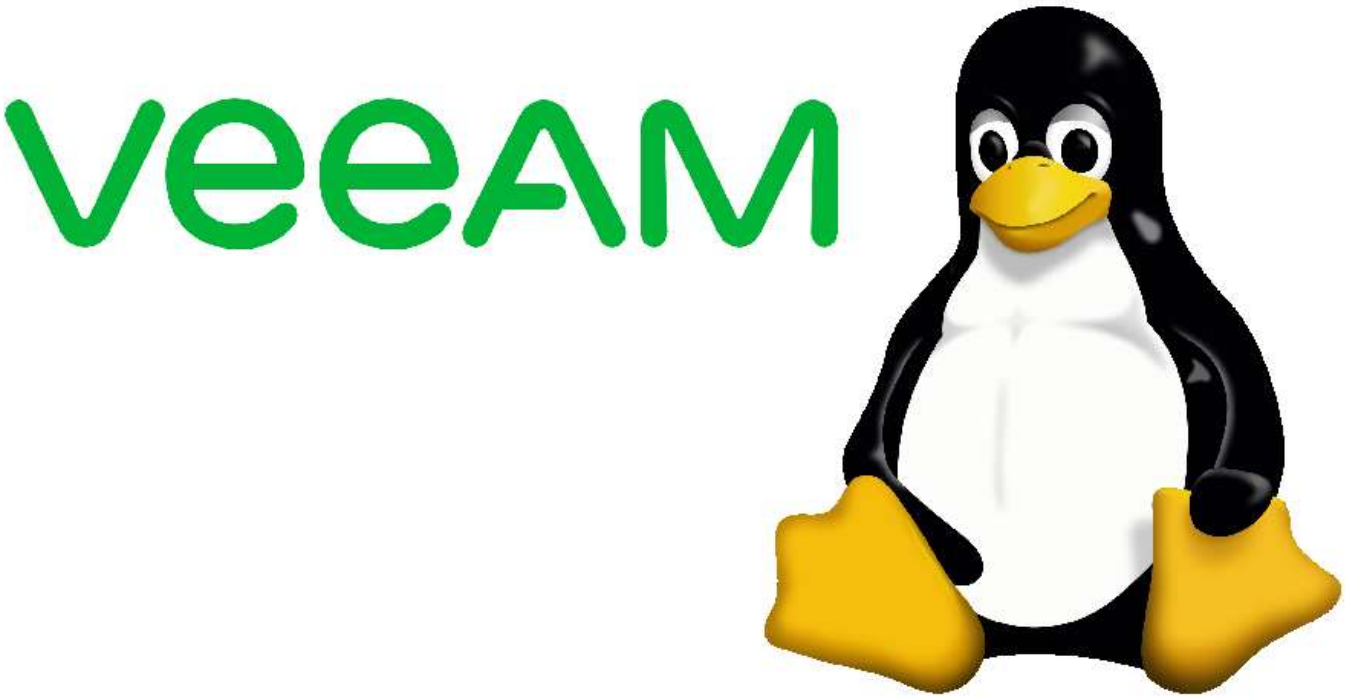
Build an immutable backup repository for Veeam Backup & Replication. Part 5



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: Prepare for backup of the Linux server itself.

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 5. Prepare for backup of the Linux server itself

In this section, following Part 4, we will configure a backup job for the Linux server itself which can be used 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, thus having at least one backup repository at your disposal, all we need is:

- install the *Veeam Agent for Linux* on the Linux server
- create a recovery media to boot from in case of a system drive failure
- create a backup job that will backup the Linux server's system drive

This section will cover the two first tasks. Creating the backup job will be described in the next section of this series.

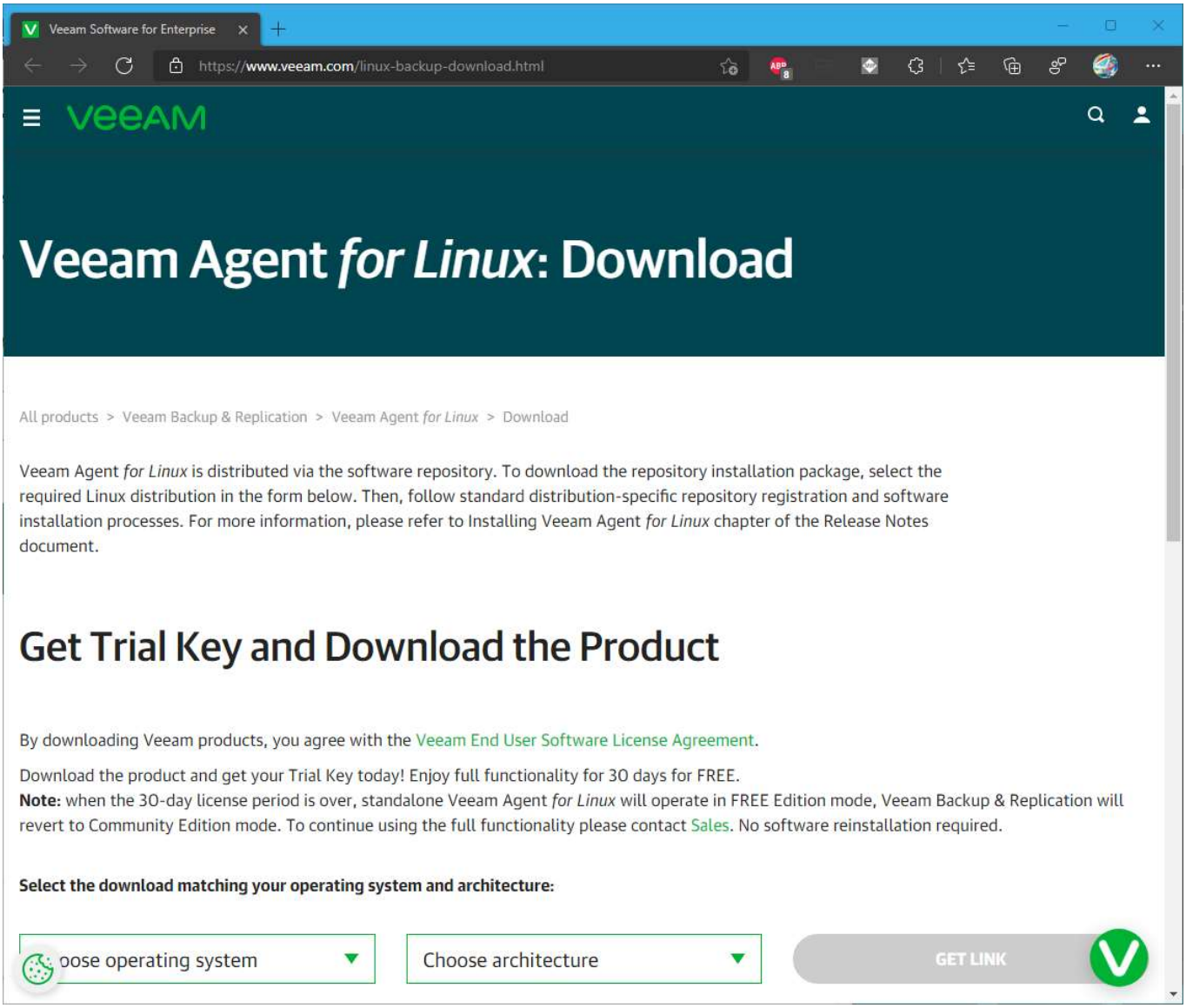
Install *Veeam Agent for Linux*

To install the *Veeam Agent for Linux*, we need the install package. This can be downloaded from the Veeam site, though not directly, as a direct URL to the install package is not published.

To obtain that URL, follow these steps.

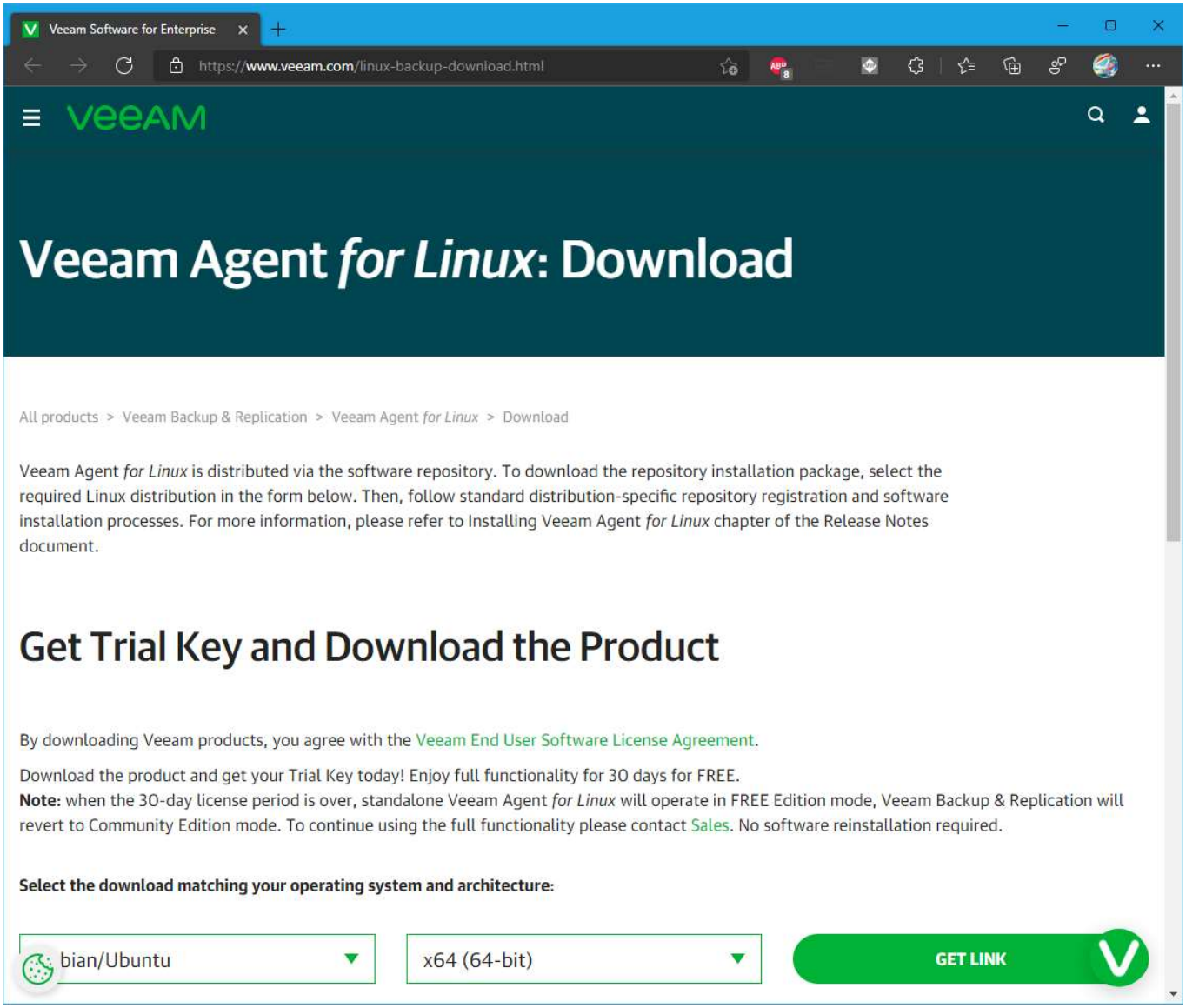
First, go to the Veeam site hosting the download:

https://www.veeam.com/linux-backup-download.html

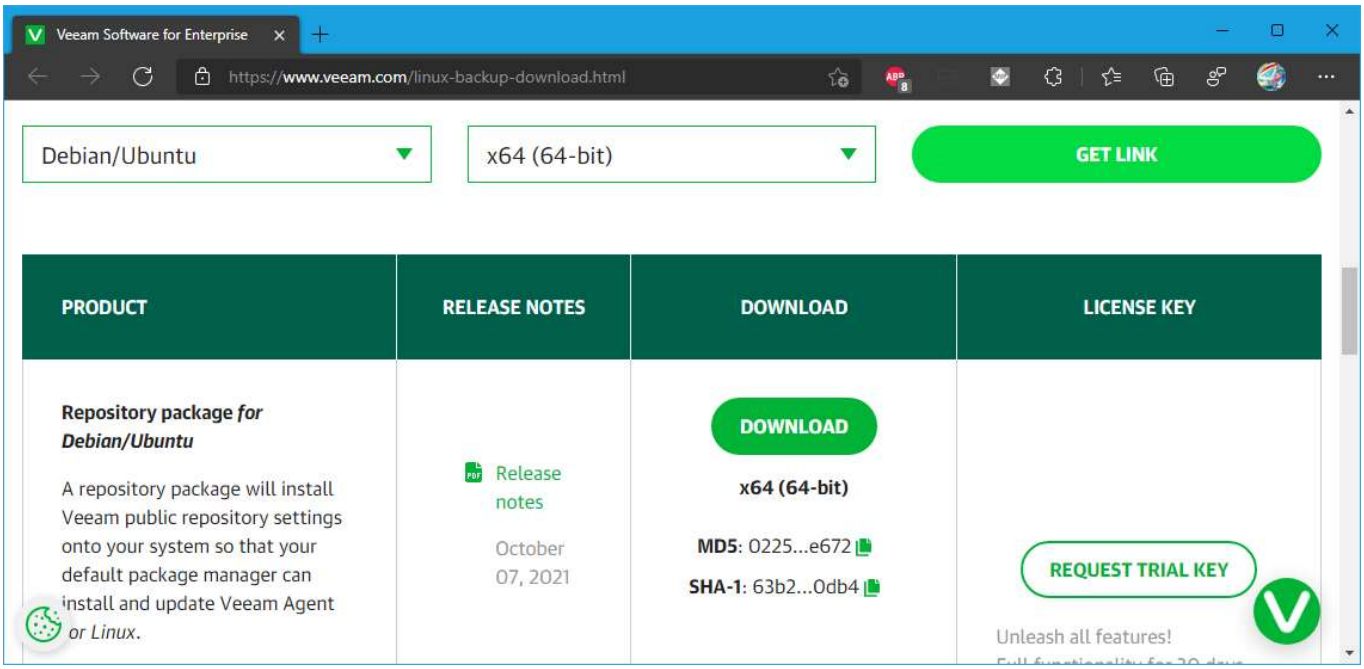


Go to *Choose operating system* and *Choose architecture* select:

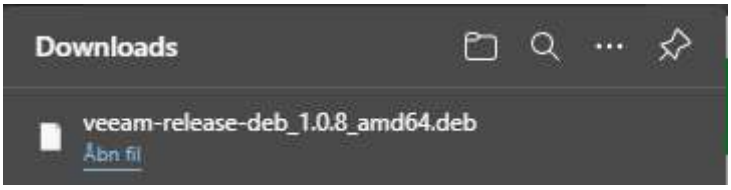
Debian/Ubuntu x64 (64-bit)



Click the green *GET LINK* button down-right, and the Download page is shown:

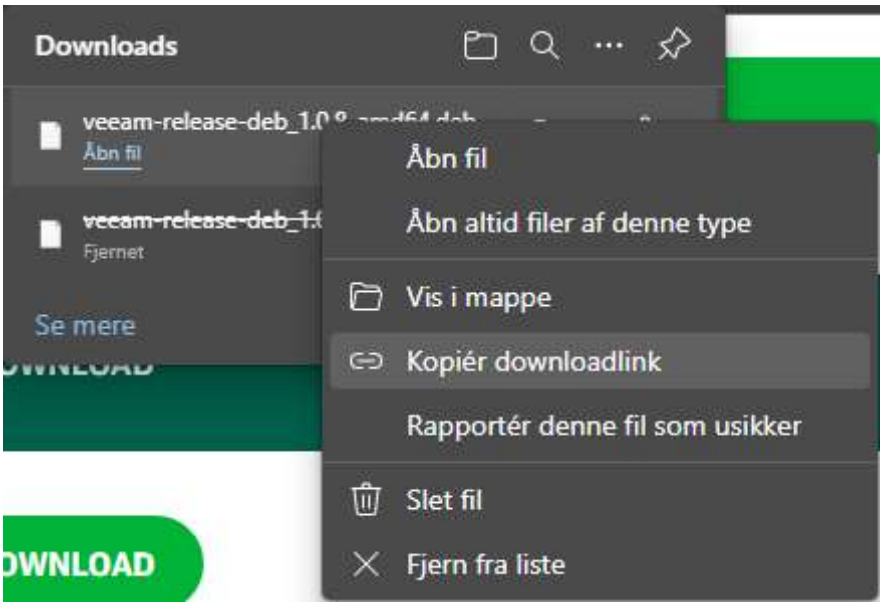


Click the green *DOWNLOAD* button, and the download will start. Here it will download the package of version 1.0.8:



The file will be downloaded to your machine.

When ready, it will be listed in the Downloads info box of Edge. Right-click the filename and, from the popup menu, select *Copy download link*:



Paste the link somewhere where you can find it later. It will appear similar to:

https://download2.veeam.com/veeam-release-deb_1.0.8_amd64.deb

You may close the browser window.

Now, create a *bin* folder in the home folder to host the package using the *mkdir* command:

```
mkdir /home/linuxadmin/bin
```

Next, using the command *wget*, we can download the install package to this folder (one line, no line breaks) from the URL you copied above. The *-P* is used to specify the local folder:

```
wget -P /home/linuxadmin/bin https://download2.veeam.com/veeam-release-
deb_1.0.8_amd64.deb
```

The output will be similar to this:

```
linuxadmin@vebuntum: ~
linuxadmin@vebuntum: $ wget -P /home/linuxadmin/bin https://download2.veeam.com/veeam-release-deb_1.0.8_amd64.deb
--2021-12-28 14:08:04--  https://download2.veeam.com/veeam-release-deb_1.0.8_amd64.deb
Resolving download2.veeam.com (download2.veeam.com)... 13.33.152.39, 13.33.152.22, 13.33.152.81, ...
Connecting to download2.veeam.com (download2.veeam.com)|13.33.152.39|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 5850 (5.7K) [binary/octet-stream]
Saving to: '/home/linuxadmin/bin/veeam-release-deb_1.0.8_amd64.deb'

veeam-release-deb_1.0.8_amd64 100%[=============================================>]   5.71K  --.-KB/s    in 0s

2021-12-28 14:08:04 (596 MB/s) - '/home/linuxadmin/bin/veeam-release-deb_1.0.8_amd64.deb' saved [5850/5850]

linuxadmin@vebuntum: $
```

Prepare to install the package (the star (*) means what-ever-version) and also install any updates (one line):

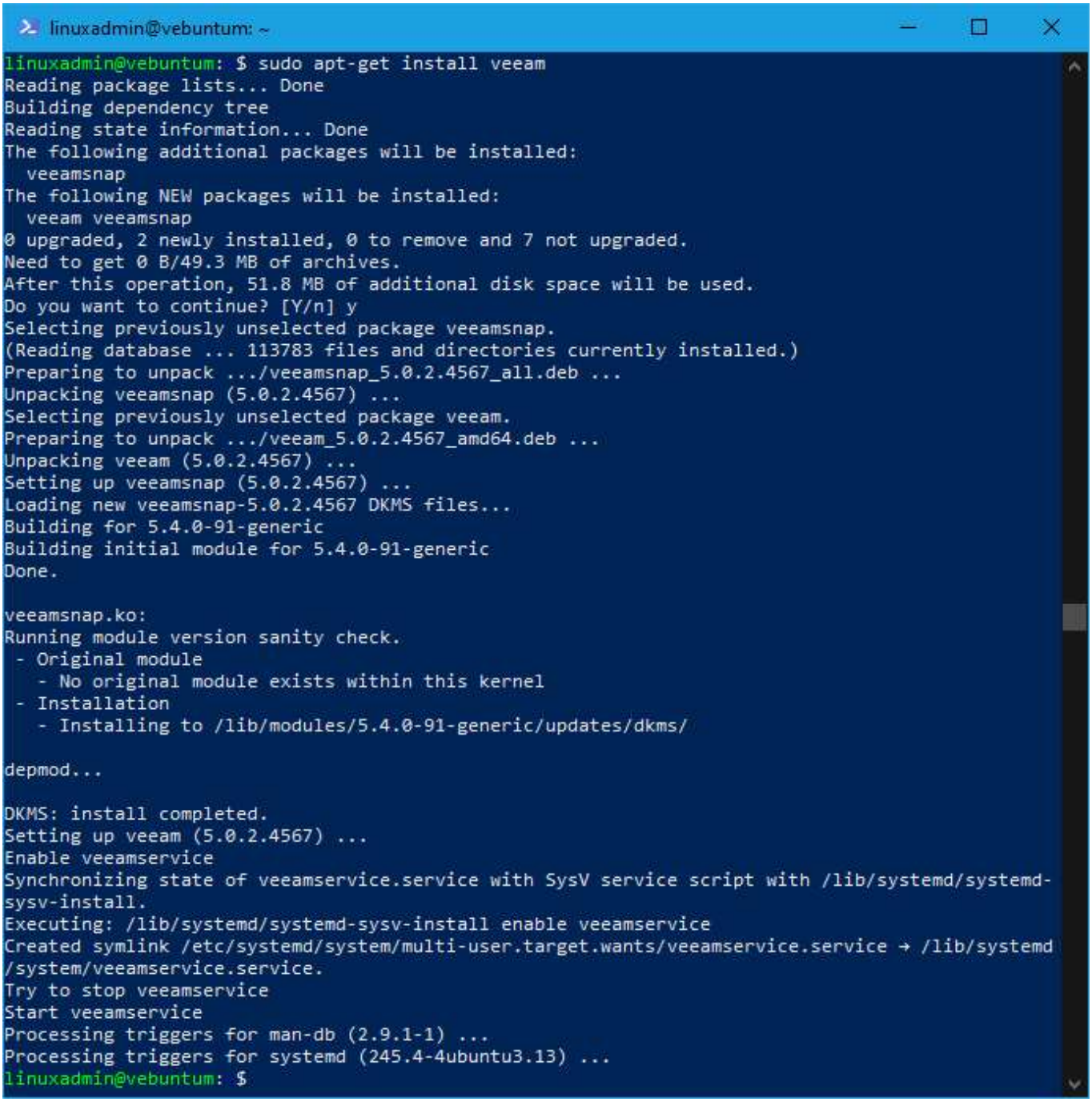
```
sudo dpkg -i /home/linuxadmin/bin/veeam-release* && sudo apt-get update
```

```
linuxadmin@vubuntum: ~
linuxadmin@vubuntum: $ sudo dpkg -i /home/linuxadmin/bin/veeam-release* && sudo apt-get update
Selecting previously unselected package veeam-release-deb.
(Reading database ... 71574 files and directories currently installed.)
Preparing to unpack .../veeam-release-deb_1.0.8_amd64.deb ...
Unpacking veeam-release-deb (1.0.8) ...
Setting up veeam-release-deb (1.0.8) ...
Hit:1 http://dk.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://dk.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://dk.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://dk.archive.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://repository.veeam.com/backup/linux/agent/dpkg/debian/public stable InRelease [7,549 B]
Get:6 http://dk.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1,400 kB]
Get:7 http://dk.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [283 kB]
Get:8 http://dk.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [14.7 kB]
Get:9 http://dk.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [616 kB]
Get:10 http://repository.veeam.com/backup/linux/agent/dpkg/debian/public stable/veeam amd64 Packages [6,448 B]
Get:11 http://dk.archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [88.1 kB]
Get:12 http://dk.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [528 B]
Get:13 http://dk.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [884 kB]
Get:14 http://dk.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [193 kB]
Get:15 http://dk.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [19.9 kB]
Get:16 http://dk.archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [42.0 kB]
Get:17 http://dk.archive.ubuntu.com/ubuntu focal-backports/main Translation-en [10.0 kB]
Get:18 http://dk.archive.ubuntu.com/ubuntu focal-backports/main amd64 c-n-f Metadata [864 B]
Get:19 http://dk.archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [18.9 kB]
Get:20 http://dk.archive.ubuntu.com/ubuntu focal-backports/universe Translation-en [7,492 B]
Get:21 http://dk.archive.ubuntu.com/ubuntu focal-backports/universe amd64 c-n-f Metadata [636 B]
Get:22 http://dk.archive.ubuntu.com/ubuntu focal-security/main amd64 Packages [1,069 kB]
Get:23 http://dk.archive.ubuntu.com/ubuntu focal-security/main Translation-en [197 kB]
Get:24 http://dk.archive.ubuntu.com/ubuntu focal-security/main amd64 c-n-f Metadata [9,096 B]
Get:25 http://dk.archive.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [566 kB]
Get:26 http://dk.archive.ubuntu.com/ubuntu focal-security/restricted Translation-en [80.9 kB]
Get:27 http://dk.archive.ubuntu.com/ubuntu focal-security/restricted amd64 c-n-f Metadata [528 B]
Get:28 http://dk.archive.ubuntu.com/ubuntu focal-security/universe amd64 Packages [668 kB]
Get:29 http://dk.archive.ubuntu.com/ubuntu focal-security/universe Translation-en [112 kB]
Get:30 http://dk.archive.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [13.0 kB]
Fetched 6,643 kB in 1s (6,781 kB/s)
Reading package lists... Done
linuxadmin@vubuntum: $
```

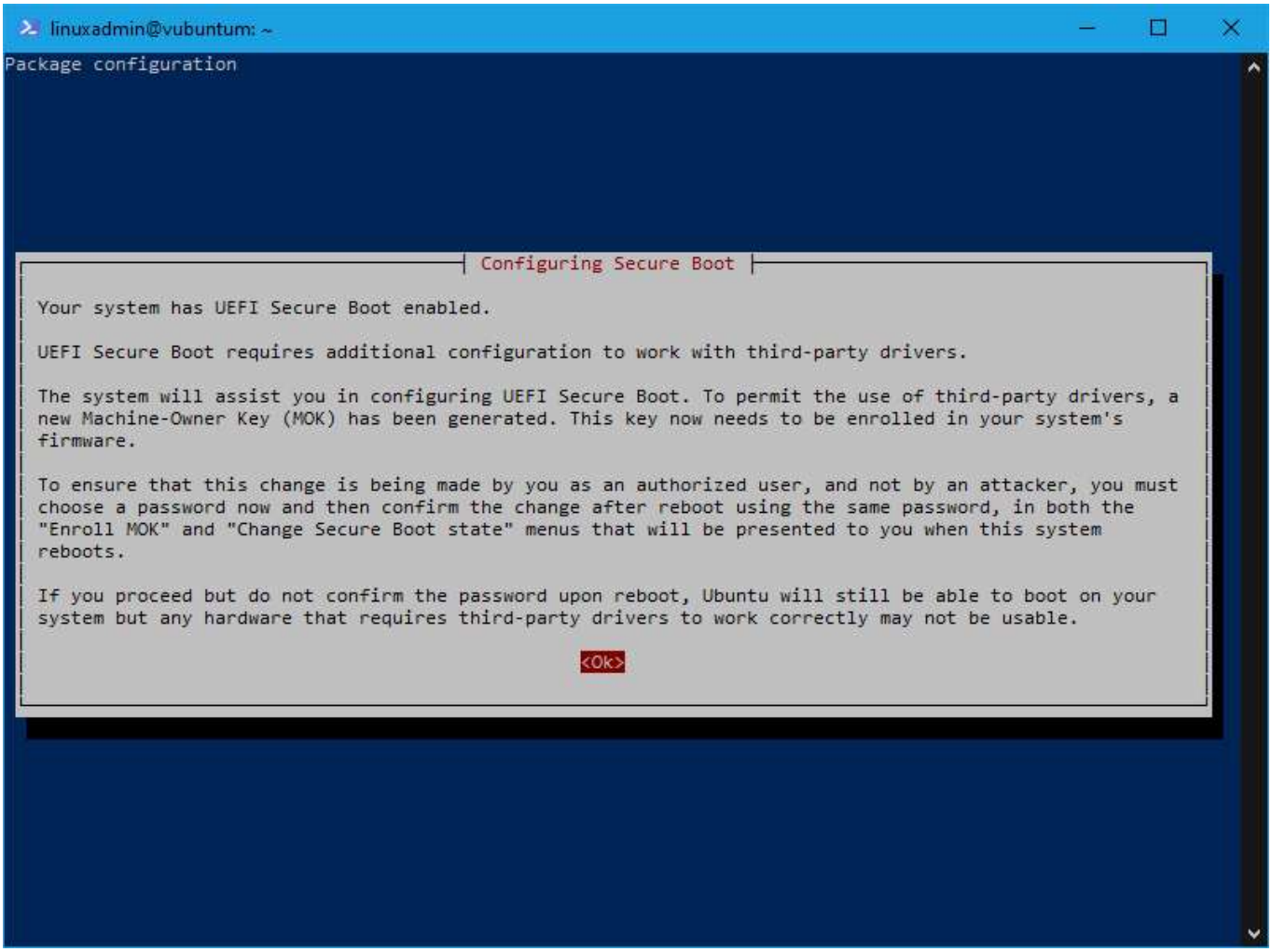
Finally, retrieve and install the agent itself:

```
sudo apt-get install veeam
```

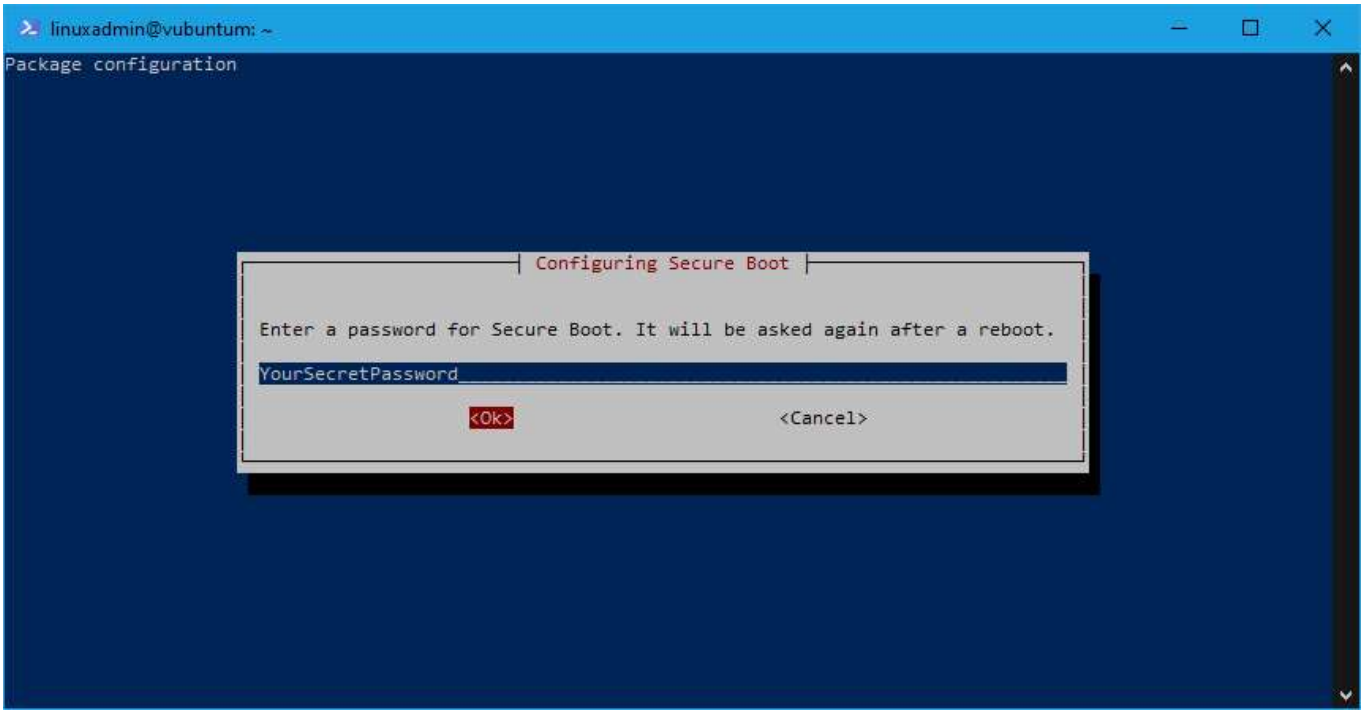
This can take a minute or so, and will run like this:



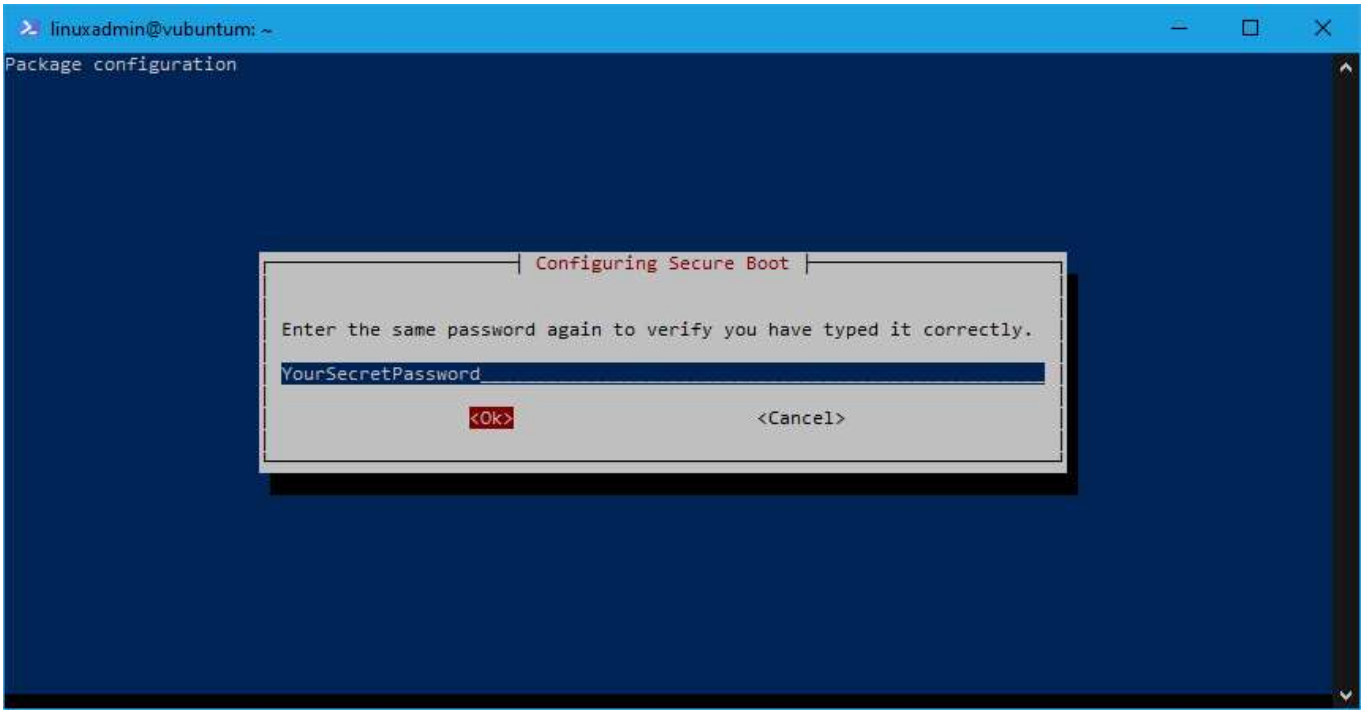
but you will hardly be able to see it, as it at once will pause to show the *Configuring Secure Boot* window as UEFI is enabled (which you should have):



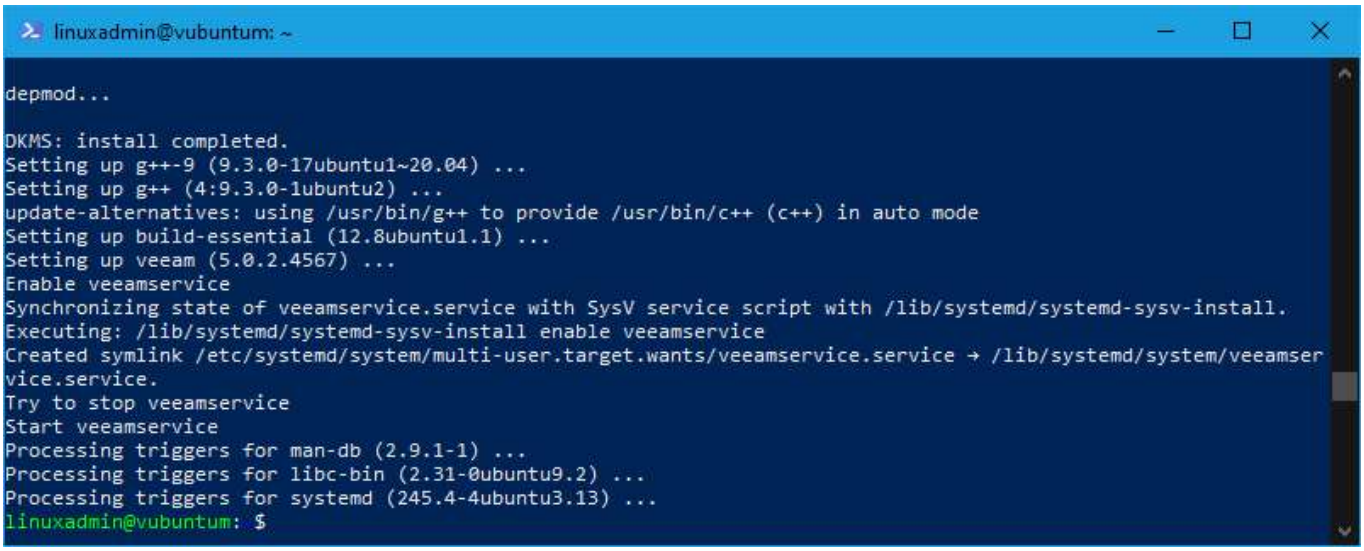
Press *OK* and enter your secret password for **MOK** (see later):



and confirm the password:



The install will now run to an end:

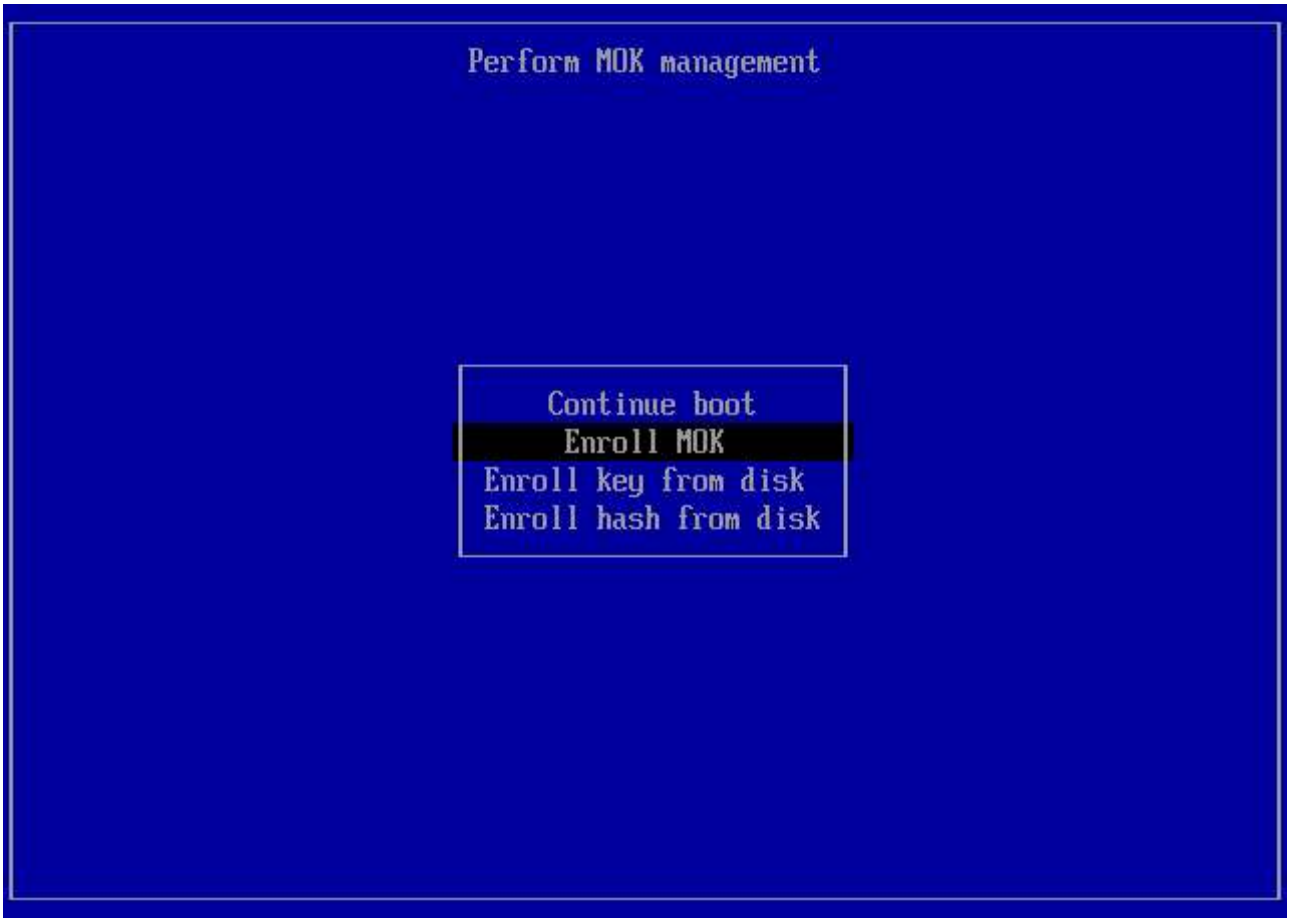


The *Veeam Agent for Linux* is now installed. Leave the remote control if you use this, and go to the physical machine and its keyboard to manage **MOK** (Machine Owner Key).

> **Important**
>
> *Do not proceed* further before you have enrolled the *Secure Boot* password entered above.
>
> To do so, don't use remote control, but *go to the physical console*

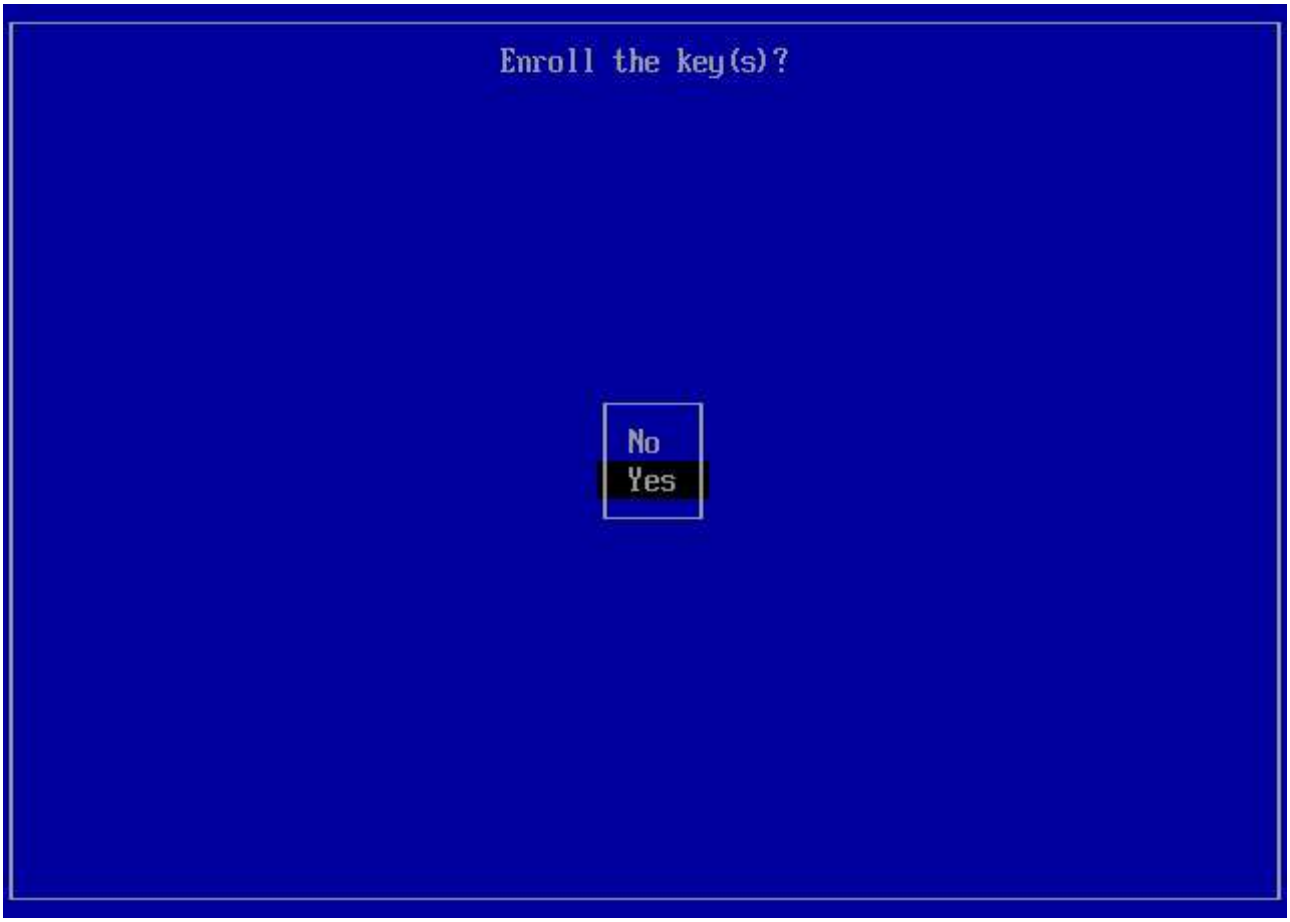
When you have approached the physical machine, reboot it.

When booted, it will at once launch the **MOK** management and display:

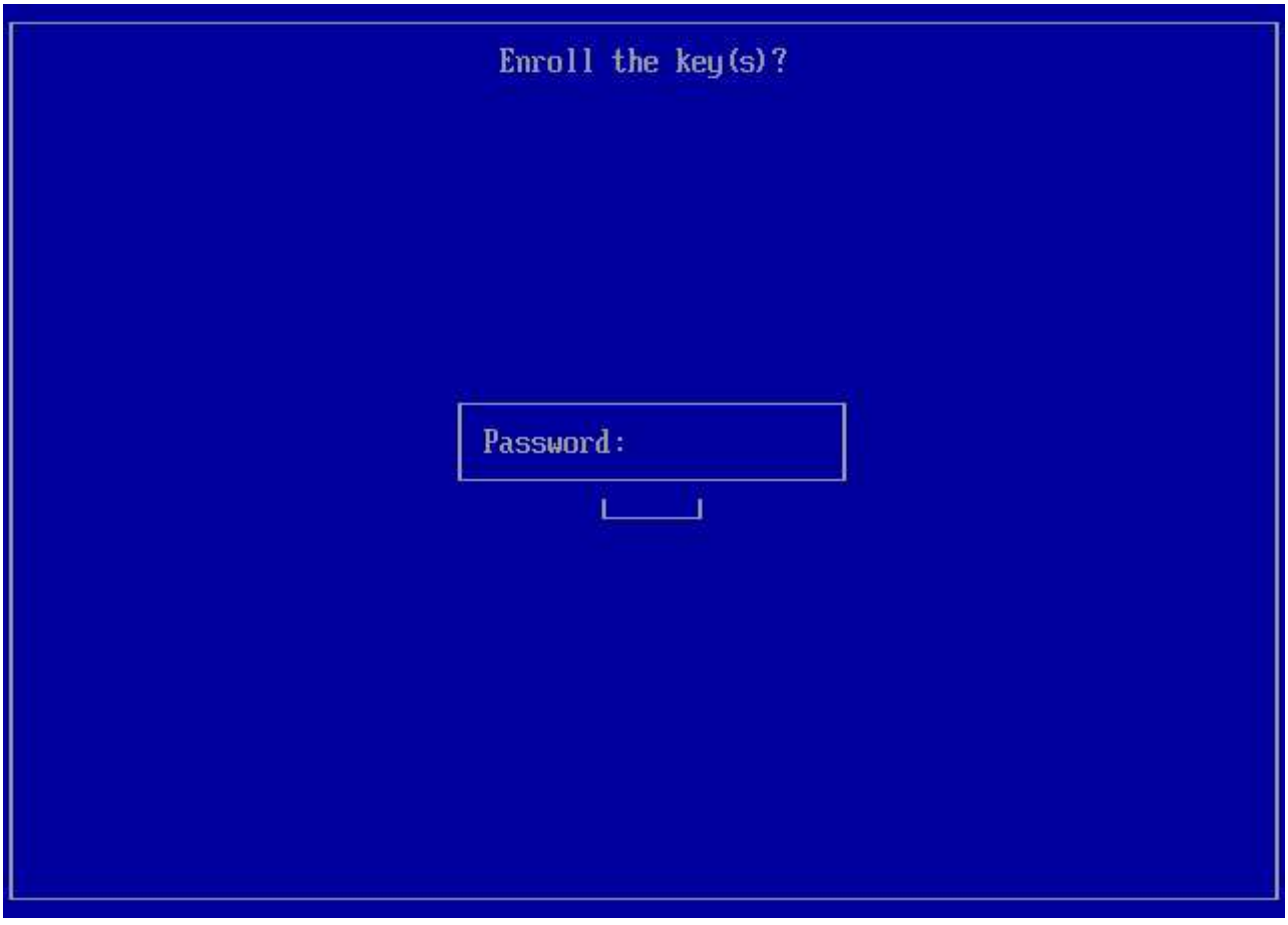


Select *Enroll MOK* and press *Enter* to proceed:

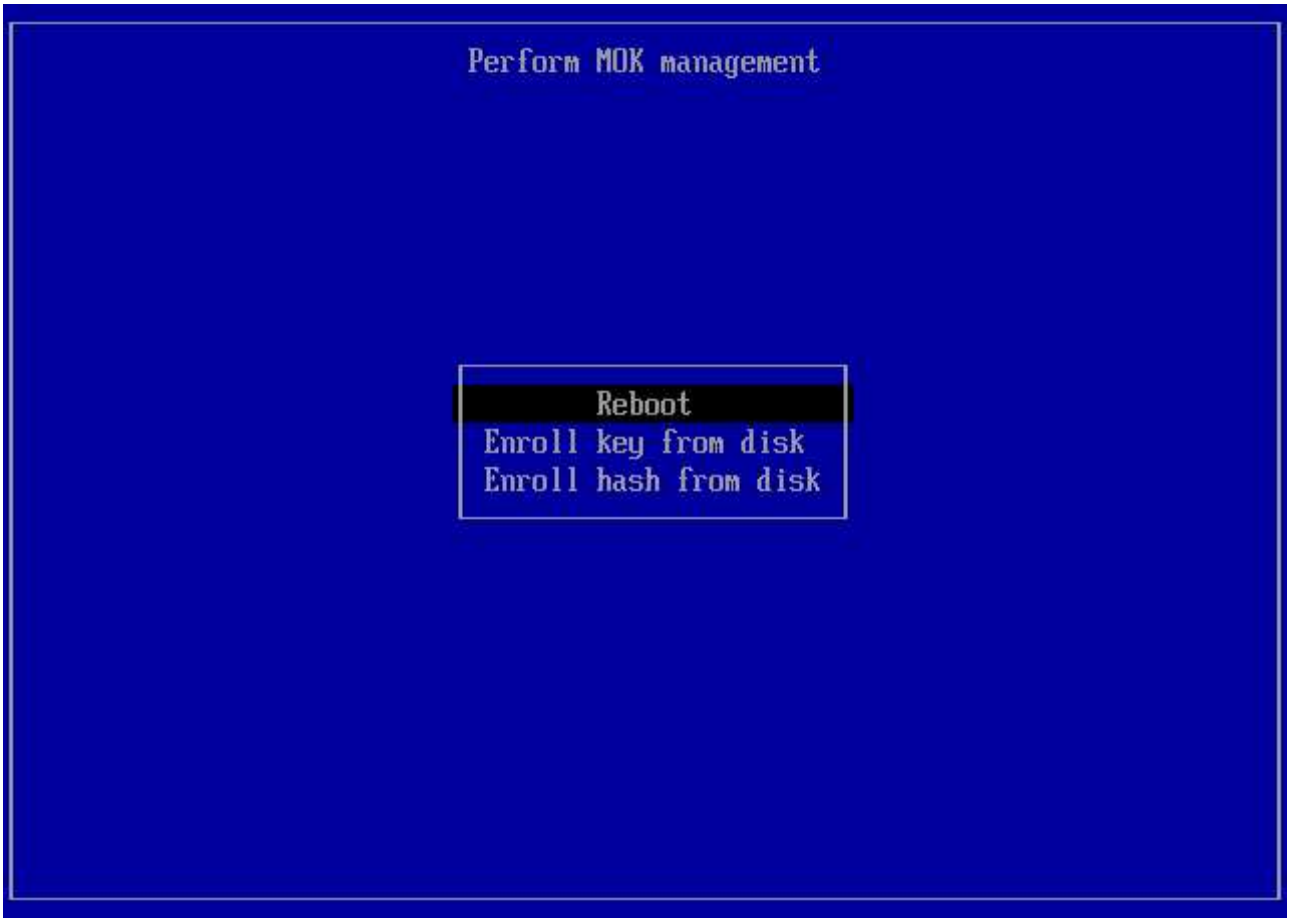
Select *Continue* and press *Enter* to proceed:



Select *Yes* and press *Enter* to proceed:



Enter the password (*YourSecretPassword* as you entered above) and press *Enter*:



You must reboot now, so select *Reboot* and press *Enter*.

The machine will restart, and then you can let the machine boot the normal way.

Proceed with the next steps.

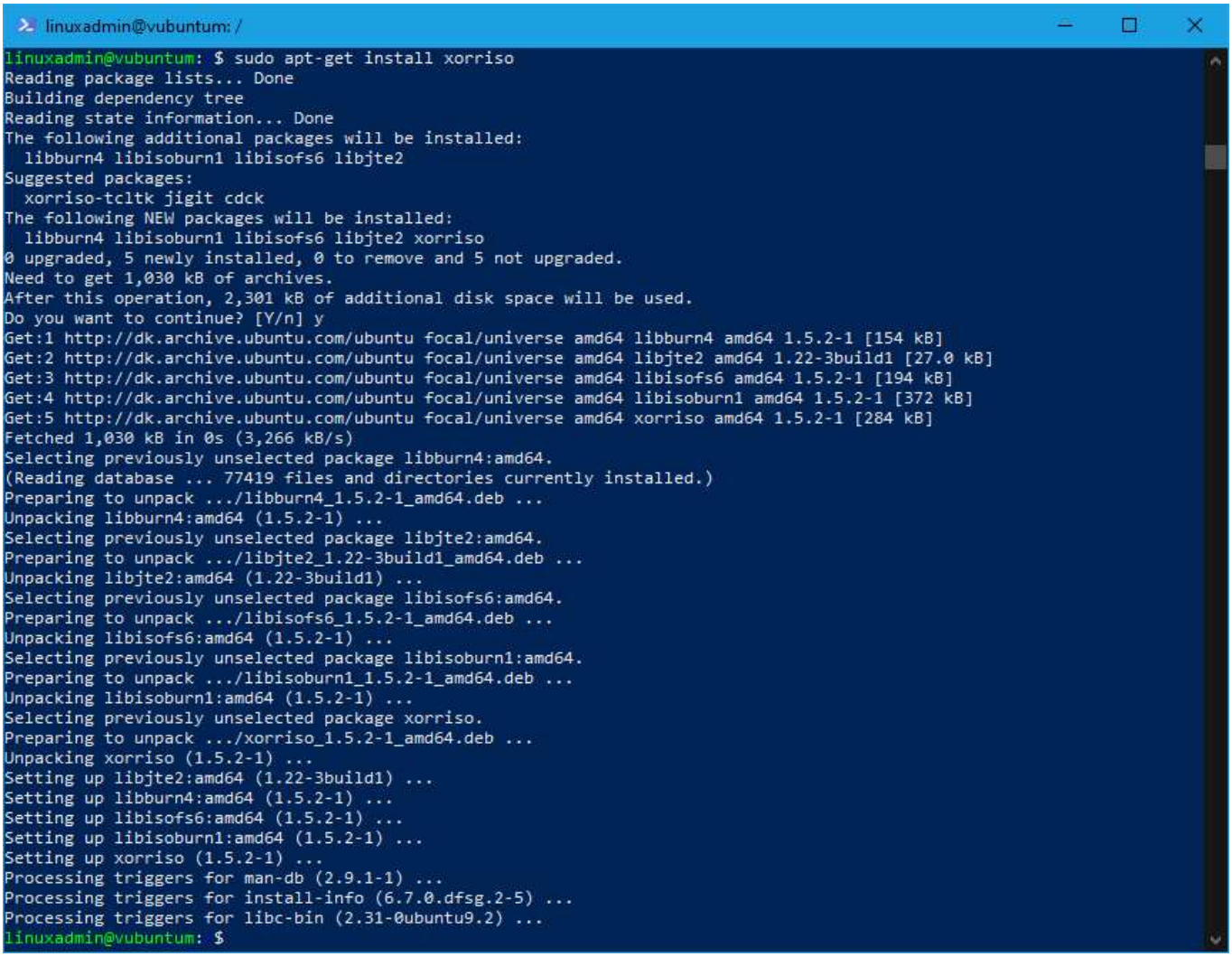
Prepare to create the recovery media

First, a module is needed, that the Veeam Agent for some reason doesn't check for. Install *xorriso*, or the recovery ISO can't be created.

Use this command:

```
sudo apt-get install xorriso
```

and it will quickly install:



Also, resources available for the Veeam Agent must be increased, or the creation of the ISO file will fail. Call this command:

```
sudo systemctl edit veeamservice.service
```

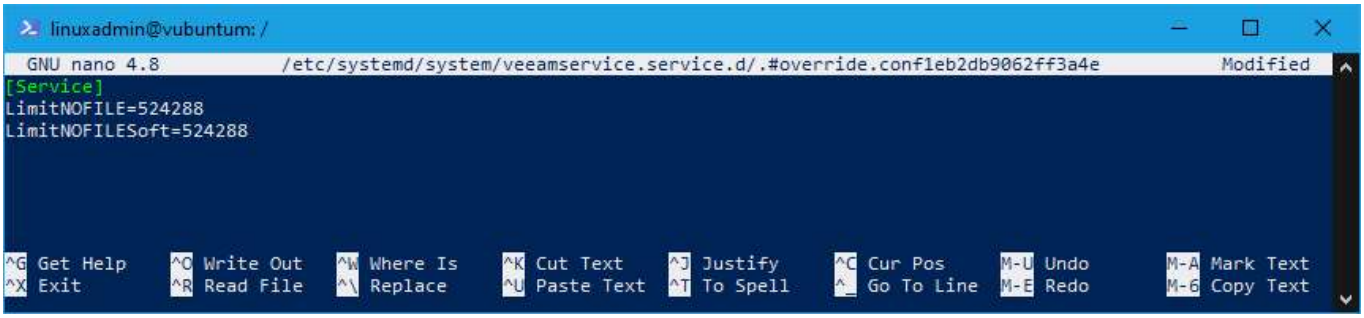
and the Nano editor will open its service file (it is blank).

Insert these lines:

```
[Service]
LimitNOFILE=524288
LimitNOFILESoft=524288
```

> As you will see, there are few rules in Linux; this file, for example, uses the well-known (if you are old enough) syntax of Windows INI files, but it is not named as such.

It should appear like this:



When confirmed, press *Ctrl+O* and *Enter* to save the file, and then *Ctrl+X* to exit.

Finally, restart the veeamservice with these commands:

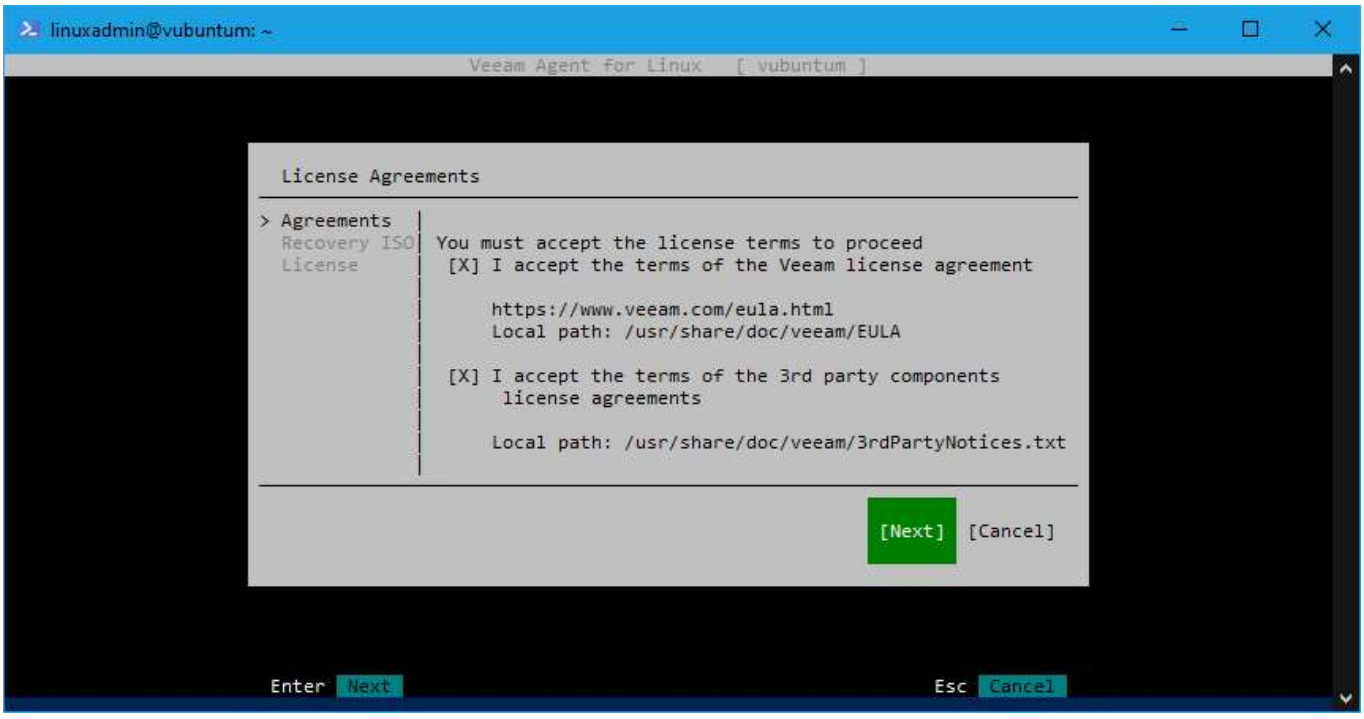
```
sudo systemctl daemon-reload
sudo systemctl restart veeamservice.service
```

Create the recovery ISO file

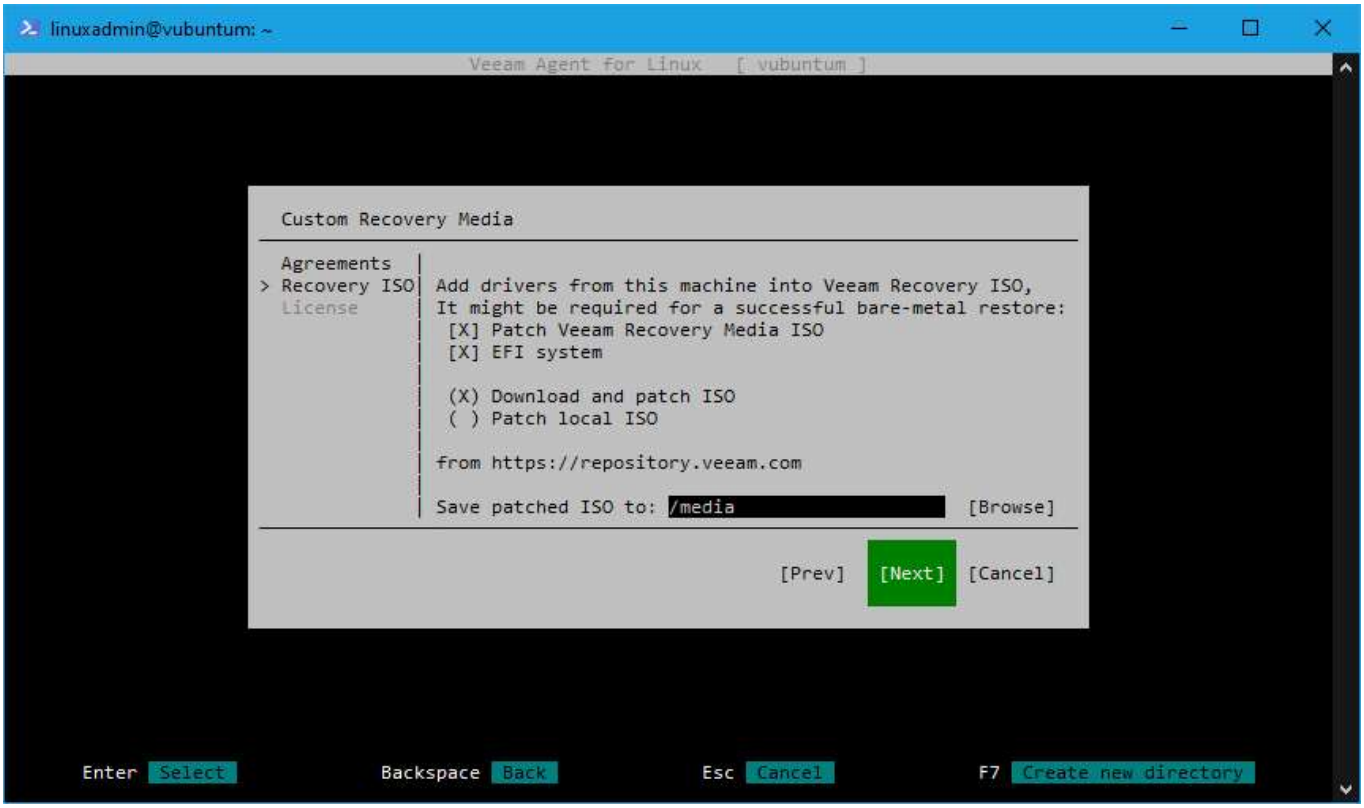
Now, open the *Veeam Agent* with this command:

```
sudo veeam
```

Accept the license terms:



Press *Enter* to open the *Custom Recovery Media* window:



Press *Tab* a couple of times to navigate to:

- Patch Veeam Recovery Media ISO

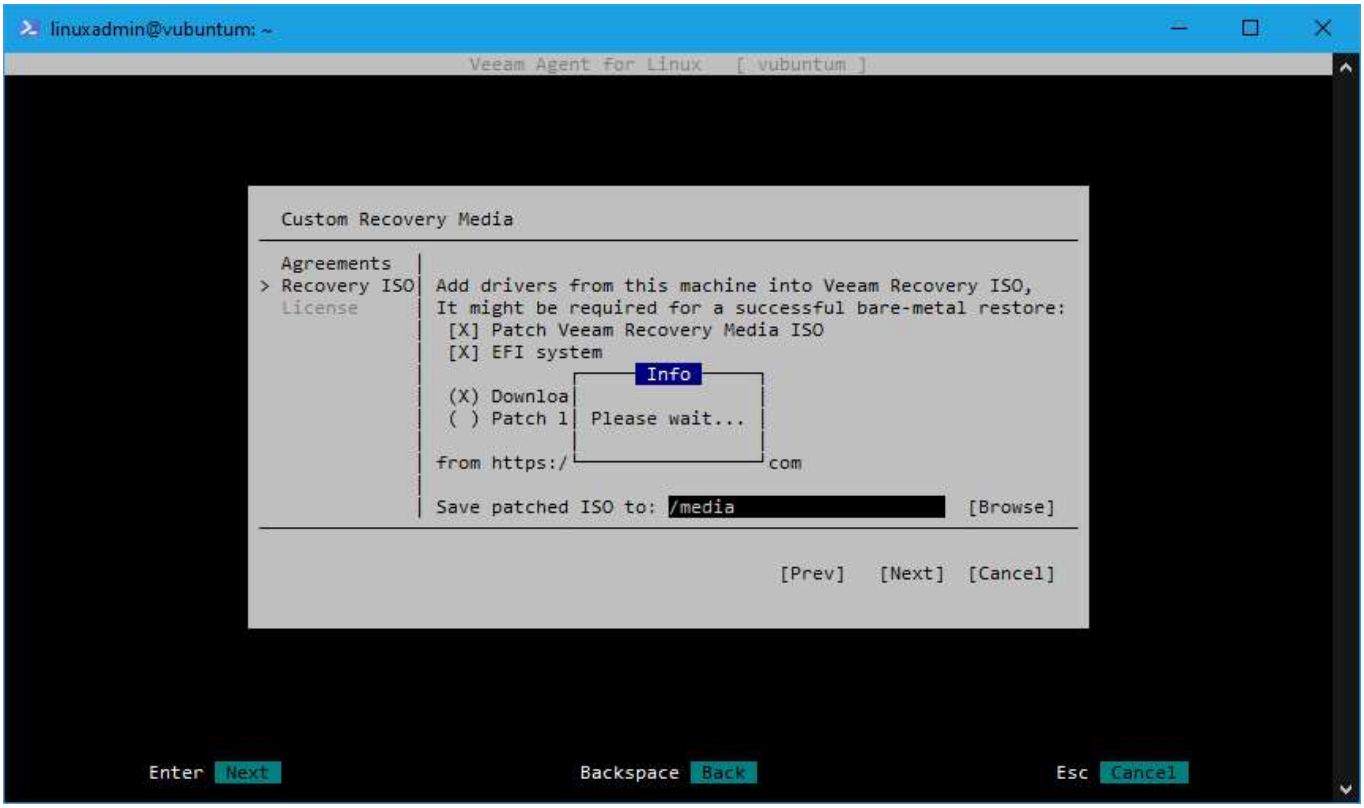
Mark this and the next entry, that will show up:

- EFI system

and select to *Download and patch ISO*.

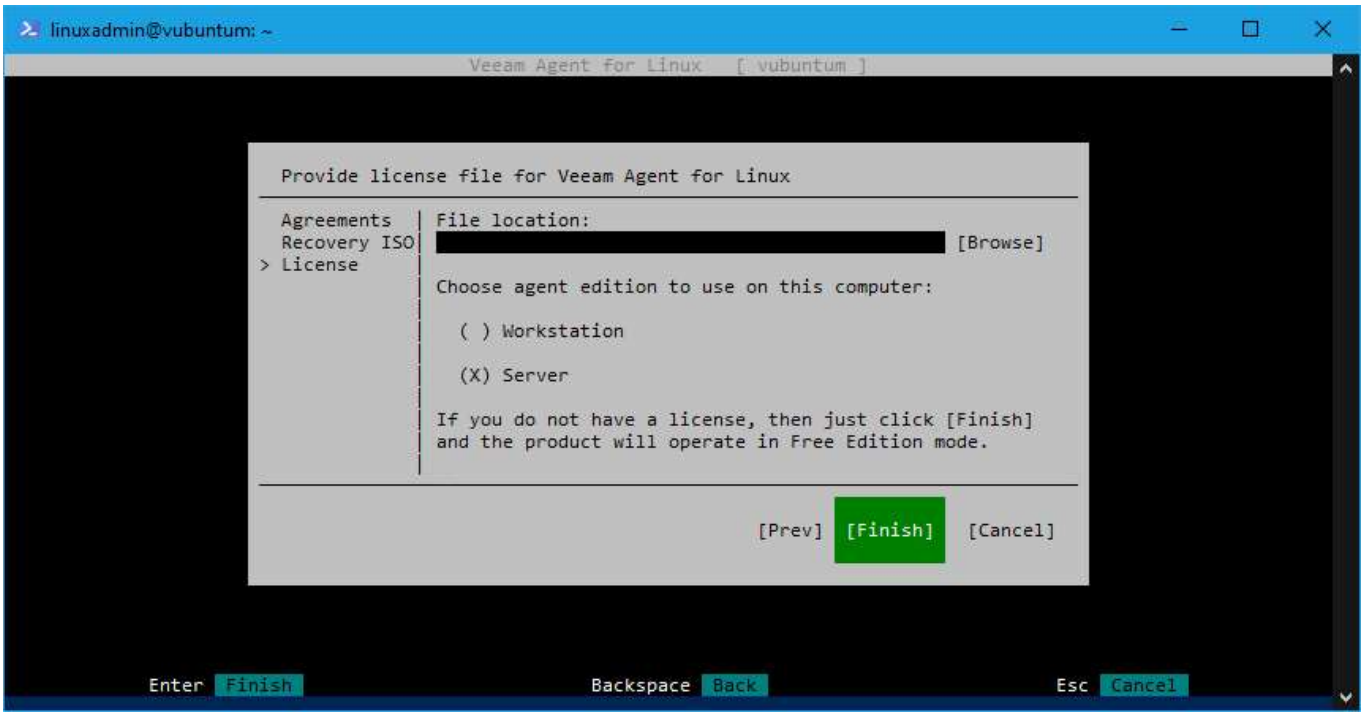
Also, fill in - or browse to and select - the folder where to save the patched ISO file. Here, */media* is chosen.

When ready, press *Finish*, and the ISO will be build:

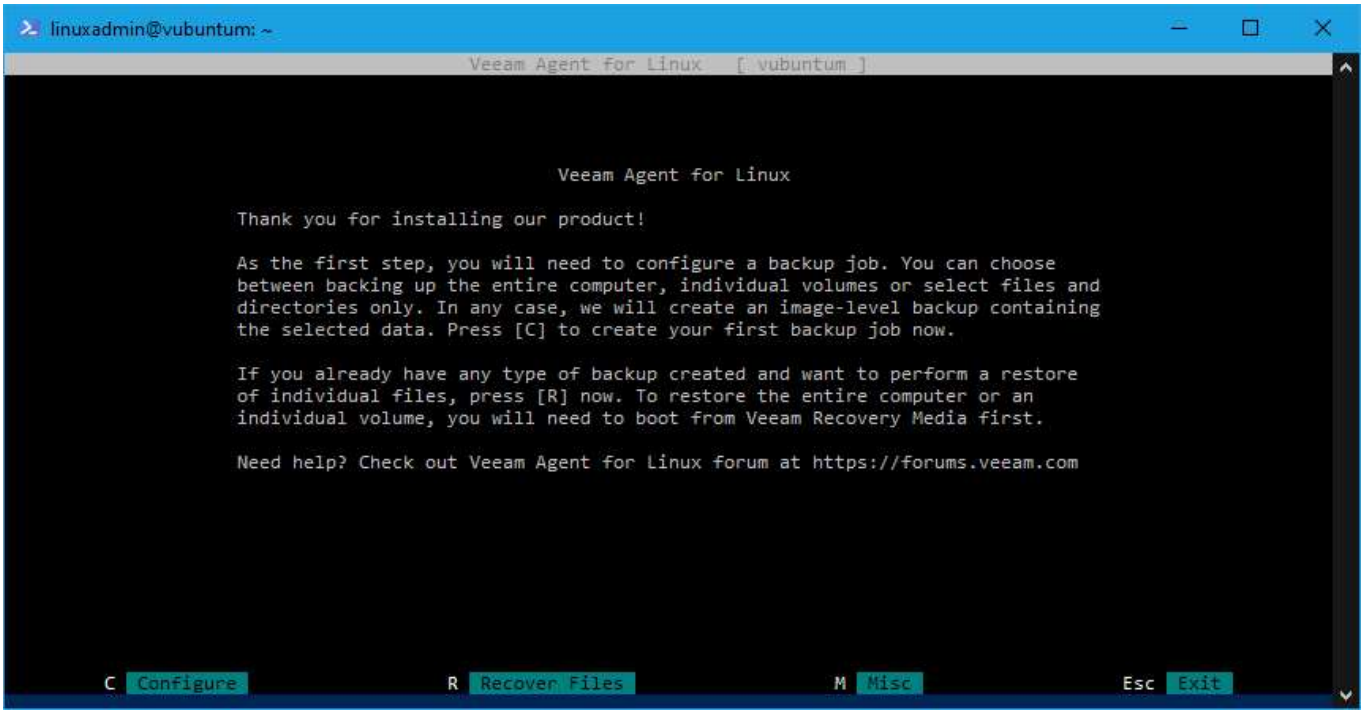


This will take a little while.

When done, the *license* window is displayed:



Select *Server* and click *Finish* to proceed, and the *Welcome* message will be displayed:



Press *Esc* to exit to the command line.

This concludes the installation of the *Veeam Agent for Linux* and the initial creation of a recovery ISO file that can be used for restoring the system.

Create the recovery media

Now, armed with the ISO file just created, it is time create the physical recovery media - an external USB drive.

It can be a stick or a SSD/harddisk as you prefer, but an old USB stick of decent quality will fit, as the requirements are very modest: A capacity of 1 GB will do for Ubuntu 20.x and 2 GB for 22.x.

Insert the USB drive in your Windows workstation and format the drive - preferably *not* using a quick format - to be sure it is absolutely healthy.

When done, insert the USB drive in the Linux server and run this command to list all the available drives:

```
sudo fdisk -l
```

The last disk listed should be the USB drive, most likely labeled */dev/sdg*:

```
Disk /dev/sdg: 960.77 MiB, 1007419392 bytes, 1967616 sectors
Disk model: PDU01_1G 63G2.0
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x00bbea81

Device     Boot Start     End Sectors   Size Id Type
/dev/sdg1  *     2048 1967615 1965568 959.8M  7 HPFS/NTFS/exFAT
```

When located, you can now copy the ISO file to the drive using the *dd* command.

Here, the file path and the drive respectively are:

- /media/veeam-recovery-amd64-5.0.0.iso
- /dev/sdg

and the full command will be (no line break):

```
sudo dd bs=4M if=/media/veeam-recovery-amd64-5.0.0.iso of=/dev/sdg
status=progress oflag=sync
```

Had you used an internal separate disk, it would most likely had been labelled */dev/sdc*.

When the copy is done, your recovery media is ready for use. However, for quick identification, do add a *label* to the drive, for example *VEEAM BOOT*, with this command:

```
$ sudo fatlabel /dev/sdg2 "VEEAM BOOT"
```

> If you are the cautious type, you will - of course - pick yet a USB drive and repeat the last steps to have a *spare recovery drive*, just in case.

Reinstall the *Veeam Agent for Linux*

In case a reinstall is desired or needed - to update or to correct some misbehaviour - first remove the agent. It can safely be done, as neither the backup job(s) configured, nor the backup history will be removed.

Use this command:

```
sudo apt-get remove veeam veeamsnap
```

Then perform the reinstallation like the install as described above.

Conclusion

The server has now been equipped with a top-class system backup, and a recovery media has been created. These make it possible to perform a *bare metal recovery* of the Linux system in case the system drive should cease to function.

However, first a backup job must be configured. This will be explained in detail in **Part 6** of this series:

Build an immutable backup repository for Veeam Backup & Replication. Part 6