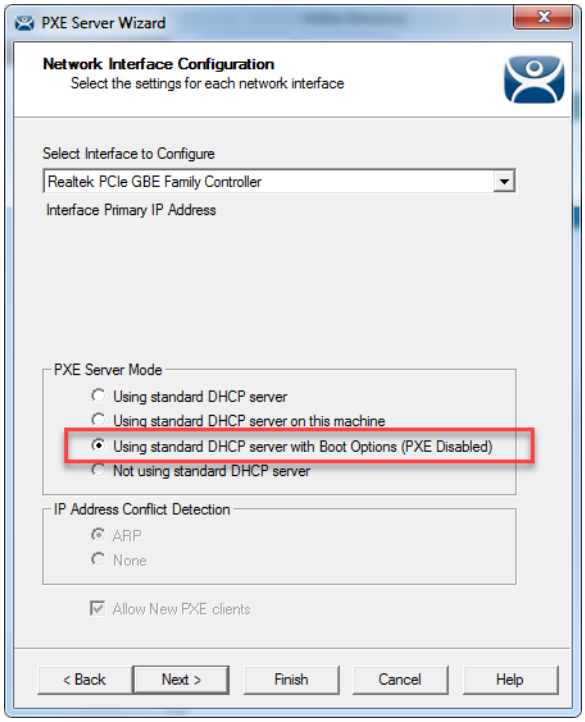
Configuring a Windows DHCP Server with Vendor Classes for UEFI Boot

ThinManager can be configured to allow generic thin clients to boot from ThinManager using the PXE Boot extension, or the Pre-Boot Execution Environment, of the BIOS. ThinManager 11 and later also allow thin clients with the Unified Extensible Firmware Interface (UEFI) to boot as ThinManager Compatible thin clients. This article will discuss the means to achieve this.

PXE Boot Clients, called ThinManager Compatible, need an IP address from a DHCP server and a bootfile from a PXE server. ThinManager provides the PXE server and can provide the IP address by acting as the DHCP server for PXE requests, or letting an existing DHCP server provide the IP address.



The ThinManager PXE Server has four modes:

- **#1 - Using standard DHCP server**
- **#2 - Using standard DHCP server on this machine**
- **#3 - Using standard DHCP server with Boot Options**
- **#4 Not using standard DHCP server**

Using modes #1, #2, and #4 require no additional configuration to boot UEFI thin clients. The PXE Server in ThinManager can distinguish between Legacy PXE and the new UEFI and will send the right firmware to the thin client.

Mode #3, **Using standard DHCP server with Boot Options**, requires configuration to boot UEFI thin clients because it relies on the DHCP Server instead of a PXE Server to provide boot information. This Tech Note will cover the steps needed to get a DHCP Server to provide the UEFI boot information.

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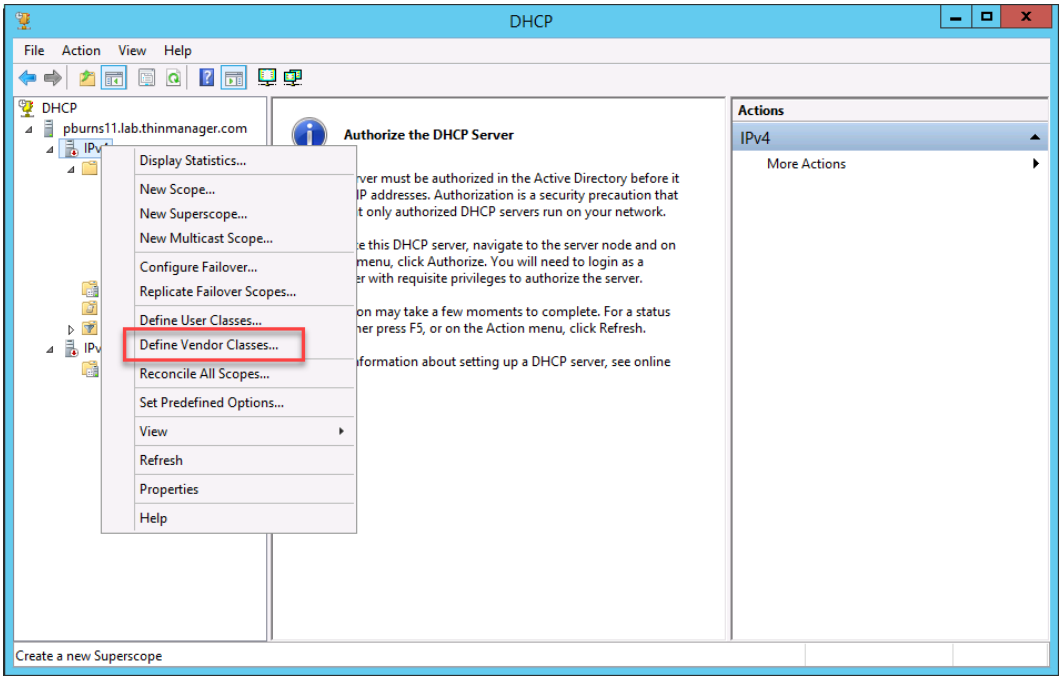
Here is an expansion of the roles of the four PXE Boot Server modes:

- **Using standard DHCP server:** Use this setting when you have an existing DHCP server to provide IP addresses. ThinManager will provide the PXE information.
- **Using standard DHCP server on this machine:** This mode is required to provide the PXE information when a standard DHCP server is installed on the same computer as the ThinManager Server. Additionally Port UDP-4011 will need to be opened on the computer if you have UEFI booting thin clients.
- **Using standard DHCP server with Boot Options:** A DHCP server can be configured to use Option 066 (Boot Server Host Name) with the ThinManager Server IP address. You need to also use Option 067 (Bootfile name) to tell the client what file to download for firmware. The PXE server is still needed to be turned on in ThinManager.
- **Not using standard DHCP server:** Use this setting if you want to configure ThinManager to provide IP addresses with associated boot information to the PXE boot thin clients. Use this setting if you do not have a DHCP Server on your network. Configure ThinManager to serve out IP addresses on the IP Address Range Page. This is not a traditional DHCP Server and will only provide IP addresses to devices making a PXE request.

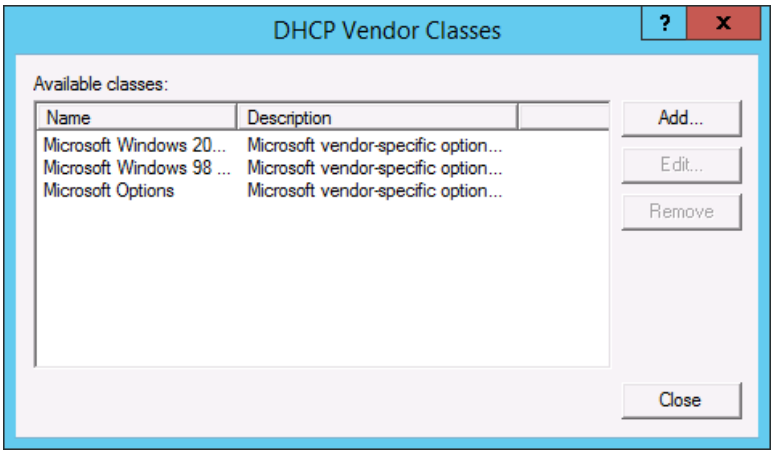
Using standard DHCP server with Boot Options

Note: This only applies to **Mode #3**, **Using standard DHCP server with Boot Options.** Other options are handled by the PXE Server built into ThinManager.

Mixing legacy PXE clients and the new UEFI PXE Boot add complexity because the two methods require two different bootfiles as provided by DHCP Server Option 67. A method to provide the right information to the thin client is to set up Vendor Classes in the DHCP server.



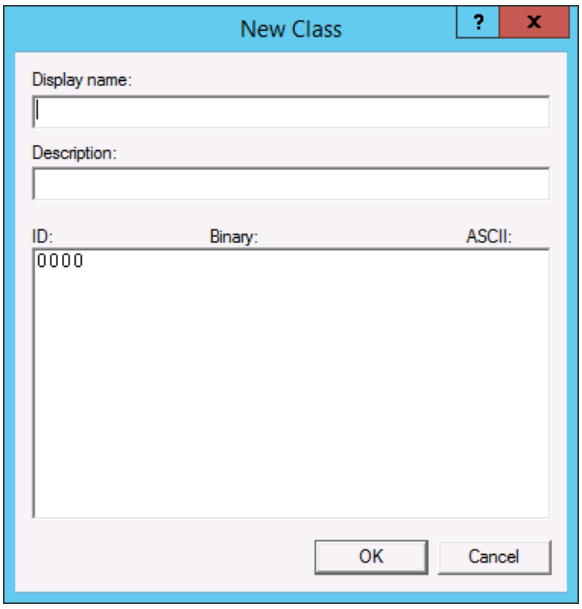
On your Dynamic Host Configuration Protocol Server (DHCP Server) right click on your DHCP type, either IPv4 or IPv6, and select ***Define Vendor Classes…*** This will open the **DHCP Vendor Class** window.



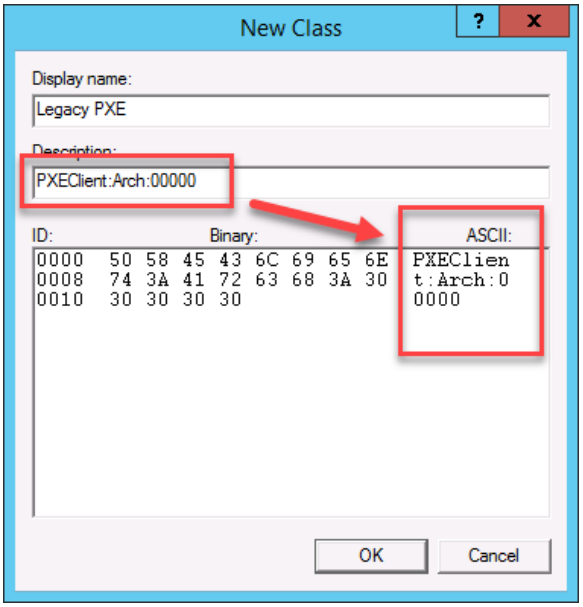
There are three classes that need added.

- **Legacy** - PXEClient:Arch:00000
- **x86 UEFI** - PXEClient:Arch:00006
- **x64 UEFI** - PXEClient:Arch:00007

Select the ***Add*** button to open the **New Class** window.



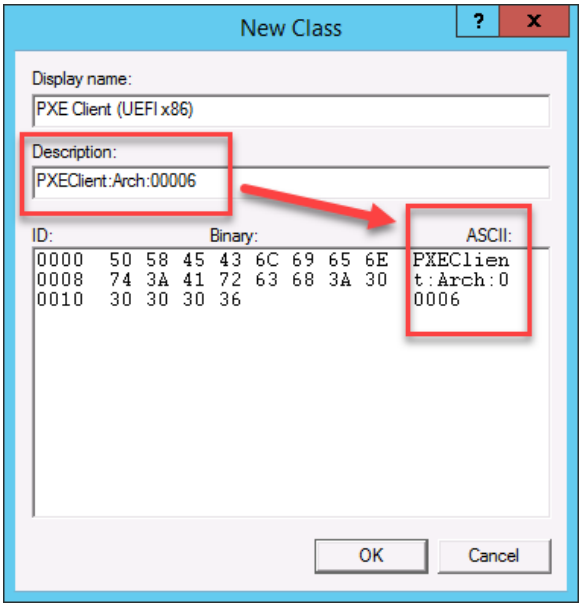
Enter a name for the new class in the ***Display name*** field to the **New Class** window.



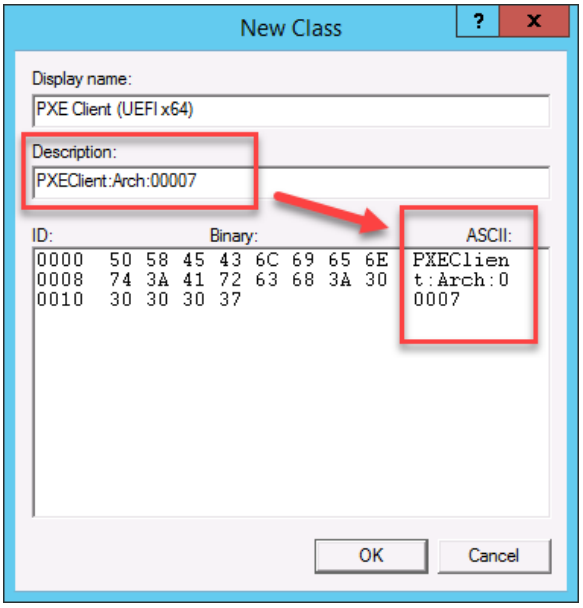
The syntax for the ***Description*** is very specific. It needs to be entered in the ***ASCII*** field also.

- Legacy PXE = **PXEClient:Arch:00000**
- PXE Client (UEFI x86) = **PXEClient:Arch:00006**
- PXE Client (UEFI x64) = **PXEClient:Arch:00007**

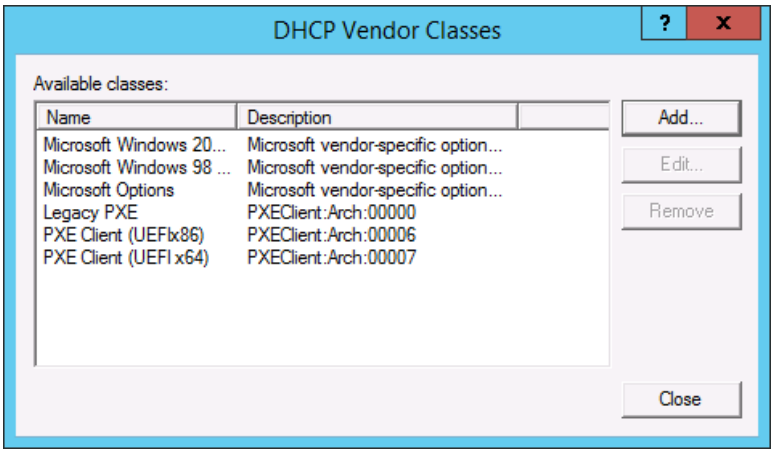
Create the first, select ***OK*** to finish, and define the next class.



PXE Client (UEFI x86) = **PXEClient:Arch:00006**



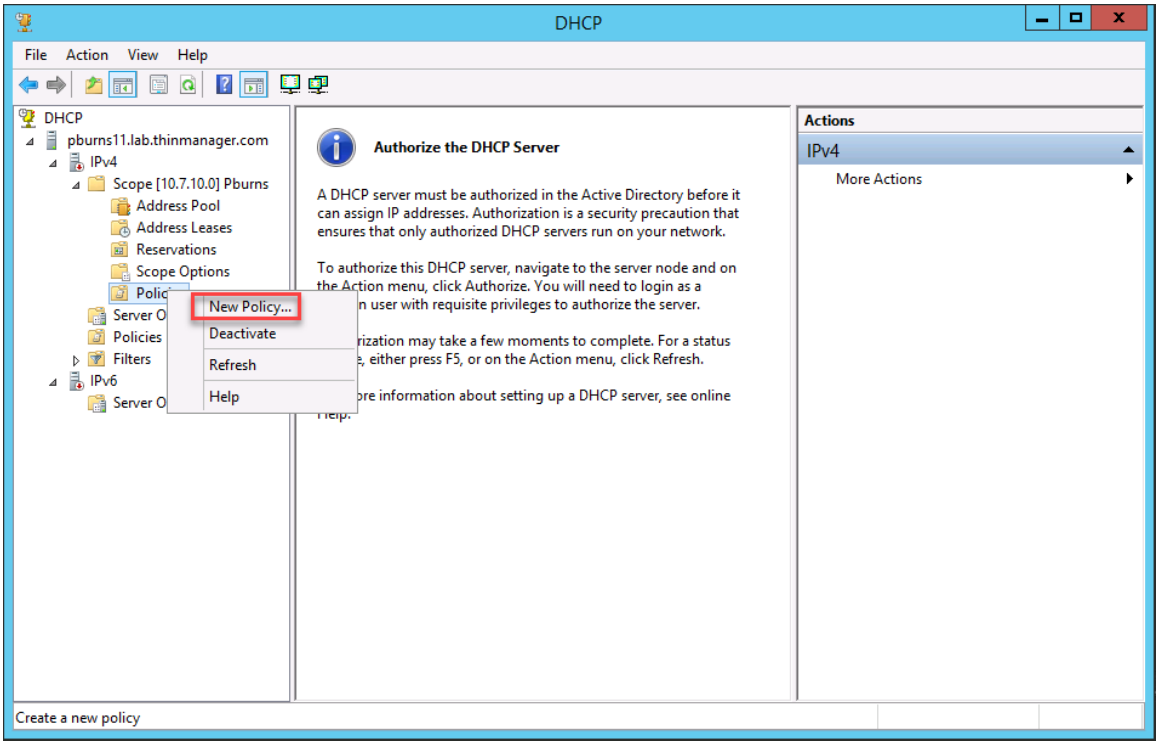
PXE Client (UEFI x64) = **PXEClient:Arch:00007**



When defined the new classes will be displayed in the **DHCP Vendor Classes** window.

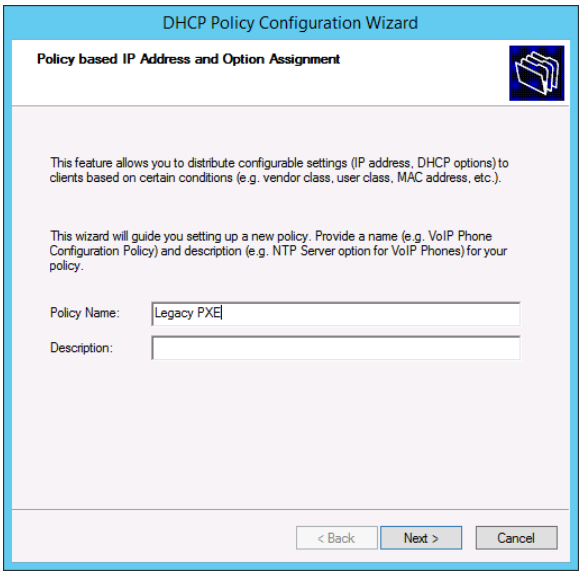
Select ***Close***

Right click on ***Policies*** in the Scope

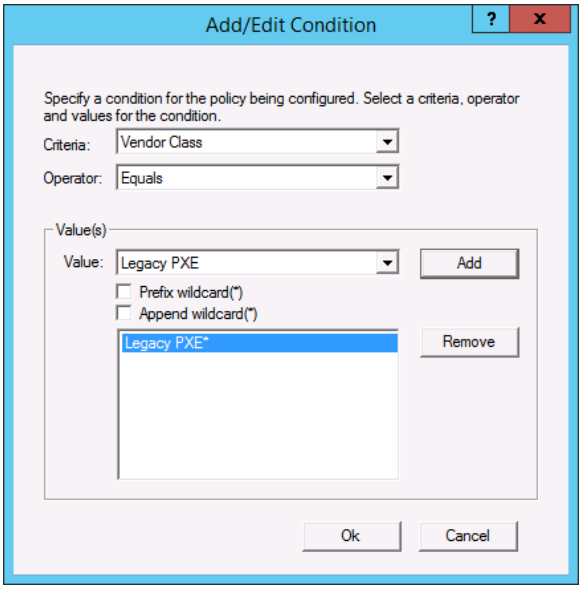


Select ***New Policy*** to launch the **DHCP Policy Configuration** window.

Three policies need created, one for each Vendor Class, so this wizard needs run three times.



Enter a ***Policy name*** and select ***Next***.

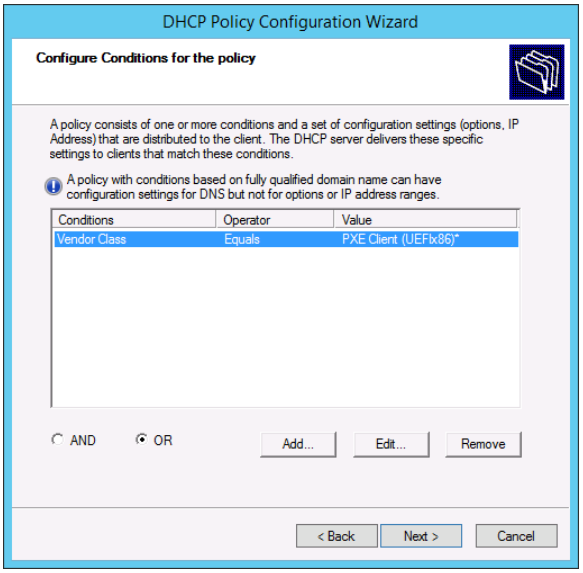


Select the user defined Vendor Class from the ***Value*** drop-down.

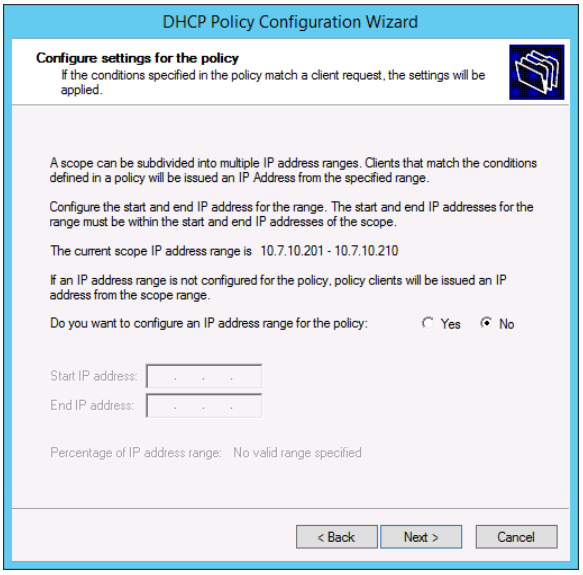
Select ***Add*** to move it to the text field.

Select ***OK***

Select ***Next*** to continue.

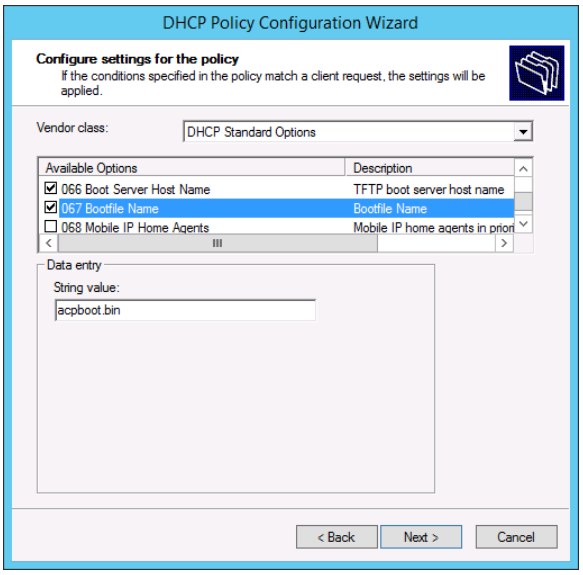


Select ***Next*** to continue.



Select a segment of the IP range or use the entire range.

Select ***Next*** to continue.

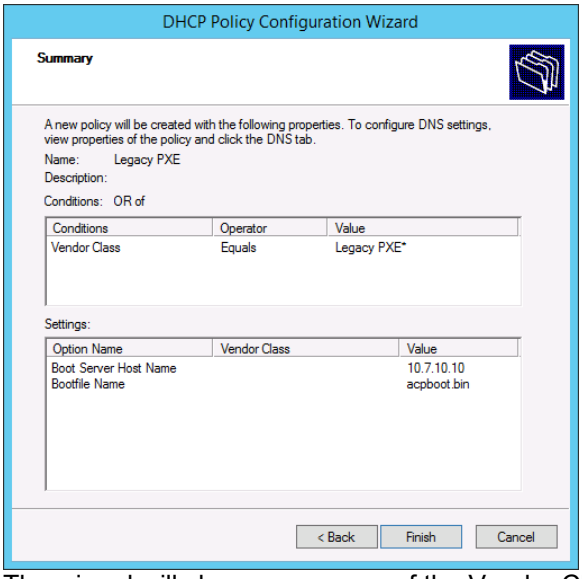


Enter the ThinManager IP Address in the ***Option 66 String value*** field.

Note: Only one ThinManager Server can be specified in Option 66 when using PXE boot.

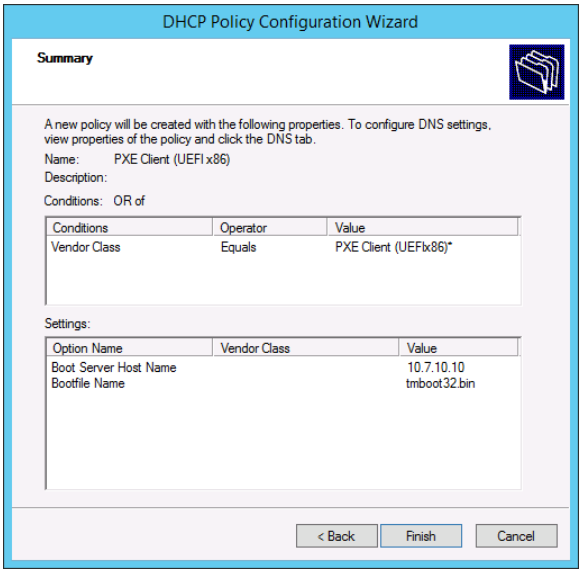
Enter the Option 67 value that matches the mode of thin client boot.

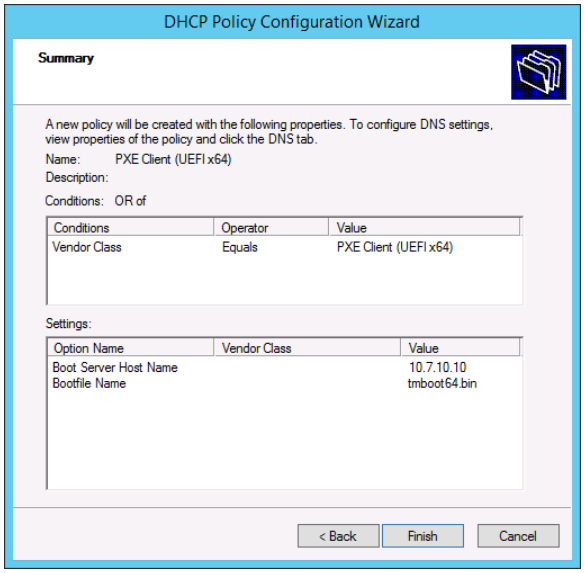
- Legacy PXE Boot uses **acpboot.bin**.
- x86 UEFI Boot uses **tmboot32.bin**.
- x64 UEFI Boot uses **tmboot64.bin**



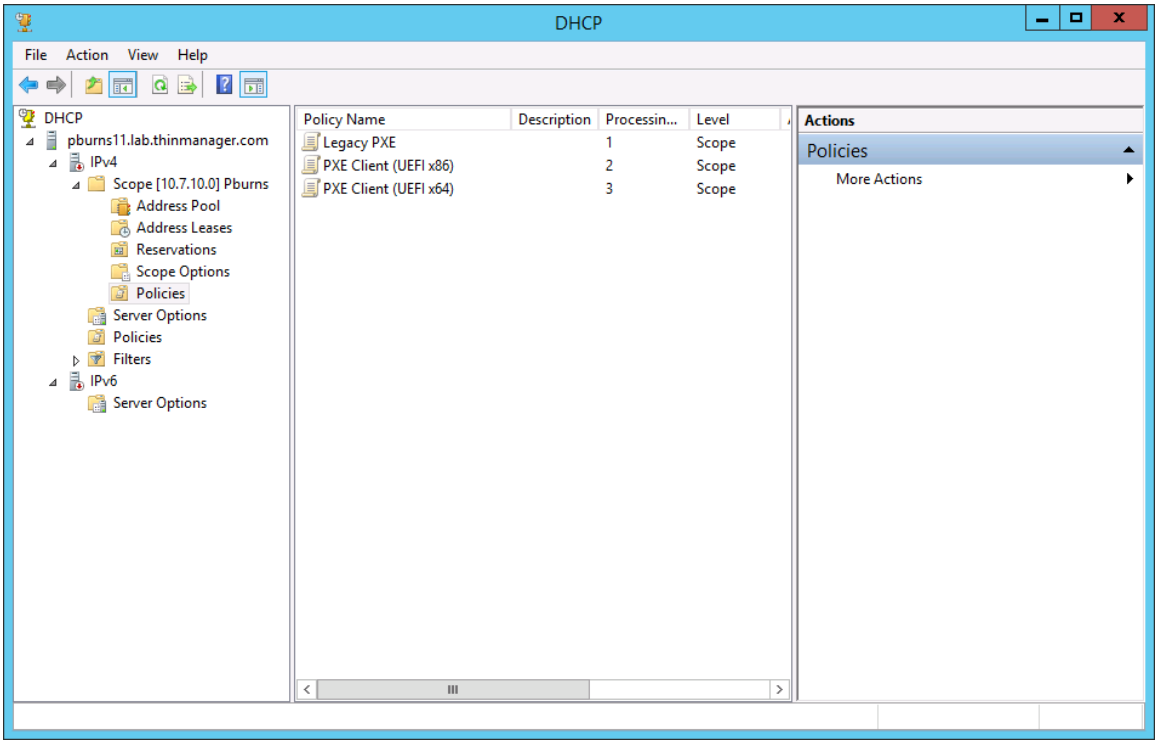
The wizard will show a summary of the Vendor Class Policy.

Repeat the wizard to create the other user created Vendor Classes.





Each policy will show a summary.



When done the policies will be shown in the **DHCP** dashboard.