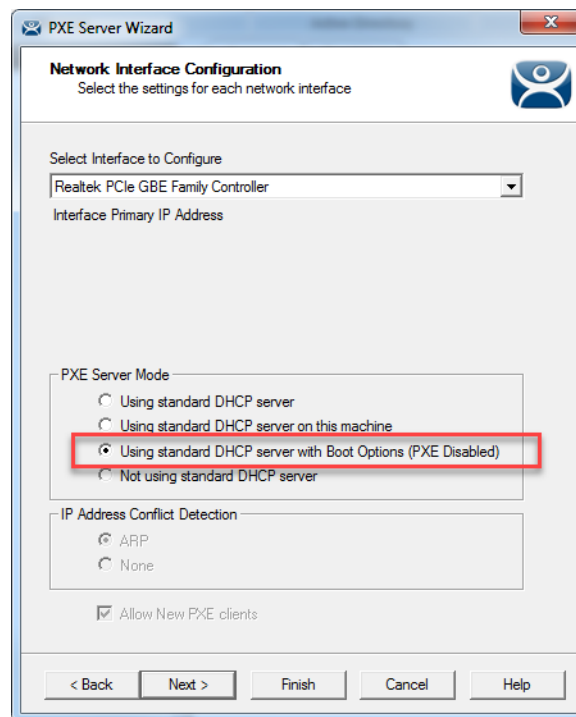


## Configuring a Windows DHCP Server with Vendor Classes for UEFI Boot

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.

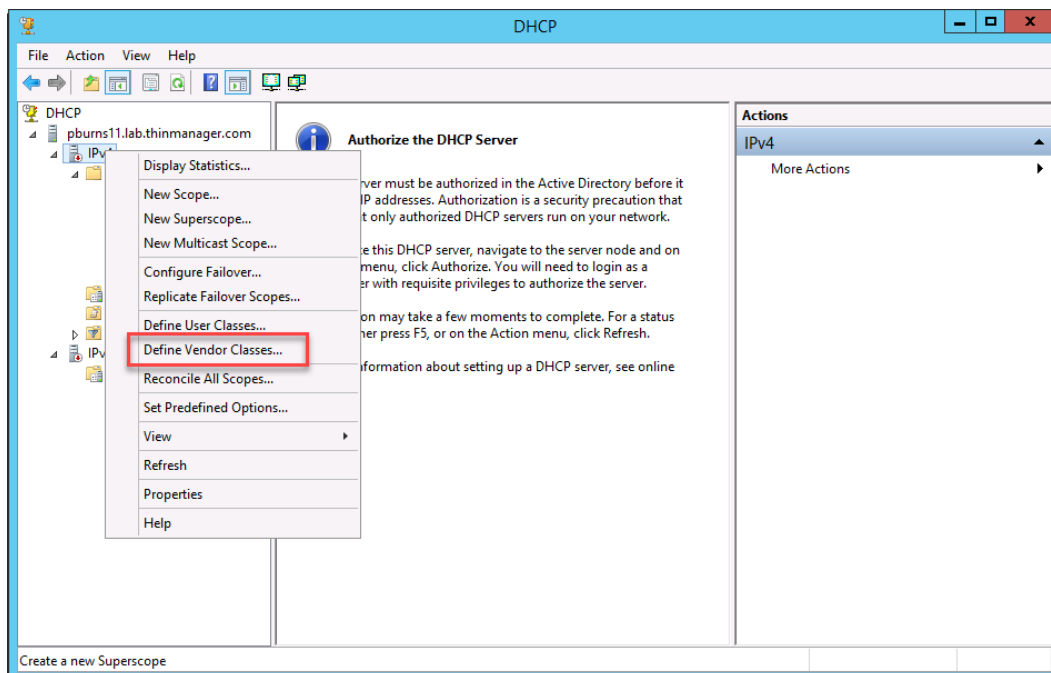
Here is an expansion of the roles of the four PXE Boot Server modes:

- **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.

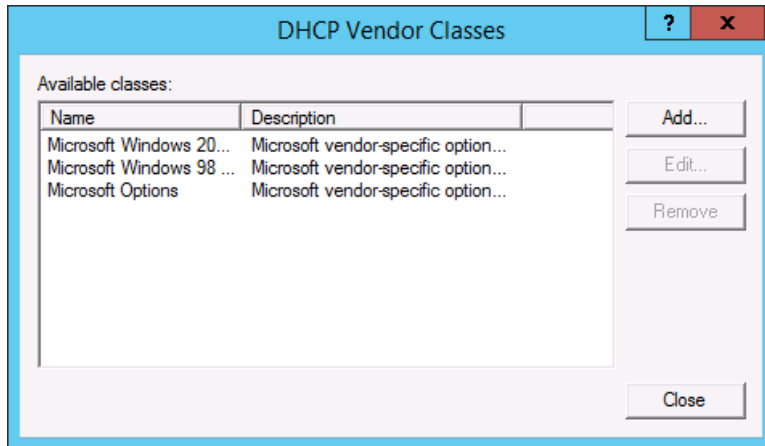
### Using standard DHCP server with Boot Options

**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.



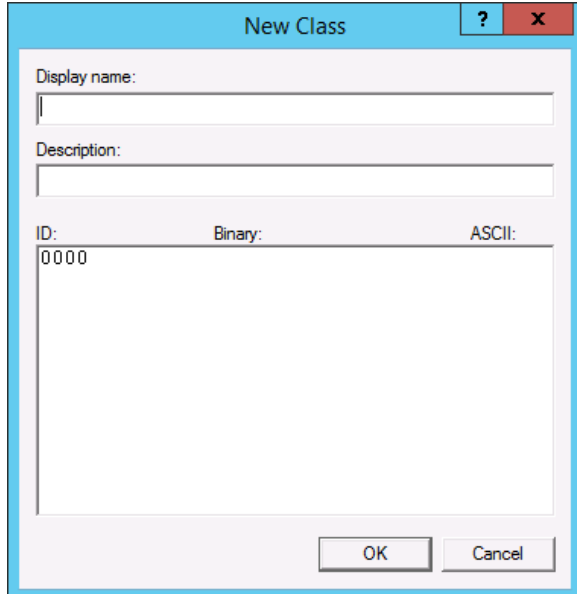
On your Dynamic Host Configuration Protocol Server (DHCP Server) right click on your DHCP type, either IPv4 or IPv6, and select **Define Vendor Classes...** This will open the **DHCP Vendor Class** window.



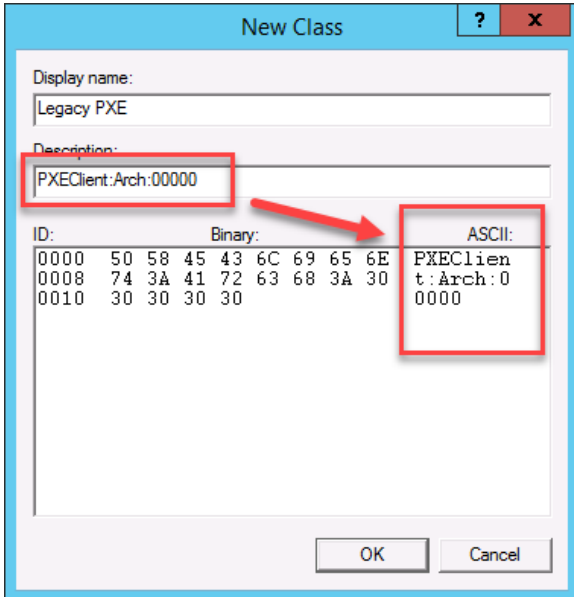
There are three classes that need added.

- **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.



Display name:  
Legacy PXE

Description:  
PXEClient:Arch:00000

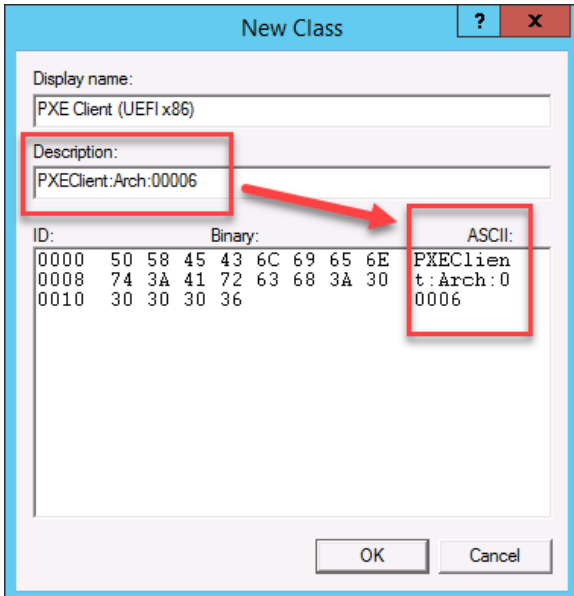
ID:	Binary:	ASCII:
0000	50 58 45 43 6C 69 65 6E	PXEClient:
0008	74 3A 41 72 63 68 3A 30	t:Arch:0
0010	30 30 30 30	0000

OK Cancel

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.



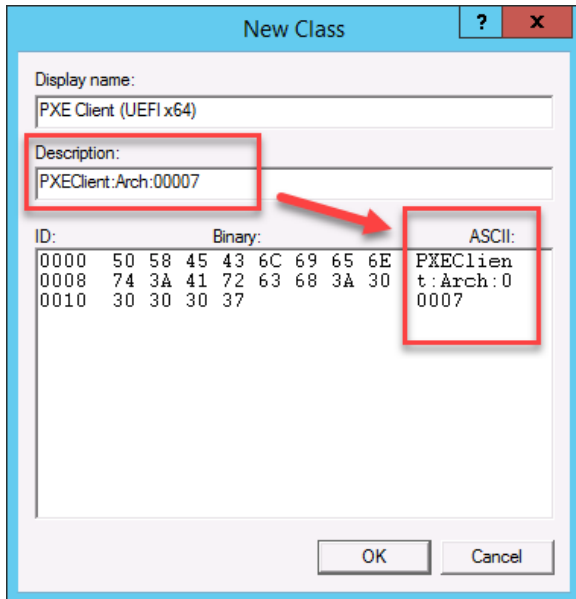
Display name:  
PXE Client (UEFI x86)

Description:  
PXEClient:Arch:00006

ID:	Binary:	ASCII:
0000	50 58 45 43 6C 69 65 6E	PXEClient:
0008	74 3A 41 72 63 68 3A 30	t:Arch:0
0010	30 30 30 36	0006

OK Cancel

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



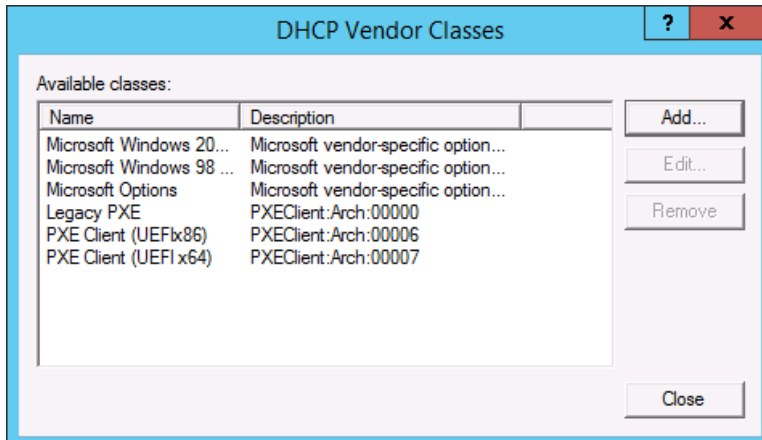
Display name:  
PXE Client (UEFI x64)

Description:  
PXEClient:Arch:00007

ID:	Binary:	ASCII:
0000	50 58 45 43 6C 69 65 6E	PXEClient
0008	74 3A 41 72 63 68 3A 30	:Arch:0
0010	30 30 30 37	00007

OK Cancel

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



DHCP Vendor Classes

Available classes:

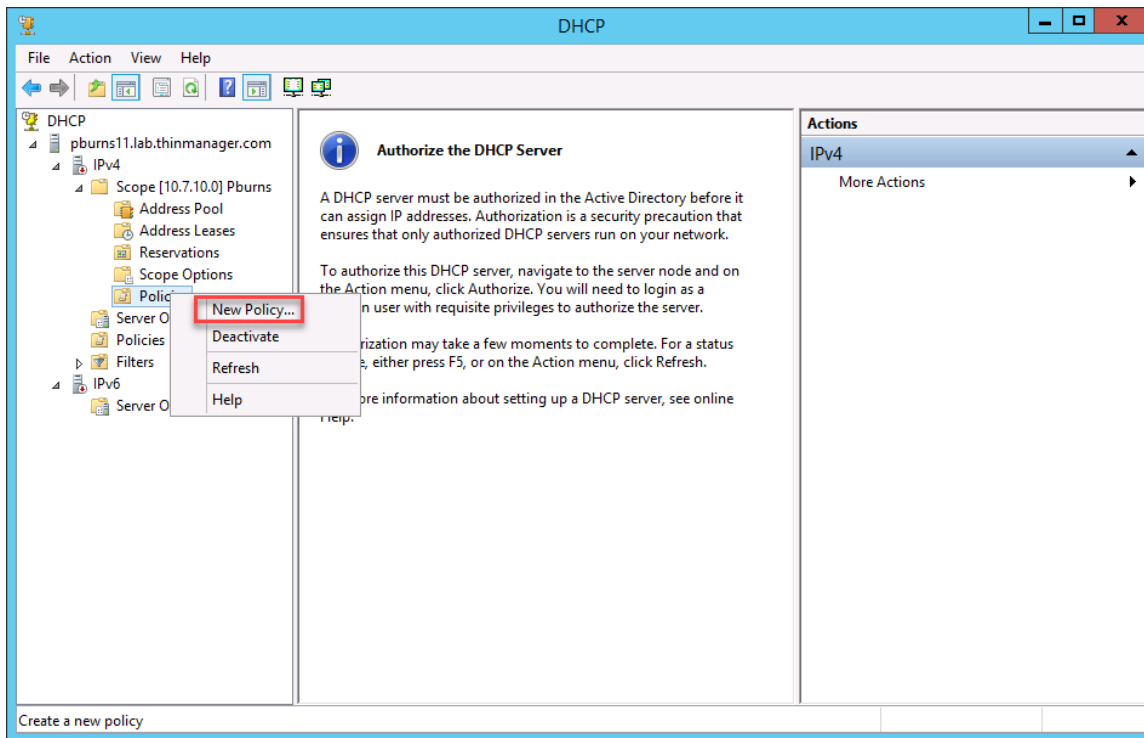
Name	Description
Microsoft Windows 20...	Microsoft vendor-specific option...
Microsoft Windows 98 ...	Microsoft vendor-specific option...
Microsoft Options	Microsoft vendor-specific option...
Legacy PXE	PXEClient:Arch:00000
PXE Client (UEFIx86)	PXEClient:Arch:00006
PXE Client (UEFI x64)	PXEClient:Arch:00007

Add... Edit... Remove... Close

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

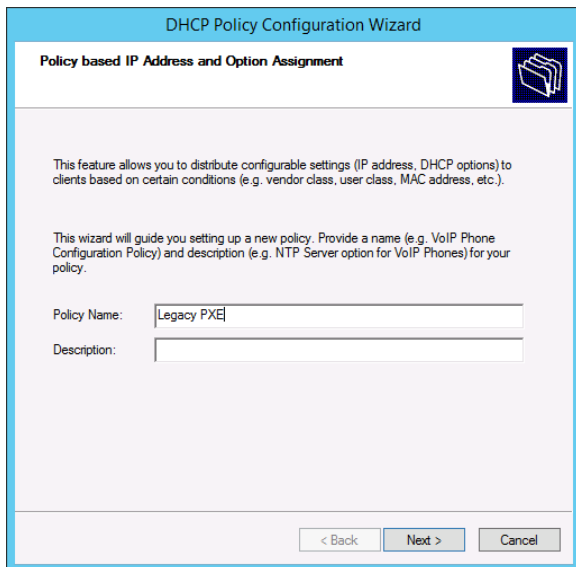
Select **Close**

Right click on **Policies** in the Scope

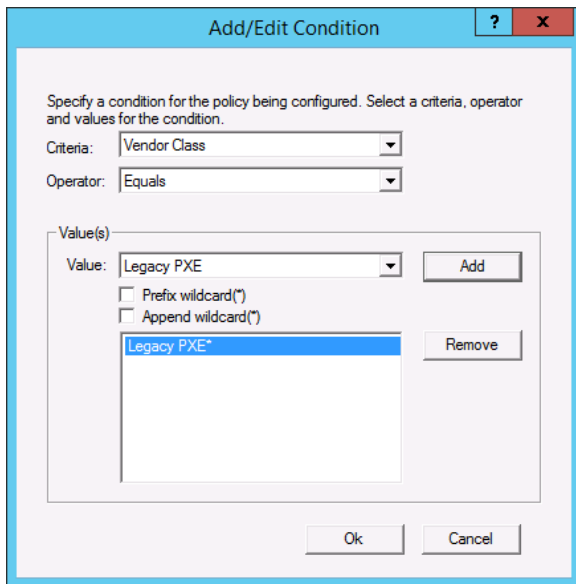


Select **New Policy** to launch the **DHCP Policy Configuration** window.

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



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

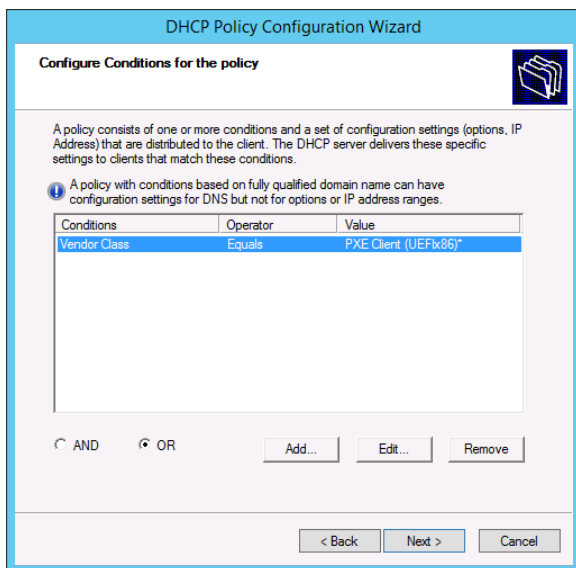


Select the user defined Vendor Class from the **Value** drop-down.

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

Select **OK**

Select **Next** to continue.



Select **Next** to continue.

**DHCP Policy Configuration Wizard**

**Configure settings for the policy**  
 If the conditions specified in the policy match a client request, the settings will be applied.

A scope can be subdivided into multiple IP address ranges. Clients that match the conditions defined in a policy will be issued an IP Address from the specified range.

Configure the start and end IP address for the range. The start and end IP addresses for the range must be within the start and end IP addresses of the scope.

The current scope IP address range is 10.7.10.201 - 10.7.10.210

If an IP address range is not configured for the policy, policy clients will be issued an IP address from the scope range.

Do you want to configure an IP address range for the policy:  Yes  No

Start IP address:

End IP address:

Percentage of IP address range: No valid range specified

Select a segment of the IP range or use the entire range.  
 Select **Next** to continue.

**DHCP Policy Configuration Wizard**

**Configure settings for the policy**  
 If the conditions specified in the policy match a client request, the settings will be applied.

Vendor class: DHCP Standard Options

Available Options	Description
<input checked="" type="checkbox"/> 066 Boot Server Host Name	TFTP boot server host name
<input checked="" type="checkbox"/> 067 Bootfile Name	Bootfile Name
<input type="checkbox"/> 068 Mobile IP Home Agents	Mobile IP home agents in prior

Data entry

String value:

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**



DHCP Policy Configuration Wizard

**Summary**

A new policy will be created with the following properties. To configure DNS settings, view properties of the policy and click the DNS tab.

Name: Legacy PXE  
 Description:

Conditions: OR of

Conditions	Operator	Value
Vendor Class	Equals	Legacy PXE*

Settings:

Option Name	Vendor Class	Value
Boot Server Host Name		10.7.10.10
Bootfile Name		acpboot.bin

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

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

DHCP Policy Configuration Wizard

**Summary**

A new policy will be created with the following properties. To configure DNS settings, view properties of the policy and click the DNS tab.

Name: PXE Client (UEFI x86)  
 Description:

Conditions: OR of

Conditions	Operator	Value
Vendor Class	Equals	PXE Client (UEFI x86)*

Settings:

Option Name	Vendor Class	Value
Boot Server Host Name		10.7.10.10
Bootfile Name		tmboot32.bin

DHCP Policy Configuration Wizard

**Summary**

A new policy will be created with the following properties. To configure DNS settings, view properties of the policy and click the DNS tab.

Name: PXE Client (UEFI x64)  
 Description:

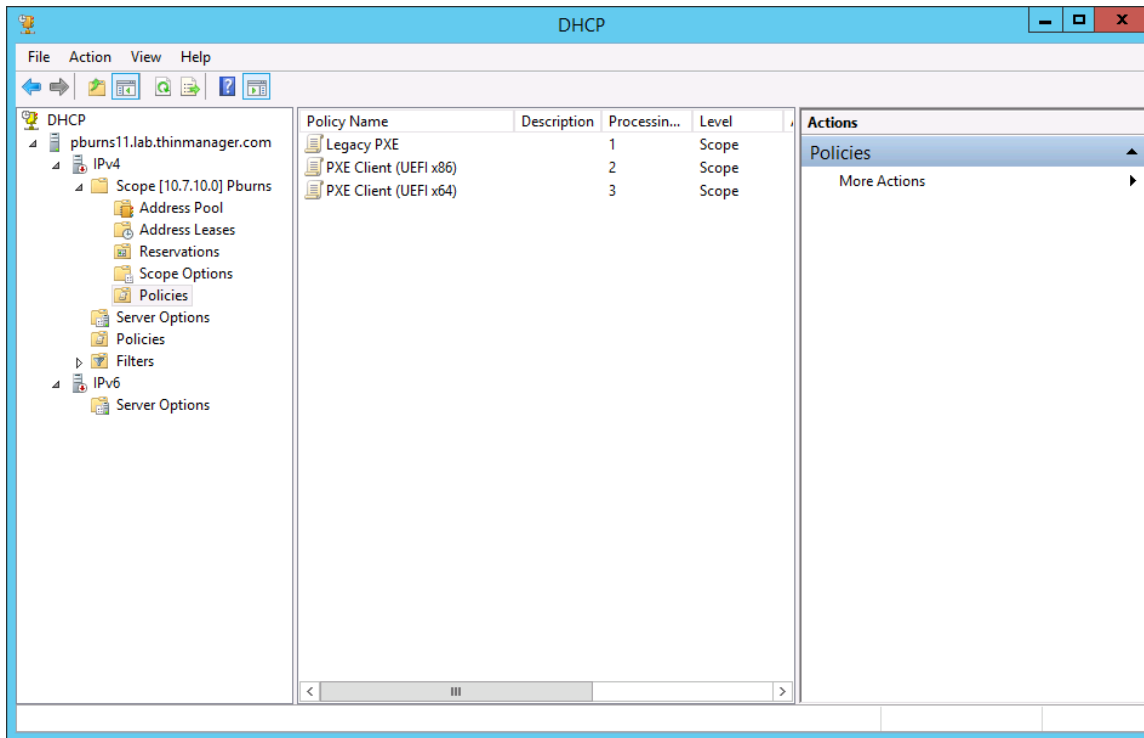
Conditions: OR of

Conditions	Operator	Value
Vendor Class	Equals	PXE Client (UEFI x64)

Settings:

Option Name	Vendor Class	Value
Boot Server Host Name		10.7.10.10
Bootfile Name		tmboot64.bin

Each policy will show a summary.



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