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# Loppuraportti

Virtualisointi

2025



Kaakkois-Suomen  
ammattikorkeakoulu

## SISÄLLYS

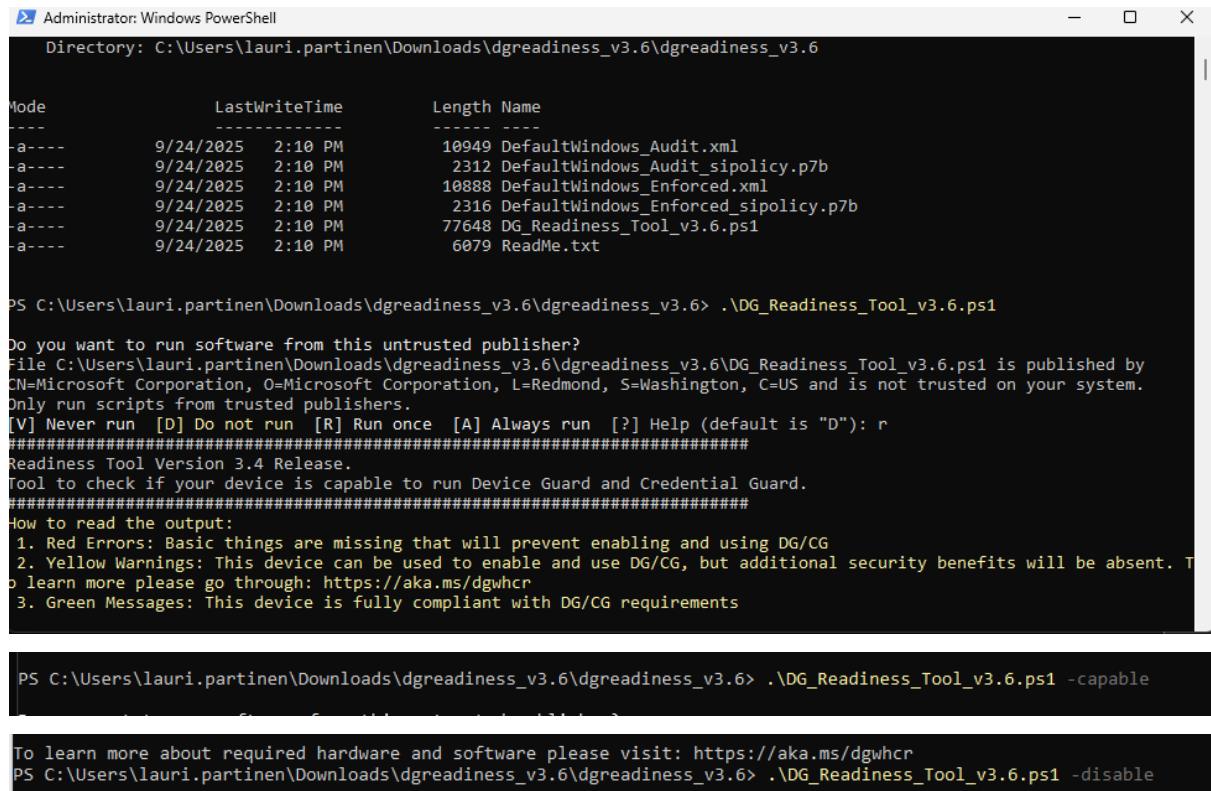
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## 1 JOHDANTO

Raportti dokumentoi virtualisointi kurssin lopputyönä toteutetun virtualisointi ympäristön rakentamisen. Tehtävässä asennetaan vCenter hallintapaneeli, useita ESXI koneita sekä TrueNAS pohjainen jaettu tallennusratkaisu. Tehtävässä käytettiin klusteria ja sen eri ominaisuuksia osana ympäristöä.

## 2 ADDITIONAL SETTINGS AFTER WINDOWS 24H2. DG\_READINESS.PS1

Työkalulla tarkistetaan, tukeeko laitteisto Windowsin Device Guard- ja Credential Guard turvaominaisuuuksia.



```

Administrator: Windows PowerShell
Directory: C:\Users\lauri.partinen\Downloads\dgreadiness_v3.6\dgreadiness_v3.6

Mode          LastWriteTime      Length Name
----          -----          ---- 
-a---  9/24/2025  2:10 PM       10949 DefaultWindows_Audit.xml
-a---  9/24/2025  2:10 PM       2312  DefaultWindows_Audit_sipolicy.p7b
-a---  9/24/2025  2:10 PM      10888 DefaultWindows_Enforced.xml
-a---  9/24/2025  2:10 PM      2316  DefaultWindows_Enforced_sipolicy.p7b
-a---  9/24/2025  2:10 PM     77648 DG_Readiness_Tool_v3.6.ps1
-a---  9/24/2025  2:10 PM       6079  ReadMe.txt

PS C:\Users\lauri.partinen\Downloads\dgreadiness_v3.6\dgreadiness_v3.6> .\DG_Readiness_Tool_v3.6.ps1

Do you want to run software from this untrusted publisher?
File C:\Users\lauri.partinen\Downloads\dgreadiness_v3.6\dgreadiness_v3.6\DG_Readiness_Tool_v3.6.ps1 is published by
CN=Microsoft Corporation, O=Microsoft Corporation, L=Redmond, S=Washington, C=US and is not trusted on your system.
Only run scripts from trusted publishers.
[V] Never run [D] Do not run [R] Run once [A] Always run [?] Help (default is "D"): r
#####
Readiness Tool Version 3.4 Release.
Tool to check if your device is capable to run Device Guard and Credential Guard.
#####
How to read the output:
1. Red Errors: Basic things are missing that will prevent enabling and using DG/CG
2. Yellow Warnings: This device can be used to enable and use DG/CG, but additional security benefits will be absent. To
learn more please go through: https://aka.ms/dgwhcr
3. Green Messages: This device is fully compliant with DG/CG requirements

PS C:\Users\lauri.partinen\Downloads\dgreadiness_v3.6\dgreadiness_v3.6> .\DG_Readiness_Tool_v3.6.ps1 -capable

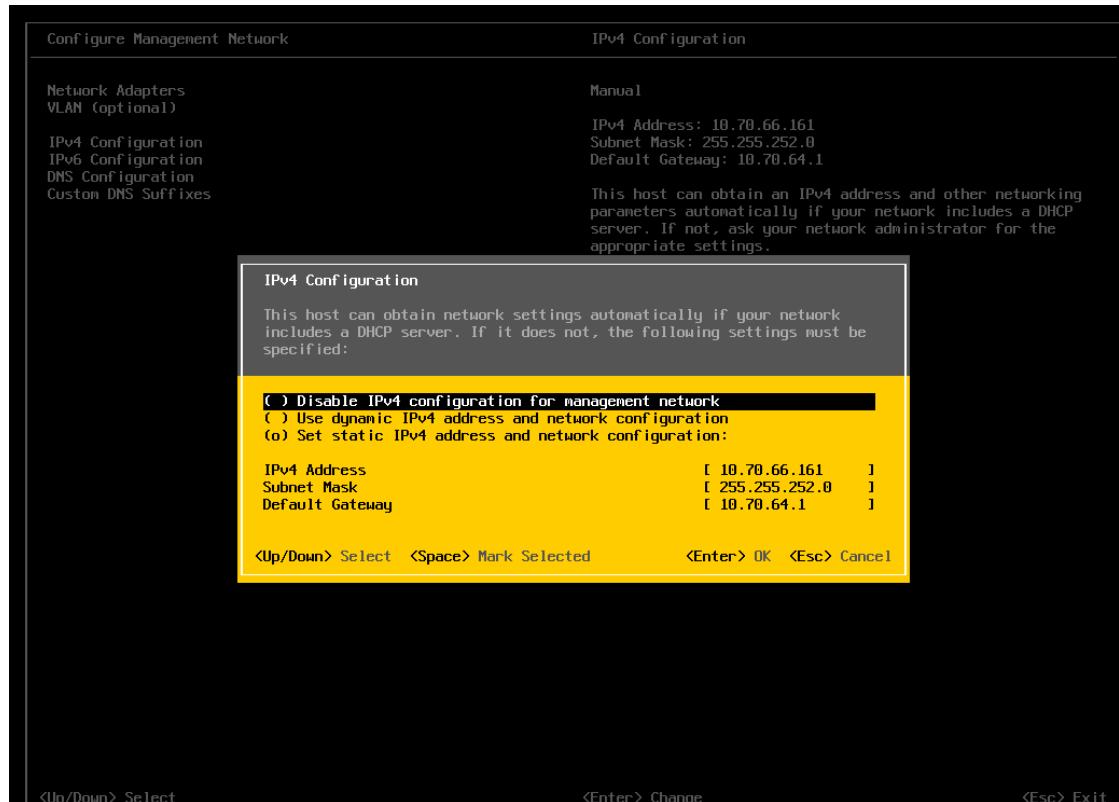
To learn more about required hardware and software please visit: https://aka.ms/dgwhcr
PS C:\Users\lauri.partinen\Downloads\dgreadiness_v3.6\dgreadiness_v3.6> .\DG_Readiness_Tool_v3.6.ps1 -disable

```

## 3 ESXI ASENNUS

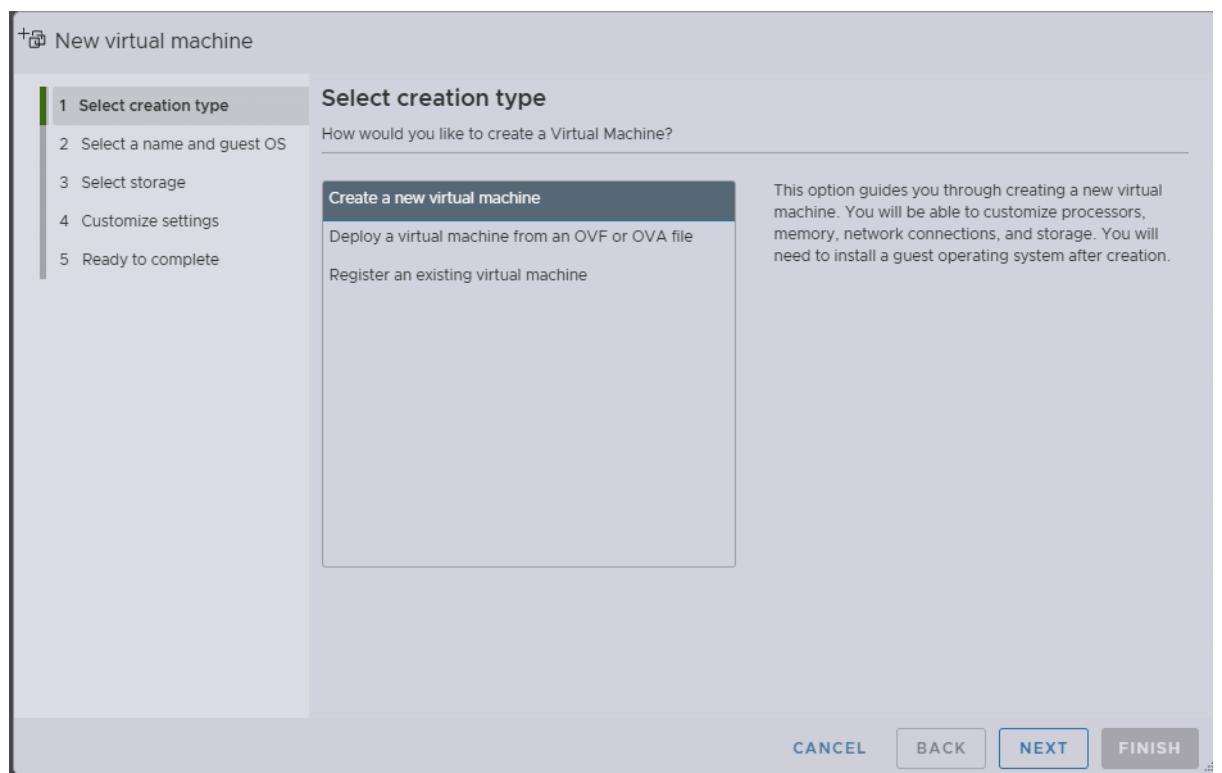
Suoritettiin ESXI asennus. Lisätään ip-osoiteeksi ESXI 1 10.70.66.161. Default-gateway 10.70.64.1.

F1-VCENTER,10.70.66.160
F1-ESX1,10.70.66.161
F1-ESX2,10.70.66.162
F1-ESX3,10.70.66.163
F1-NAS,10.70.66.164



## 4 WINDOWS JA CENTOS VIRTUAALIKONEIDEN ASENNUS

Luodaan Windows ja Centos virtual machine ESXI.



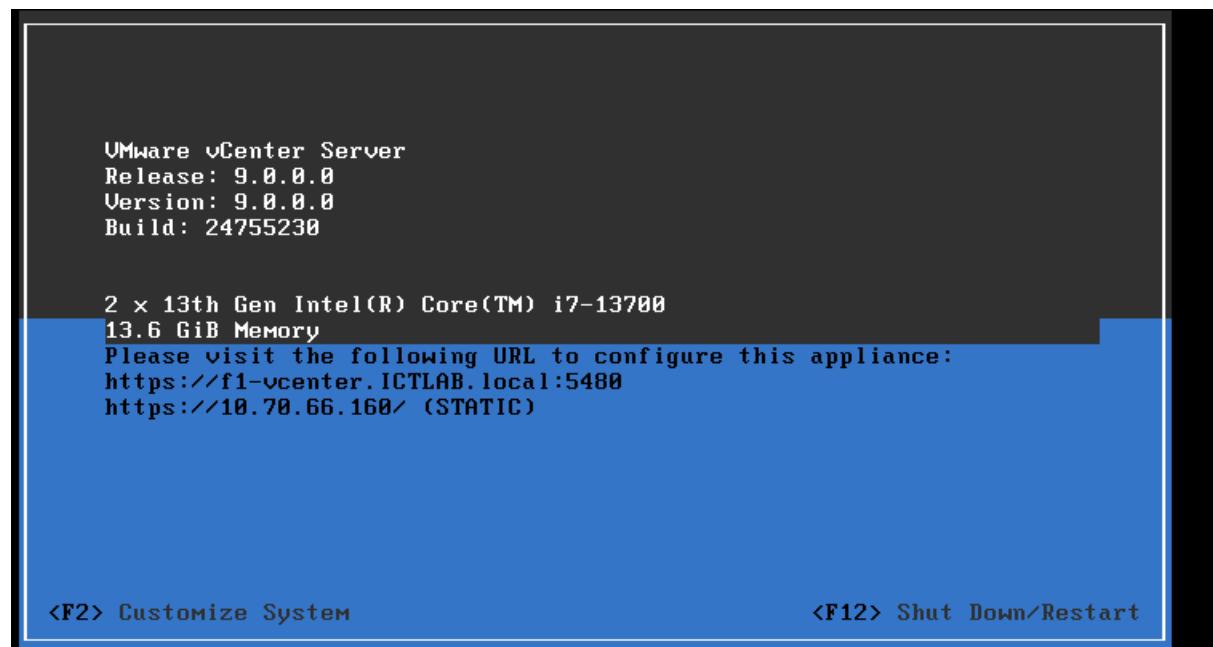
Molemmat virtuaalikoneet toiminnassa.

<input type="checkbox"/>	Centos	<input checked="" type="radio"/> Normal	16 GB	CentOS 8 (64-bit)	Unknown	0 MHz	0 MB
<input type="checkbox"/>	windows	<input checked="" type="radio"/> Normal	64 GB	Microsoft Windows 10 (64-bit)	Unknown	0 MHz	0 MB

## 5 VCENTERIN ASENNUS JA KÄYTTÖÖNOTTO

VCenter Serverin käyttöönotto: VCenter-hallintapalvelin F1-VCENTER konfiguroidaan taulukon IP-osoitteeseen 10.70.66.160.

F1-VCENTER,10.70.66.160



## vCenter Server Configuration

Fields marked with \* are required

Network configuration *	Assign static IP address
IP version *	IPv4
System name * <small>(i)</small>	f1-vcenter.ICTLAB.local
IP address *	10.70.66.160
Subnet mask or prefix length *	22
Default gateway *	10.70.64.1
DNS servers *	10.70.10.21
Time synchronization mode *	Synchronize time with the NTP servers
NTP servers (comma-separated list) *	pool.ntp.org
SSH access *	Activated

## 5.1 SSO konfigurointi

Luodaan SSO domain vsphere.local ja määritetään järjestelmänvalvojan tunukset.

## SSO Configuration

Fields marked with \* are required

Create a new SSO domain

Single Sign-On domain name *	vSphere.local
Single Sign-On username *	administrator
Single Sign-On password *	*****
Confirm password *	*****

Join an existing SSO domain

## 5.2 Fully qualified domainname

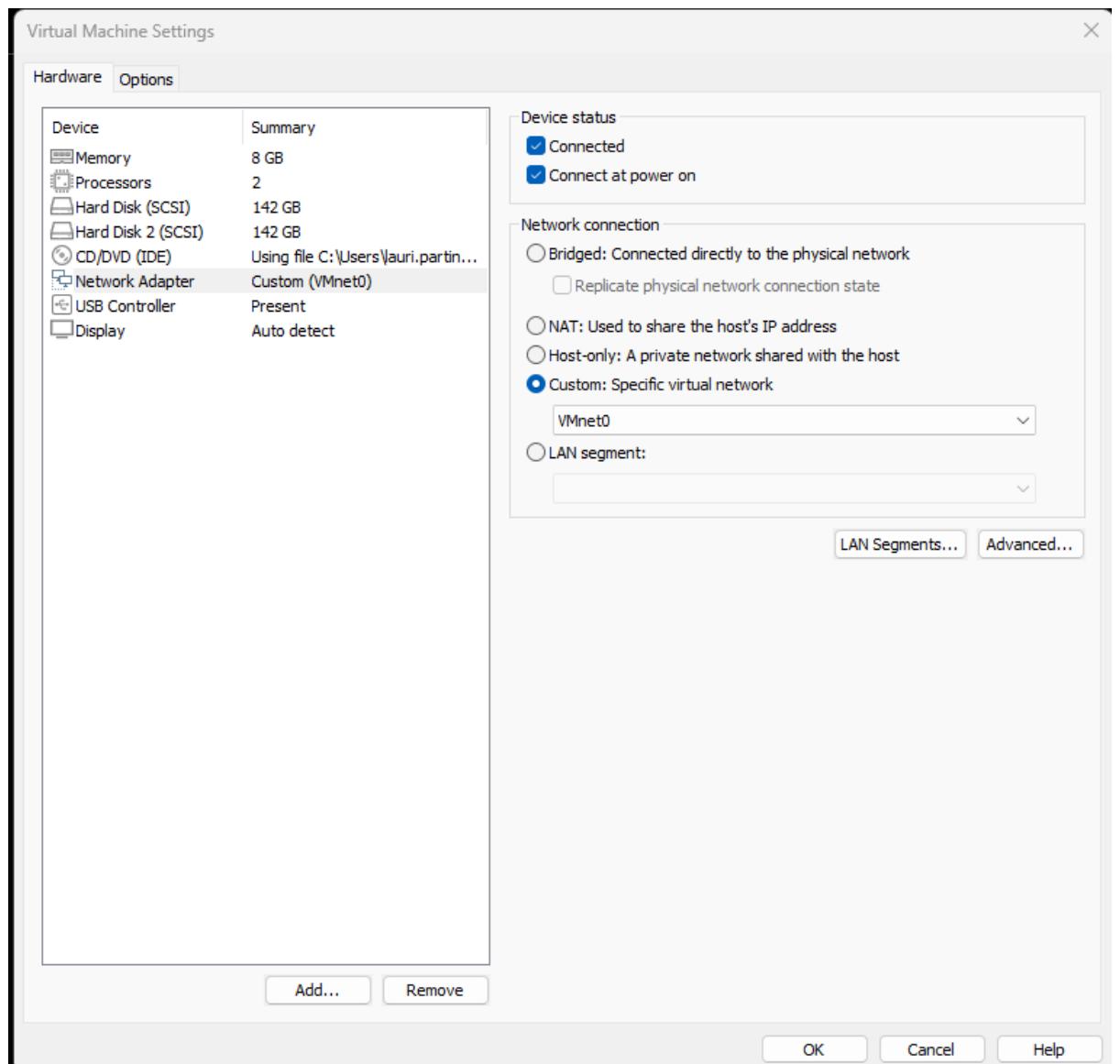
XX-vcenter.ictlab.local (?? = name from IP-address list).

Lisätään domain nimi F1-vcenter.ictlab.local.

The screenshot shows the vSphere Client interface with the following details:

- Summary Screen:** The main area displays "Capacity and Usage" statistics for the vCenter server, showing 0 GHz free CPU, 0 B used Memory, 0 B used Storage, and 0 B used Network.
- Custom Attributes:** A section titled "Custom Attributes" lists "com.vmware.vcenter.network.folder.externalManaged".
- vCenter Health:** Shows "Overall Health" as "Good".
- Recent Tasks:** A table at the bottom shows no items found.

Luodaan verkkoadapteri VMnet0.



Luodaan kytkin 0 ja lisätään se vcenteriin.

Name	Port groups	Uplinks	Type
vSwitch0	2	1	Standard vSwitch

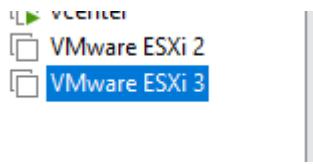
Lisätään ESXi host vCenteriin.

<h3>Add Host</h3> <p><b>1 Name and location</b></p> <p>2 Connection settings 3 Host summary 4 Host lifecycle 5 Assign license 6 Lockdown mode 7 VM location 8 Ready to complete</p>	<h3>Name and location</h3> <p>Enter the name or IP address of the host to add to vCenter Server. <i>Fields marked with * are required</i></p> <p><b>Host name or IP address:</b> * <input type="text" value="10.70.64.167"/></p> <p><b>Location:</b> <input type="button" value="Datacenter"/></p>
---	--

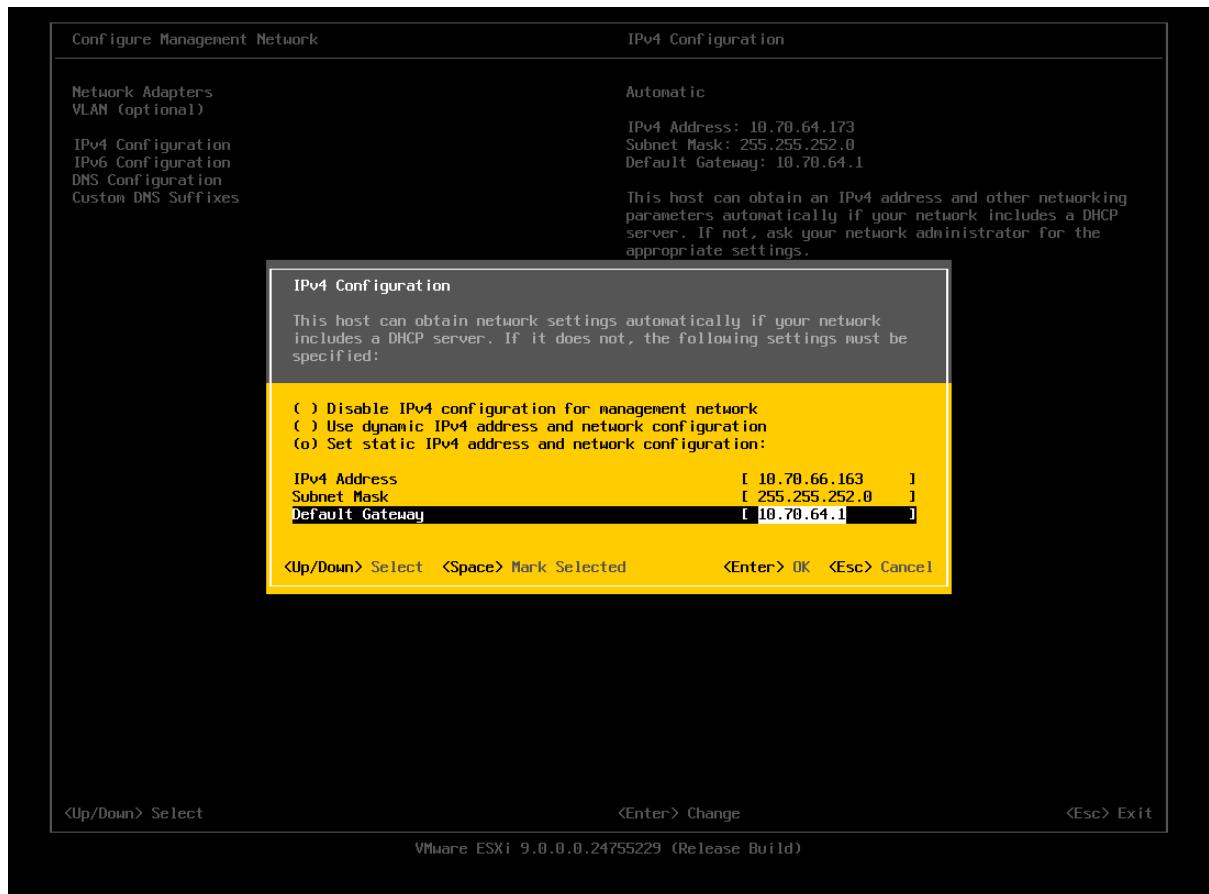
Lisätään ESXi image.

<h3>Add Host</h3> <p><b>1 Name and location</b></p> <p>2 Connection settings 3 Host summary <b>4 Host lifecycle</b></p> <p>5 Assign license 6 Lockdown mode 7 VM location 8 Ready to complete</p>	<h3>Host lifecycle</h3> <p>The host lifecycle is managed with images. Set up an image to specify the software and firmware to be installed, updated, or upgraded on the host.</p> <p><b>Set up the host image</b></p> <ul style="list-style-type: none"> <li><input type="radio"/> Select an image from the Image Library <small>(i)</small></li> <li><input type="radio"/> Extract an image from a host in this vCenter instance <small>(i)</small></li> <li><input checked="" type="radio"/> Extract the image on the host <small>(i)</small></li> <li><input type="radio"/> Create a new image <small>(i)</small></li> </ul>
---	---

Virtuaalikoneet vcenterin alla vmware.



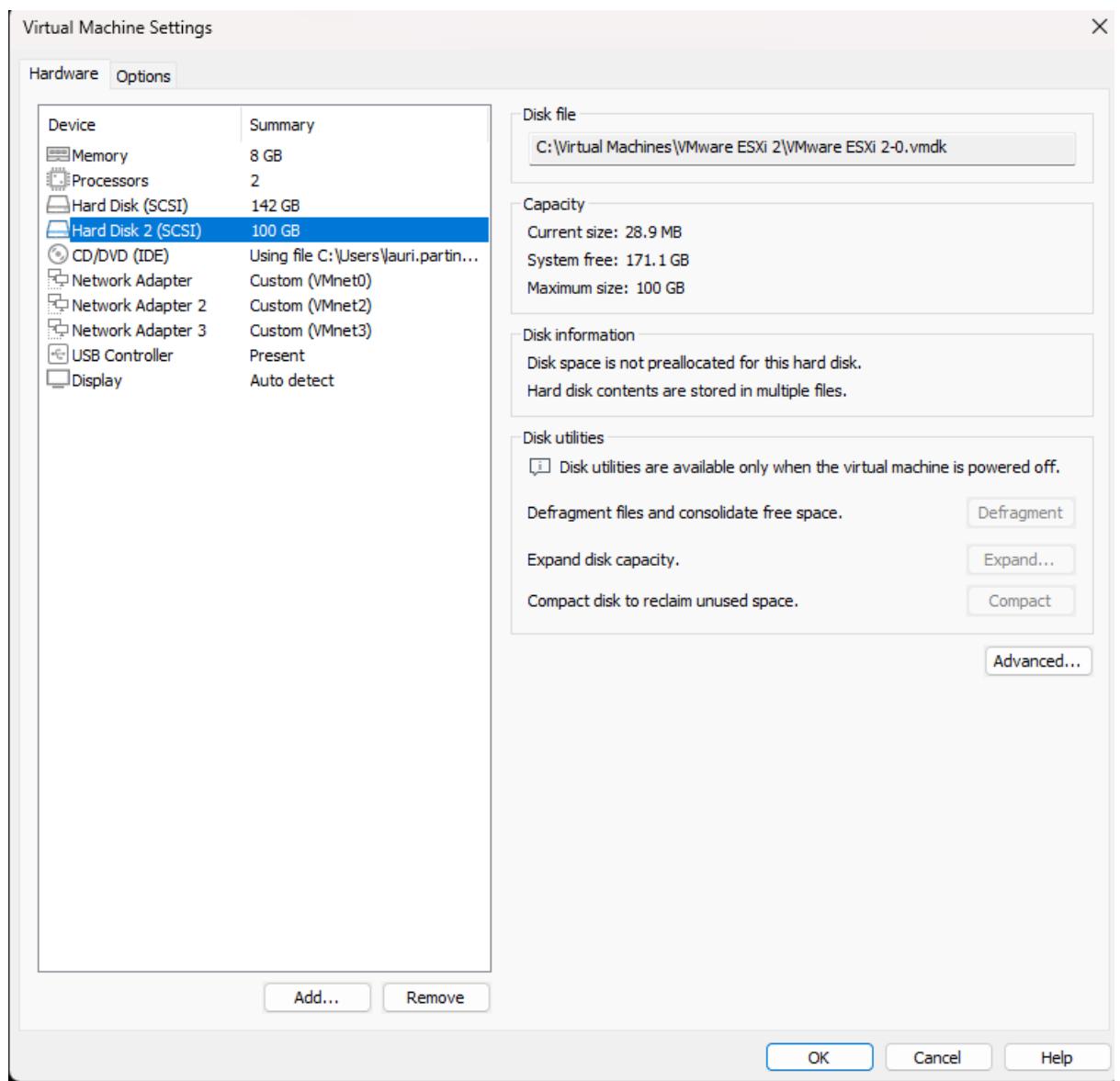
Luodaan ESXI 2 ja 3. Tässä esimerkki ESXI 3 konfiguroinnista.



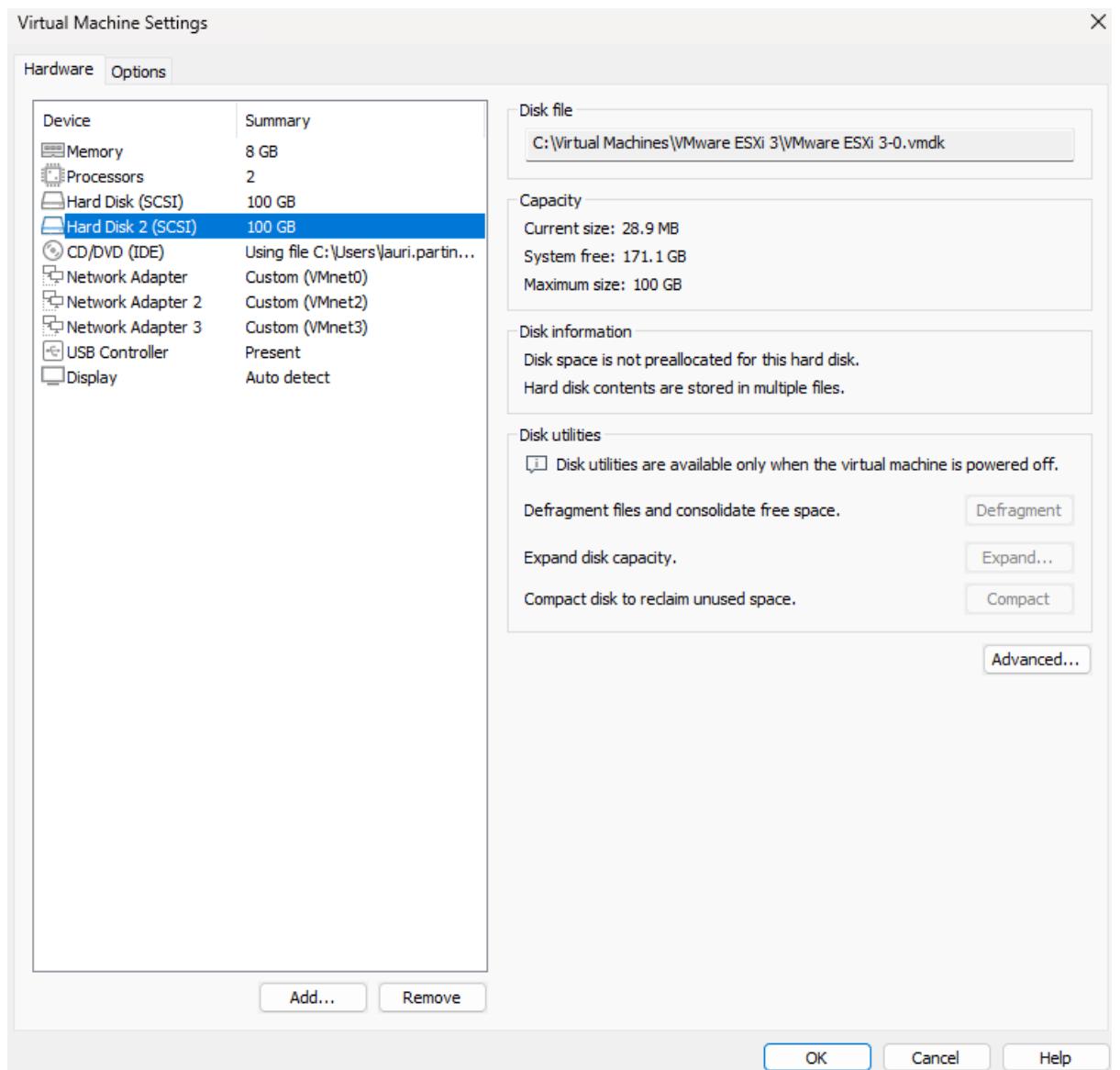
## 6 ESX2 JA EX3 DATASTORE LUONTI

Esx2

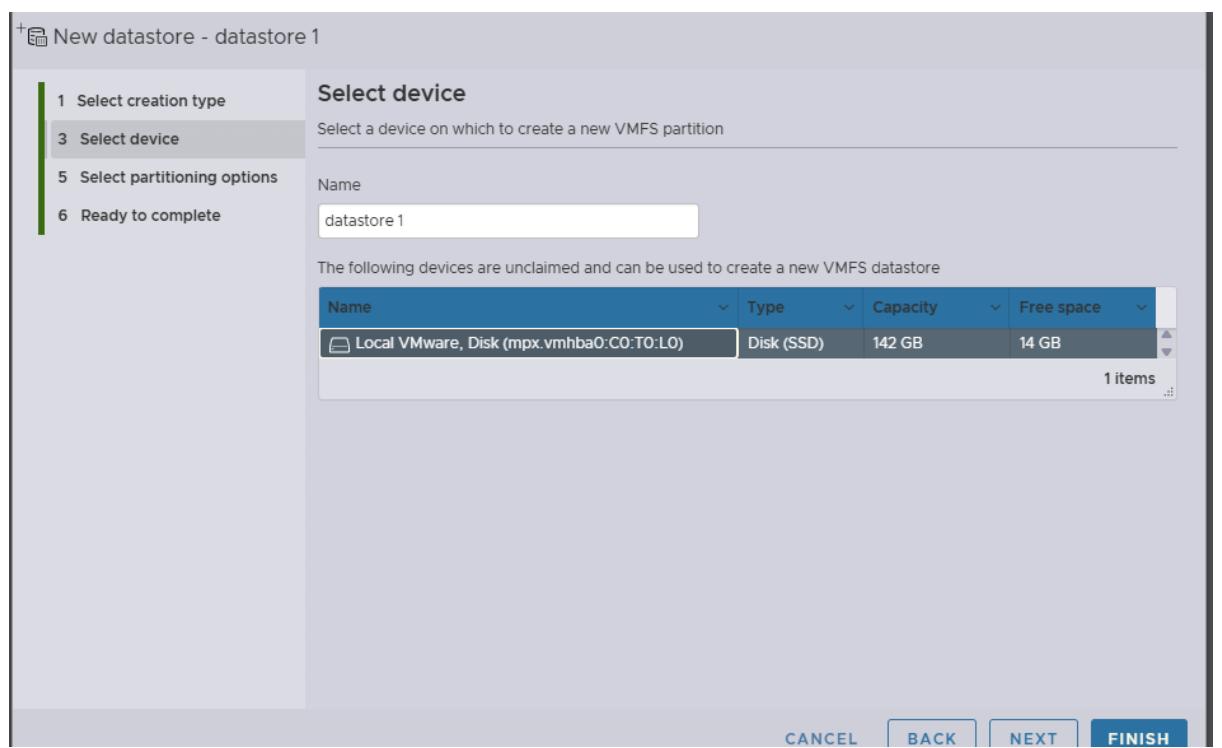
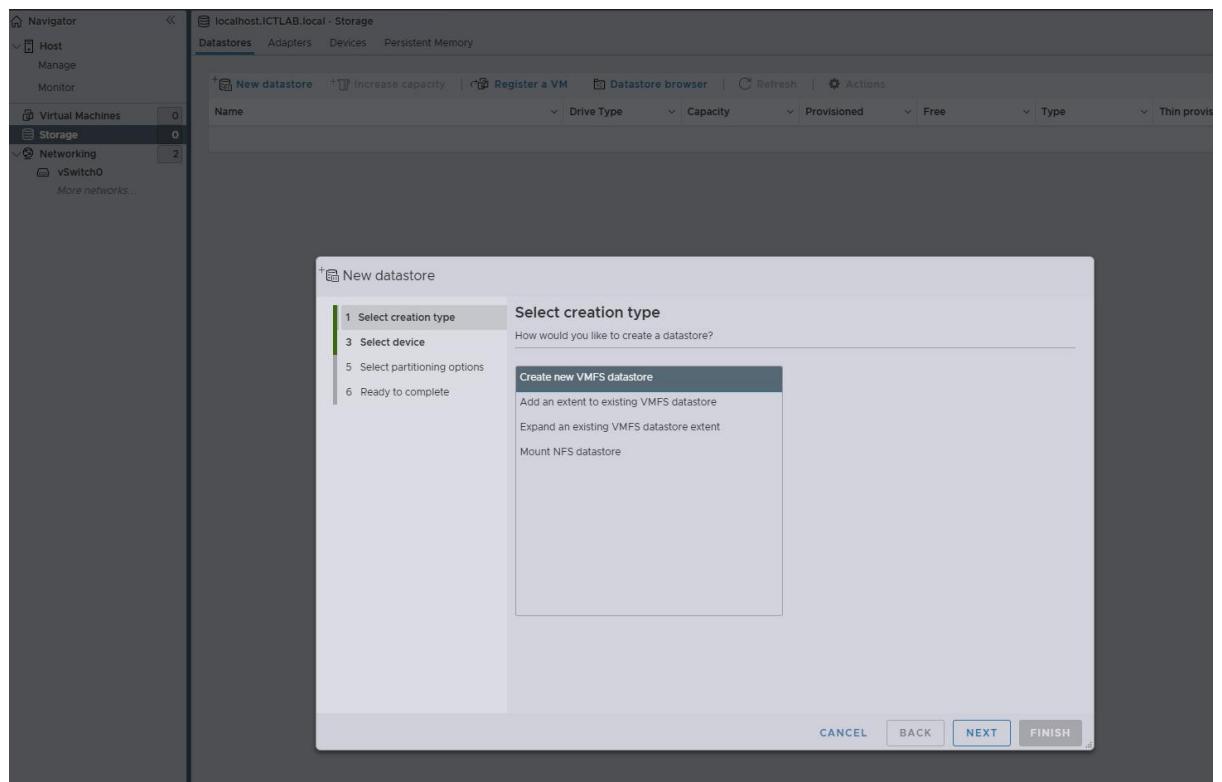
Lisätään asetuksista lisää tallennustilaa



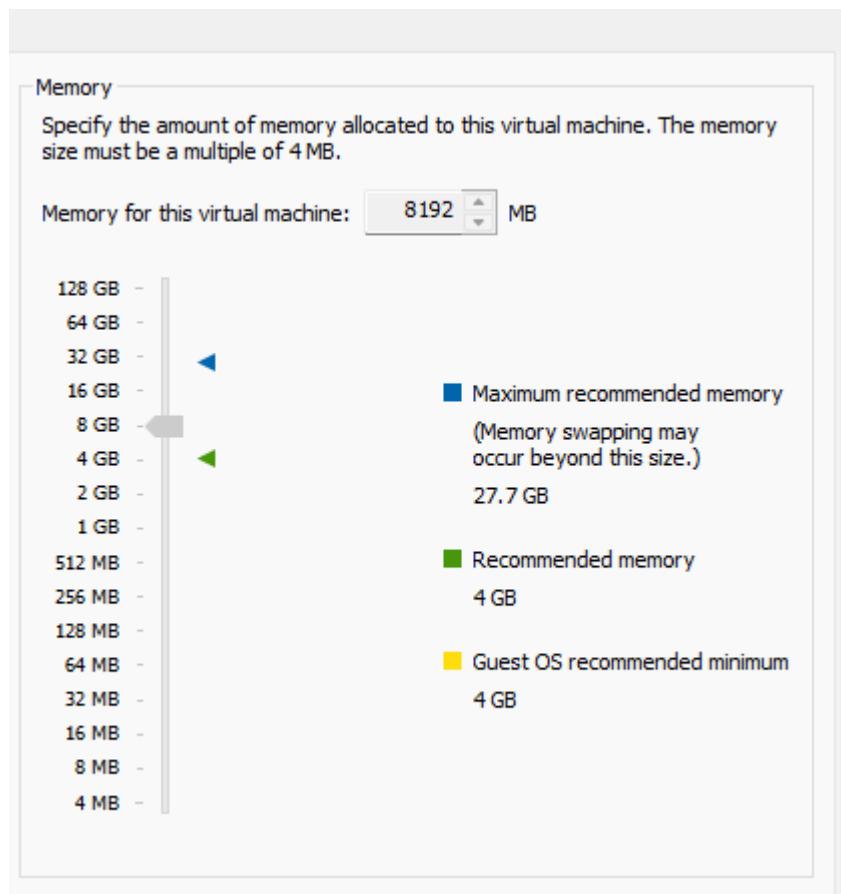
Esx3 lisää tallennustilaa



Luodaan datastore tallennustila varten.

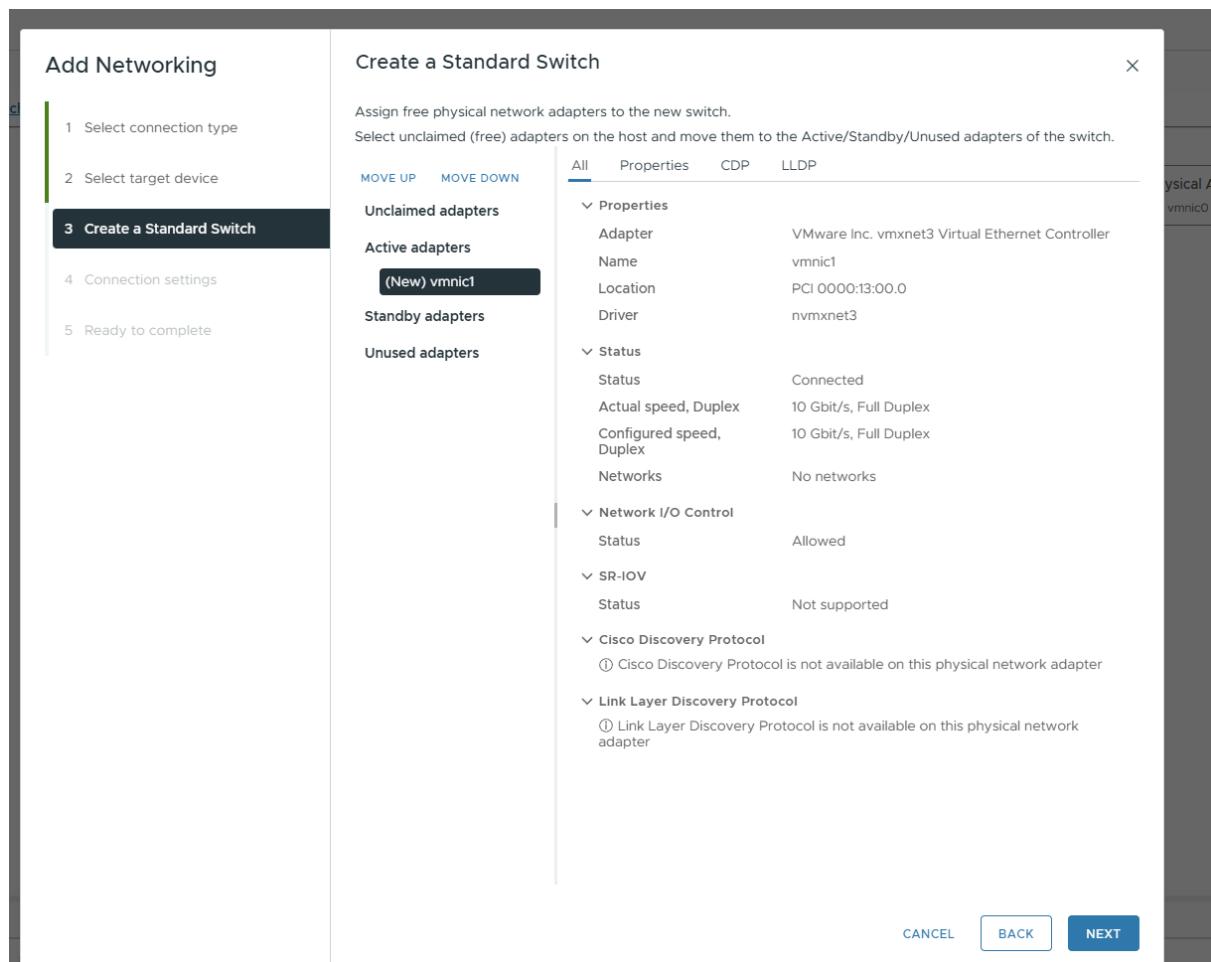


Lisätään muistia ESXi virtuaali koneille.



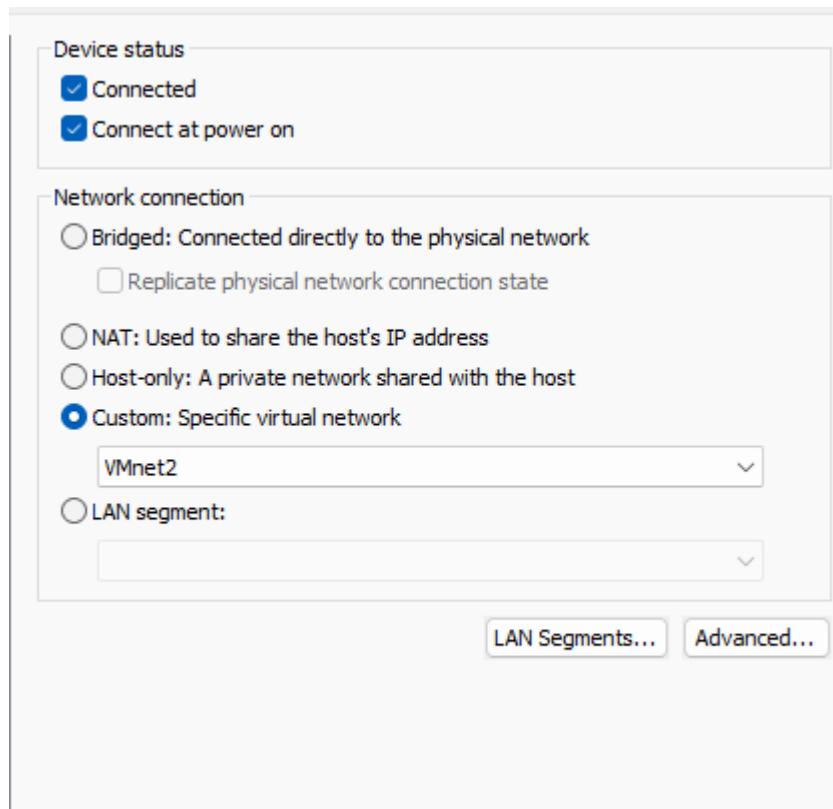
## 6.1 VMware vmnic virtuaalikytkimen luonti

Määritteellään fyysinen verkkokortti vmnic1 aktiiviseksi. Kytkin luodaan, jotta ESXI pystyy toimimaan jaetun tallennustilan kanssa nopeasti.



Kytkimeen asetetaan taulukosta ESXI IP-osoite.

Lisätään toinen network kortti.



Lisätään vmnic2 aktiiviseksi.

### Add Networking

- 1 Select connection type
- 2 Select target device
- 3 Create a Standard Switch**
- 4 Connection settings
- 5 Ready to complete

### Create a Standard Switch

Assign free physical network adapters to the new switch.  
Select unclaimed (free) adapters on the host and move them to the Active/Standby/Unused adapters of the switch.

MOVE UP	MOVE DOWN	All	Properties	CDP	LLDP	
		<b>Unclaimed adapters</b>				
		<b>Active adapters</b>	(New) vmnic2			
		<b>Standby adapters</b>				
		<b>Unused adapters</b>				

**Properties**

Adapter	VMware Inc. vmxnet3 Virtual Ethernet Controller
Name	vmnic2
Location	PCI 0000:1b:00.0
Driver	nvmxnet3

**Status**

Status	Connected
Actual speed, Duplex	10 Gbit/s, Full Duplex
Configured speed, Duplex	10 Gbit/s, Full Duplex
Networks	No networks

**Network I/O Control**

Status	Allowed
--------	---------

**SR-IOV**

Status	Not supported
--------	---------------

**Cisco Discovery Protocol**

① Cisco Discovery Protocol is not available on this physical network adapter

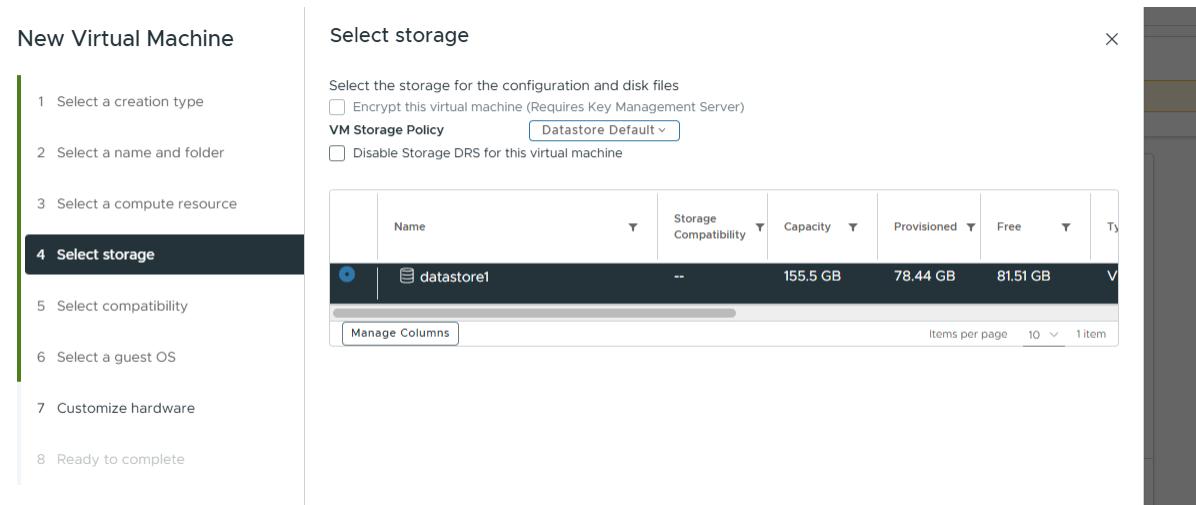
**Link Layer Discovery Protocol**

① Link Layer Discovery Protocol is not available on this physical network adapter

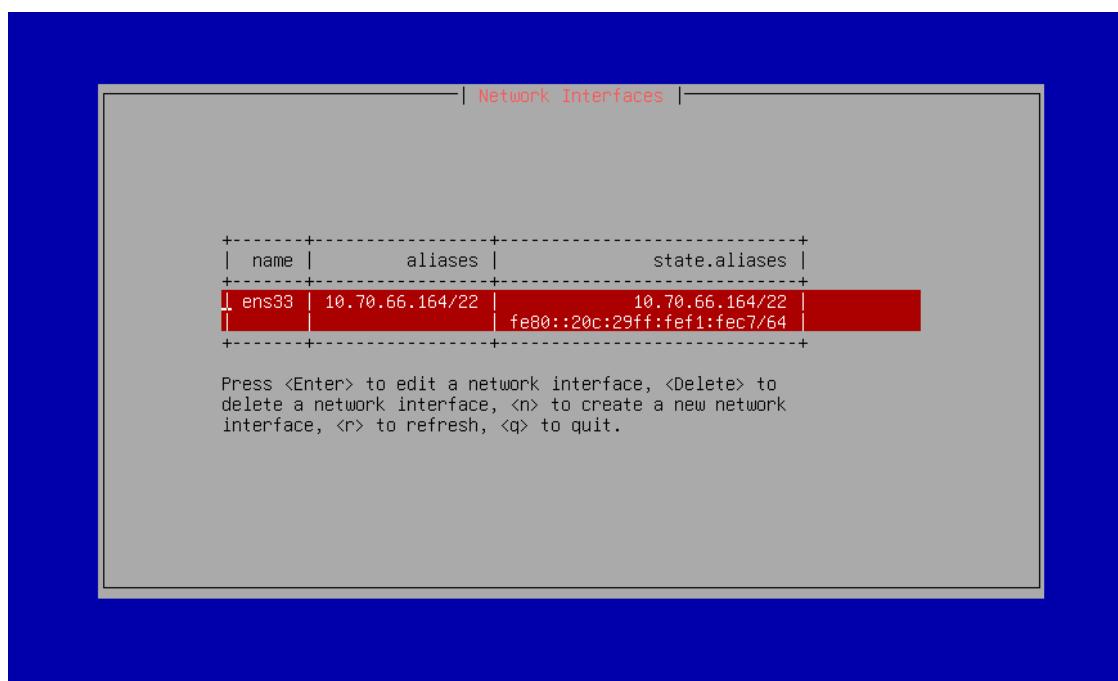
CANCEL
BACK
NEXT

## 7 PFSENSE ASENNUS

Asennetaan pfsense aiemmin luotuun datacenteriin.



Konfiguroidaan pfsense. Asetetaan IP-osoite.



```

VMX0      00:50:56:81:bd:1d    (up)
VMX1      00:50:56:81:77:3d    (up)

Enter the parent interface name for the new VLAN (or nothing if finished)
Enter the VLAN tag (1-4094): 1

VLAN Capable interfaces:

VMX0      00:50:56:81:bd:1d    (up)
VMX1      00:50:56:81:77:3d    (up)

Enter the parent interface name for the new VLAN (or nothing if finished)

VLAN interfaces:

VMX0.1          VLAN tag 1, parent interface VMX0

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

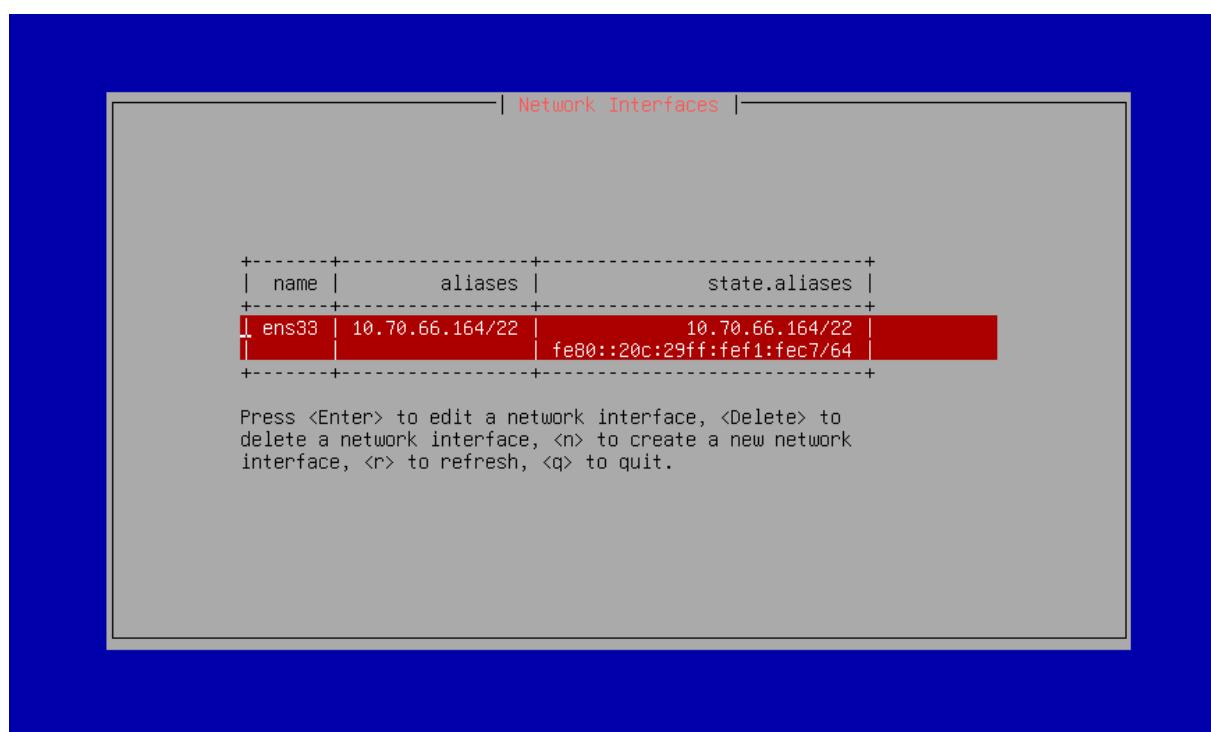
Enter the WAN interface name or 'a' for auto-detection
(VMX0 VMX1 VMX0.1 or a): VMX0

```

Luodaan pfSense network adapterit.

Adapteri 1 (WAN): Yhdistetään ulkoiseen verkkoon (VM Network).

Adapteri 2 (LAN): Sisäinen verkko muille virtuaalikoneille (VM Network 2)



```
*** Welcome to pfSense 2.7.2-RELEASE (amd64) on pfSense ***

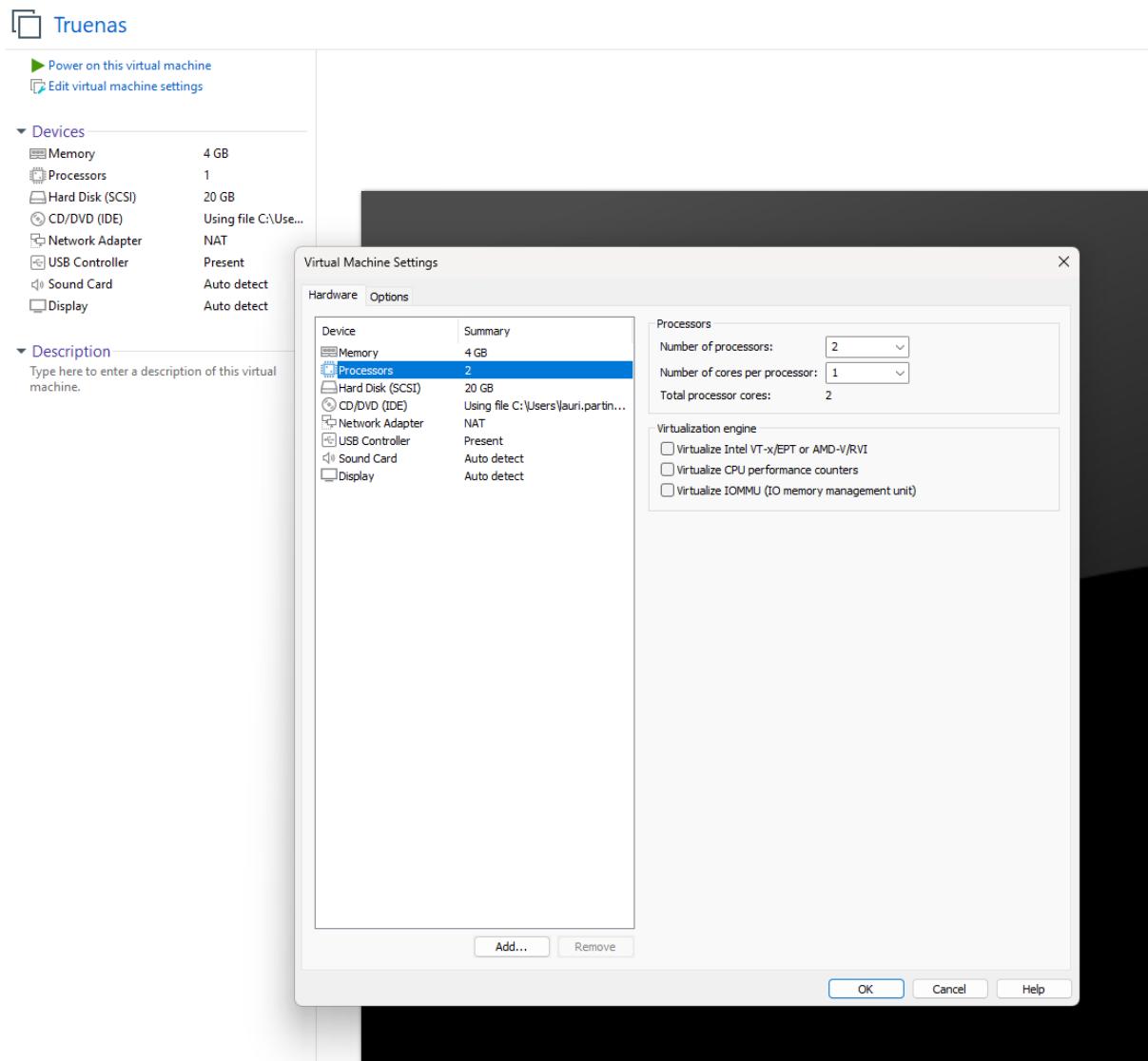
WAN (wan)      -> vMX0      -> v4/DHCP4: 10.70.64.101/22
LAN (lan)      -> vMX1      -> v4: 192.168.1.1/24

0) Logout (SSH only)          9) pfTop
1) Assign Interfaces          10) Filter Logs
2) Set interface(s) IP address 11) Restart webConfigurator
3) Reset webConfigurator password 12) PHP shell + pfSense tools
4) Reset to factory defaults   13) Update from console
5) Reboot system               14) Enable Secure Shell (sshd)
6) Halt system                 15) Restore recent configuration
7) Ping host                   16) Restart PHP-FPM

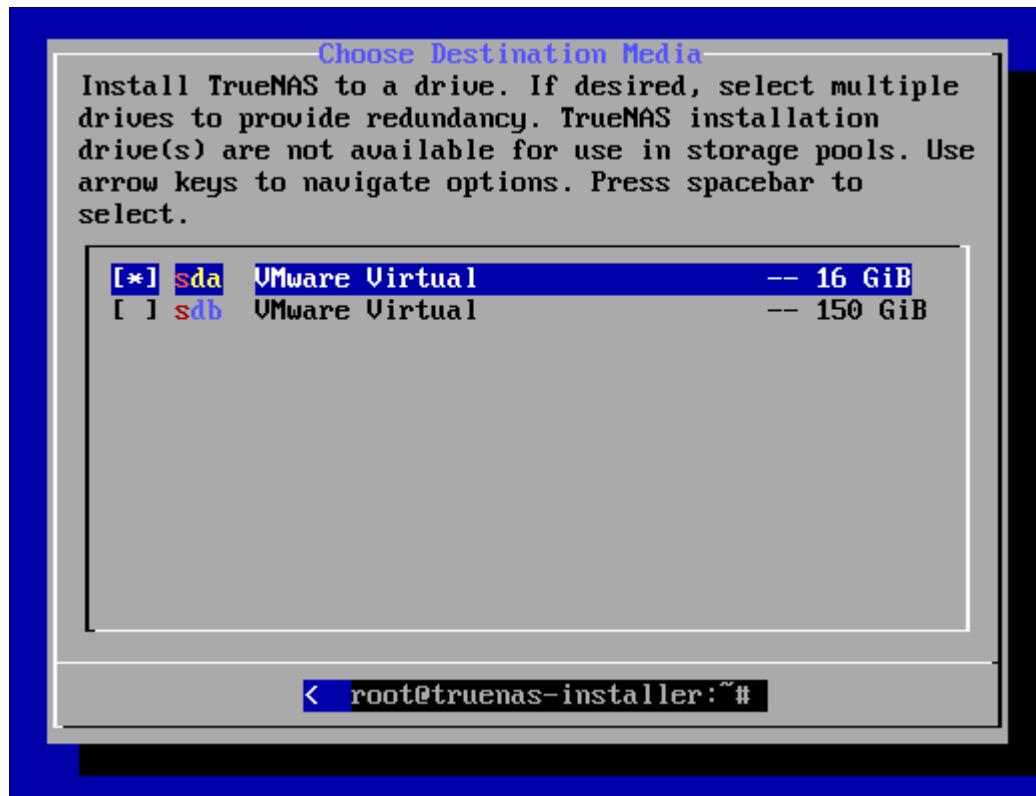
8) Shell
```

## 8 TRUE NAS ASENNUS

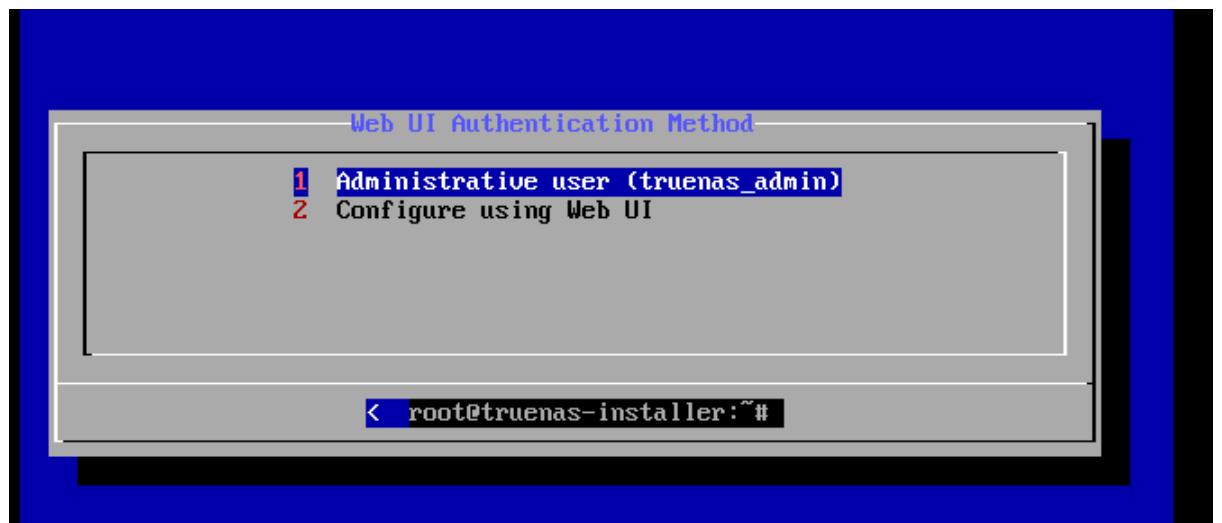
Luodaan TrueNAS-virtuaalipalvelin tallennustilan hallintaan.



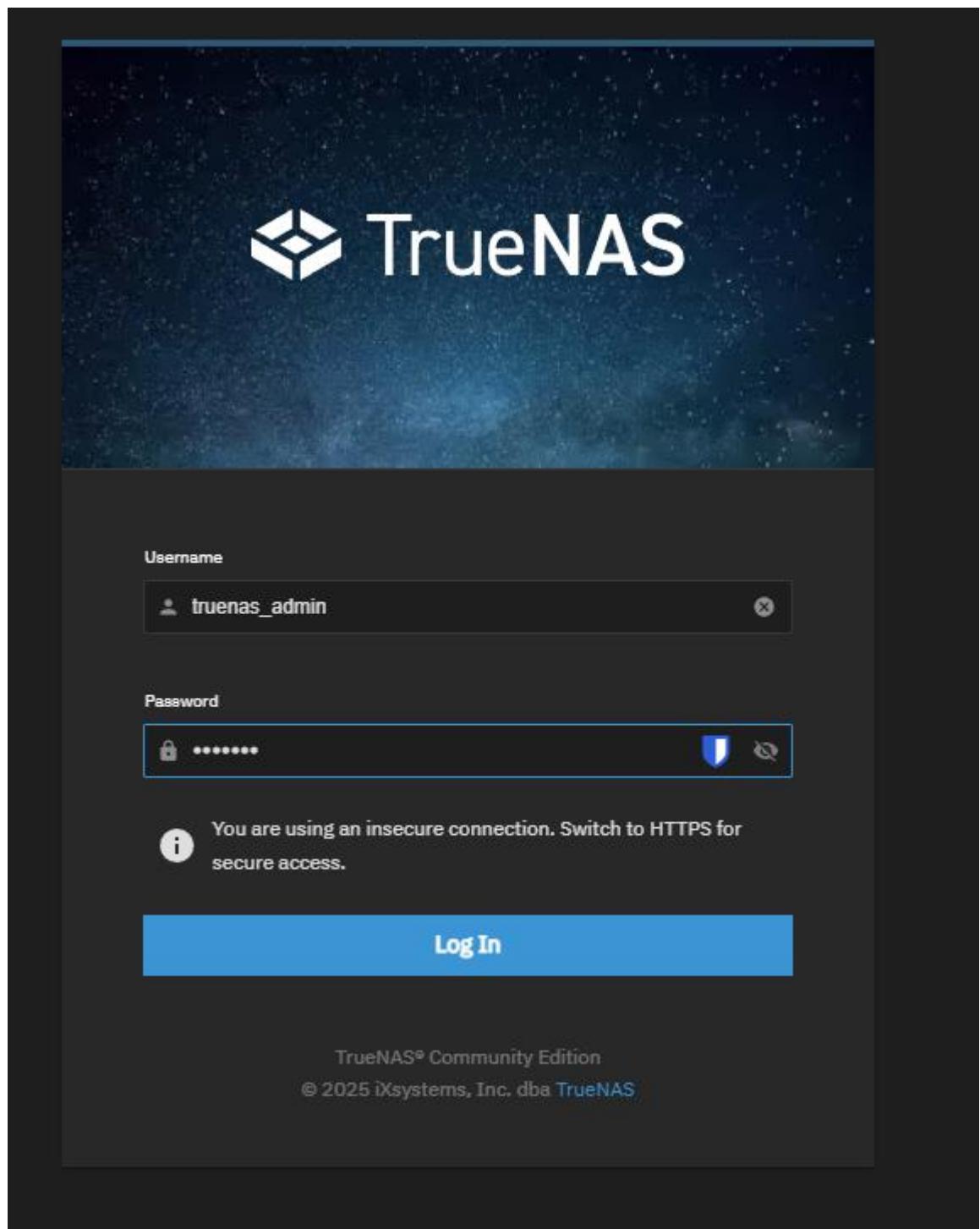
Valitaan asennusta varten luotu 16gb.



Luodaan admin käyttäjätunnukset.



Asennuksen jälkeen kirjaudutaan asettamilla käyttäjätunnuksilla.



Konfiguroidaan Truenas verkko asetukset. Asetetaan taulukosta Truenas IP-osoite.

Lisätään Truenas default-gateway

**Register Default Gateway**

Editing interface will result in default gateway being removed, which may result in TrueNAS being inaccessible. You can provide new default gateway now:

Current Default Gateway: 192.168.181.2

New IPv4 Default Gateway\* ②

10.70.64.1

Enter a valid IPv4 address.

Skip Register

## 8.1 Storage create pool

Pool avulla luodaan jaettua tallennustilaa.

The screenshot shows the TrueNAS web interface with the 'Storage' menu selected. The main title is 'Pool Creation Wizard'. The current step is 'General Info' for a 'Data' VDEV. The layout is set to 'Stripe'. In the 'Automated Disk Selection' section, disk size is set to '150 GiB (HDD)', width to '1', and number of VDEVs to '1'. A note at the bottom states: 'A stripe data VDEV is highly discouraged and will result in data loss if it fails'. At the bottom are buttons for 'Back', 'Next', 'Reset Step', and 'Save And Go To Review'.

Luodaan 100gb SCSI virtuaalinen kovalevy datan käsittelyyn.

### iSCSI Wizard

Target

**2** Extent

Name\* ⓘ  
nas-share ✖

Extent Type\* ⓘ  
Device ▼

Device\* ⓘ  
Create New ▼

Pool/Dataset\* ⓘ  
/mnt/Truestorage + Create Dataset

▼ /mnt  
► Truestorage

Size\* ⓘ  
100 GiB ✖

Sharing Platform\* ⓘ  
VMware: Extent block size 512b, TPC enabled, no Xen compat mode, SSD speed ▼

Back Next

**3** Protocol Options

## 8.2 Lisätään isci adapteri vcenteriin

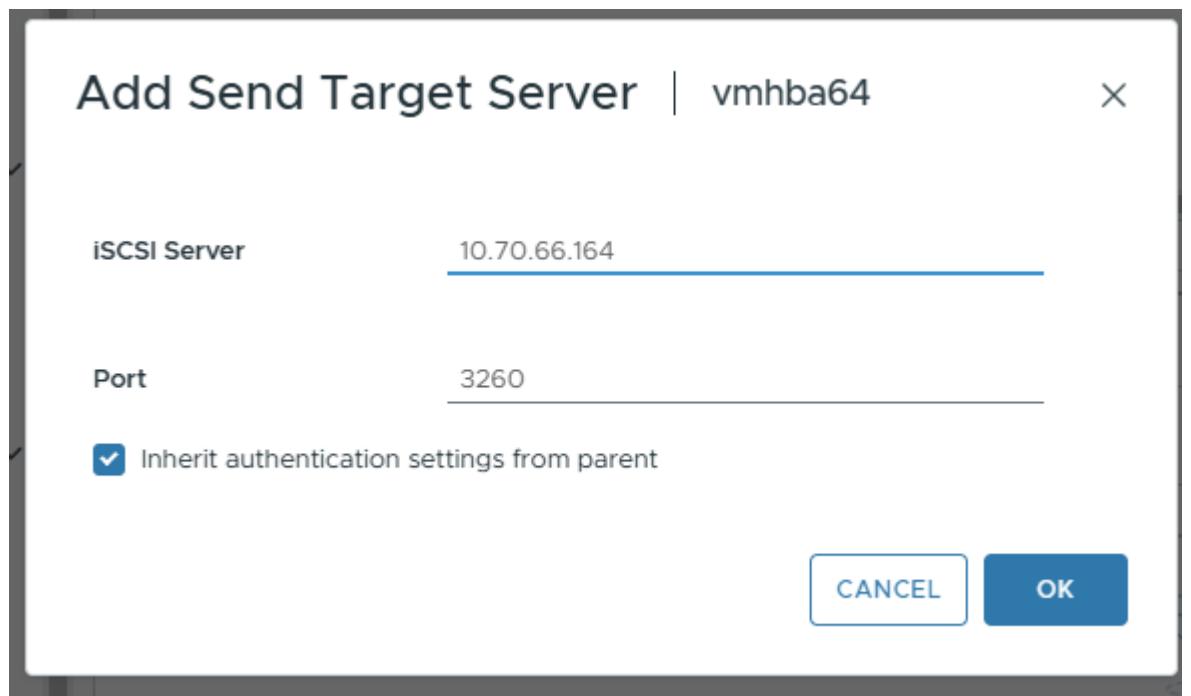
**Storage Adapters**

Adapter	Model	Type	Status	Identifier	Targets	Devices	Paths
vmhba64	ISCSI Software Adapter	ISCSI	Online	iscsi_vmk(lqn.1998-01.com.vmware:localhost.ictlab.local:268882932:64)	0	0	0
vmhba0	PVSCSI SCSI Controller	SCSI	Unknown	--	2	2	2

**Dynamic Discovery**

No items found

Laitetaan server target Truenas ip-osoite.



### Rescan adapter + rescan storage

**Storage Adapters**

ADD SOFTWARE ADAPTER ▾ REFRESH RESCAN STORAGE RESCAN ADAPTER REMOVE

Adapter	Model	Type	Status	Identifier	Targets	Devices	Paths
vmhba64	iSCSI Software Adapter	iSCSI	Online	iscsi_vmk(iqn.1998-01.com.vmware:localhost.ictlab.local:268882932:64)	1	1	1
vmhba0	PVSCSI SCSI Controller	SCSI	Unknown	--	2	2	2

Manage Columns Export ▾ 2 items

Properties Devices Paths Dynamic Discovery Static Discovery Network Port Binding Advanced Options

REFRESH ATTACH DETACH RENAME TURN ON LED TURN OFF LED ERASE PARTITIONS MARK AS HDD DISK MARK AS LOCAL ...

Name	LUN	Type	Capacity	Datastore	Operational State	Hardware Acceleration	Drive Type	Transport
TrueNAS iSCSI Disk (name: a6589fc000000af597d10529d46d13a2)	0	disk	100.00 GB	Not Consumed	Attached	Supported	Flash	iSCSI

## 9 YHDISTETÄÄN FREENAS DATASTORE VSPHERE HOSTEIHIN

Yhdistetään truenas 10.70.66.161

## New Datastore

1 Type

2 Name and device selection

3 Partition configuration

4 Ready to complete

## Type

Specify datastore type.

VMFS  
Create a VMFS datastore on a disk/LUN.

NFS  
Create an NFS datastore on an NFS share over the network.

vVol  
Create a Virtual Volumes datastore on a storage container connected to a storage provider.

## New Datastore

1 Type

2 Name and device selection

3 VMFS version

4 Partition configuration

5 Ready to complete

## Name and device selection

Specify datastore name and a disk/LUN for provisioning the datastore.  
Fields marked with \* are required

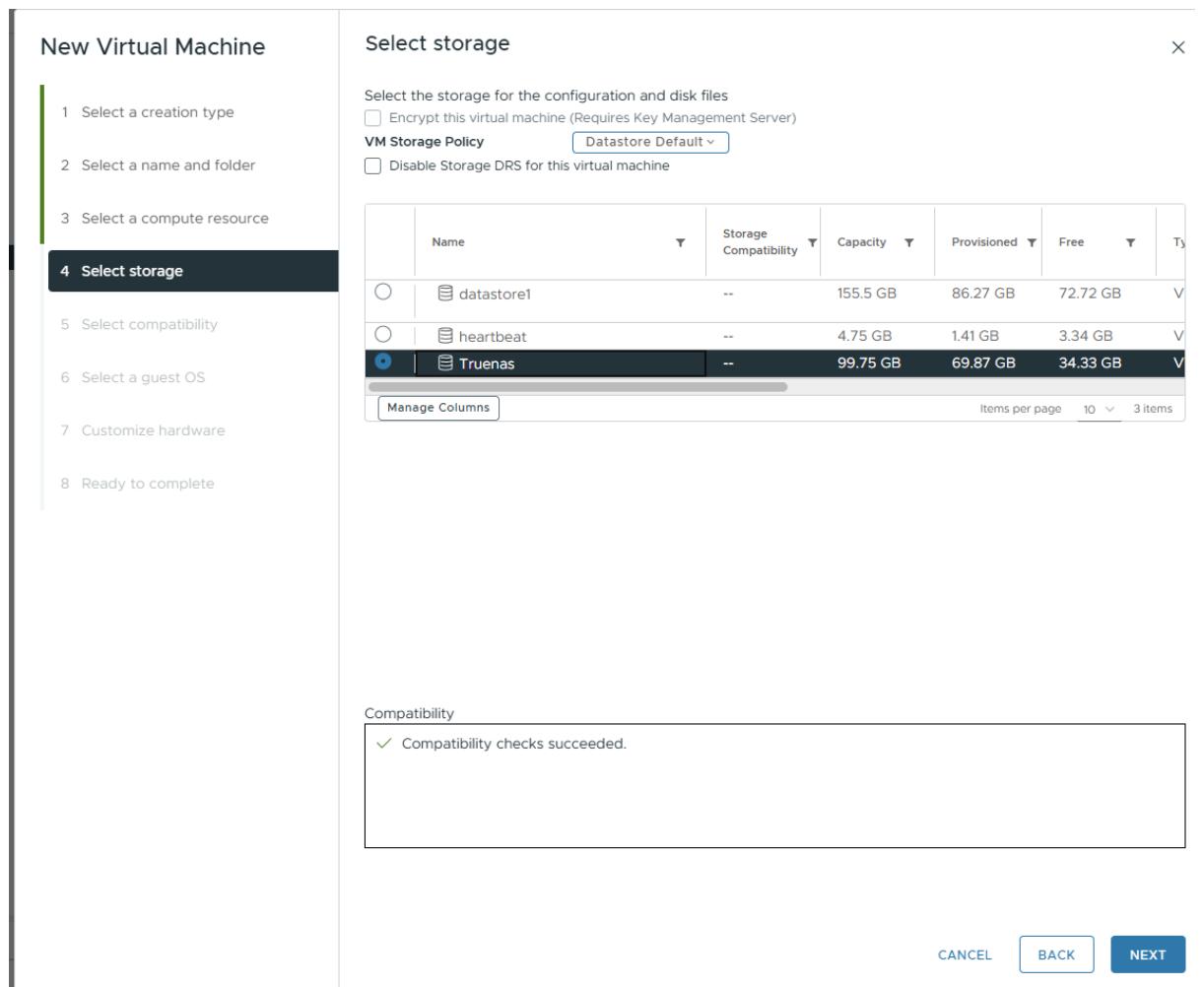
Name \* Truenas

	Name	LUN	Capacity	Hardware Acceleration	Drive Type	Sector Format	Cloud VM Sync
<input checked="" type="radio"/>	TrueNAS iSCSI Disk (naa.6589cf000000af597d10529d46d13a2)	0	100.00 GB	Supported	Flash	--	No

Manage Columns Export ▾ 1 item

## 9.1 Luodaan uusi virtuaalikone ja käytetään jaettua datastorea

Luotiin uusi virtuaalikone ja käytettiin aiemmin luotua Truenas nimistä jaettua datastorea.



## 9.2 Kopioidaan asennettu virtuaalikone toiseen datastoreen

Testataan, pystyykö virtuaalikoneita siirtämään toiseen datastoreen migrate ominaisuutta hyödyntäen.

Migrate | windows

- Select a migration type**
- Select storage
- Ready to complete

Select a migration type

Change the virtual machines' compute resource, storage, or both.

VM ORIGIN ⓘ

- Change compute resource only  
Migrate the virtual machines to another host or cluster.
- Change storage only  
Migrate the virtual machines' storage to a compatible datastore or datastore cluster.
- Change both compute resource and storage  
Migrate the virtual machines to a specific host or cluster and their storage to a specific datastore or datastore cluster.
- Change management layer (New)  
Migrate the virtual machines to the vSphere Supervisor.
- Cross vCenter Server export  
Migrate the virtual machines to a vCenter Server not linked to the current SSO domain.

Migrate | alpine

Select storage

Select the destination storage for the virtual machine migration.

**VM ORIGIN** ⓘ

**BATCH CONFIGURE** **CONFIGURE PER DISK**

Select virtual disk format: Same format as source

VM Storage Policy: Keep existing VM storage policies

Disable Storage DRS for this virtual machine

Name	Storage Compatibility	Capacity	Provisioned	Free	...
datastore1	--	155.5 GB	141.78 GB	25.03 GB	V
Truenas	--	99.75 GB	17.41 GB	82.34 GB	V

Manage Columns

Items per page: 10 2 items

Compatibility

✓ Compatibility checks succeeded.

CANCEL BACK NEXT

### 9.3 Luodaan klusteri ja liitetään vSphere hostit klusteriin

Klusteri luodaan, jotta resurssien hallinta olisi mahdollisimman optimoitua.

New Cluster

Basics

Name	<input type="text" value="Klusteri"/>
Location	<input type="text" value="Datacenter"/>
vSphere DRS	<input checked="" type="checkbox"/>
vSphere HA	<input checked="" type="checkbox"/>
vSAN	<input checked="" type="checkbox"/>
<input type="checkbox"/> Enable vSAN ESA <small>(i)</small>	

Choose how to set up the cluster's image

- Select an image from the Image Library (i)
- Extract an image from a host in this vCenter instance (i)
- Extract an image from a new host (i)
- Create a new image (i)
- Manage configuration at a cluster level (i)

CANCEL    **NEXT**

Vedä aiemmin luodut hostit klusteriin.

Hosts and Clusters

- f1-vcenter.ICTLAB.local
  - Datacenter
    - Klusteri
      - 10.70.64.167 (Disconnected)**
      - 10.70.66.162
      - 10.70.66.163
      - Centos (disconnected)
      - windows (disconnected)

Lisätään v motion ja fault tolerance.

## vmk0 - Edit Settings | 10.70.66.161

**Port properties**

Fields marked with \* are required

IPv4 settings	TCP/IP stack	Default
IPv6 settings	MTU (Bytes) *	1500

**Available services**

Configuring vSAN/vSAN Witness and vSAN Storage Cluster Client Network interfaces together is not supported.

Enabled services				
<input checked="" type="checkbox"/> vMotion	<input type="checkbox"/> vSphere Replication NFC	<input type="checkbox"/> NVMe over TCP		
<input type="checkbox"/> Provisioning	<input type="checkbox"/> vSAN	<input type="checkbox"/> NVMe over RDMA		
<input checked="" type="checkbox"/> Fault Tolerance logging	<input type="checkbox"/> vSAN Witness			
<input checked="" type="checkbox"/> Management	<input type="checkbox"/> vSAN Storage Cluster Client			
<input type="checkbox"/> vSphere Replication	<input type="checkbox"/> vSphere Backup NFC			

10.70.66.162 | ACTIONS

Summary Monitor Configure Permissions VMs Datastores Networks Updates

**Storage**

Storage Adapters  
Storage Devices  
Host Cache Configuration  
Protocol Endpoints  
I/O Filters  
Storage Providers

**Networking**

- Virtual switches** (selected)
- VMkernel adapters
- Physical adapters
- TCP/IP configuration
- Virtual Machines

**Virtual switches**

Standard Switch: vSwitch0 | ADD NETWORKING EDIT MANAGE PHYSICAL ADAPTERS ...

**Management Network** (selected)

VLAN ID: --  
VMkernel Ports (1)  
vmk0 : 10.70.66.162

**Physical Adapters**

vmnic0 10000 Full

**VM Network**

VLAN ID: --  
Virtual Machines (0)

**Action menu** (over VM Network): View Settings, Edit Settings, View Settings, Remove

**Buttons:** ADD NETWORKING..., REFRESH

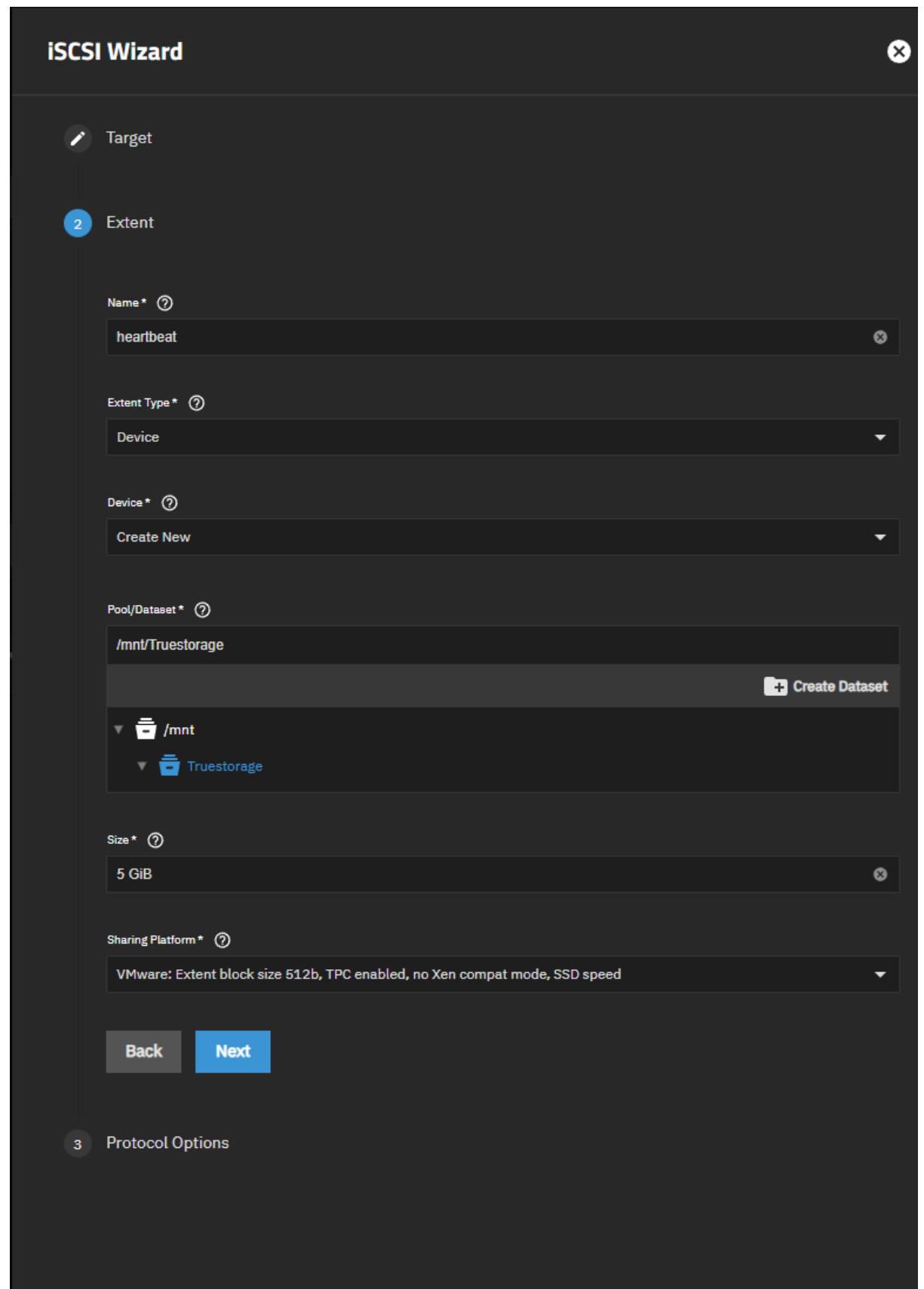
## 10 CHANGE YOUR NETWORK ISOLATION ADDRESS TO YOUR VCENTER ADDRESS

Option	Value
das.isolationaddress0	10.70.64.1

1 item

## 11 HEARTBEAT KONFFAUS

Luodaan toinen ISCSI vara tallennustilaksi.



Luodaan heartbeat datastore

New Datastore

1 Type

**2 Name and device selection**

3 VMFS version

4 Partition configuration

5 Ready to complete

Name and device selection

Specify datastore name and a disk/LUN for provisioning the datastore.  
Fields marked with \* are required

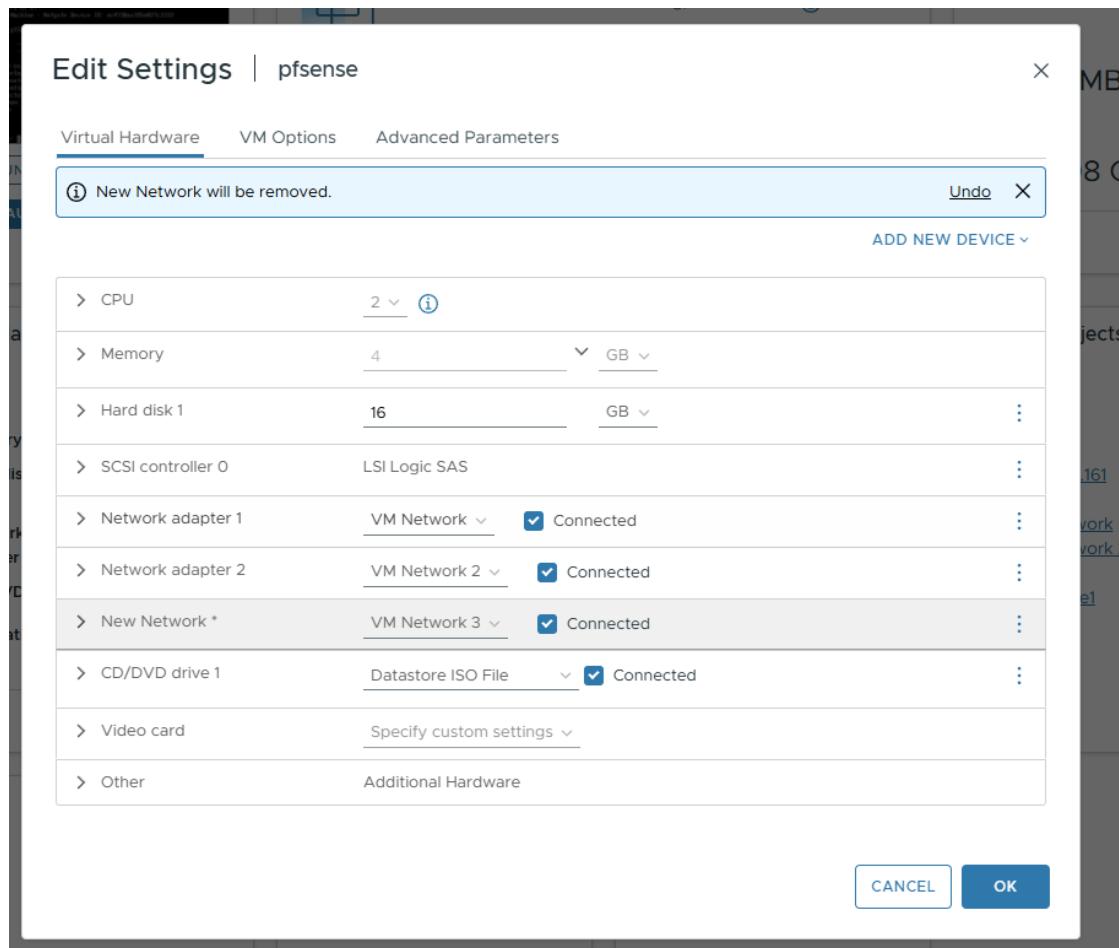
Name \* heartbeat

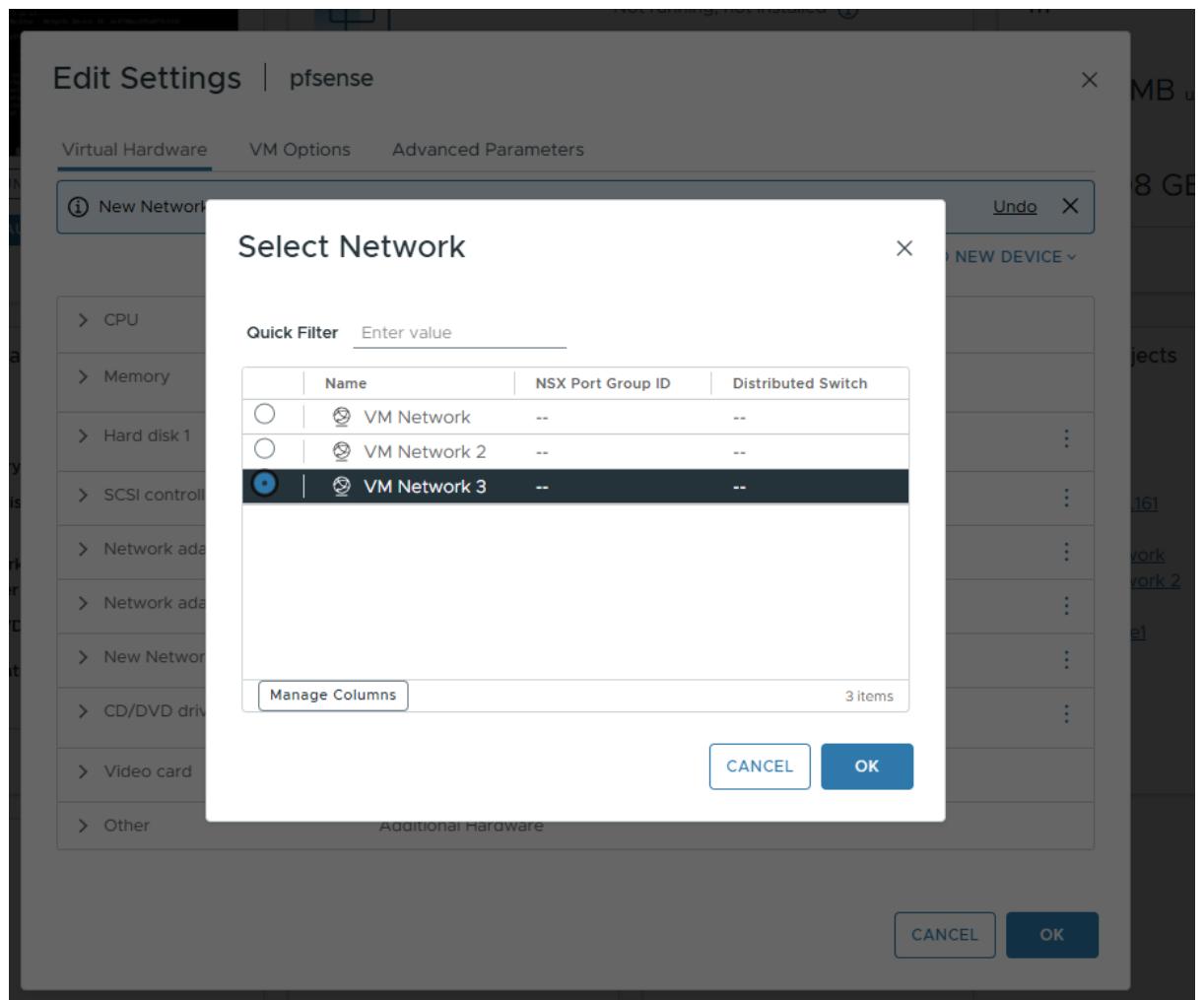
Name	LUN	Capacity	Hardware Acceleration	Drive Type	Sector Format	Clu VM Sup
TrueNAS iSCSI Disk (naa.6589fc0000004c320e cbefc2294bafd)	0	5.00 GB	Supported	Flash	--	No

Manage Columns Export ▾ 1 item

CANCEL BACK NEXT

## 11.1 Lisätään kolmas interface pfSenseen.





Lisätään network address: 192.168.2.0/24

vmk2 - Edit Settings | 10.70.66.161

Port properties

Fields marked with \* are required

IPv4 settings

No IPv4 settings

Obtain IPv4 settings automatically

Use static IPv4 settings

IPv4 address \* 192.168.2.0

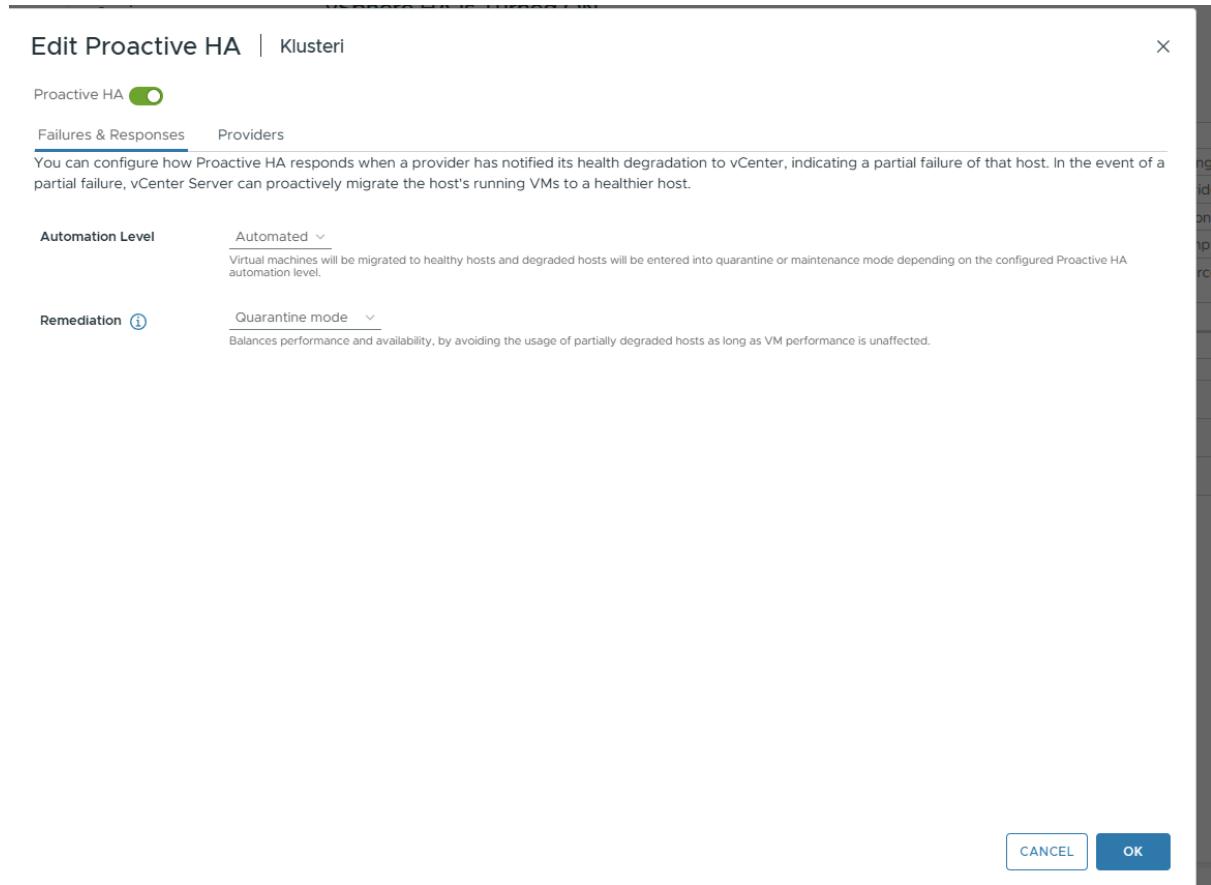
Subnet mask \* 255.255.255.0

Default gateway  Override default gateway for this adapter  
10.70.64.1

DNS server addresses 10.70.10.21

## 12 VMWARE VSOPHERE PROACTIVE HA

Testataan klusterin HA and FT ominaisuuksia sulkemalla yksi vSphere ESX-serveri.



Klusteri Vsphere DRS automatisoidaan resurssien jako klusterissa. Muutetaan asetuksia.

Edit Cluster Settings | Klusteri X

vSphere HA

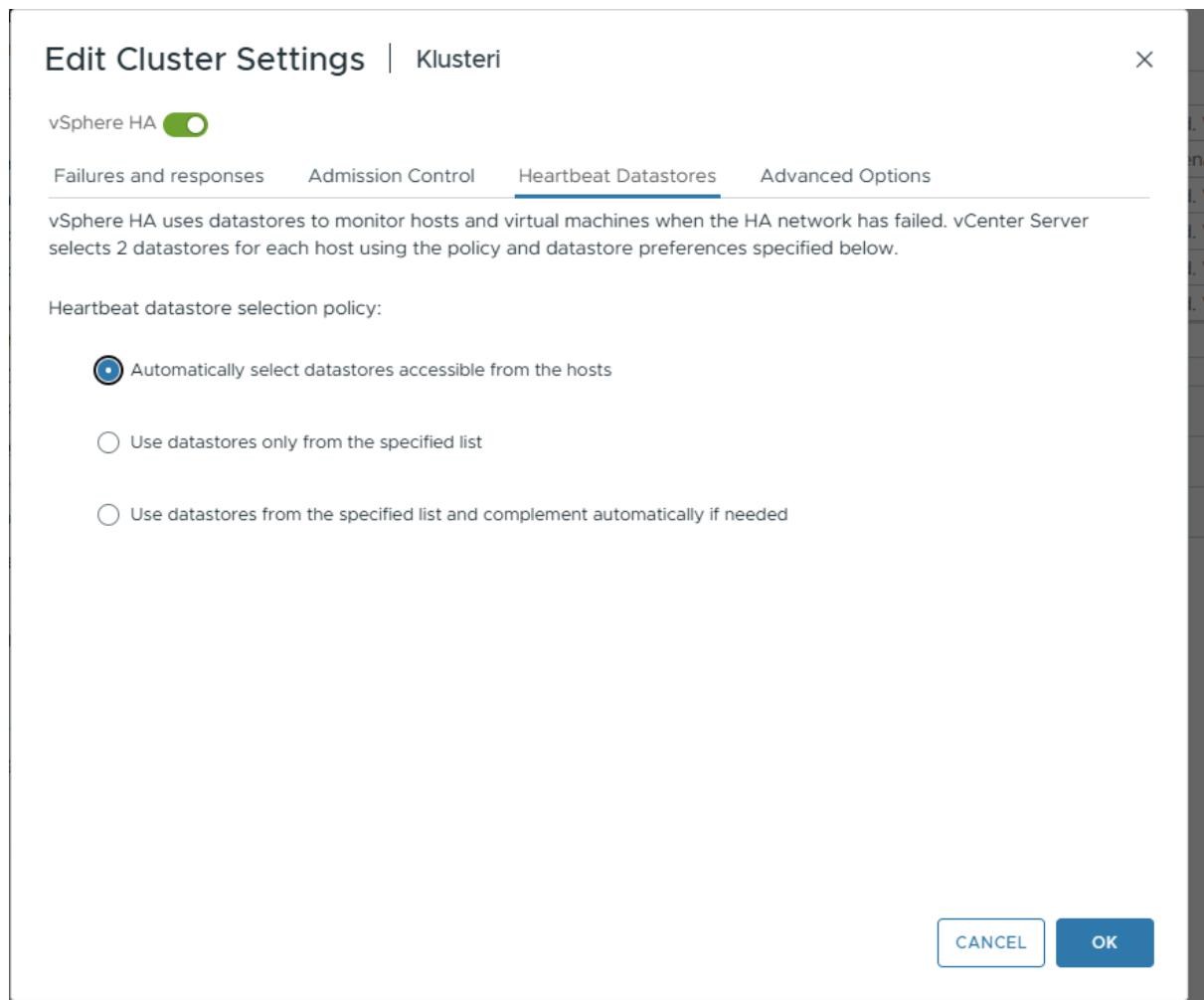
[Failures and responses](#) [Admission Control](#) [Heartbeat Datastores](#) [Advanced Options](#)

You can configure how vSphere HA responds to the failure conditions on this cluster. The following failure conditions are supported: host, host isolation, VM component protection (datastore with PDL and APD), VM and application.

Enable Host Monitoring  [i](#)

> Host Failure Response	Restart VMs
> Response for Host Isolation	Disabled
> Datastore with PDL	Power off and restart VMs
> Datastore with APD	Power off and restart VMs - Conservative restart policy
> VM Monitoring	VM Monitoring Only

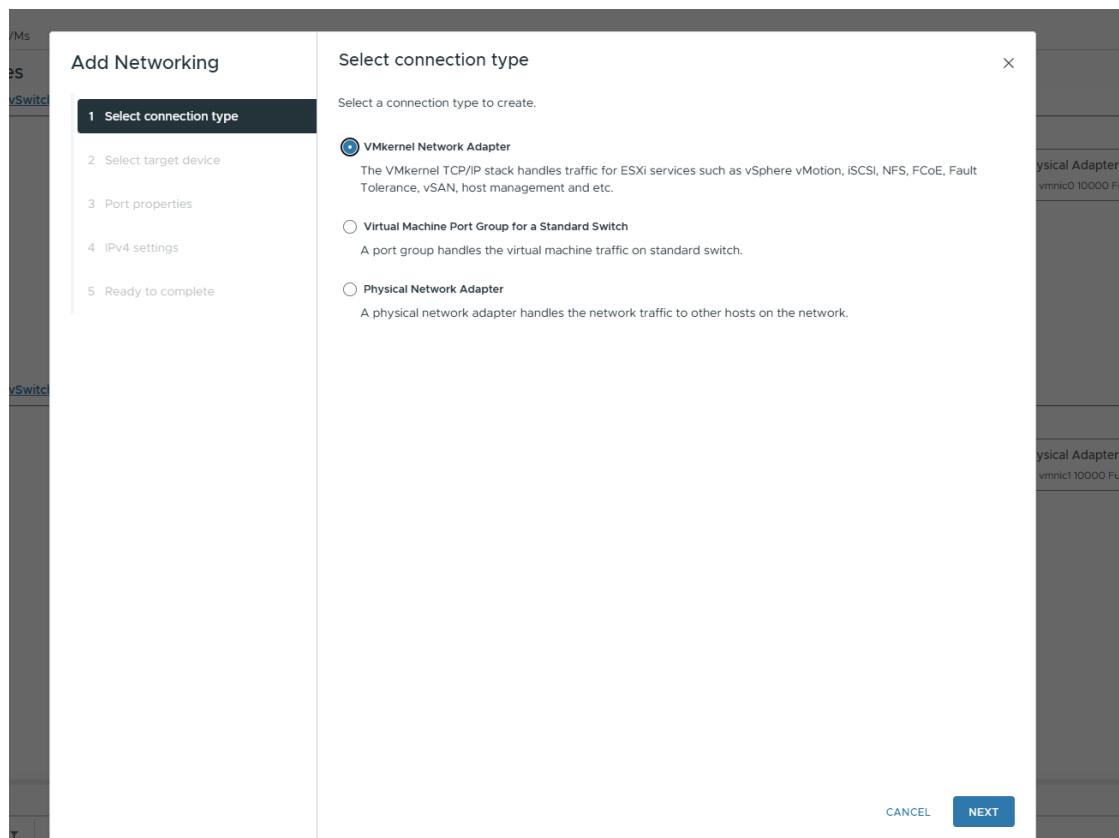
[CANCEL](#) [OK](#)



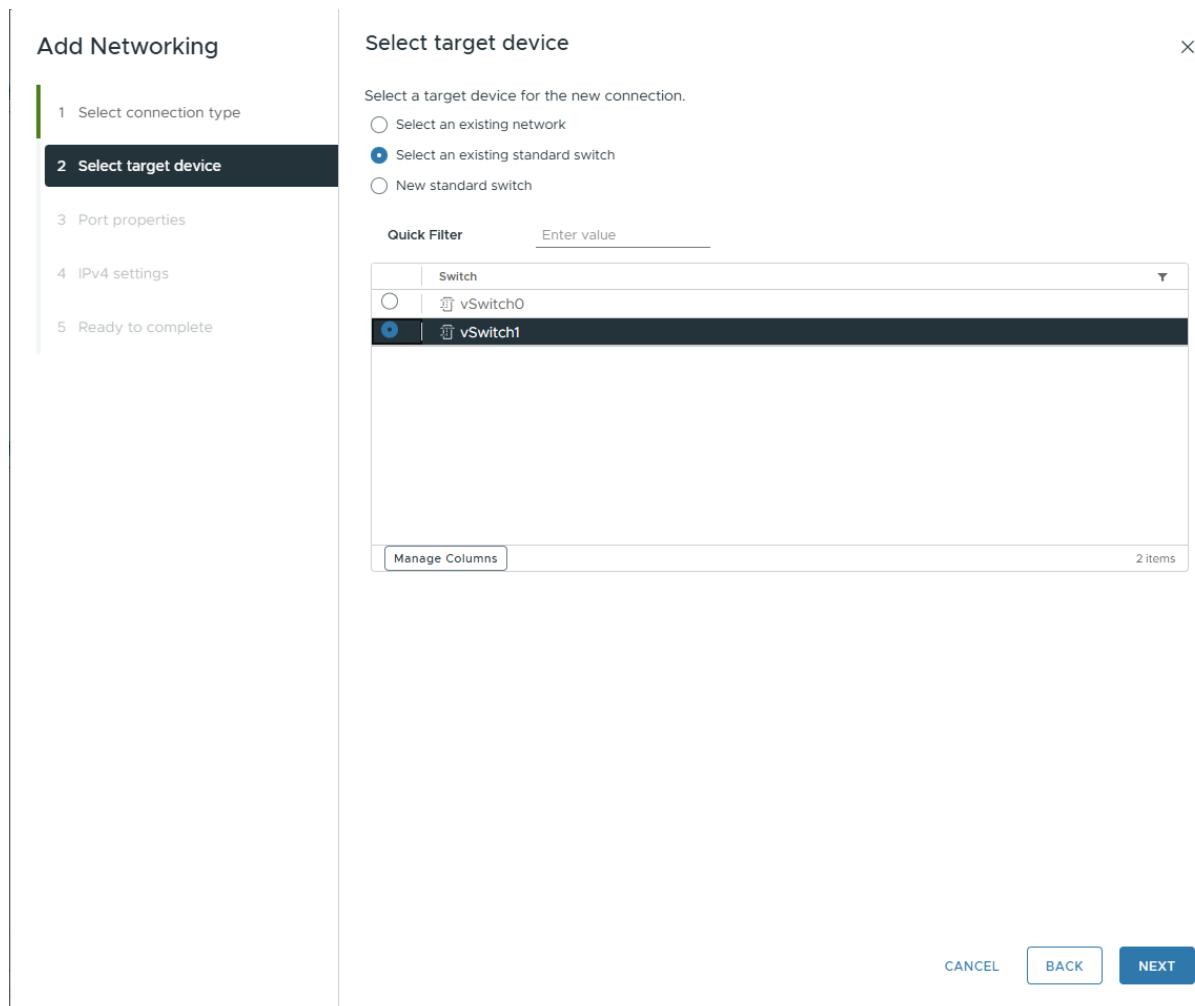
Lisätään kerner kytkimeen 1.

VMkernel adapteri luodaan, jotta ESXi voi viestiä verkon kautta eri palveluiden ja muiden isäntien kanssa.

Esimerkki konfiguraatio.



Valitaan switch 1.



**Add Networking**

- 1 Select connection type
- 2 Select target device
- 3 Port properties**
- 4 IPv4 settings
- 5 Ready to complete

**Port properties**

Specify VMkernel port settings.  
Fields marked with \* are required

Network label *	VMkernel
VLAN ID	None (0) ▾
IP settings	IPv4 ▾
MTU	Get MTU from switch ▾ 1500
TCP/IP stack	Default ▾

**Available services**

ⓘ Configuring vSAN/vSAN Witness and vSAN Storage Cluster Client Network interfaces together is not supported.

Enabled services	<input checked="" type="checkbox"/> vMotion	<input type="checkbox"/> vSphere Replication NFC	<input type="checkbox"/> NVMe over TCP
<input checked="" type="checkbox"/> Provisioning	<input type="checkbox"/> vSAN	<input type="checkbox"/> NVMe over RDMA	
<input type="checkbox"/> Fault Tolerance logging	<input type="checkbox"/> vSAN Witness		
<input checked="" type="checkbox"/> Management	<input type="checkbox"/> vSAN Storage Cluster Client		
<input type="checkbox"/> vSphere Replication	<input type="checkbox"/> vSphere Backup NFC		

CANCEL BACK NEXT

Kytämen 2 kohdissa vmnic3 varten.

Add Networking

**1 Select connection type**

2 Select target device  
3 Connection settings  
4 Ready to complete

Select connection type

Select a connection type to create.

**VMkernel Network Adapter**  
The VMkernel TCP/IP stack handles traffic for ESXi services such as vSphere vMotion, iSCSI, NFS, FCoE, Fault Tolerance, vSAN, host management and etc.

**Virtual Machine Port Group for a Standard Switch**  
A port group handles the virtual machine traffic on standard switch.

**Physical Network Adapter**  
A physical network adapter handles the network traffic to other hosts on the network.

CANCEL   **NEXT**

**Add Networking**

- 1 Select connection type
- 2 Select target device
- 3 Create a Standard Switch**
- 4 Connection settings
- 5 Ready to complete

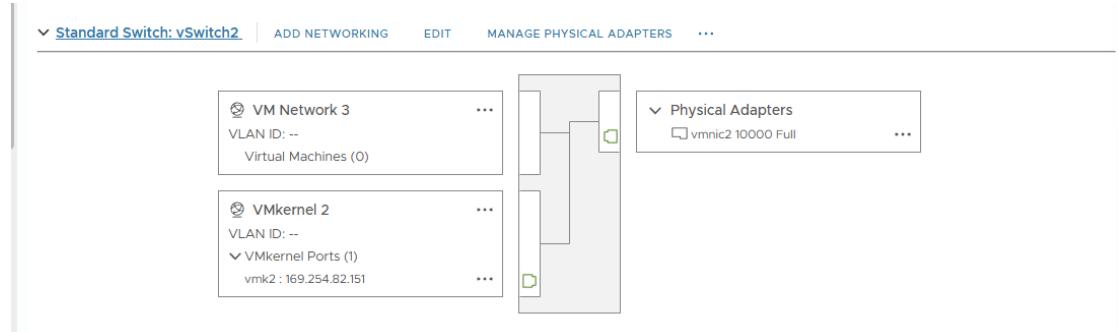
**Create a Standard Switch**

Assign free physical network adapters to the new switch.  
Select unclaimed (free) adapters on the host and move them to the Active/Standby/Unused adapters of the switch.

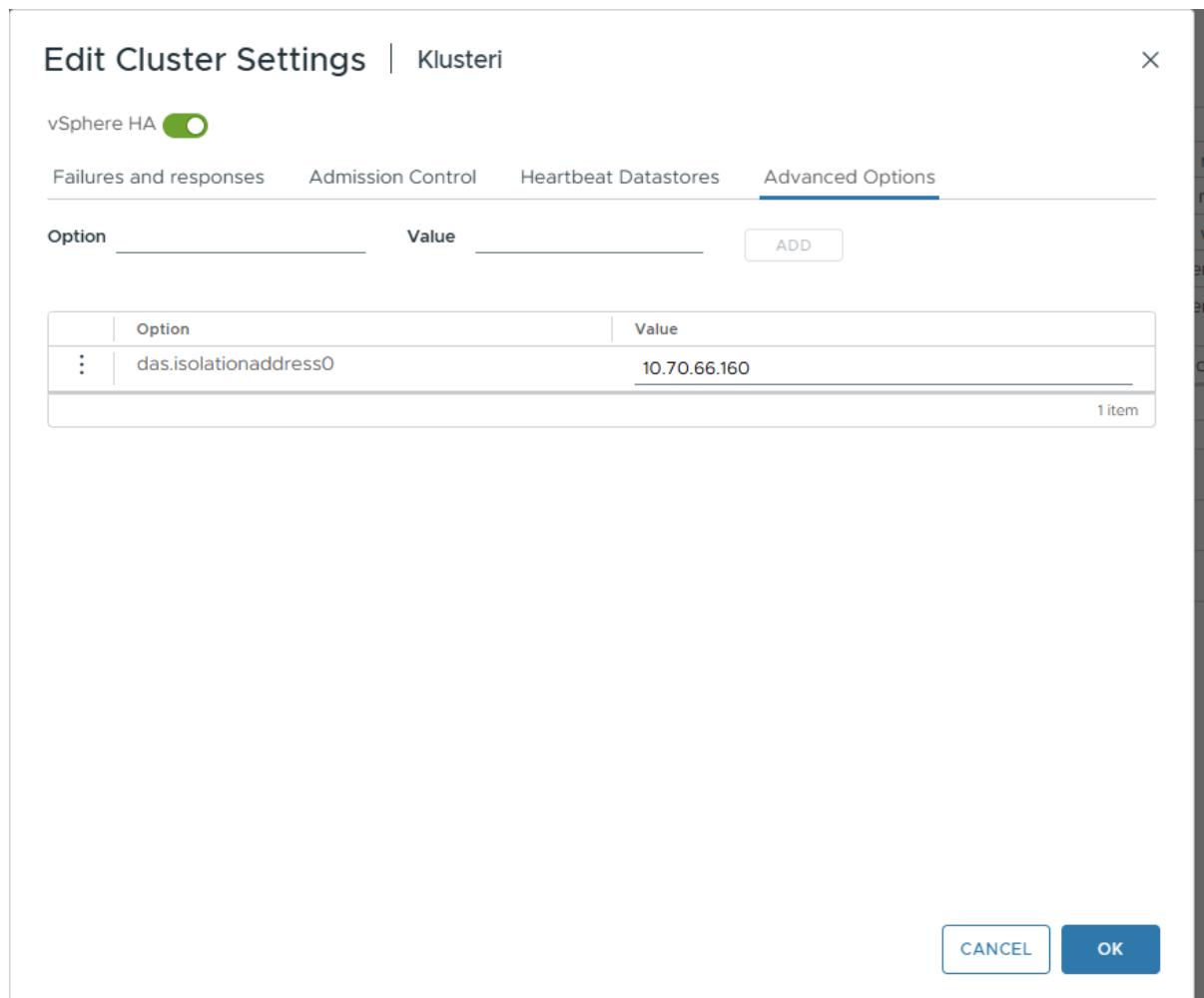
MOVE UP	MOVE DOWN	All	Properties	CDP	LLDP
<b>Unclaimed adapters</b>					
<b>Active adapters</b>					
(New) vmnic2					
<b>Standby adapters</b>					
<b>Unused adapters</b>					
<span style="margin-right: 10px;">▼ Properties</span> <span>Adapter VMware Inc. vmxnet3 Virtual Ethernet Controller</span>					
<span>Name</span> vmnic2					
<span>Location</span> PCI 0000:1b:00.0					
<span>Driver</span> nvmxnet3					
<span>▼ Status</span>					
<span>Status</span> Connected					
<span>Actual speed, Duplex</span> 10 Gbit/s, Full Duplex					
<span>Configured speed, Duplex</span> 10 Gbit/s, Full Duplex					
<span>Networks</span> No networks					
<span>▼ Network I/O Control</span>					
<span>Status</span> Allowed					
<span>▼ SR-IOV</span>					
<span>Status</span> Not supported					
<span>▼ Cisco Discovery Protocol</span>					
<span>① Cisco Discovery Protocol is not available on this physical network adapter</span>					
<span>▼ Link Layer Discovery Protocol</span>					
<span>① Link Layer Discovery Protocol is not available on this physical network adapter</span>					

CANCEL BACK NEXT

vSwitch2 topologiassa.



**13 DAS. ISOLATIONADDRESS0. V-CENTER IP-OSOITE 10.70.66.160**



## 14 PÄIVITETÄÄN VSphere-SERVERIT LIFECYCLE MANAGER HYÖDYNTÄEN

Aluksi tarkistetaan isäntäkoneiden sopivuus. Käytetään Remiate-toimintoa. Kun aiemmin luotu vSphere DRS on käytössä Lifecycle Manager siirtää virtuaalikoneet automaattisesti päivittäväältä isäntäkoneelta toiselle. Isäntäkone menee maintenance tilaan päivityksen ajaksi.

**Klusteri** | ACTIONS

Summary Monitor Configure Permissions Hosts VMs Datastores Networks Updates

**Hosts** ▾

- Image**
- Hardware Compatibility
- VMware Tools
- VM Hardware

**Image**  
Hosts in this cluster are managed collectively. This image below will be applied to all hosts in this cluster.

**Image Name** autogen-software-spec-1

**Default Image**

ESXi Version	9.0.0.24755229
Vendor Addon ⓘ	None
Firmware and Drivers Addon ⓘ	None
Components ⓘ	No additional components <a href="#">SHOW DETAILS</a> ▾

**Image Compliance**  
Last checked on 12/17/2025, 5:59:33 PM (0 days ago)  
All hosts in this cluster are compliant

[CHECK COMPLIANCE](#) ...

## 14.1 Päivitetään vCenter-server vCenter Server Appliance Management

Päivittäminen tapahtuu taulukosta vcenter <https://10.70.66.160:5480> IP-osoitteesta. Päivitetään check updates kohdasta ja valitaan tarkista url+CD-Rom kohta, joka hakee päivitykset.