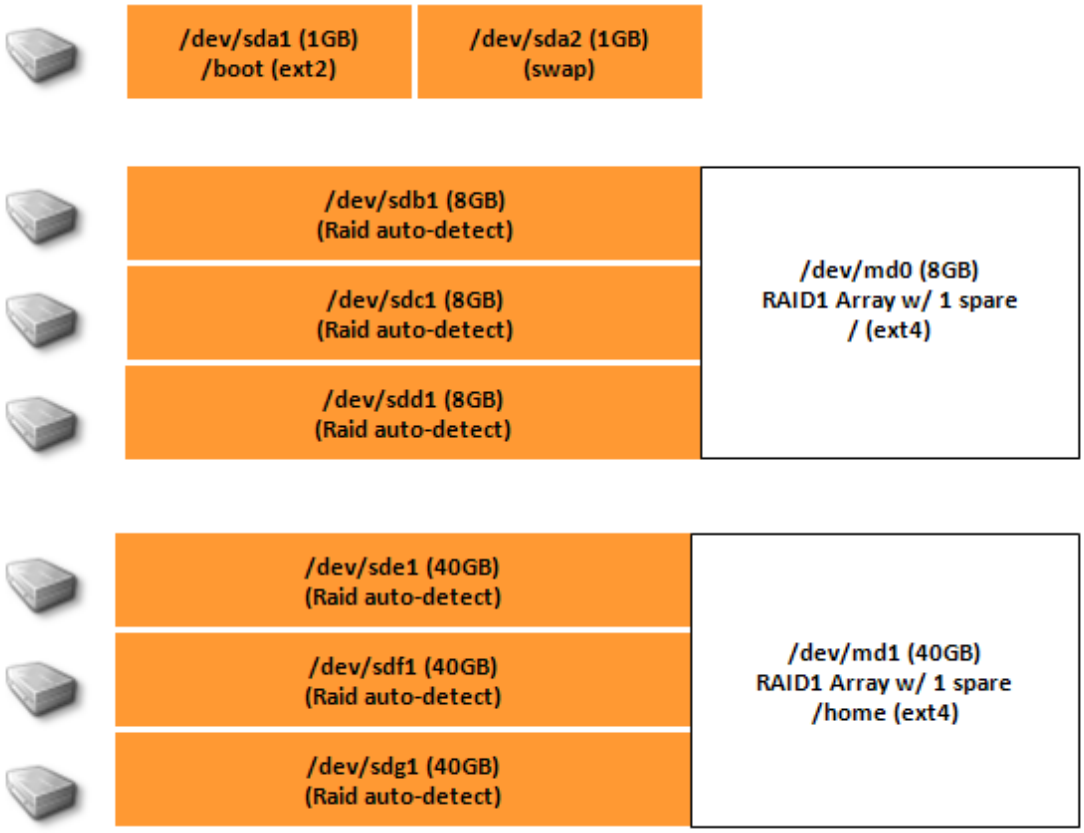
# Performing Bare-Metal Restore with RAID (MD)



## Preparations

### Configuring Agent

For testing purposes, create an Agent with a complex software RAID layout with seven (7) different disks:

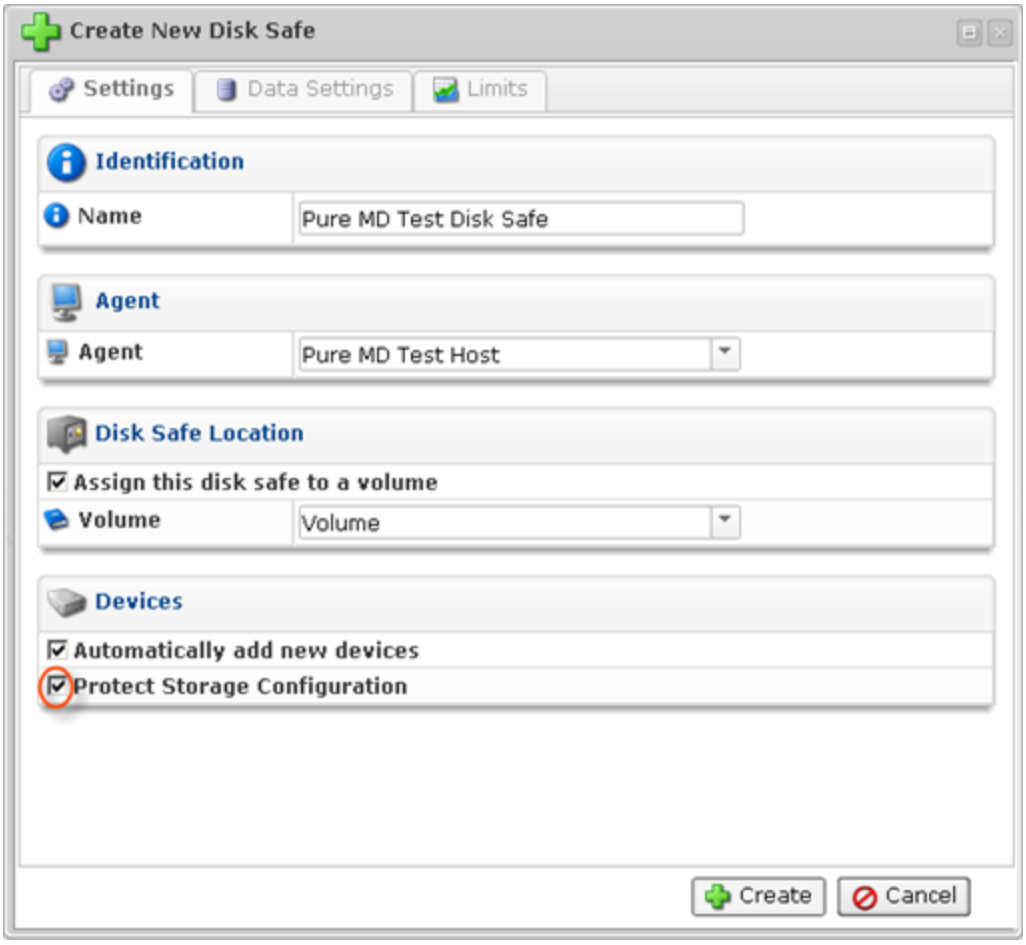



The following screen-shot shows how the example layout looks in fdisk.

```
root@tekpuremd1:/home# fdisk -l /dev/sd[a-z] | grep '[Dd]ev'
Disk /dev/sda: 2147 MB, 2147483648 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1         131     1046528   83  Linux
/dev/sda2             131         261     1048576   82  Linux swap / Solaris
Disk /dev/sdb: 8589 MB, 8589934592 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1               1        1045     8386560   fd  Linux raid autodetect
Disk /dev/sdc: 8589 MB, 8589934592 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdc1               1        1045     8386560   fd  Linux raid autodetect
Disk /dev/sdd: 8589 MB, 8589934592 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdd1               1        1045     8386560   fd  Linux raid autodetect
Disk /dev/sde: 42.9 GB, 42949672960 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sde1               1        5222    41940992   fd  Linux raid autodetect
Disk /dev/sdf: 42.9 GB, 42949672960 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdf1               1        5222    41940992   fd  Linux raid autodetect
Disk /dev/sdg: 42.9 GB, 42949672960 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdg1               1        5222    41940992   fd  Linux raid autodetect
```

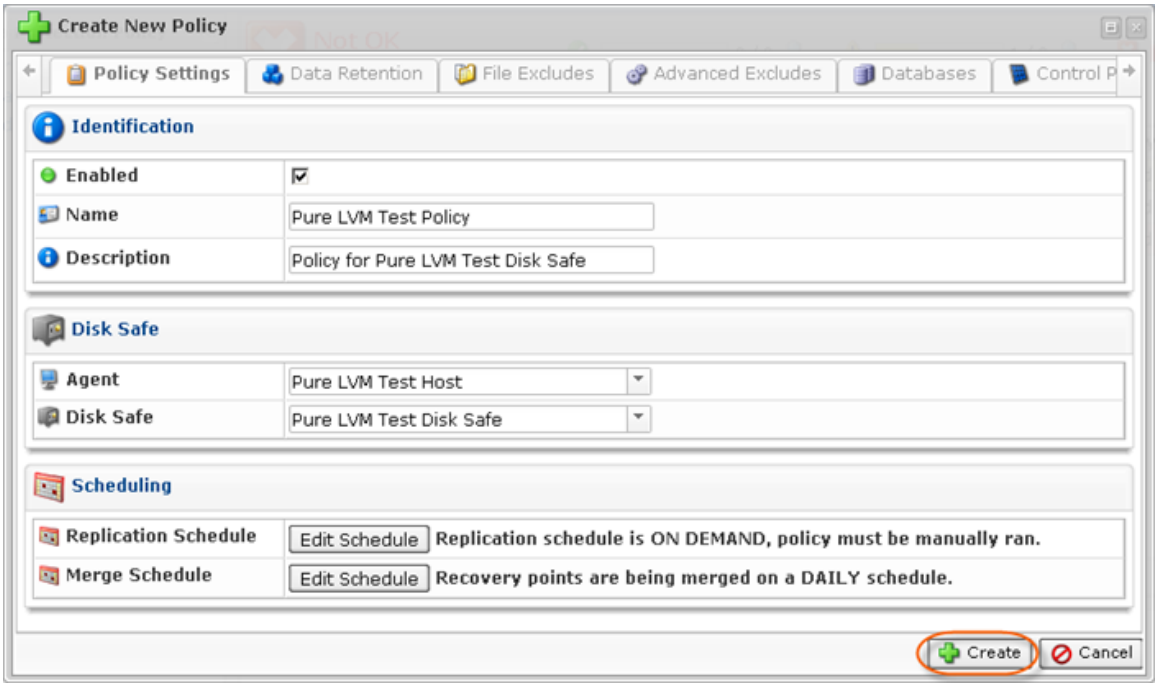
Creating a Disk Safe

Create a Disk Safe with the "Protect Storage Configuration" option enabled. See Creating Disk Safes.




Creating and Running a Policy

1. Create a basic Policy for the new Disk Safe. See Creating Policies.



2. Run the created Policy. See Running Policies.

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## Bare-Metal Restore Process

Follow the instructions below to start the Software RAID (MD) Bare Metal Restore.

> **Note**
> The process is the same for all Boot methods:
>
> - Live CD
> - PXE Network Boot

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Step 1: Boot from Live CD or PXE Network Boot | Step 2: Initiate a Bare-Metal Restore from "Recovery Points" | Step 3: Choose Filesystems | Step 4: Select Host | Step 5: Define Restore Storage Configuration | Step 6: Map Filesystems | Step 7: Map Filesystems | Step 8: Summary | Step 9: Bare-Metal Restore Start | Step 9: Reboot

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### Step 1: Boot from Live CD or PXE Network Boot

If you are restoring your system partition (e.g., `/`, `/boot`, `/bin`, `/lib`, etc.), boot the physical or virtual machine from one of the available CDP disaster recovery media options (Live CD or PXE Network Boot).

For more information, see:

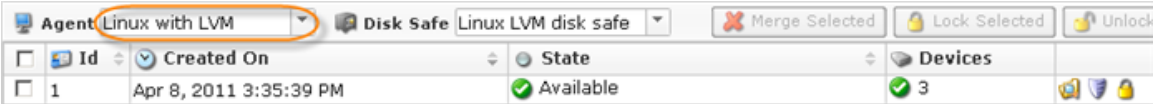
- Booting Server From CD
- Using PXE Network Boot

### Step 2: Initiate a Bare-Metal Restore from "Recovery Points"

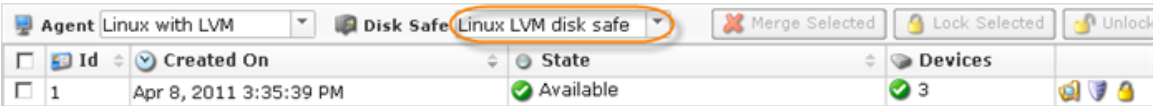
1. Click on "Recovery Points" in the Main Menu to open the "Recovery Points" screen.

| Enterprise Edition | LiveCD Server, PXE Server |
|---|---|

2. Select an Agent from the drop-down menu located on the "Recovery Points" list toolbar.

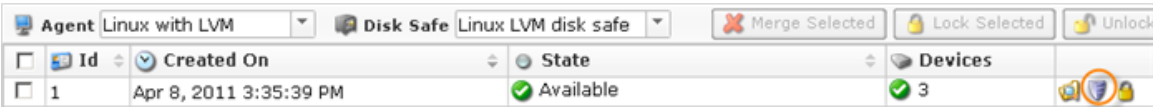



3. Select a Disk Safe from the drop-down menu located on the "Recovery Points" list toolbar.



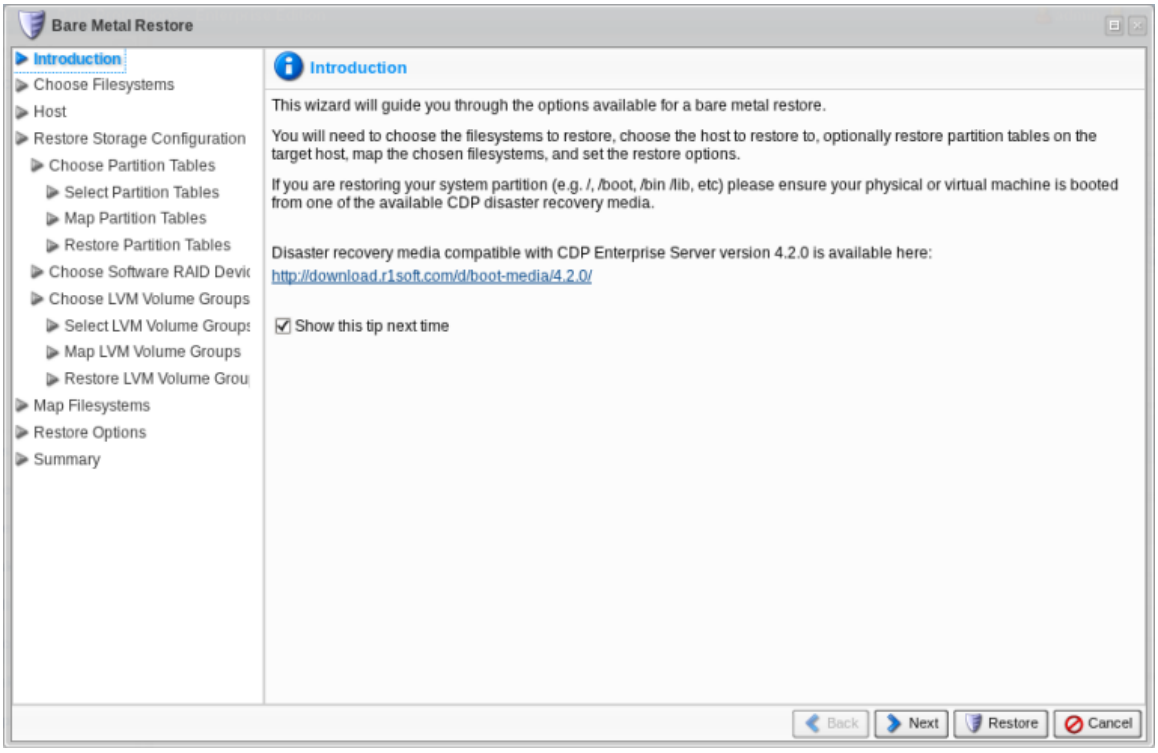

> **Tip**
> Alternatively, you can click on "Agents" in the main menu, then select the "Disk Safes" tab in the bottom pane, and then click on the "Recovery Points" icon for the Disk Safe to access the Recovery Points list.

4. In the "Recovery Points" list, click on the "Bare-Metal Restore" icon in the "Actions" column for the Recovery Point from which you are going to restore.




> **Tip**
> To find a Recovery Point, you can use the Basic and Advanced List Filters. See Customizing the Recovery Points List.

5. The "Bare-Metal Restore" window opens.

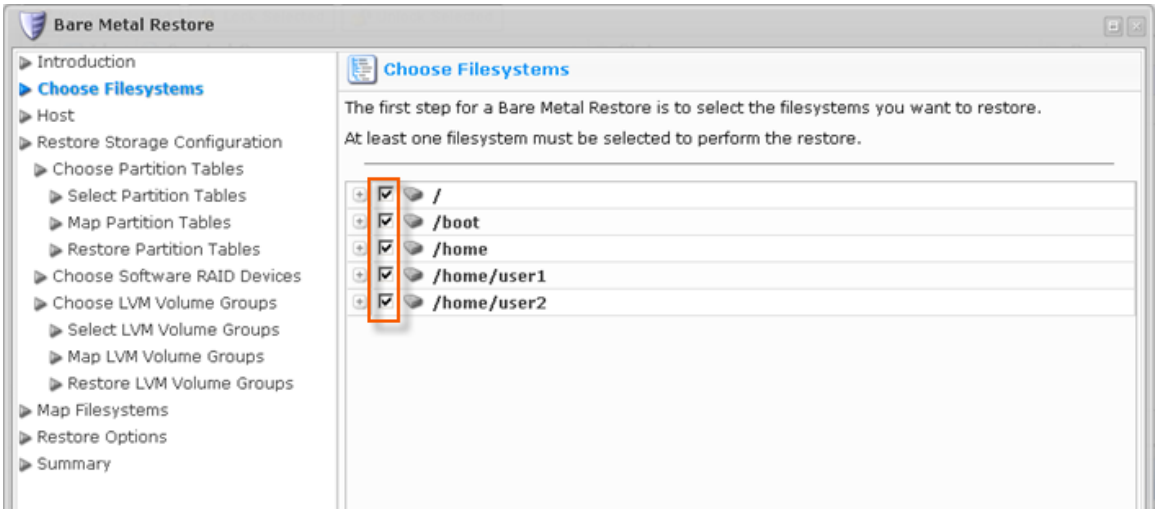



Look through the information on the Introduction screen and click "Next."

Step 3: Choose Filesystems

> **Note**
> Hereinafter on this page there are some changes (for version 4.2.0). Please refer to this link Bare-Metal Restore Device Auto-Mapping explaining the new feature: Bare-Metal Restore Device Auto-Mapping.

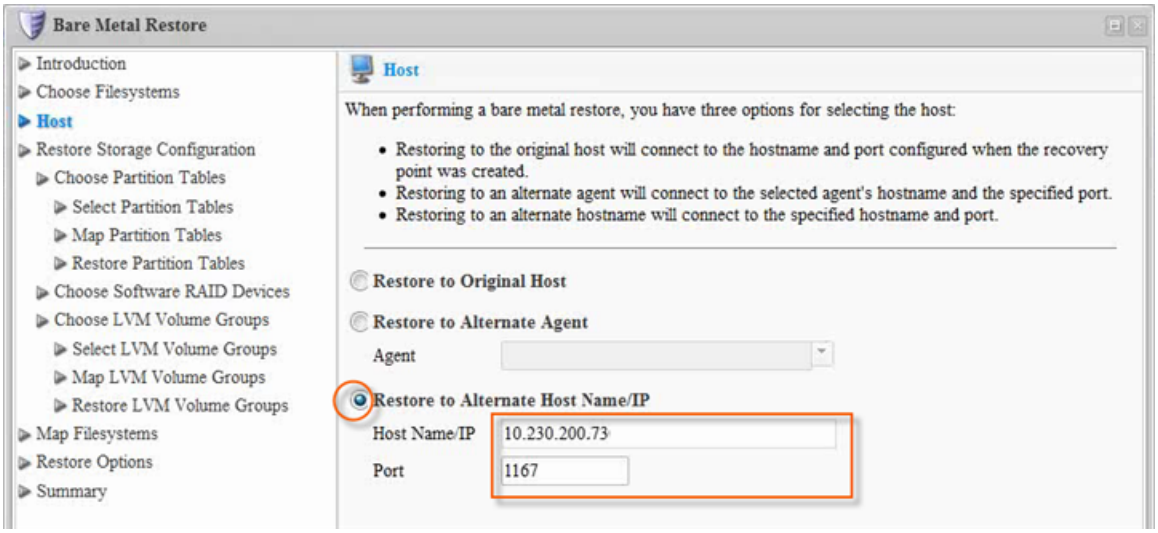
On the next page, select the filesystem(s) you want to restore. All available filesystems are listed. In our example, we select the `/`, `/boot`, `/home`, `/home/user1`, and `/home/user2` filesystems.




Click "Next" to proceed to the following step.

Step 4: Select Host

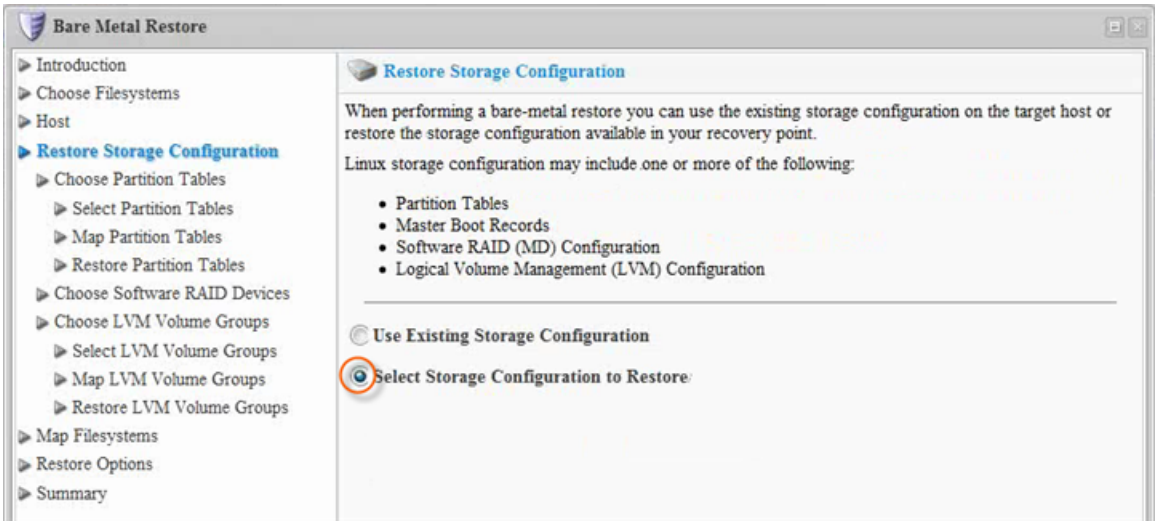
On the next screen, select the "Restore to Alternate Host Name/IP" option. Enter the IP address and port of your Live CD or PXE Boot environment.




Click "Next" to proceed to the following step.

Step 5: Define Restore Storage Configuration

On the "Restore Storage Configuration" screen, choose the "Select Storage Configuration to Restore" option.



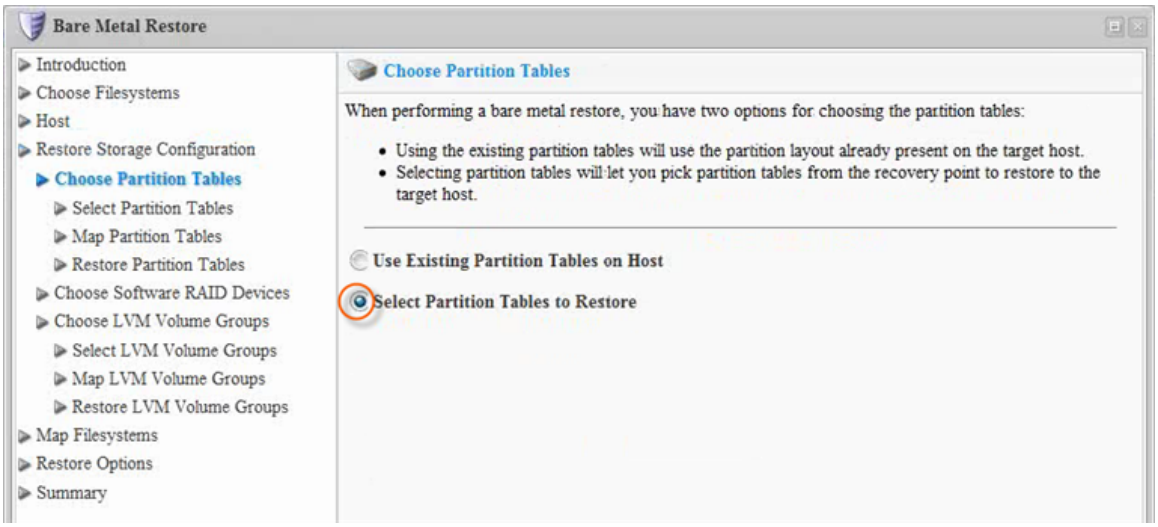

Click "Next" to proceed to the following step.

5.1 Choose Partition Tables

Partition tables should be restored before restoring LVM Volume Groups. Go through all of the Partition Tables steps before moving on to the LVM Volume Groups:

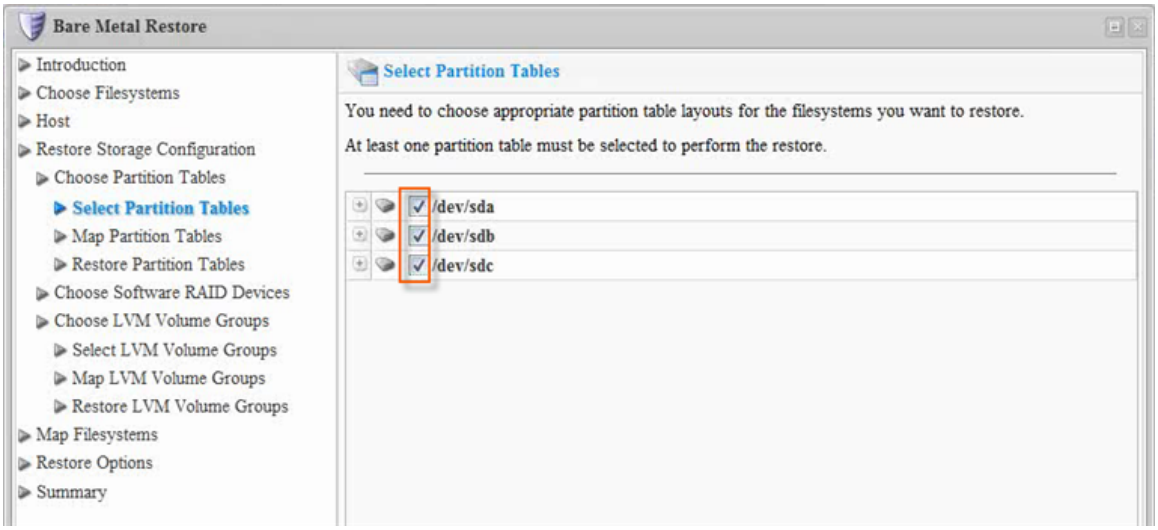
- Choose Partition Tables
- Select Partition Tables
- Map Partition Tables
- Restore Partition Tables

On the "Choose Partition Tables" screen, choose the "Select Partition Tables to Restore" to select partition tables from the Recovery Point to restore to the target host.




Click "Next" to proceed to the following step.

Then choose the appropriate partition table layout(s) for the filesystems you want to restore. At least one partition table check-box must be selected.

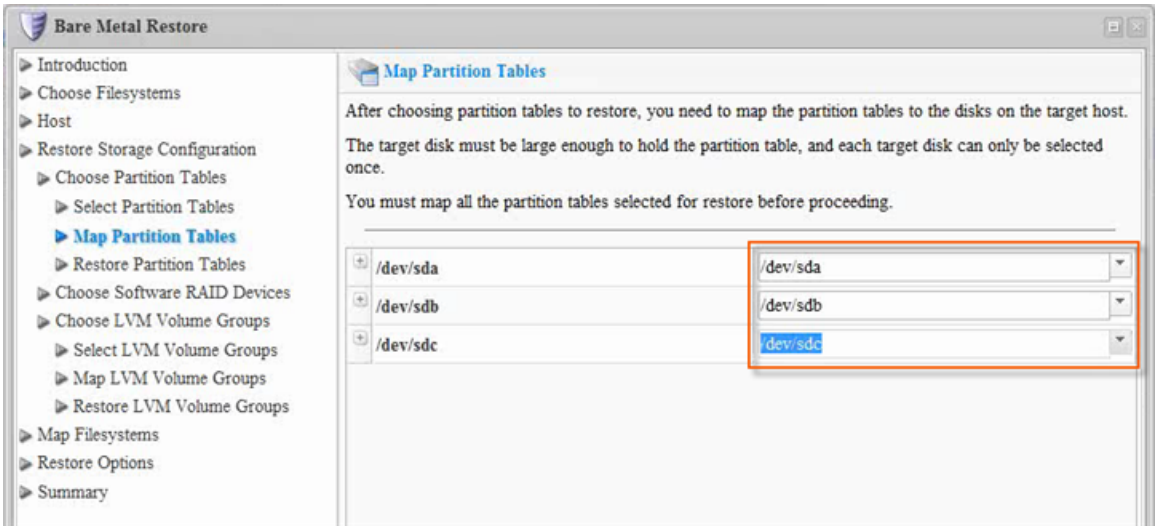



Click "Next" to proceed to the following step.

After choosing partition tables to restore, you need to map the partition tables to the disks on the target host. Map all the partition tables selected.

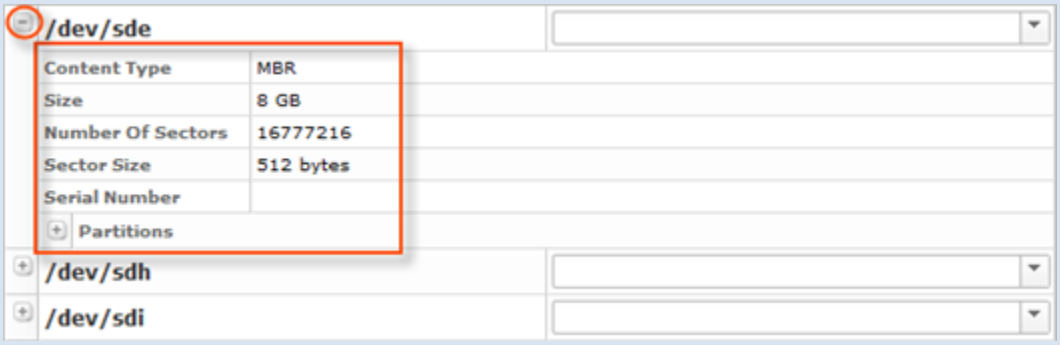
**Notice**

The target disk must be large enough to hold the partition table, and each target disk can only be selected once.




**Tip**

Click the plus-sign to see the details of a partition table.

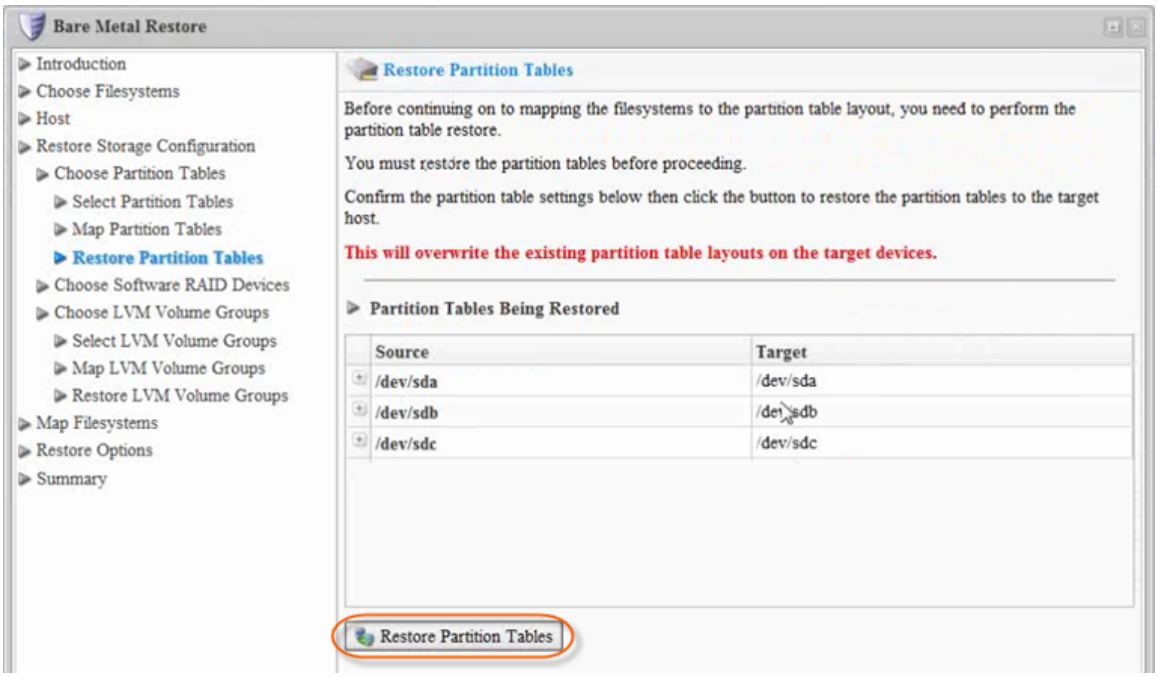



The following information is available:

- Content Type
- Size
- Number Of Sectors
- Sector Size
- Serial Number
- Partitions

Click "Next" to proceed to the following step.

On the next screen, click on the "Restore Partition Tables" button.




You should then receive the "Successfully Restored Partition Tables" message. Click "OK."

Output from fdisk before partition table restore:

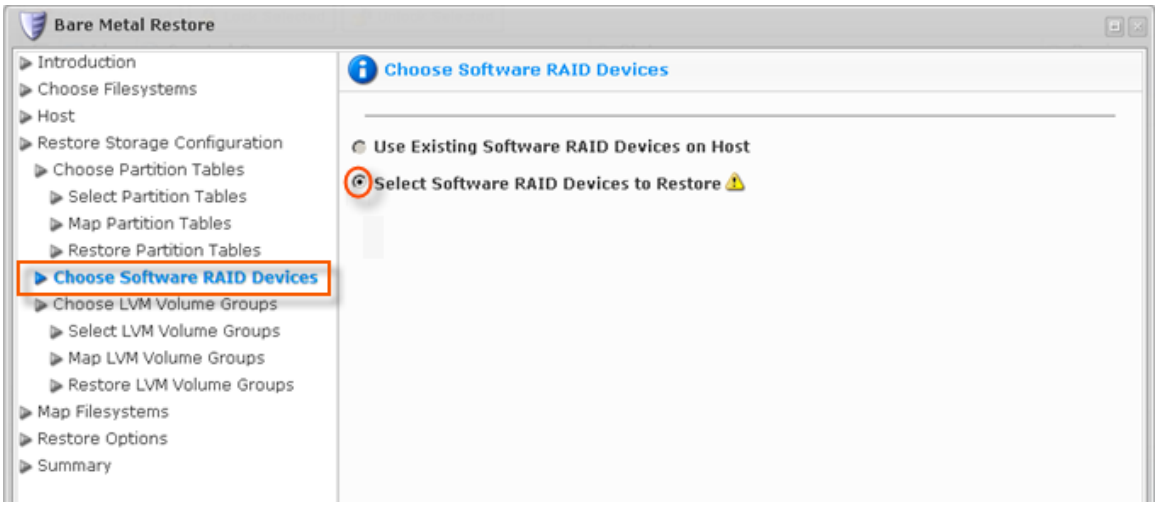
```
root@r1soft-recovery:~# fdisk -l /dev/sd[a-z] | grep '[Dd]ev'
Disk /dev/sda doesn't contain a valid partition table
Disk /dev/sdb doesn't contain a valid partition table
Disk /dev/sdc doesn't contain a valid partition table
Disk /dev/sdd doesn't contain a valid partition table
Disk /dev/sde doesn't contain a valid partition table
Disk /dev/sdf doesn't contain a valid partition table
Disk /dev/sdg doesn't contain a valid partition table
Disk /dev/sda: 2147 MB, 2147483648 bytes
Disk /dev/sdb: 8589 MB, 8589934592 bytes
Disk /dev/sdc: 8589 MB, 8589934592 bytes
Disk /dev/sdd: 8589 MB, 8589934592 bytes
Disk /dev/sde: 42.9 GB, 42949672960 bytes
Disk /dev/sdf: 42.9 GB, 42949672960 bytes
Disk /dev/sdg: 42.9 GB, 42949672960 bytes
```

Output from fdisk after partition table restore (should match original):

```
root@r1soft-recovery:~# fdisk -l /dev/sd[a-z] | grep '[Dd]ev'
Disk /dev/sda: 2147 MB, 2147483648 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1         131     1046528   83  Linux
/dev/sda2             131         261     1048576   82  Linux swap / Solaris
Disk /dev/sdb: 8589 MB, 8589934592 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1               1        1045     8386560   fd  Linux raid autodetect
Disk /dev/sdc: 8589 MB, 8589934592 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdc1               1        1045     8386560   fd  Linux raid autodetect
Disk /dev/sdd: 8589 MB, 8589934592 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdd1               1        1045     8386560   fd  Linux raid autodetect
Disk /dev/sde: 42.9 GB, 42949672960 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sde1               1        5222    41940992   fd  Linux raid autodetect
Disk /dev/sdf: 42.9 GB, 42949672960 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdf1               1        5222    41940992   fd  Linux raid autodetect
Disk /dev/sdg: 42.9 GB, 42949672960 bytes
   Device Boot      Start         End      Blocks   Id  System
/dev/sdg1               1        5222    41940992   fd  Linux raid autodetect
```

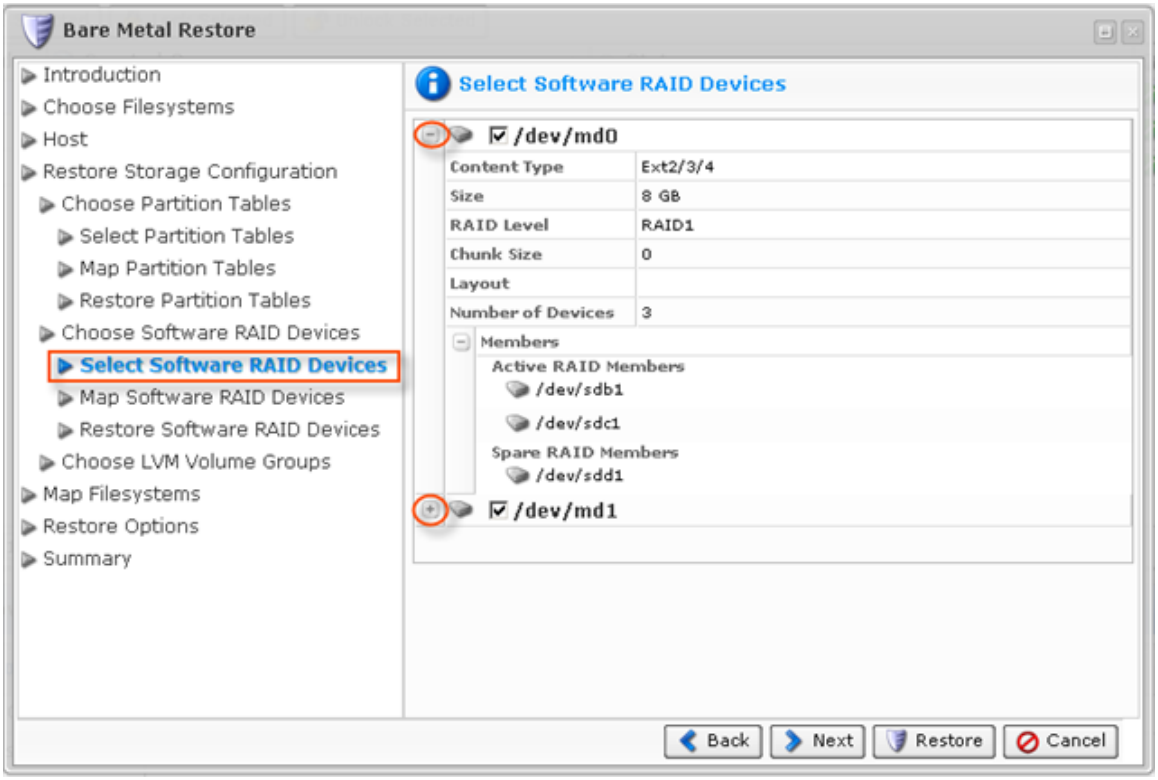
5.2 Choose Software RAID Devices

On the "Choose Software RAID Device" screen, choose the "Select Software RAID Device to Restore" option.




Click "Next" to proceed to the following step.

Then select Software RAID arrays to restore with the corresponding check-boxes.


Bare Metal Restore
Introduction
Choose Filesystems
Host
Restore Storage Configuration
Choose Partition Tables
Select Partition Tables
Map Partition Tables
Restore Partition Tables
Choose Software RAID Devices
Select Software RAID Devices
Map Software RAID Devices
Restore Software RAID Devices
Choose LVM Volume Groups
Map Filesystems
Restore Options
Summary
Select Software RAID Devices
/dev/md0
Content Type
Ext2/3/4
Size
8 GB
RAID Level
RAID1
Chunk Size
0
Layout
Number of Devices
3
Members
Active RAID Members
/dev/sdb1
/dev/sdc1
Spare RAID Members
/dev/sdd1
/dev/md1
Back
Next
Restore
Cancel

Tip

Click the plus-sign to see the details of a Software RAID array.

The following information is available:

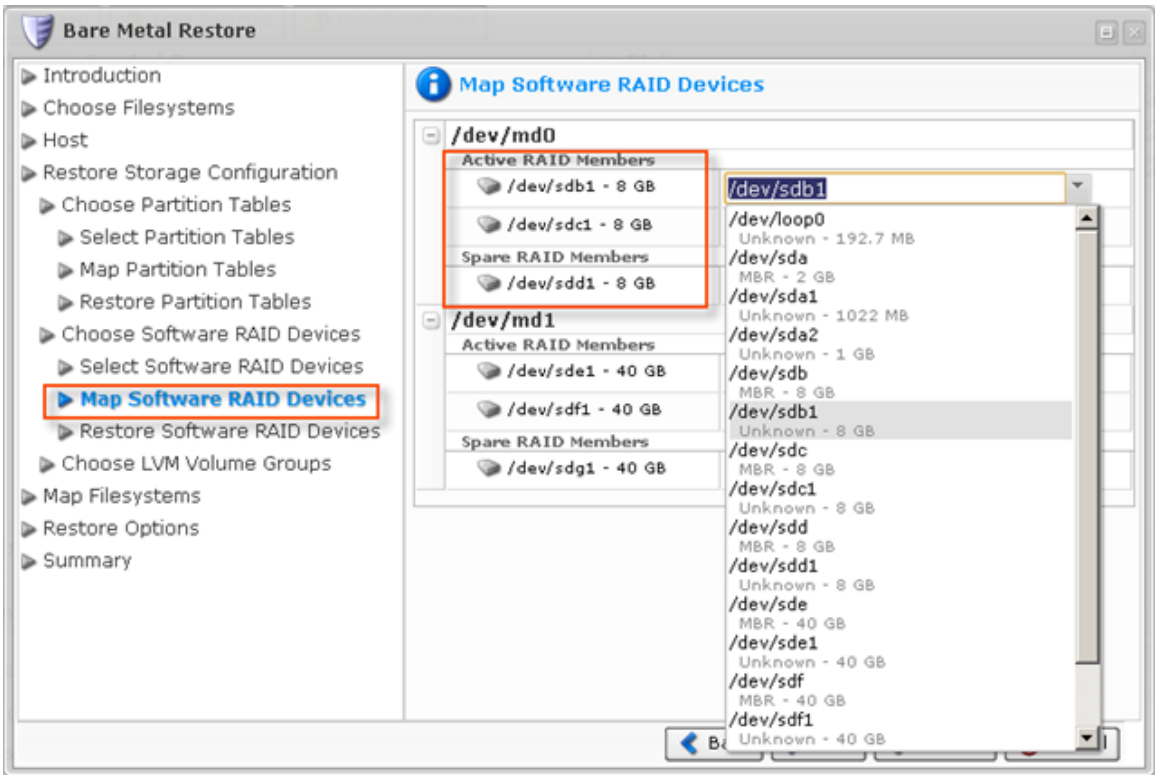
- Content Type
- Size
- RAID Level
- Chunk Size
- Layout
- Number of Devices
- Members

Click "Next" to proceed to the following step.

After choosing the Software RAID arrays to restore, map them.

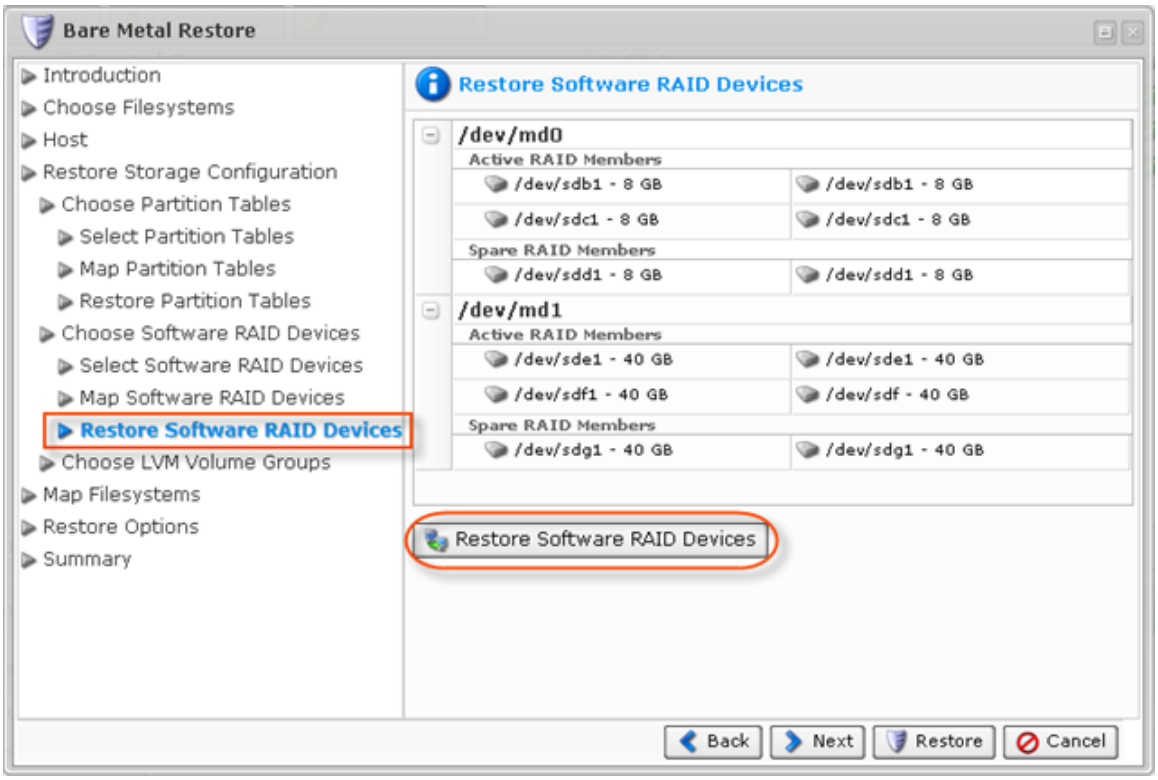
Notice

Mapping RAID arrays is hierarchical. Instead of mapping the actual RAID device (/dev/md0), you should map its active and spare members.




Click "Next" to proceed to the following step.

When all the members are mapped, click the "Restore Software RAID Devices" button to launch the restore.

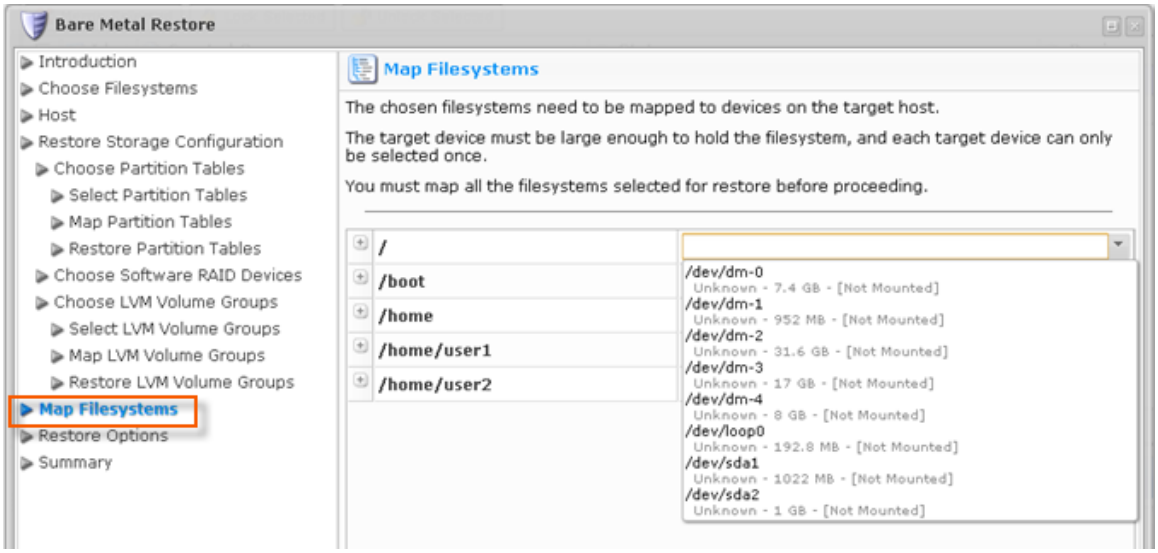



When the restore completes successfully, the RAID arrays will be available for mapping the selected filesystems.

Step 6: Map Filesystems

Map filesystems in the Recovery Point to software RAID devices as a restore destination.

Enter the new software RAID device as the destination (for example, /dev/md_new).




You are provided a table that allows you to map the chosen partition tables to physical Disks on the Target Agent. You can see as many lines in the table as the number of Partition Tables

selected for restore. Each Partition Table must be mapped to a physical Disk on the Target Agent before proceeding.

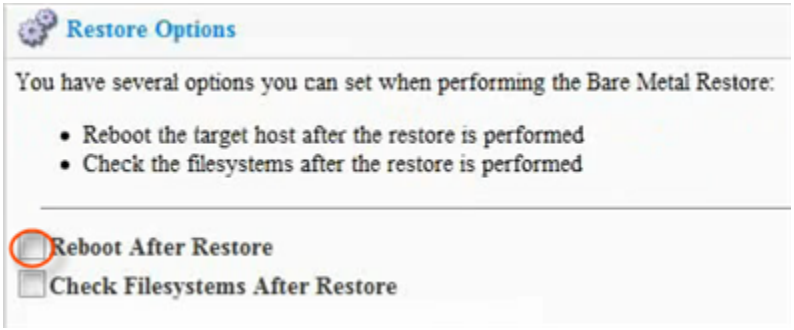
> **Notice**
> Make sure that the partition for /boot is big enough.

> **Tip**
> Click the plus-sign to see the details of filesystems.

After selecting the Disks, click on "Next" to proceed to the next page.

Step 7: Map Filesystems

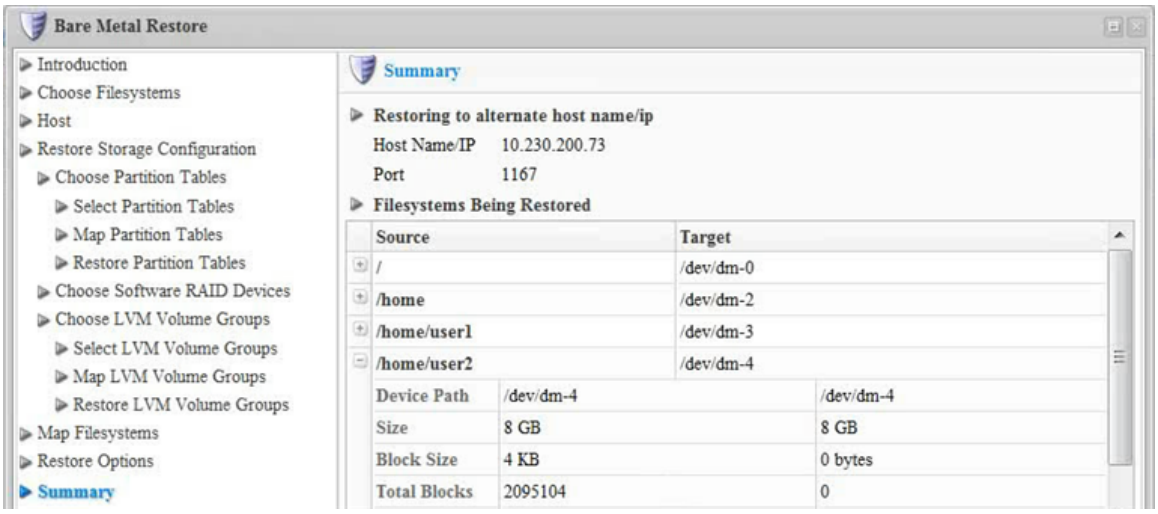
Make sure the "Reboot after restore" box is unchecked.




Click "Next" to proceed to the following step.

Step 8: Summary

On the "Summary" page, you will need to confirm the selected Bare-Metal Restore options. Each selected filesystem is listed, along with the name of the target device to which it is being mapped.




Click "Restore" to start the Bare-Metal Restore task.

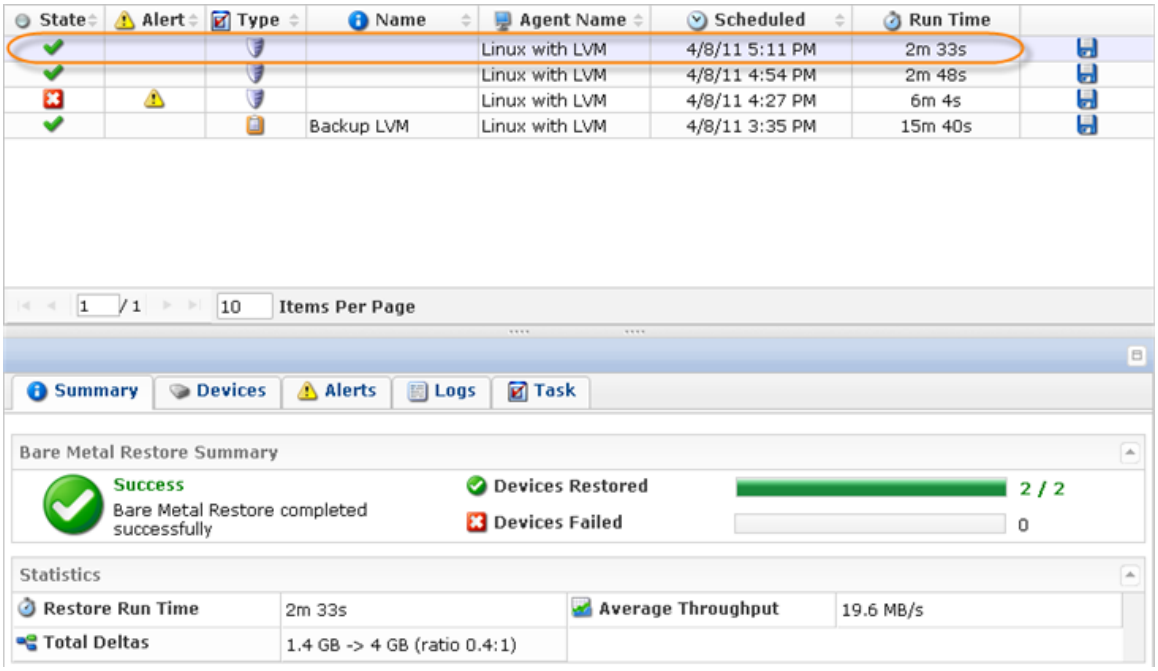
The data Restore is initiated. Click "OK" in the notification pop-up.

> **Tip**
> The Task results can be sent via email as a Report. See Reporting.

Step 9: Bare-Metal Restore Start

The Restore process starts and can take a while. You can go to the "Task History" screen to observe the task progress. See Accessing Task History.

The Task History page displays the State, Alert, Type, Progress Percentage, and the Started Time Stamp of the Bare-Metal Restore process.




Step 9: Reboot

When the process is complete, you can reboot the server you just restored by pressing <Ctrl><Alt><Del> or by executing the reboot command in the root shell.

Note
Make sure you eject the Disk from the CD-ROM drive so that the server will boot from the hard Disk.

If the Disk you used for your Bare-Metal Restore is larger than the Disk you backed up previously, the free space on the new Disk will remain free. You can create a new partition in this space.

Results of RAID array creation can be verified at the command line via the "ls" command.

Before restoring software RAID devices:

```
root@r1soft-recovery:~# ls /dev/md[0-9]
ls: cannot access /dev/md[0-9]: No such file or directory
```

After restoring software RAID devices:

```
root@r1soft-recovery:~# ls /dev/md[0-9]
/dev/md0  /dev/md1
```