Configuring a FlexPod for iSCSI Boot

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Introduction

This document will step the reader through configuring a FlexPod to boot its' servers over iSCSI to the storage array. This document does assume that the reader is familiar with the UCS and its management portal, as well as the NetApp array and Filerview. This document will give detailed instructions only on items relating to the iSCSI and iSCSI boot portion. From working with the UCS and iSCSI boot it's fairly obvious that this feature is new and does not have all the bugs worked out. Many of the wizards and selections do not work the same as the rest of the UCS. This procedure will be updated as often as possible.

NOTE: This Document includes the "fix" that was discovered to allow ESXi 5.0 to iSCSI Boot. This is a workaround to an issue already identified by Cisco TAC.

Prerequisites

This document requires the following to be in place in order to use it completely. If your environment does not conform to the below, I cannot guarantee that this procedure will work for you.

-Entire UCS System must be running firmware release 2.0(1m) or later.
-Your servers are using the Palo Adapter (M81KR)
-NetApp must have iSCSI feature licensed
-Appropriate Network interface must be configured on the NetApp with access to the VLAN that the iSCSI traffic will utilize.
-Uplinks from the 6XXX Interconnect(s) must also have access to the iSCSI traffic VLAN.
-NetApp must have Aggregates and volumes created
-UCS must have all the minimum necessary "pools" & "polices" created.
-You know what the IQN format is, as UCS will NOT generate it, it must be manually entered.

Overview

The basic premise of the iSCSI NIC and Booting feature in the UCS Environment should be very familiar to some Server Administrators. The premise is basically the same as a Physical Broadcom or Intel-based NIC card with an iSCSI TOE chipset built into it.

This means that within the UCS Environment we still must create a vNIC that will "Overlay" the iSCSI portion of the hardware. So if in a typical ESXi Setup you'd normally create two vNICs, one for Fabric A and one for Fabric B for example, you'll have to create a third vNIC. This one will have only the IP Storage VLAN on it, which also MUST be set to "NATIVE". This vNIC should be set to "Enable Failover" for HA functionality.

This vNIC will then have an IQN associated with it, as well as what the "Overlay NIC" is. The Boot Policy is then created with the iSCSI vNIC, much like a SAN Boot & Target. The NetApp's target IP, IQN & LUN ID is also specified.

Within the NetApp the configuration is almost identical to creating Initiator Groups & LUNs, except WWPN's are substituted for IQN's.

Installation

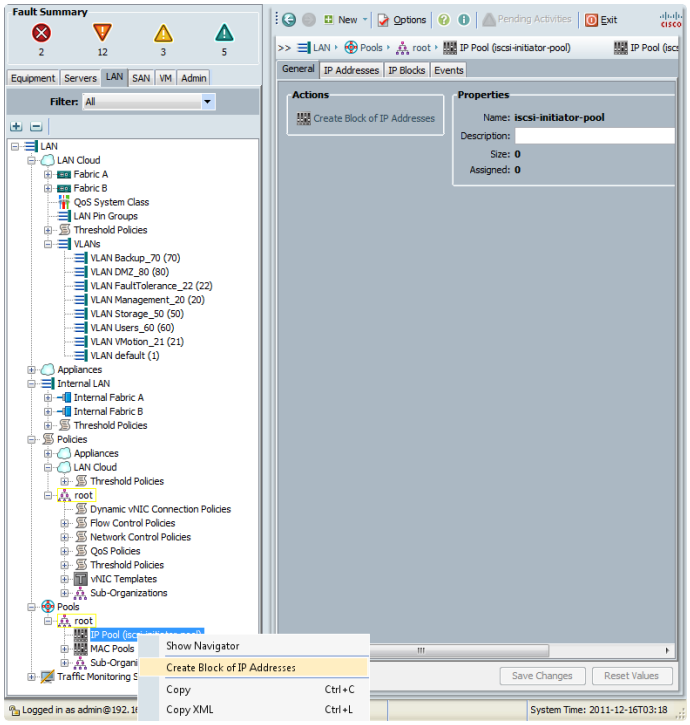
Configuring the UCS – Part 1

The first item we must configure is the UCS chassis and its' necessary pools and templates.

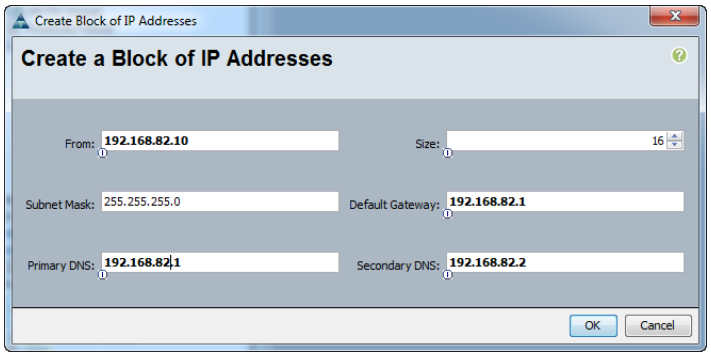
iSCSI IP Pool

This pool will give us the IP Addresses for the iSCSI portion of the vNIC.

1. Click on the LAN Tab, expand LAN and then Pools.
2. Right-click on IP Pool (iscsi-initiator-pool), choose "Create Block of IP Addresses".



3. Enter in all the requested information. (For Gateway & DNS, use .1 if it won't conflict with anything)



vNIC Templates

When you are creating your vNIC Templates , do **NOT** create a vNIC Template for the iSCSI NIC. For some reason when you use a Template during the creation of a Service Profile or Service Profile Template, for the iSCSI NIC, it does not grab the information from the vNIC Template correctly, and thus the iSCSI vNIC in the Service Profile is created incorrectly. The iSCSI NIC will be created during the Service Profile or Service Profile Template creation.

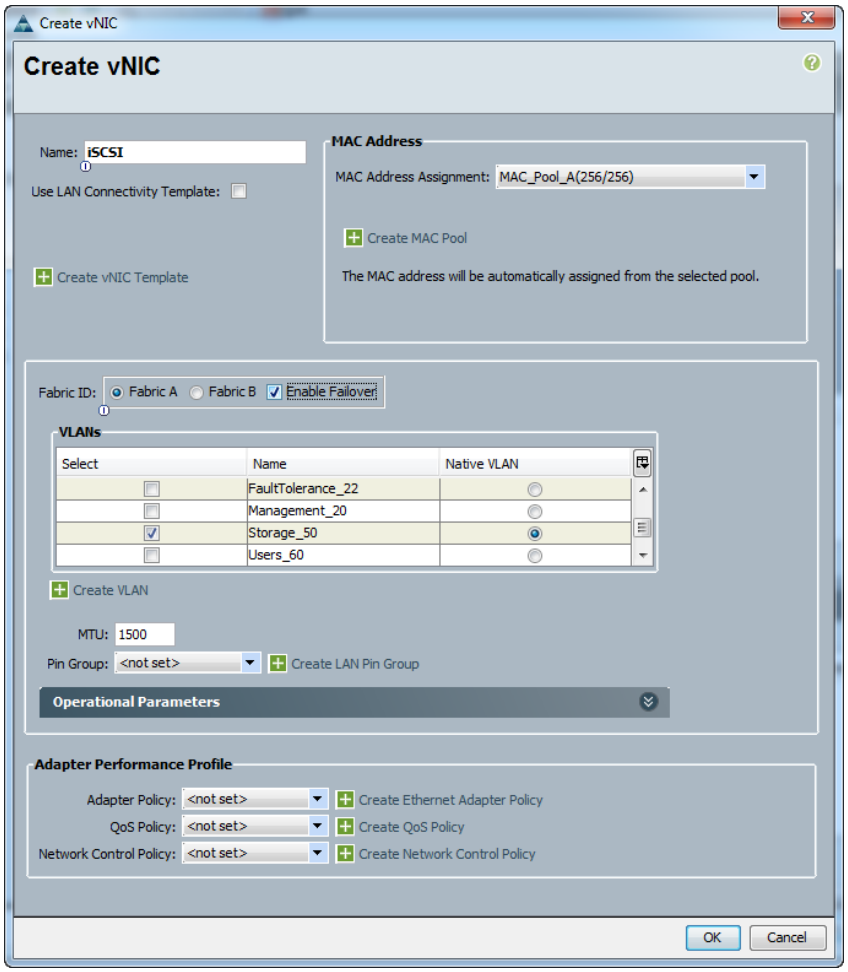
Boot Policies

When you are creating Boot Policies, do **NOT** create a boot policy for the iSCSI boot. Since the typical Boot Policy wizard does not include all the information we need. It will be easier to create later.

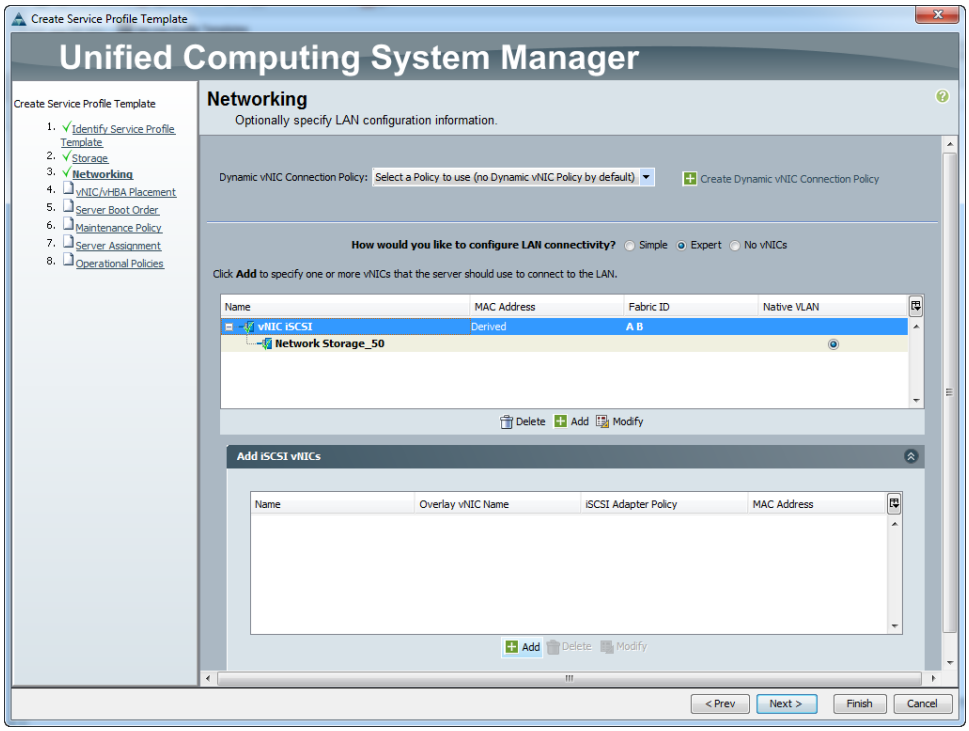
Service Profile Templates

During the creation of the Service Profile Templates, perform the following steps when doing the Networking Portion;

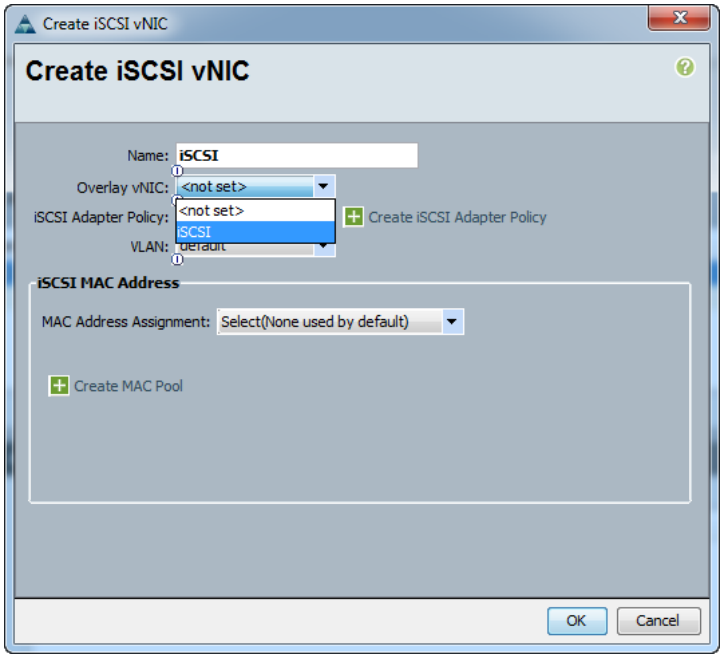
1. Ensure the “Expert” Radio button is selected and click on the “Add” button to add a vNIC.
2. Name the vNIC. (Something like “iSCSI” makes sense)
3. Select a MAC Address Assignment. (Use the Pool for the Initial Fabric the vNIC will use)
4. Make sure to Select the Initial Fabric, and ensure “Enable Failover” is selected
5. In the VLANs window, choose ONLY the IP Storage VLAN, ensure the “Native VLAN” Radio button is selected next to the IP Storage VLAN.
6. Configure the other settings to your specific settings, then click “OK”. (Recommend leaving default though)



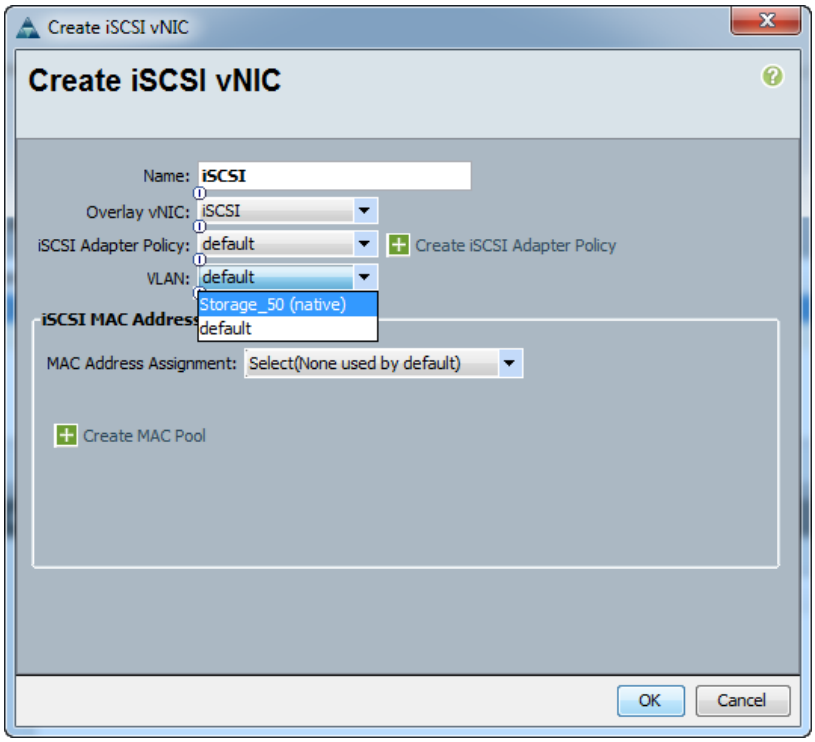
7. Expand the “Add iSCSI vNICs” section, click “Add”.



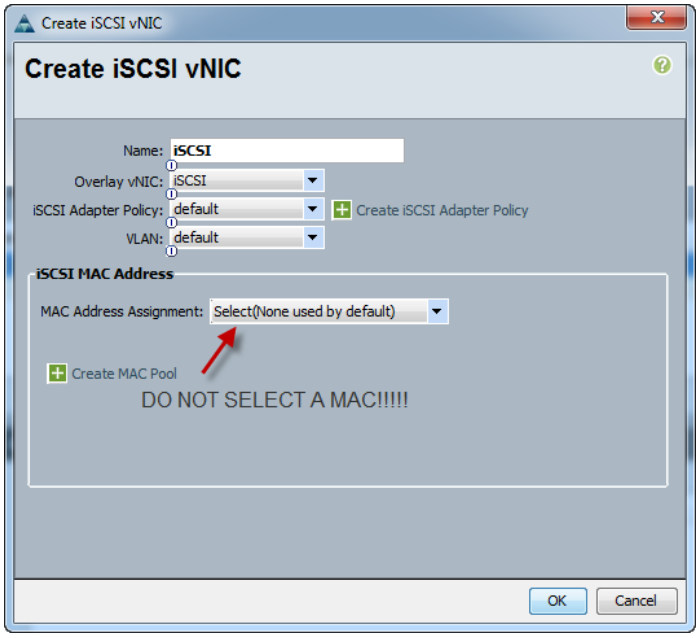
8. Name the iSCSI vNIC. (Again iSCSI is a good choice)
9. Choose the Overlay vNIC.



10. Leave the “iSCSI Adapter Policy” at “Default”.
11. Select the VLAN. (There should be only one other then Default, should be the IP Storage VLAN)



12. Do NOT change anything under “MAC Address Assignment”, leave it at “Select(None used by default)



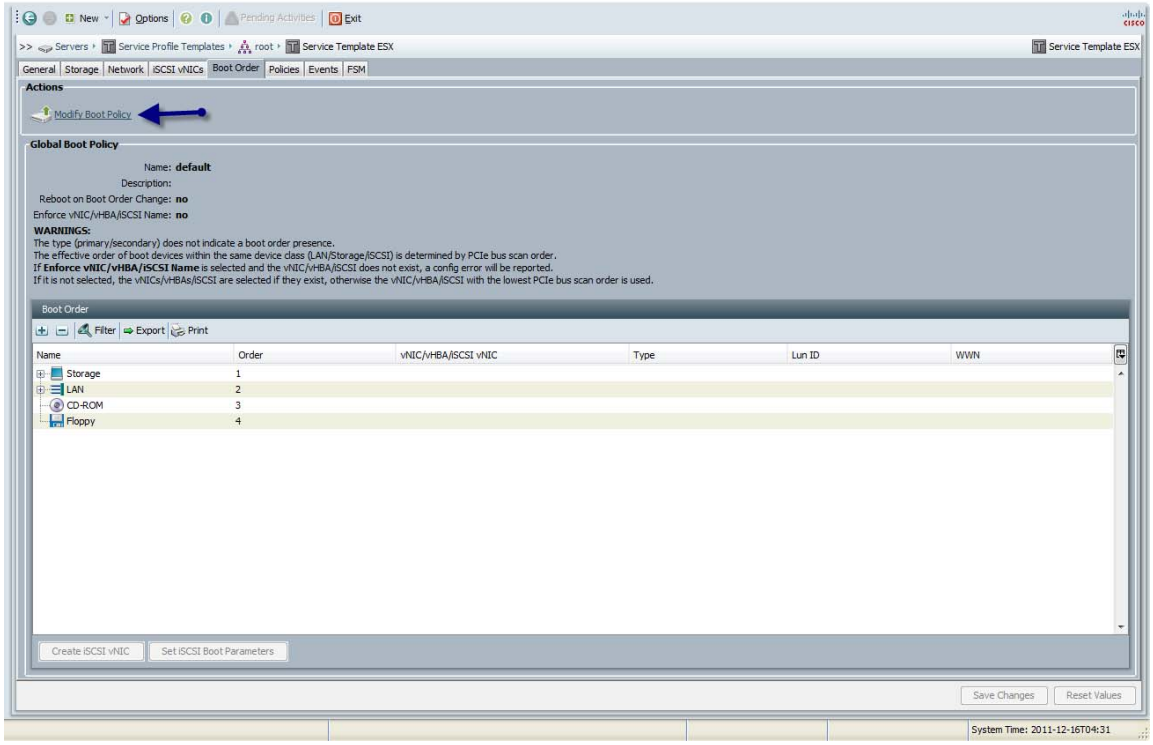
13. Continue to add your other normal NICs you need as normal, and then finish creating the Service Profile Template. (Note: Choose “default” for your Boot Policy)

14. For the vNIC/vHBA Placement policy, manually chose the placement & ensure that the vNIC that is the overlay NIC for the iSCSI adapter is set to the last NIC. This appears to correct the issue with ESXi 5.0 not installing correctly when iSCSI booting.

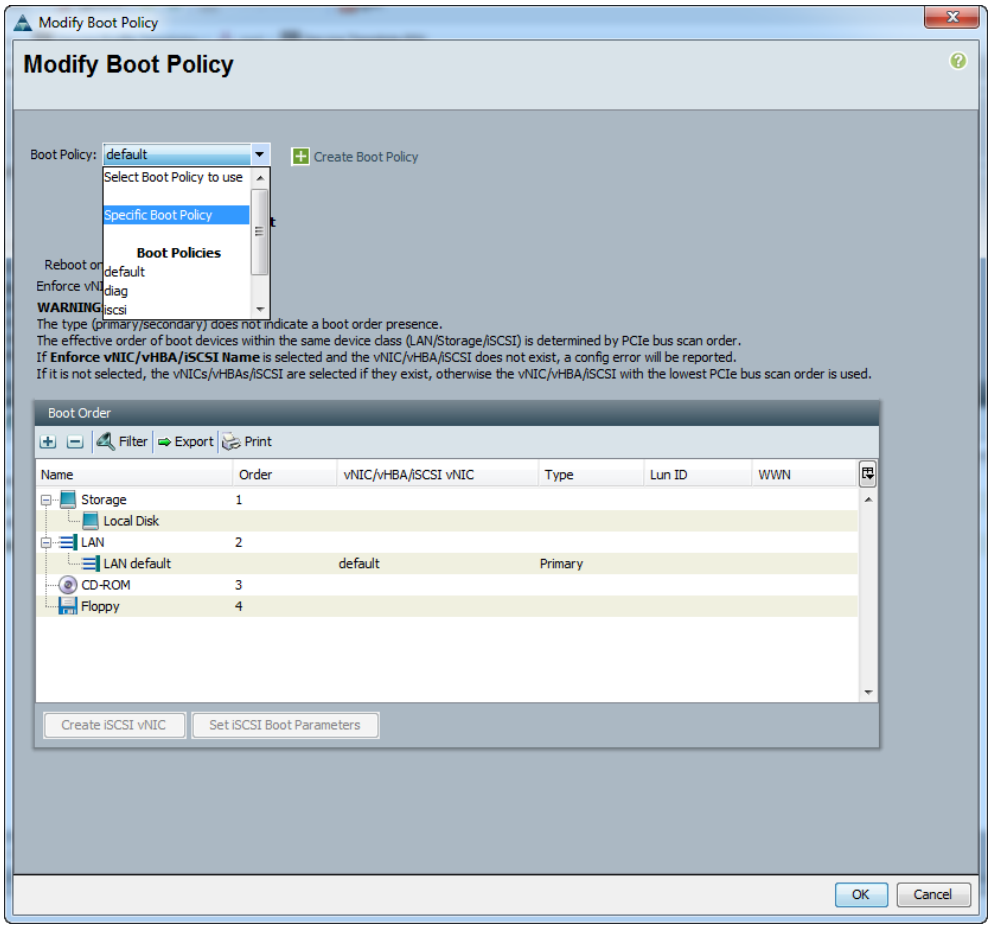
Editing the Service Profile Template

We must now edit the Service Profile Template to create a Boot Policy, including adding IQNs & Boot Targets.

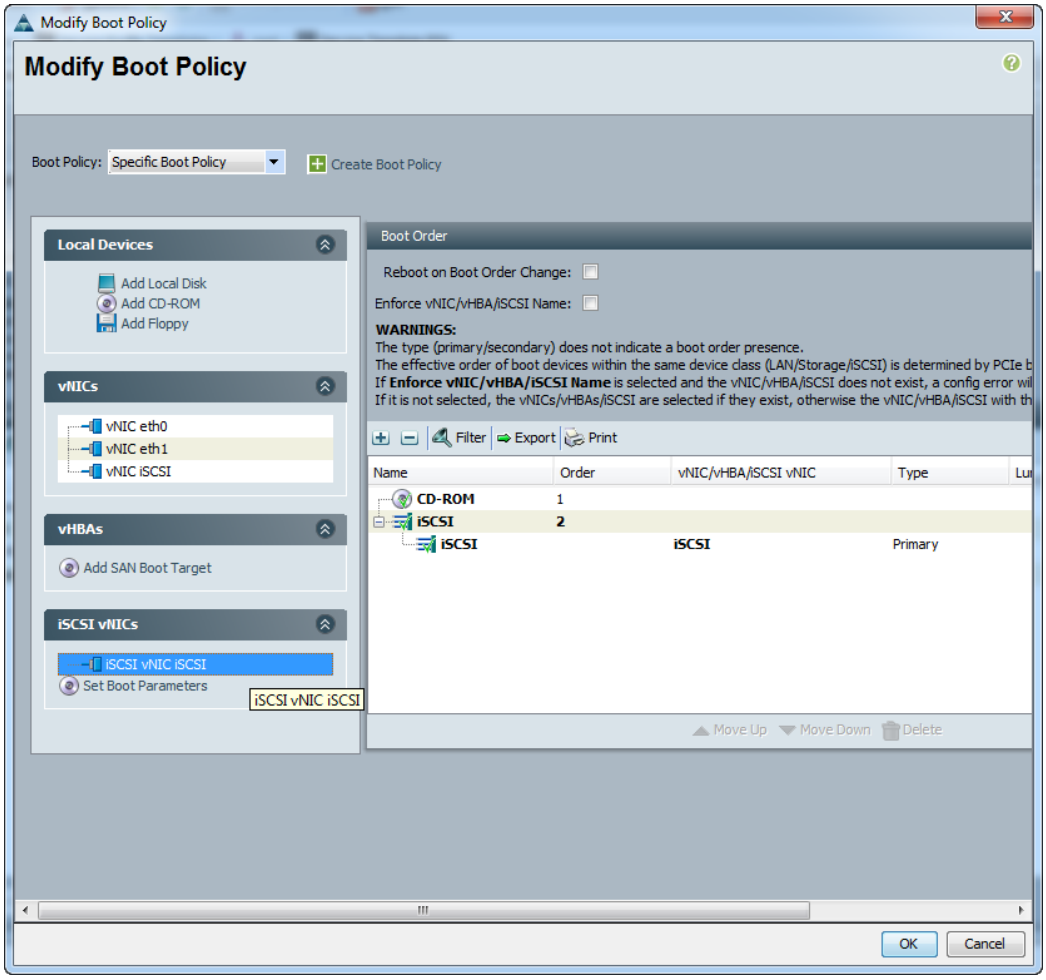
1. Select the Service Profile Template created above.
2. Click on the "Boot Order" tab on the right navigation window.
3. Click on the "Modify Boot Policy" link near the top.



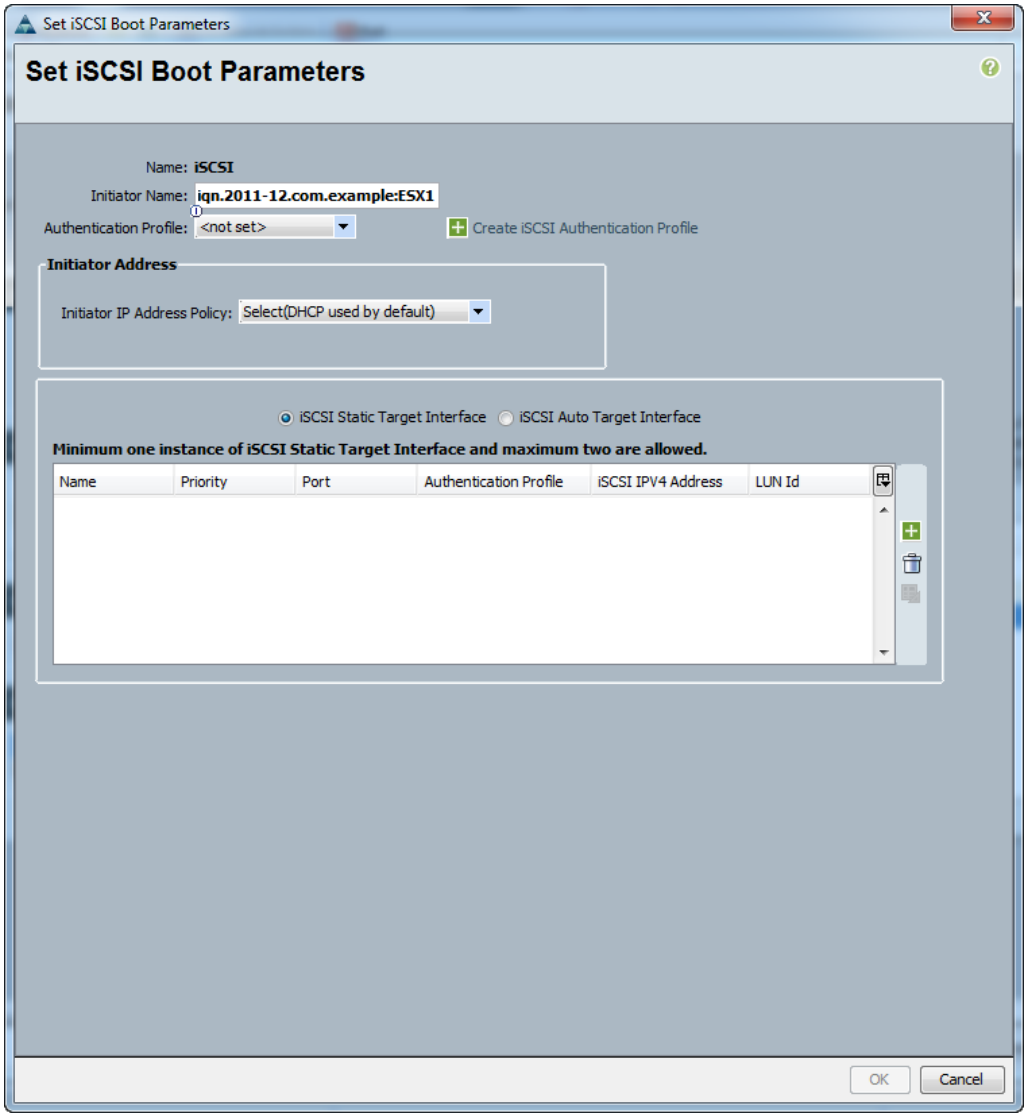
4. Under the “Boot Policy” dropdown, choose “Specific Boot Policy”.



5. Click on the “Add CD-ROM” icon under “Local Devices”.
6. Click on the name of the iSCSI vNIC under “iSCSI vNICs”.

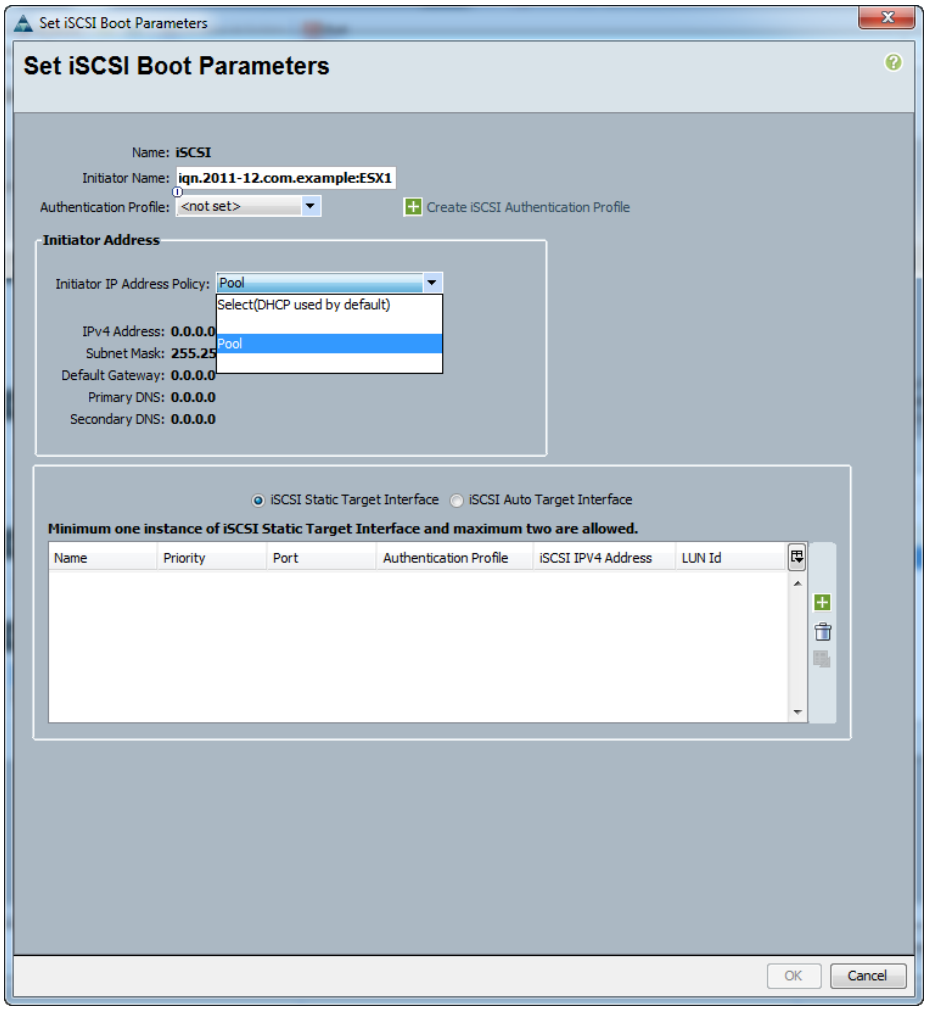


7. Click on “Set Boot Parameters”.
8. Under “Initiator Name” you must specify an IQN. Write this IQN down, we will need it later during the NetApp setup. (Cisco doesn’t generate one, you must create it manually. Its recommended to follow basic IQN formatting rules.)



9. If you’re using CHAP you must create an authentication profile and select that. (In this example we’re not doing CHAP as the entire VLAN/Subnet is isolated & private)

10. For “Initiator IP Address Policy” select “Pool”. (Note: this will select the pool we create earlier. For some reason it does not pull the pool name. Also it is OK that the addressing shows all 0’s. It will resolve itself later.



11. Click on the + in the iSCSI Target interface window.
12. Enter a generic name in the “Name” field. (We will come back and change this when we know the actual IQN of the NetApp. The real purpose right now was to specify the IQN of the iSCSI NIC.)

For now we’re done on the UCS. We will configure the NetApp side, and then come back to the UCS and finish up.

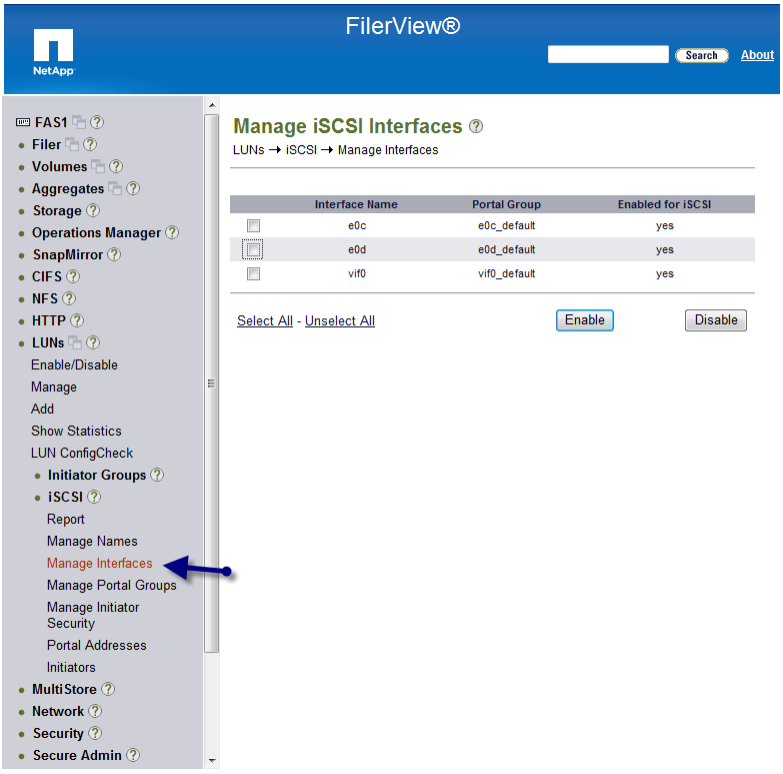
NetApp Configuration

We will now configure the iSCSI portion of the NetApp.

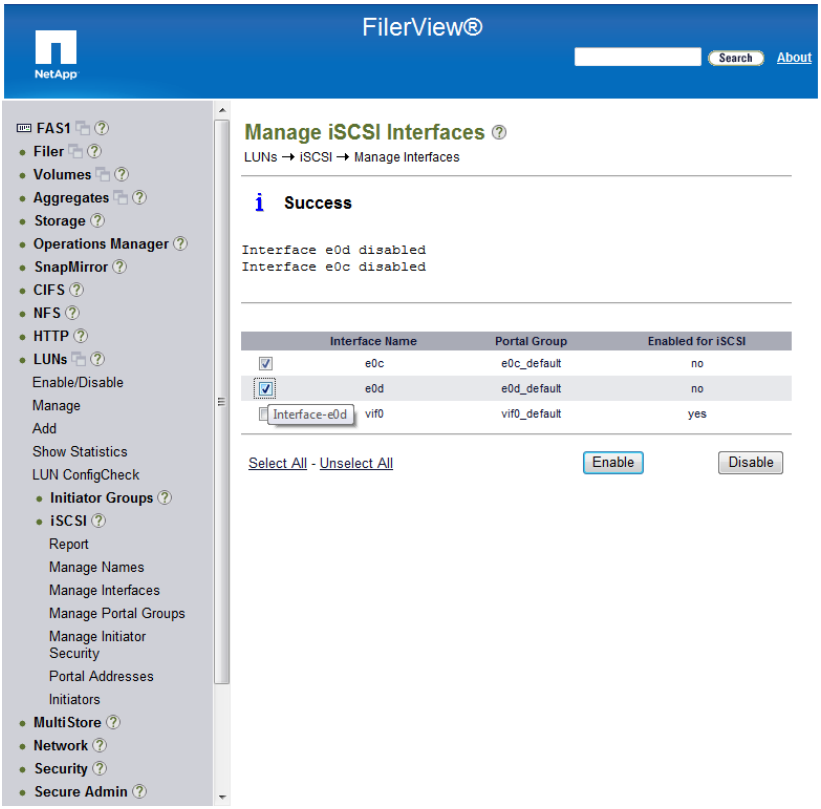
Enabling iSCSI

We need to enable the iSCSI service as well as specify which interfaces are allowed to service iSCSI requests.

1. Open up Filerview of the first Filer.
2. Expand “LUNs”, expand “iSCSI”.
3. Click on “Manage Interfaces”.



4. Select the interfaces that should NOT service iSCSI and click on “Disable”.

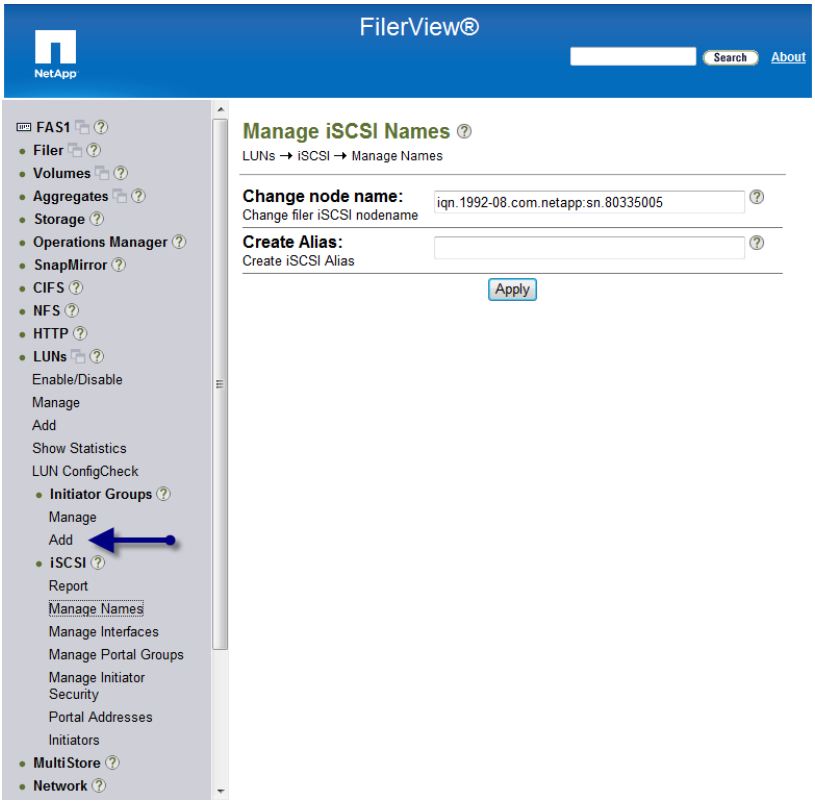


5. Click on “Manage Names”. The “Node Name” is important write it down, we’ll need to put that into the “Boot Policy” in the UCS Manager.

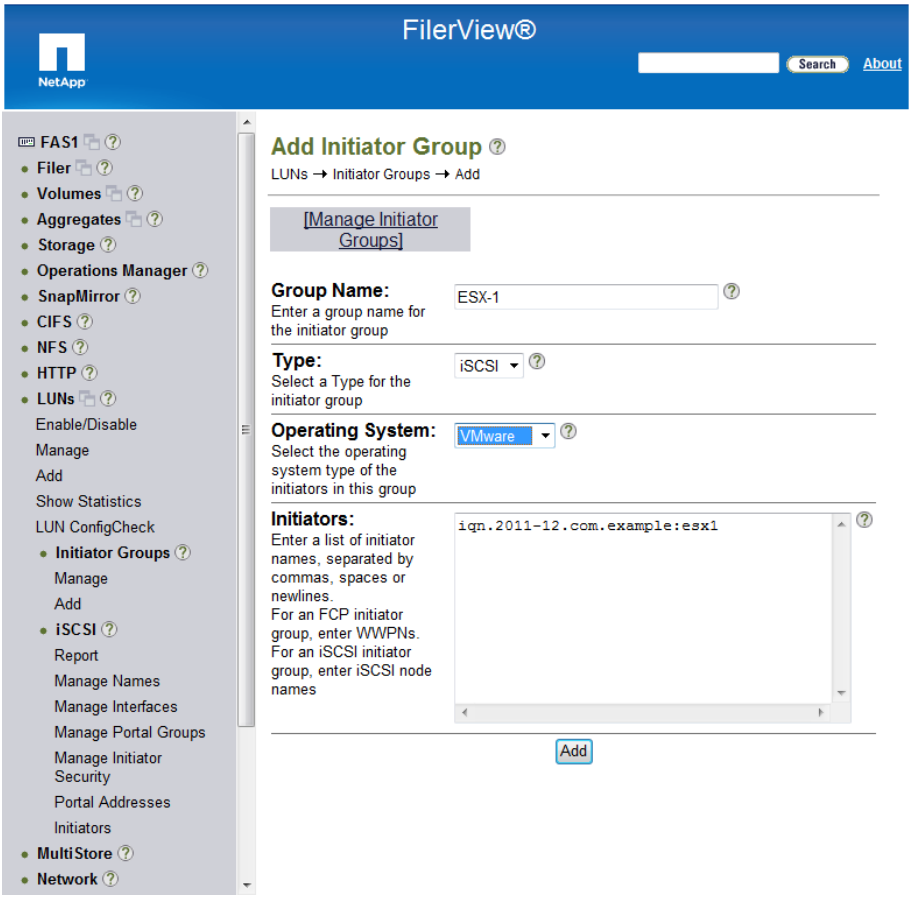
Creating Initiator Groups

We now need to create Initiator Groups. Initiator groups handle all of LUN masking. It allows you to put multiple IQNs (if needed) into a single group to simplify the mapping of LUNs to IQNs.

1. Expand “LUNs”.
2. Expand “Initiator Groups”, Click “Add”.



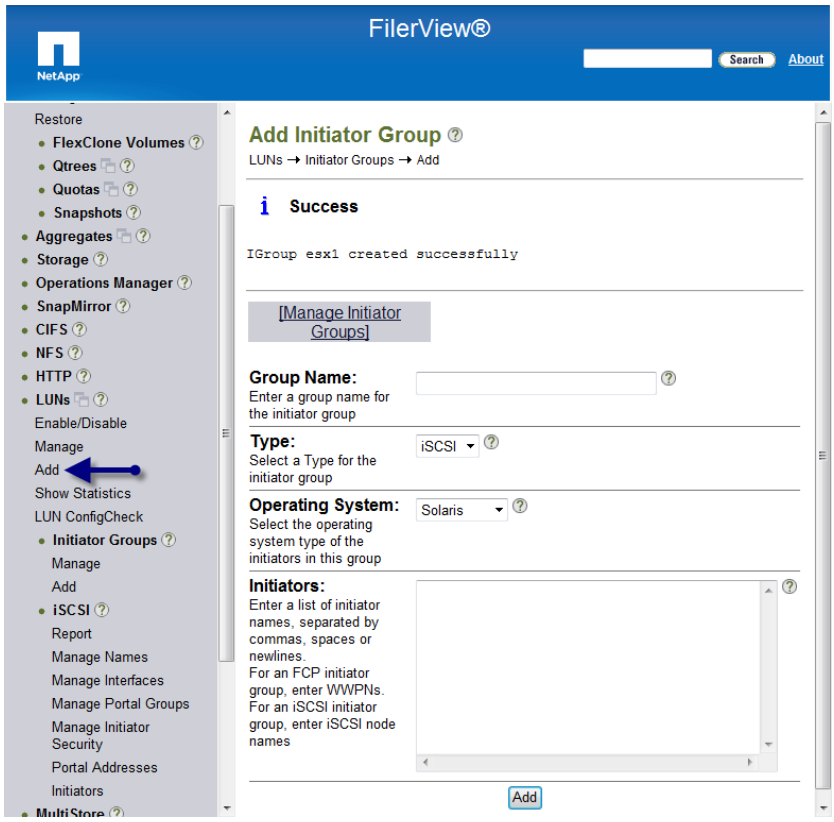
3. Under “Group Name” put whatever name you’d like for the group. (Recommend something like ESX-#)
4. Leave “Type” as “iSCSI”.
5. Change “Operating System” to “VMware”.
6. Under “Initiators” enter the IQNs from the ESX host your creating an igroup for.
7. Click “Add”.
8. Repeat for all your ESXi Hosts



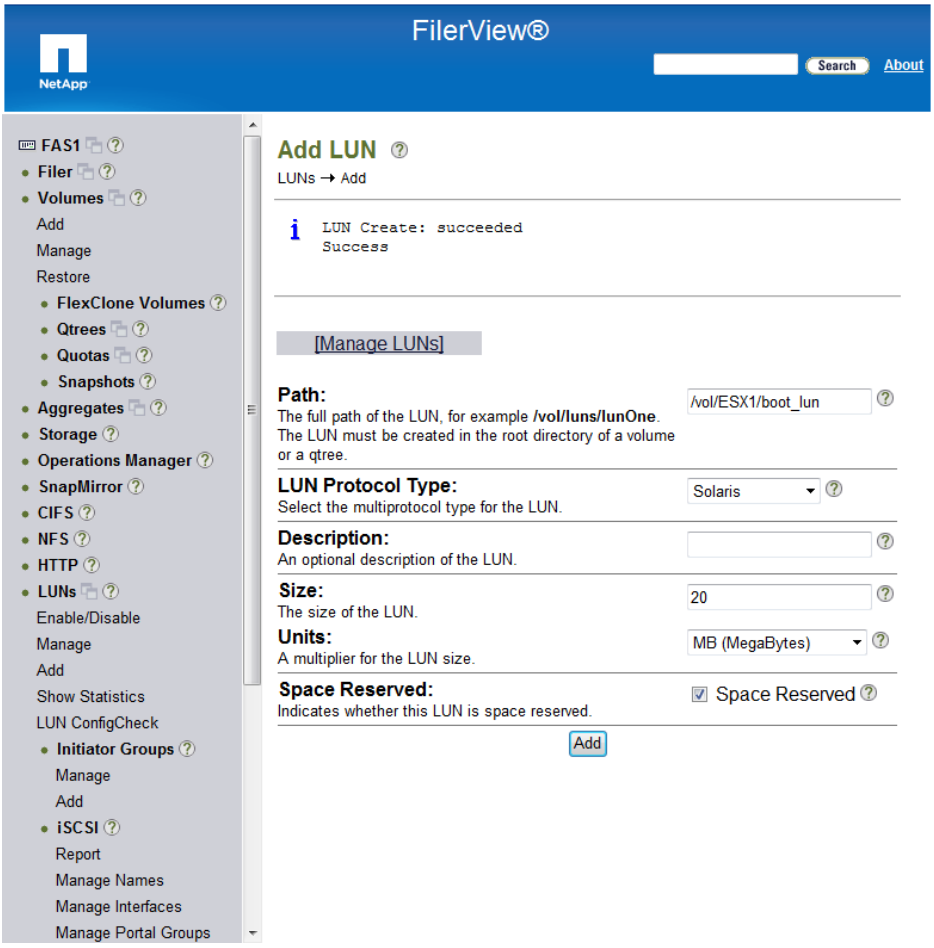
Creating LUNs

We now have to create the actual LUNs under the volumes..

1. Expand “LUNs”.
2. Click on “Add”.



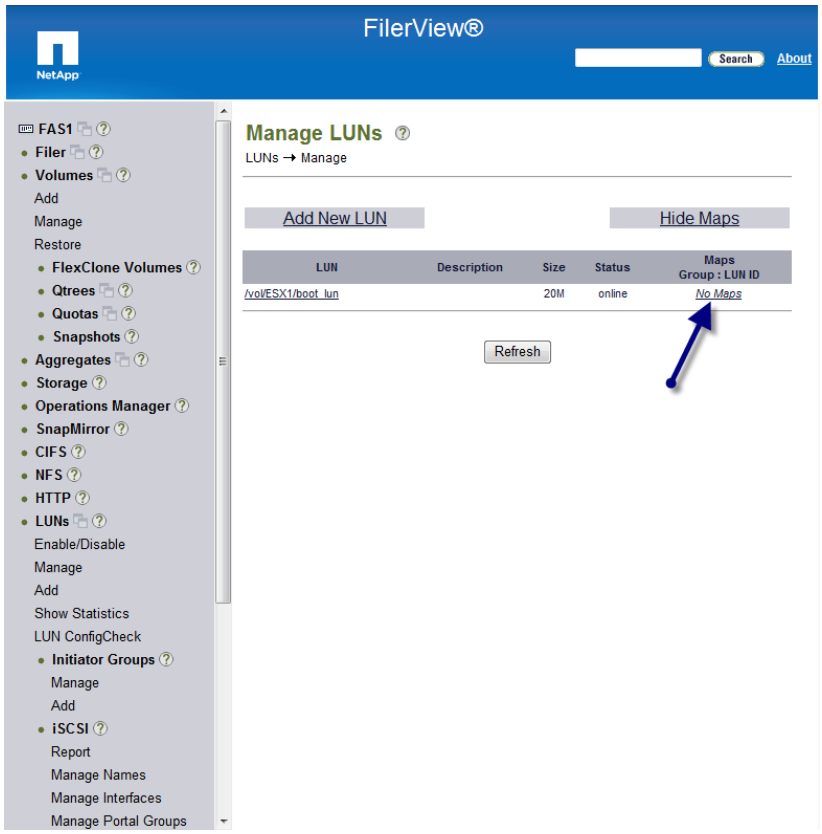
3. For “Path” you must enter in the full path to the LUN. (For example /vol/esx1/boot_lun. The /vol/ must always be there, then it’s the volume name that was create earlier, then the name of the lun we’re creating here.)
4. “LUN Protocol Type” should be set to “VMware”.
5. Size of the LUN should be at least 20gb. (Note: the screen shot shows a smaller size)
6. Ensure “Space Reserved” is checked.
7. Click “Add”.



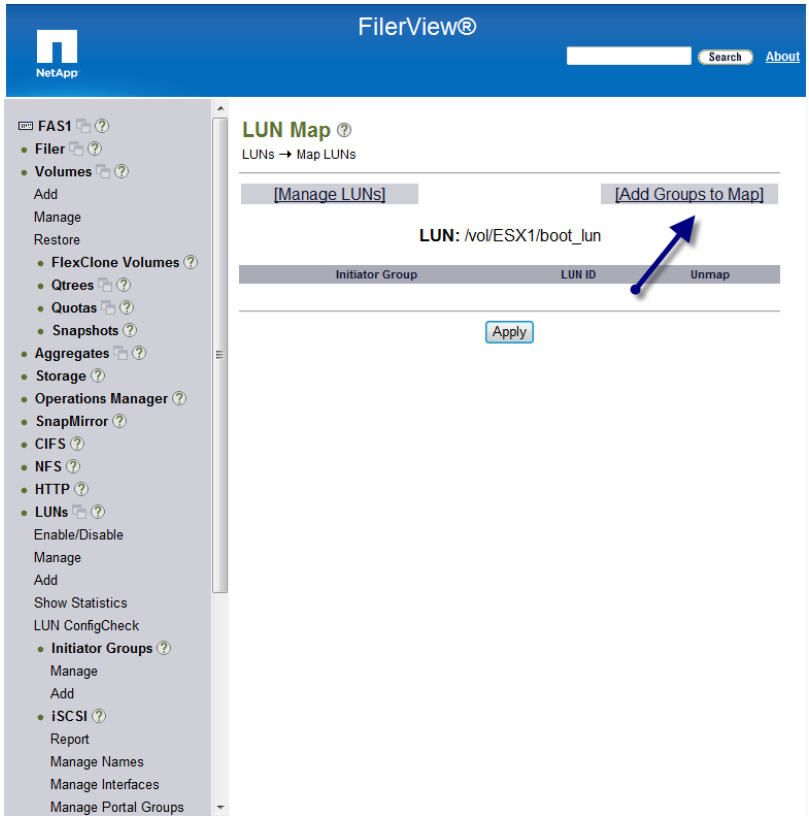
Mapping the LUNs to the Initiator Groups.

We now have to map LUNs to the actual iSCSI boot volumes.

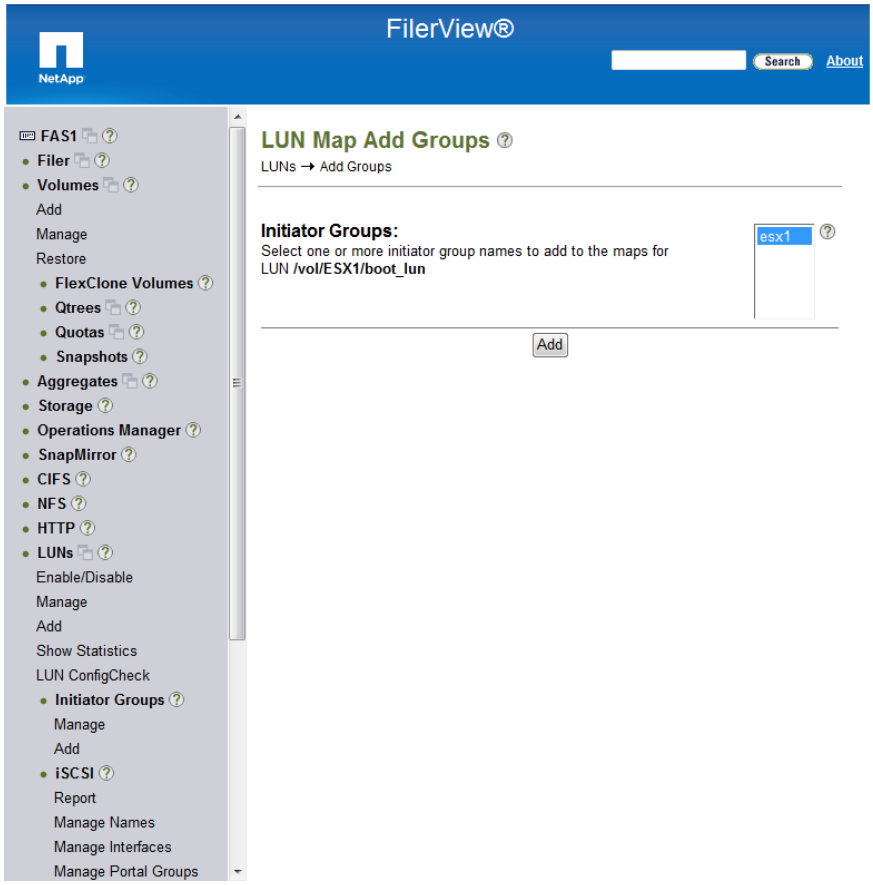
1. Under “LUNs”, click on “Manage”.
2. Click on the “No Maps” link on the LUN you want to create a LUN mapping.



3. At the top right click on “Add Groups to Map”.

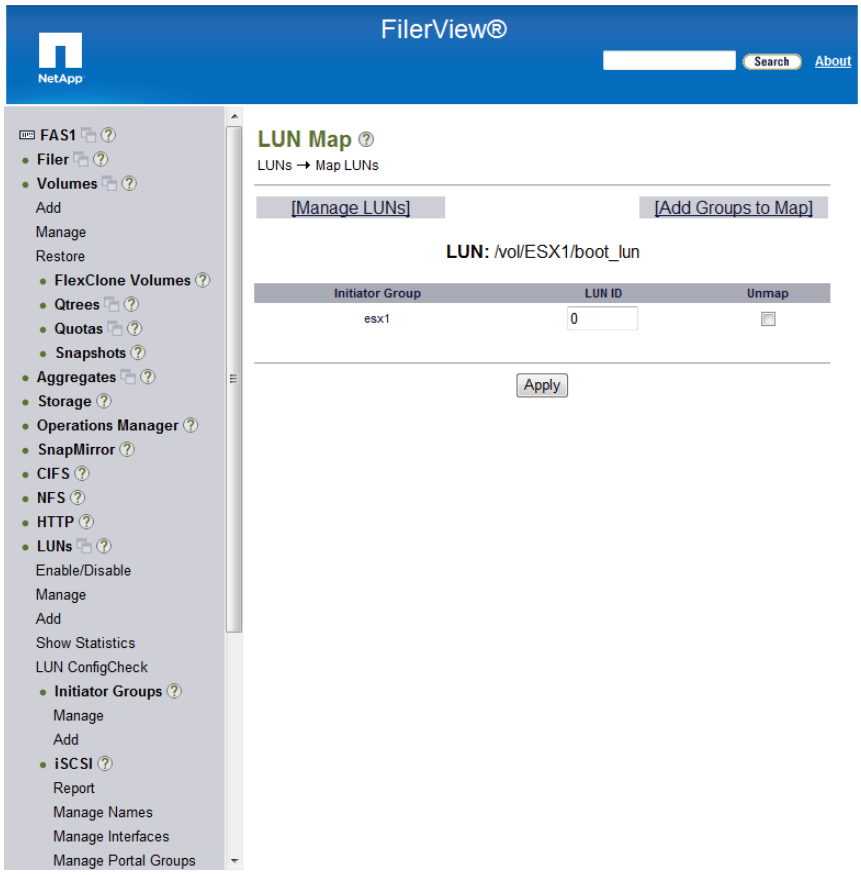


4. Select the Initiator Group you wish to map to this LUN. (you should have more initiator groups then shown.)



5. Click “Add”.

6. Specify a LUN ID.
7. Click “Apply”



8. Repeat to map all the igroups to their respective LUNs.

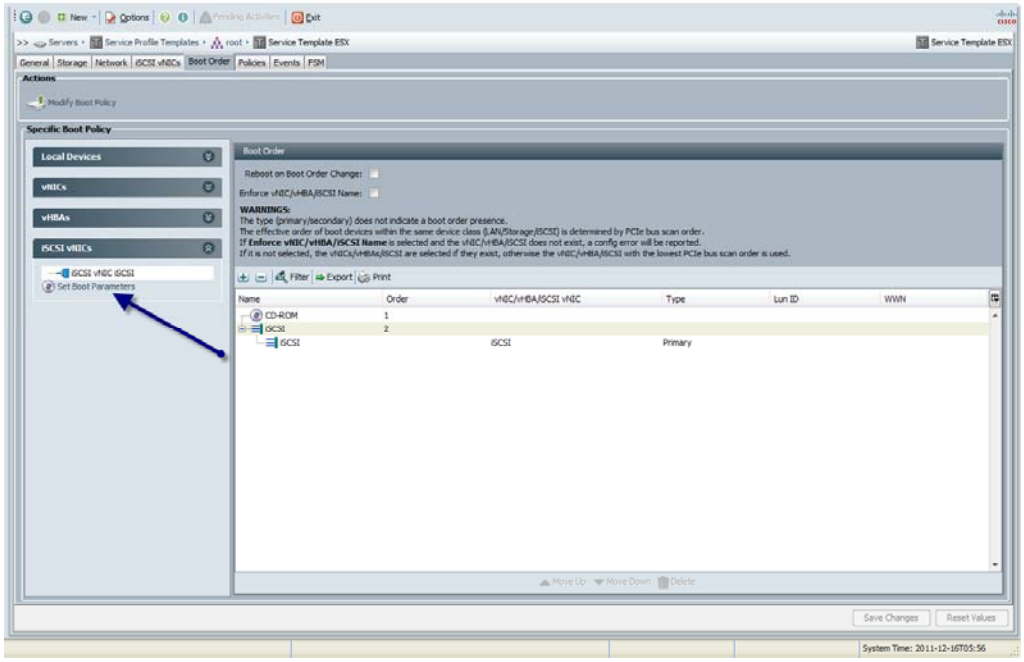
We are now complete with the NetApp portion of the configuration. We must now go back to the UCS and finalize the Boot Policies.

Configuring the UCS – Part 2

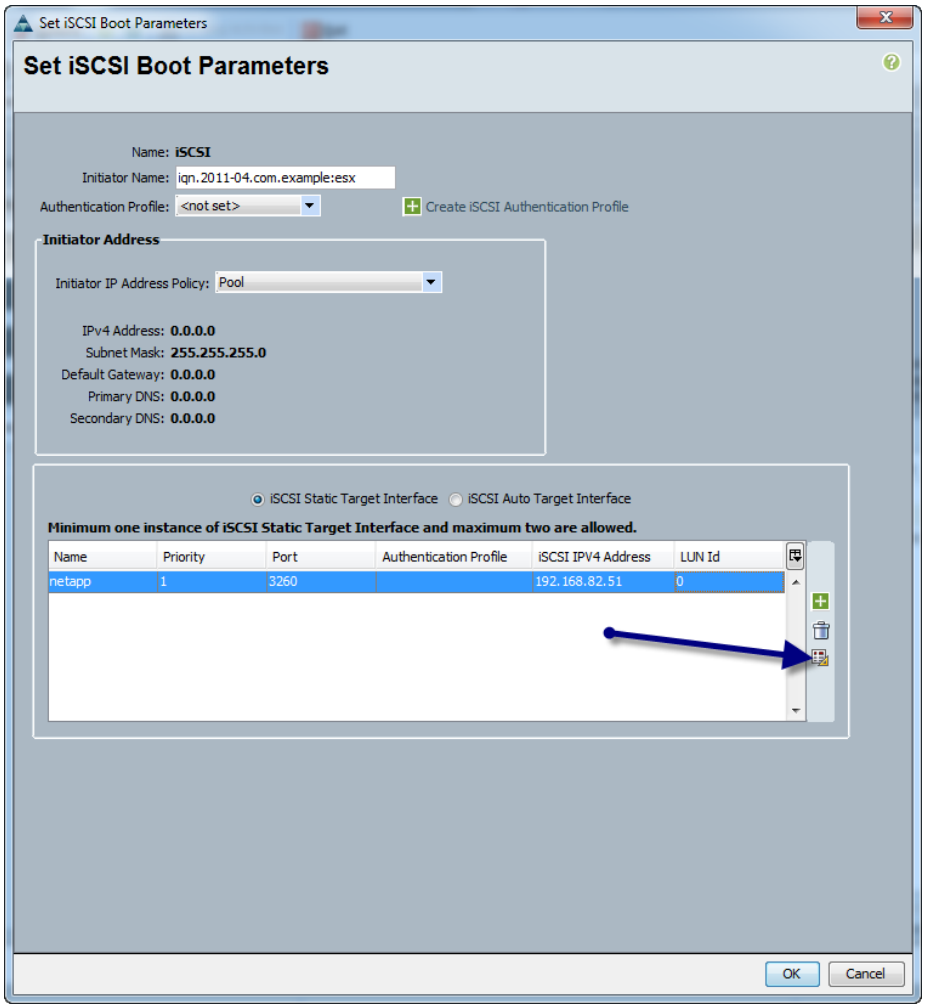
Setting the Correct Boot Target

In the previous steps we had specified a incorrect boot target because we did not yet know the IQN of the NetApp. We will now specify the correct target.

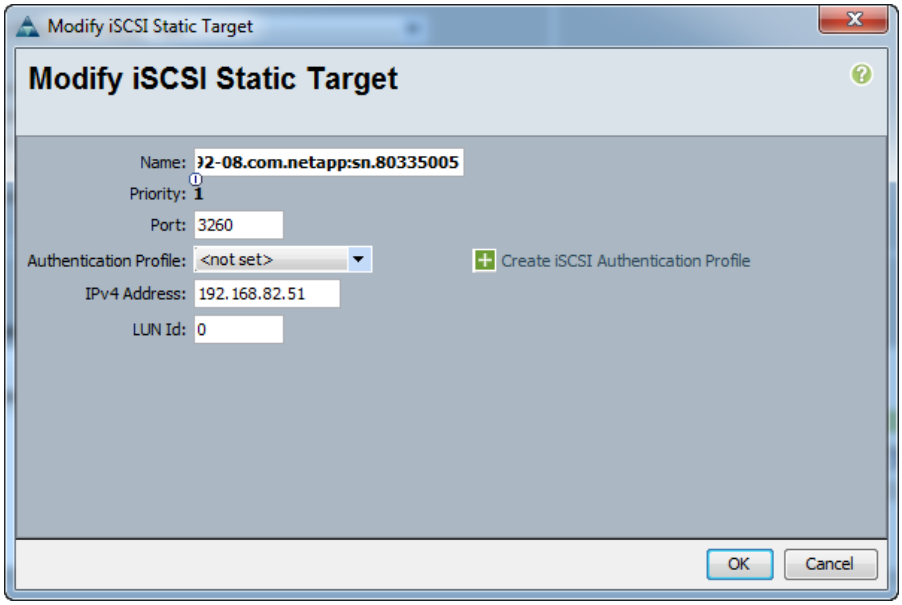
1. Select the Service Profile Template we are modifying.
2. Select the "Boot Order" tab.
3. Select "Set Boot Parameters" under "iSCSI vNICs".



4. Under the “iSCSI Target” section, highlight the instance and click on the modify button.



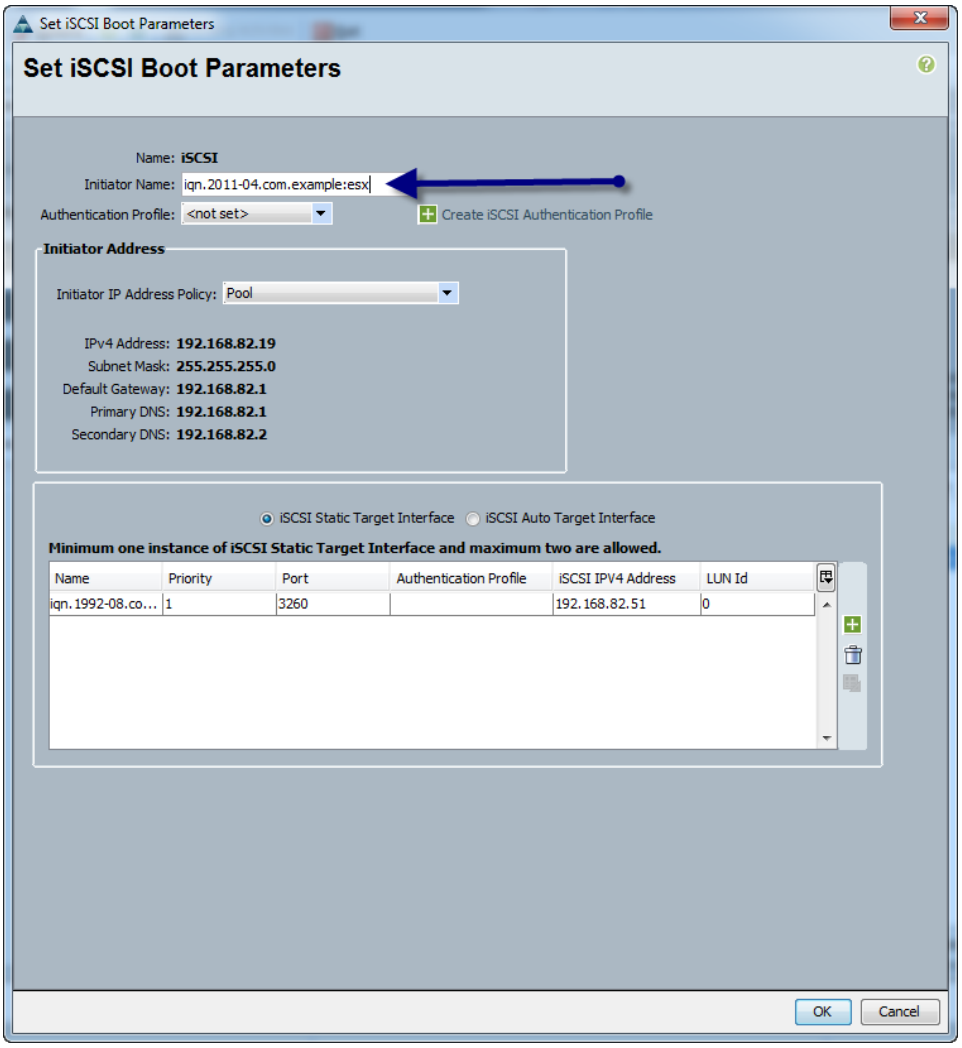
5. Change the incorrect generic name under the “Name” field to the correct NetApp IQN we recorded earlier.



6. You can now deploy your Service Profiles from the Templates.

Adjusting the IQN on the Service Profiles.

The final step is to adjust the IQNS on each of the Service Profiles as they are all exactly the same since they can't pull from a pool. So you repeat the above procedure "Setting the Correct Boot Target". However instead of modifying the iSCSI Target, you modify the "Initiator Name". (Set the last section to something like esx1 or esx2.)



You should now be able to boot your blades, install ESXi and it should see the iSCSI LUN. In addition after the install is complete it should boot off the