Lauri Partinen ktkt23sp

Loppuraportti

Virtualisointi

2025

Kaakkois-Suomen
ammattikorkeakoulu

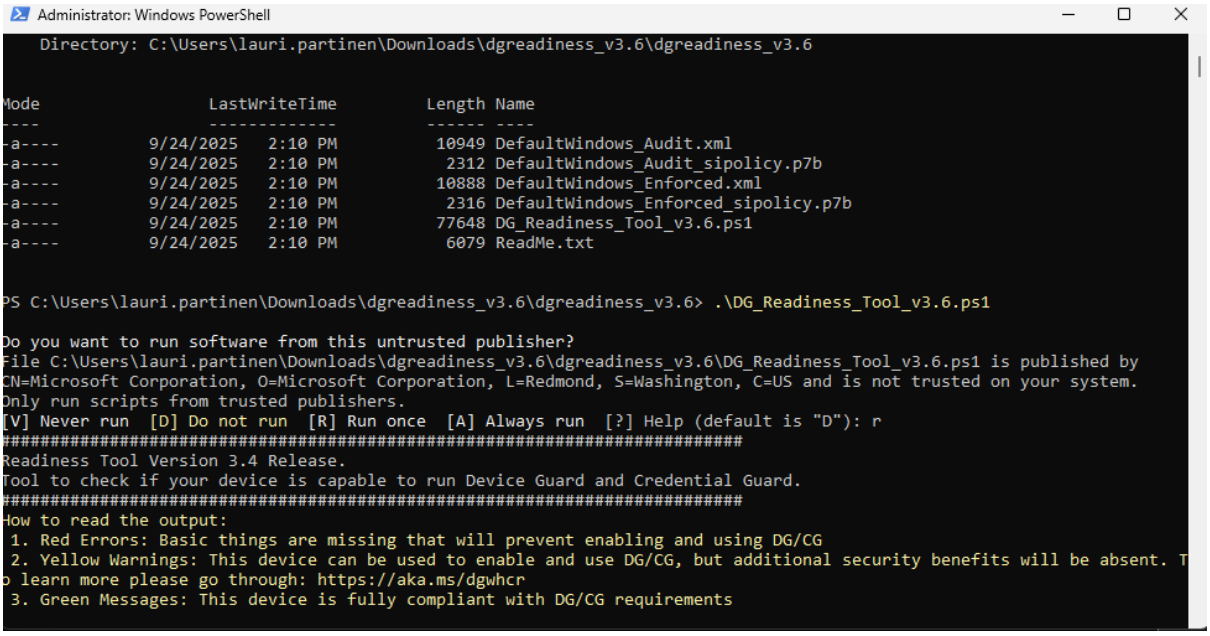
SISÄLLYS

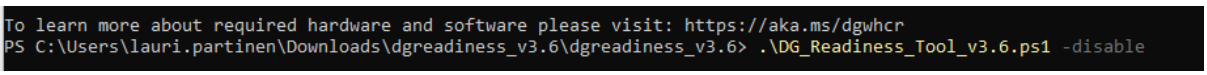
1 JOHDANTO

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 turvaominaisuuksia.





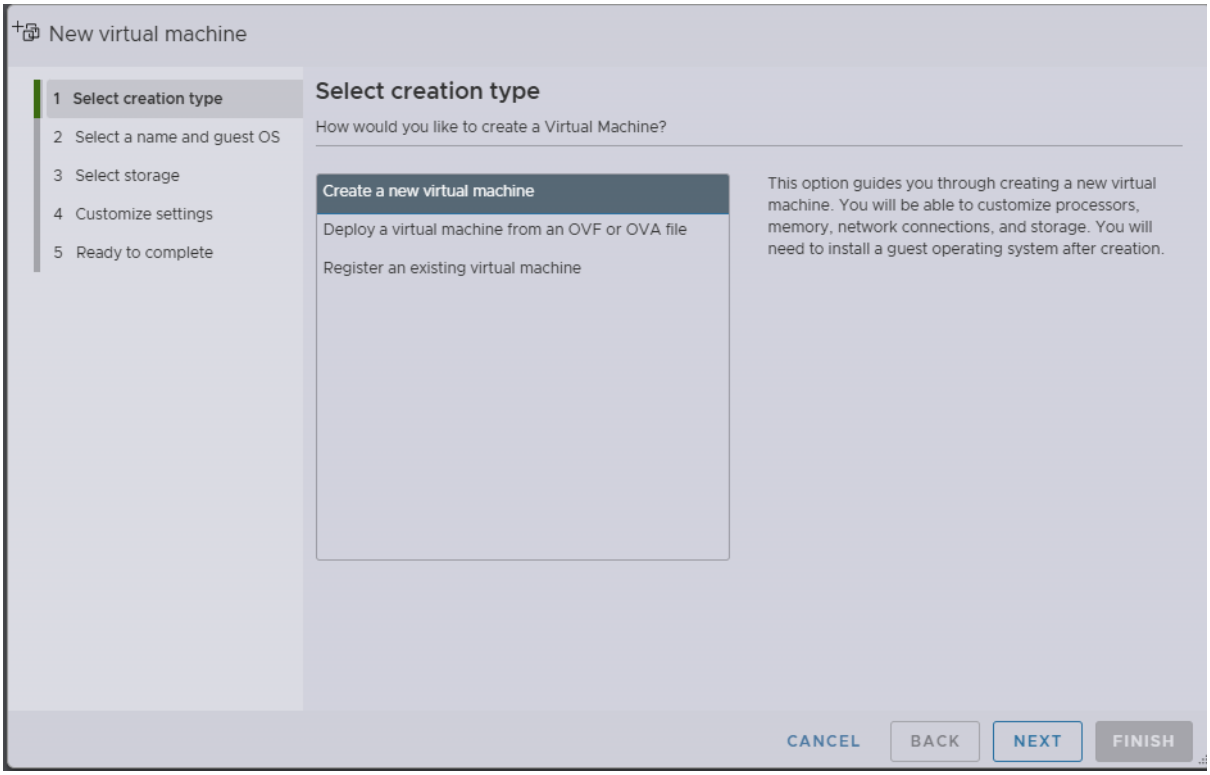
3 ESXI ASENNUS

Suoritettiin ESXI asennus. Lisätään ip-osoitteeksi 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.

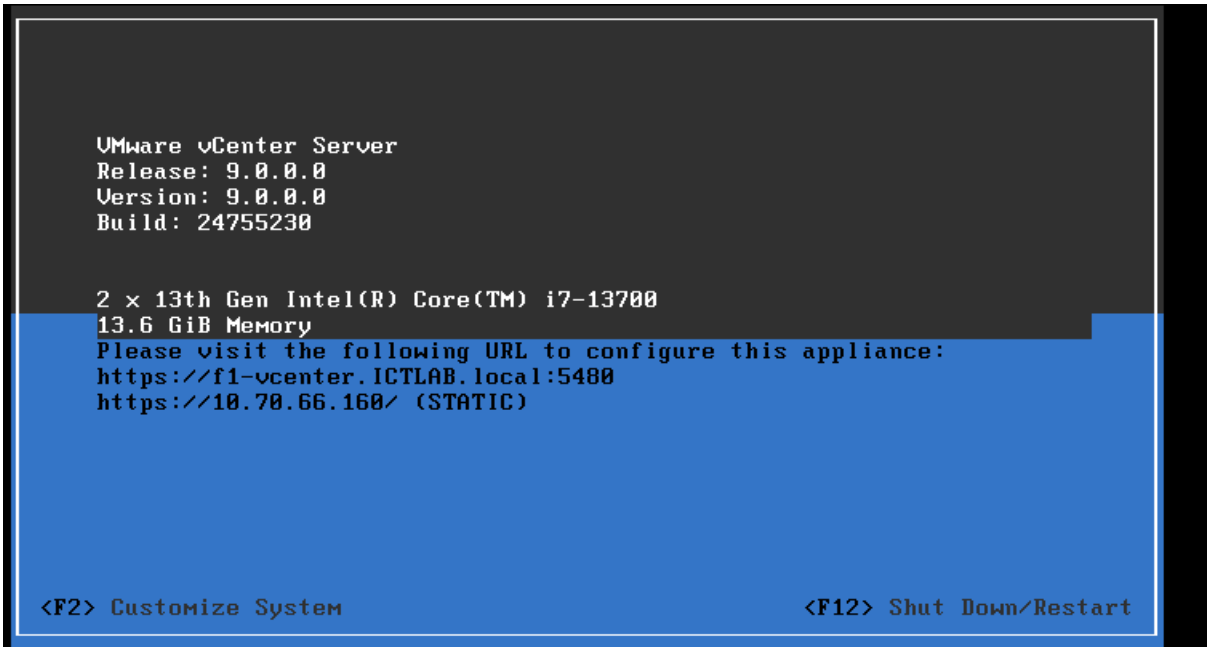


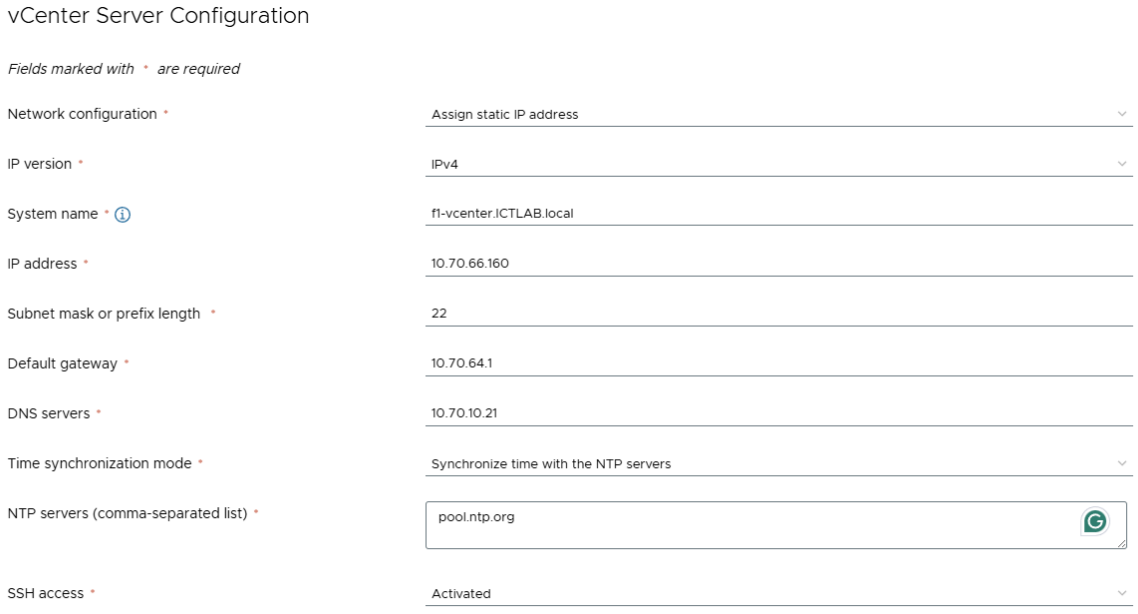
Molemmat virtuaalikoneet toiminnassa.

5 VCENTERIN ASENNUS JA KÄYTTÖÖNOTTO

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

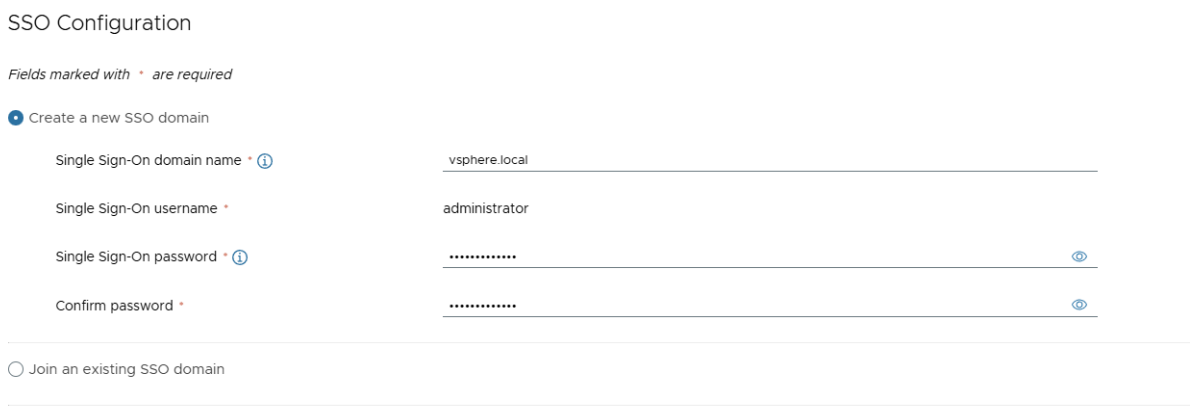
F1-VCENTER,10.70.66.160





5.1 SSO konfigurointi

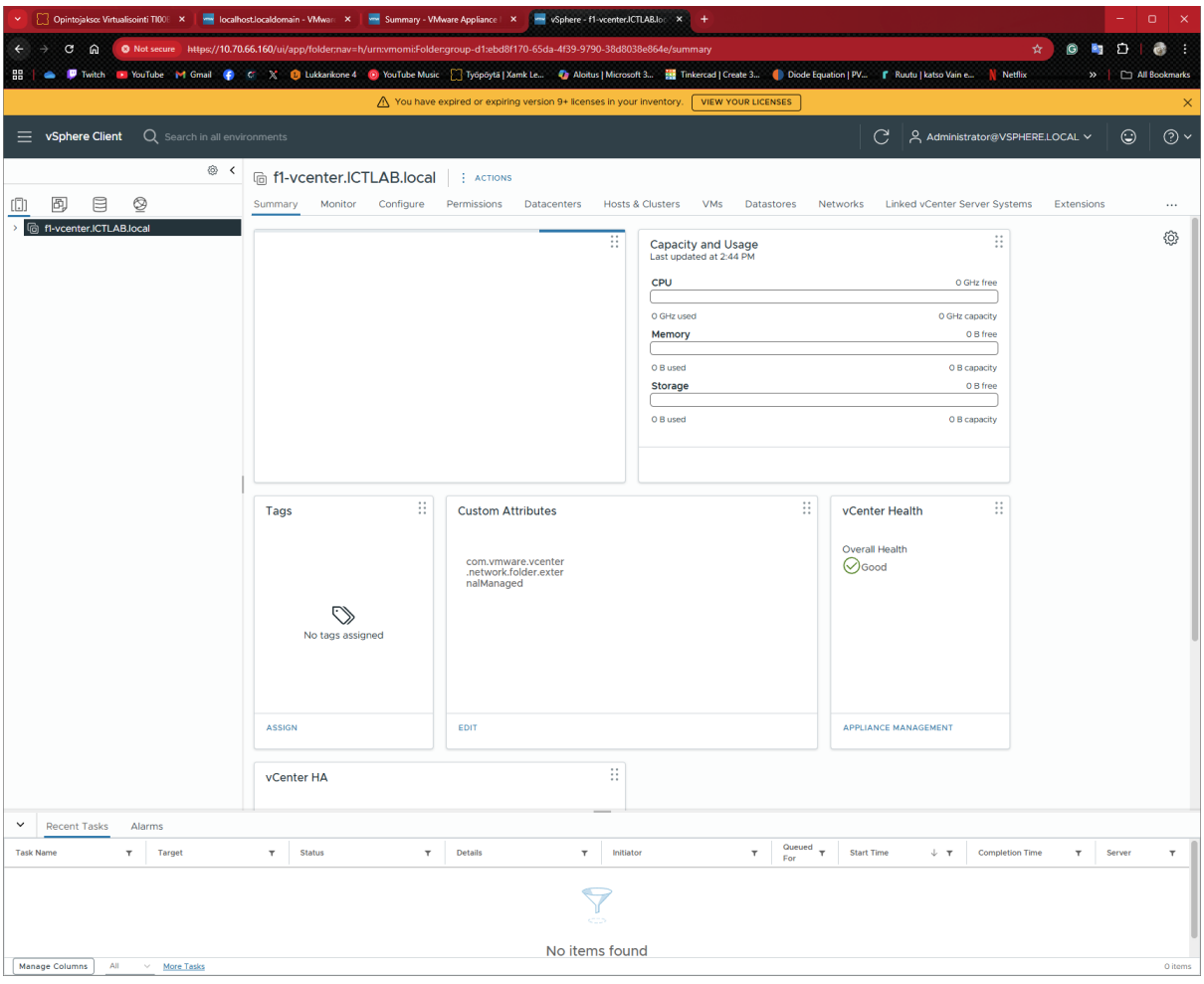
Luodaan SSO domain vsphere.local ja määritetään järjestelmänvalvojan tunnukset.



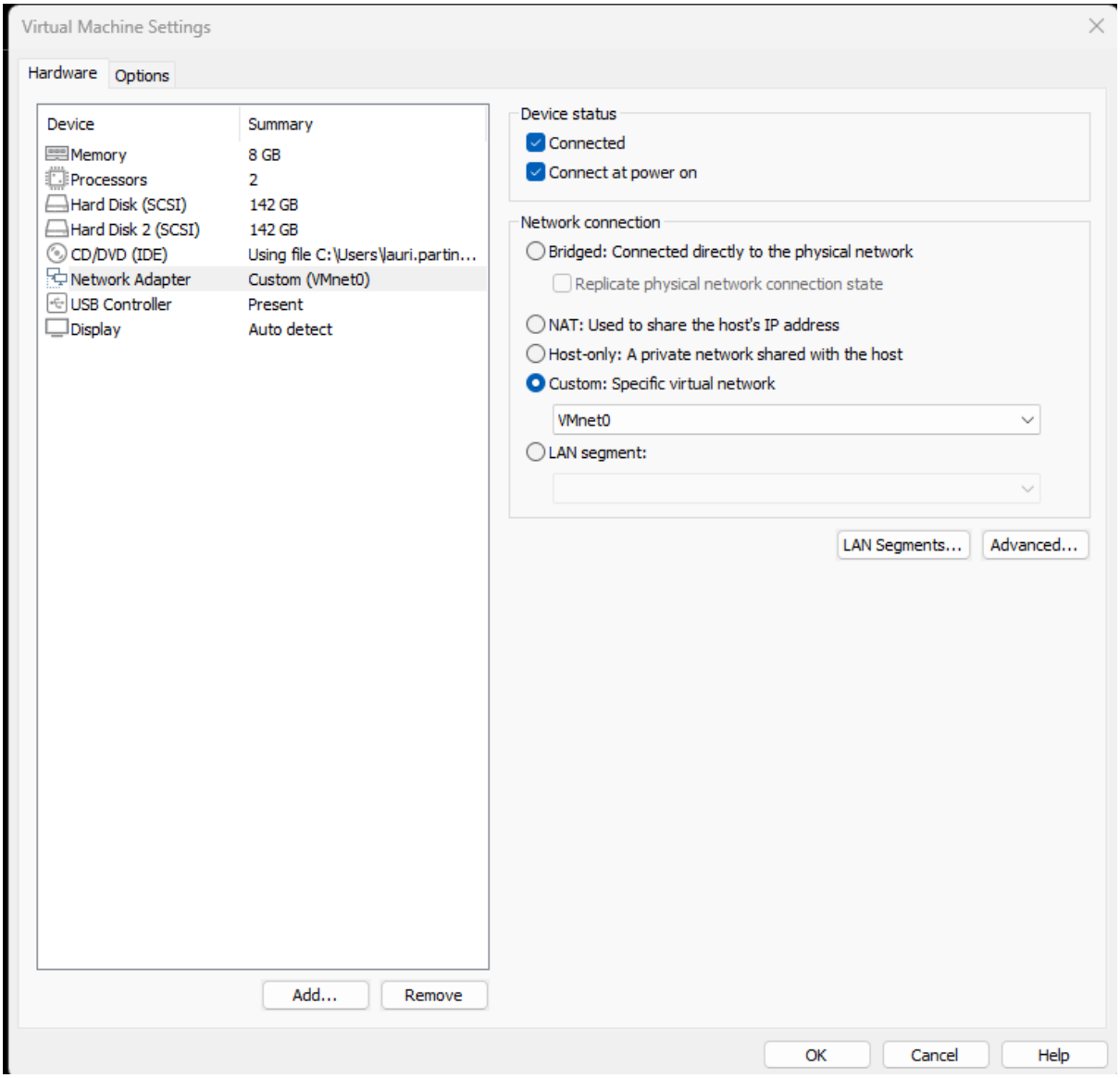
5.2 Fully qualified domainname

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

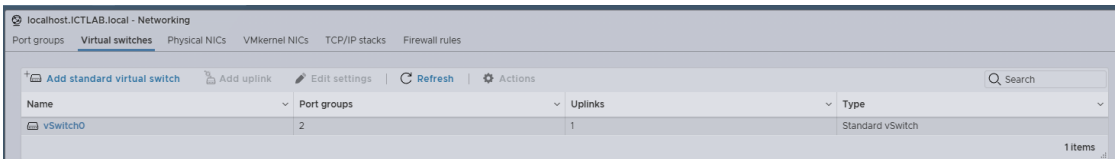
Lisätään domain nimi F1-vcenter.ictlab.local.

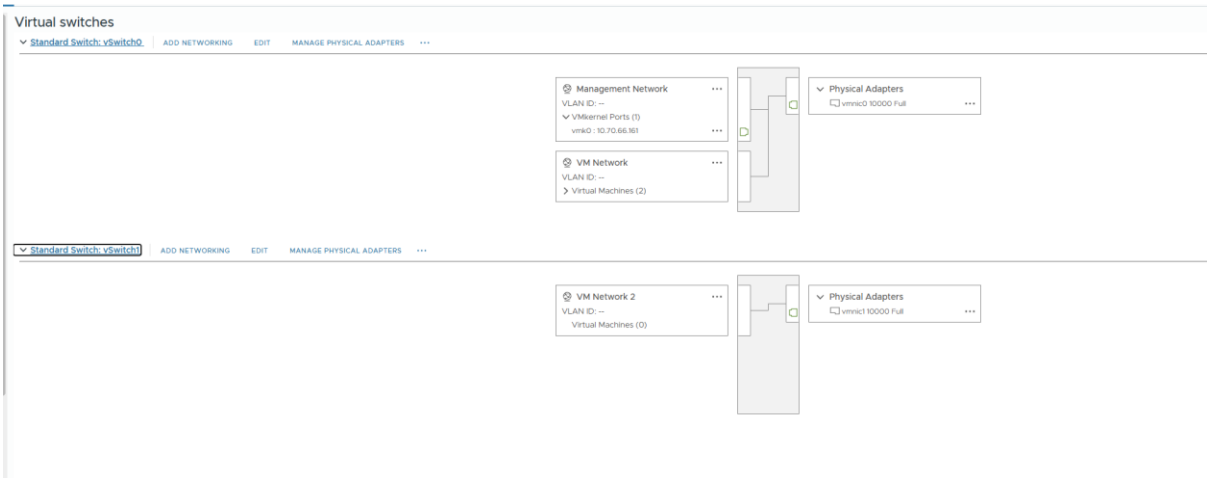


Luodaan verkkoadapteri VMnet0.

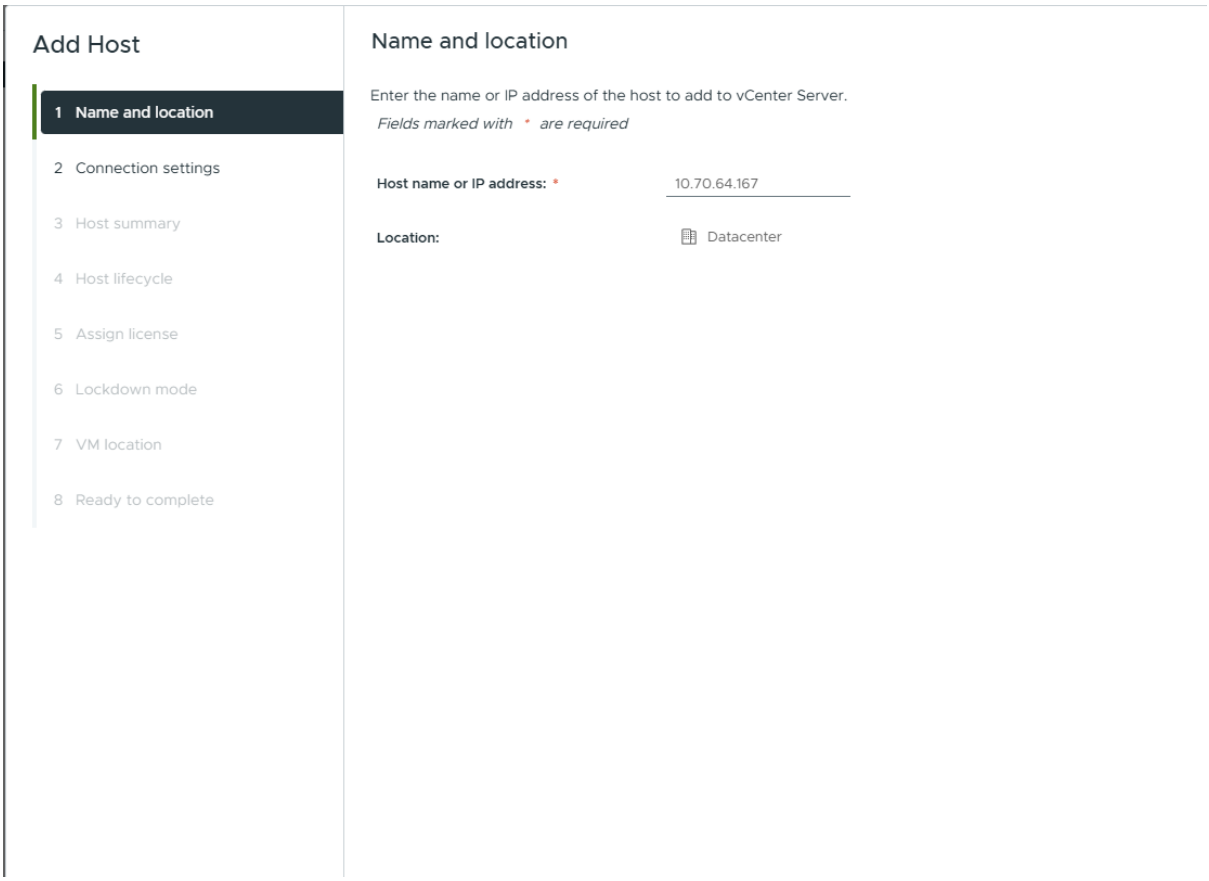


Luodaan kytkin 0 ja lisätään se vcenteriin.

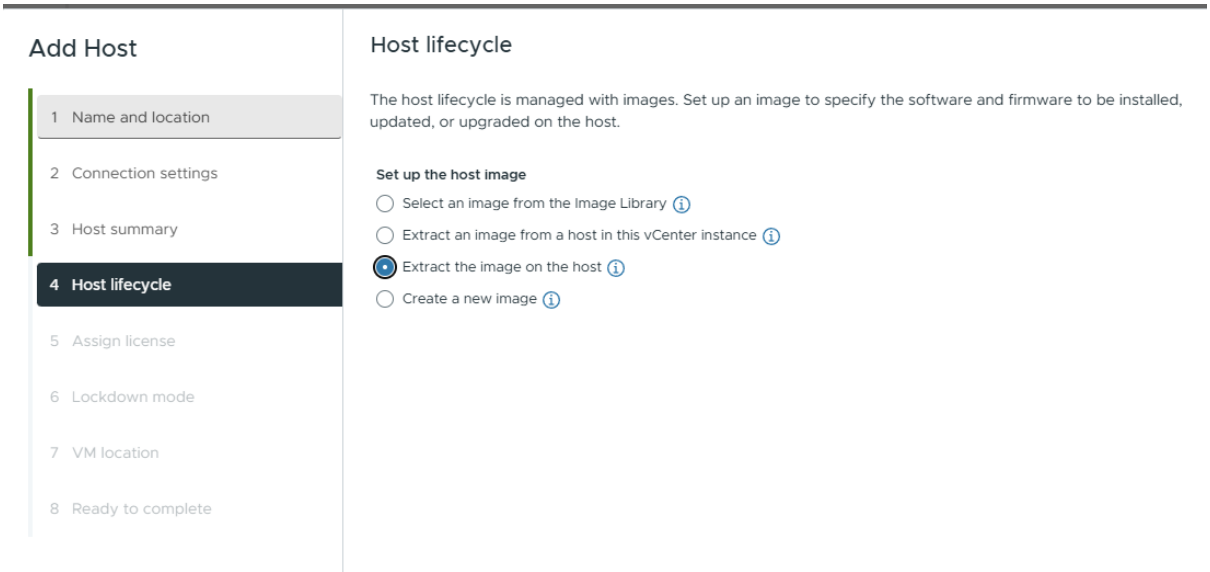




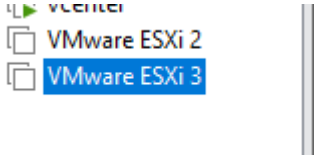
Lisätään ESXI host vCenteriin.



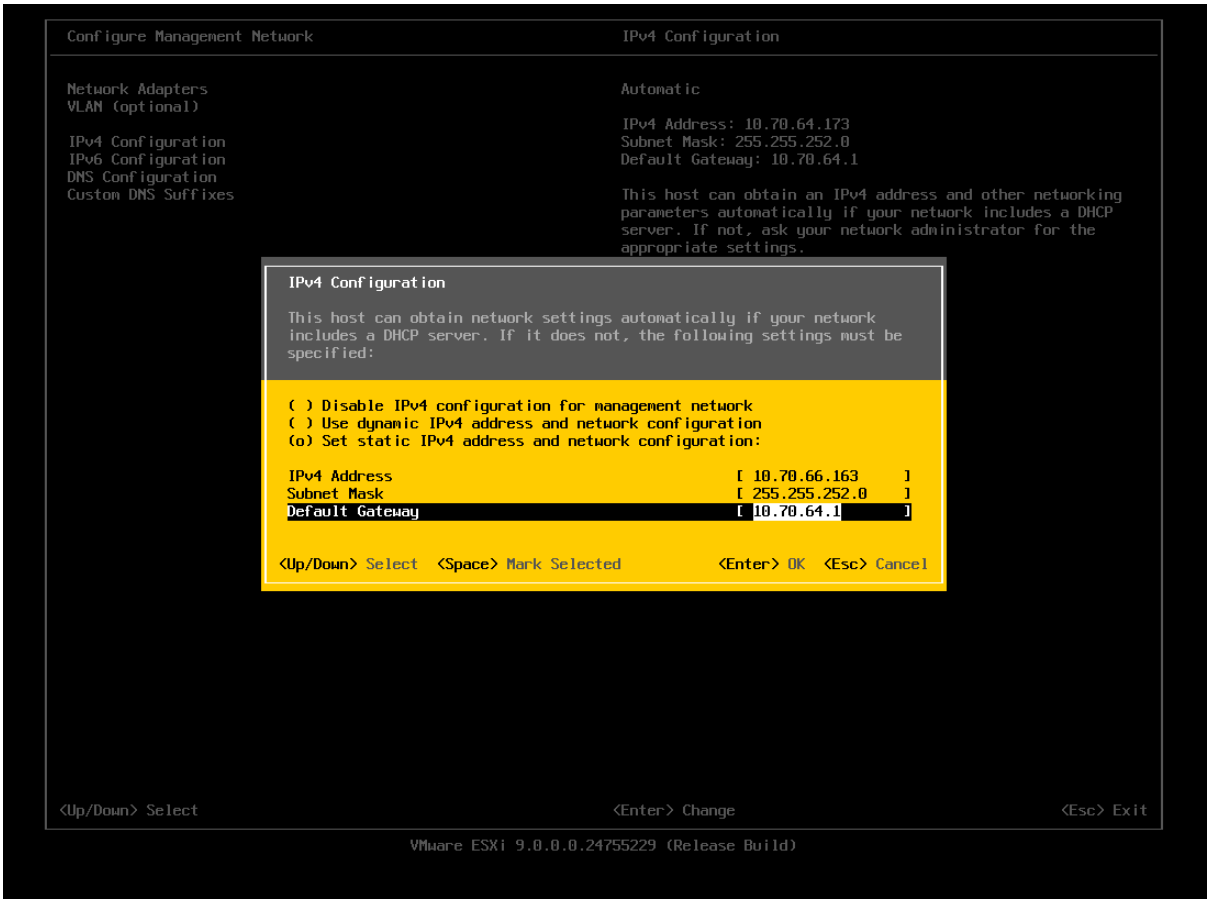
Lisätään ESXi image.



Virtuaalikoneet vcenterin alla vmware.



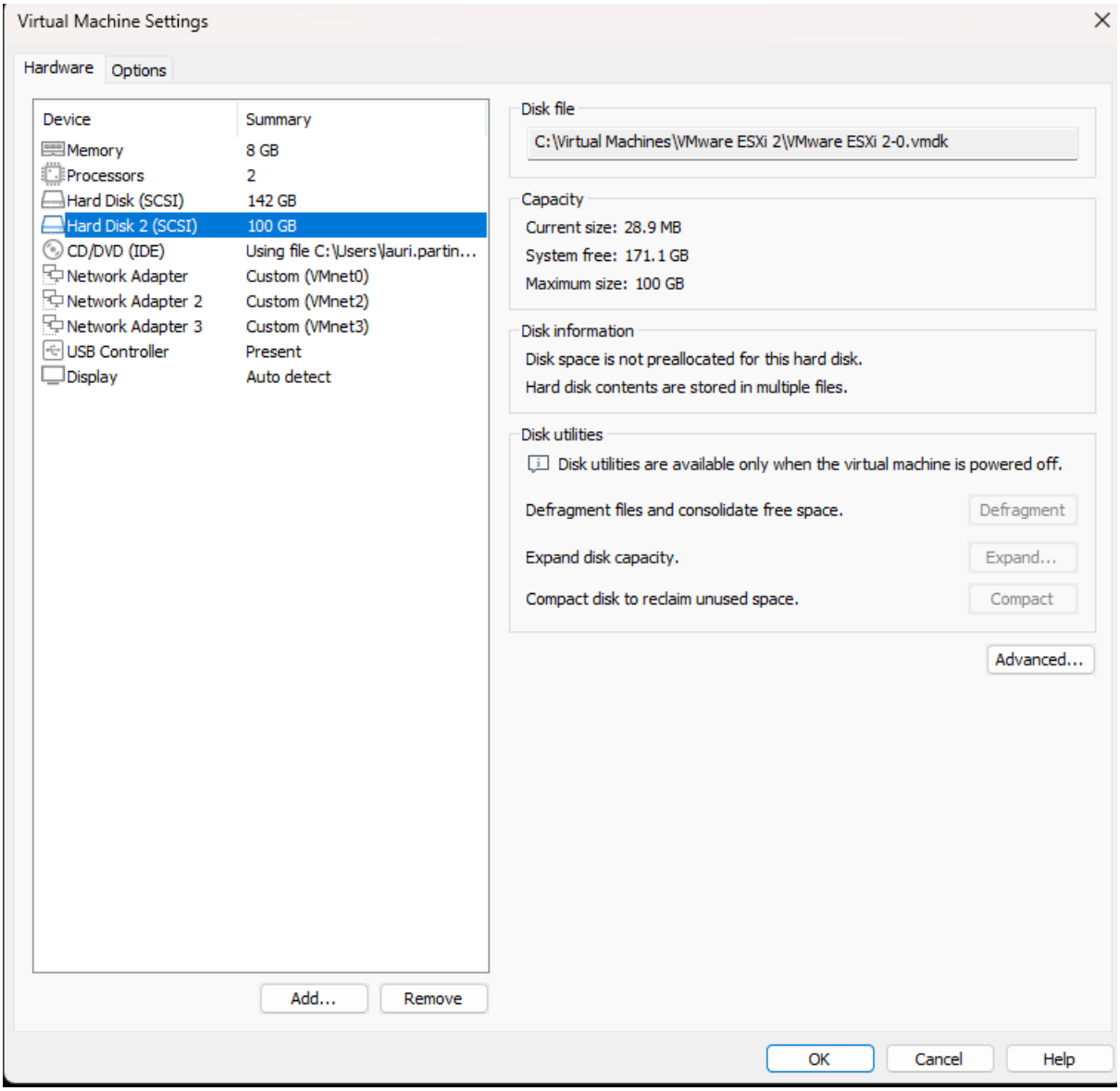
Luodaan ESXI 2 ja 3. Tässä esimerkki ESXI 3 konfiguroinnista.



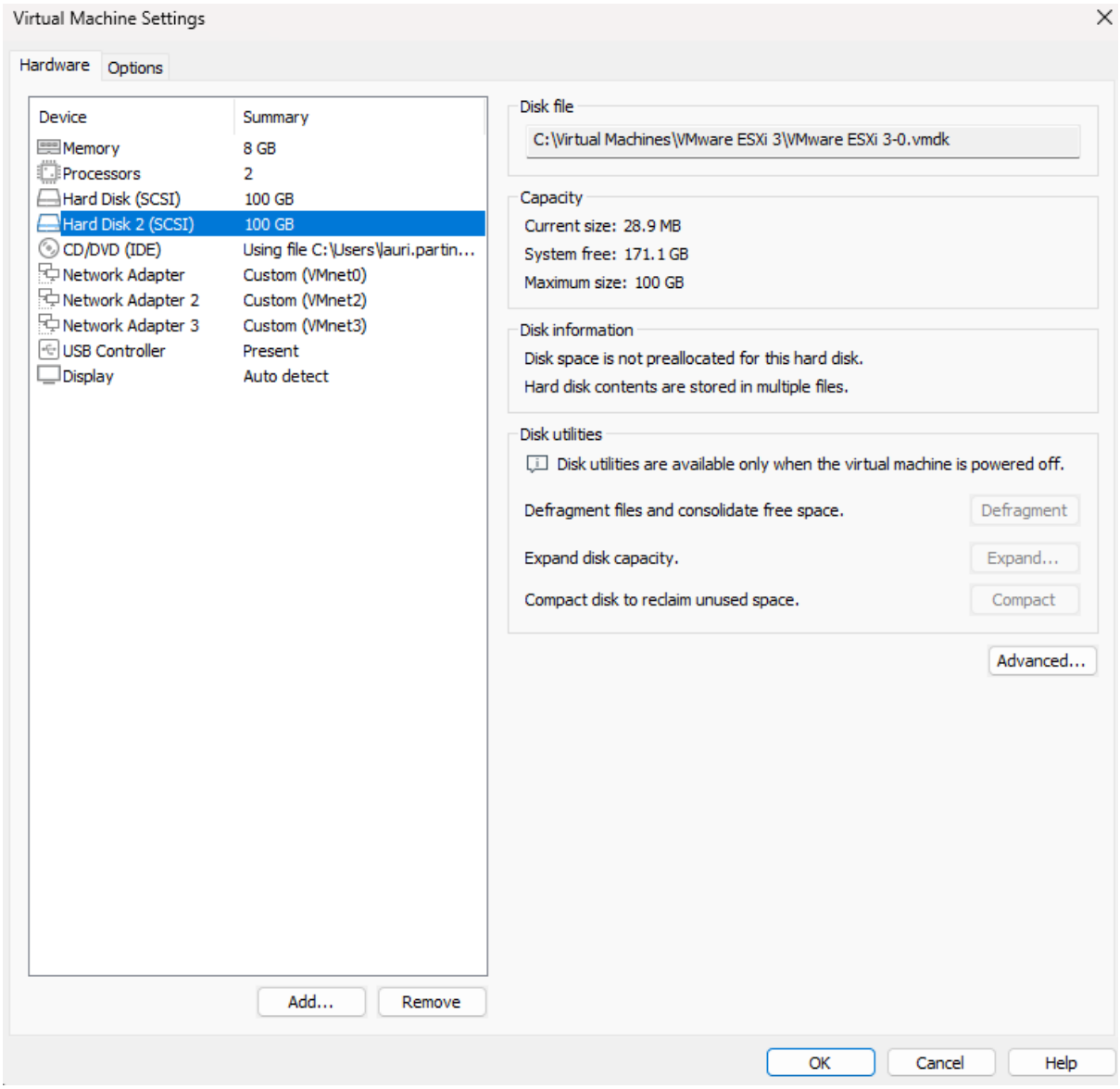
6 ESX2 JA EX3 DATASTORE LUONTI

Esx2

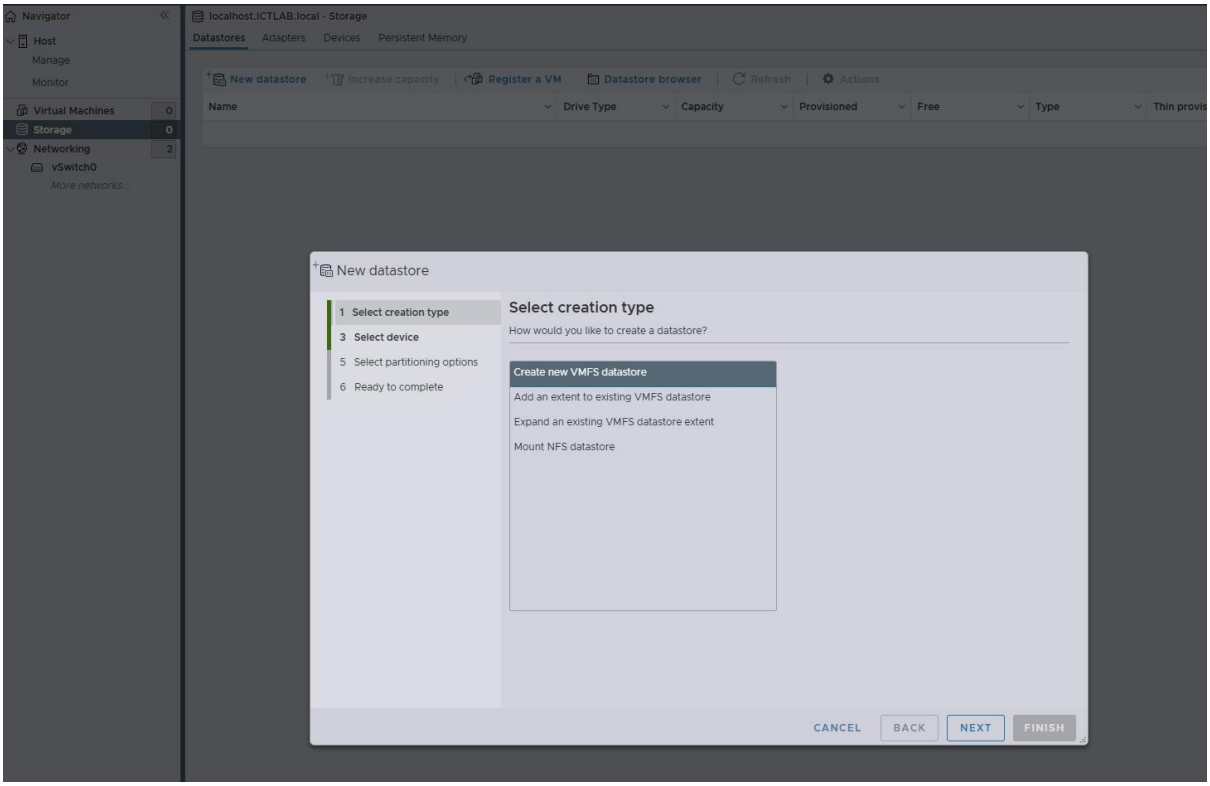
Lisätään asetuksista lisää tallennustilaa

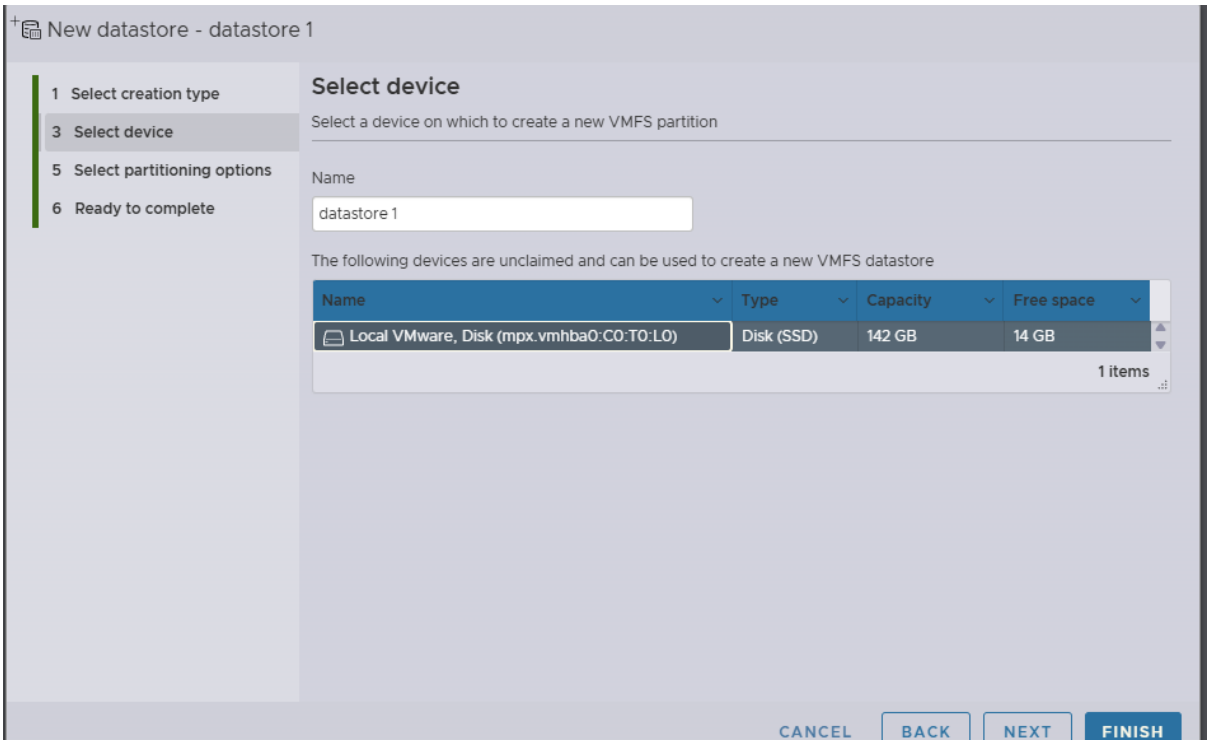


Esx3 lisää tallennustilaa

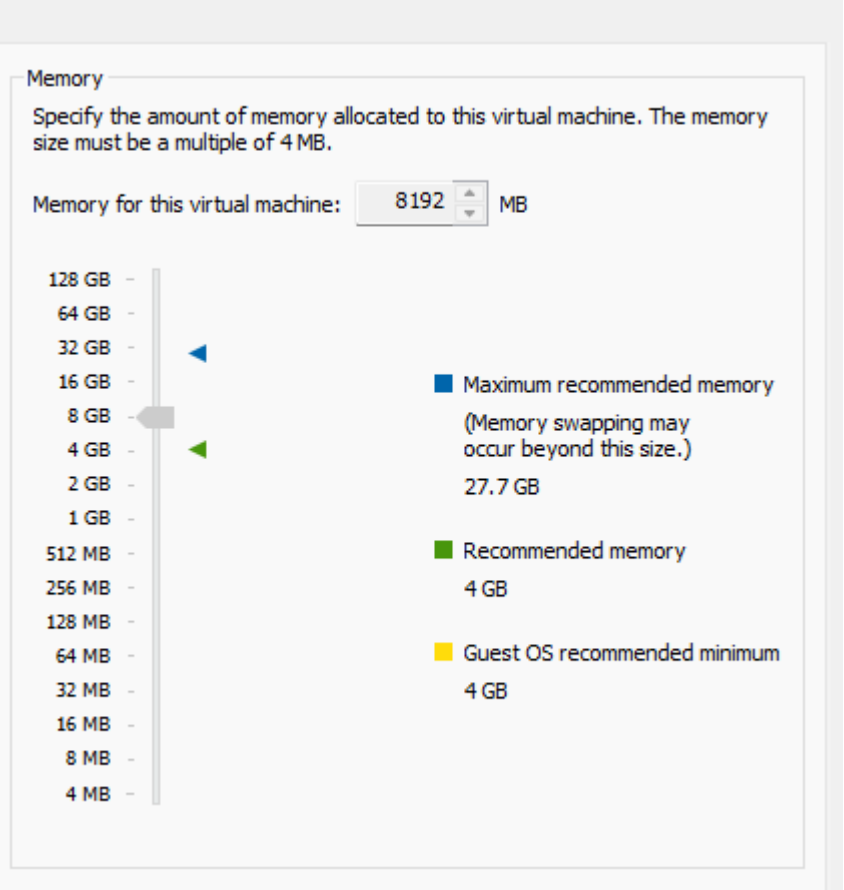


Luodaan datastore tallennustilaa varten.



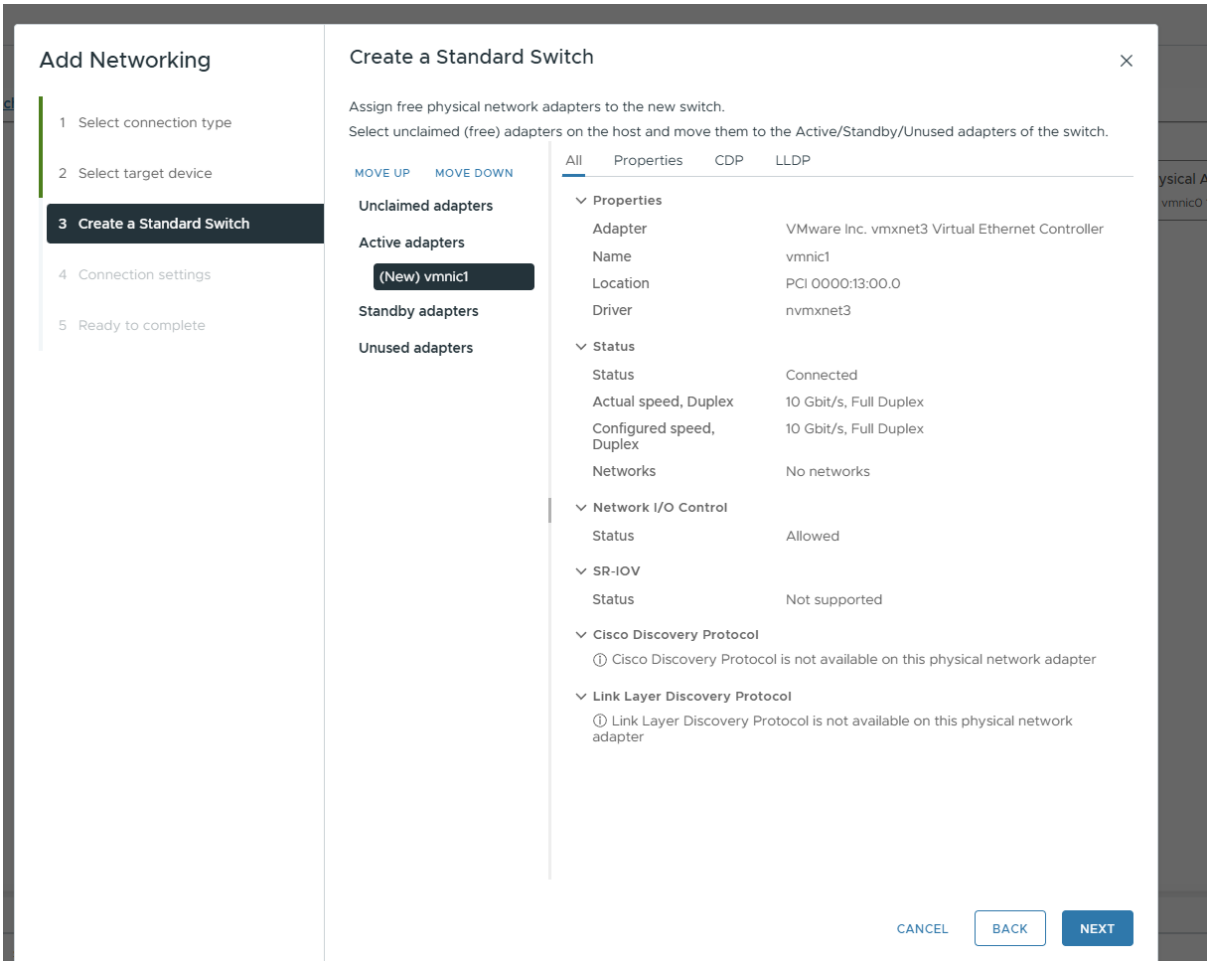


Lisätään muistia ESXi virtuaali koneille.



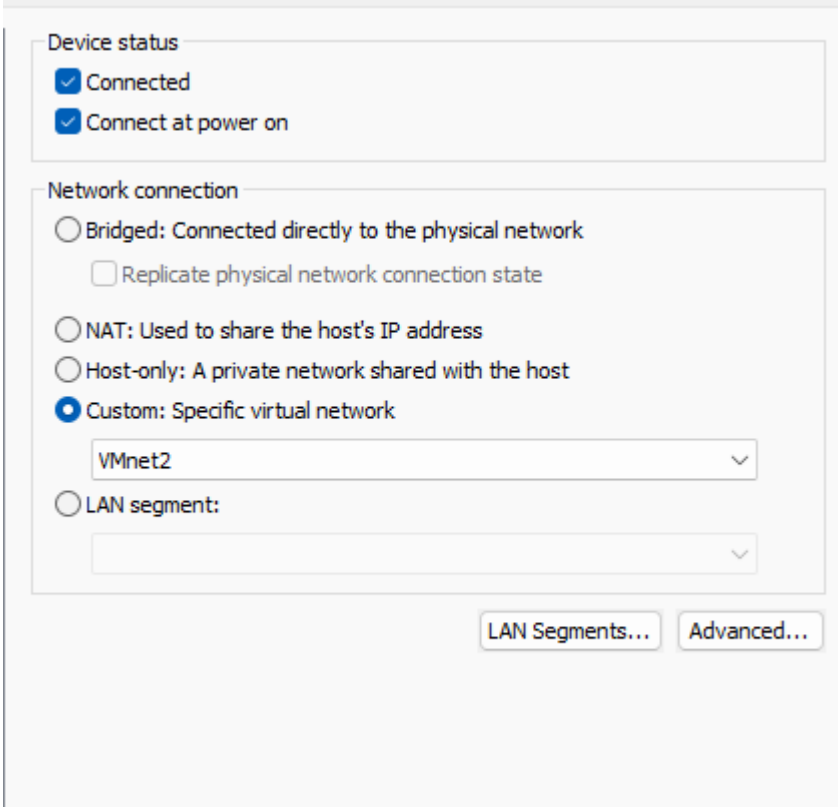
6.1 VMware vmnic virtuaalikytkimen luonti

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

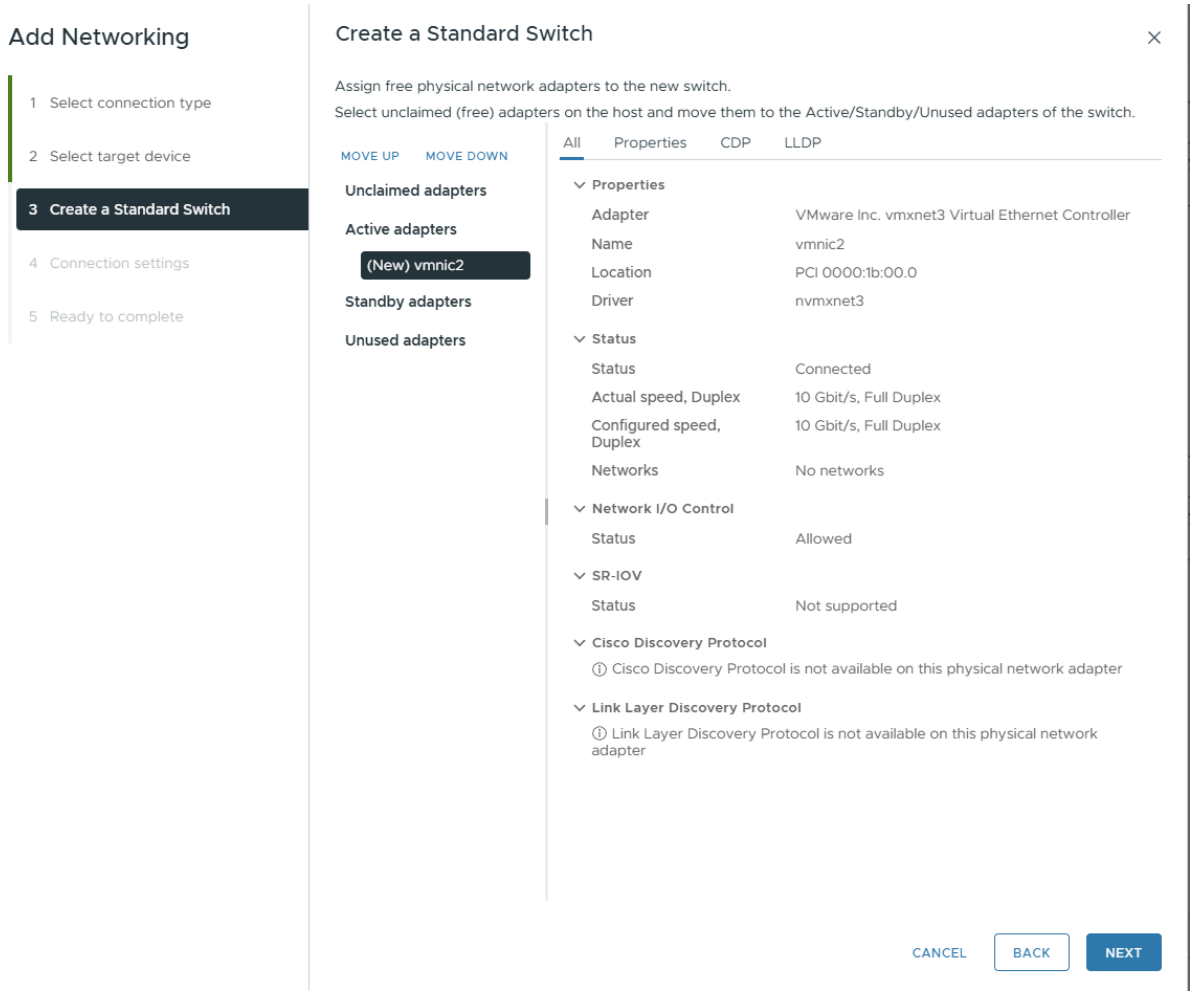


Kytkimeen asetetaan taulukosta ESXI IP-osoite.

Lisätään toinen network kortti.

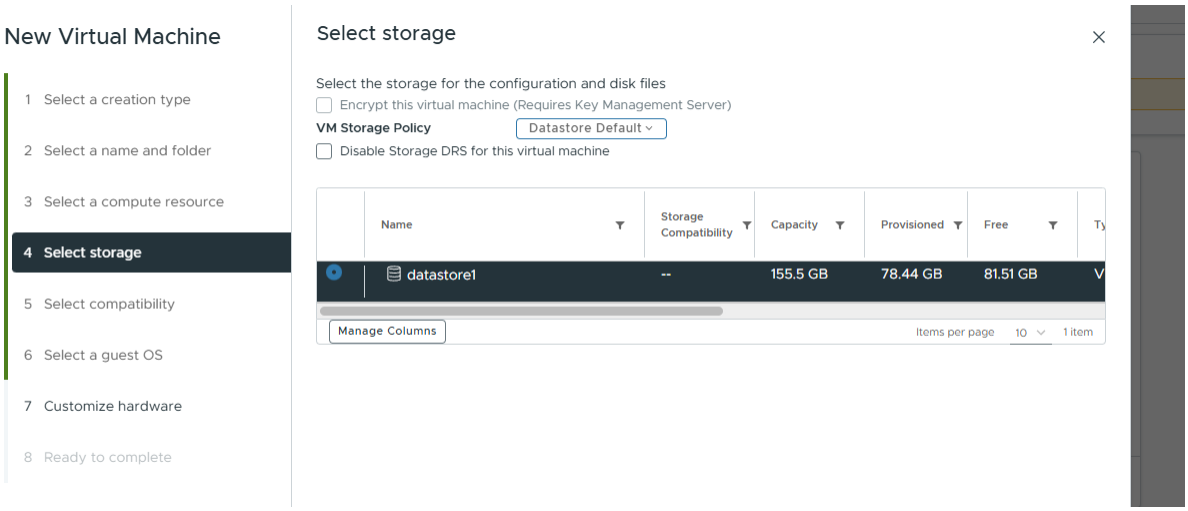


Lisätään vmnic2 aktiiviseksi.

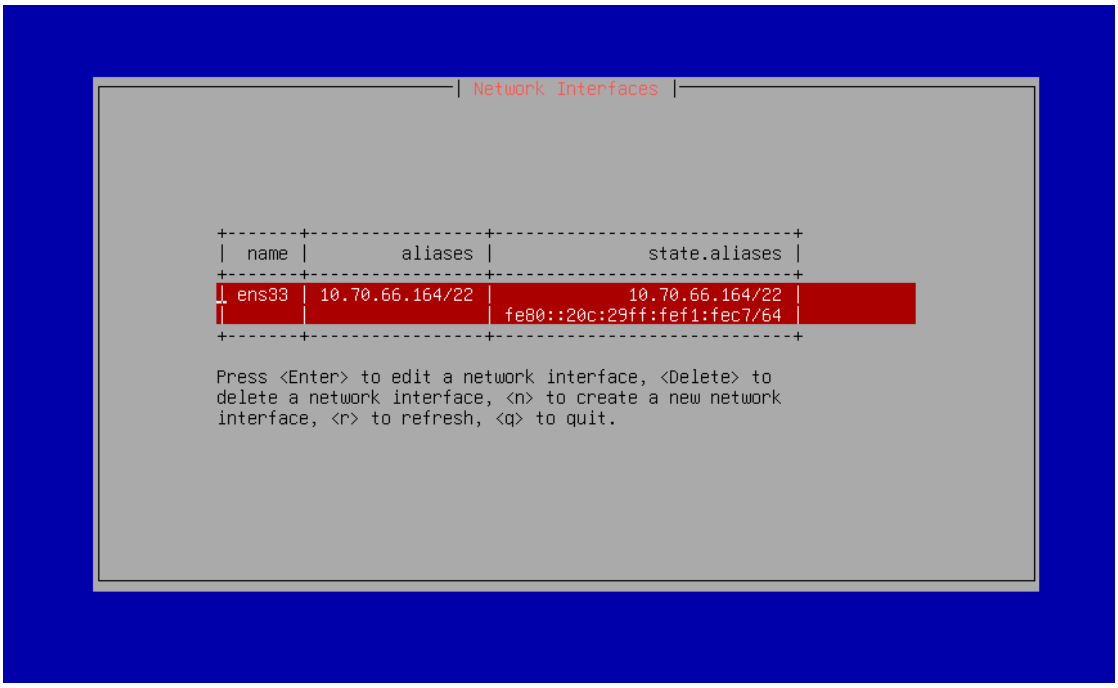


7 PFSENSE ASENNUS

Asennetaan pfsense aiemmin luotuun datacenteriin.



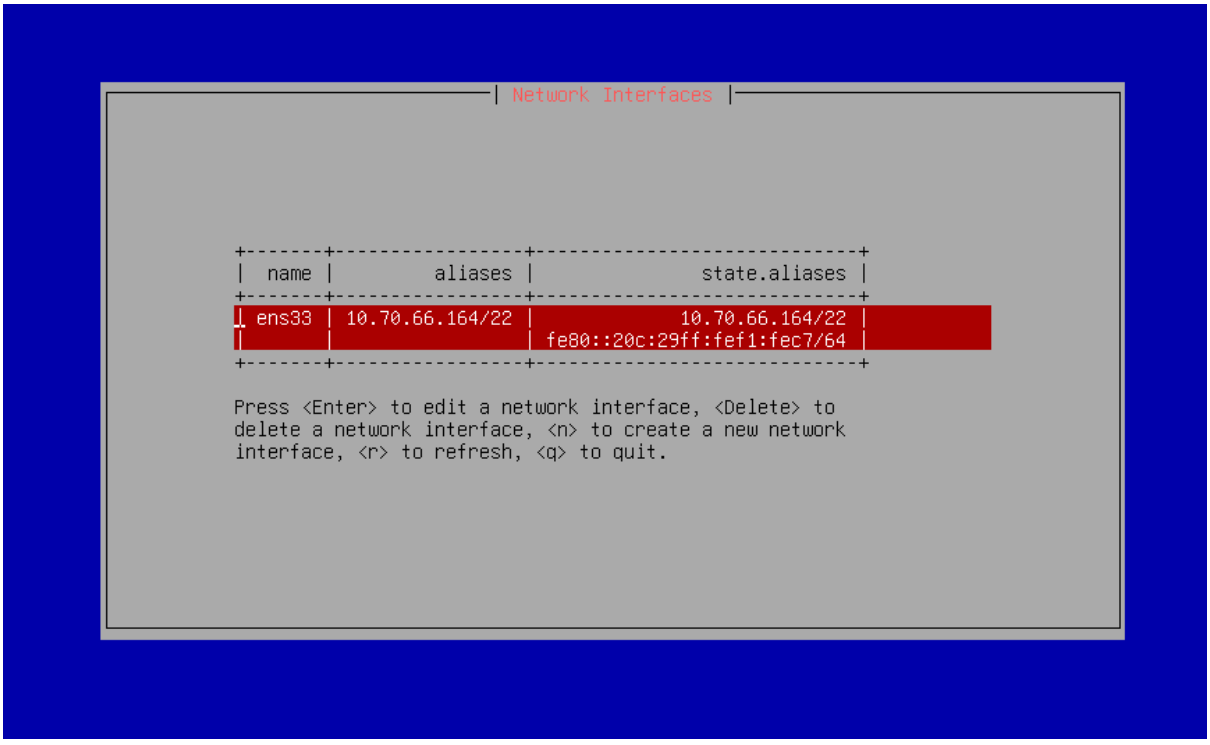
Konfiguroidaan pfsense. Asetetaan IP-osoite.



```
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 finis
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 finis


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
```

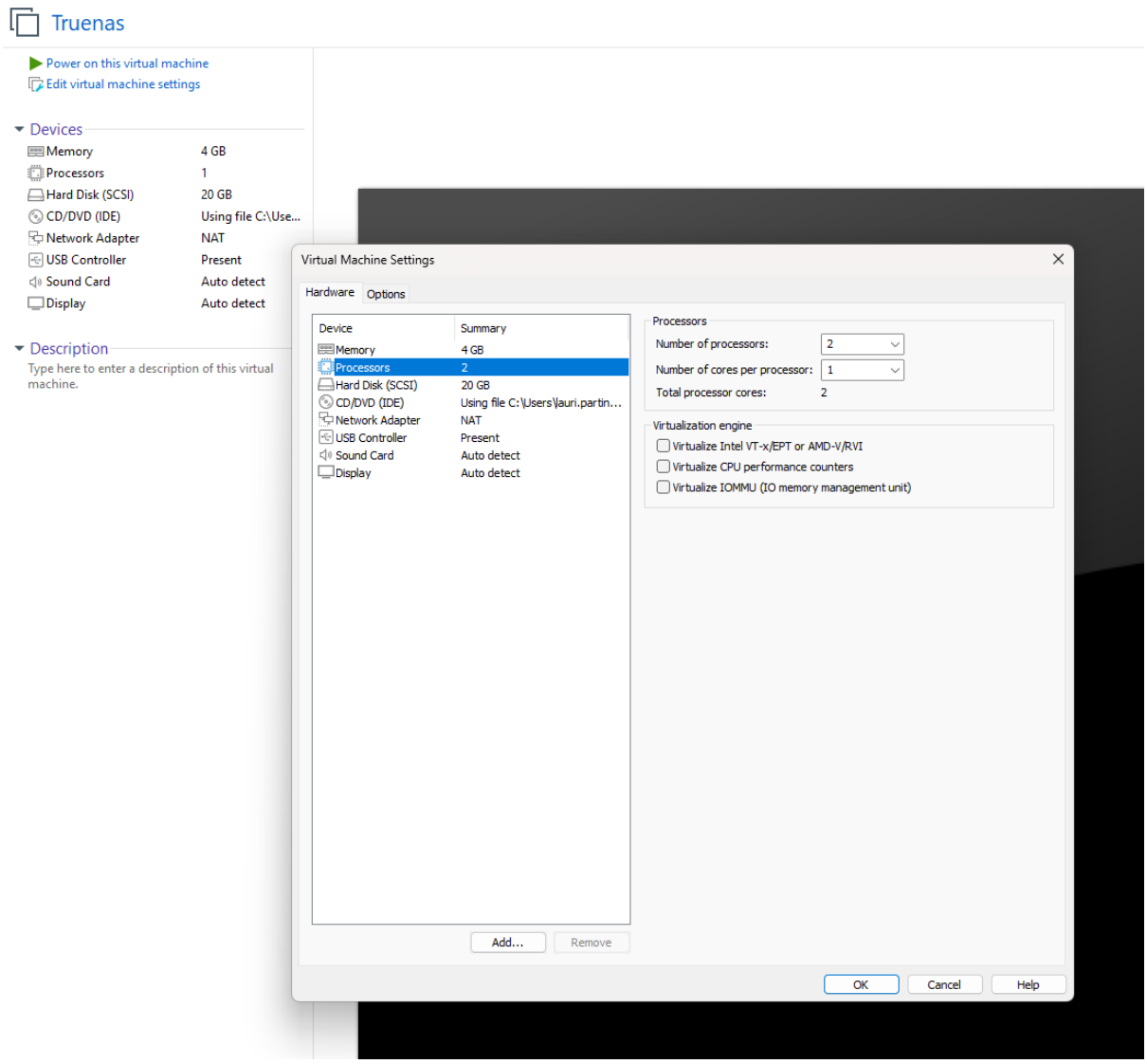
Luodaan pfsense network adapterit.

Adapteri 1 (WAN): Yhdistetään ulkoiseen verkkoon (VM Network).
Adapteri 2 (LAN): Sisäinen verkko muille virtuaalikoneille (VM Network 2)

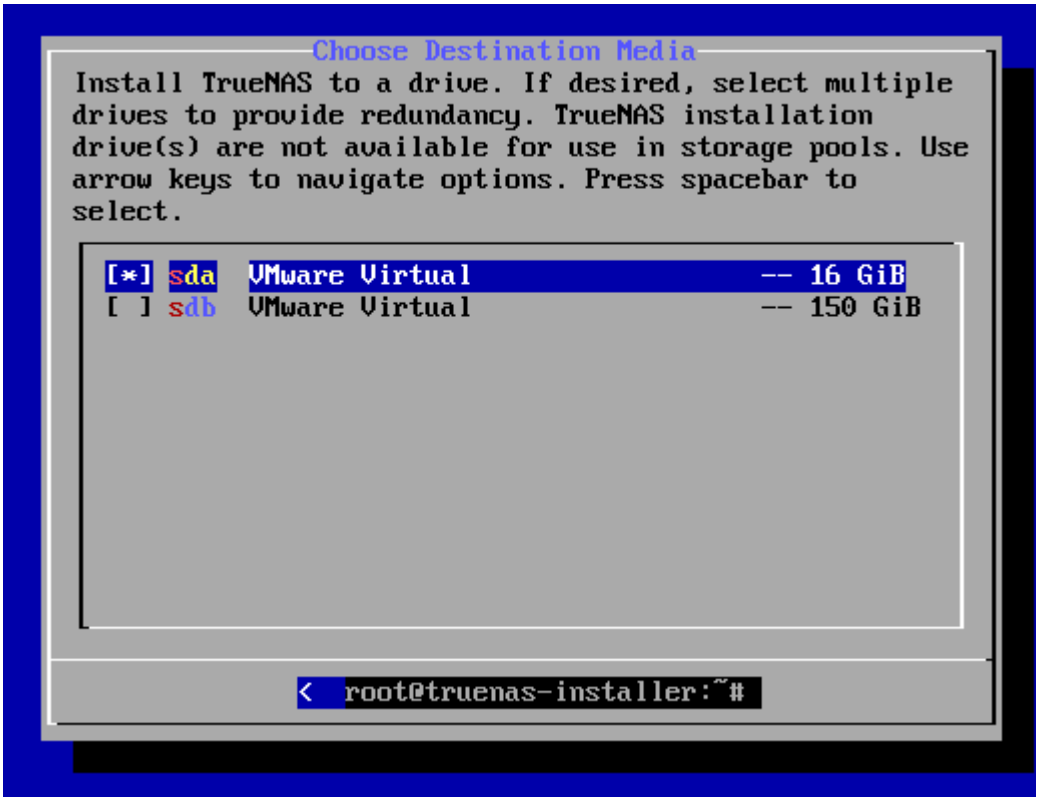


8 TRUE NAS ASENNUS

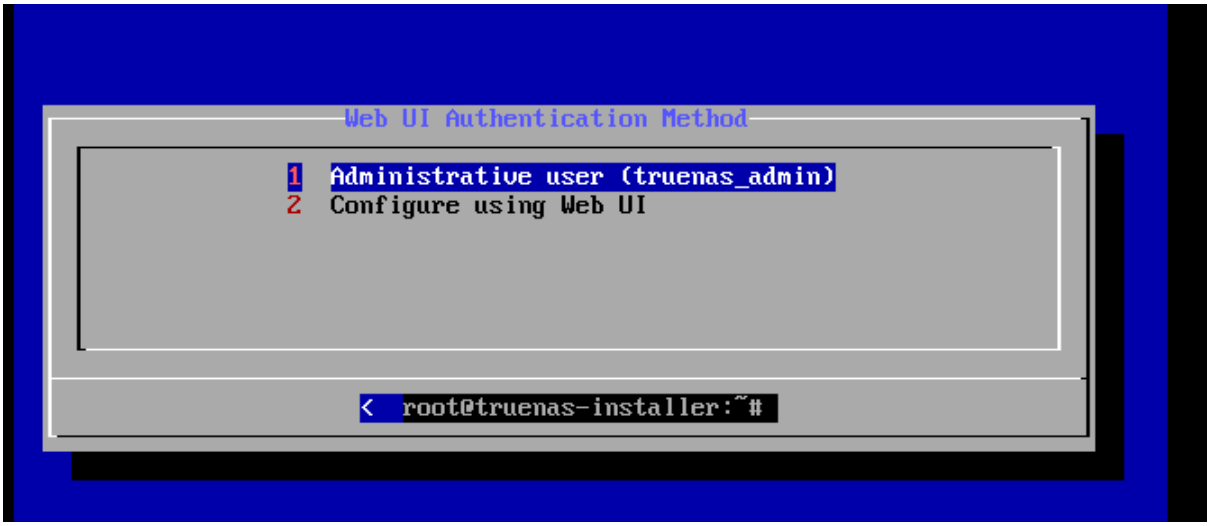
Luodaan TrueNAS-virtuaalipalvelin tallennustilan hallintaan.



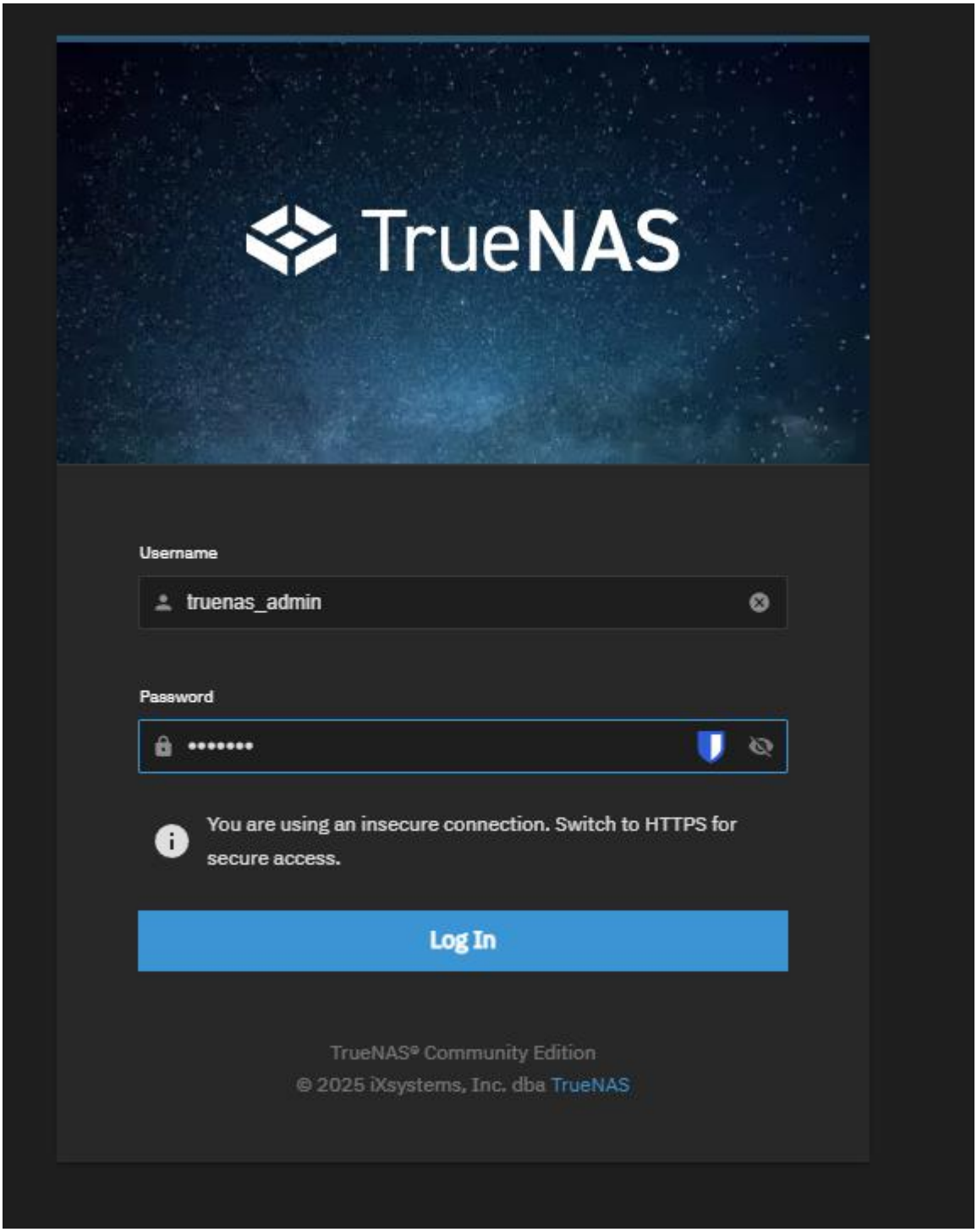
Valitaan asennusta varten luotu 16gb.



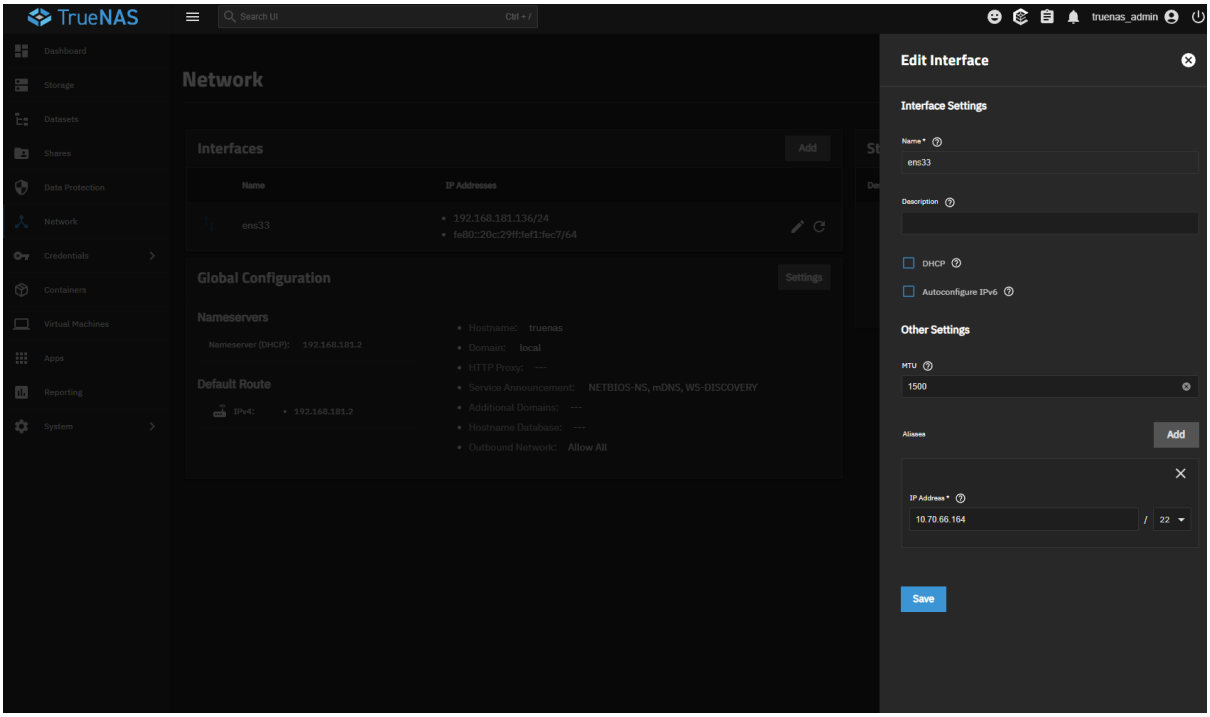
Luodaan admin käyttäjätunnukset.



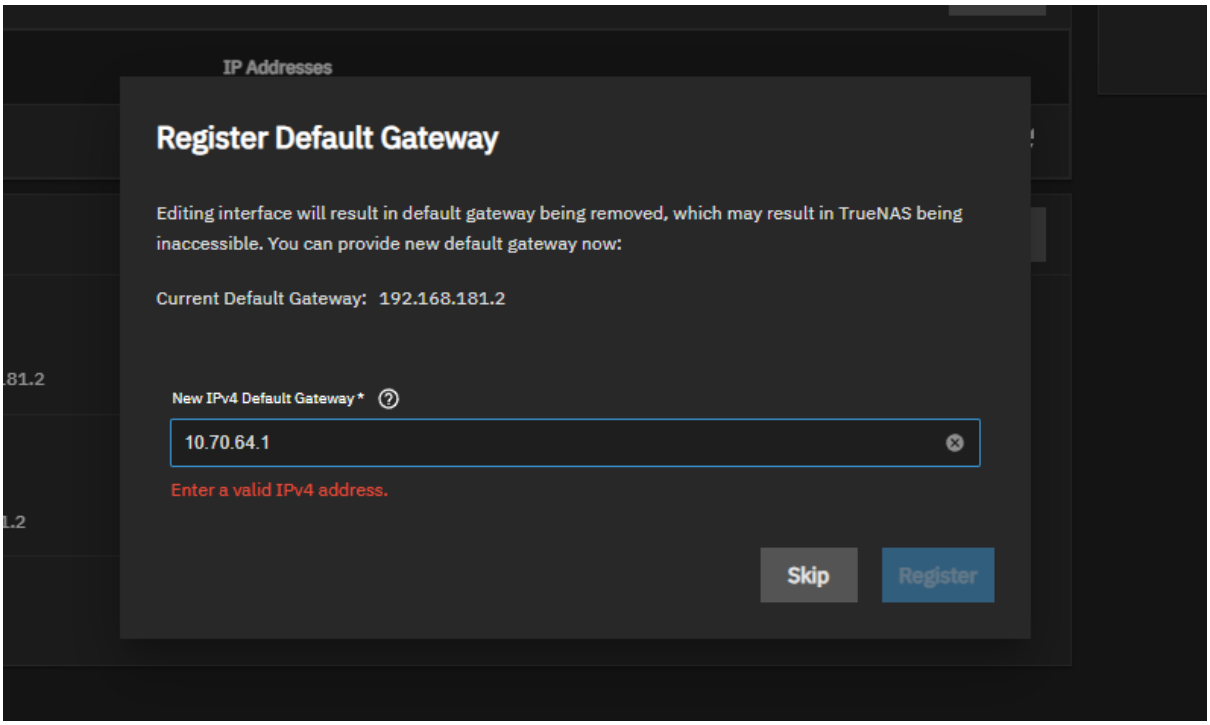
Asennuksen jälkeen kirjaudutaan asettamilla käyttäjätunnuksilla.



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

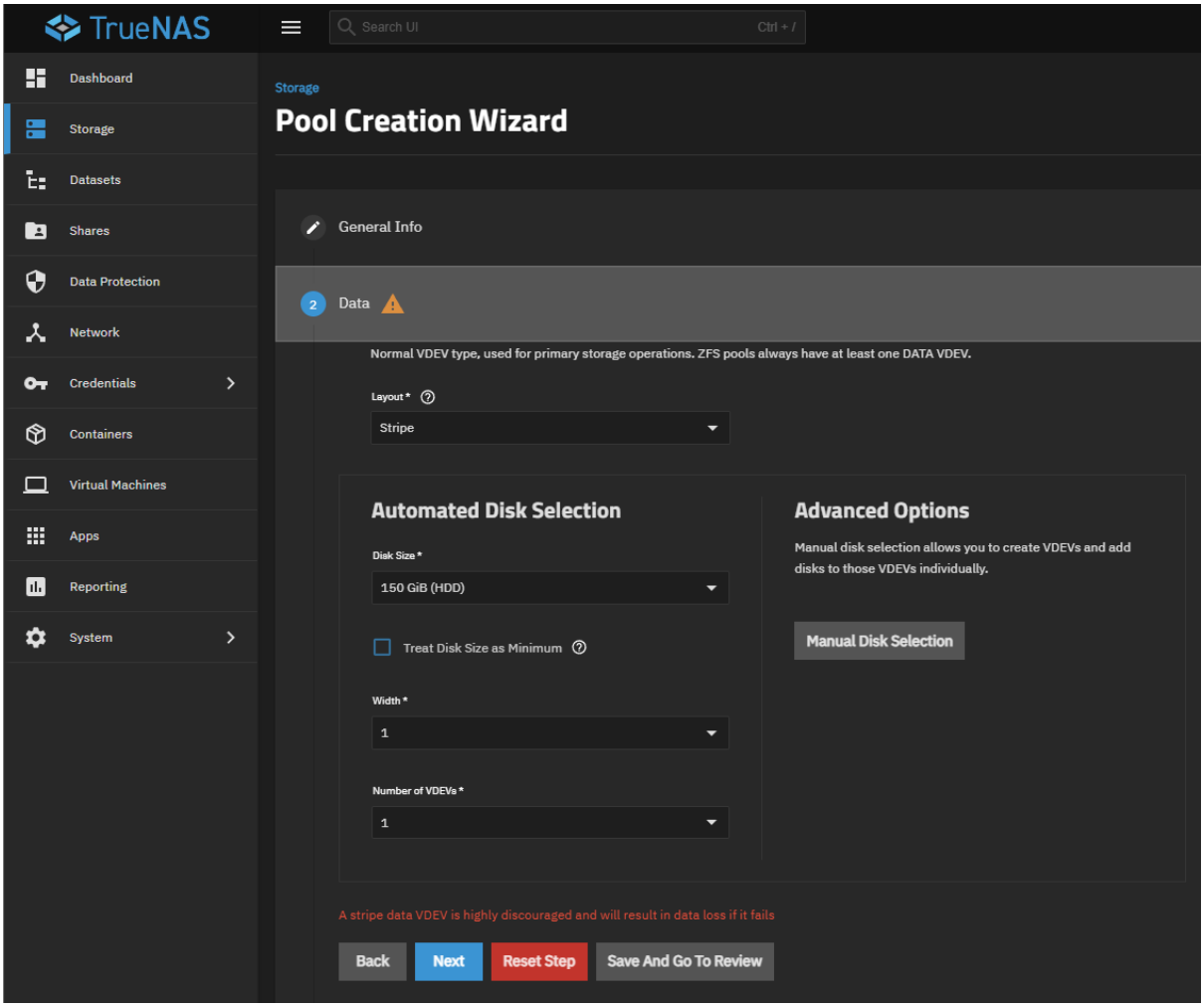


Lisätään Truenas default-gateway

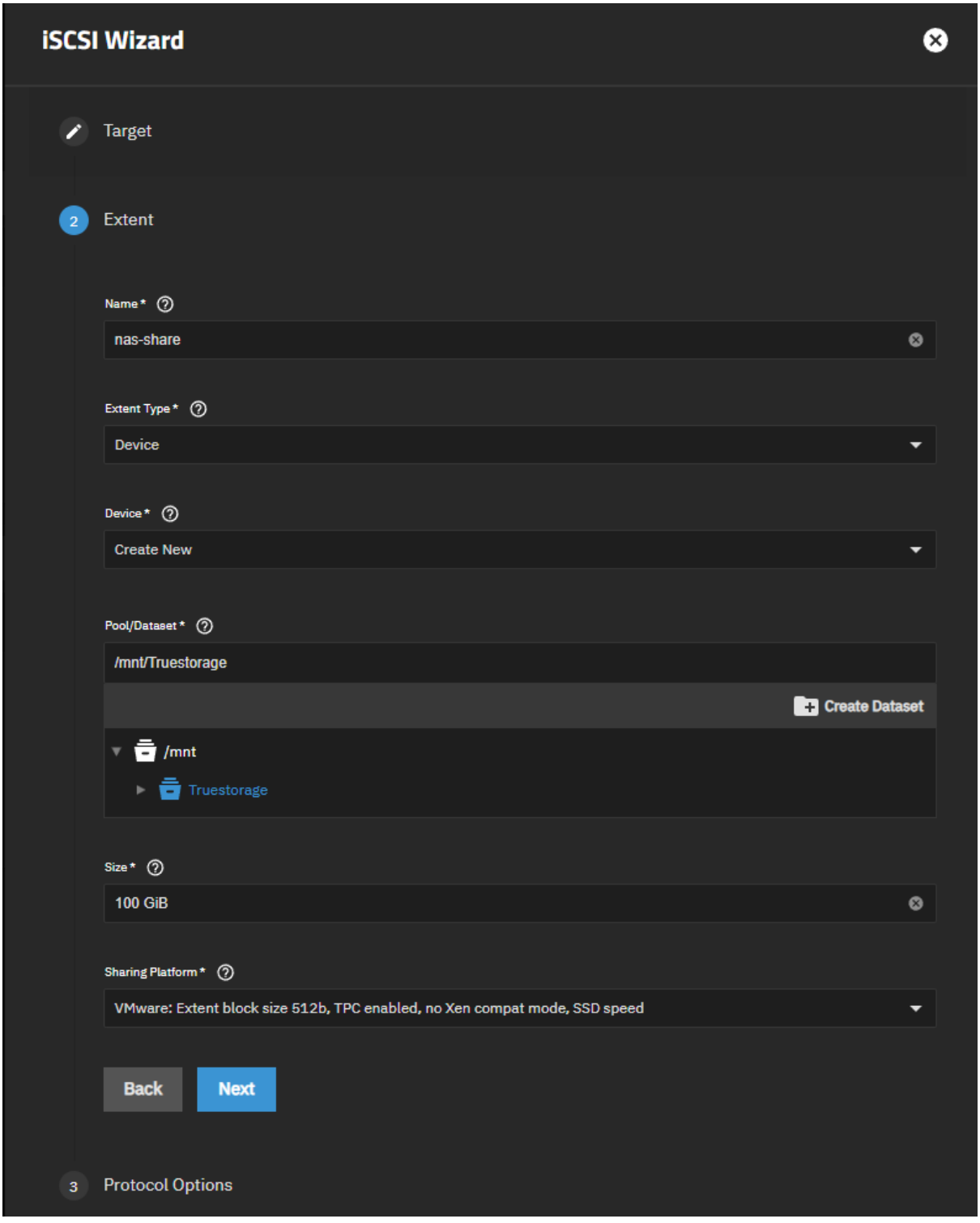


8.1 Storage create pool

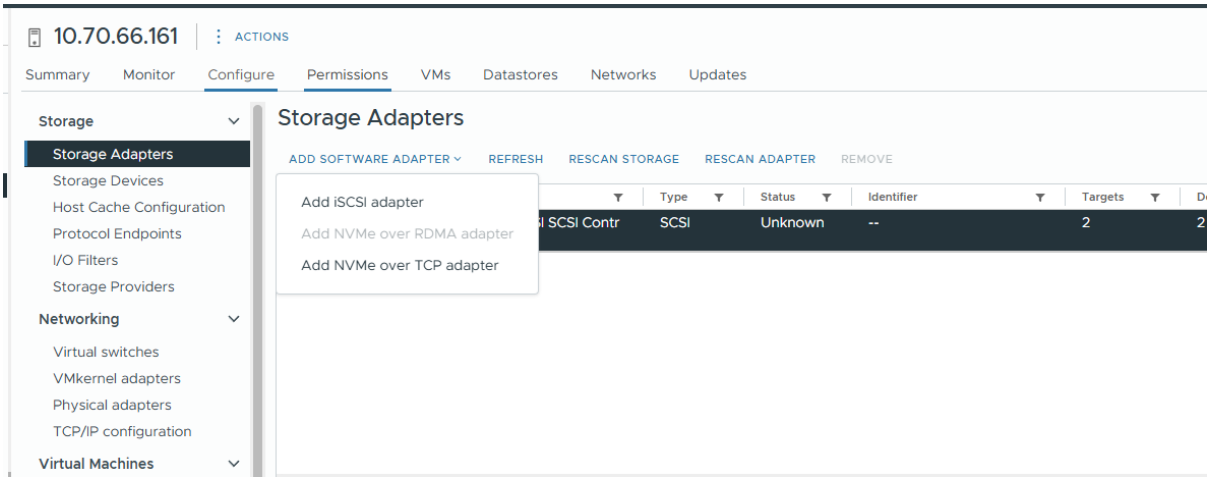
Pool avulla luodaan jaettua tallennustilaa.

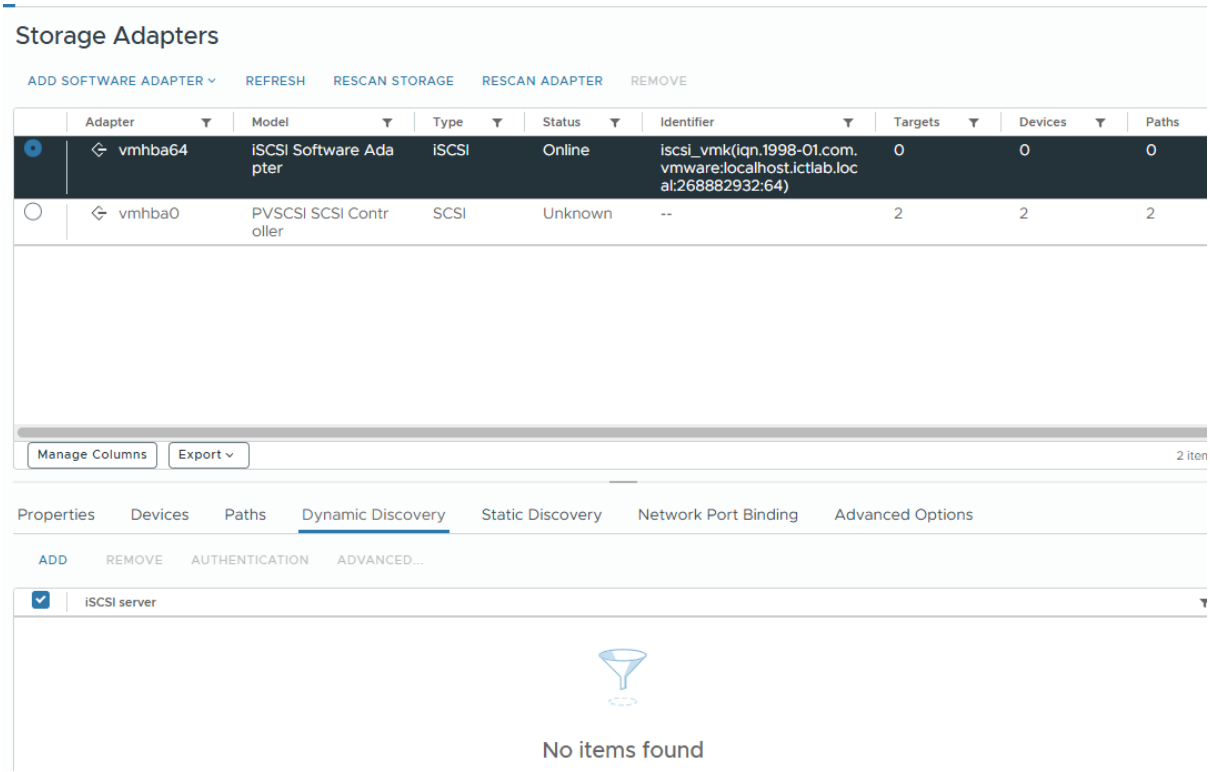


Luodaan 100gb SCSI virtuaalinen kovalevy datan käsittelyyn.

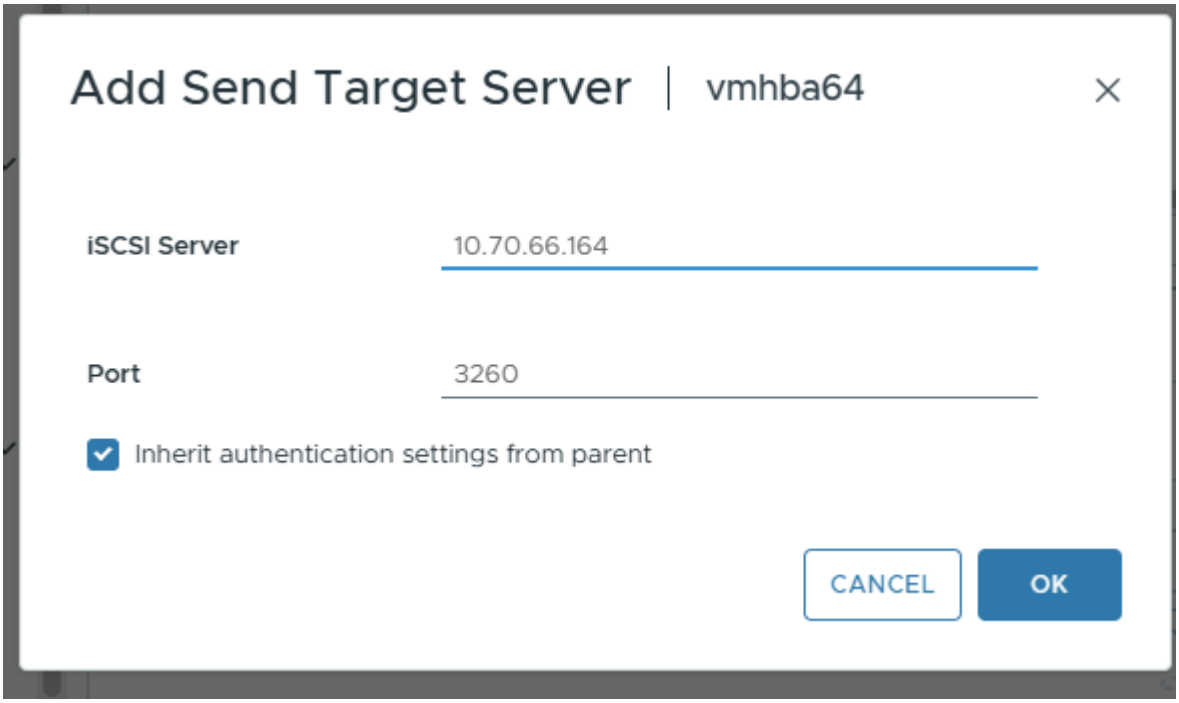

iSCSI Wizard
Target
2
Extent
Name *
nas-share
Extent Type *
Device
Device *
Create New
Pool/Dataset *
/mnt/Truestorage
Create Dataset
/mnt
Truestorage
Size *
100 GiB
Sharing Platform *
VMware: Extent block size 512b, TPC enabled, no Xen compat mode, SSD speed
Back
Next
3
Protocol Options

8.2 Lisätään isci adapteri vcenteriin

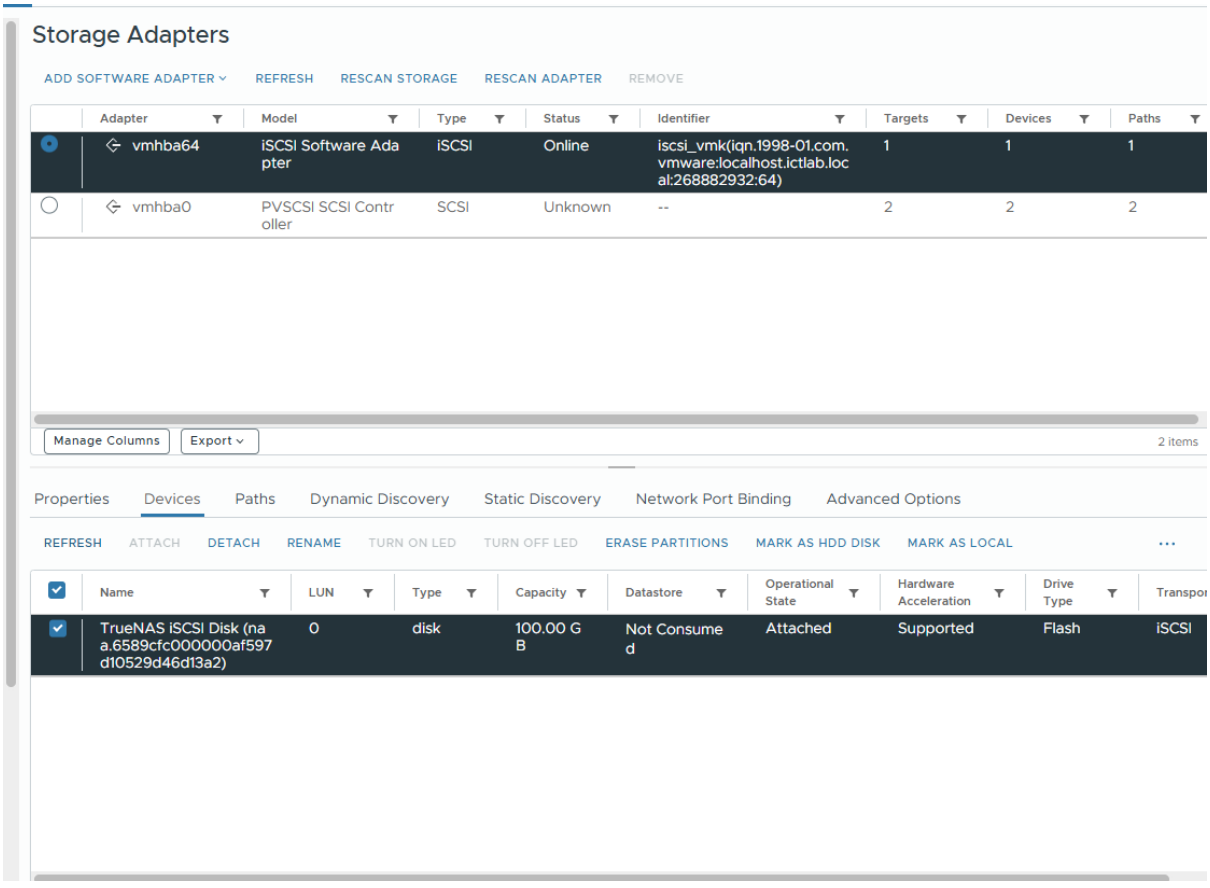




Laitetaan server target Truenas ip-osoite.

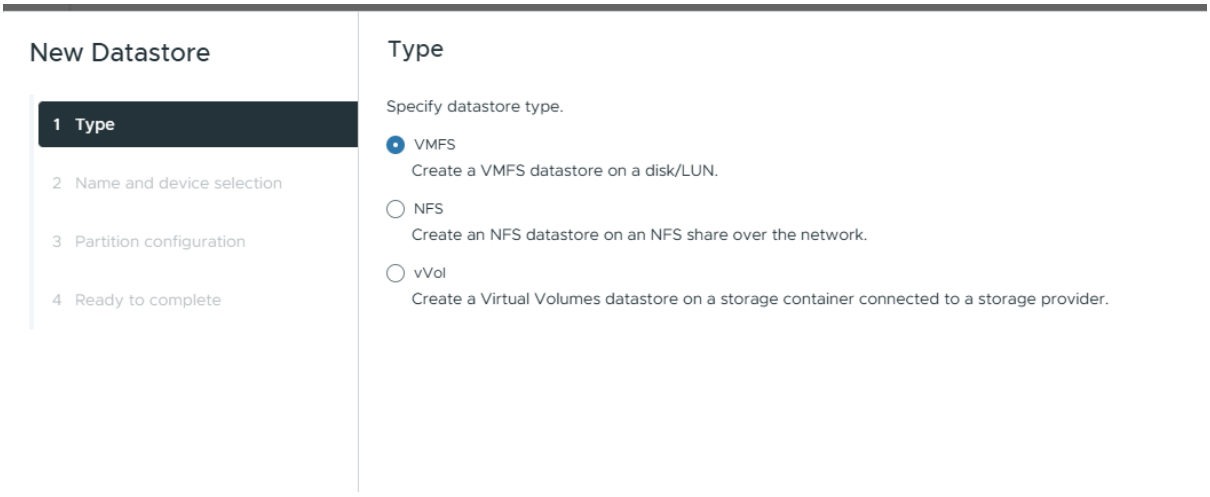


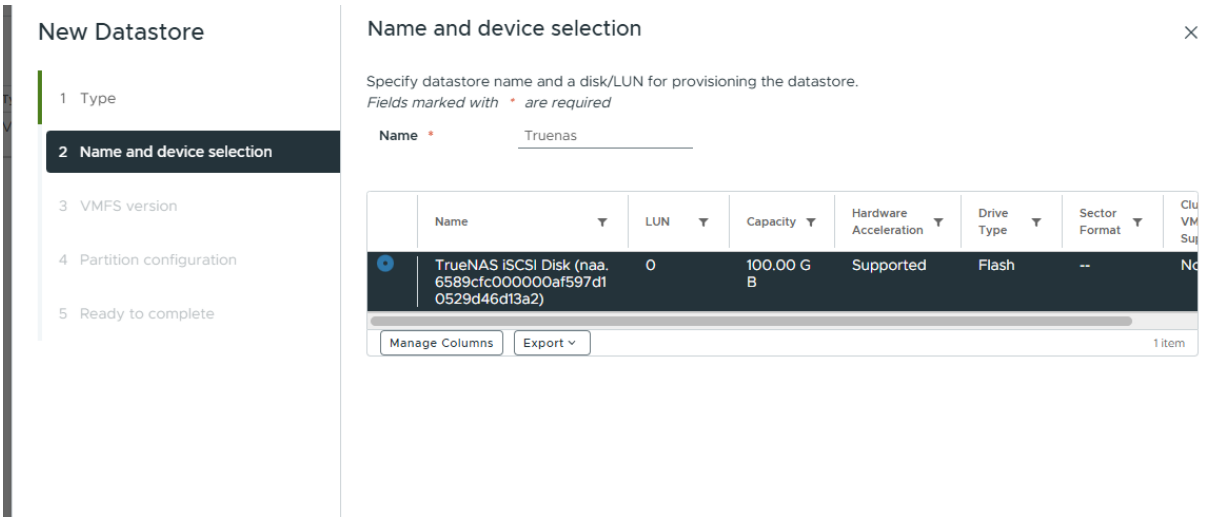
Rescan adapter + rescan storage



9 YHDISTETÄÄN FREENAS DATASTORE VSPHERE HOSTEIHIN

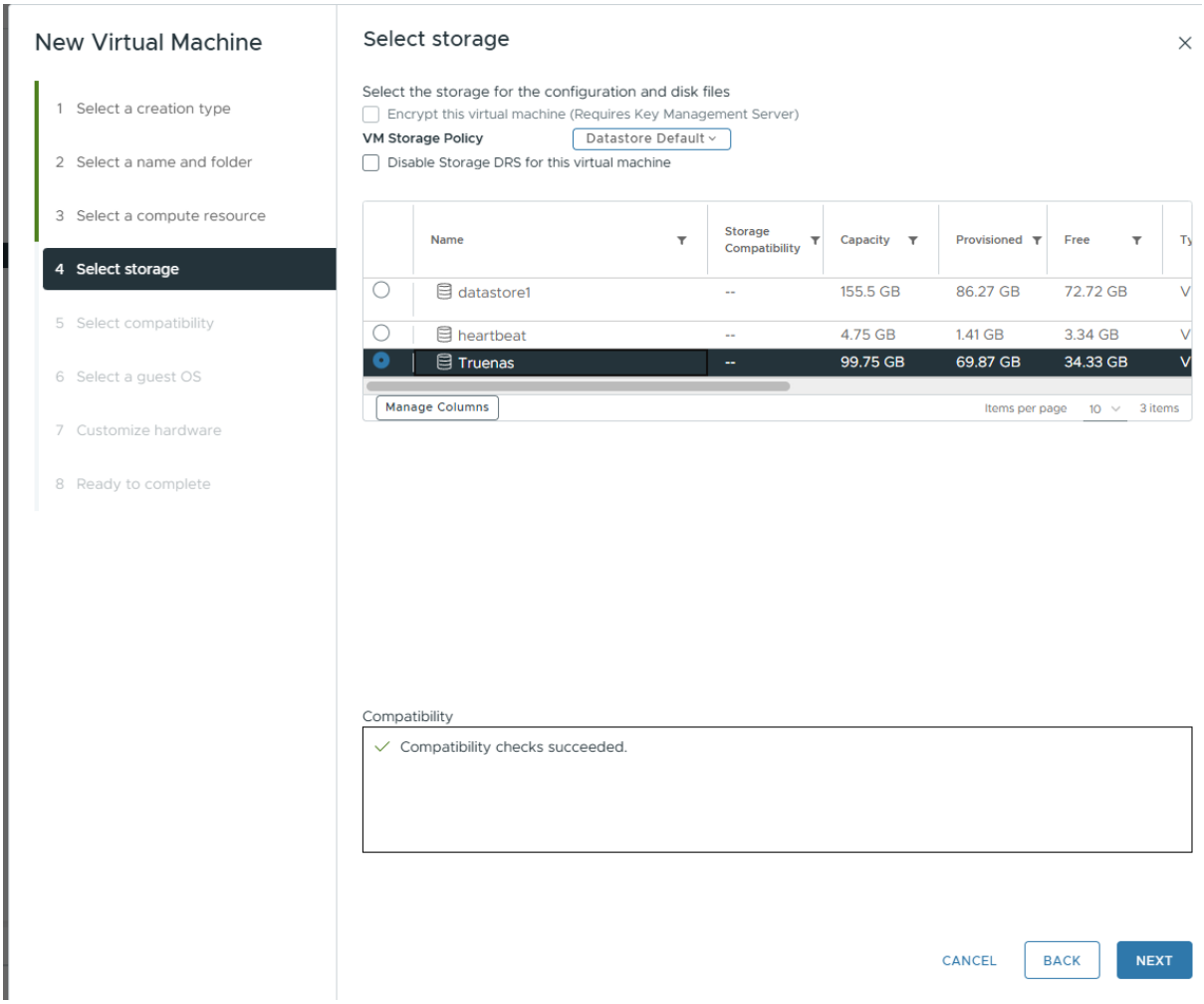
Yhdistetään truenas 10.70.66.161





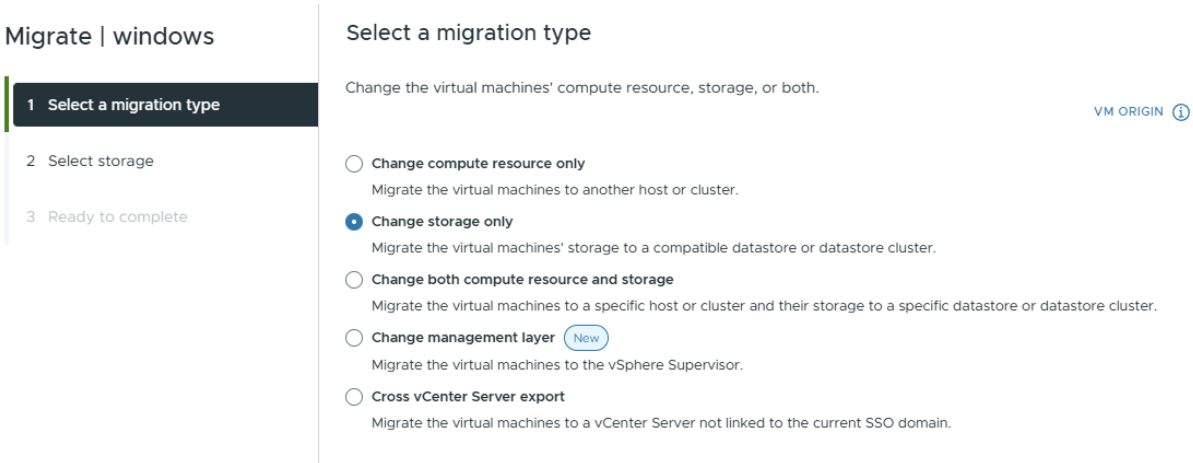
9.1 Luodaan uusi virtuaalikone ja käytetään jaettua datastorea

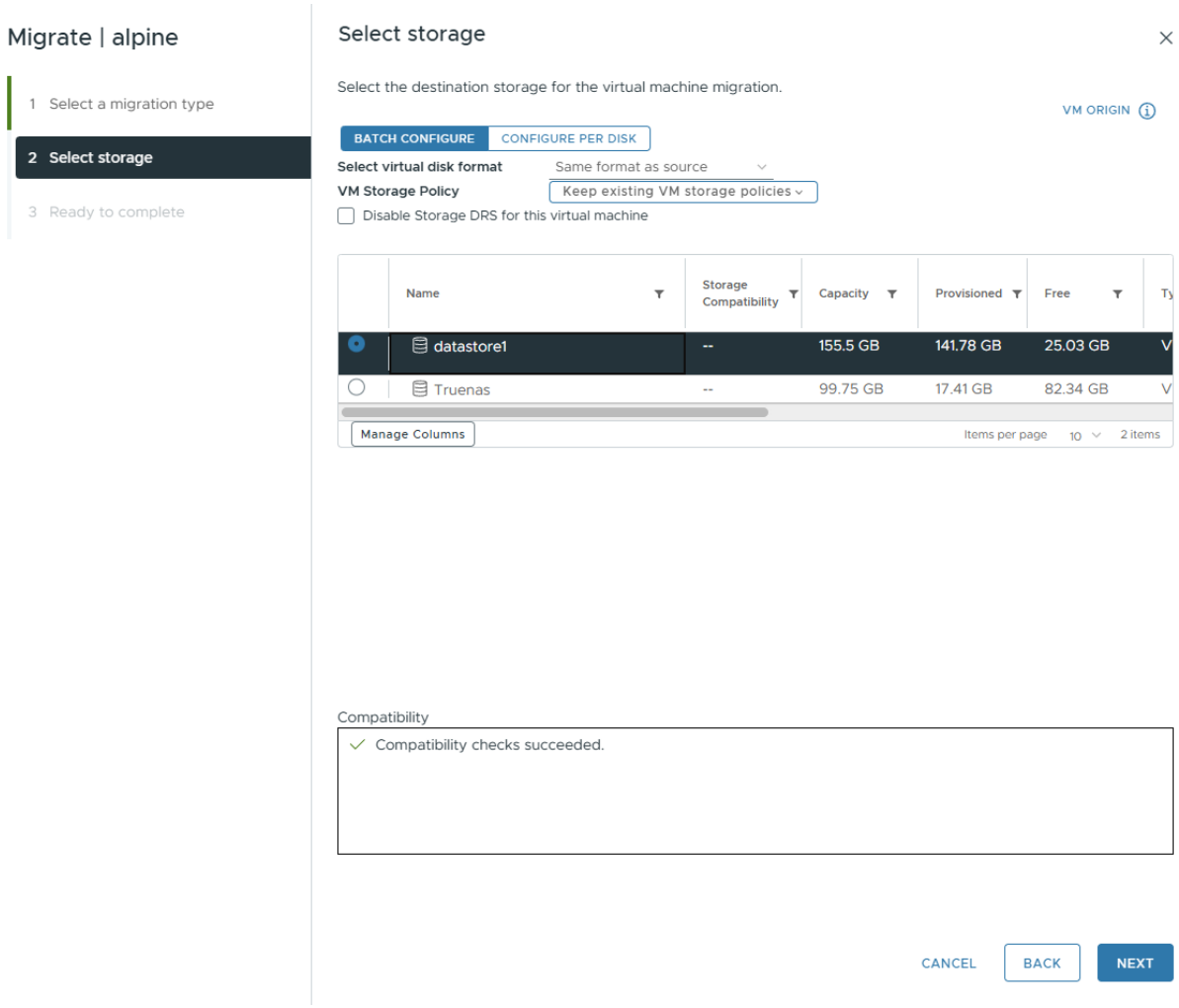
Luotiin uusi virtuaalikone ja käytettiin aiemmin luotua Truenas nimistä jaettua datastorea.



9.2 Kopioidaan asennettu virtuaalikone toiseen datastoreen

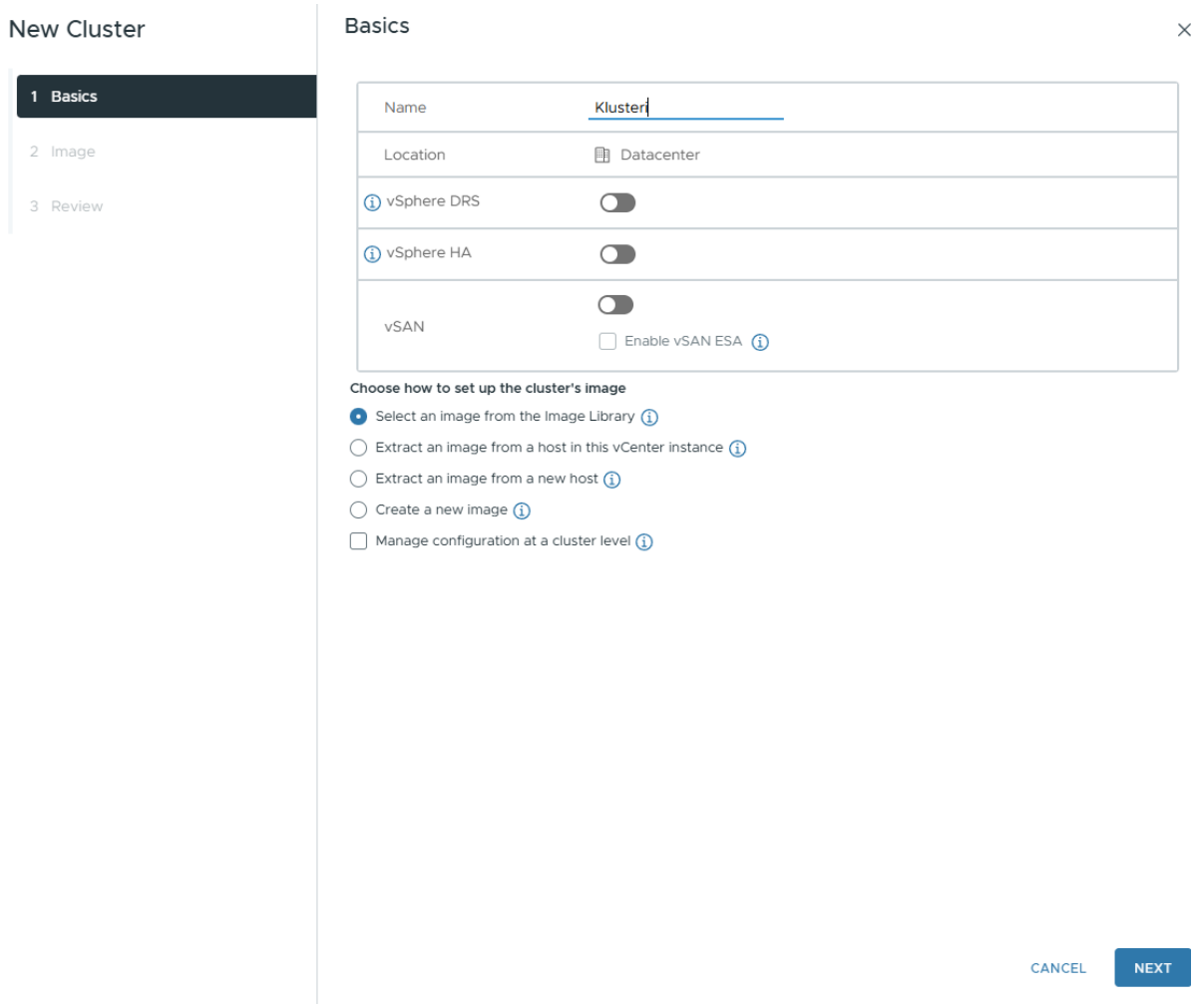
Testataan, pystyykö virtuaalikoneita siirtämään toiseen datastoreen migrate ominaisuutta hyödyntäen.





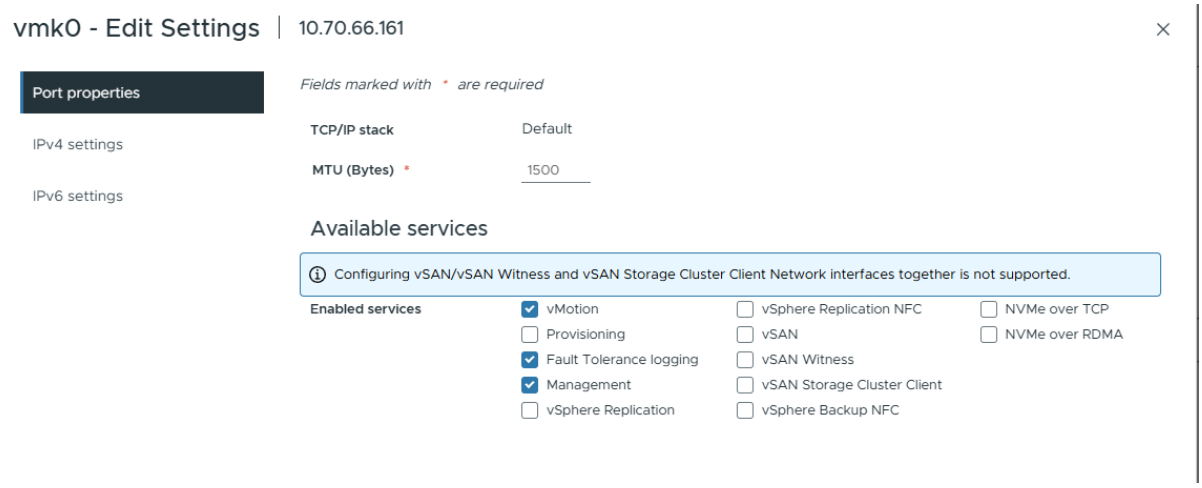
9.3 Luodaan klusteri ja liitetään vSphere hostit klusteriin

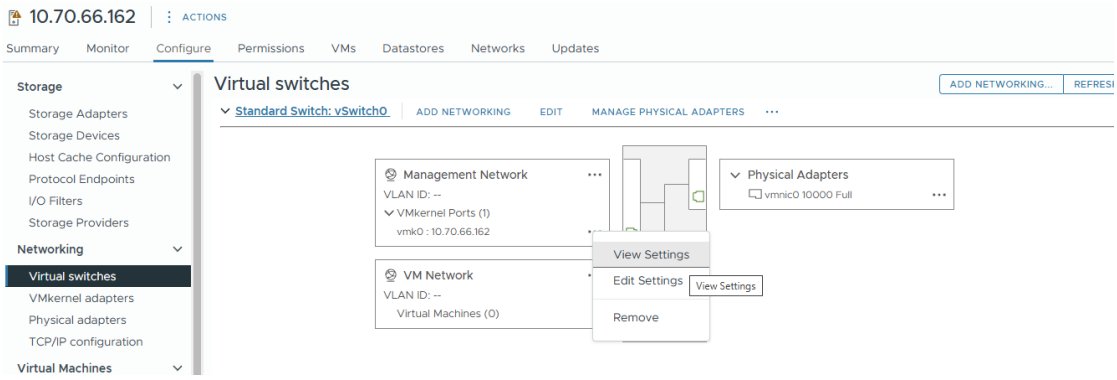
Klusteri luodaan, jotta resurssien hallinta olisi mahdollisimman optimoitua.



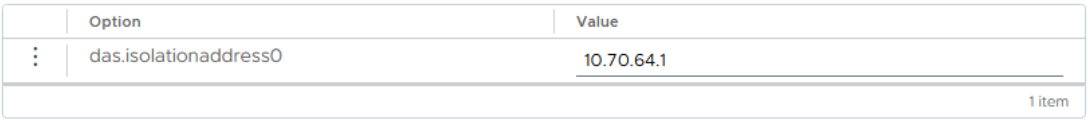
Vedä aiemmin luodut hostit klusteriin.

Lisätään v motion ja fault tolerance.



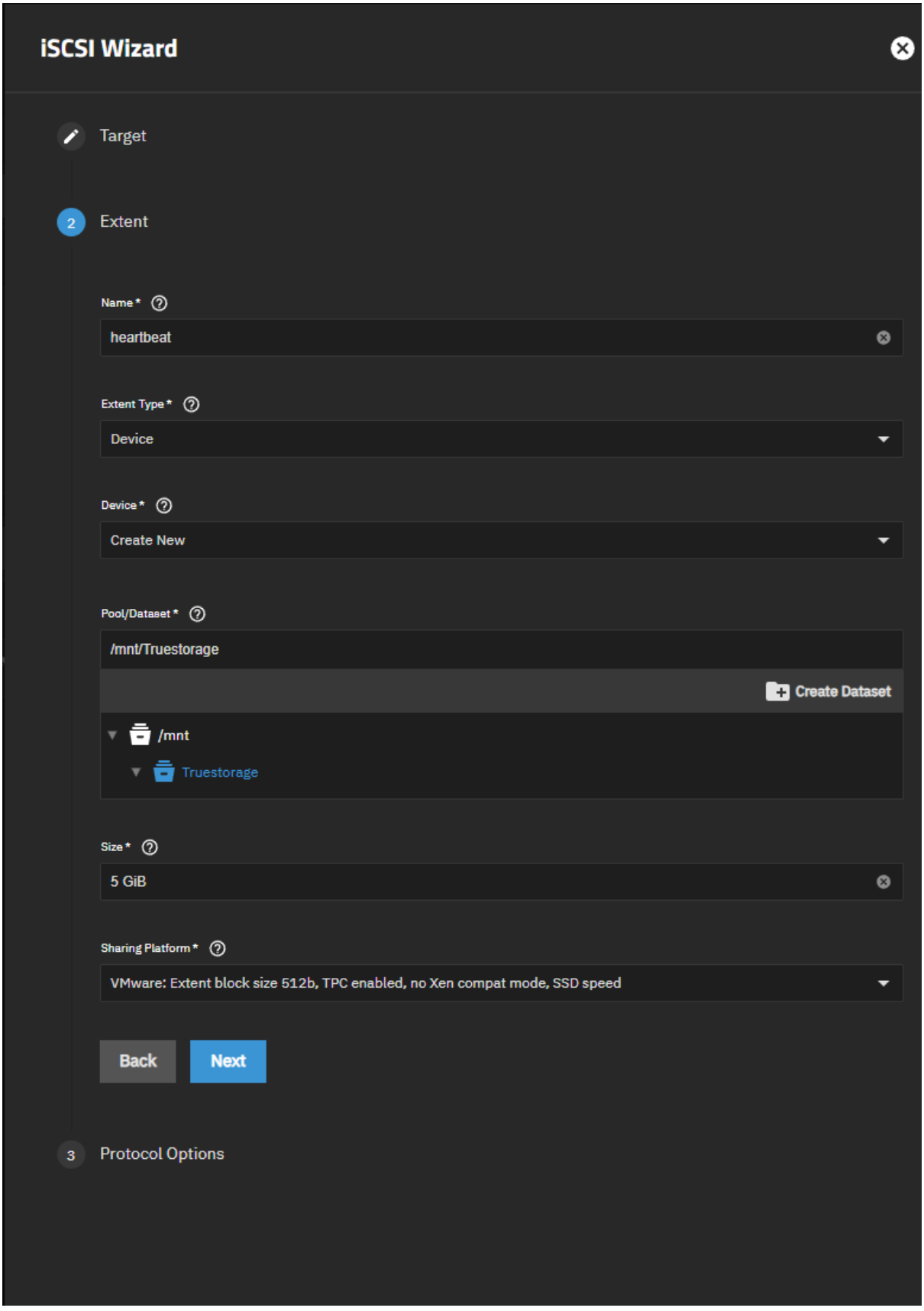


10 CHANGE YOUR NETWORK ISOLATION ADDRESS TO YOUR VCENTER ADDRESS

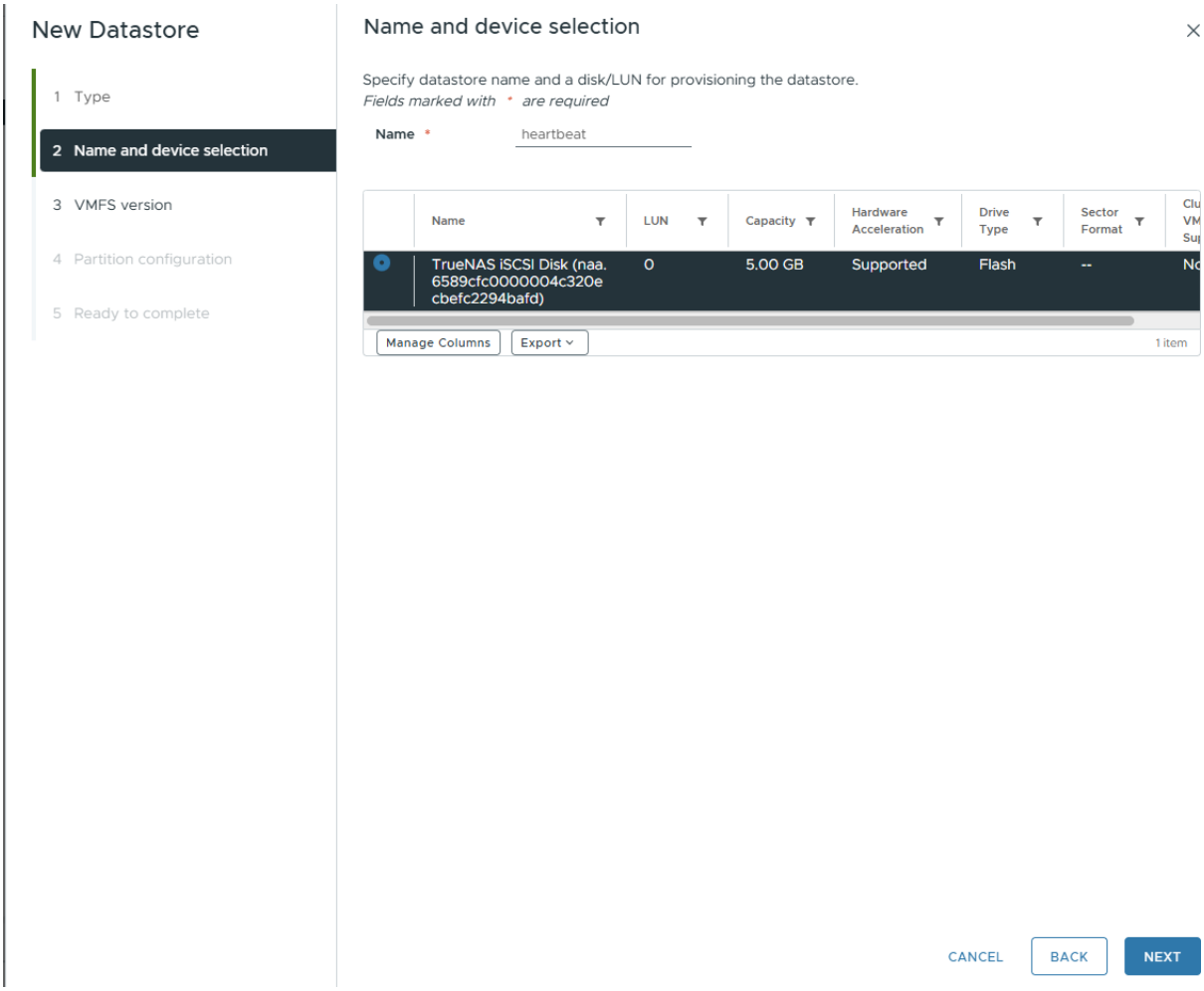


11 HEARTBEAT KONFFAUS

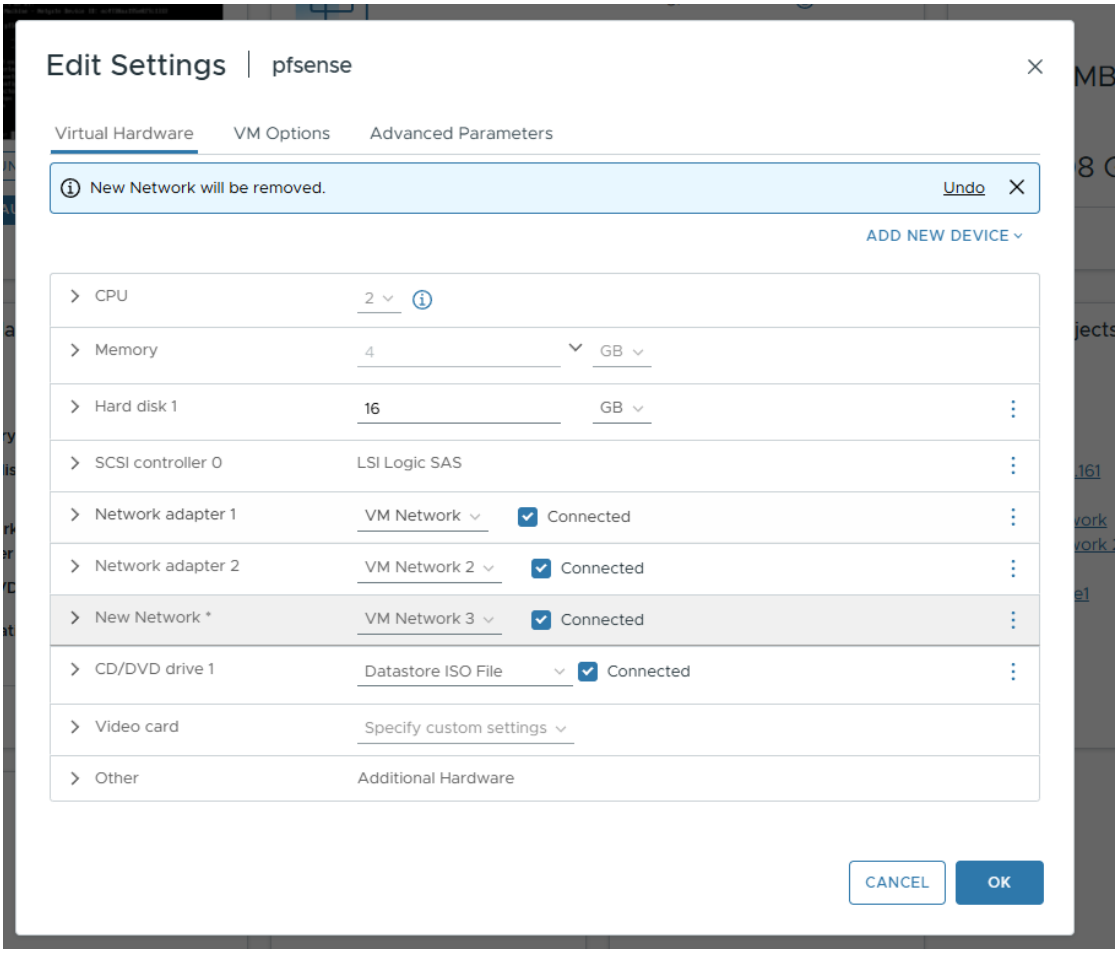
Luodaan toinen ISCSI vara tallennustilaksi.

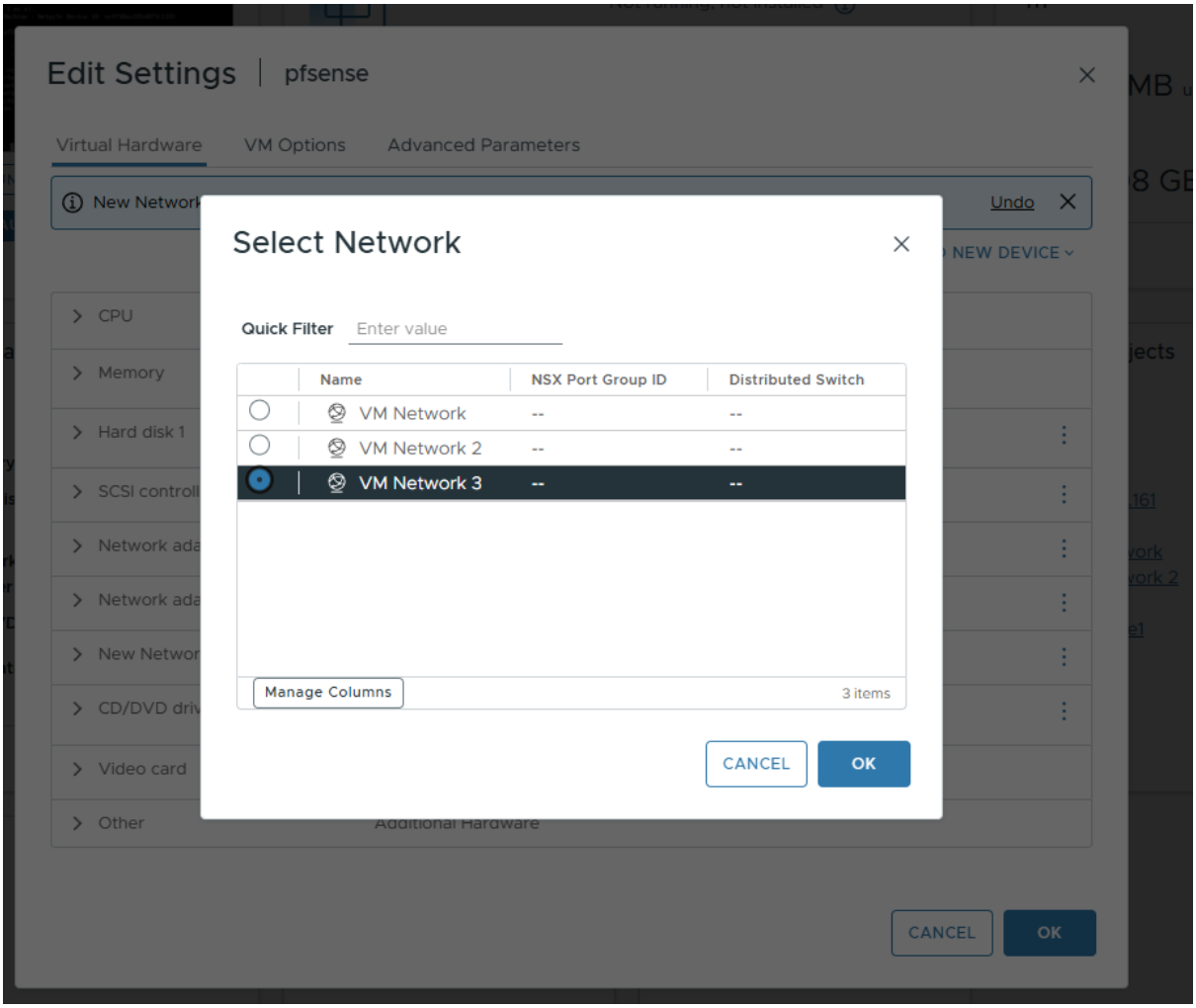


Luodaan heartbeat datastore

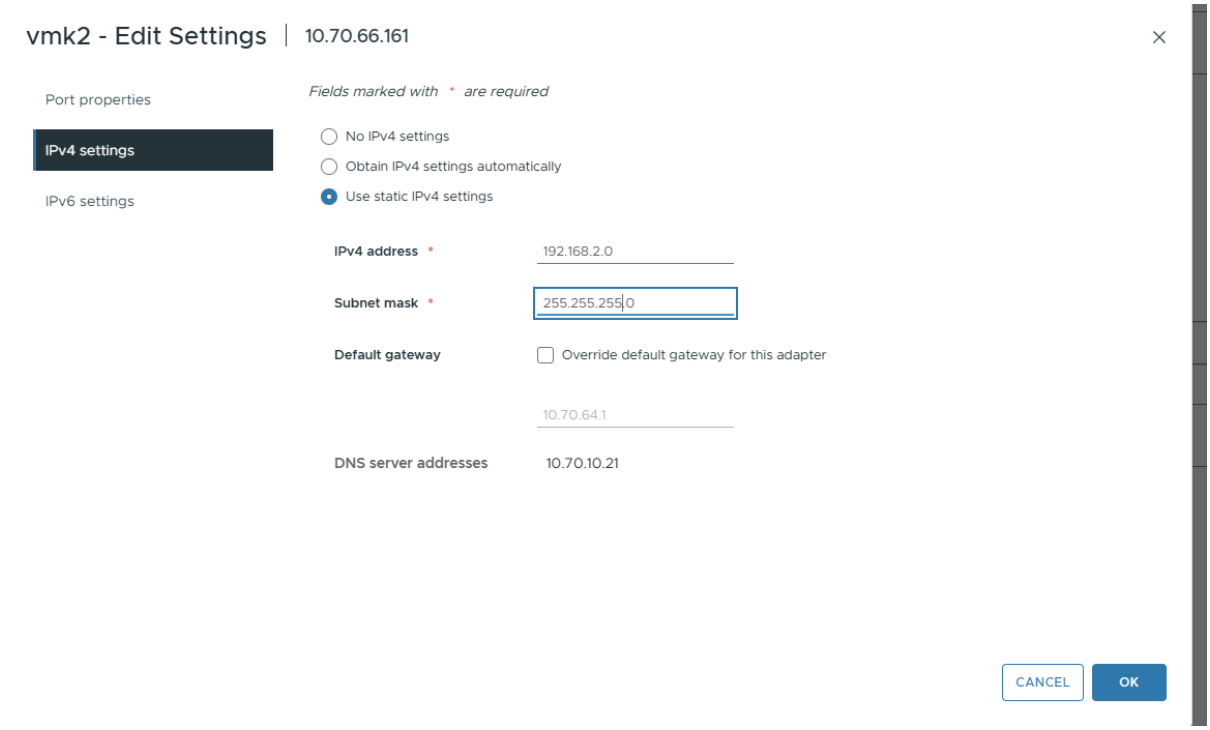

New Datastore
1 Type
2 Name and device selection
3 VMFS version
4 Partition configuration
5 Ready to complete
Name and device selection
Specify datastore name and a disk/LUN for provisioning the datastore.
Fields marked with * are required
Name *
heartbeat
Name
LUN
Capacity
Hardware Acceleration
Drive Type
Sector Format
TrueNAS iSCSI Disk (naa.6589cfc0000004c320ecbefc2294bafd)
0
5.00 GB
Supported
Flash
--
Manage Columns
Export
1 item
CANCEL
BACK
NEXT

11.1 Lisätään kolmas interface pfSenseen.



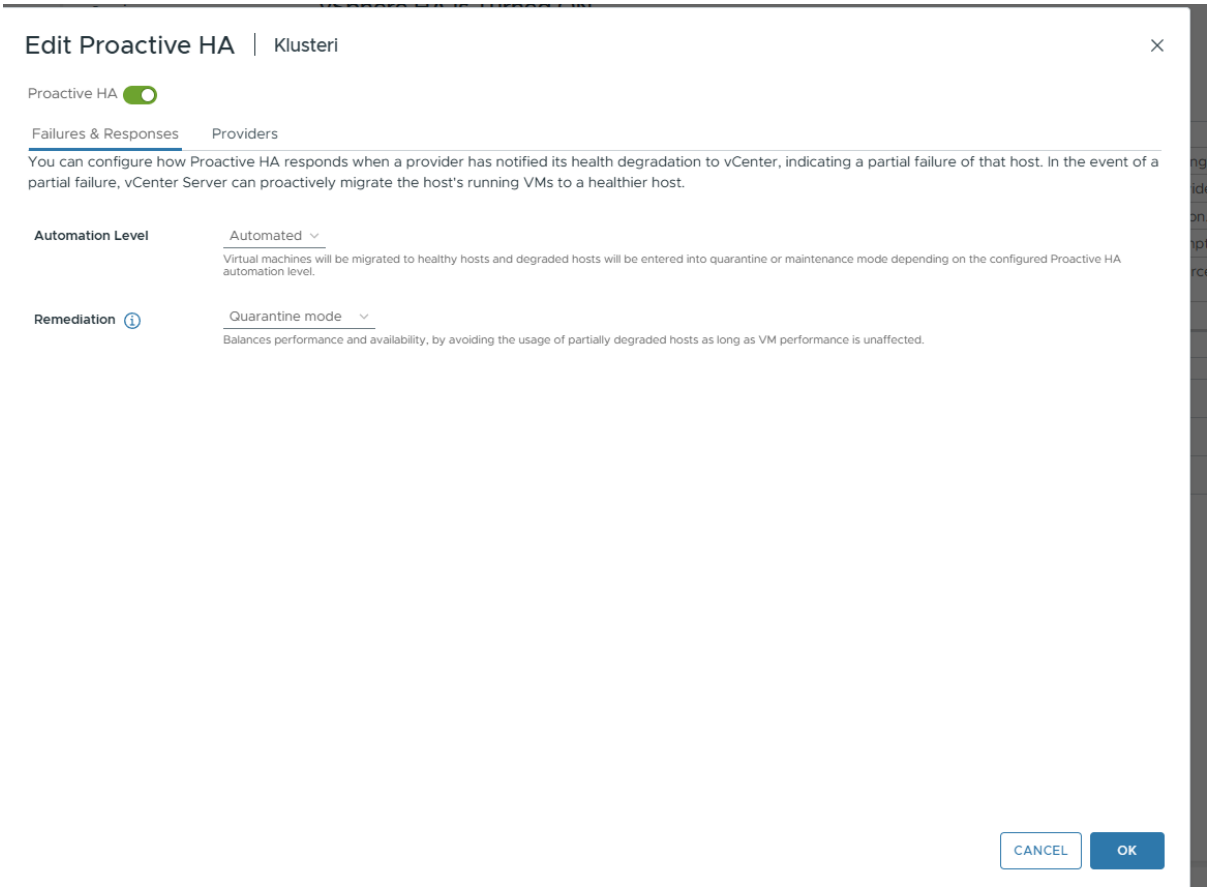


Lisätään network address: 192.168.2.0/24

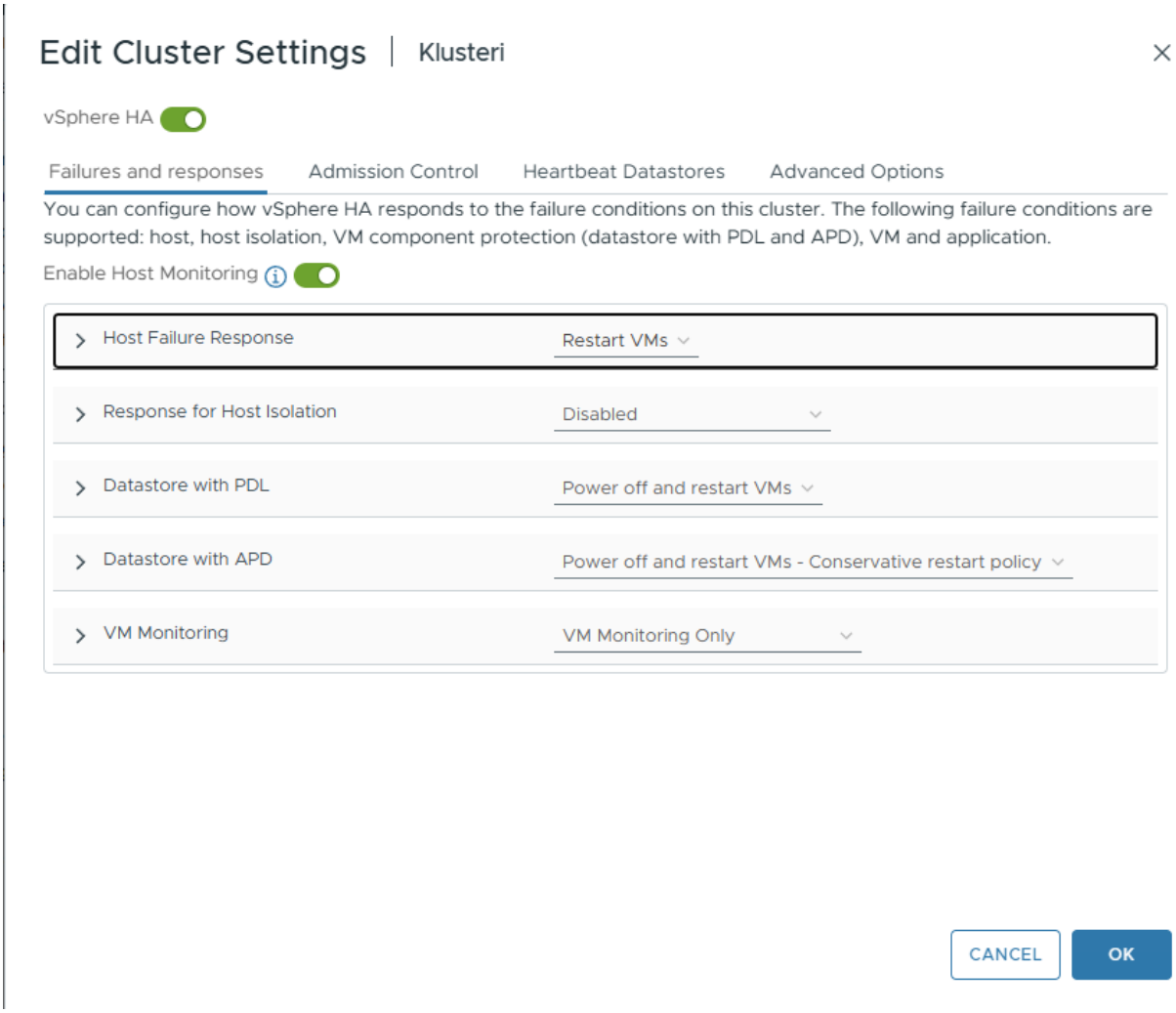


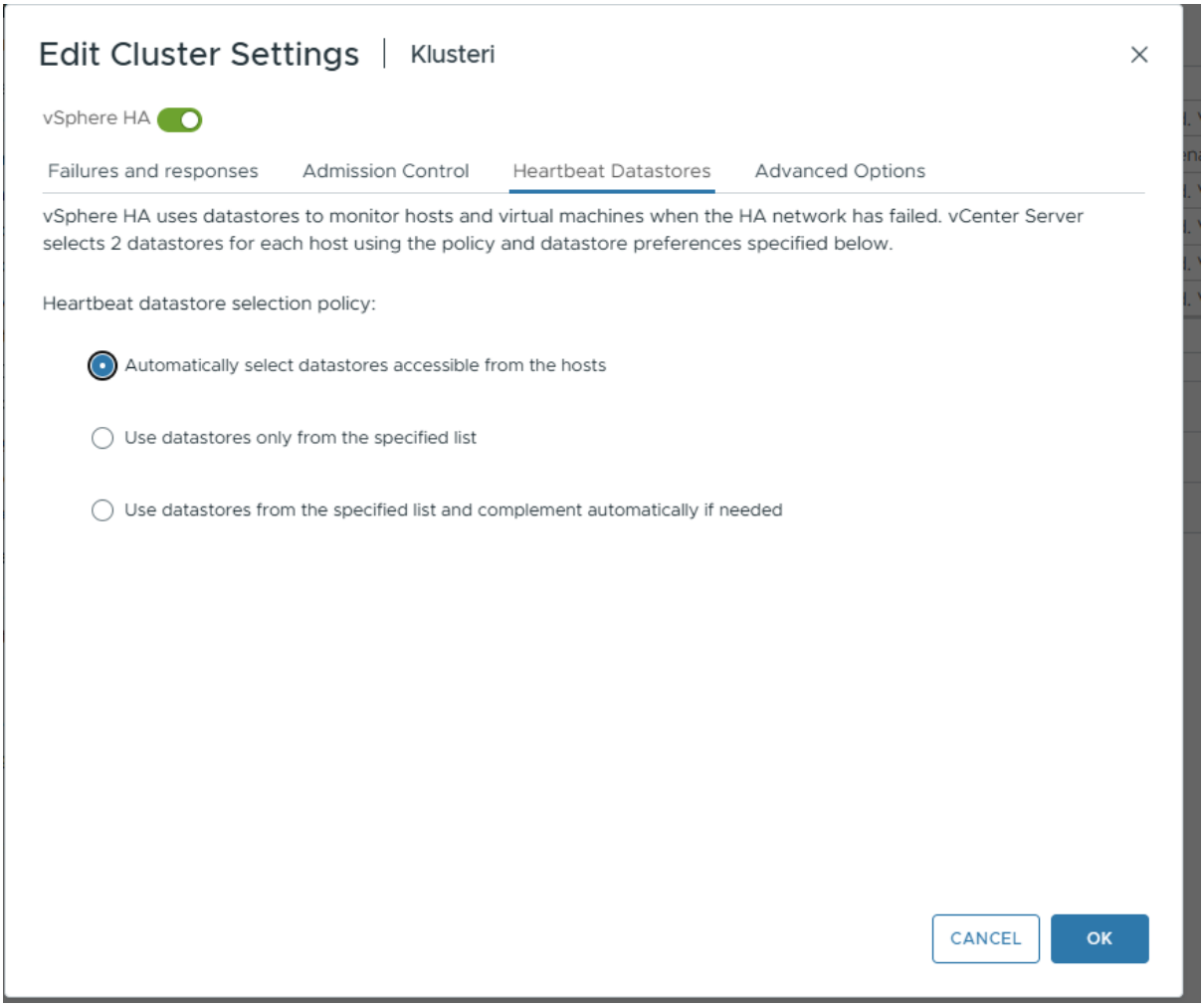
12 VMWARE VSPHERE PROACTIVE HA

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



Klusteri Vsphere DRS automatisoidaan resurssien jako klusterissa. Muutetaan asetuksia.

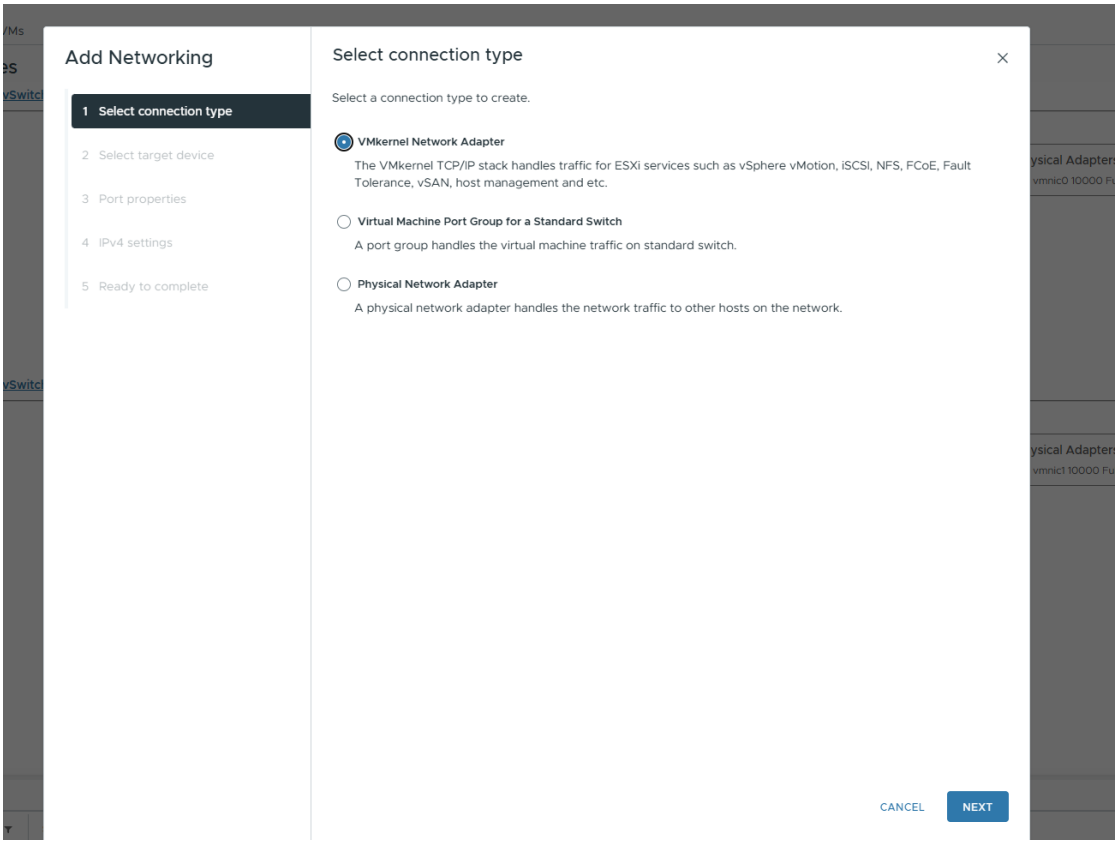

Edit Cluster Settings | Klusteri
vSphere HA
Failures and responses
Admission Control
Heartbeat Datastores
Advanced Options
You can configure how vSphere HA responds to the failure conditions on this cluster. The following failure conditions are supported: host, host isolation, VM component protection (datastore with PDL and APD), VM and application.
Enable Host Monitoring
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



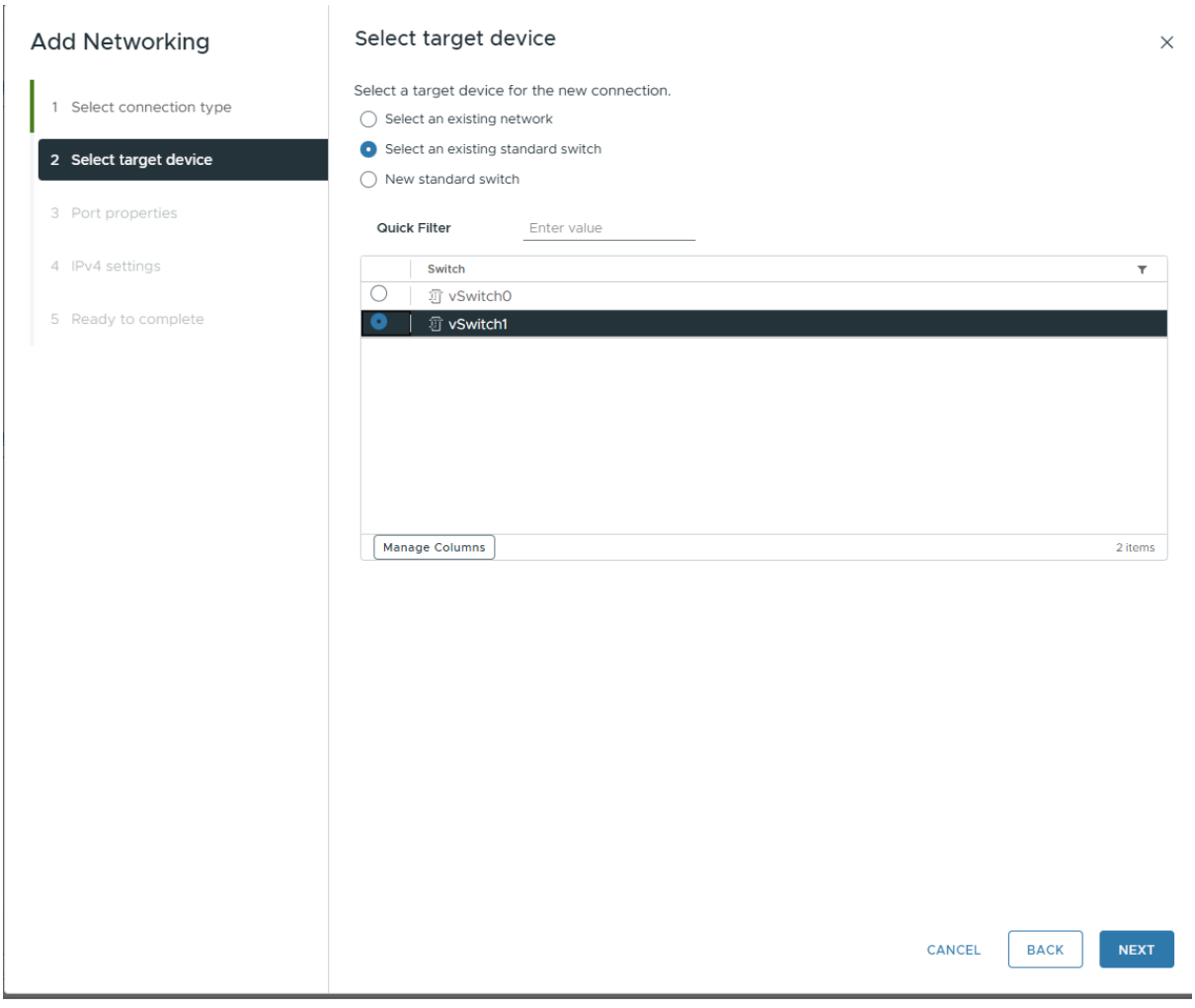
Lisätään kerner kytkimeen 1.

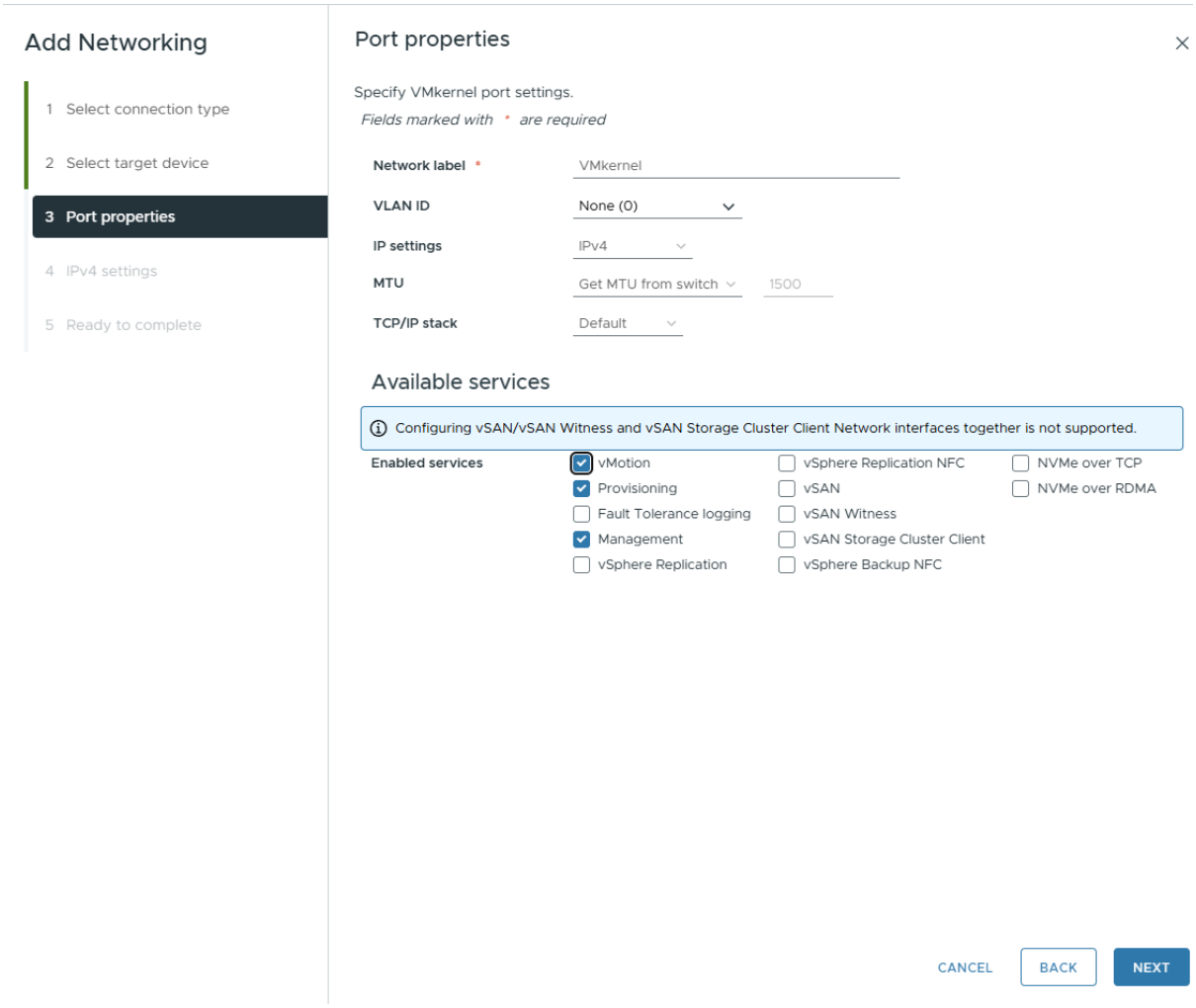
VMkernel adapteri luodaan, jotta ESXi voi viestiä verkon kautta eri palveluiden ja muiden isäntien kanssa.

Esimerkki konfiguraatio.

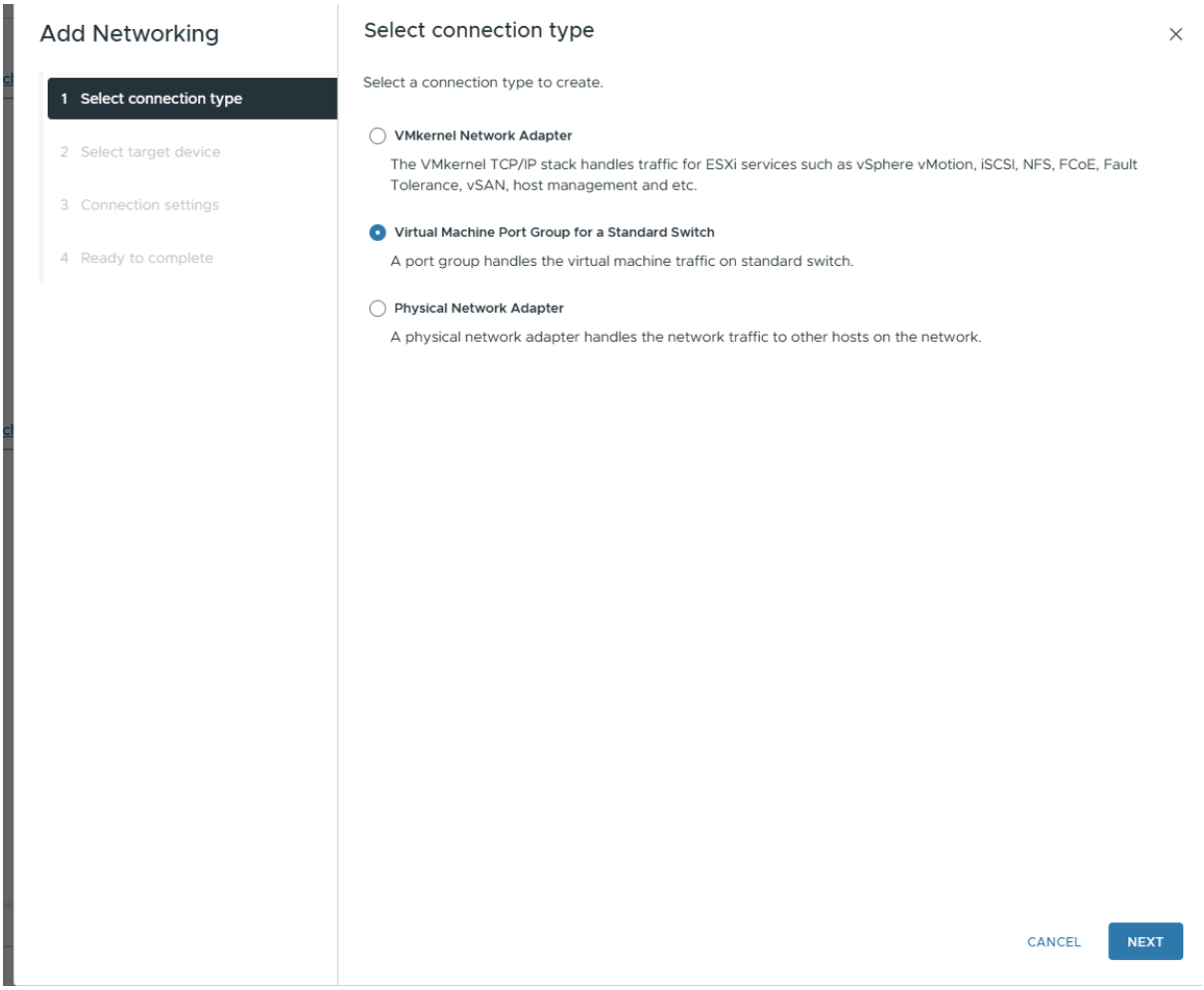


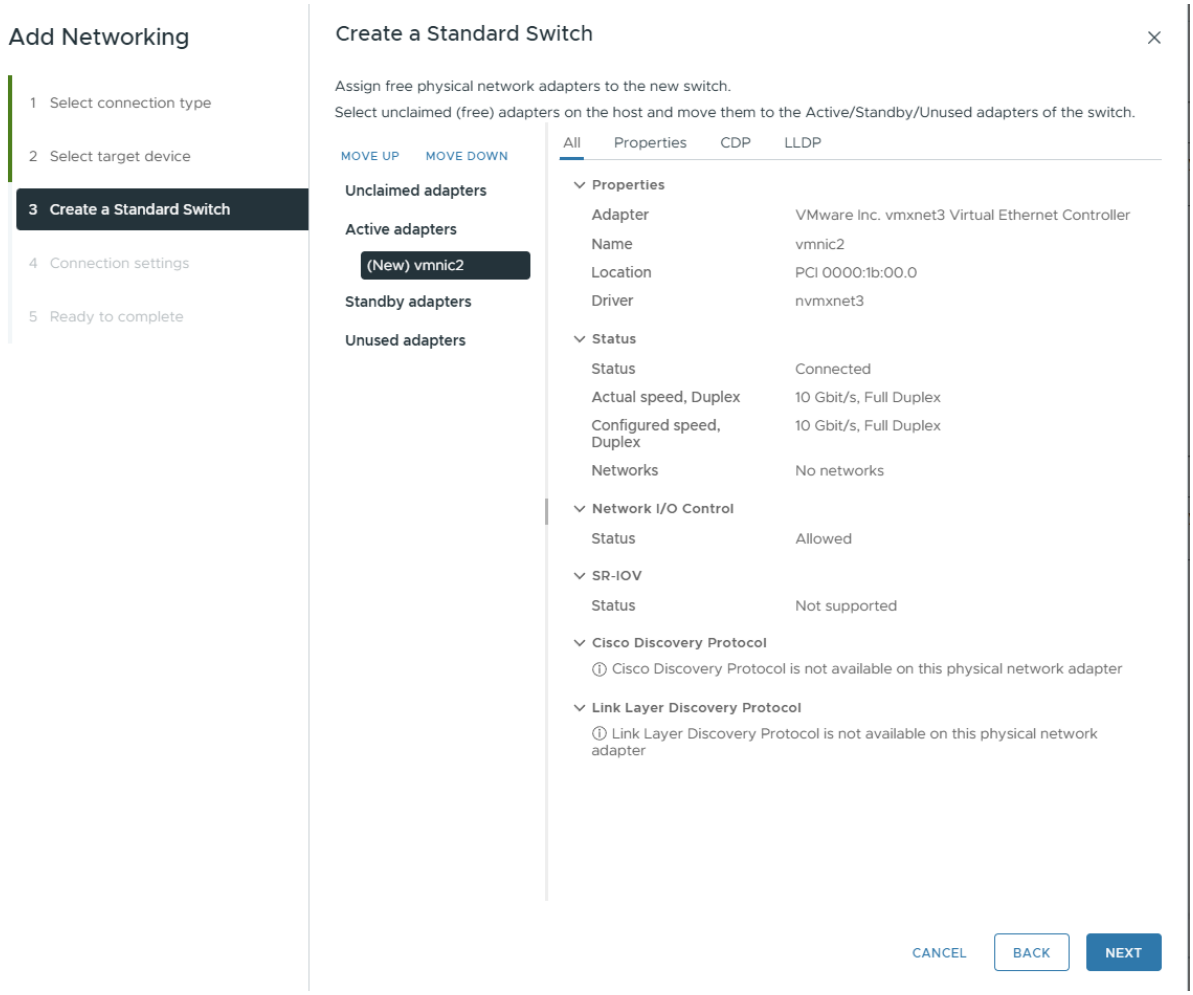
Valitaan switch 1.



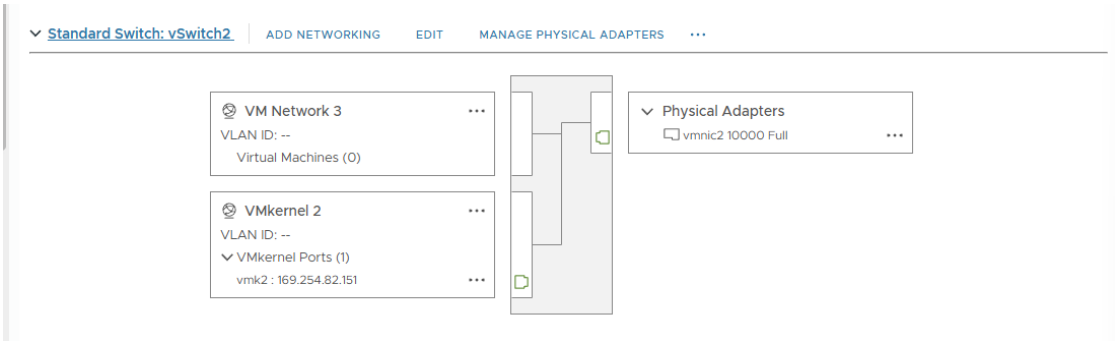


Kytkimen 2 kofigurointi. vmnic3 varten.

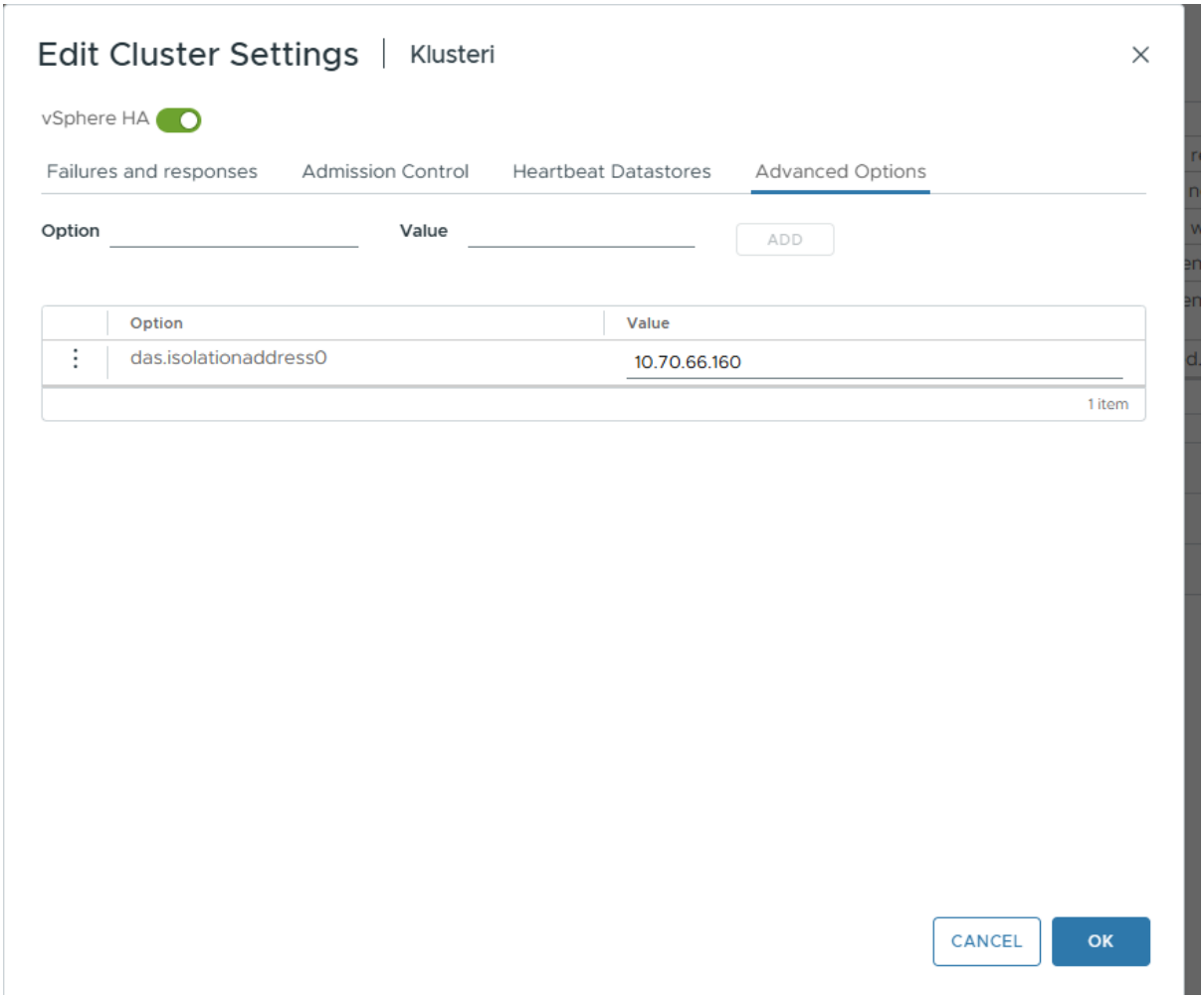

Add Networking
1 Select connection type
2 Select target device
3 Connection settings
4 Ready to complete
Select connection type
Select a connection type to create.
VMkernel Network Adapter
The VMkernel TCP/IP stack handles traffic for ESXi services such as vSphere vMotion, iSCSI, NFS, FCoE, Fault Tolerance, 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



vSwitch2 topologiassa.

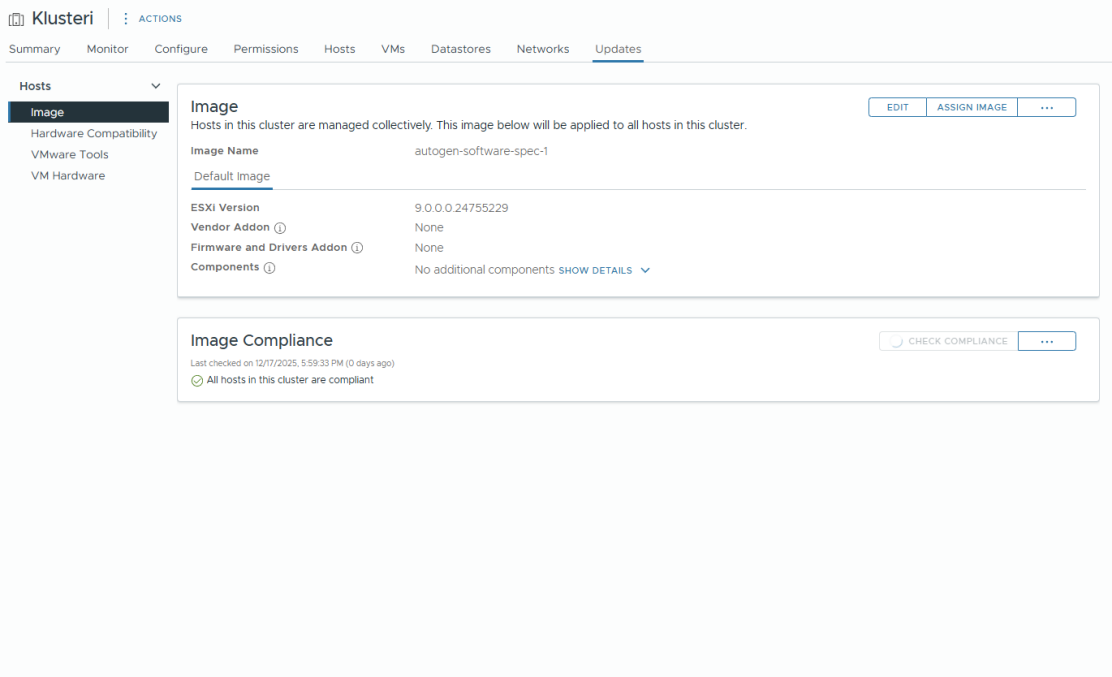


13 DAS. ISOLATIONADDRESS0. V-CENTER IP-OSOITE 10.70.66.160



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 päivittävältä isäntäkoneelta toiselle. Isäntäkone menee maintenance tilaan päivityksen ajaksi.



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.