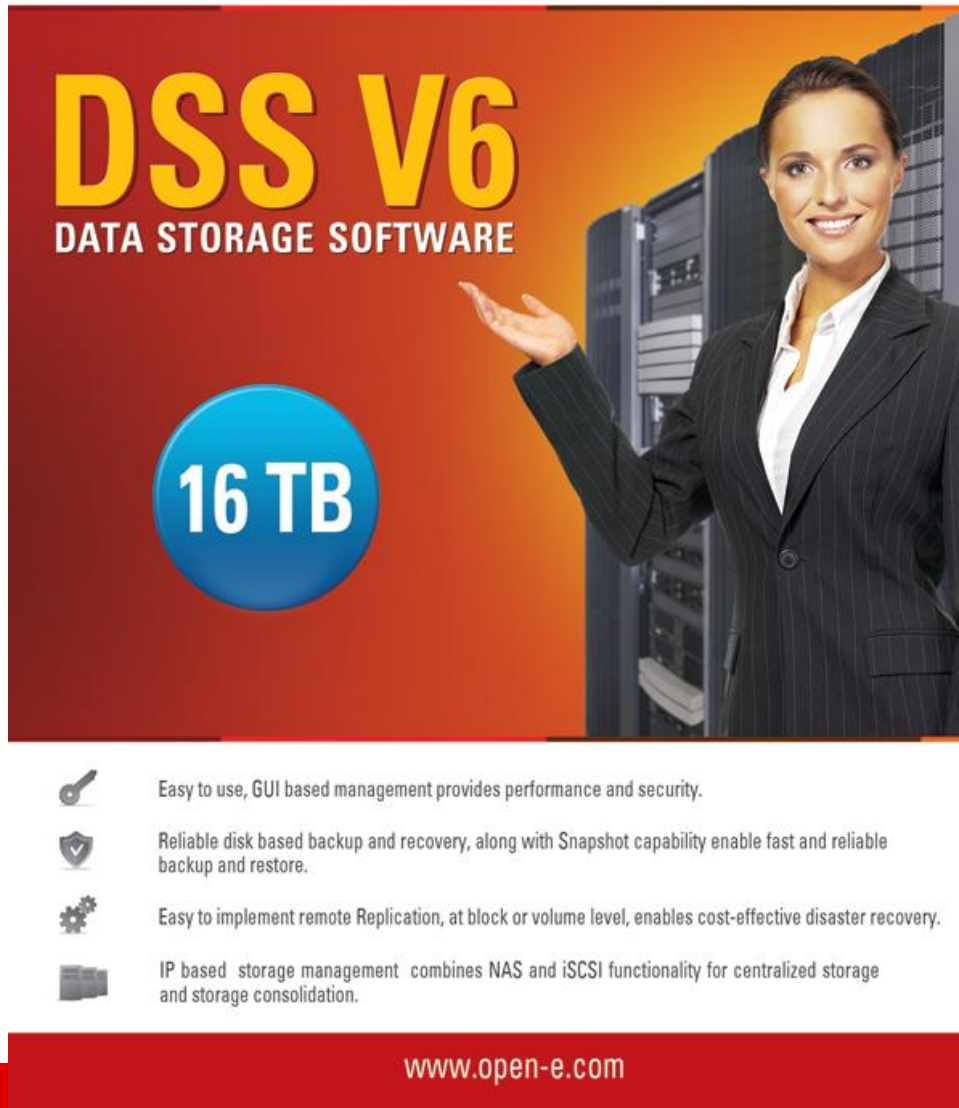
Open-E DSS V6 MPIO with VMware ESXi 4.x

Software Version: DSS ver. 6.00 up55

Presentation updated: August 2011

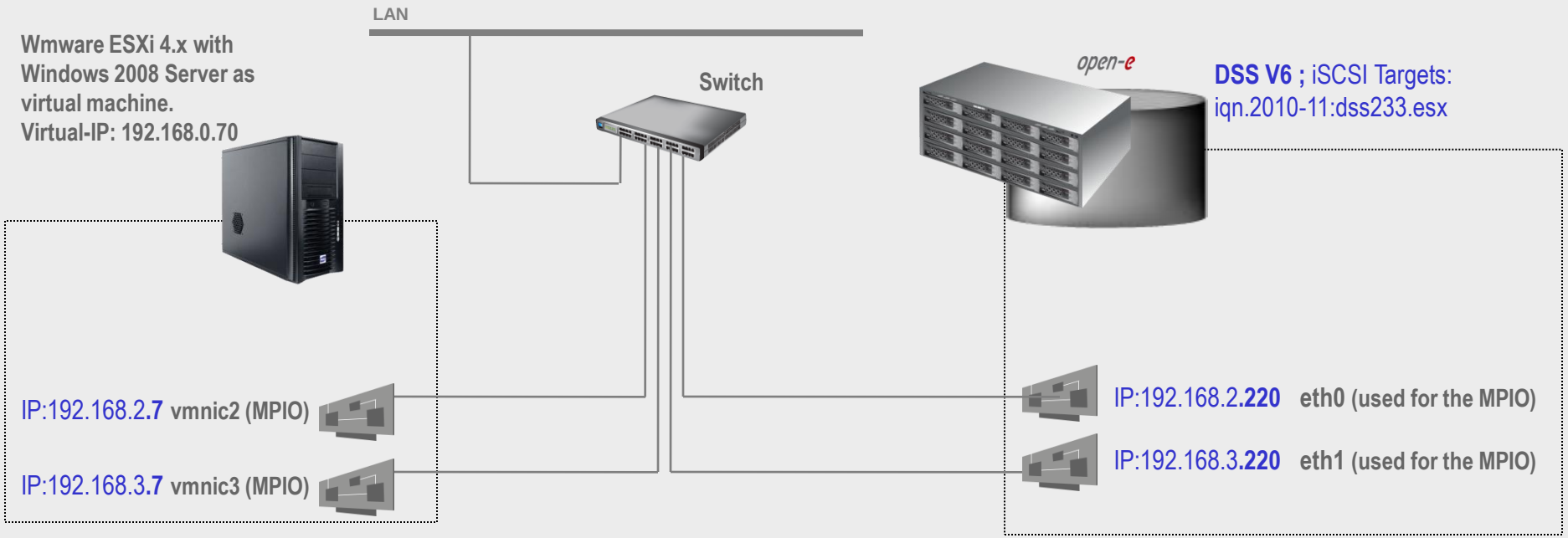


Multipath I/O on DSS V6 with ESXi 4.x

Example configuration of Multipath I/O on DSS V6 with VMware ESXi 4.x and VM-Windows 2008

Hardware Requirements:

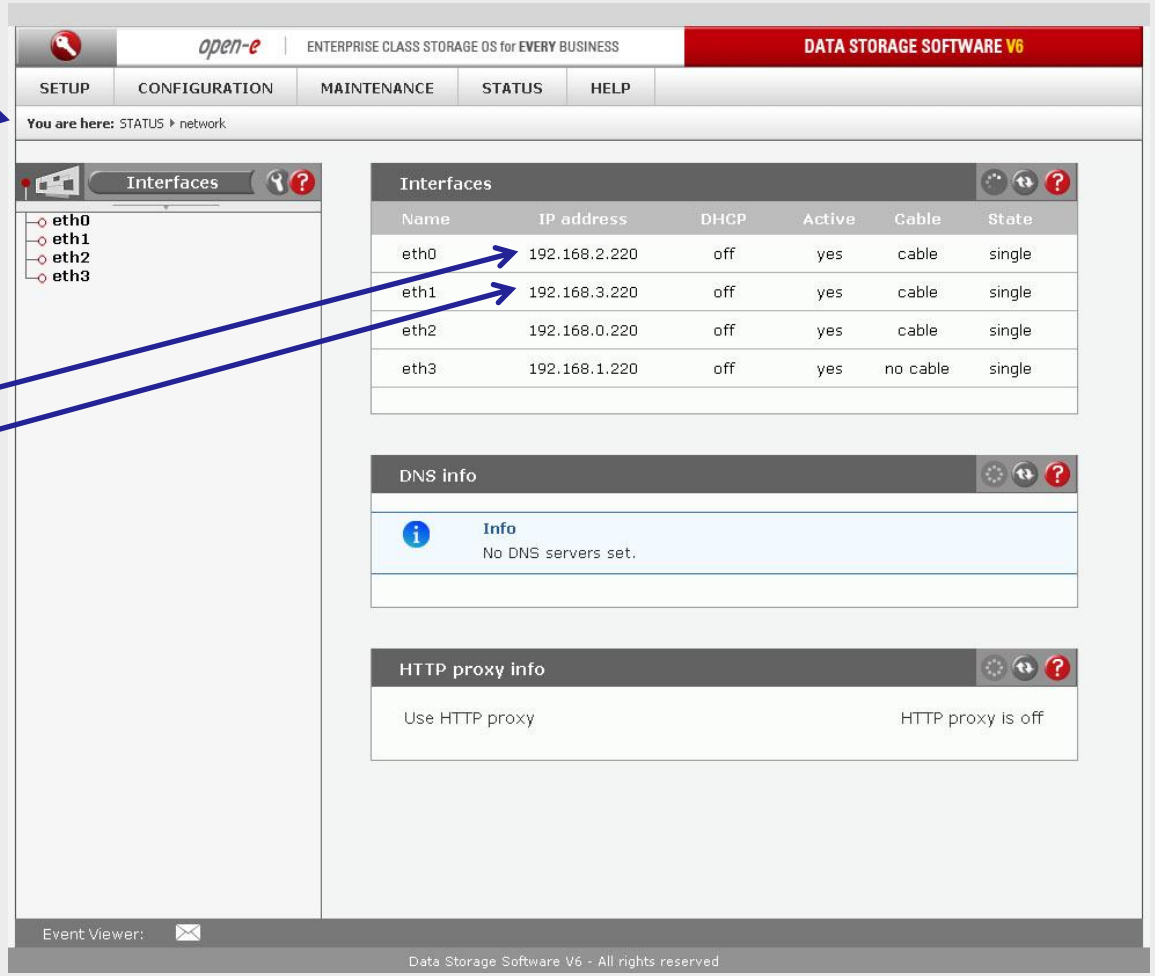
To run the Multipath I/O on DSS V6 with WMware ESXi 4.x and Windows 2008 server running as virtual machine, a minimum of two network cards in both systems are required. In this example the DSS V6 system and ESXi 4.x use two NICs.



Configure the DSS V6

In order to verify proper NICs settings, go to menu: **„STATUS"** tab, **„network"** and **Interfaces**.

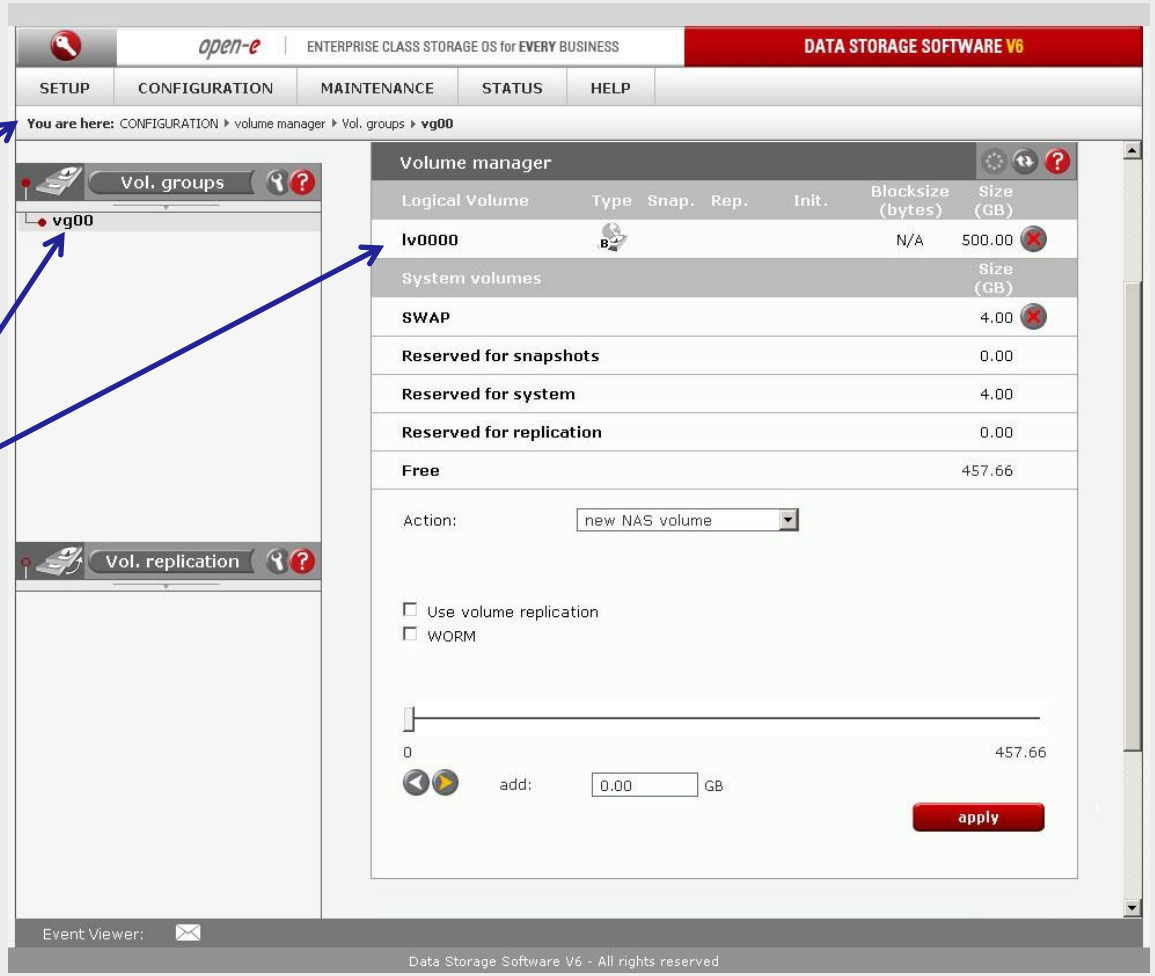
Two NICs to be used for MPIO has IP address:
192.168.2.220
192.168.3.220



Configure the DSS V6

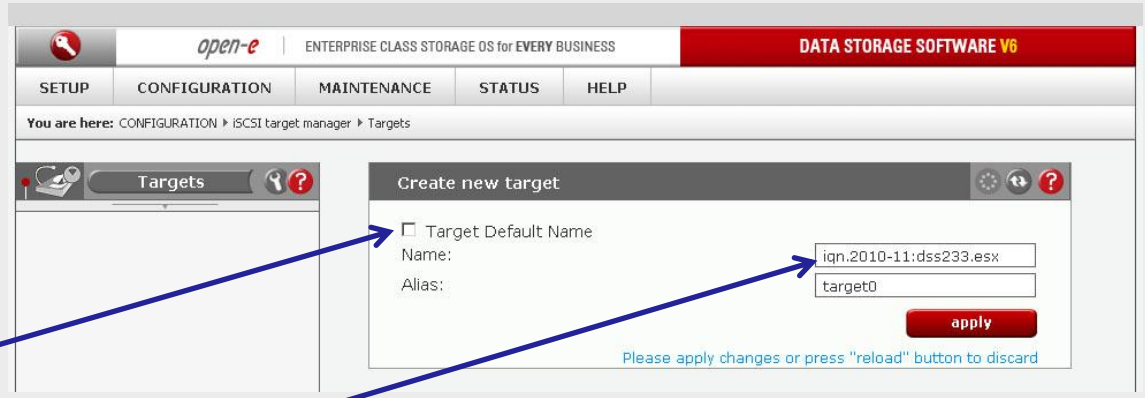
Next, please go to menu: **„CONFIGURATION"** tab, **„volume manager"** and **Vol. groups**.

Select **vg0** and in **Volume manager**, create **Block-IO** or **File-IO** iSCSI volume.



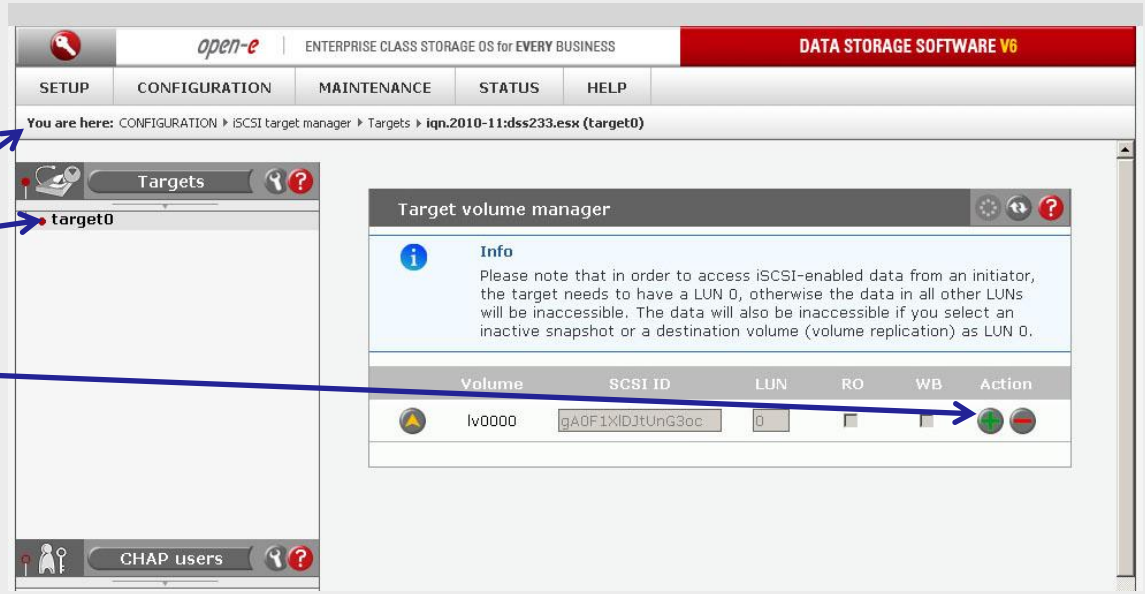
Configure the DSS V6

In menu: **„CONFIGURATION”** tab, **„iSCSI target manager”**, **Targets,** please uncheck the **Target Default Name** and enter target name: **iqn.2010-11:dss233.esx**



Configure the DSS V6

In menu **„CONFIGURATION"** tab, **„iSCSI target manager"**, **target0**, select first alias: **target0** and click on the ⊕ button.



Now, configuring DSS V6 is finished.

Using ESXi 4.x CLI

[root@esx ~]# nano /etc/ssh/sshd_config

PermitRootLogin yes

<Ctrl-o>

<Ctrl-x>

Fixing „iSCSI MPIO throughtput limited to 1G“

Setting the Round Robin params:

esxcli nmp roundrobin setconfig --type "iops" --iops 1 --device <device UID>

Listing devices:

esxcli nmp device list

Using ESXi 4.x CLI

Example commands for fixing „iSCSI MPIO throughtput limited to 1G“ issue:

Setting the Round Robin params for the first device:

```
esxcli nmp roundrobin setconfig --type "iops" --iops 1 --device `esxcli nmp device list | grep ^eui | head -n 1 `
```

Setting the Round Robin params for the second device:

```
esxcli nmp roundrobin setconfig --type "iops" --iops 1 --device `esxcli nmp device list | grep ^eui  |head -n 2 | tail -n 1`
```

Entering the settings into ESX start script:

```
[root@esx ~]# nano /etc/rc.local

# Fixing iSCSI MPIO throughtput limited to 1G.
esxcli nmp device list | grep  ^eui  |
while read device ; do
    esxcli nmp roundrobin setconfig --type "iops" --iops 1 --device ${device}
done
<Ctrl-o>
<Ctrl-x>
```

Using ESXi 4.x CLI

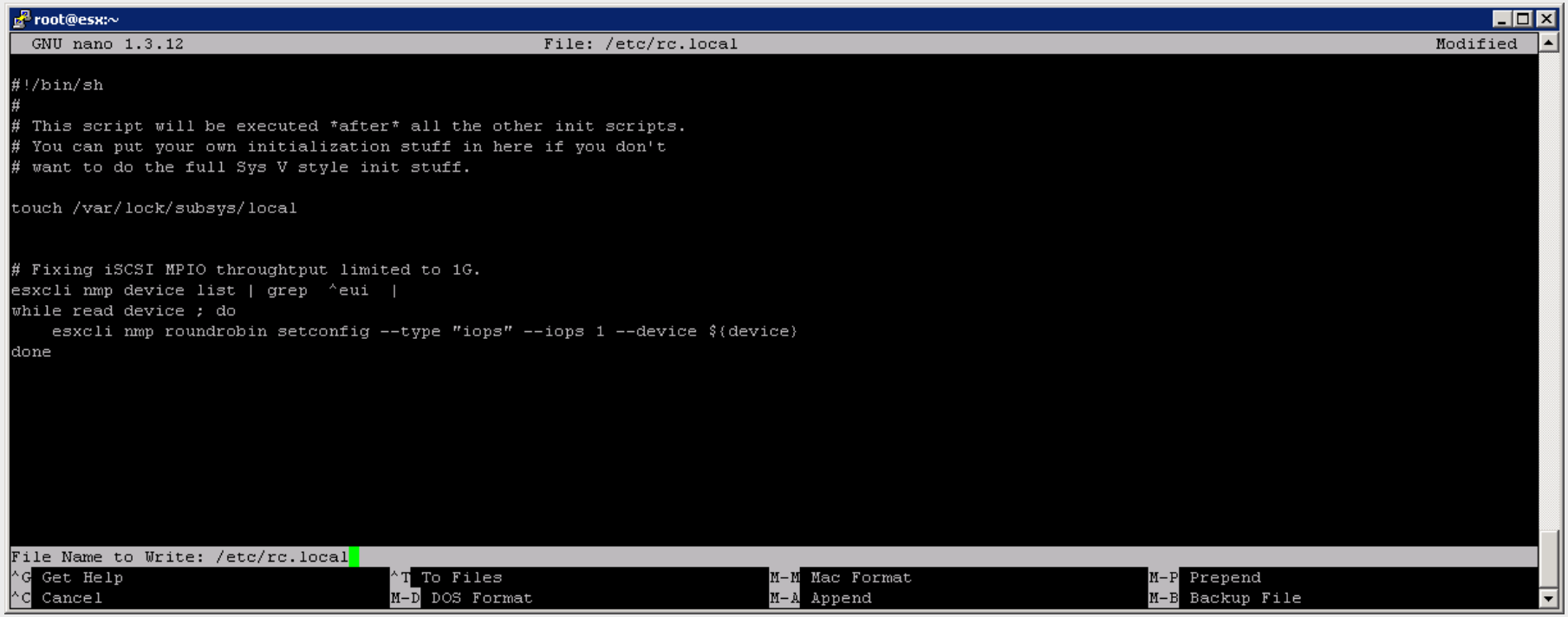
Now, in order to fix:
"iSCSI Round Robin limited to 1G" problem, please use following CLI command first:
esxcli nmp device list

```
root@esx:~
[root@esx ~]#
[root@esx ~]# esxcli nmp device list
eui.00000000c1742b0a
    Device Display Name: SCST_BIO iSCSI Disk (eui.00000000c1742b0a)
    Storage Array Type: VMW_SATP_DEFAULT_AA
    Storage Array Type Device Config:
    Path Selection Policy: VMW_PSP_RR
    Path Selection Policy Device Config: {policy=iops,iops=1514565248,bytes=10485760,useANO=0;lastPathIndex=1: NumIOsPending=0,numBytesPending=0}
    Working Paths: vmhba36:C0:T0:L0, vmhba36:C1:T0:L0

mpx.vmhba32:C0:T0:L0
    Device Display Name: Local USB CD-ROM (mpx.vmhba32:C0:T0:L0)
    Storage Array Type: VMW_SATP_LOCAL
    Storage Array Type Device Config:
    Path Selection Policy: VMW_PSP_FIXED
    Path Selection Policy Device Config: {preferred=vmhba32:C0:T0:L0;current=vmhba32:C0:T0:L0}
    Working Paths: vmhba32:C0:T0:L0

mpx.vmhba3:C0:T1:L0
    Device Display Name: Local Slimtype CD-ROM (mpx.vmhba3:C0:T1:L0)
    Storage Array Type: VMW_SATP_LOCAL
    Storage Array Type Device Config:
    Path Selection Policy: VMW_PSP_FIXED
    Path Selection Policy Device Config: {preferred=vmhba3:C0:T1:L0;current=vmhba3:C0:T1:L0}
    Working Paths: vmhba3:C0:T1:L0

naa.600605b000161ab00f8e8ce6c527141b
    Device Display Name: Local LSI Disk (naa.600605b000161ab00f8e8ce6c527141b)
    Storage Array Type: VMW_SATP_LOCAL
    Storage Array Type Device Config:
    Path Selection Policy: VMW_PSP_FIXED
    Path Selection Policy Device Config: {preferred=vmhba2:C0:T0:L0;current=vmhba2:C0:T0:L0}
    Working Paths: vmhba2:C0:T0:L0

mpx.vmhba33:C0:T0:L0
    Device Display Name: Local USB CD-ROM (mpx.vmhba33:C0:T0:L0)
    Storage Array Type: VMW_SATP_LOCAL
    Storage Array Type Device Config:
    Path Selection Policy: VMW_PSP_FIXED
    Path Selection Policy Device Config: {preferred=vmhba33:C0:T0:L0;current=vmhba33:C0:T0:L0}
    Working Paths: vmhba33:C0:T0:L0

eui.000000007f95b4e8
    Device Display Name: SCST_BIO iSCSI Disk (eui.000000007f95b4e8)
    Storage Array Type: VMW_SATP_DEFAULT_AA
    Storage Array Type Device Config:
    Path Selection Policy: VMW_PSP_RR
    Path Selection Policy Device Config: {policy=iops,iops=1514565248,bytes=10485760,useANO=0;lastPathIndex=1: NumIOsPending=0,numBytesPending=0}
    Working Paths: vmhba36:C0:T1:L0, vmhba36:C1:T1:L0

[root@esx ~]#
```

Using ESXi 4.x CLI

Entering the settings into ESX start script:

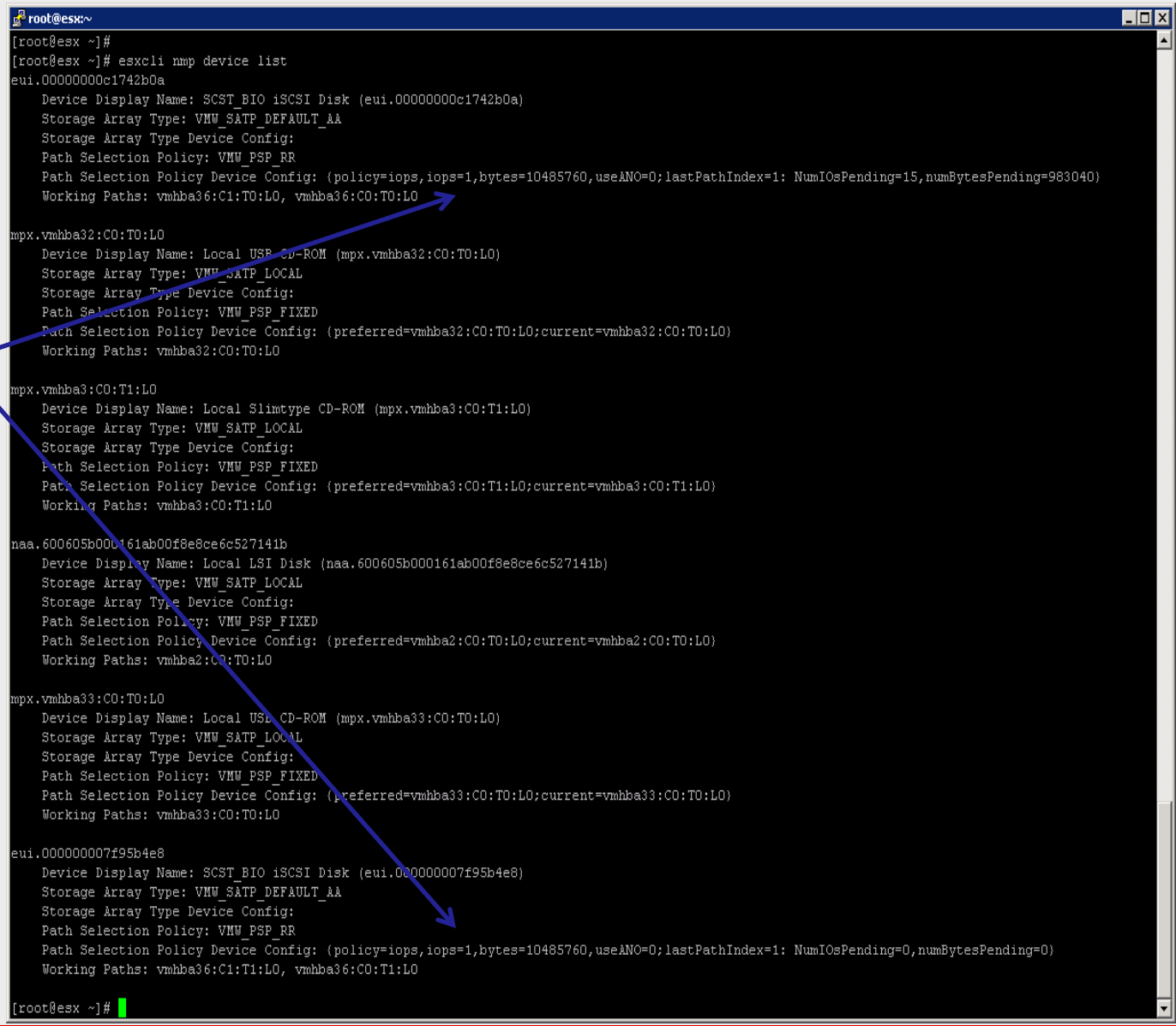
```
# Fixing iSCSI MPIO throughtput limited to 1G.
esxcli nmp device list | grep  ^eui  |
while read device ; do
    esxcli nmp roundrobin setconfig --type "iops" --iops 1 --device ${device}
done
<Ctrl-o>
<Ctrl-x>
```



Using ESXi 4.x CLI

In order to check the settings, please run the list command: esxcli nmp device list

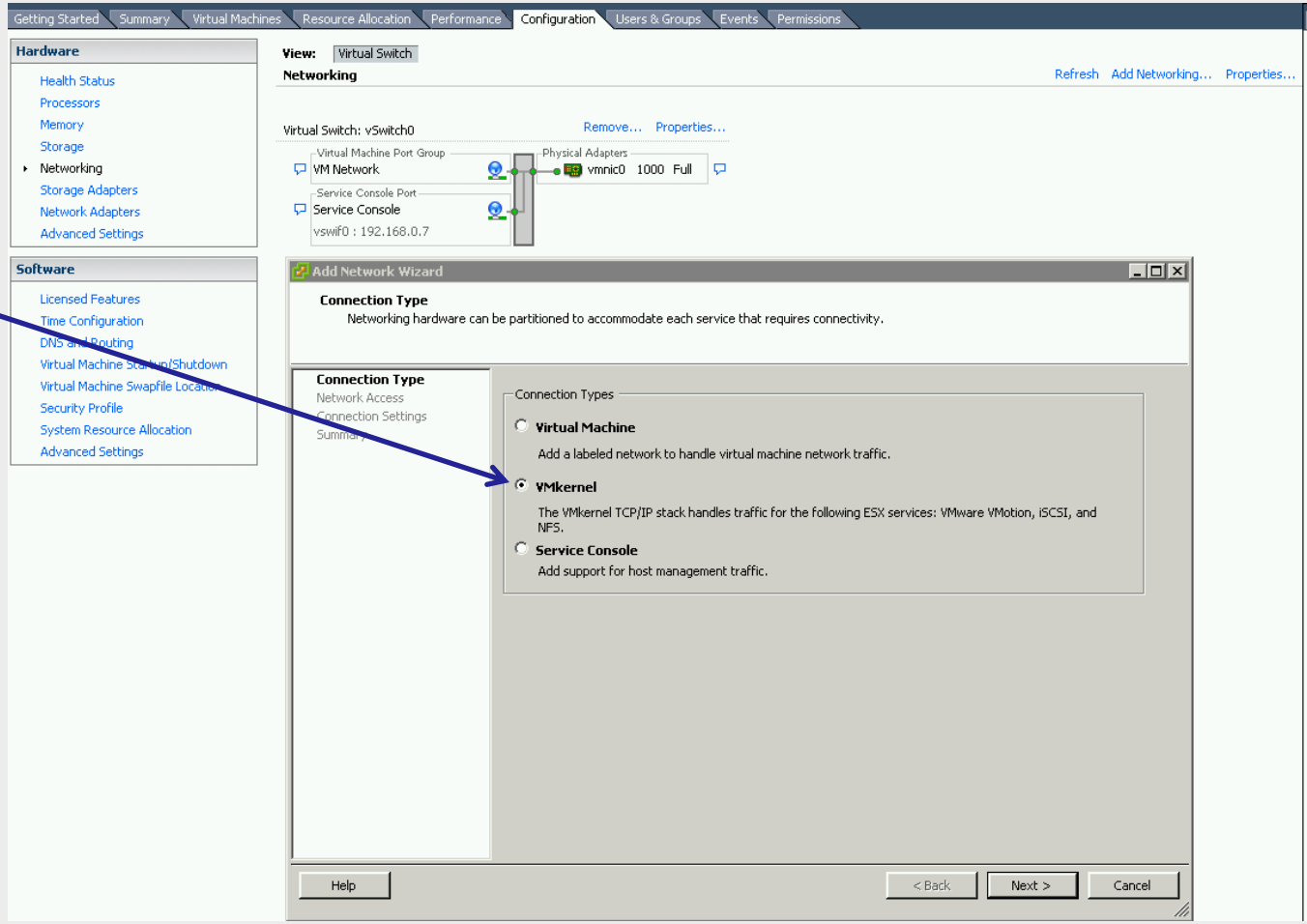
Now, the iops parameter is changed to 1



Using ESXi 4.x CLI

Step 1

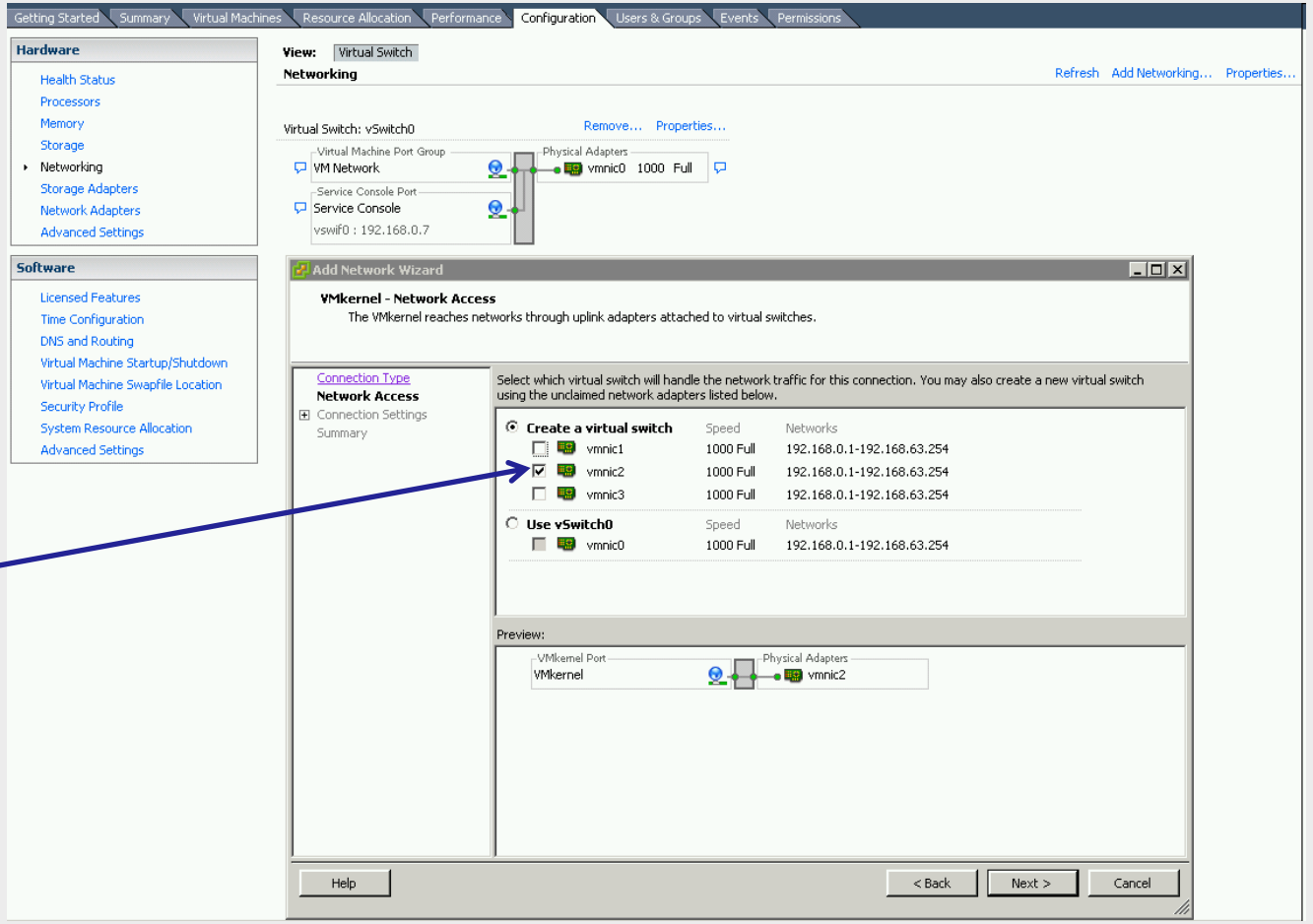
Navigate in the ESX 4.0 host Configuration tab and select Networking. Click on **„Add Networking...”** , select Vmkernel and then on **„Next >”** button.



Configure MPIO on ESXi 4.x

Step 2

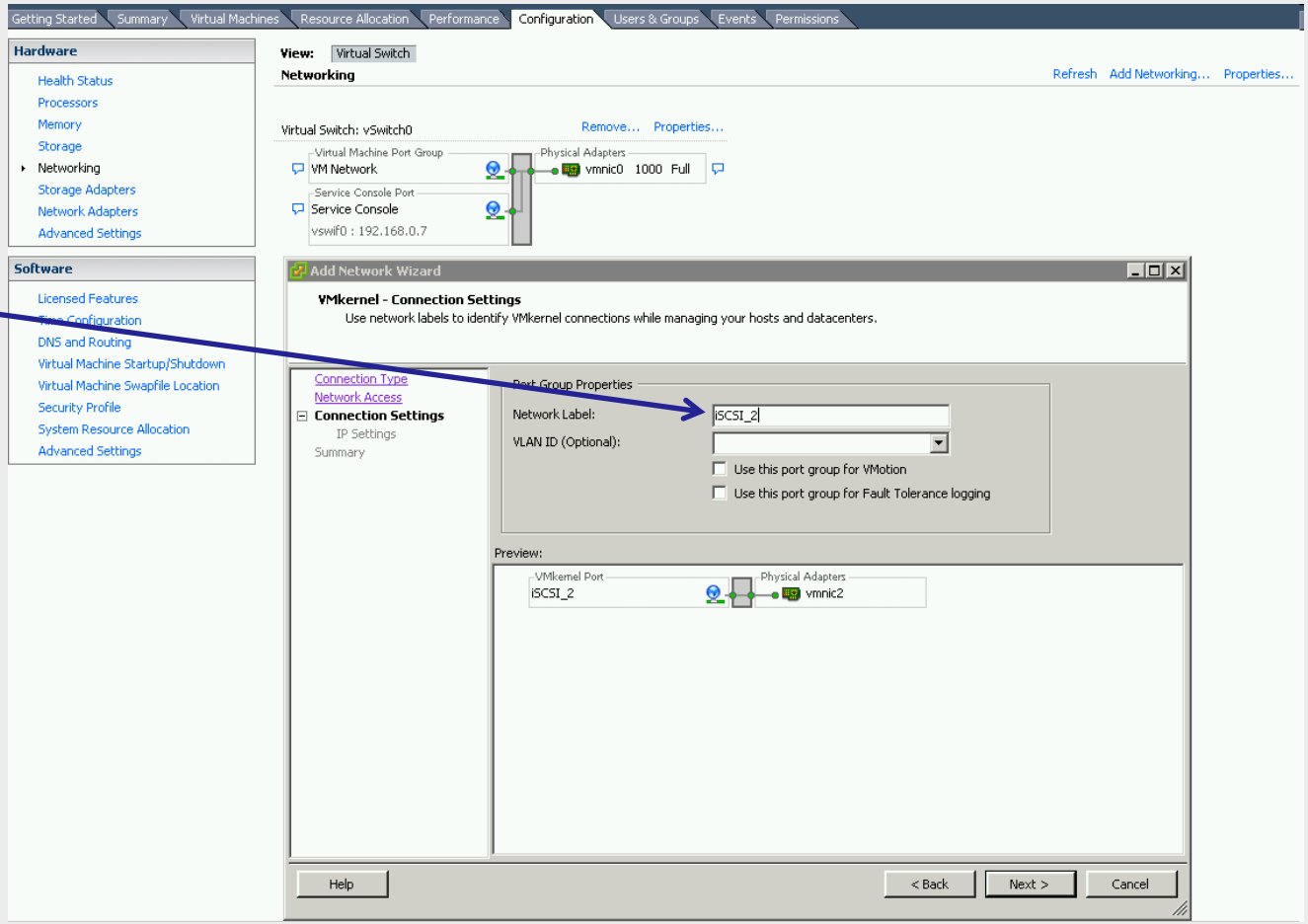
Please select one network adapter dedicated for the first Vmkernel. In this example: vmnic2



Configure MPIO on ESXi 4.x

Step 3

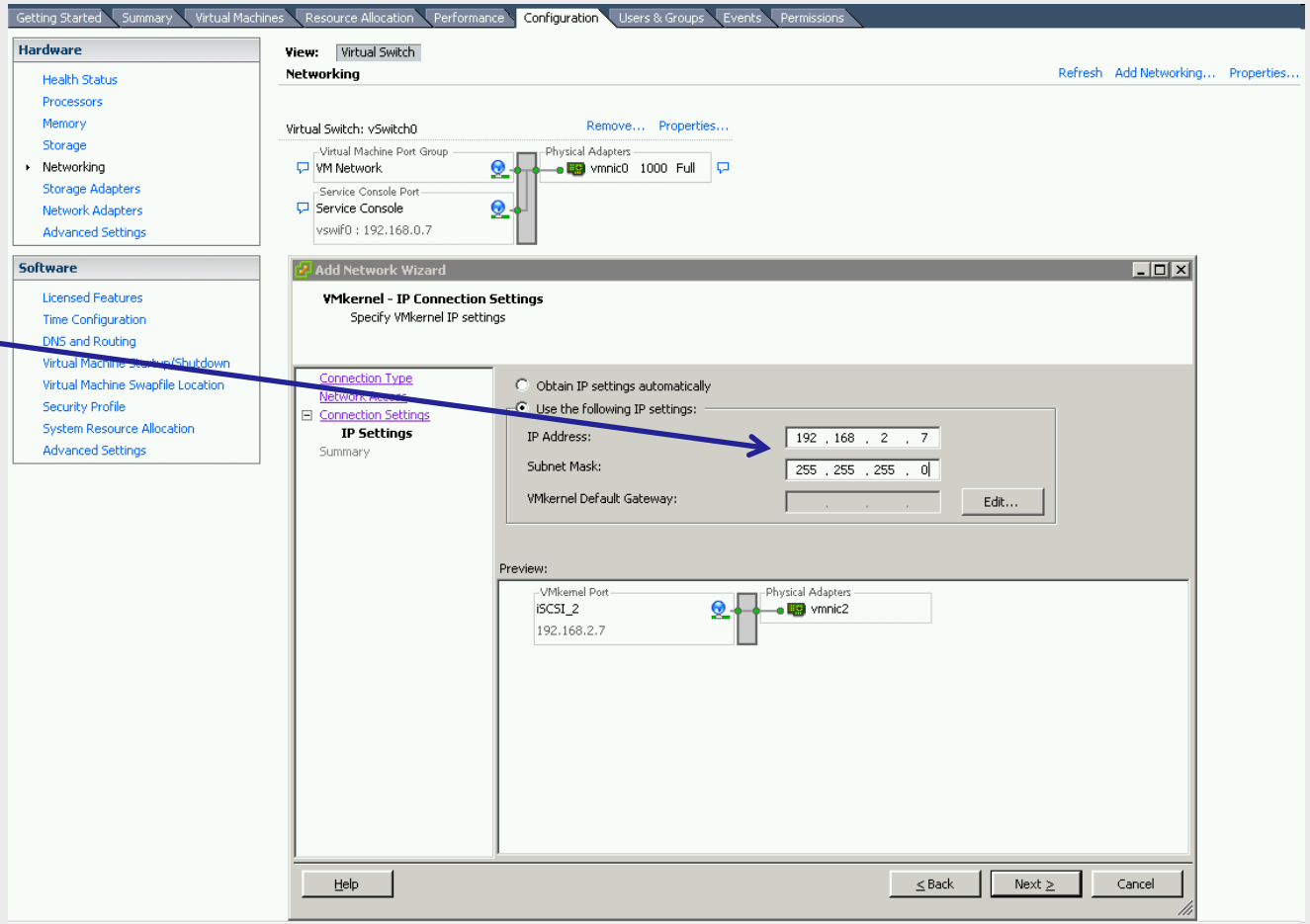
Please enter the Network Label for the first Vmkernel: iSCSI_2
And click on the **„Next >"** button.



Configure MPIO on ESXi 4.x

Step 4

Please enter the IP Address and Subnet Mask
192.168.3.7
255.255.255.0
And click on the **„Next >"** button.

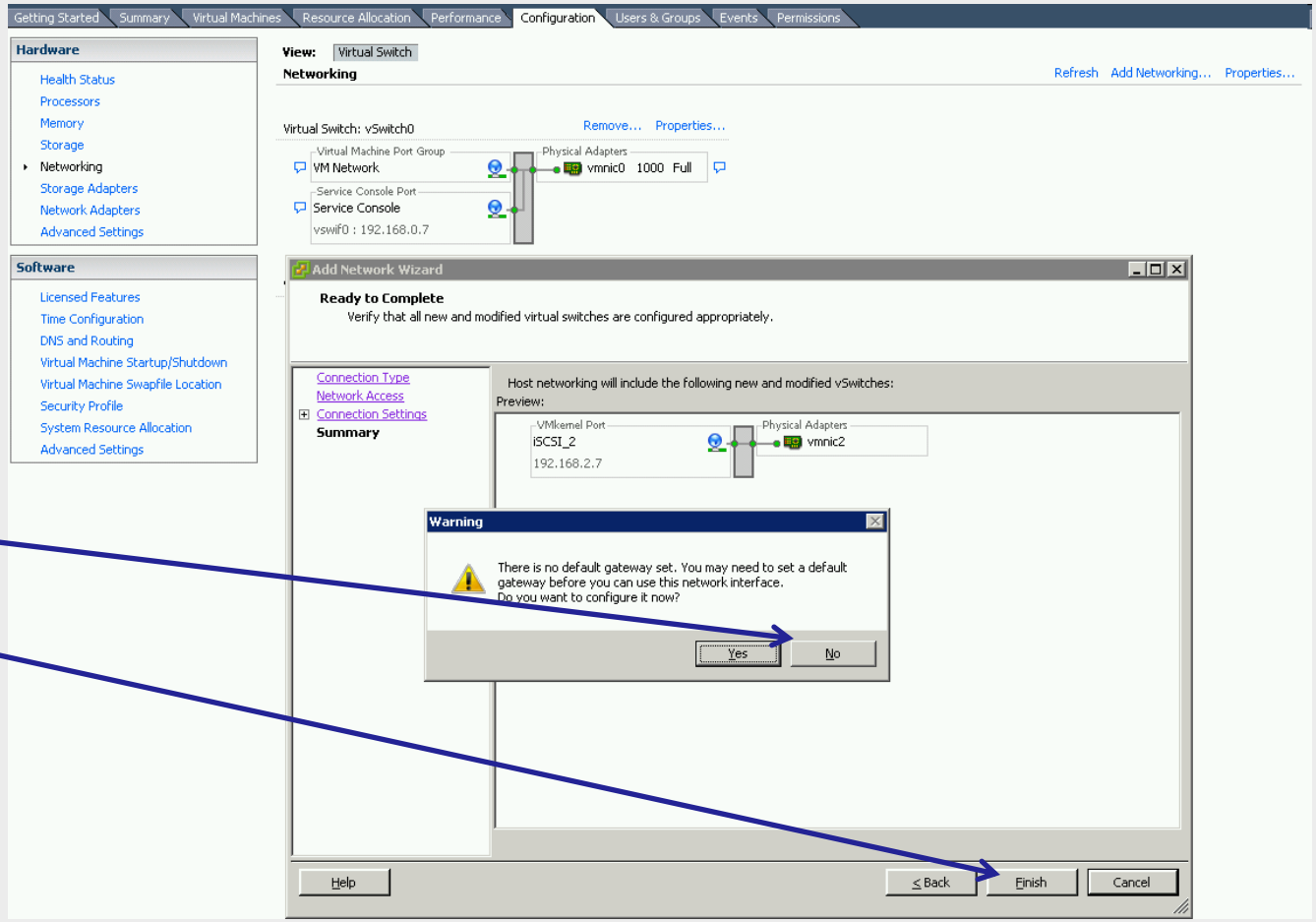


Configure MPIO on ESXi 4.x

Step 5

Now, click on the **„Finish"** button. Next, in the Warning prompt about default gateway, click on **„No"**

Now repeat steps 1 to 5 for the second Vmkernel. This time use: **vmnic3** for the network adapter, **iSCSI_3** for the Network Label, **192.168.3.7** for IP Address and **255.255.255.0** for the Network Subnet.

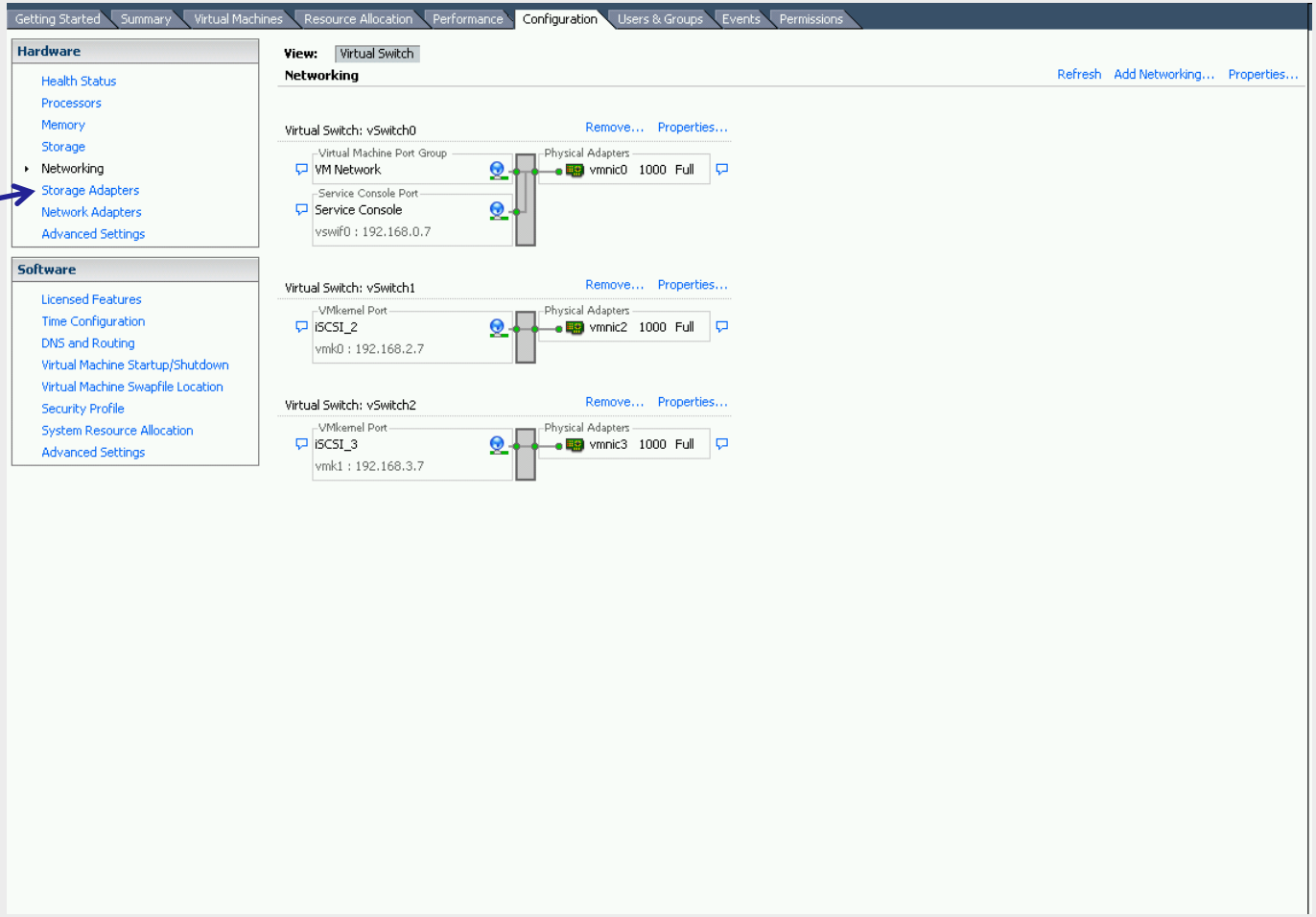


Configure MPIO on ESXi 4.x

Step 6

Now, there are 2 vmkernel ports with dedicated network adapter.
„iSCSI_2" -- „vmnic2"
„iSCSI_3" -- „vmnic3"

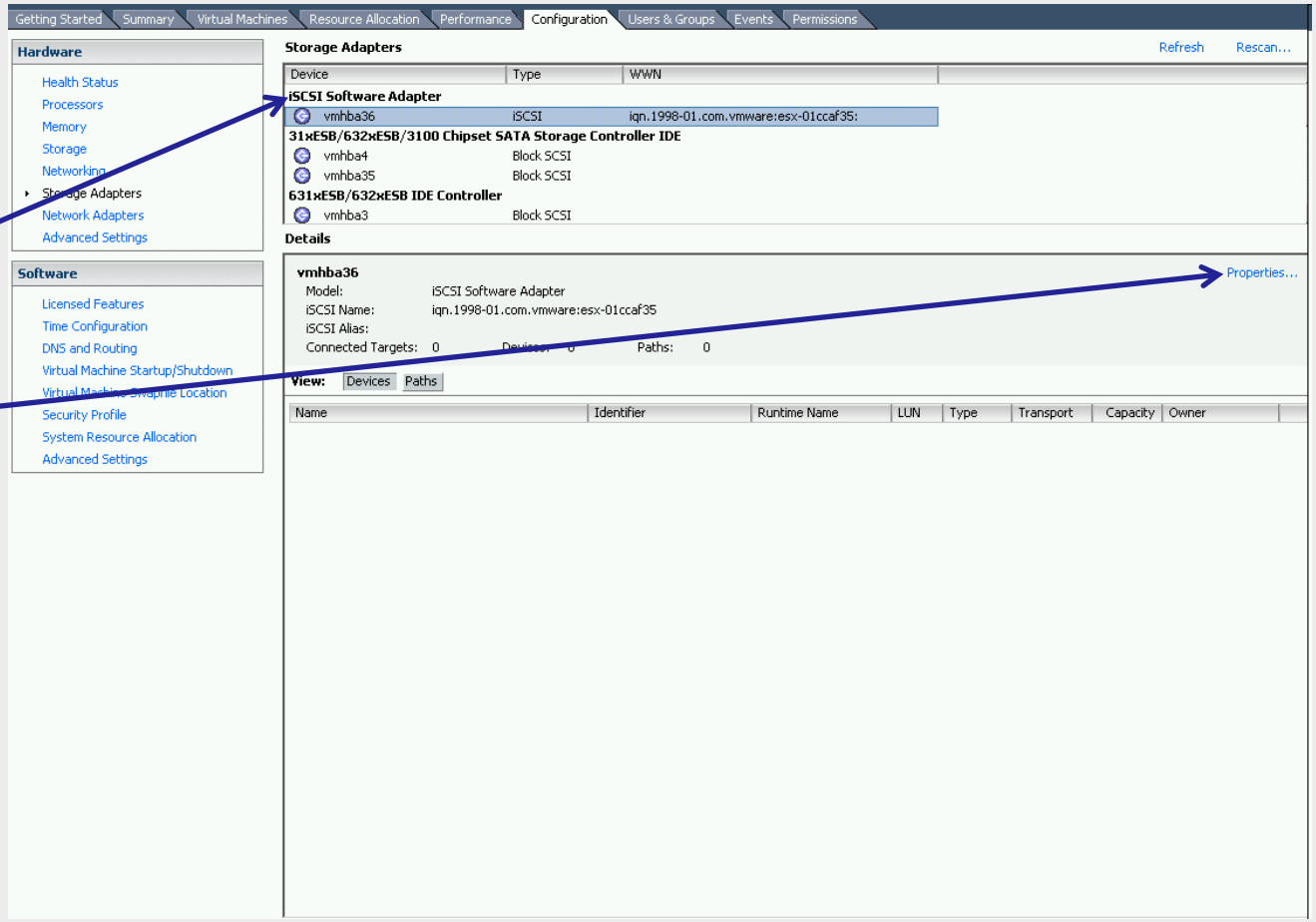
Next, please select **„Storage Adapters".**



Configure MPIO on ESXi 4.x

Step 7

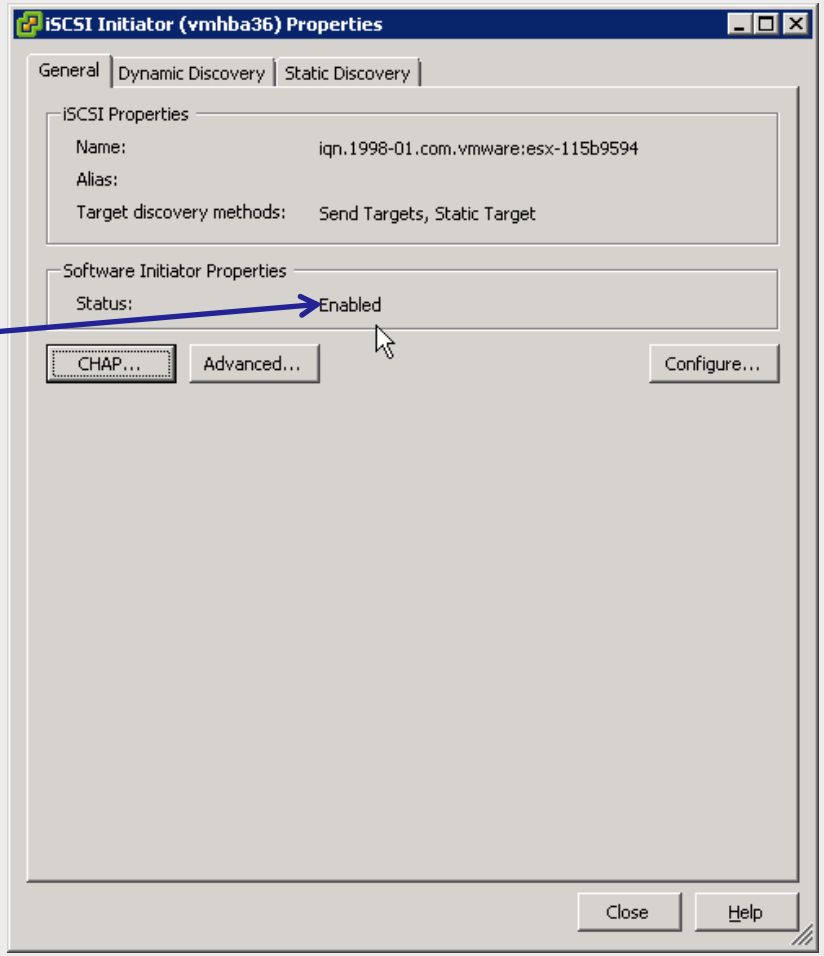
In **„Storage Adapters"** menu, please select **„iSCSI Software Adapter"** and click on **„Properties"** button.



Configure MPIO on ESXi 4.x

Step 8

In the iSCSI Initiator Properties, make sure the status is **„Enabled"**. If not, then click on **„Configure…"** button and enable it.
Next, click on the **„Static Discovery"** tab.

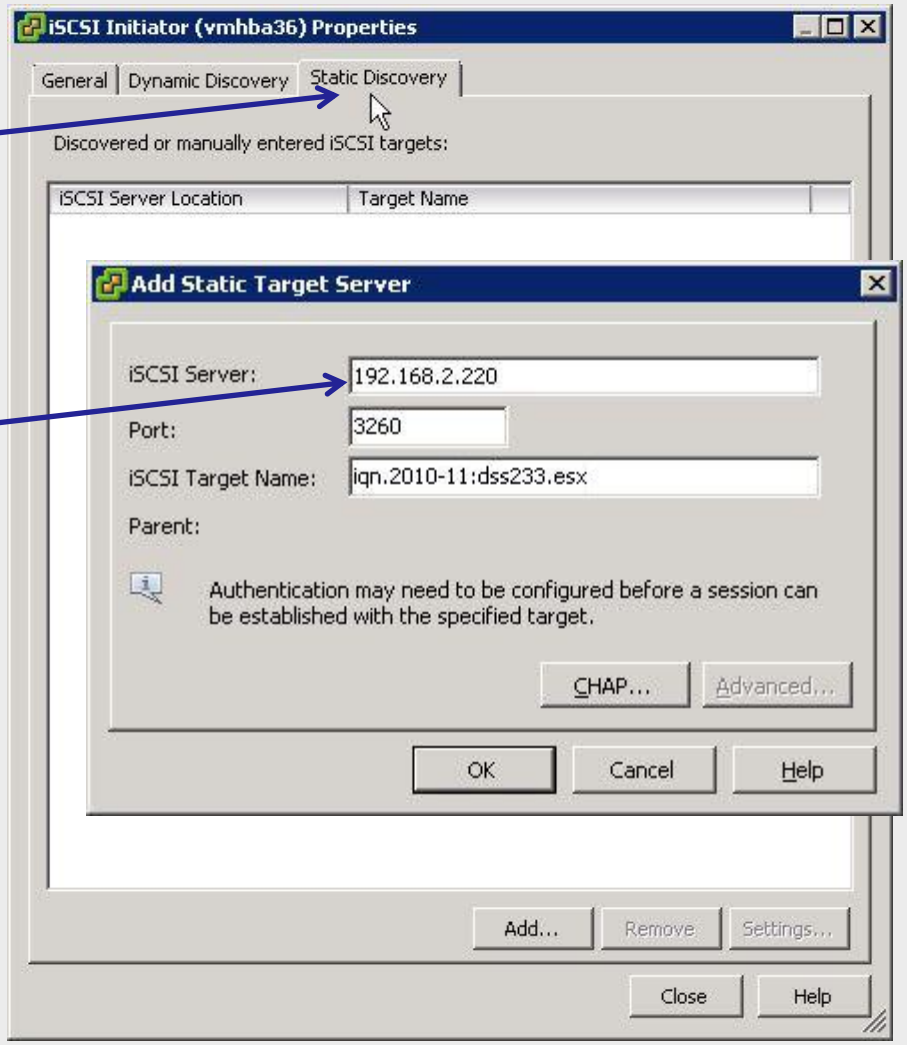


Configure MPIO on ESXi 4.x

Step 9

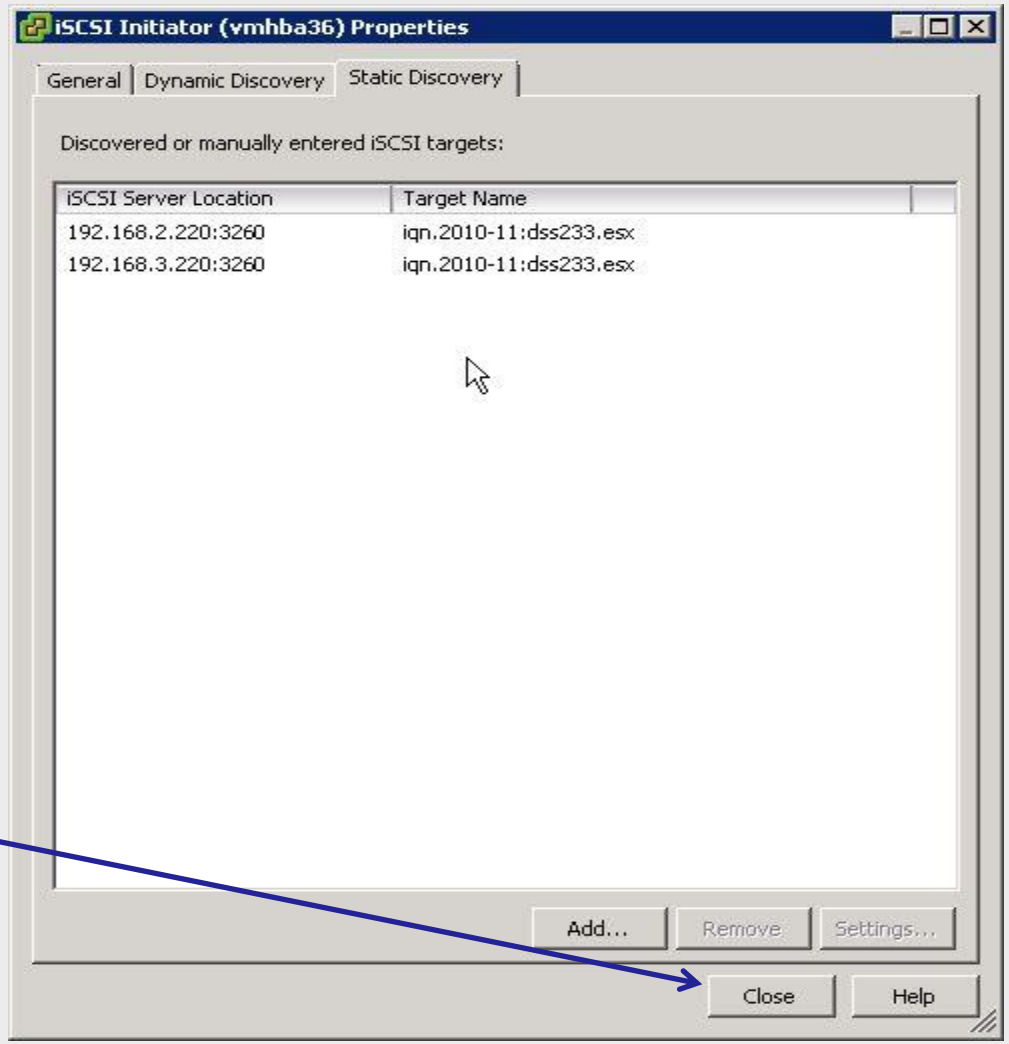
In the **„Static Discovery"** tab click the **„Add…"** button and enter the IP address and Target Name of the iSCSI target for the first path.
In this example: **192.168.2.220** and **iqn.2010-11:ds233.esx.**

Then click the **„Add…"** button and enter the IP address and Target Name of the iSCSI Target for the second path: **192.168.3.220** and **iqn.2010-11:ds233.esx**



Configure MPIO on ESXi 4.x

Step 10

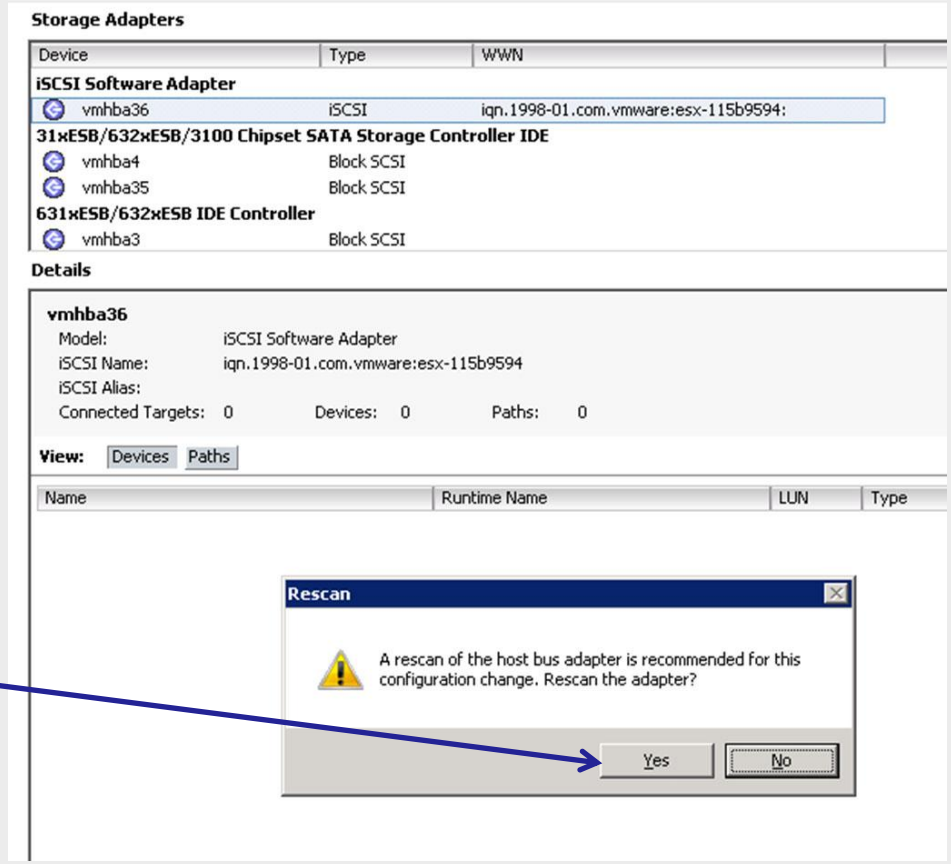


Next, click on **„Close"** button.

Configure MPIO on ESXi 4.x

Step 11

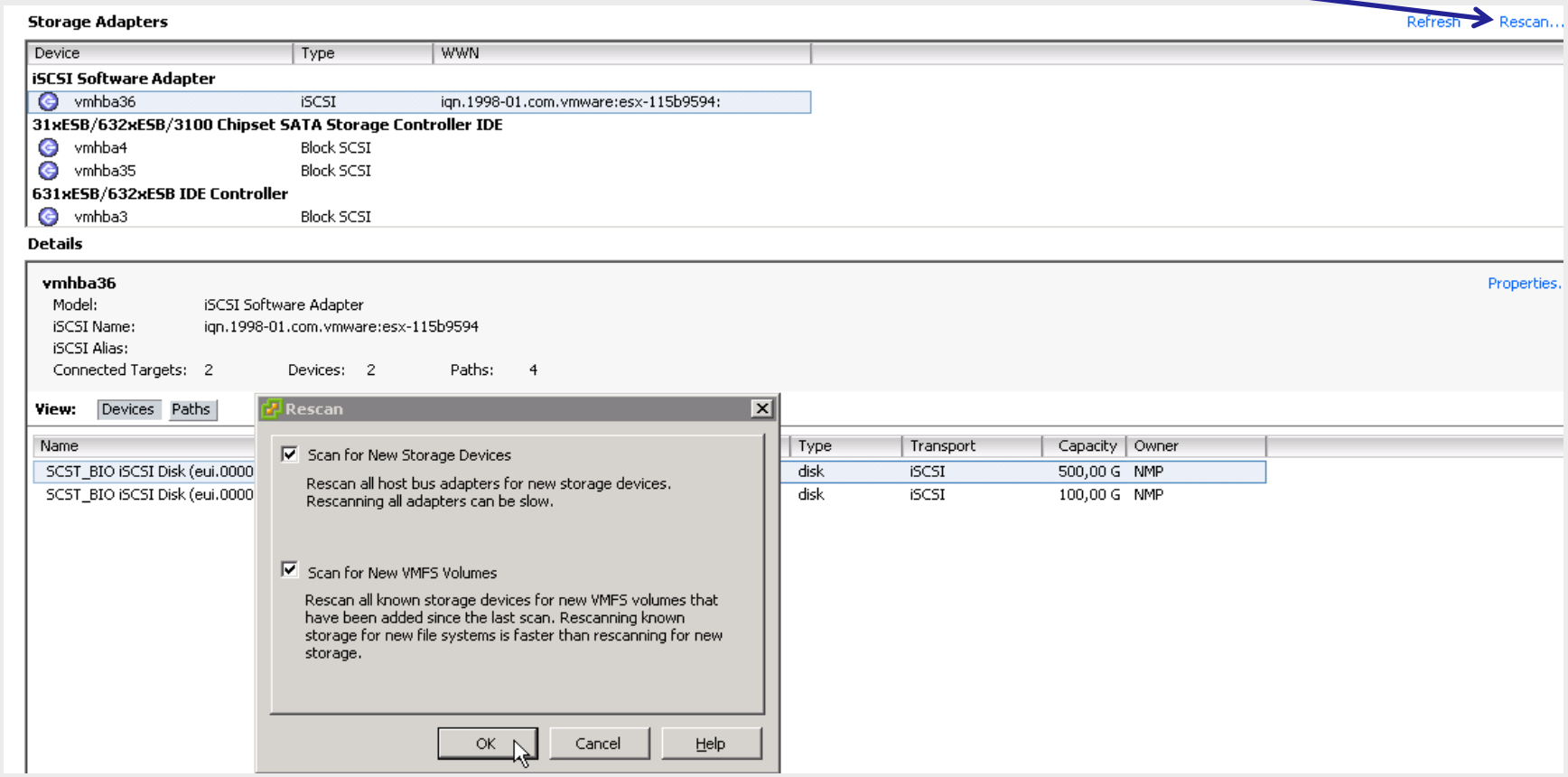
Now, click on the „**Yes**" button in order to start adapter rescan.



Configure MPIO on ESXi 4.x

Step 12

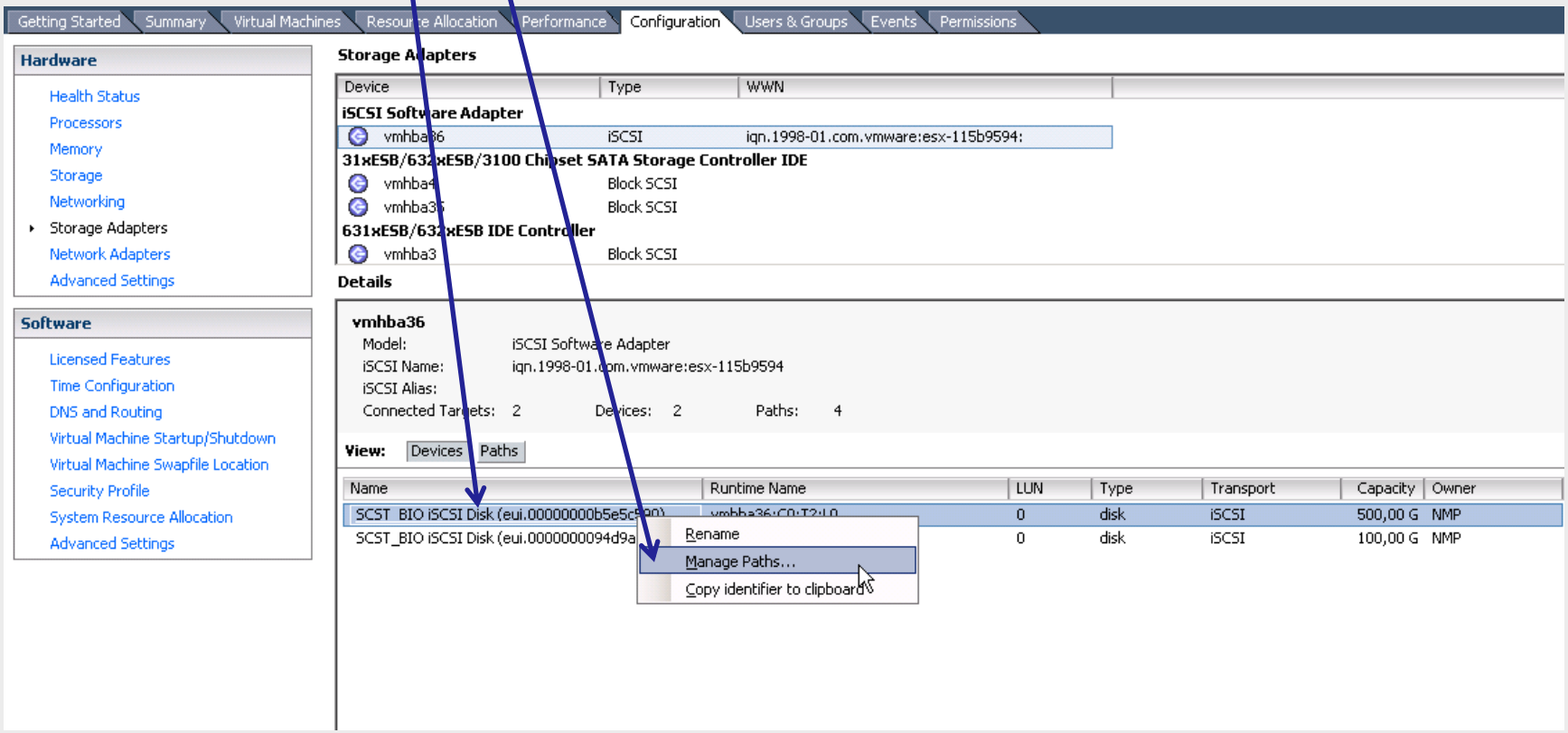
There is an option to run one more adapter to rescan now click on the **„Rescan"** button.



Configure MPIO on ESXi 4.x

Step 13

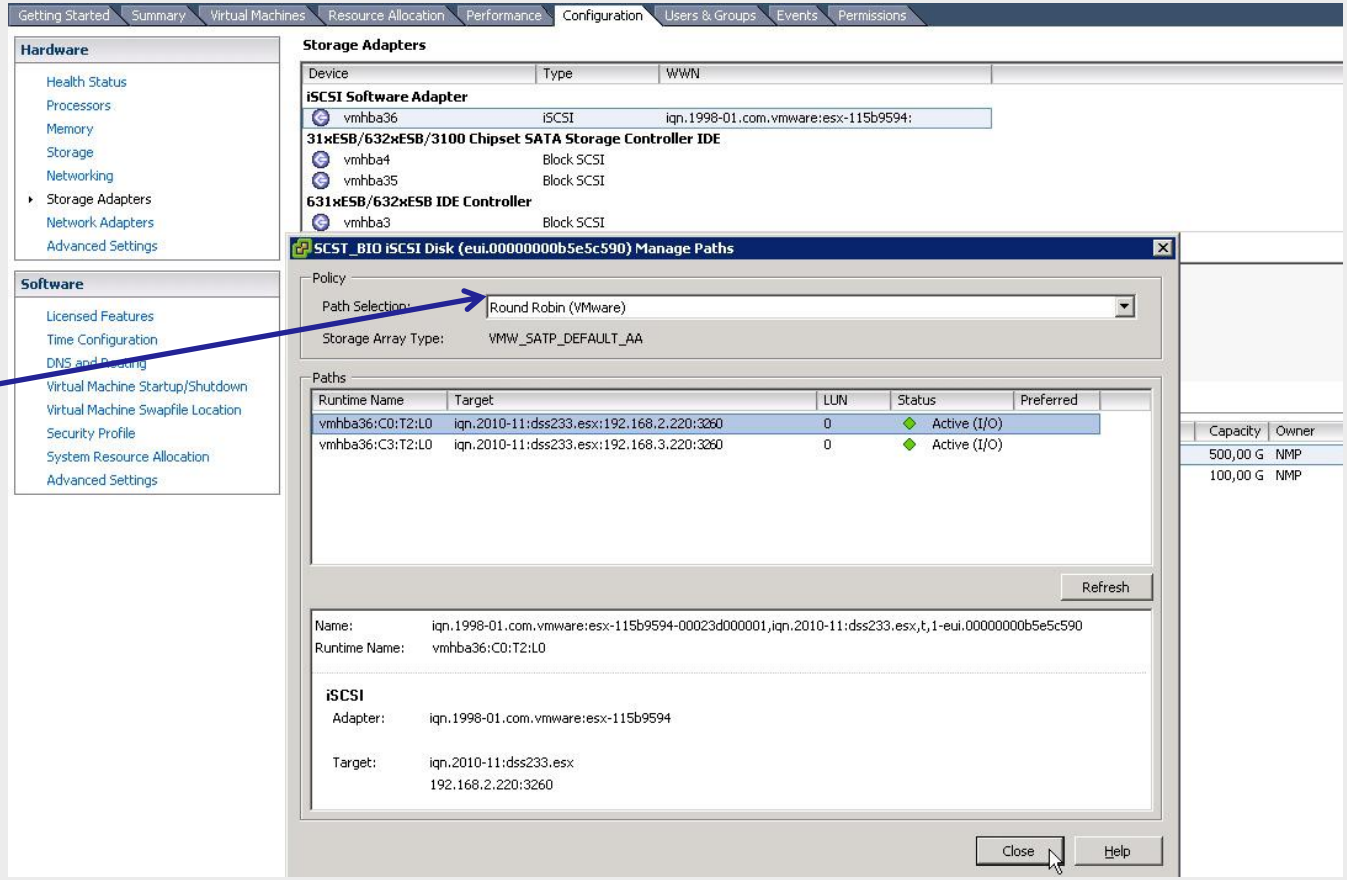
Now, in the Storage Adapters menu, locate the first iSCSI LUN and right-mouse click on it. From pull-down menu select: **„Manage Paths"**.



Configure MPIO on ESXi 4.x

Step 14

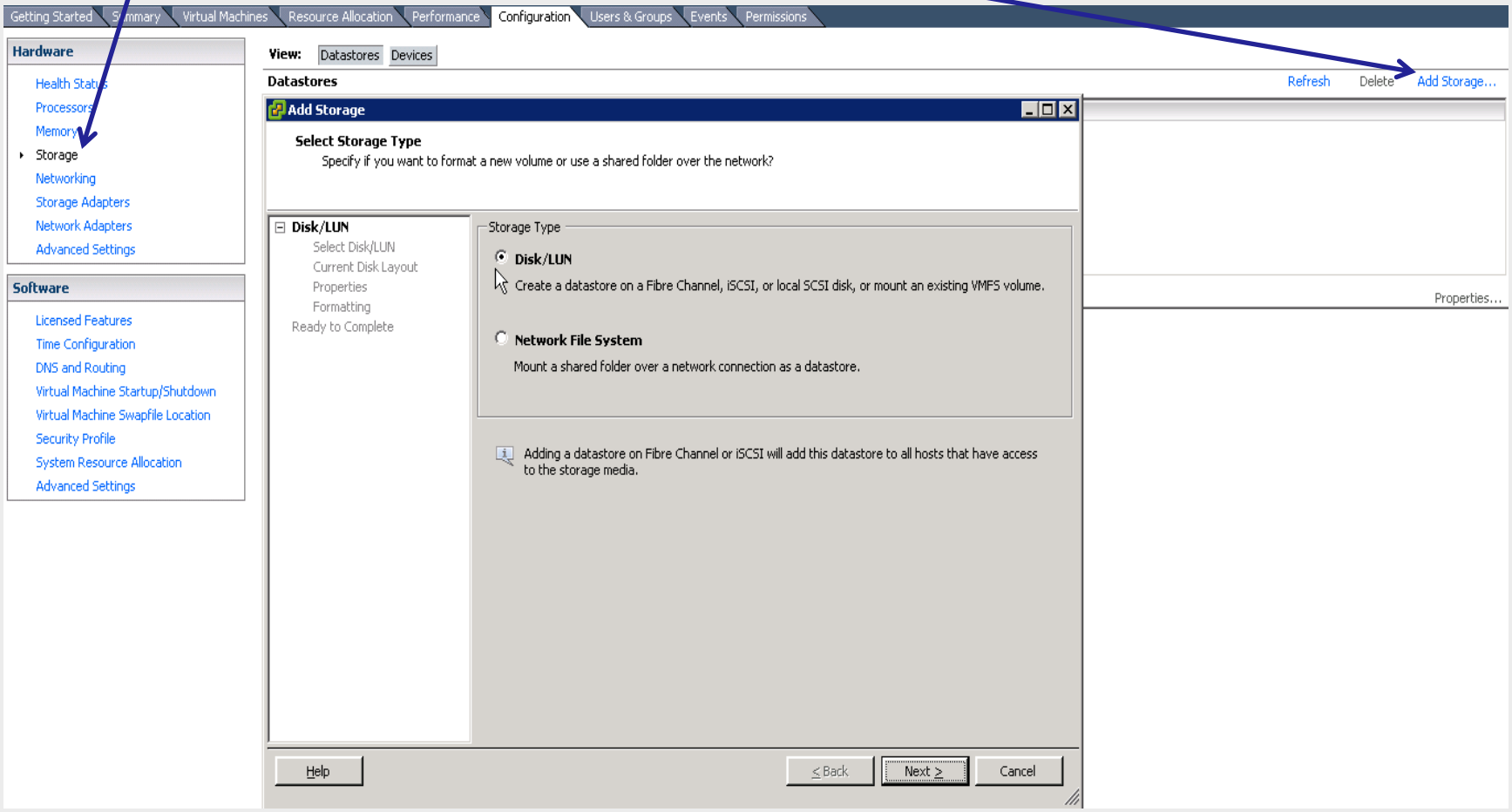
Next, in Path selection pull-down menu please select: **„Round Robin”**.



Configure MPIO on ESXi 4.x

Next, in the **„Storage"** menu, click on the **„Add Storage"** button and follow the next steps to add new LUN.

Step 15



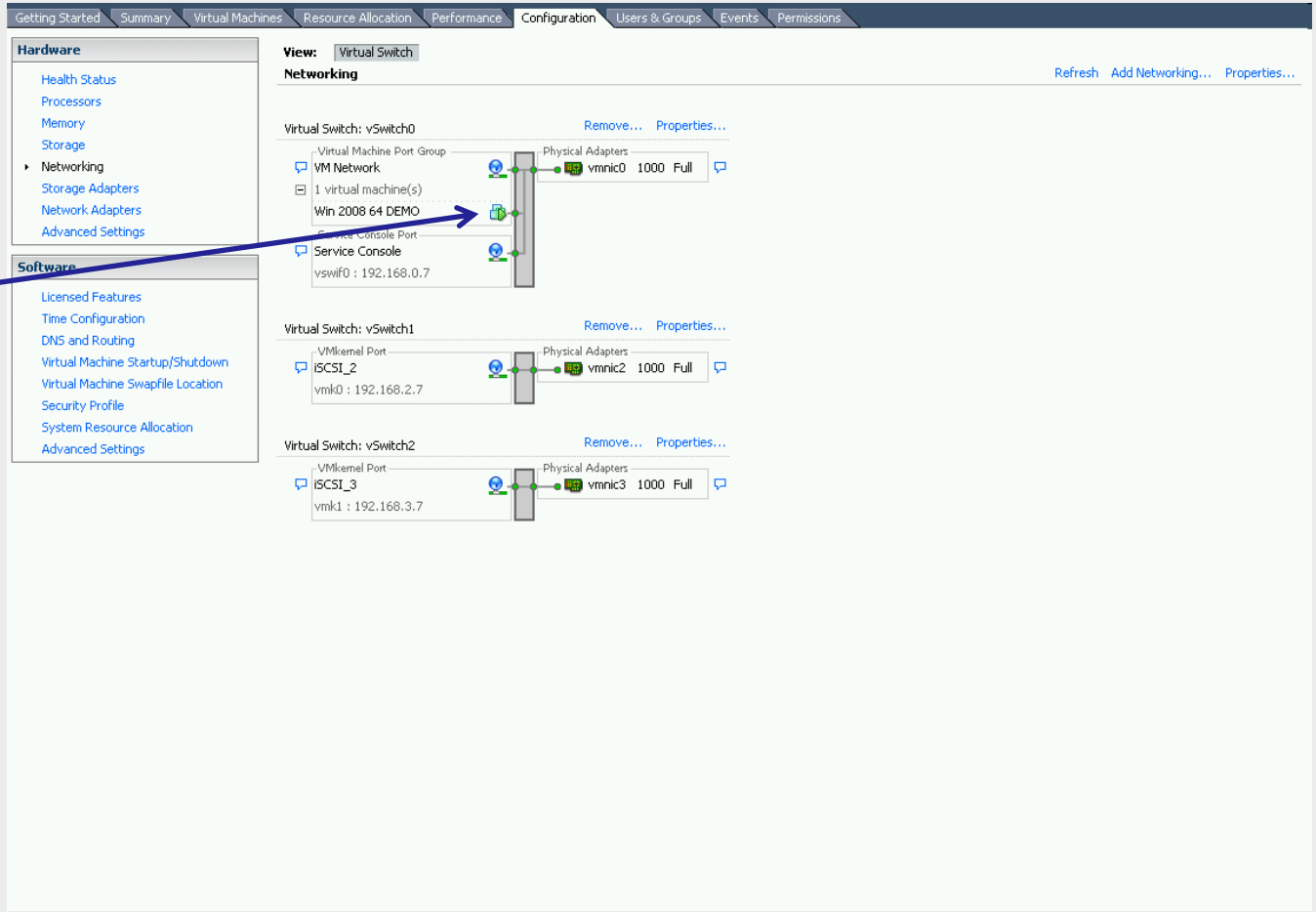
Configure MPIO on ESXi 4.x

Now install the Windows 2008 virtual machine on the new added LUN and run Iometer in order to check the performance.

Configure MPIO on ESXi 4.x

Step 16

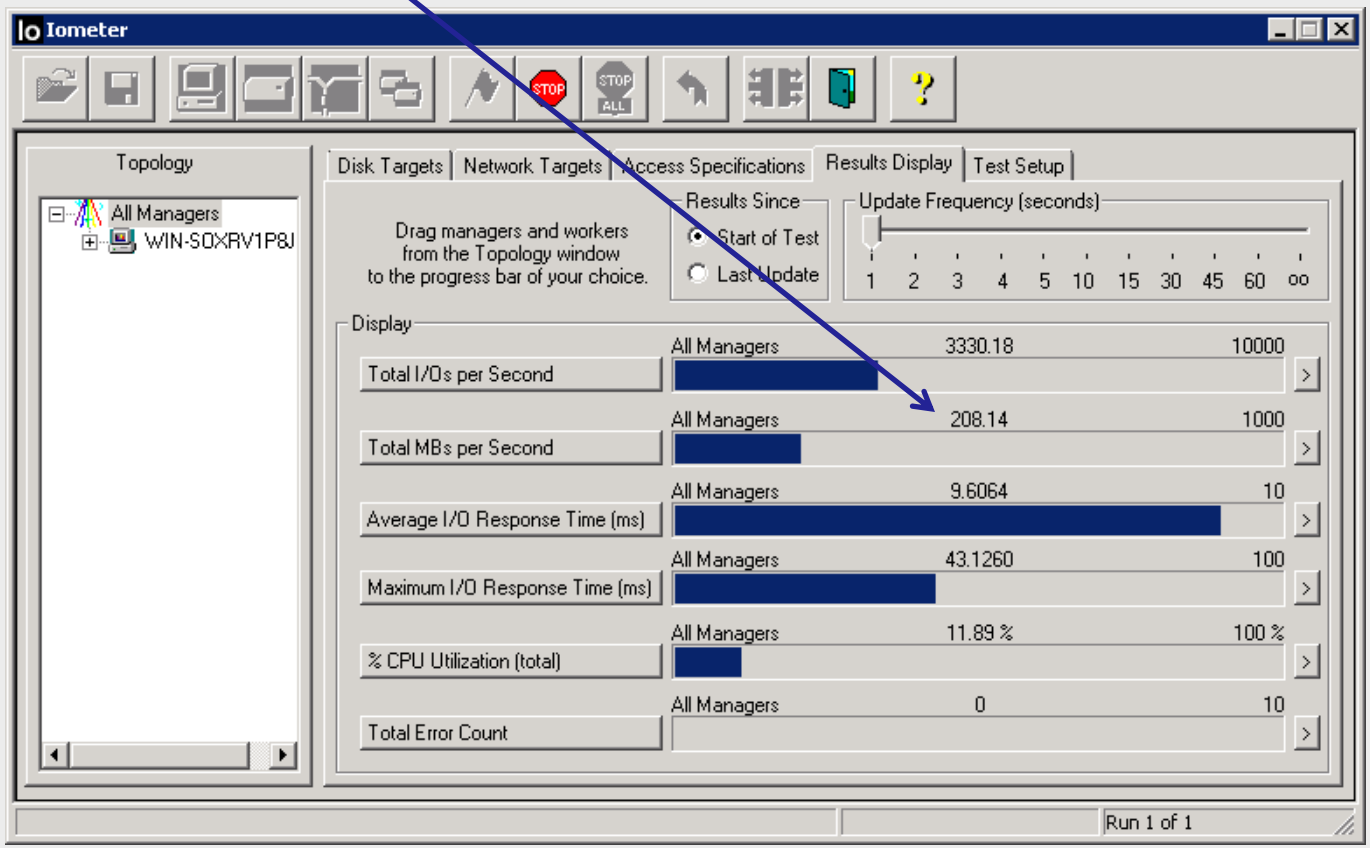
Once the virtual machine is installed and running the network chart will like this screenshot.



Multipath I/O on DSS V6 with ESXi 4.x

Step 17

Verify the performance with **„Iometer"** running on



Now you have completed the configuration of Multipath I/O on DSS V6 with ESX4.

Thank you!