

Creating LUKS Encrypted Volumes

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Creating LUKS Encrypted Volumes

OpenStack allows you to encrypt volumes **at rest** using **LUKS**. On NWS OpenStack, the **volume type** that provides encryption-at-rest is conveniently called **LUKS**. See below for further information and how to setup encrypted volumes.

How Does OpenStack Encrypt Volumes?

When you create an encrypted volume from the [Horizon UI](#) or the [OpenStack CLI](#), OpenStack will generate the necessary **encryption key** for you and store it in [Barbican](#), OpenStack's **key manager**. All LUKS encryption keys on NWS OpenStack use **256bit aes-xts-plain64 encryption**.

i As **Secrets** are billed on a per-secret basis in NWS OpenStack, each encrypted volume will incur **minimal additional cost** (0.40€ p. Secret p. Month, 03/2024)

When **attaching** an encrypted volume to a server, OpenStack will decrypt it in the background using the encryption key stored in Barbican. The attached volume can be handled and consumed on the server like any other (unencrypted) volume.

Creating Encrypted Volumes in OpenStack

Encrypted volumes can be created either from the [Horizon UI](#) or from the terminal using the [OpenStack CLI](#).

Using Horizon UI

In your OpenStack Horizon UI (at <https://cloud.netways.de>) make sure to pick the correct **project**, then follow the steps below:

1. Navigate to **Volumes > Volumes**
2. Click on **Create Volume**
3. **Configure** the volume
 1. **[Required]** Set a **name**
 2. **[Optional]** Set a **description**
 3. **[Required]** Pick a **volume source**
 4. **[Required]** Set **LUKS** as **Volume Type**
 5. **[Optional]** Adjust **volume size**
 6. **[Optional]** Pick a **volume group**
4. Confirm settings and create volume by clicking **Create Volume**

OpenStack will start creating the volume, which will appear listed under **Volumes > Volumes** upon reload.

Using OpenStack CLI

Source your `OpenStackRC.sh` file and pick the correct **project**:

```
source nws-id-openstack-rc.sh
```

```
Testing authentication and fetching project list ...
```

```
Please select one of your OpenStack projects.
```

```
1) 20631-openstack-04223 3) 5475-openstack-41b6b 5) 5475-openstack-8bdaf 7) 5475-openstack-a169e
2) 5475-openstack-1ccca 4) 5475-openstack-4745f 6) 5475-openstack-9d52e 8) 5475-openstack-c716d
```

```
Enter a number: 1
```

```
Selected project: 20631-openstack-04223
```

Then, create a new, encrypted volume like this:

```
openstack volume create \
```

```
--type LUKS \
--size <size> \
--description <description> \
--image <image> \
<name>
```

The following options can be passed as parameters:

- **<size>** : **size** of the volume in GB, **required** if **<image>** is **not** passed
- **<description>** : **description** of the volume, **optional**
- **<image>** : **image reference** if the volume should be based on an image, **optional**
- **<name>** : **name** of the volume, **required**

Attaching Encrypted Volumes to Servers

Encrypted volumes can be attached to servers either from the [Horizon UI](#) or from the terminal using the [OpenStack CLI](#), just like any other volume.

Using Horizon UI

In your OpenStack Horizon UI (at <https://cloud.netways.de>) make sure to pick the correct **project**, then follow the steps below:

1. Navigate to **Compute > Instances**
2. **Identify** the server you want to attach the volume to in the list
3. **Expand** the dropdown menu in the server's **Action** column
4. Click **Attach Volume** and select the **desired volume**
5. Confirm by clicking **Attach Volume**.

After a few seconds, the volume should be visible on the server at `/dev/sdX`

Using OpenStack CLI

Source your `OpenStackRC.sh` file and pick the correct **project**:

```
source nws-id-openstack-rc.sh
```

```
Testing authentication and fetching project list ...
```

```
Please select one of your OpenStack projects.
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```
1) 20631-openstack-04223  3) 5475-openstack-41b6b  5) 5475-openstack-8bdaf  7) 5475-openstack-a169e
2) 5475-openstack-1ccca  4) 5475-openstack-4745f  6) 5475-openstack-9d52e  8) 5475-openstack-c716d
Enter a number: 1
Selected project: 20631-openstack-04223
```

Then, attach the volume to a server like this:

```
openstack server add volume --device <device> <server> <volume>
```

The following options need to be passed as parameters:

- **<device>** : server internal **device name**, e.g. `/dev/sdb`, **required**
- **<server>** : **name** or **UUID** of the server to attach the volume to, **required**
- **<volume>** : **name** or **UUID** of the volume to attach to the server, **required**

After a few seconds, the volume should be visible on the server at `/dev/sdX`

Further Information

If you are looking for more detailed instructions on creating and mounting encrypted volumes or want to learn more

about encrypted volumes on OpenStack in general, see the links below:

- **NWS-Blogpost:** [LUKS Encrypted Storage on OpenStack](#)
 - **OpenStack Documentation:** [Volume encryption supported by the key manager](#)
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