>1GB</td>
<td>uEFI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda2</td>
<td>ext4</td>
<td>1GB</td>
<td>Boot</td>
<td>/boot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda3</td>
<td>ext3</td>
<td>300GB</td>
<td>BACKUP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda4</td>
<td>swap</td>
<td>50GB</td>
<td>SWAP</td>
<td>(swap)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda5</td>
<td>ext3</td>
<td>1,4TB</td>
<td>OS/AP</td>
<td>/</td>
</tr>
<tr>
<td></td>
<td>2,1TB</td>
<td>/dev/sdb</td>
<td>/dev/sdb1</td>
<td>xfs</td>
<td>2,1TB</td>
<td>Shared</td>
<td>/hana/shared</td>
</tr>
<tr>
<td></td>
<td>1,2TB</td>
<td>/dev/sdc</td>
<td>/dev/sdc1</td>
<td>xfs</td>
<td>1,2TB</td>
<td>Log</td>
<td>/hana/log</td>
</tr>
<tr>
<td>External disks</td>
<td>60</td>
<td>6,5TB</td>
<td>/dev/sdd</td>
<td>/dev/sdd1</td>
<td>xfs</td>
<td>6,5TB</td>
<td>Data</td>
</tr>
</tbody>
</table>
1.2 Backup procedure overview

The backup procedure exists of the following 4 phases:

1. Boot up to the rescue mode.
2. Read-only mount each volume.
3. Backup each volume with the tar command.
4. Reboot server and start SAP HANA.

2. Backup

In this chapter a procedure to obtain an initial backup of the environment is shown. This procedure should be run after the construction of SAP HANA.

2.1 Backup procedure

2.1.1 Boot to rescue mode

① Insert the RHEL Installation Media and boot from DVD

② As soon as the system starts from the DVD the following screen is displayed:

```
Press any key to enter the menu

Booting Red Hat Enterprise Linux 6.5 in 3 seconds...
```

Please press any key to enter the boot menu.

③ Select “rescue” in the menu and then press “ENTER”:

```
GNU GRUB  version 0.97  (640K lower / 1661428K upper memory)

Red Hat Enterprise Linux 6.5
    Install system with basic video driver
    rescue
```

Use the ↑ and ↓ keys to select which entry is highlighted. Press enter to boot the selected OS, ‘c’ to edit the commands before booting, ‘a’ to modify the kernel arguments before booting, or ‘c’ for a command line.
4. When the rescue mode loads it will ask you several questions. Please use the following settings:
- Change a Language: English
- Keyboard Type: us
- Rescue Method: Local CD/DVD
- Setup Networking: No
- Rescue: Skip (no automatic mount on /mnt/sysimage)
- Start shell: Ok

2.1.2 Backup
In this chapter you will create a backup of every partition. All commands are valid for all appliance models, if not otherwise mentioned. This backup will be saved to /dev/sda5 (up to 1TB) or /dev/sda3 (2TB).

1. Create a temporary mount point for every device:
   mkdir /tmp/osmount
   mkdir /tmp/bootefimount
   mkdir /tmp/bootmount
   mkdir /tmp/log
   mkdir /tmp/backup
   For up to 1TB additionally:
   mkdir /tmp/disk
   For 2TB additionally:
   mkdir /tmp/shared
   mkdir /tmp/data
   Example from 1TB appliance

2. Mount all devices to relevant mount points:
   For up to 1TB only:
   mount -o ro /dev/sda1 /tmp/bootefimount
   mount -o ro /dev/sda2 /tmp/bootmount
   mount -o ro /dev/sda3 /tmp/osmount
   mount -o ro /dev/sdb1 /tmp/disk
   mount -o ro /dev/scd1 /tmp/log
   mount -o rw /dev/sda5 /tmp/backup
   For 2TB only:
   mount -o ro /dev/sda1 /tmp/bootefimount
   mount -o ro /dev/sda2 /tmp/bootmount
   mount -o ro /dev/sda5 /tmp/osmount
   mount -o ro /dev/sdb1 /tmp/shared
   mount -o ro /dev/scd1 /tmp/log
   mount -o ro /dev/sdd1 /tmp/data
mount -o rw /dev/sda3 /tmp/backup

③ Please verify the success of the previous step by typing
mount

④ Run the following command in the directory /tmp/booteffimount to get a backup of the uEFI boot partition:
   cd /tmp/booteffimount
   tar zc -sp . > /tmp/backup/hana-bootefi.tar.gz

⑤ Run the following command in the directory /tmp/bootmount to get a backup of the boot partition:
   cd /tmp/bootmount
   tar zc -sp . > /tmp/backup/hana-boot.tar.gz

⑥ Run the following command in the directory /tmp/osmount to get a backup of the OS partition:
   cd /tmp/osmount
   tar zc -sp . > /tmp/backup/hana-root.tar.gz

⑦ For up to 1TB only:
   Run the following command in the directory /tmp/disk to get a backup of the HANA data and shared partition:
   cd /tmp/disk
   tar zc -sp . > /tmp/backup/hana-disk.tar.gz

   For 2TB only:
   Run the following command in the directory /tmp/data to get a backup of the HANA data partition:
   cd /tmp/data
   tar zc -sp . > /tmp/backup/hana-data.tar.gz

   For 2TB only:
   Run the following command in the directory /tmp/shared to get a backup of the HANA shared partition:
   cd /tmp/shared
   tar zc -sp . > /tmp/backup/hana-shared.tar.gz

⑧ Run the following command in the directory /tmp/log to get a backup of the HANA log partition:
   cd /tmp/log
   tar zc -sp . > /tmp/backup/hana-log.tar.gz

⑨ Verify that 5 backup files exist in the backup partition (in case of 2TB appliance 6 files should be there):
2.1.3 Reboot and HANA startup

After the backup finished restart your NEC HANA appliance and start HANA in this chapter.

① Reboot your server by typing
   
   shutdown -r now

② Remove all DVD / USB medias used in the previous steps before the bios boots up.

③ Login to the OS, open a terminal and change to/usr/sap/hostctrl/exe/:

   cd /usr/sap/hostctrl/exe

④ Start your HANA instance and verify the command output is “OK”:

   ./sapcontrol -nr <instance no> -function Start

⑤ Run this command and check its output says “OK” and all listed processes have the status "Green". If some are still “Initializing”, wait a while and issue the same command again:

   ./sapcontrol -nr <instance no> -function GetProcessList

```
mechana01:/usr/sap/hostctrl/exe # ./sapcontrol -nr 00 -function GetProcessList
22.08.2012 10:34:08
GetProcessList
OK
name, description, dispstatus, textstatus, starttime, elapsedtime, pid
hdbdaemon, HDB Daemon, GREEN, Running, 2012 08 22 10:33:17, 0:00:51, 36349
hdbnameserver, HDB Nameserver, GREEN, Running, 2012 08 22 10:33:19, 0:00:49, 36572
hdpresprocessor, HDB Preprocessor, GREEN, Running, 2012 08 22 10:33:29, 0:00:39, 36466
hdbindexserver, HDB Indexserver, GREEN, Running, 2012 08 22 10:33:32, 0:00:35, 36495
hdbstatisticserver, HDB Statisticserver, GREEN, Running, 2012 08 22 10:33:33, 0:00:35, 36493
hdxsengine, HDB XSEngine, GREEN, Running, 2012 08 22 10:33:34, 0:00:34, 36512
sapwebdisp_hdb, SAP WebDispatcher, GREEN, Running, 2012 08 22 10:33:50, 0:00:18, 37447
```