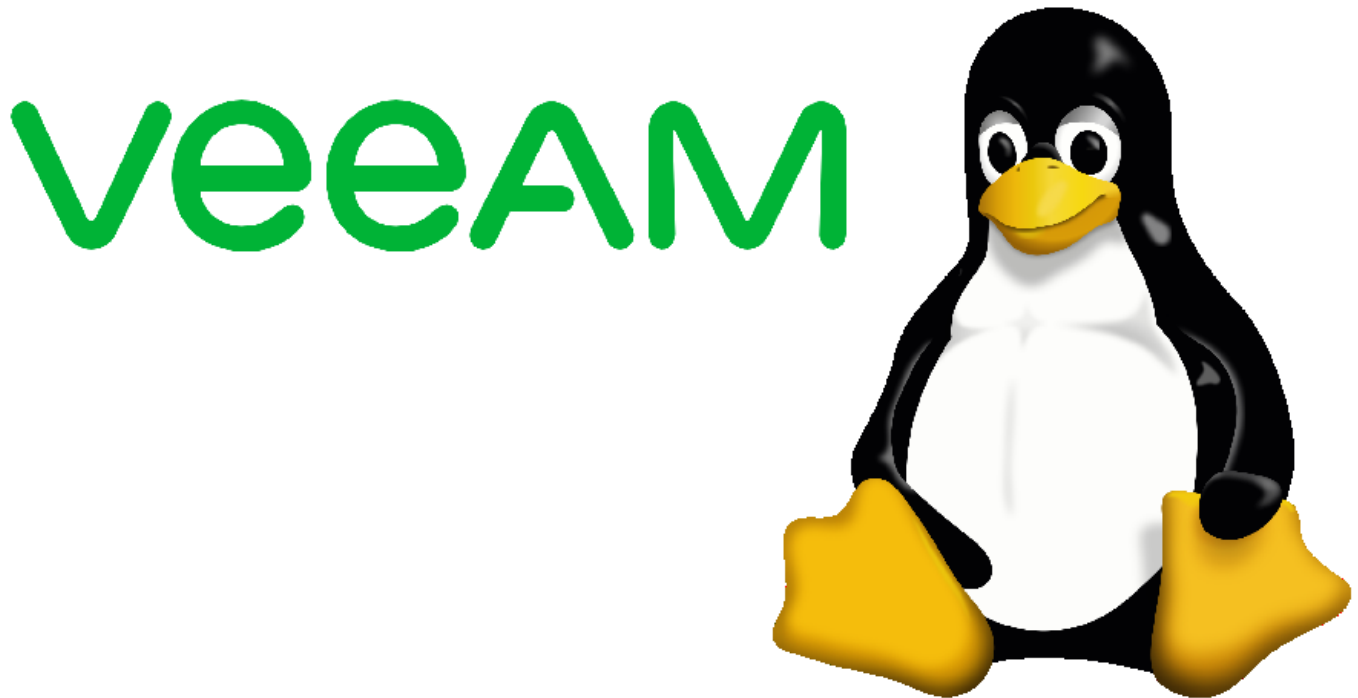# Build an immutable backup repository for Veeam Backup & Replication. Part 7

This guide will show you, step by step, how to create and implement a disk-based immutable Veeam backup repository from scratch. In this part: Bare Metal Recovery of the Linux server.

Introduction

Purpose of these articles

You are a Windows administrator running Veeam Backup & Replication and wish to raise protection against malware attacks and hackers without reverting to shuffle or rotate physical media.

This you can accomplish by *immutable backups* stored on a physical server running Linux. However, you have no Linux servers running and don't want to.

But, like it or not, that is your only option, as the XFS file system is the only one capable of immutability, and XFS only runs under Linux.

Thus, a Linux server is a must. When you have accepted this fact, then what? Where to start?

Like me, you have about zero experience with Linux and, therefore, hesitate to set up a Linux server, indeed in a production environment.

If so, this guide is for you. Here, nothing about Linux is taken for granted.

Sections

The guide has been split in eight parts. This allows you to skip parts you are either familiar with or wish to implement later if at all.

1. Prepare the install of Linux
2. Install Linux on the server
3. Prepare the Linux server for Veeam
4. Create the immutable Veeam backup repository
5. Prepare for backup of the Linux server itself
6. Backup of the Linux server itself
7. Bare Metal Recovery of the Linux server
8. Tighten security on the Linux server (MFA/2FA)
9. Maintenance and deactivation/reactivation of MFA/2FA

Requirements

You are familiar with:

- the usual tasks administering at least a small network with one Windows Server
- *Veeam Backup & Replication* and have it installed and running
- the command line - from PowerShell, Command Prompt, or even DOS

> *Veeam Backup & Replication* is assumed to be of *version 11* or later. It can be a licensed trial or paid version or even the free *Community Edition*.

Part 7. Bare Metal Recovery of the Linux server

In the previous sections, we installed the *Veeam Agent for Linux*, created recovery media, and configured regular backup of the Linux system.

In this section we will, using the *Veeam Agent*, show how to restore the Linux system from scratch - to perform a *bare metal recovery* of the server - in case its system drive should cease to function.

Concept

As you already have *Veeam Backup & Replication* running, we have used a repository of this to store the backup of the server.

> As mentioned in the previous section, the backup files could have been stored elsewhere - on a network share or a USB drive. To use either of these options is trivial, thus will not be covered here.

The created recovery media will be used to boot the server and then restore the server from the backup.

Restoring the Linux server's system drive

The steps to take in case of a system drive failure are these:

- replace the system drive
- boot the server from the recovery media
- locate and select the backup to restore from
- restore the system drive from the backup

So, first replace the system drive. You know how to do this, and the only requirement is, that its capacity must be equal to or larger than the faulty drive.

Next, insert the recovery media and boot the machine from this:
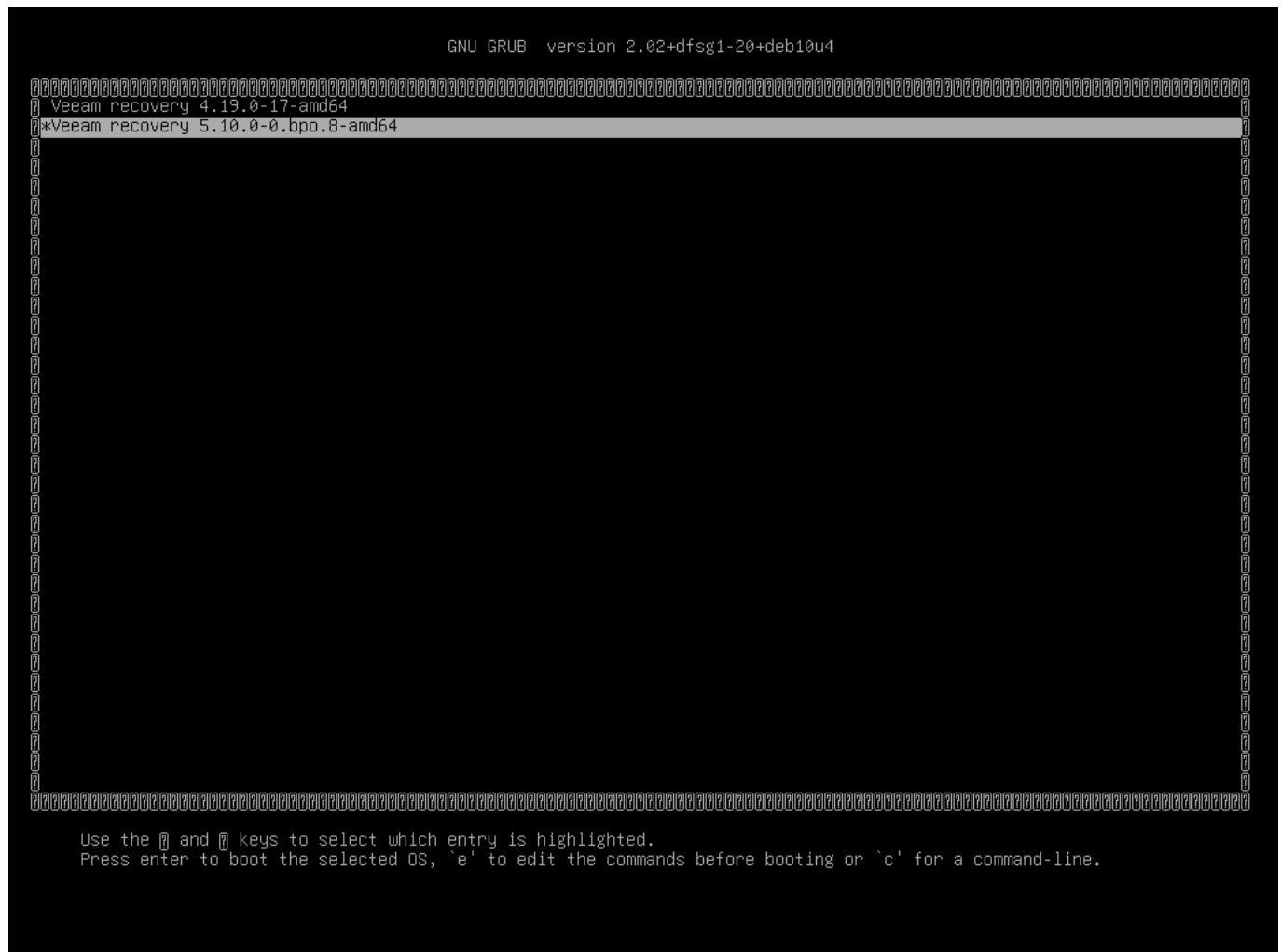
Select *Veeam Recovery 5* ..., press *Enter*, and the machine will boot from the recovery media.

When booted, you have the option to start the SSH server, allowing you to remote control the rest of the process:
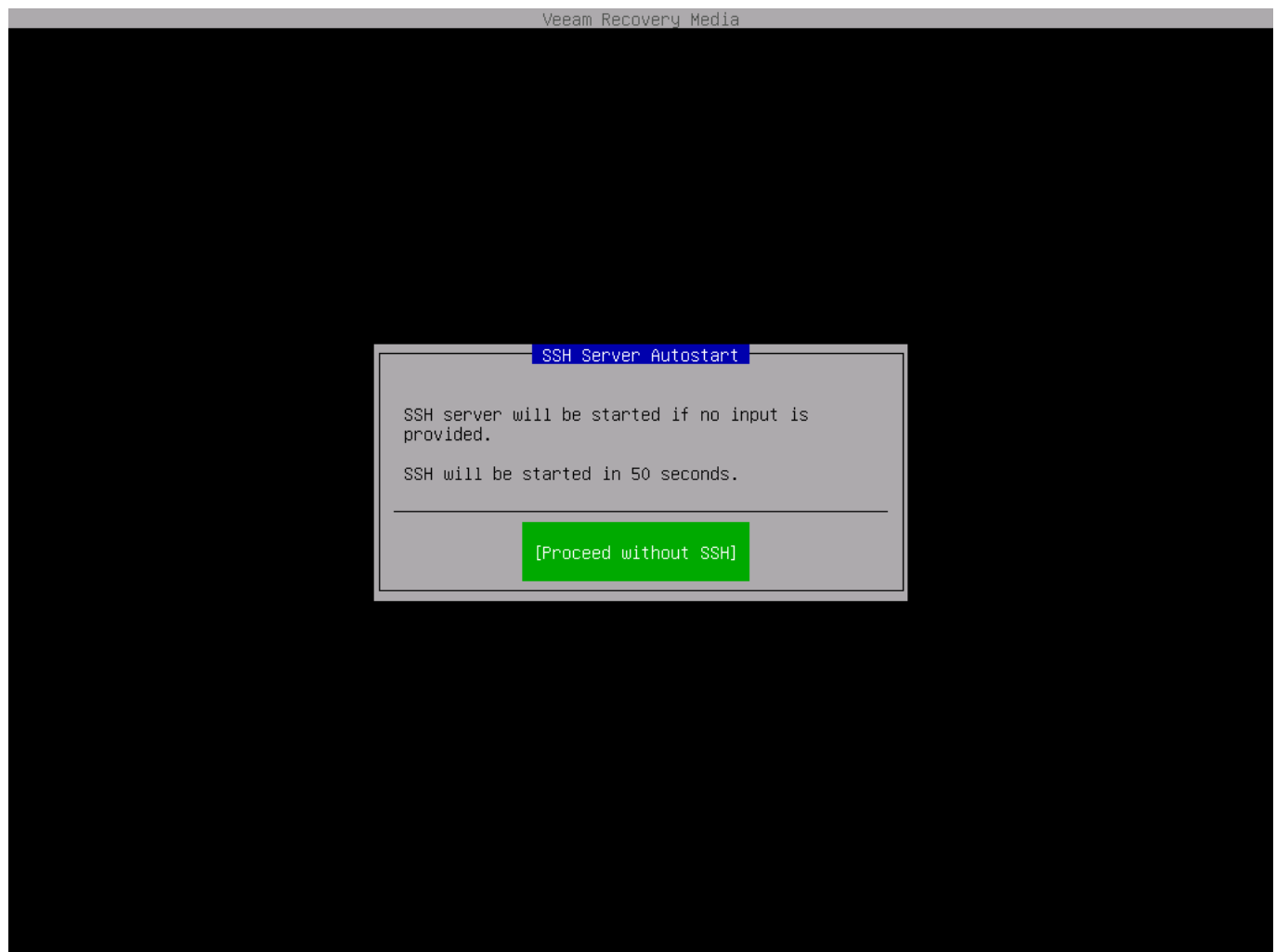
You have three options:

- To start the SSH server, press *Esc*
- If you are operating the server physically, press *Enter* to *Proceed without SSH*
- Do nothing and wait, and the autostart will time out after 60 seconds

The license screen will display:
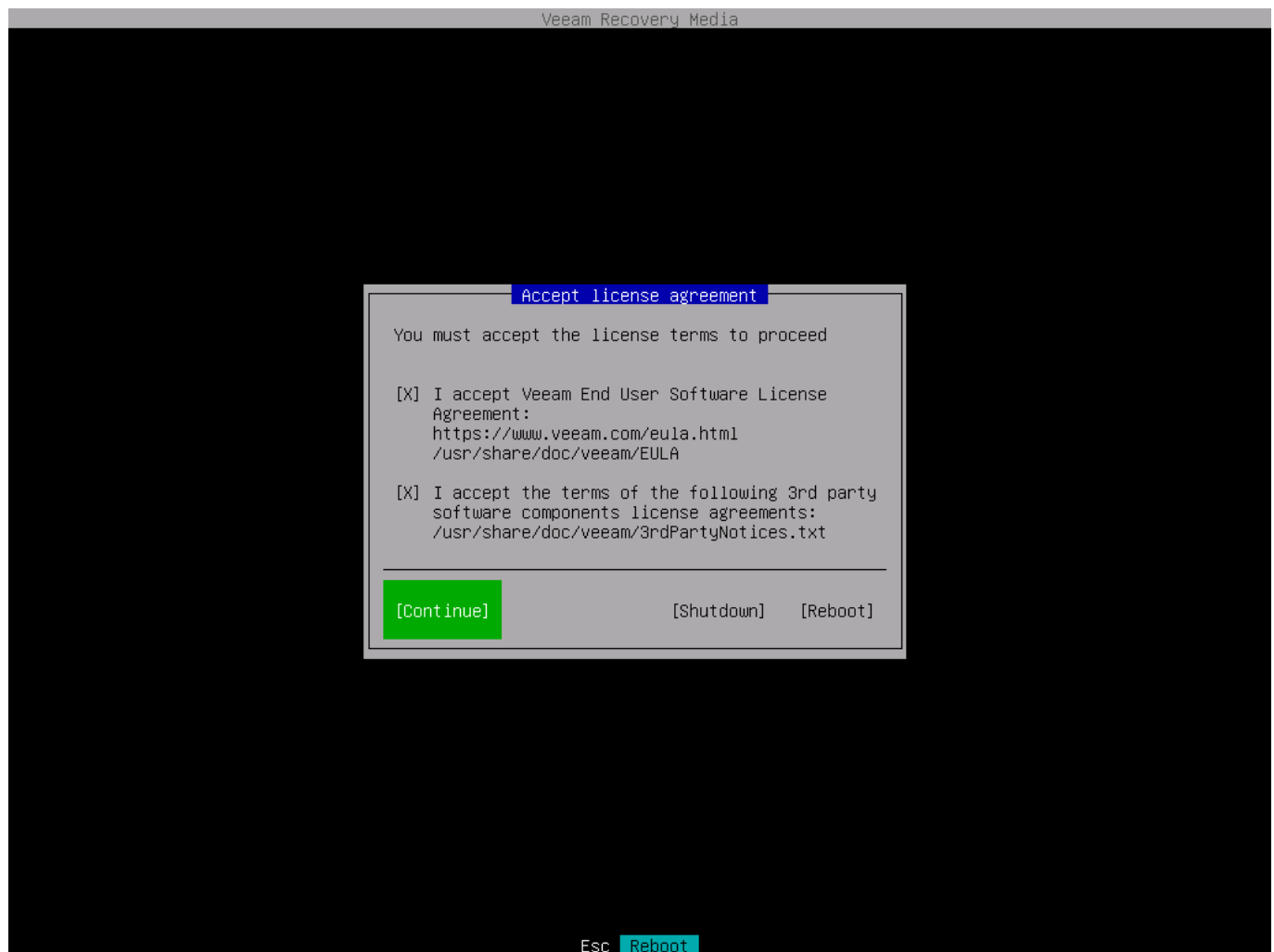
Mark the two entries and press *Continue* to reach the main menu:

```
                              Veeam Recovery Media



                                    6 / 19





                             MAIN MENU

                        Restore volumes
                        Restore files
                        Configure network
                        Exit to shell
                        Reboot
                        Shutdown




         Enter  Select                                        Up,Down  Navigate
```
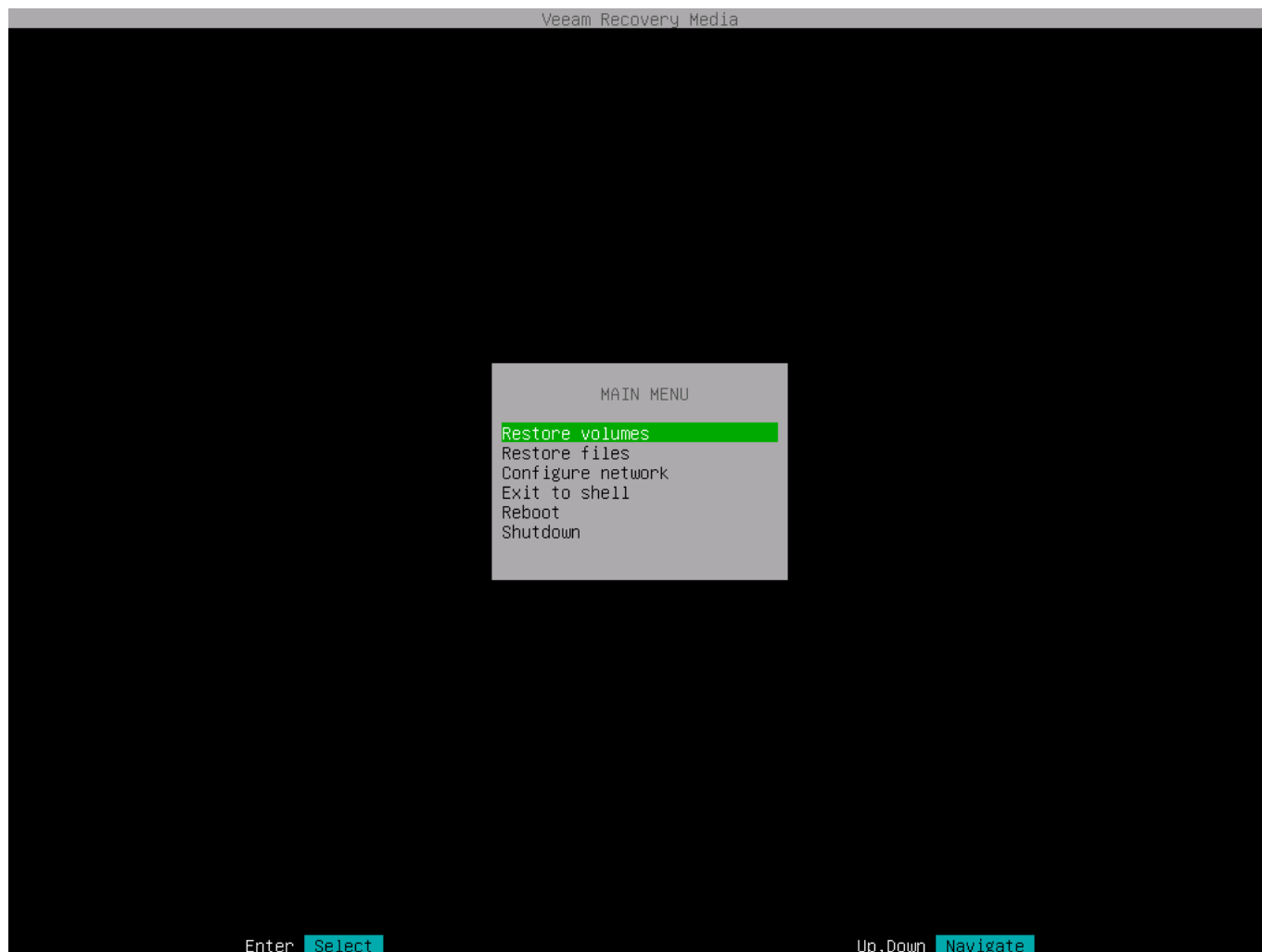
Select *Restore volumes* and press *Enter* to select the backup location.

Scroll to mark: *Add VBR server (v10 or later)* …:
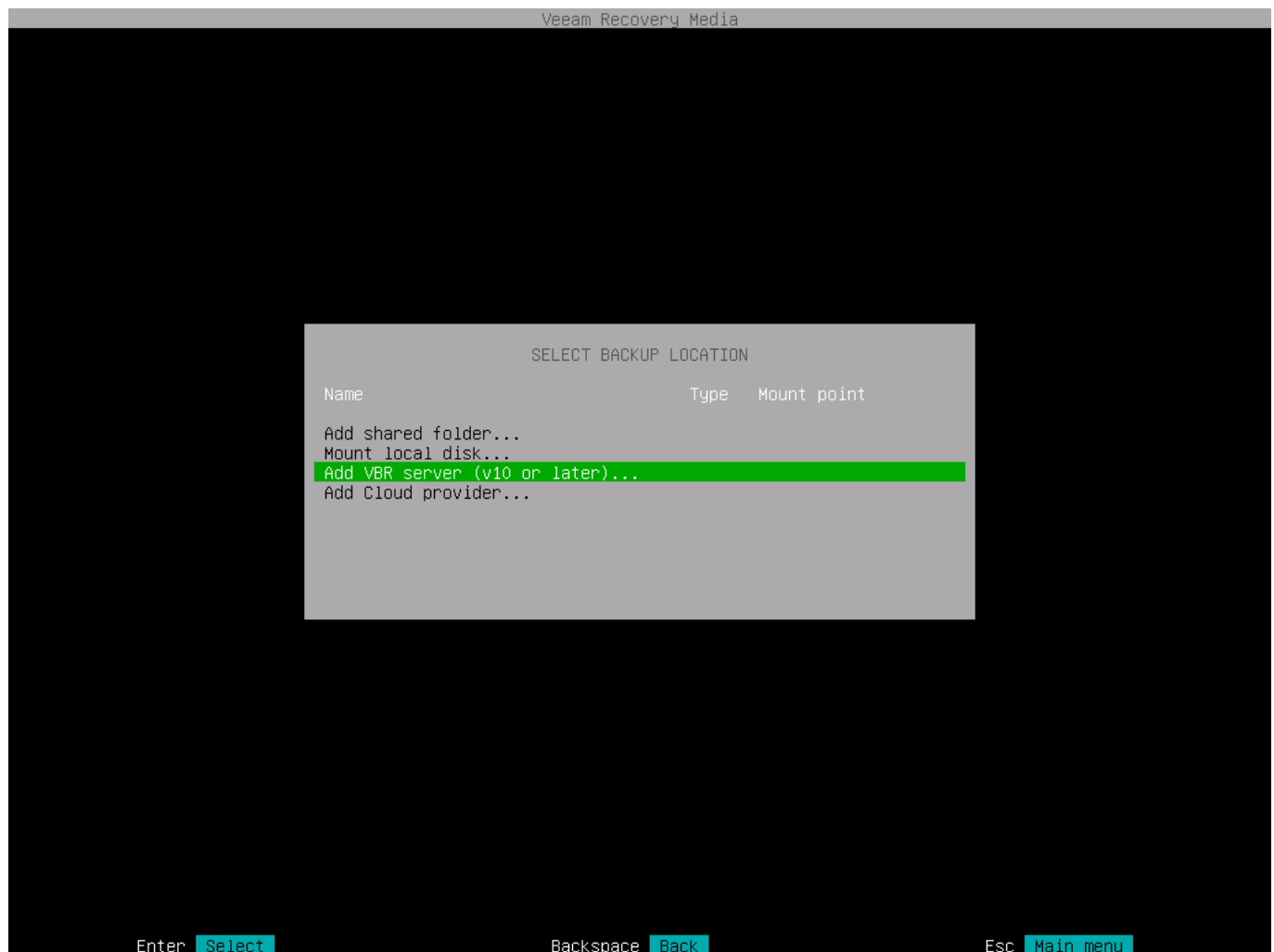
Press *Enter*, and you can specify the name and port of the backup server and the credentials to use:
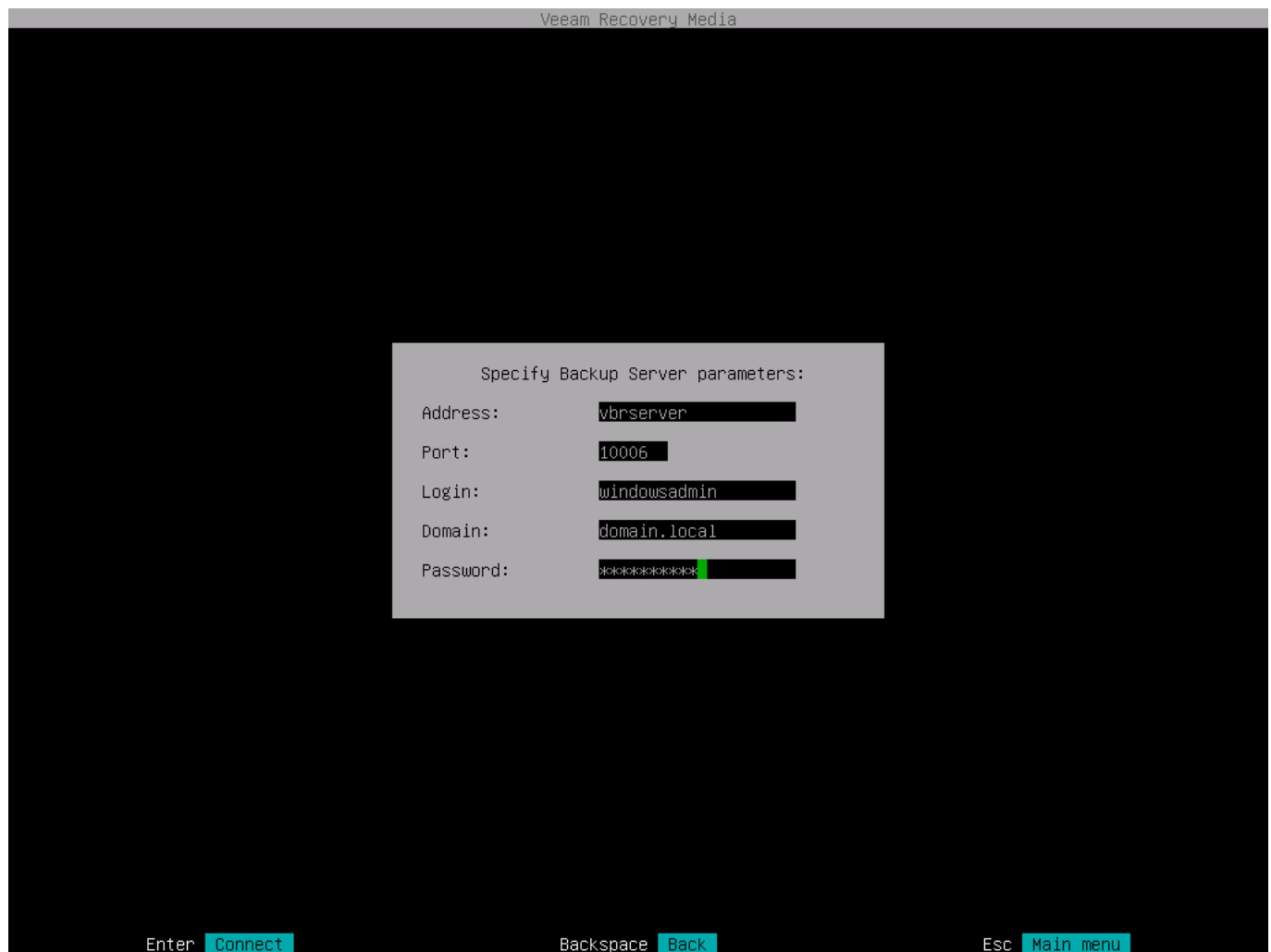
Press *Enter* to connect to the server, retrieve the stored restore points, and list these:
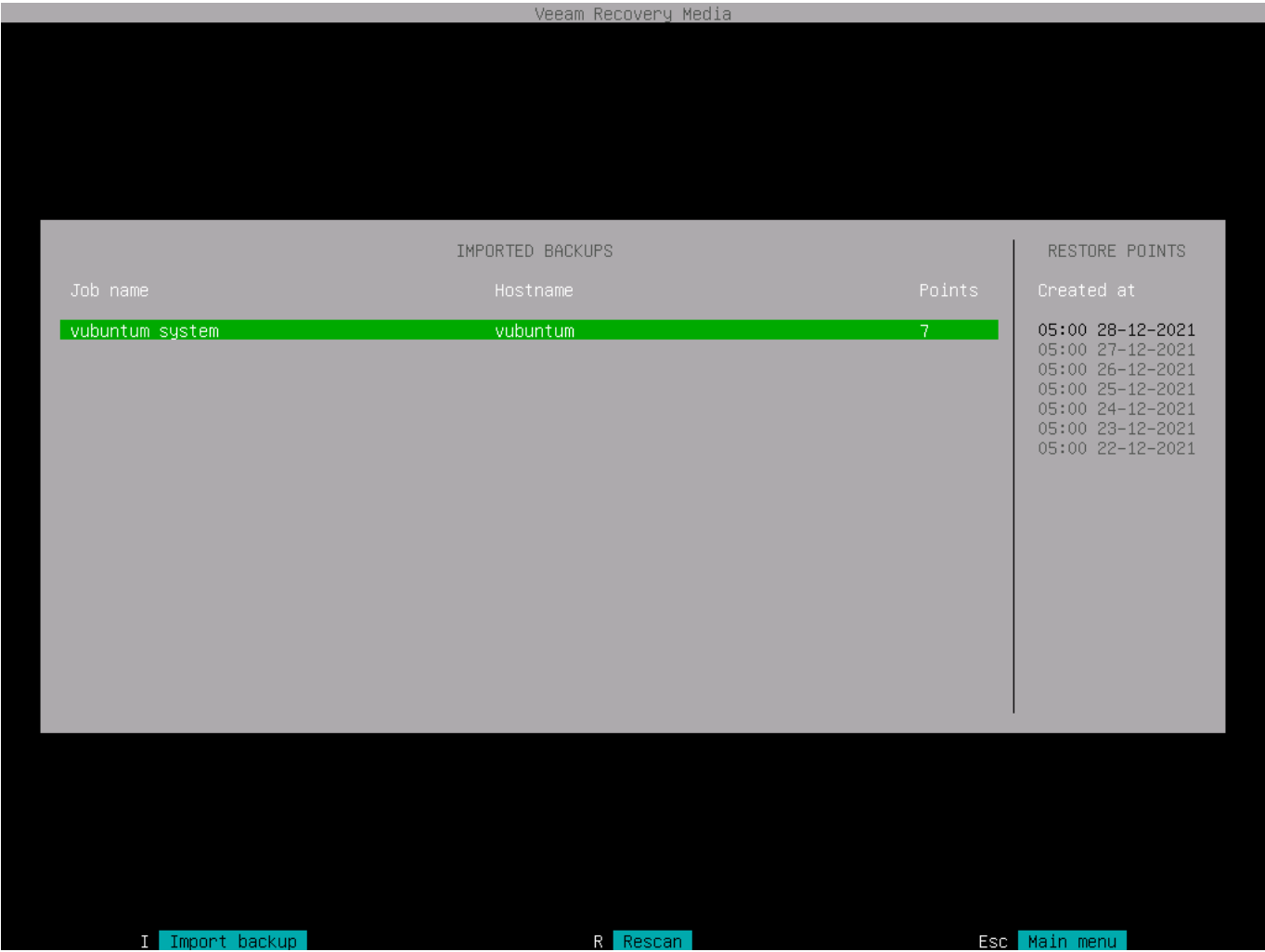
Select (green bar) the *Job name* to use, and then navigate to the list of *Restore Points*:
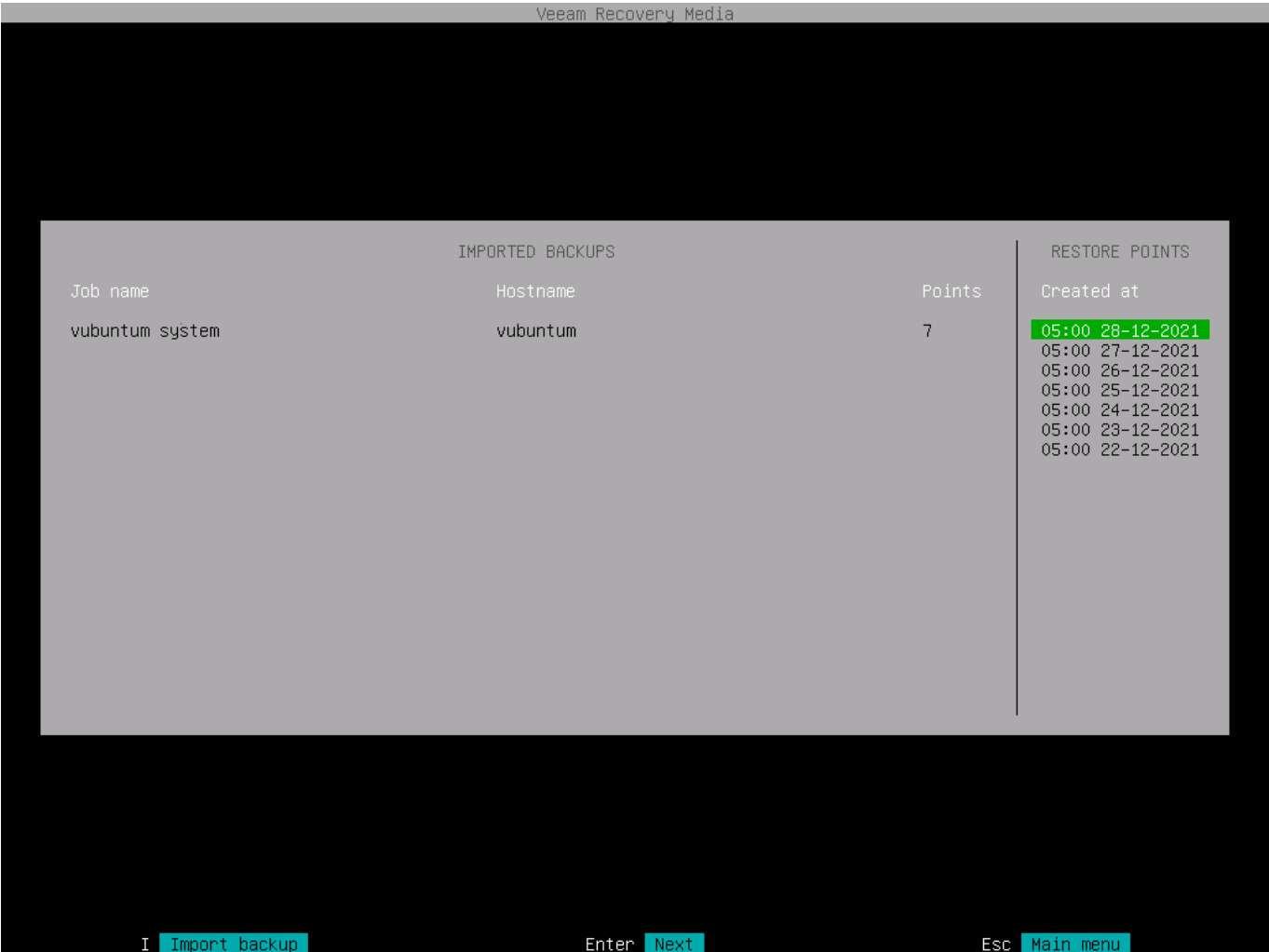
Mark the *Restore Point* to be used to restore the machine and press *Enter*.

You will now (at left) see a list of the current devices in the machine and (at right) of the devices held in the chosen backup:

```
                                    Veeam Recovery Media

              CURRENT SYSTEM                              IN BACKUP

      Device          Restore      Size        Device                Size    Usage

    sda                            118.0G     sda                    118.0G
     sda1                          512.0M      sda1                  512.0M   /boot/efi...
     sda2                          1.00G       sda2                  1.00G    /boot (ext4)
     sda3 (lvm)                    116.4G      sda3 (lvm)            116.4G
    sdb                            1.81T      ubuntu-vg              116.4G
    ubuntu-vg                      116.4G      ubuntu-lv             58.25G   / (ext4)
     ubuntu-lv                     58.25G
     free                          58.24G




      Enter  Select                    Backspace  Back                  Esc  Main menu
```
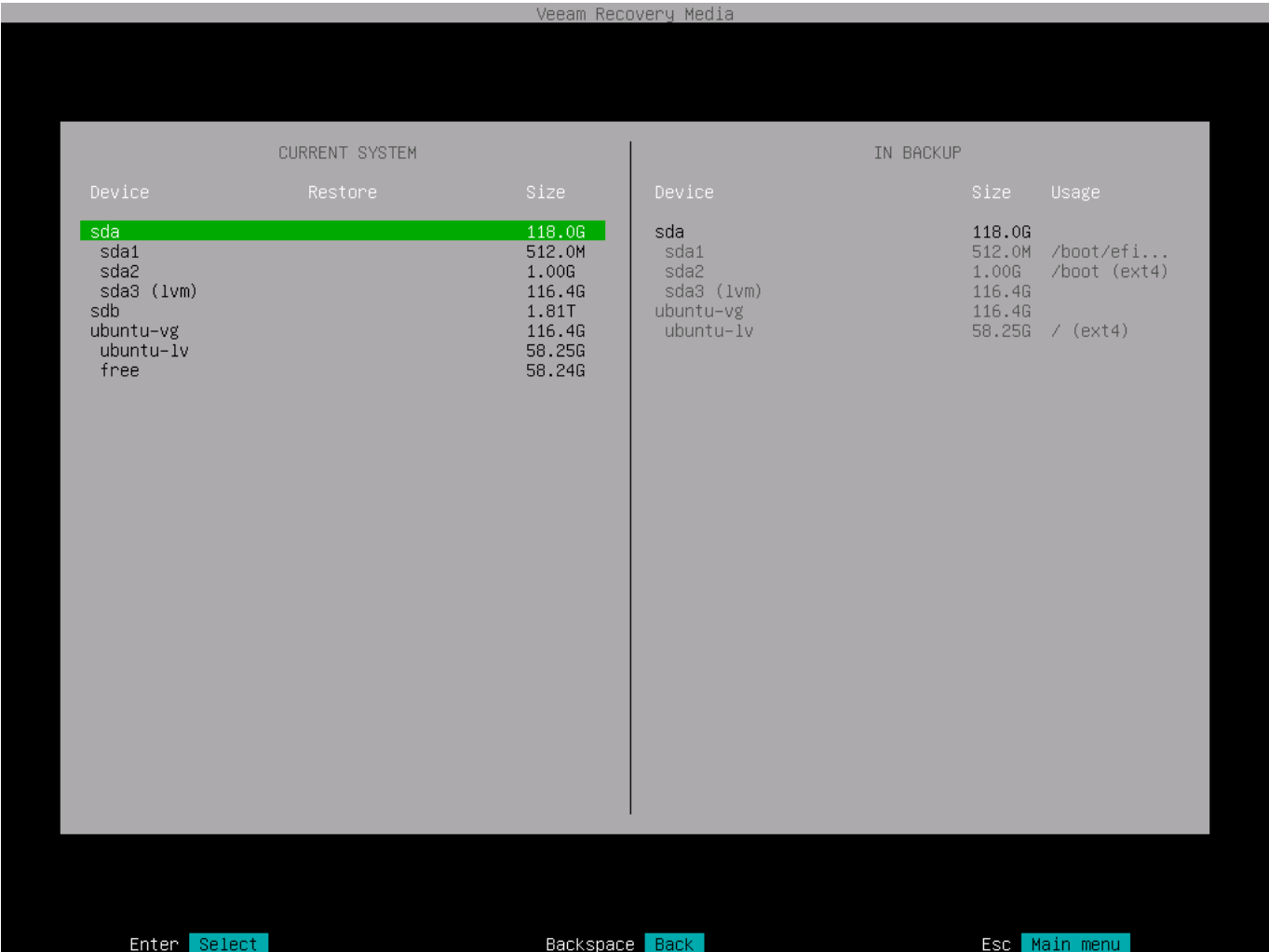
Mark the *sda* device, as this is the system drive, and press *Enter* to select what to do with the *sda* device:

```
                            Veeam Recovery Media

                CURRENT SYSTEM                                 IN BACKUP

    Device           Restore         Size      Device                   Size    Usage

    sda                              118.0G     sda                      118.0G
     sda1                            512.0M      sda1                    512.0M  /boot/efi...
     sda2                            1.00G       sda2                    1.00G   /boot (ext4)
     sda3 (lvm)                      116.4G      sda3 (lvm)              116.4G
    sdb                              1.81T       ubuntu-vg              116.4G
    ubuntu-vg                                  ┌──sda──┐               58.25G  / (ext4)
     ubuntu-lv                                 │       │
     free                           ┌──────────────────────────────┐↑
                                    │Restore from...               │▓
                                    │Restore bootloader...         │▓
                                    │Create a new volume group     ││
                                    │Add to an existing volume group.│
                                    │Create a new BTRFS pool       │↓
                                    │                              │
                                    │Size: 118.00G                 │
                                    │Table type: gpt               │
                                    │                              │
                                    │                              │
                                    └──────────────────────────────┘



                 Enter  Select                            Esc  Cancel
```

Select *Restore from …* and press *Enter* to select what to restore from:
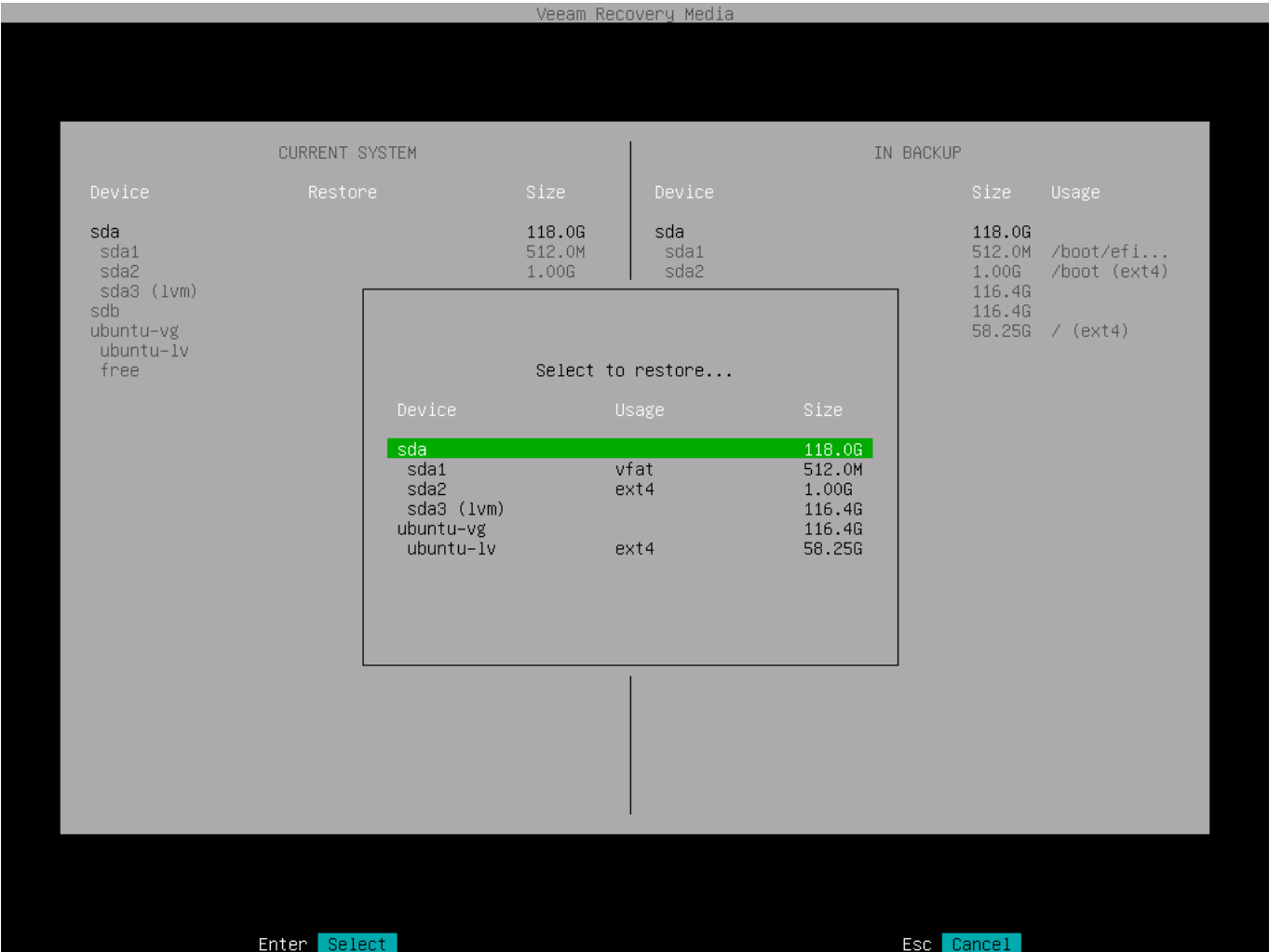
Select the *sda* device as shown, and press *Enter* to finish the selection:

```
                                    Veeam Recovery Media

                CURRENT SYSTEM                                    IN BACKUP

        Device           Restore          Size          Device                    Size     Usage

        sda                               118.0G         sda                       118.0G
         sda1            sda1 (/boot/efi) 512.0M          sda1                     512.0M   /boot/efi...
         sda2            sda2 (/boot)     1.00G           sda2                     1.00G    /boot (ext4)
         sda3 (lvm)                       116.4G          sda3 (lvm)               116.4G
        sdb                               1.81T         ubuntu-vg                  116.4G
        ubuntu-vg                         116.4G          ubuntu-lv               58.25G    / (ext4)
         ubuntu-lv       ubuntu--vg-ubuntu-... 58.25G
         free                             58.24G
```

```
     Enter  Select            S  Start restore        Z  Undo        Backspace  Back         Esc  Main menu
```

It may appear, as nothing has been altered, but notice, that the bottom menu options have been expanded.

> Note: The menu option *Start restore* will not start the restore, only bring up the summary screen.

Press *S* - to view the summary screen:
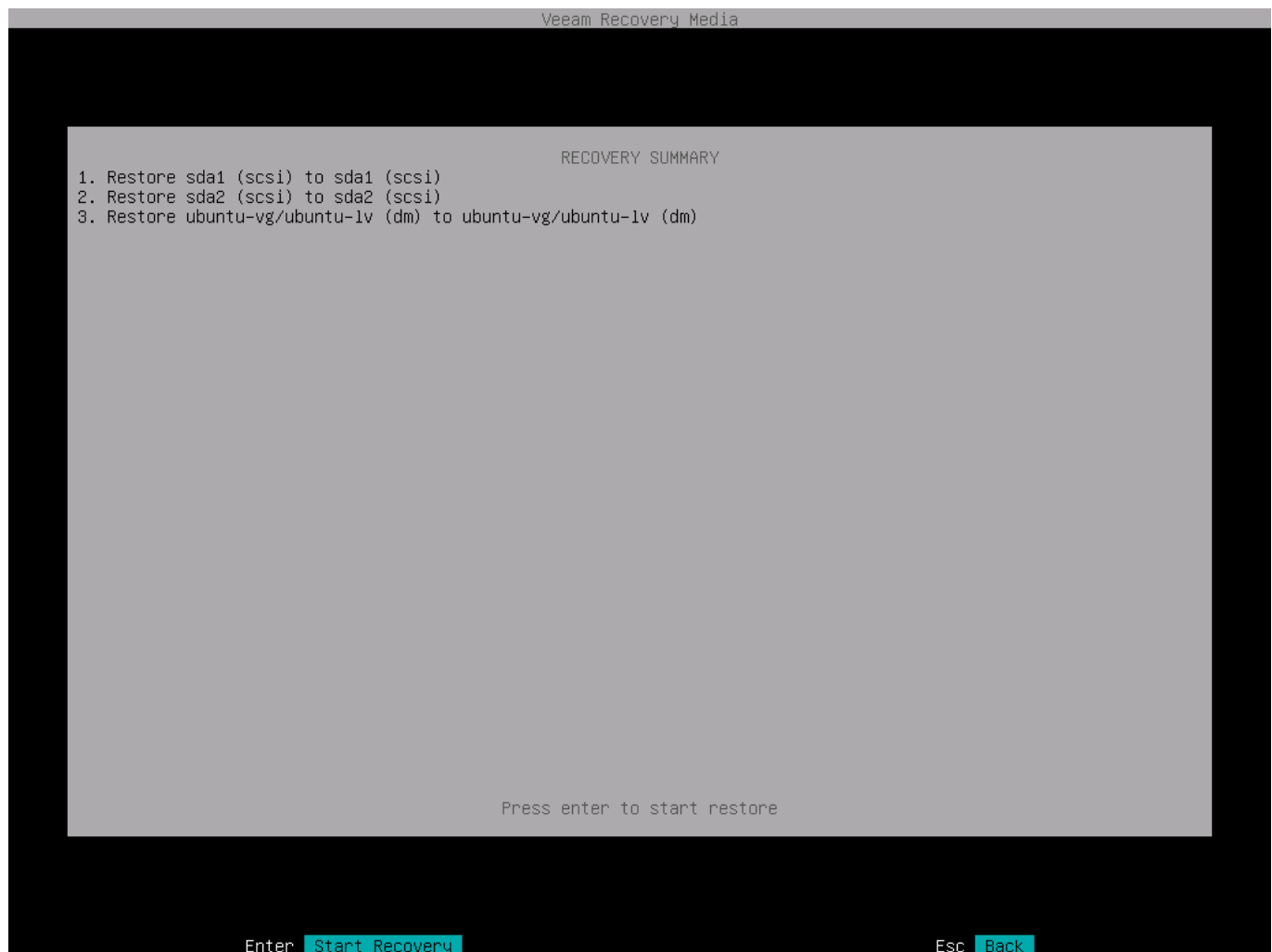
If everything seems OK, press *Enter* to actually start the restore.

In the usual Veeam style, every step of the process will be carefully listed, and you can watch the progress:

```
                            Veeam Recovery Media

    Restore                          61%                      Status: Running

    ████████████████████████████████████████

    Time              Action                                              Duration

    11:40:42          Job started at 2022-01-01 11:40:42 UTC
    11:40:43          Starting volume restore
    11:40:44          Waiting for backup infrastructure resources availability   00:00:02
    11:40:47          Applying changes to disks configuration              00:00:00
    11:40:47          sda2 restored 1 GB at 244.4 MB/s                     00:00:04
    11:40:51          sda1 restored 512 MB at 256.6 MB/s                   00:00:02
    11:40:53          ubuntu--vg-ubuntu--lv 35.5 GB at 873.8 MB/s (60%)    00:00:42

                                S  Stop restore
```

When the restore is completed, a status screen is displayed, documenting the full process:

```
                              Veeam Recovery Media

 Restore                          100%                        Status: Success


 Time            Action                                          Duration

 11:40:42        Job started at 2022-01-01 11:40:42 UTC
 11:40:43        Starting volume restore
 11:40:44        Waiting for backup infrastructure resources availability    00:00:02
 11:40:47        Applying changes to disks configuration                     00:00:00
 11:40:47        sda2 restored 1 GB at 244.4 MB/s                            00:00:04
 11:40:51        sda1 restored 512 MB at 256.6 MB/s                          00:00:02
 11:40:53        ubuntu--vg-ubuntu--lv restored 58.3 GB at 1.3 GB/s          00:00:45
 11:41:38        Restoring efi                                               00:00:01
 11:41:39        Restore EFI volume: /dev/sda1
 11:41:39        Restore EFI boot manager entry: ubuntu
 11:41:39        Processing finished at 2022-01-01 11:41:39 UTC
 11:41:46        Logs have been exported to the repository











                              Esc  Main menu
```

Note the last entry, that *Logs have been exported to the repository*.

Press *Esc* to return to the main menu:
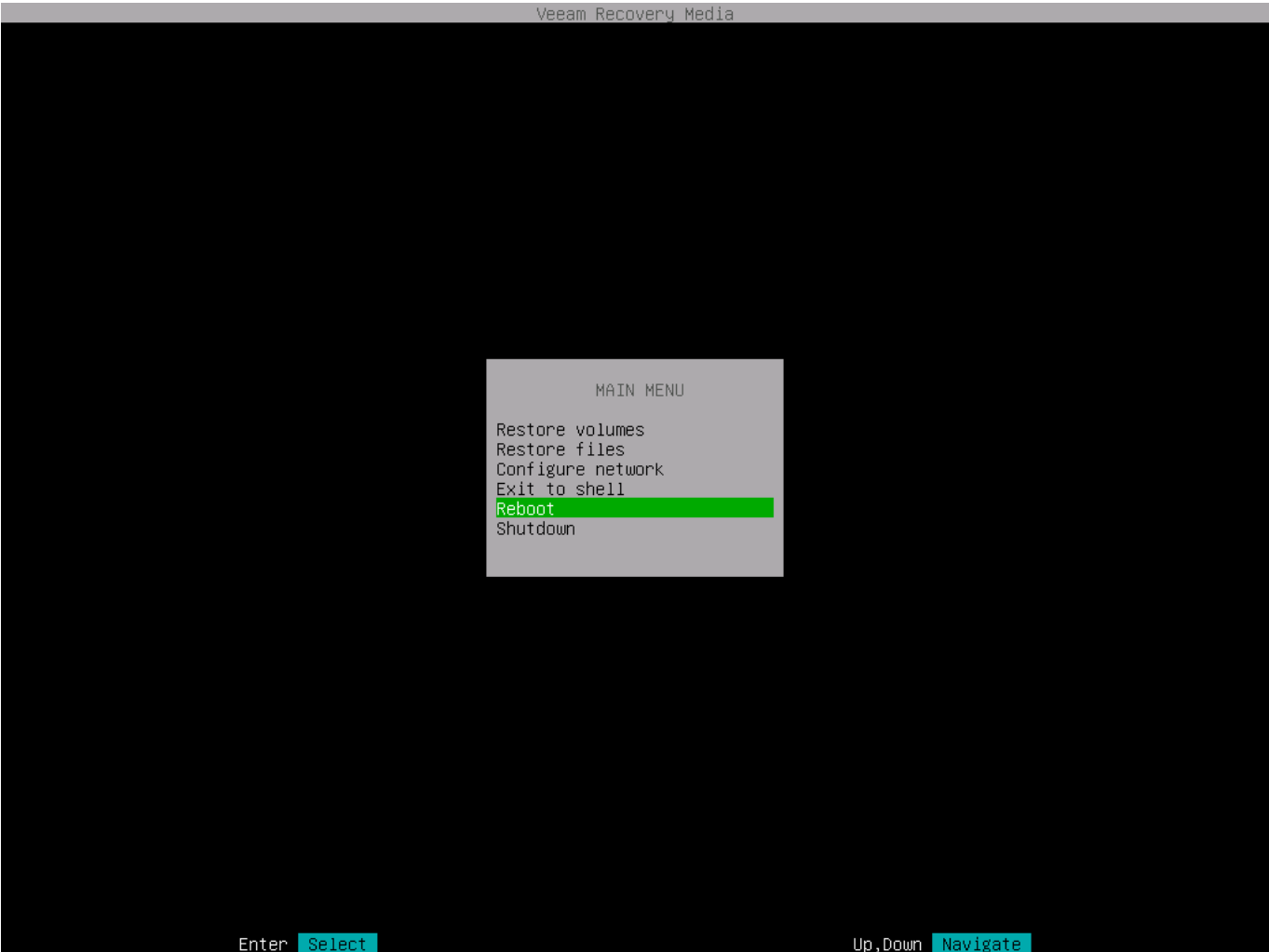
Select (as shown) *Reboot*, and press *Enter* to reboot the machine.

Also, remove the recovery media from the machine.

As noted above, the logs have been exported to the repository. However, at the VBR console, these are not to view directly, only that the restore has taken place and the status (Success or Failed) of this:
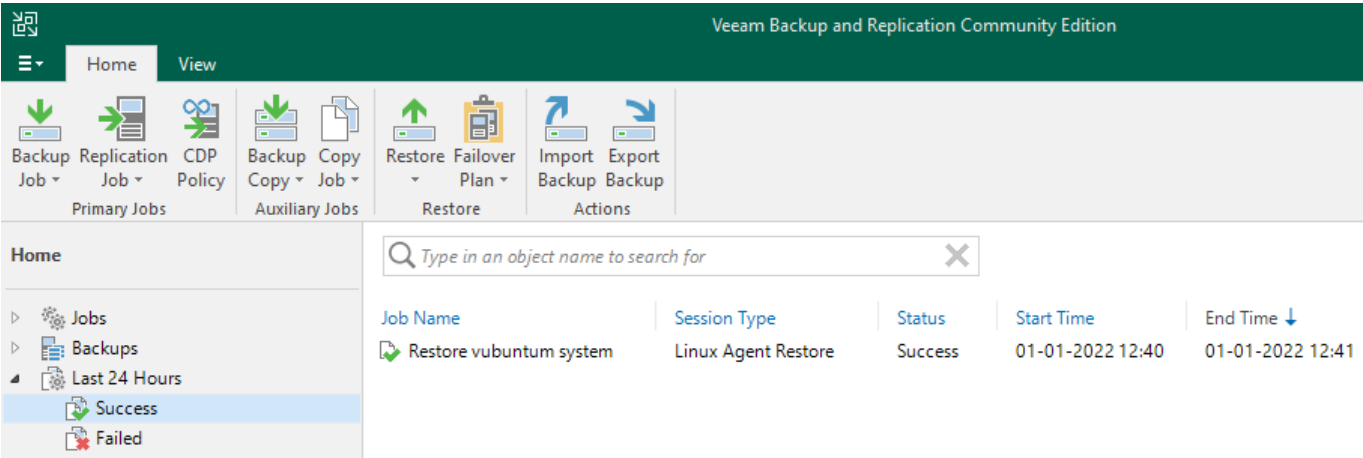
The server's Linux system has now been restored completely from the backup stored at your *Veeam Backup & Replication* server using the previously recovery media to boot from, and the restore is documented in the *Veeam Backup & Replication* console.

Conclusion

This concludes the basic setup of the immutable backup repository as well as enterprise level backup of the server itself.

What's missing could only be some added security for protecting the server from a worst case scenario. These steps and how to implement them will be explained in detail in **Part 8** of this series:

Build an immutable backup repository for Veeam Backup & Replication. Part 8