SAP HANA Backup Guide (for A2040c SLES)

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NEC SAP Global Competence Center
1. Introduction

1.1. Purpose
This manual describes how to create an initial backup after finishing the installation of SAP HANA.

1.2. Scope
- SAP HANA single model appliance
- OS is SLES 12

1.3. Reference documents
- SAP HANA Technical Operations Manual (TOM)
- SAP HANA Database Administration Guide

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

2. Planning

2.1. SAP HANA data allocation
This chapter describes the disk and filesystem layout. You can check this by typing

```bash
lsblk
```

If there was an additional (USB) drive mounted during system boot, then the devices attached to external storage may have an increased letter (e.g. /dev/sdb becomes /dev/sdc, and so on).
### 2.2. Appliances with 3 internal HDDs (up to 1TB)

All data except those on devices sda3, lv_kdump and lv_backup in the following table will be included with the backup.

<table>
<thead>
<tr>
<th>RAID</th>
<th>Size</th>
<th>Device</th>
<th>Partition name</th>
<th>File system</th>
<th>Size</th>
<th>Usage</th>
<th>Mount point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal disks</td>
<td></td>
<td>/dev/sda1</td>
<td>/dev/sda1</td>
<td>ext3</td>
<td>1GB</td>
<td>Boot</td>
<td>/boot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda2</td>
<td>/dev/sda2</td>
<td>vfat</td>
<td>1GB</td>
<td>uEFI</td>
<td>/boot/efi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda3</td>
<td>/dev/sda3</td>
<td>swap</td>
<td>10GB</td>
<td>SWAP</td>
<td>(swap)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda4</td>
<td>/dev/sda4</td>
<td>ext3</td>
<td>263GB</td>
<td>OS/AP</td>
<td>/</td>
</tr>
<tr>
<td>External disks</td>
<td>87GB</td>
<td>/dev/md127</td>
<td>/dev/md127</td>
<td>xfs</td>
<td>1,1TB</td>
<td>Log</td>
<td>/hana/log</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/md126</td>
<td>/dev/md126</td>
<td>xfs</td>
<td>3,1TB</td>
<td>Data</td>
<td>/hana/data</td>
</tr>
<tr>
<td></td>
<td>211GB</td>
<td>/dev/mapper/</td>
<td>/dev/mapper/</td>
<td>xfs</td>
<td>1TB</td>
<td>Shared</td>
<td>/hana/shared</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vg_shared-lv_shared</td>
<td>vg_shared-lv_shared</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/mapper/</td>
<td>/dev/mapper/</td>
<td>xfs</td>
<td>50GB</td>
<td>Backup</td>
<td>/backup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vg_shared-lv_backup</td>
<td>vg_shared-lv_backup</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/mapper/</td>
<td>/dev/mapper/</td>
<td>xfs</td>
<td>1TB</td>
<td>Kdump</td>
<td>/var/crash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vg_shared-lv_kdump</td>
<td>vg_shared-lv_kdump</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3. Appliances with 8 internal HDDs (up to 2TB)

All data except those on devices sda3, sda4 and sda6 in the following table will be included with the backup.

<table>
<thead>
<tr>
<th>RAID</th>
<th>Size</th>
<th>Device</th>
<th>Partition name</th>
<th>File system</th>
<th>Size</th>
<th>Usage</th>
<th>Mount point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal disks</td>
<td>1800GB</td>
<td>/dev/sda1</td>
<td>/dev/sda1</td>
<td>ext4</td>
<td>1GB</td>
<td>Boot</td>
<td>/boot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda2</td>
<td>/dev/sda2</td>
<td>vfat</td>
<td>1GB</td>
<td>uEFI</td>
<td>/boot/efi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda3</td>
<td>/dev/sda3</td>
<td>xfs</td>
<td>1,1TB</td>
<td>Kdump</td>
<td>/var/crash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda4</td>
<td>/dev/sda4</td>
<td>ext3</td>
<td>50GB</td>
<td>Backup</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda5</td>
<td>/dev/sda5</td>
<td>swap</td>
<td>10GB</td>
<td>SWAP</td>
<td>(swap)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/dev/sda6</td>
<td>/dev/sda6</td>
<td>ext3</td>
<td>678GB</td>
<td>OS/AP</td>
<td>/</td>
</tr>
<tr>
<td>External disks</td>
<td>2,1TB</td>
<td>/dev/sdb1</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/sdc1</td>
<td>/dev/sdc1</td>
<td>xfs</td>
<td>1,2TB</td>
<td>Log</td>
<td>/hana/log</td>
</tr>
<tr>
<td></td>
<td>6,6TB</td>
<td>/dev/md127</td>
<td>/dev/md127</td>
<td>xfs</td>
<td>6,5TB</td>
<td>Data</td>
<td>/hana/data</td>
</tr>
</tbody>
</table>
2.4. **Backup procedure overview**

The backup procedure exists of the following 4 phases:

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

3. **Backup procedure**

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

3.1. **Boot to rescue mode**

Insert the SLES Installation Media and boot from DVD.

As soon as the system starts from the DVD the boot menu is displayed:

![SUSE Linux Enterprise 12 boot menu](image)

Select “Rescue System” in the menu and then press “ENTER” to start loading the rescue system. Once this finished you will see a login prompt:

```
Welcome to SUSE Linux Enterprise for SAP Applications 12 (x86_64) - Kernel 3.12.28-4-default (tty1).

Rescue login: root
```

The username for the rescue system is “root”, no password.
3.2. Backup

In this chapter you will create a backup of every partition. All commands are valid for all appliance models, if not otherwise mentioned.

① Create a temporary mount point for every device:

```bash
mkdir /tmp/osmount
mkdir /tmp/logmount
mkdir /tmp/bootmount
mkdir /tmp/bootefimount
mkdir /tmp/datamount
mkdir /tmp/sharedmount
mkdir /tmp/backup
```

② Mount all devices to relevant mount points in read-only mode:

**For appliances with 3 internal disks only:**

```bash
mount -o ro /dev/sda1 /tmp/bootefimount
mount -o ro /dev/sda2 /tmp/bootmount
mount -o ro /dev/sda4 /tmp/osmount
mount -o ro /dev/md126 /tmp/datamount
mount -o ro /dev/md127 /tmp/logmount
mount -o ro /dev/mapper/vg_shared-lv_shared /tmp/sharedmount
```

**For appliances with 8 internal disks only:**

```bash
mount -o ro /dev/sda1 /tmp/bootmount
mount -o ro /dev/sda2 /tmp/bootefimount
mount -o ro /dev/sda6 /tmp/osmount
mount -o ro /dev/sdb1 /tmp/sharedmount
mount -o ro /dev/sdc1 /tmp/logmount
mount -o ro /dev/md127 /tmp/datamount
```

③ Mount backup partition in writeable mode:

**For appliances with 3 internal disks only:**

```bash
mount /dev/mapper/vg_shared-lv_backup /tmp/backup
```

**For appliances with 8 internal disks only:**

```bash
mount /dev/sda4 /tmp/backup
```

④ Run the following command in the directory /tmp/bootefimount to get a backup of the uEFI boot partition:

```bash
cd /tmp/bootefimount
tar zc -p . > /tmp/backup/hana-bootefi.tgz
```

⑤ Run the following command in the directory /tmp/bootmount to get a backup of the boot partition:

```bash
cd /tmp/bootmount
tar zc -p . > /tmp/backup/hana-boot.tgz
```

⑥ Run the following command in the directory /tmp/osmount to get a backup of the OS partition:

```bash
cd /tmp/osmount
tar zc -p . > /tmp/backup/hana-root.tgz
```
⑦ Run the following command in the directory /tmp/datamount to get a backup of the HANA data partition:

```
cd /tmp/datamount
tar zc -p . > /tmp/backup/hana-data.tgz
```

⑧ Run the following command in the directory /tmp/shared to get a backup of the HANA shared partition:

```
cd /tmp/shared
```
```
tar zc -p . > /tmp/backup/hana-shared.tgz
```

⑨ Run the following command in the directory /tmp/logmount to get a backup of the HANA log partition:

```
cd /tmp/logmount
```
```
tar zc -p . > /tmp/backup/hana-log.tgz
```

⑩ Verify that 6 backup files exist in the backup partition:

```
cd /tmp/backup
```
```
ls -lh
```

```
tty1:Rescue:/tmp/backup # ls -lh
total 5.3G
-rw-r--r-- 1 root root 30M Apr 14 07:26 hana-boot.tgz
-rw-r--r-- 1 root root 1.6M Apr 14 07:25 hana-bootefi.tgz
-rw-r--r-- 1 root root 647M Apr 14 07:28 hana-data.tgz
-rw-r--r-- 1 root root 531M Apr 14 07:30 hana-log.tgz
-rw-r--r-- 1 root root 1.1G Apr 14 07:46 hana-root.tgz
-rw-r--r-- 1 root root 3.0G Apr 14 07:40 hana-shared.tgz
```

### 3.3. Reboot and HANA startup

After the backup finished restart your NEC HANA appliance and start HANA

① Reboot your server by typing

```
shutdown -r now
```

② Remove the DVD media before the system boot starts.

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
```

![Image](image.png)