SAP HANA Backup Guide
(for Ivy-Bridge Model)

Version 1.1
2014/12/06

NEC SAP Global Competence Center
### Version history

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<tr>
<th>Version</th>
<th>Date</th>
<th>Revision contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
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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 SuSE Linux Enterprise Server 11 SP3 for SAP Applications

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/sda2" and "/dev/sda3" 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>Software RAID</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>-</td>
<td>ext3</td>
<td>300GB</td>
<td>OS/AP</td>
<td>/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda2</td>
<td>-</td>
<td>swap</td>
<td>50GB</td>
<td>SWAP</td>
<td>(SWAP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/dev/sda3</td>
<td>-</td>
<td>ext3</td>
<td>300GB</td>
<td>BACKUP</td>
<td></td>
</tr>
<tr>
<td>4TB</td>
<td></td>
<td>/dev/sdb</td>
<td>/dev/sdb1</td>
<td>-</td>
<td>xfs</td>
<td>4TB</td>
<td>Data</td>
<td>/hana/disk</td>
</tr>
<tr>
<td>1TB</td>
<td></td>
<td>/dev/sdc</td>
<td>/dev/sdc1</td>
<td>-</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/sda2" and "/dev/sda3" in the following table will be included with the backup.

<table>
<thead>
<tr>
<th>Internal disks</th>
<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>6</td>
<td>1800GB</td>
<td>/dev/sda</td>
<td>/dev/sda1</td>
<td>ext3</td>
<td>1,4TB</td>
<td>OS/AP</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda2</td>
<td>swap</td>
<td>50GB</td>
<td>SWAP</td>
<td>(SWAP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda3</td>
<td>ext3</td>
<td>300GB</td>
<td>BACKUP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td></td>
<td></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>
<td>/hana/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 after the construction of SAP HANA.

2.1 Backup procedure

2.1.1 Boot to rescue mode

① Insert the SuSE Linux Enterprise Server 11 SP3 for SAP Applications Installation Media and boot from DVD

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

Use the arrow keys to focus “Rescue System” and press “ENTER”.

③ As soon as the Rescue System finished booting it presents a login prompt. Login with the root user:
2.1.2 Backup
In this chapter you will create a backup of every partition. This backup will be saved to
/dev/sda3.
All commands are valid for all appliance models, if not otherwise mentioned.

① Create a temporary mount point for every device:
   mkdir /tmp/osmount
   mkdir /tmp/log
   mkdir /tmp/backup

   For up to 1TB additionally:
   mkdir /tmp/disk

   For 2TB additionally:
   mkdir /tmp/shared
   mkdir /tmp/data

② Mount all devices to relevant mount points:
   For up to 1TB only:
   mount -o ro /dev/sda1 /tmp/osmount
   mount -o ro /dev/sdb1 /tmp/disk
   mount -o ro /dev/sdc1 /tmp/log
   mount -o rw /dev/sda3 /tmp/backup

   For 2TB only:
   mount -o ro /dev/sda1 /tmp/osmount
   mount -o ro /dev/sdb1 /tmp/shared
   mount -o ro /dev/sdc1 /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/osmount to get a backup of the OS
   partition:
   cd /tmp/osmount
   tar zc -sp . > /tmp/backup/hana-root.tar.gz

⑤ 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:
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
```

6. 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
```

7. Verify that 3 backup files exist in the backup partition (in case of 2TB appliance 4 files should be there):
```
cd /tmp/backup
ls -lh
```

Example from 1TB appliance

<table>
<thead>
<tr>
<th>1.2G</th>
<th>1 root root 142 Apr 28 09:46 hana-data.tar.gz</th>
<th>1 root root 105 Apr 28 09:46 hana-log.tar.gz</th>
<th>1 root root 2 Apr 28 09:44 hana-root.tar.gz</th>
</tr>
</thead>
</table>

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
```

```
mehana01:/usr/sap/hostctrl/exe # ./sapcontrol -nr 00 -function Start
21.08.2012 14:50:25
Start
OK
```

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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, startime, 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, 36472
hdbpreprocessor, HDB Preprocessor, GREEN, Running, 2012 08 22 10:33:25, 0:00:39, 36466
hdbindexserver, HDB Indexserver, GREEN, Running, 2012 08 22 10:33:32, 0:00:35, 36465
hdbstatisticsserver, HDB Statisticsserver, GREEN, Running, 2012 08 22 10:33:33, 0:00:35, 36493
hdbxsengine, 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, 0:00:10, 37447
```