

Deploying SUSE Linux Micro on vSphere Using VMDK Images

WHAT?

The article describes how to use the pre-built VMDK image to deploy SUSE Linux Micro within a vSphere environment.

WHY?

You want to deploy SUSE Linux Micro using the provided VMDK image with vSphere.

EFFORT

It takes 20 minutes to read the article.

GOAL

You will have your own template for creating SUSE Linux Micro virtual machines that you can easily reuse.

REQUIREMENTS

- Access to the vSphere client.

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1 Preparing the firstboot cloud-init configuration

The system is intended to be configured on first boot to create a user, add SSH keys, install packages, and so on. To enable this, you must create a cloud-init configuration and pass it to the virtual machine.

Before you compose the cloud-init configuration, prepare hashed passwords for users of the system, as described in the following procedure:

PROCEDURE 1: CREATING A PASSWORD HASH

1. Generate a salt to include in the password hash:

```
> openssl rand -hex 16  
  
ab5c3063ff477c689288bb3891910023
```

Note the output of the command and use it in the following step.

2. Choose a strong password and generate a hash from it:

```
> openssl passwd -6 -salt ab5c3063ff477c689288bb3891910023  
password  
  
$6$ab5c3063ff477c68$ywRiGL2w2MNmnabhw1C5wjIioDC6lbcTs.tBoSK/d3bqggfD/  
nvkjB4Nw.uZrUvRQfuKLJi79SnQvxM1Xv260
```

Use the prepared hash in the cloud-init configuration described below.

An example cloud-init configuration follows:

```
#cloud-config  
package_update: true  
# disable root user  
disable_root: true  
runcmd:  
# Disable root login over ssh, both password and key based  
- transactional-update --continue run sed -i 's/#PermitRootLogin prohibit-password/  
PermitRootLogin no/' /usr/etc/ssh/sshd_config  
# Temporarily register template machine with scc to enable zypper repos  
- transactional-update --continue register --url https://scc.suse.com -r SCCREGCODEXXX  
# Install system packages  
- transactional-update --continue --non-interactive pkg install jq net-tools ca-  
certificates cloud-init cloud-init-config-suse openssh-server open-vm-tools nfs-client  
# Disable Auto update transaction-update.timer
```

```

- transactional-update --continue run systemctl --now disable transactional-
update.timer
# Set cgroupv1 hierarchy enabled
- sed -i 's/GRUB_CMDLINE_LINUX=""/'
GRUB_CMDLINE_LINUX="systemd.unified_cgroup_hierarchy=0" /etc/default/grub
# Disable selinux
- sed -i 's/selinux=1/selinux=0/' /etc/default/grub
# Enable ia32_emulation
- sed -i 's/GRUB_CMDLINE_LINUX_DEFAULT="/
GRUB_CMDLINE_LINUX_DEFAULT="ia32_emulation=on /' /etc/default/grub
- sed -i 's/GRUB_TIMEOUT=.* /GRUB_TIMEOUT=0/' /etc/default/grub
# Potential Work Around for fsck issue
- transactional-update --continue run dracut --regenerate-all -f -N
# Deregister template machine from scc
- transactional-update --continue register -d --url https://scc.suse.com -r
SCCREGCODE ❶
# Rebuild bootloader
- transactional-update --continue run update-bootloader
# Reset cloud-init for next build
- transactional-update --continue run cloud-init clean --logs

users:
# Add non-root user
- name: tux ❷
  hashed_passwd: $6$ab5c3063ff477c68$ywrIGL2w2MnMnnabhw1C5wjIioDC6lbcTs.tBoSK/d3bqggfD/
nvkjB4Nw.uZrUvRQfuKLJi79SnQvxM1Xv260 ❸
  lock_passwd: false
  shell: /bin/bash
# Add sudo entry for non-root user
  sudo: ALL=(ALL) NOPASSWD:ALL
# Add authorized keys
  ssh_authorized_keys: ❹
    - ssh-rsa
      AAAAB3NzaC1yc2EAAAABJQAAAQEAKw7bd2iQBx8/A5pAbN207oWgcrV0lXgUHT2RZI/r/
xbb9/ydLKCUBqmYhSKgBF80KJoWvE3cPeUDfThqo+qLlIvc9vrTYZDMB+7wP/XGtA99jqFQsXDyC2gb8H/
yKIRKu9eSrY9BHW9el80bpdXPID0YbxWYGJoxib5D04mg3WtGIv9MeW4bvgoMj1ZhKMFrq2tYGv3P1MpuNgkLwsGmUW
+rIOVjhCEUz3KSr2+4Efcus0V6FD32SHkIgeNy3C5MT10e6hk0bsUx/
fZ9KS9YHX6b3LuIjkw1FuZBCByMgMwa4j09QK/y76YM0FH0QtXh0szSuEkHtl6ijeejZYPtQ==
    - ssh-rsa
      AAAAB3NzaC1yc2EAAAADAQABAAQgQDZxAsYNJS266jPpWEsJwyibfZJN6FPNMHMxw9Plru0XJLrVdXc1wgo23d4c1BbaGiRoXW3xw
+QgtW1rC0YtHLGtVfIh6L5Y0SVrG0tDSVIpWYtMnt4YBfZfBeDyJfnuvZ5E8CMNI1CekzfT7FgZnF1TQig0Kg08MUUS3HTNd3oly8D
+80p75i2FE3QEMfHijXiuUbdEPTN8L2XSRe8nX7c3NZ05hWV
+t9wLyfZgc5qHC5CS9fN1vGfLTpjQoaRoxKCS9dFJKVDg4huHc0z1go0YAQy6Ef
+c7gkQv1ZV7VATTU9kVQW0y7+gzXnwoFXSg2qmn3JiJPVMDift2yozzpF
+04GpC9dgp1BcugZT5Bg3TNPcfEBLGcNgIAC/bYma1z6+TDee0RDkWLg8JsCw554QCDI/B7Is1DZ/
J4gTkm01MNw3mM=

```

```
# set desired power_state after cloud-init finishes
power_state:
  mode: poweroff
  message: Powering Off for Templating
  timeout: 10
  condition: True
```

- ② Specify the desired user name.
- ① Replace the `SCCREGCODE` with your registration code.
- ③ Paste the password hash you created in *Procedure 1, "Creating a password hash"*.
- ④ Paste your own SSH keys there.

After you finish editing the cloud-init config, convert it to the Base64 encoding:

```
> base64 -w 0 CONFIG_FILE OUTPUT_FILE
```

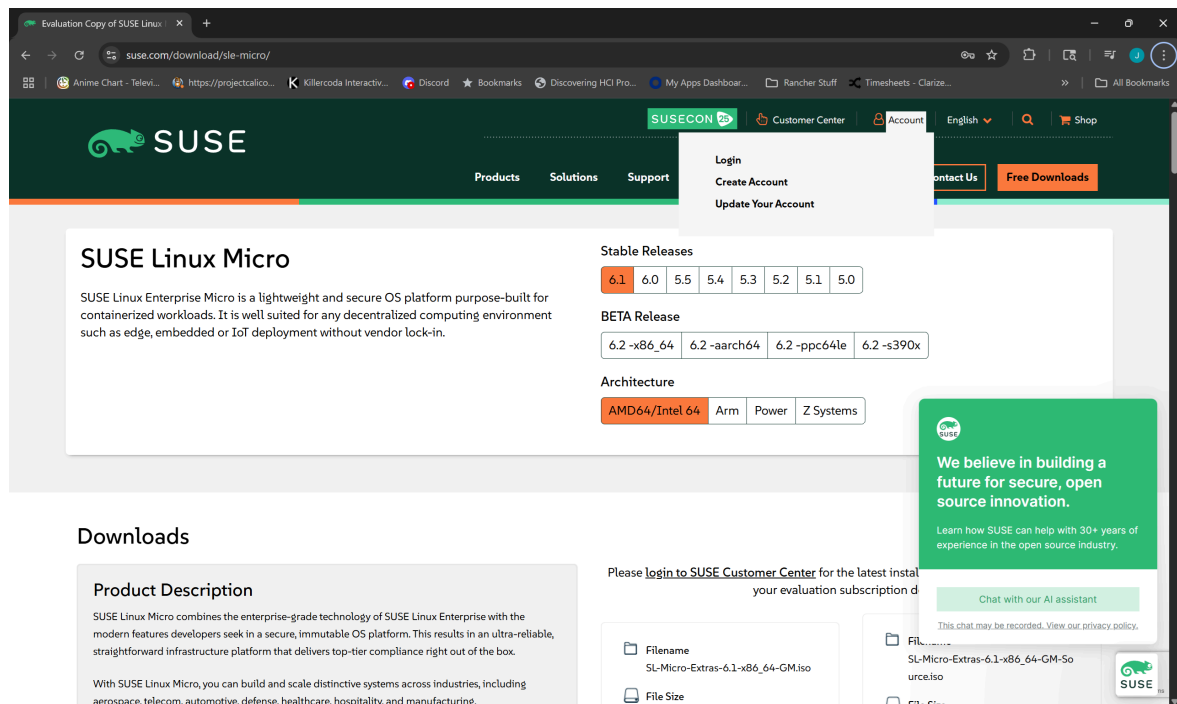
2 Preparing the SUSE Linux Micro image

The topic covers downloading the image and uploading it to the vSphere datastore.

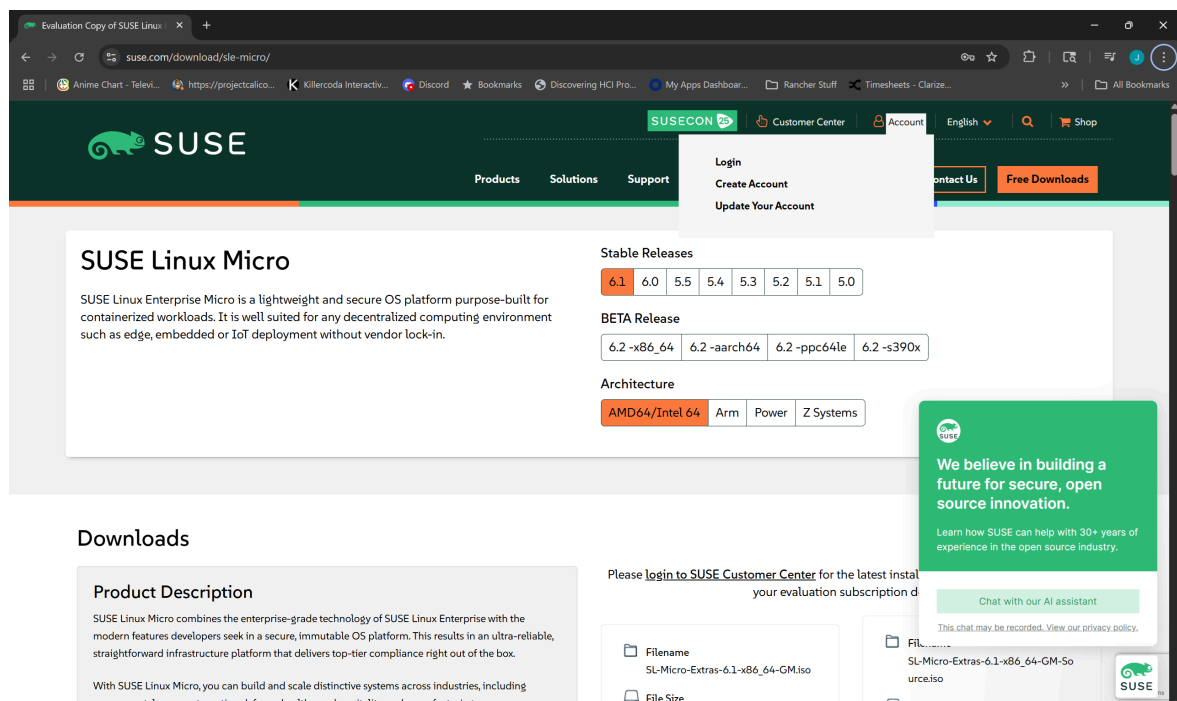
2.1 Downloading the image

To download the VMDK image of SUSE Linux Micro, proceed as follows:

1. In your Web browser, navigate to the [SUSE Linux Micro download page \(https://www.suse.com/download/sle-micro/\)](https://www.suse.com/download/sle-micro/).
2. Login to the SUSE Customer Center by clicking *Login* from *Account*.



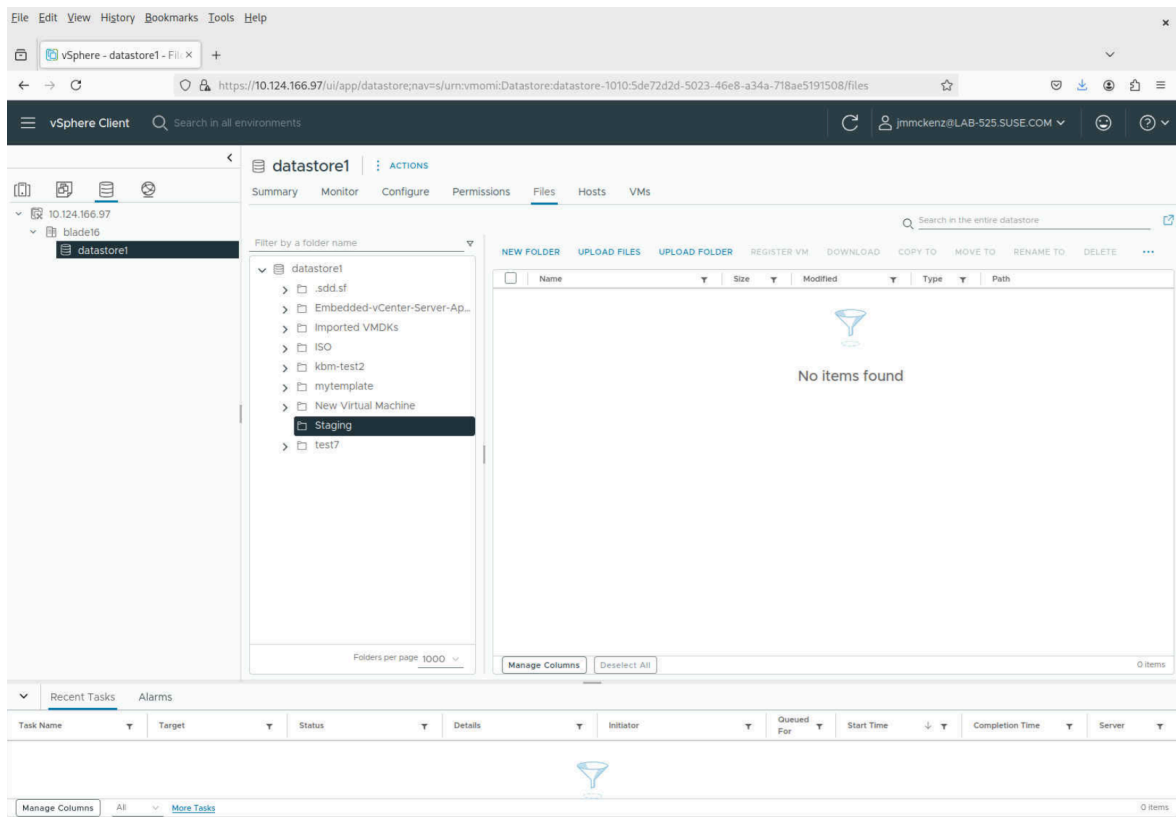
3. Fill in your credentials and, if prompted for two-factor authentication, follow the instructions.
4. Find the VMDK image and click *Download*.



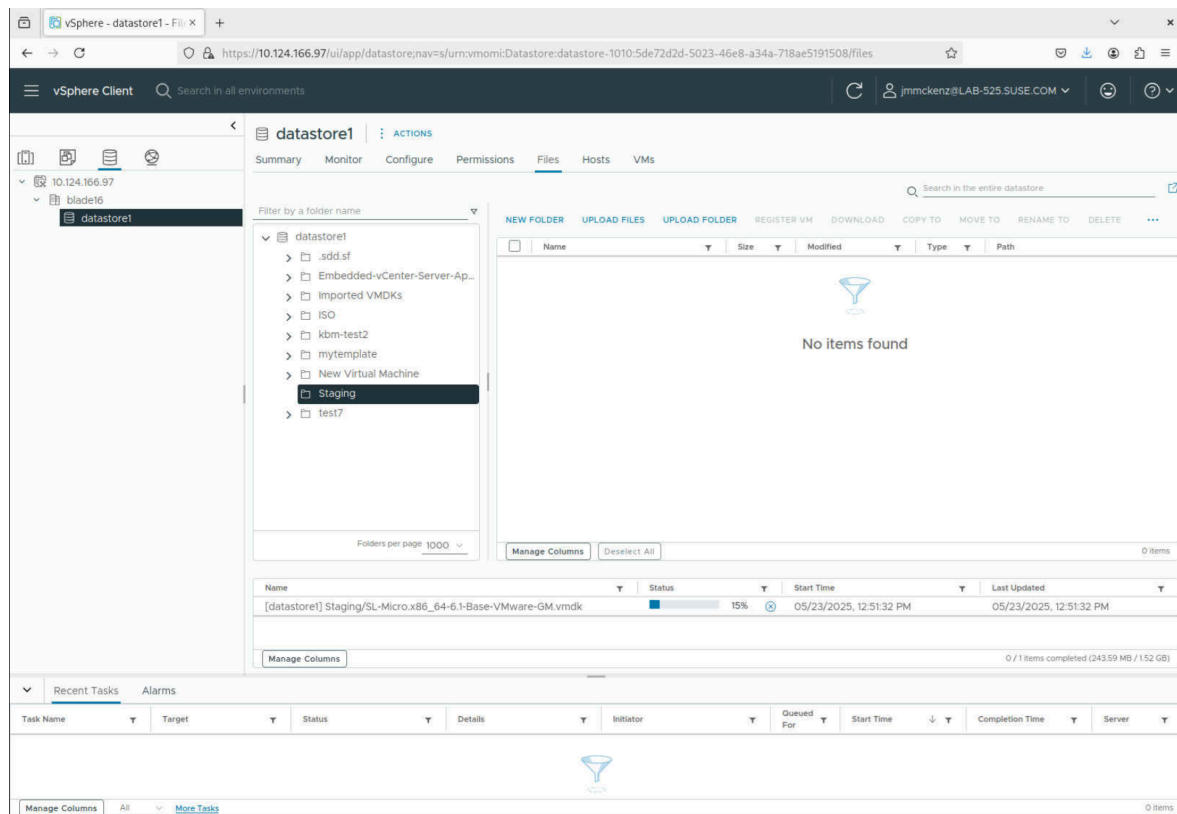
2.2 Uploading the image to the datastore staging area

To upload the downloaded VMDK image to the vSphere datastore, proceed as described below:

1. Open the vSphere client and navigate to the Datastore Staging Area.



2. Click *Upload Files*.
3. Select the SUSE Linux Micro VMDK image and click *Open*.



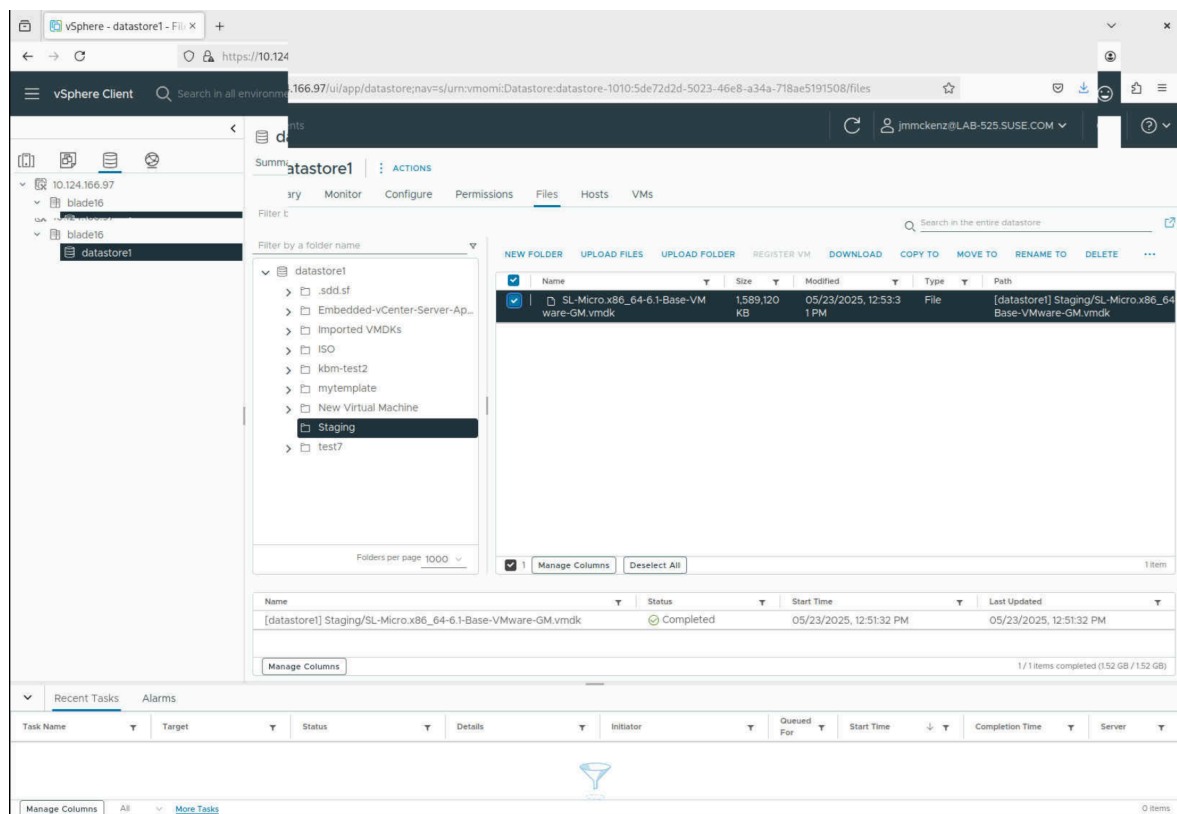
3 Creating a template from the delivered VMDK image

Creating a virtual machine template with a preconfigured SUSE Linux Micro accelerates future deployment and keeps the delivered image untouched.

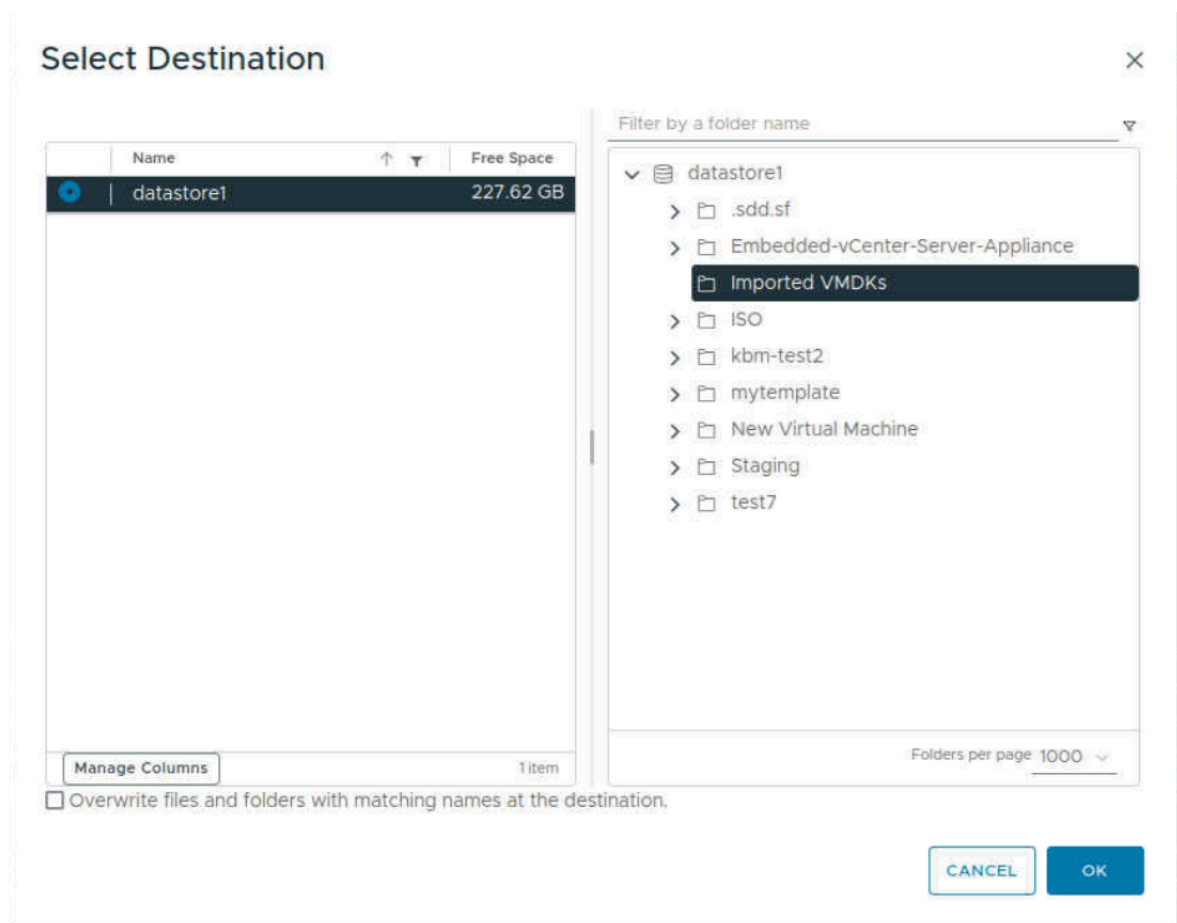
To create the template, you first need to import the SUSE Linux Micro VMDK image, then create a machine from the imported image and then convert the machine into a template. All steps are described in the following sections.

3.1 Importing the VMDK image

1. Navigate to the *Staging* area and select the uploaded image.



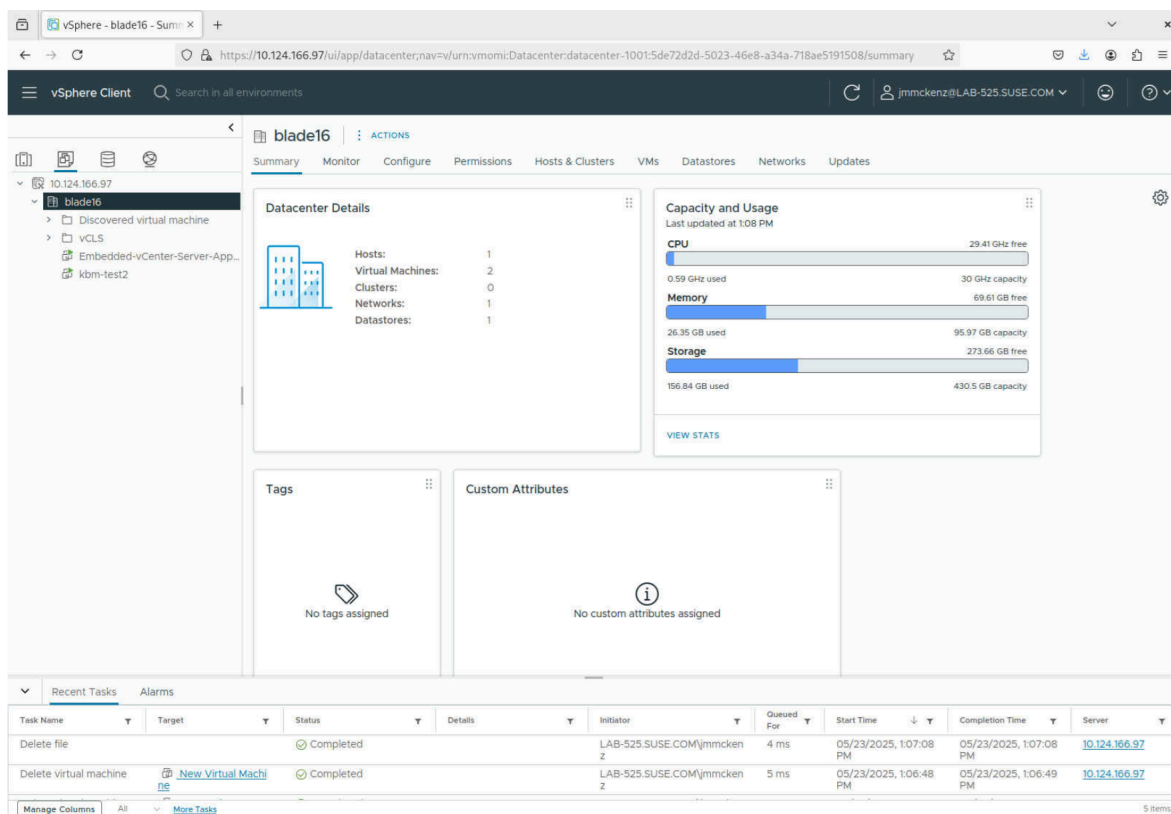
- Click **MOVE TO** to copy the image to the *Imported VMDKs* location and confirm with **OK**. Wait for the process to be complete.



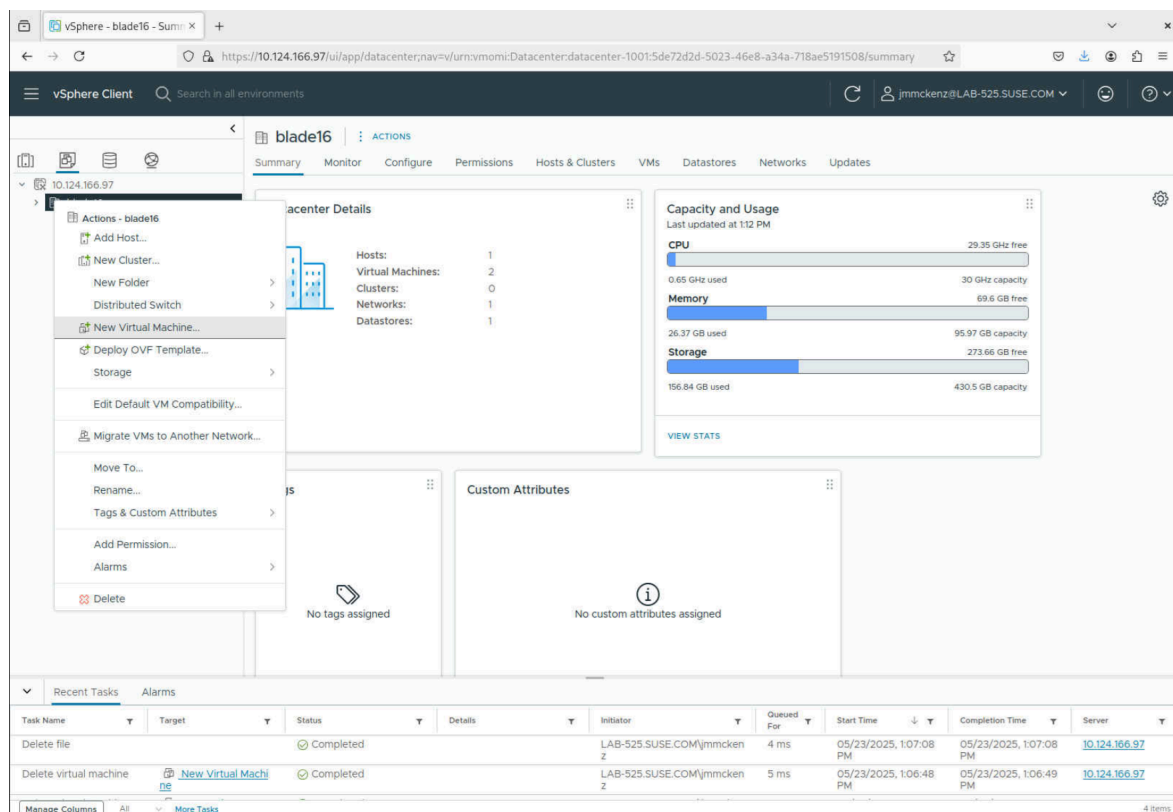
3.2 Creating a virtual machine

Now you need to create a virtual machine from the image. To do so, proceed as follows:

1. Navigate to the *VMs and Templates* view.



- Right-click the cluster and host where you want to create the virtual machine, and select *New Virtual Machine*.



3. The wizard for adding virtual machine details opens. See details in the following procedure.

The following procedure describes how to provide virtual machine details.

1. Under *Select a creation type*, choose *Create a New Virtual Machine* and proceed with *Next*.

New Virtual Machine

- 1 Select a creation type
- 2 Select a name and folder
- 3 Select a compute resource
- 4 Select storage
- 5 Select compatibility
- 6 Select a guest OS
- 7 Customize hardware
- 8 Ready to complete

Select a creation type

How would you like to create a virtual machine?

- Create a new virtual machine
- Deploy from template
- Clone an existing virtual machine
- Clone virtual machine to template
- Convert template to virtual machine
- Clone template to template

This option guides you through creating a new virtual machine. You will be able to customize processors, memory, network connections, and storage. You will need to install a guest operating system after creation.

CANCEL
NEXT

2. Under *Select a name and folder*, fill in the *Virtual machine name* and select a location for the machine. Proceed with *Next*.

New Virtual Machine

1 Select a creation type

2 Select a name and folder

3 Select a compute resource

4 Select storage

5 Select compatibility

6 Select a guest OS

7 Customize hardware

8 Ready to complete

Select a name and folder ×

Specify a unique name and target location.

Virtual machine name: slmicro-6-1-template

Select a location for the virtual machine.

10.124.166.97

blade16

CANCEL BACK NEXT

3. Under *Select a compute resource*, click the destination machine IP address on the list. Proceed with *Next*.

New Virtual Machine

1 Select a creation type

2 Select a name and folder

3 Select a compute resource

4 Select storage

5 Select compatibility

6 Select a guest OS

7 Customize hardware

8 Ready to complete

Select a compute resource

Select the destination compute resource for this operation

blade16

10.124.165.59

Compatibility

✓ Compatibility checks succeeded.

CANCEL

BACK

NEXT

4. Under *Select storage*, click the target datastore on the right and click *Next*.

New Virtual Machine

- Select a creation type
- Select a name and folder
- Select a compute resource
- Select storage**
- Select compatibility
- Select a guest OS
- Customize hardware
- Ready to complete

Select storage

Select the storage for the configuration and disk files

☐ Encrypt this virtual machine (Requires Key Management Server)

VM Storage Policy Datastore Default

☐ Disable Storage DRS for this virtual machine

	Name	Storage Compatibility	Capacity	Provisioned	Free	Type
	datastore1	--	430.5 GB	811.09 GB	273.66 GB	VMFS

Manage Columns Items per page 10 1 item

Compatibility

✓ Compatibility checks succeeded.

CANCEL
BACK
NEXT

5. Under *Select compatibility*, select *ESX 6.7 and later* and proceed with *Next*.

New Virtual Machine

- Select a creation type
- Select a name and folder
- Select a compute resource
- Select storage
- Select compatibility
- Select a guest OS
- Customize hardware
- Ready to complete

Select compatibility

Select compatibility for this virtual machine depending on the hosts in your environment
The host or cluster supports more than one VMware virtual machine version. Select a compatibility for the virtual machine.

Compatible with: ESXi 6.7 and later ⓘ

This virtual machine uses hardware version 14, which is compatible with ESXi 6.7 and later. Some virtual machine hardware features are unavailable with this option.

CANCELBACKNEXT

6. Under *Select a guest OS*, choose *Linux* as the *Guest OS Family* and as the *Guest OS Version*, select *SUSE Linux Enterprise 15 (64-bit)*. Proceed with *Next*.

New Virtual Machine

1 Select a creation type

2 Select a name and folder

3 Select a compute resource

4 Select storage

5 Select compatibility

6 Select a guest OS

7 Customize hardware

8 Ready to complete

Select a guest OS

Choose the guest OS that will be installed on the virtual machine

Identifying the guest operating system here allows the wizard to provide the appropriate defaults for the operating system installation.

Guest OS Family:

Linux

Guest OS Version:

SUSE Linux Enterprise 15 (64-bit)

Compatibility: ESXi 6.7 and later (VM version 14)

CANCEL

BACK

NEXT

7. Under *Customize hardware*, perform the following steps:

- a. Remove the preconfigured hard disk.

New Virtual Machine

- Select a creation type
- Select a name and folder
- Select a compute resource
- Select storage
- Select compatibility
- Select a guest OS
- Customize hardware**
- Ready to complete

Customize hardware

Configure the virtual machine hardware

Virtual Hardware VM Options Advanced Parameters

[ADD NEW DEVICE](#)

> CPU	1		
> Memory	1	GB	
> New Hard disk *	16	GB	
> New SCSI controller	VMware Paravirtual		Remove device
> New Network	VM Network	<input checked="" type="checkbox"/> Connected	
> New CD/DVD Drive	Client Device	<input type="checkbox"/> Connect At Power On	
> Video card	Specify custom settings		
> New SATA Controller	New SATA Controller		
> Other	Additional Hardware		

Compatibility: ESXi 6.7 and later (VM version 14)

[CANCEL](#) [BACK](#) [NEXT](#)

b. Click *ADD NEW DEVICE* and *Existing Hard Disk*.

New Virtual Machine

- Select a creation type
- Select a name and folder
- Select a compute resource
- Select storage
- Select compatibility
- Select a guest OS
- Customize hardware**
- Ready to complete

Customize hardware

Configure the virtual machine hardware

Virtual Hardware VM Options Advanced Parameters

New Hard disk will be removed. [Undo](#) [X](#)

[ADD NEW DEVICE](#)

> CPU	1		
> Memory	1	GB	
> New SCSI controller	VMware Paravirtual		
> New Network	VM Network	<input checked="" type="checkbox"/> Connected	
> New CD/DVD Drive	Client Device	<input type="checkbox"/> Connect At Power On	
> Video card	Specify custom settings		
> New SATA Controller	New SATA Controller		
> Other	Additional Hardware		

Compatibility: ESXi

[CANCEL](#) [OK](#)

Disks, Drives and Storage

Hard Disk

Existing Hard Disk

RDM Disk

Host USB Device

NVDIMM

CD/DVD Drive

Controllers

NVMe Controller

SATA Controller

SCSI Controller

USB Controller

Other Devices

PCI Device

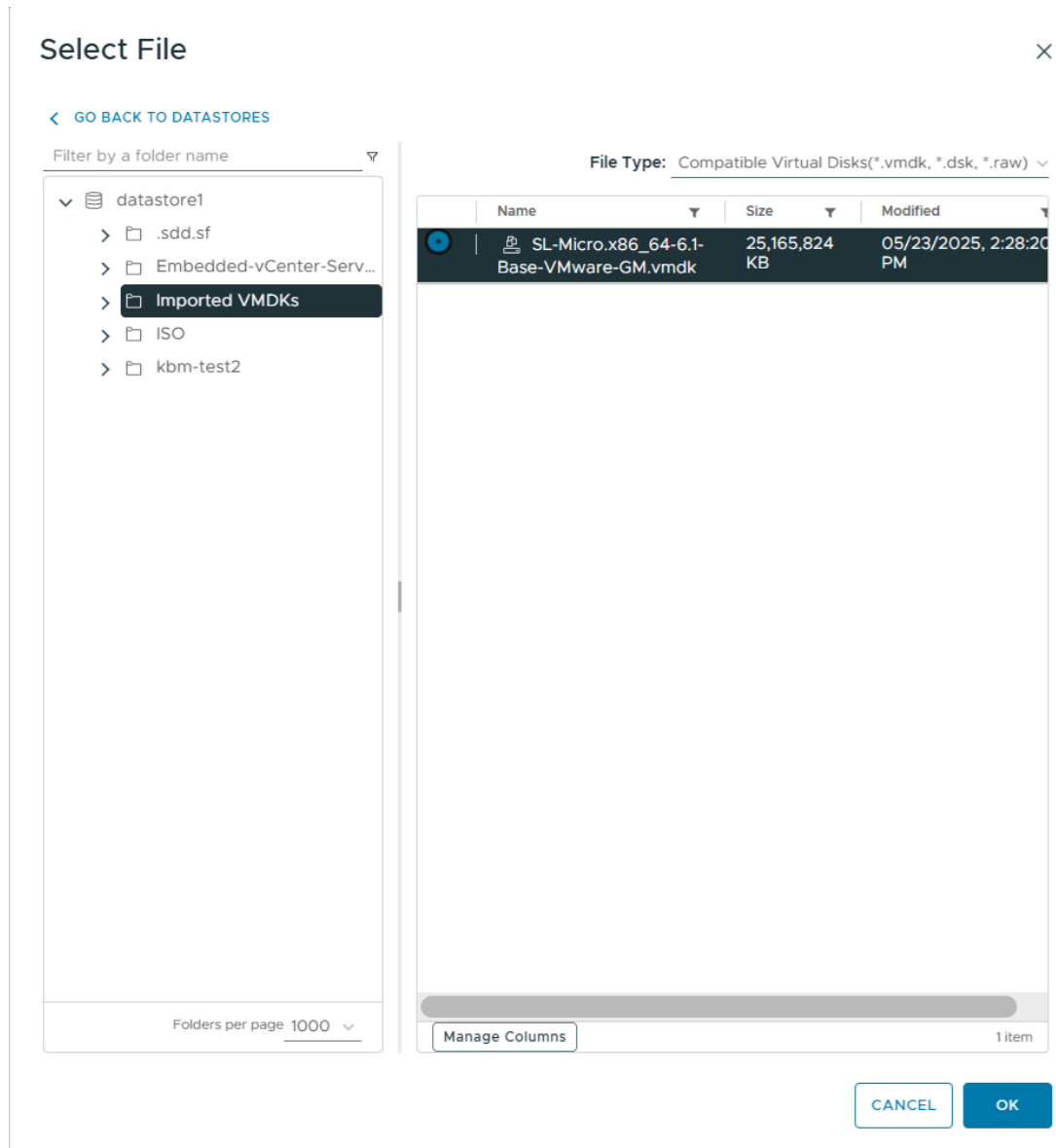
Serial Port

Network

Network Adapter

c. Select a datastore and click *OK*.

- d. In the *Select File* window, under *Imported VMDKs*, select the SUSE Linux Micro image and proceed with *OK*.



- e. Click *Advanced Parameters*. Set the *Attribute* to `guestinfo.userdata.encoding` and set its value to `base64`. Click *Add*.
Add another *Attribute*, `guestinfo.userdata`, and set its value field to the encoded user data.
Proceed with *Next*.

New Virtual Machine

- Select a creation type
- Select a name and folder
- Select a compute resource
- Select storage
- Select compatibility
- Select a guest OS
- Customize hardware**
- Ready to complete

Customize hardware

Configure the virtual machine hardware

Virtual Hardware VM Options Advanced Parameters

Advanced Configuration Parameters

Modify or add configuration parameters as needed for experimental features or as instructed by technical support. Empty values will be removed (supported on ESXi 6.0 and later).

Attribute	Value	
guestinfo.userdata	?GI0aW9uOiBUcnVICg==	ADD

Attribute	Value
guestinfo.userdata.encoding	base64

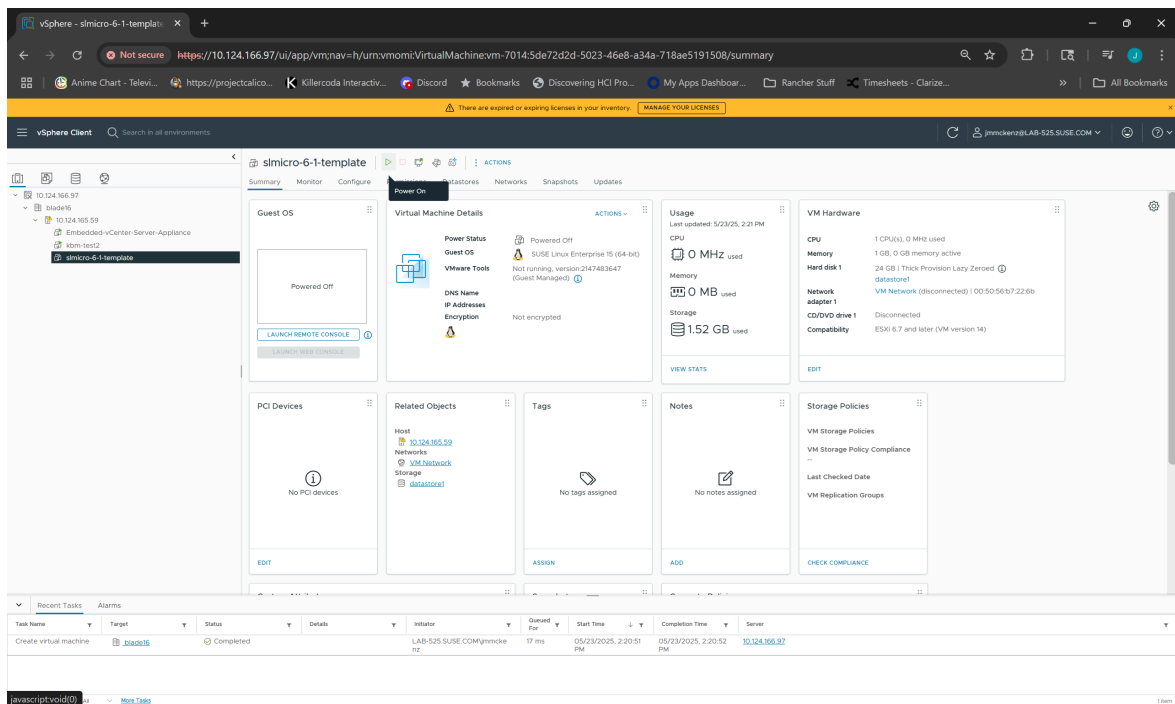
CANCEL BACK NEXT

- In *Ready to complete*, review the configuration and if everything is correct, click *Finish*.
- The template should appear in the *Hosts and Clusters* view.

3.3 Installing the virtual machine

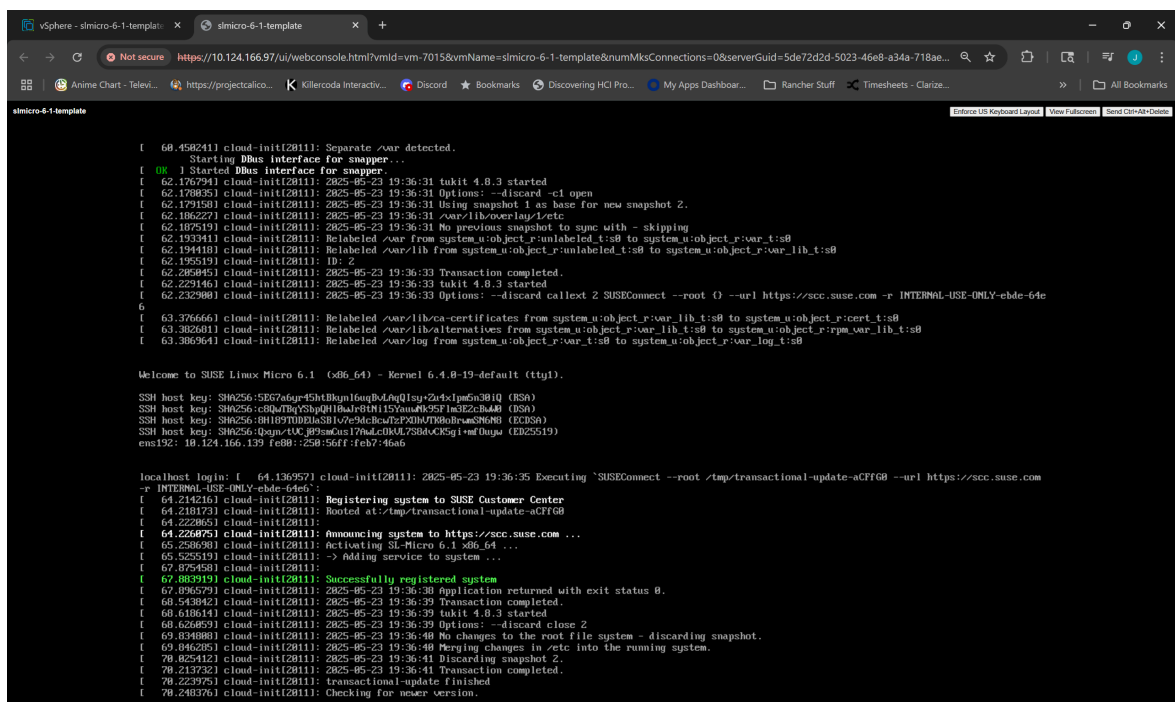
After the configuration is finished, you can start the installation of the virtual machine as described below.

- Navigate to the *Hosts and Clusters* view and select the SUSE Linux Micro template.
- Click the *Power on* icon.



3. Open the Web console to monitor the installation process.

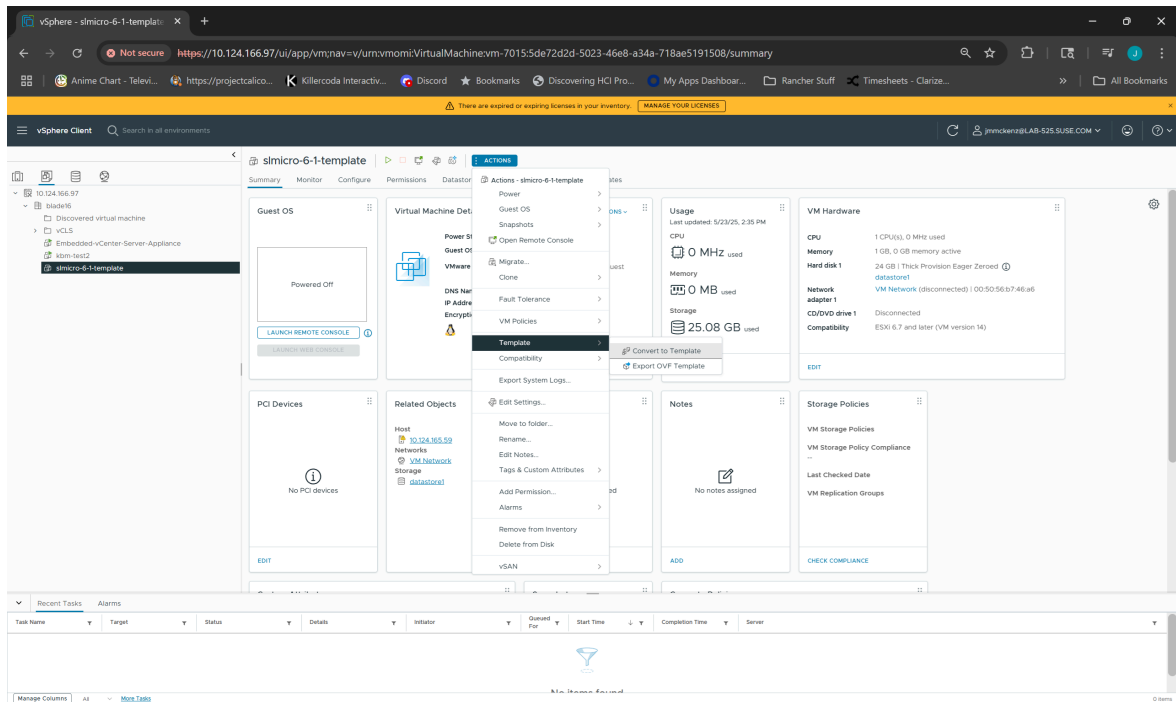
After the installation is complete, the virtual machine should power off as configured in the provided user data.



3.4 Converting the virtual machine into a template

The final part of the deployment is to create a template from the configured machine that can be used to clone virtual machines from and thus speed up the later deployment.

1. Navigate to the *VMs and Templates* and select the template there.
2. Click *Actions* and in the roll-up menu, select *Template* or right-click the template.



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