

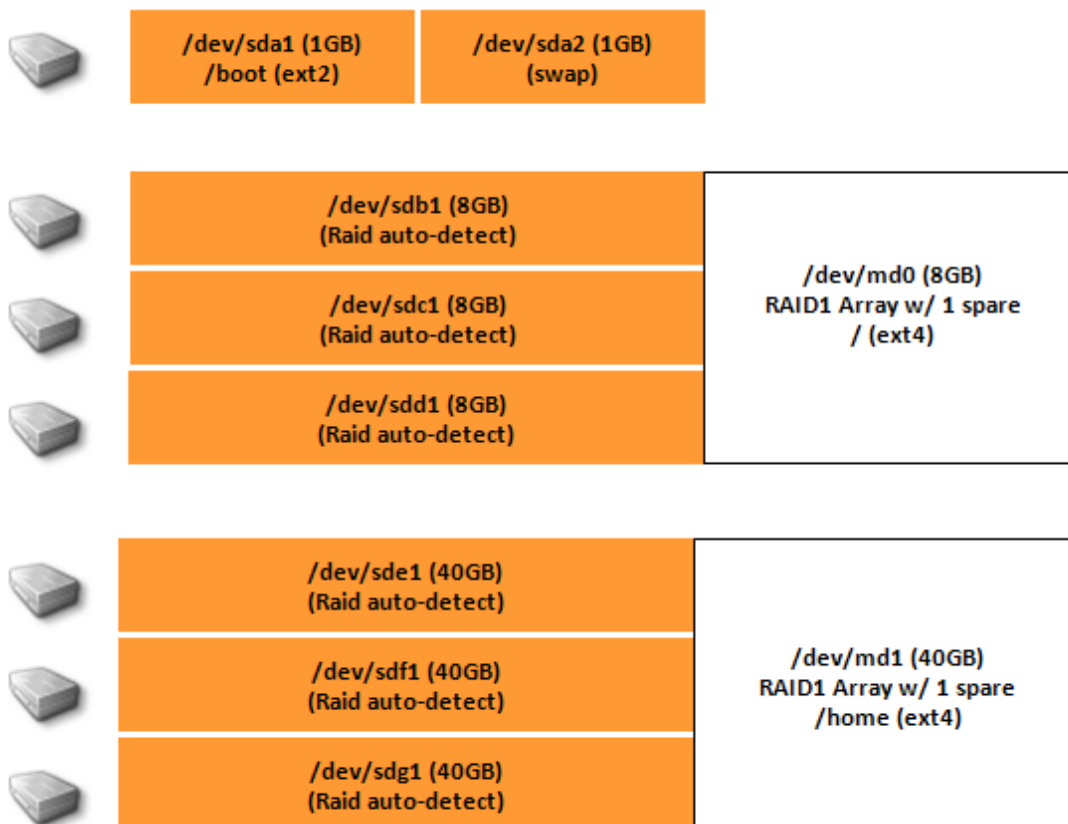
# Performing Bare-Metal Restore with RAID (MD)

## Preparations | Bare-Metal Restore Process

### 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](#).

**Create New Disk Safe**

Settings | Data Settings | Limits

**Identification**

Name: Pure MD Test Disk Safe

**Agent**

Agent: Pure MD Test Host

**Disk Safe Location**

Assign this disk safe to a volume

Volume: Volume

**Devices**

Automatically add new devices

Protect Storage Configuration

Create | Cancel

Creating and Running a Policy

1. Create a basic Policy for the new Disk Safe. See [Creating Policies](#).

**Create New Policy**

Policy Settings | Data Retention | File Excludes | Advanced Excludes | Databases | Control P

**Identification**

Enabled:

Name: Pure LVM Test Policy

Description: Policy for Pure LVM Test Disk Safe

**Disk Safe**

Agent: Pure LVM Test Host

Disk Safe: Pure LVM Test Disk Safe

**Scheduling**

Replication Schedule:  Replication schedule is ON DEMAND, policy must be manually ran.

Merge Schedule:  Recovery points are being merged on a DAILY schedule.

Create | Cancel

## 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).

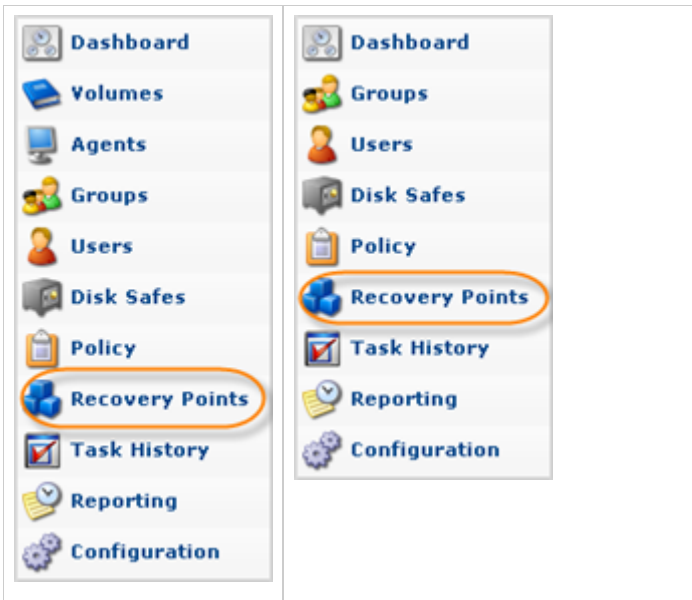
For more information, see:

- [Booting Server From CD](#)
- [Using PXE Network Boot](#)

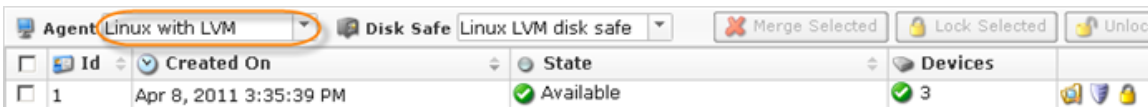
#### Step 2: Initiate a Bare-Metal Restore from "Recovery Points"

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

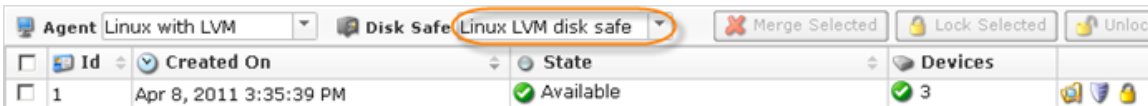
<a href="#">Enterprise Edition</a>	<a href="#">LiveCD Server, PXE Server</a>
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2. Select an Agent from the drop-down menu located on the "Recovery Points" list toolbar.



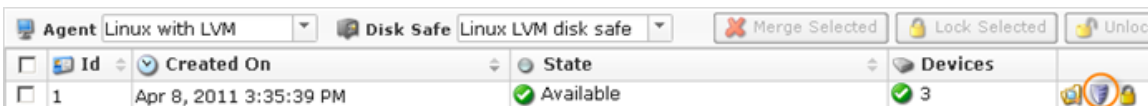
3. Select a Disk Safe from the drop-down menu located on the "Recovery Points" list toolbar.



#### 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.

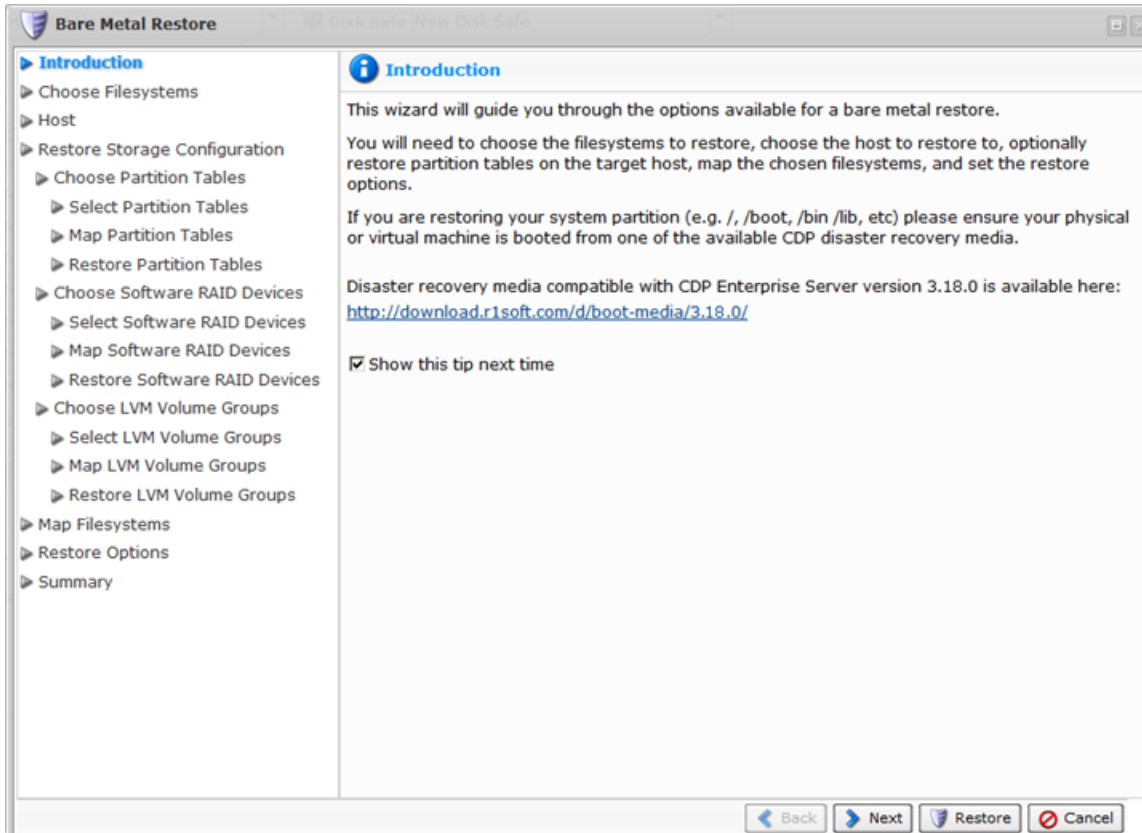
4. In the "Recovery Points" list, click on the "Bare-Metal Restore" icon in the "Actions" column for the Recovery Point from which you are going to restore.



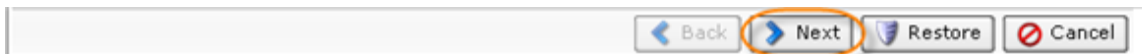
#### Tip

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.

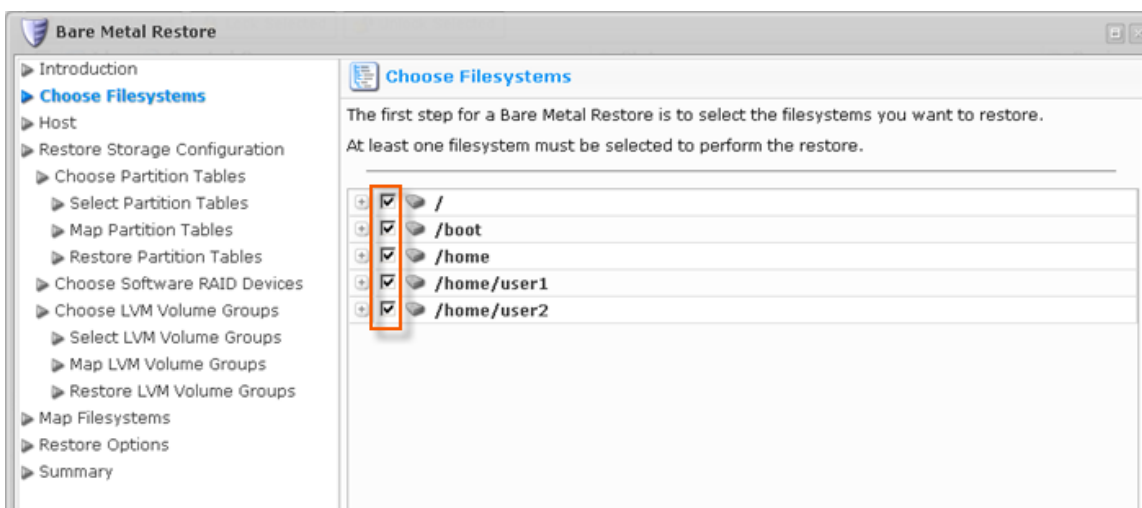


Look through the information on the Introduction screen and click "Next."

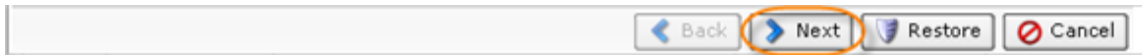


### Step 3: Choose Filesystems

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.

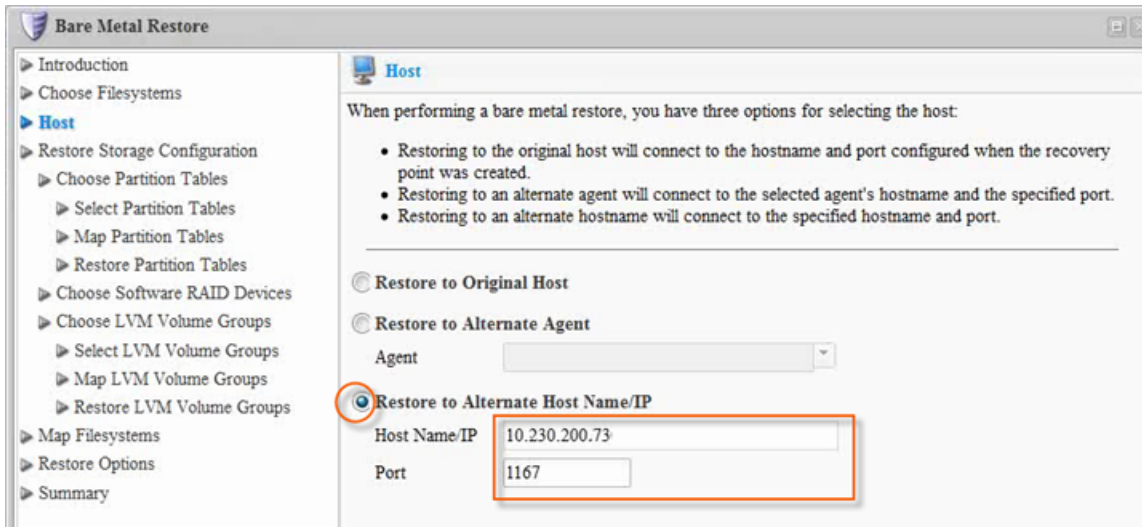


Click "Next" to proceed to the following step.

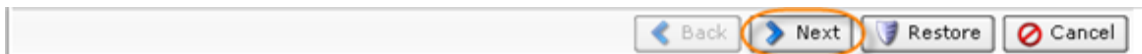


#### Step 4: Select Host

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.

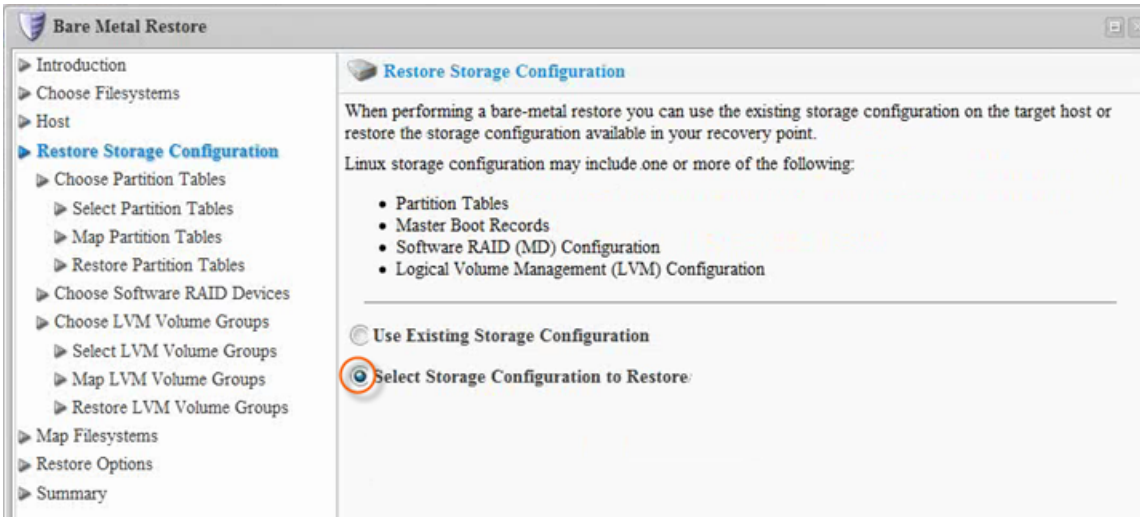


Click "Next" to proceed to the following step.

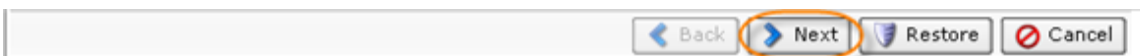


#### Step 5: Define Restore Storage Configuration

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



Click "Next" to proceed to the following step.



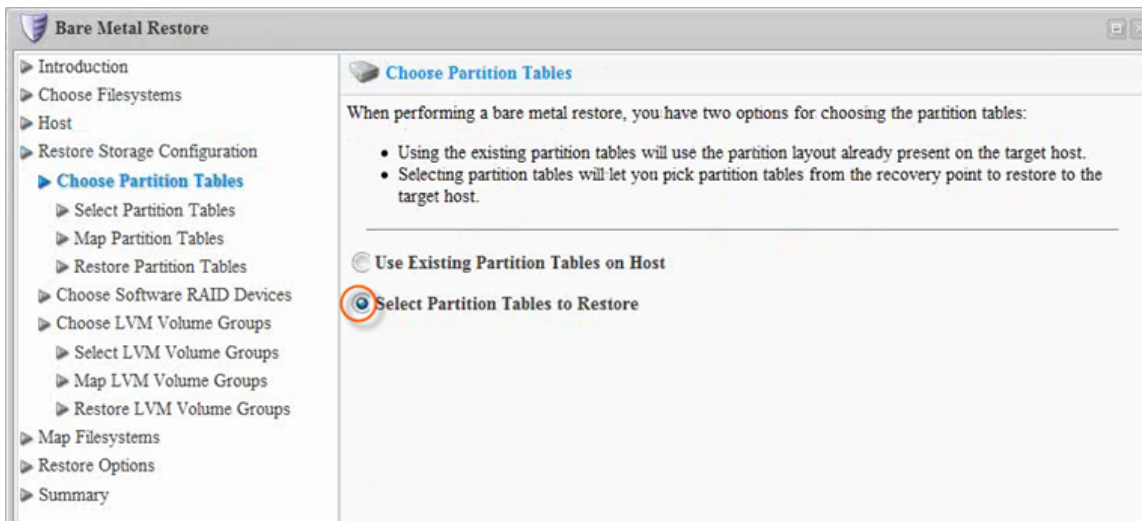
#### 5.1 Choose Partition Tables

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:

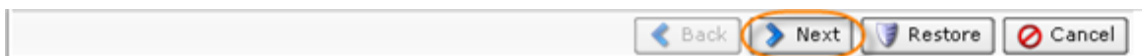
- Choose Partition Tables
- Select Partition Tables
- Map Partition Tables
- Restore Partition Tables



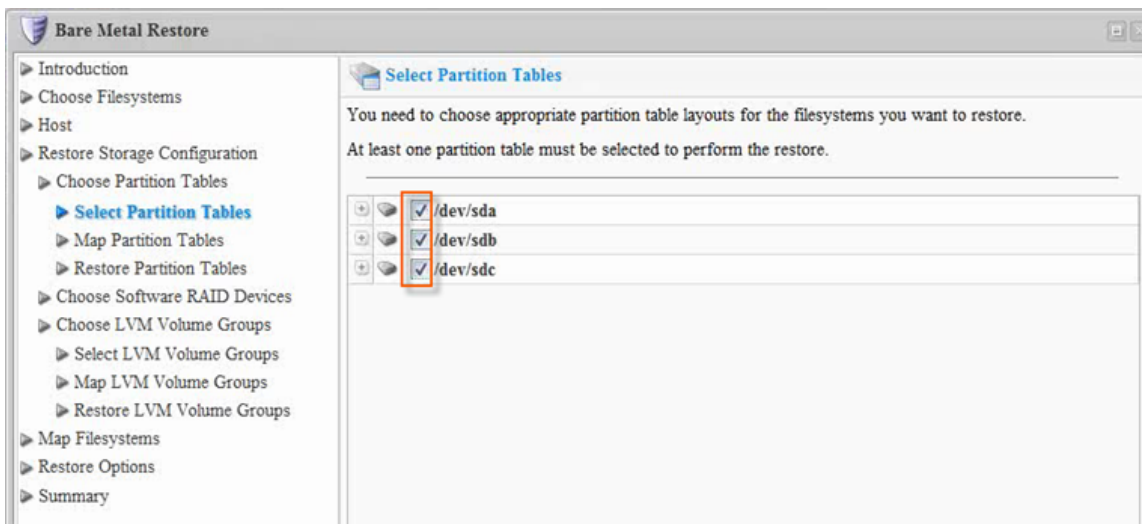
On the "Choose Partition Tables" screen, choose the "Select Partition Tables to Restore" to select partition tables from the Recovery Point to restore to the target host.



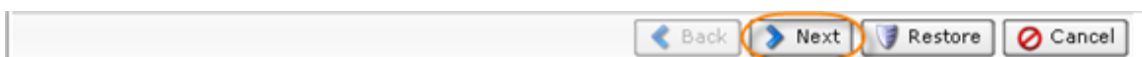
Click "Next" to proceed to the following step.



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.



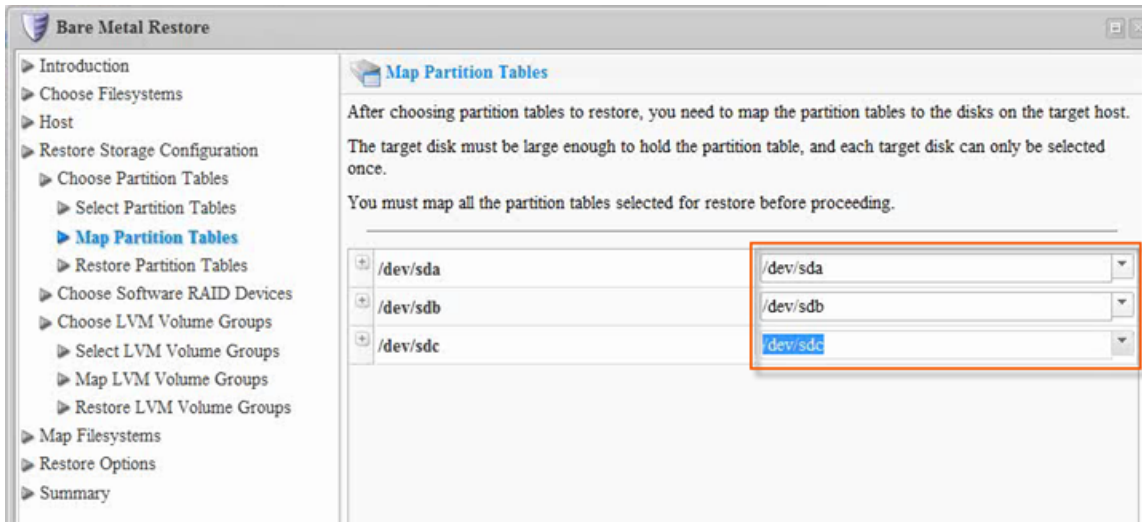
Click "Next" to proceed to the following step.



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.

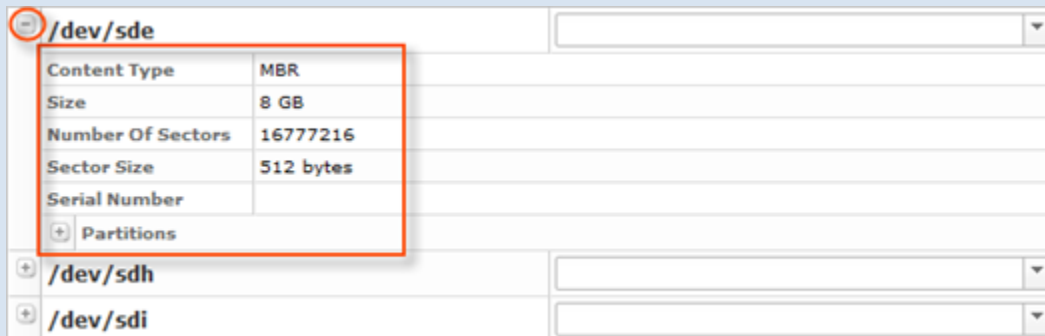
### ⚠ Notice

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



### ℹ Tip

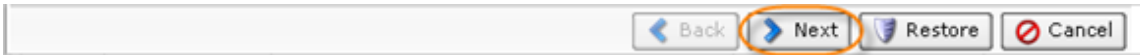
Click the plus sign to see the details of a partition table.



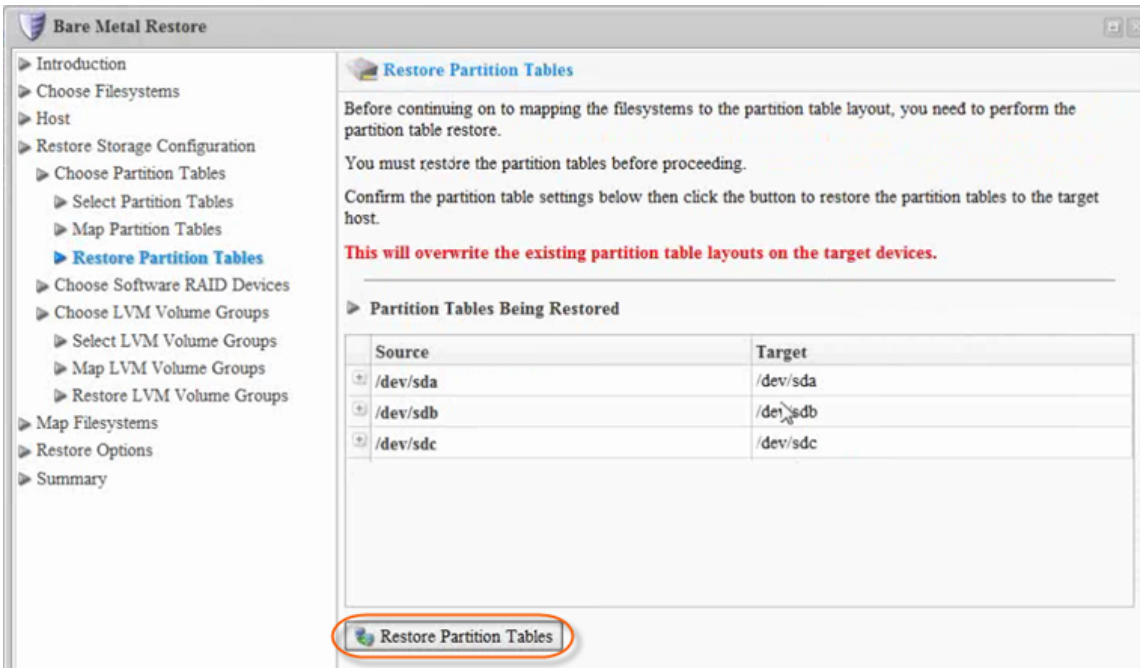
The following information is available:

- 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

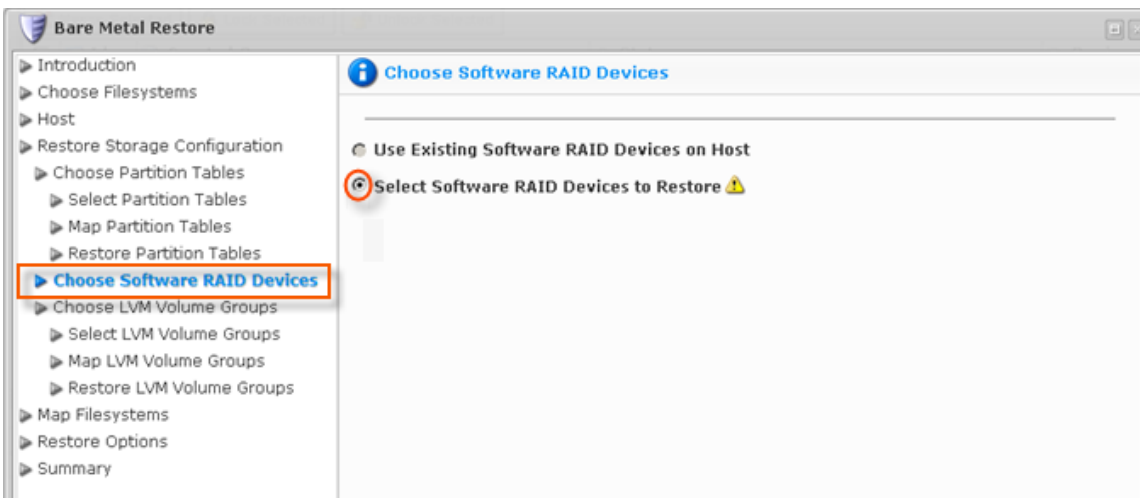
Output from fdisk after partition table restore (should match original):

```
root@r1soft-recovery:~# fdisk -l /dev/sd[a-z] | grep '[Dd]ev'
```

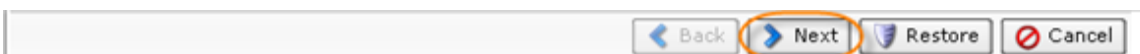
Disk	Device	Boot	Start	End	Blocks	Id	System
Disk /dev/sda: 2147 MB, 2147483648 bytes	/dev/sda1	*	1	131	1046528	83	Linux
	/dev/sda2		131	261	1048576	82	Linux swap / Solaris
Disk /dev/sdb: 8589 MB, 8589934592 bytes	/dev/sdb1		1	1045	8386560	fd	Linux raid autodetect
Disk /dev/sdc: 8589 MB, 8589934592 bytes	/dev/sdc1		1	1045	8386560	fd	Linux raid autodetect
Disk /dev/sdd: 8589 MB, 8589934592 bytes	/dev/sdd1		1	1045	8386560	fd	Linux raid autodetect
Disk /dev/sde: 42.9 GB, 42949672960 bytes	/dev/sde1		1	5222	41940992	fd	Linux raid autodetect
Disk /dev/sdf: 42.9 GB, 42949672960 bytes	/dev/sdf1		1	5222	41940992	fd	Linux raid autodetect
Disk /dev/sdg: 42.9 GB, 42949672960 bytes	/dev/sdg1		1	5222	41940992	fd	Linux raid autodetect

## 5.2 Choose Software RAID Devices

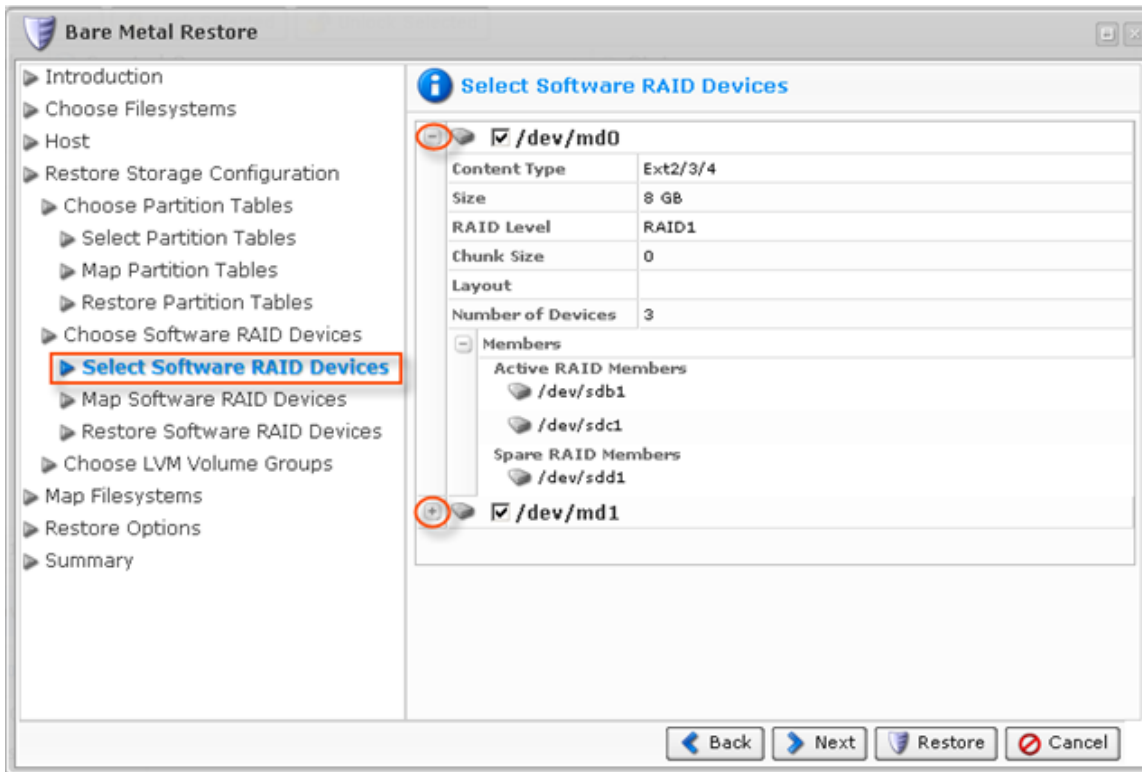
On the "Choose Software RAID Device" screen, choose the "Select Software RAID Device to Restore" option.



Click "Next" to proceed to the following step.

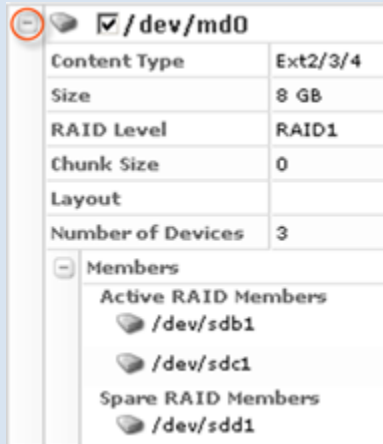







Then select Software RAID Arrays to restore in the corresponding check box.



**Tip**

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

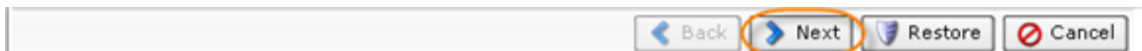


  <input checked="" type="checkbox"/> /dev/md0	
Content Type	Ext2/3/4
Size	8 GB
RAID Level	RAID1
Chunk Size	0
Layout	
Number of Devices	3
Members	
Active RAID Members	
 /dev/sdb1	
 /dev/sdc1	
Spare RAID Members	
 /dev/sdd1	

The following information is available:

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

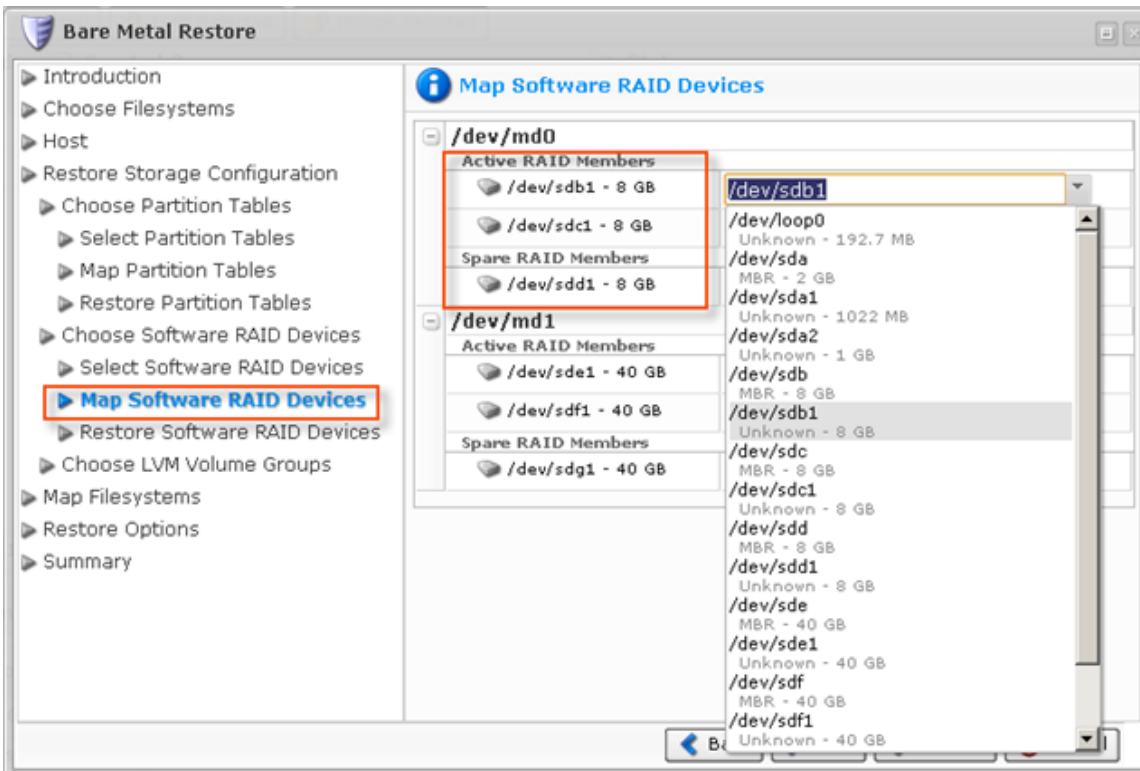
Click "Next" to proceed to the following step.



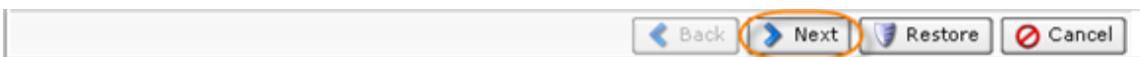
After choosing the Software RAID Arrays to restore, map them.

**Notice**

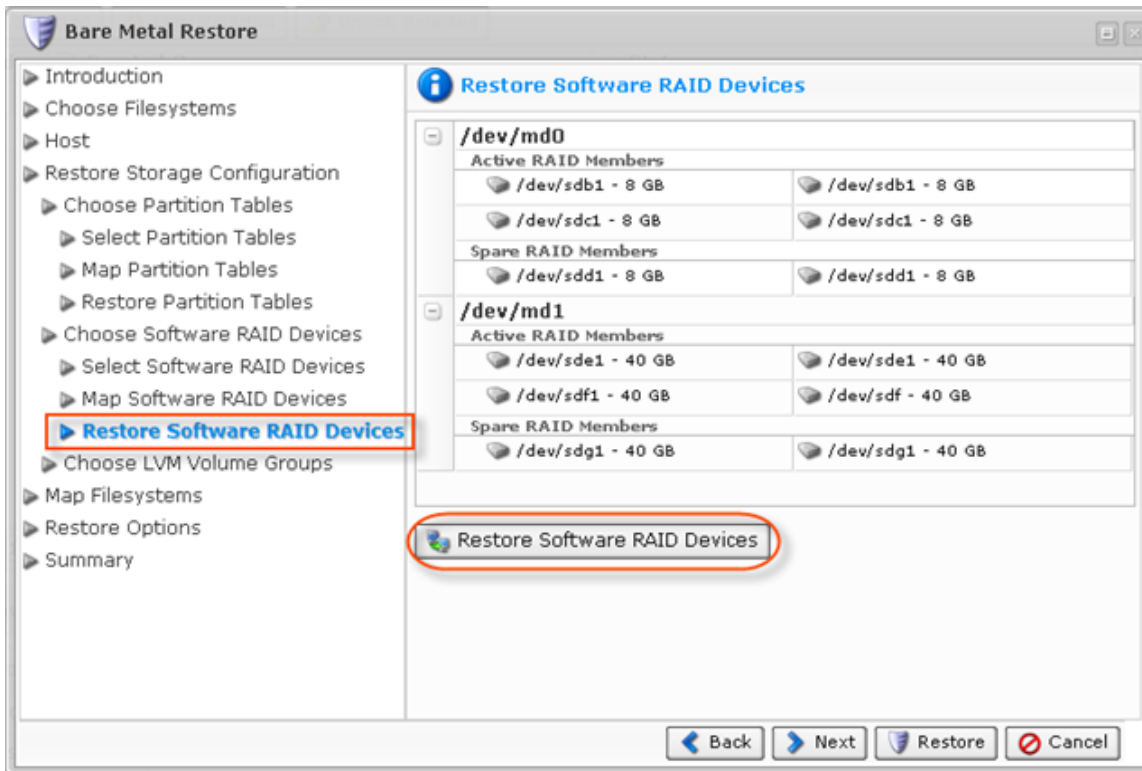
Mapping RAID arrays is hierarchical. Instead of mapping the actual RAID device (/dev/md0), you should map its active and spare members.



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.

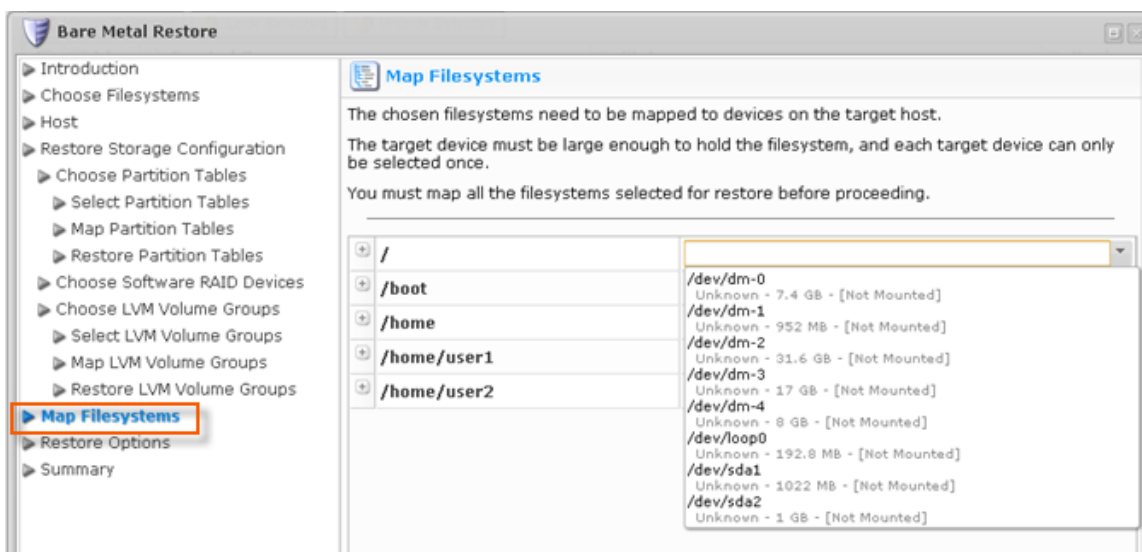


When the restore completes successfully, the RAID arrays will be available for mapping the selected file systems.

#### Step 6: Map Filesystems


Map file systems 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).



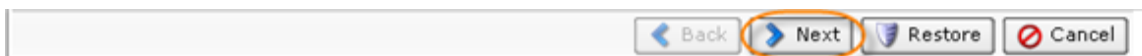
You are provided a table that allows you to map the chosen Partition Tables to physical Disks on the Target Agent. You can see as many lines in the table as the number of Partition Tables

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.

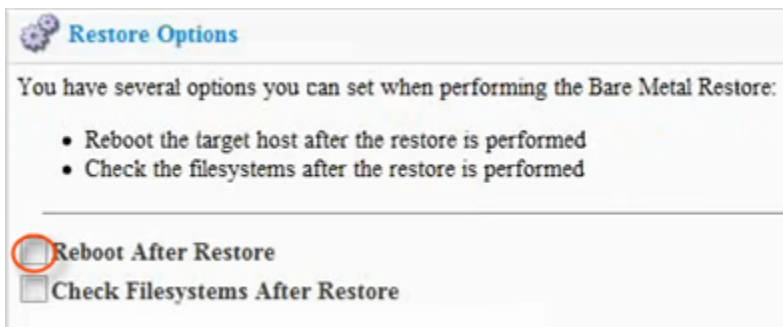
 **Tip**  
Click the plus sign to see the details of filesystems.

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

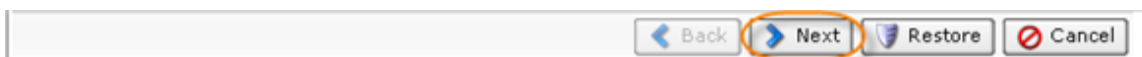


Step 7: Map Filesystems

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

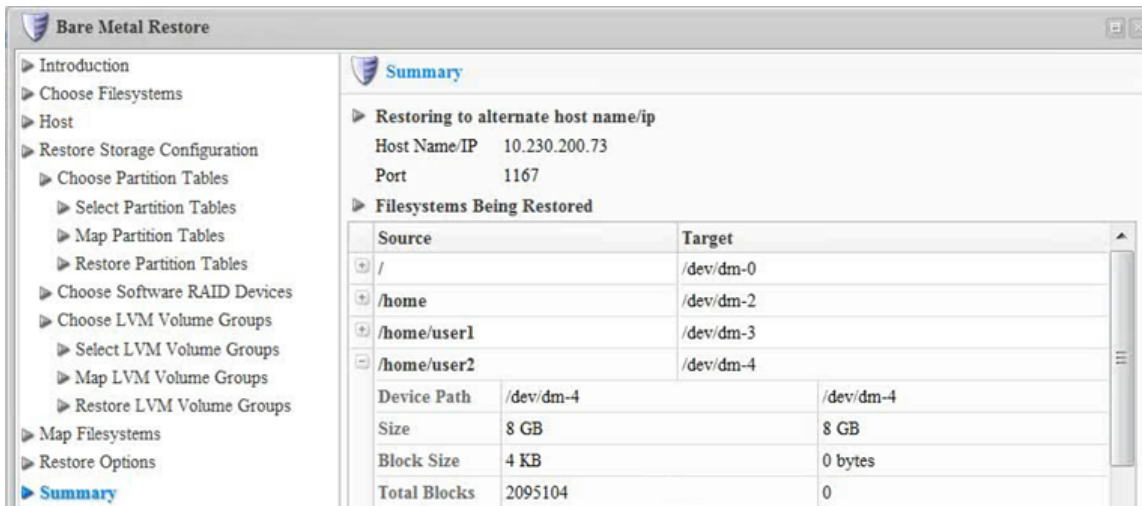


Click "Next" to proceed to the following step.

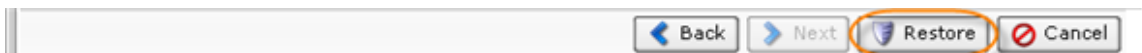


Step 8: Summary

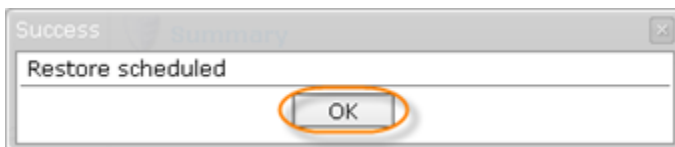
On the "Summary" page, you will need to confirm the selected Bare-Metal Restore options. Each selected file system is listed along with the name of the target device to which it is being mapped.



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



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



- i** 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 awhile. 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.

State	Alert	Type	Name	Agent Name	Scheduled	Run Time	
✓				Linux with LVM	4/8/11 5:11 PM	2m 33s	📄
✓				Linux with LVM	4/8/11 4:54 PM	2m 48s	📄
✗	⚠			Linux with LVM	4/8/11 4:27 PM	6m 4s	📄
✓		📁	Backup LVM	Linux with LVM	4/8/11 3:35 PM	15m 40s	📄

1 / 1 10 Items Per Page

Summary Devices Alerts Logs Task

**Bare Metal Restore Summary**

**Success**  
Bare Metal Restore completed successfully

✓ **Devices Restored** 2 / 2  
✗ **Devices Failed** 0

**Statistics**

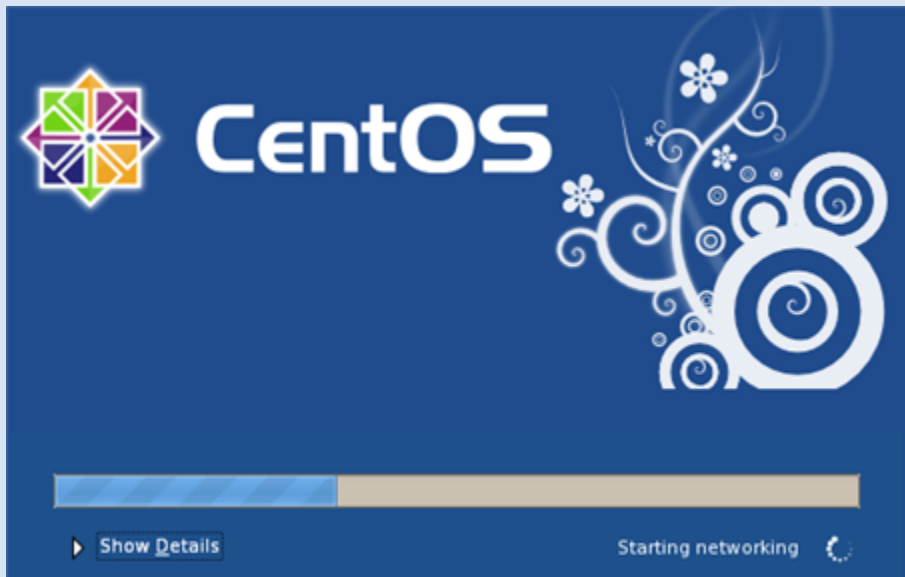
Restore Run Time	2m 33s	Average Throughput	19.6 MB/s
Total Deltas	1.4 GB -> 4 GB (ratio 0.4:1)		

### 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 Arrays 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
```