

# Using Windows 2008 With Aruba Controllers

Version 1.0

Tobias Rice

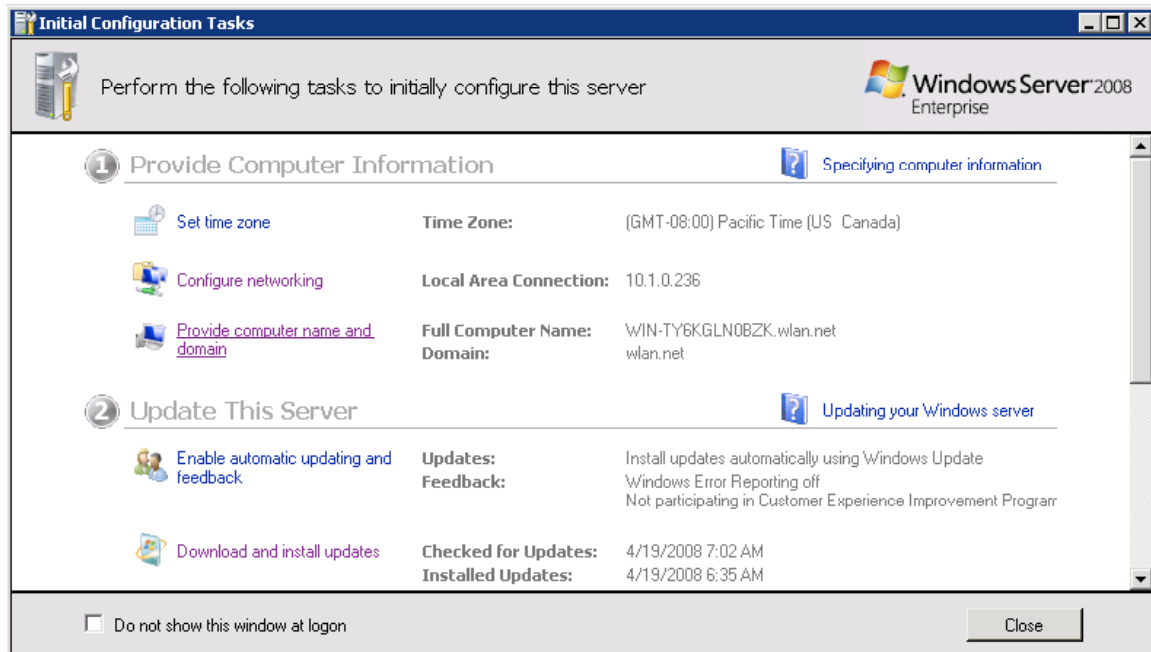
This will be a basic setup using Windows 2008 Server to allow dot1x auth with an Aruba controller. Steps to have a basic installation include:

1. Rename the server
2. Setting server as Domain Controller
3. Installing Certificate Services
4. Request Certificates (optional)
5. Installing Network Policy Services (previously IAS)
6. Creating Group Policies

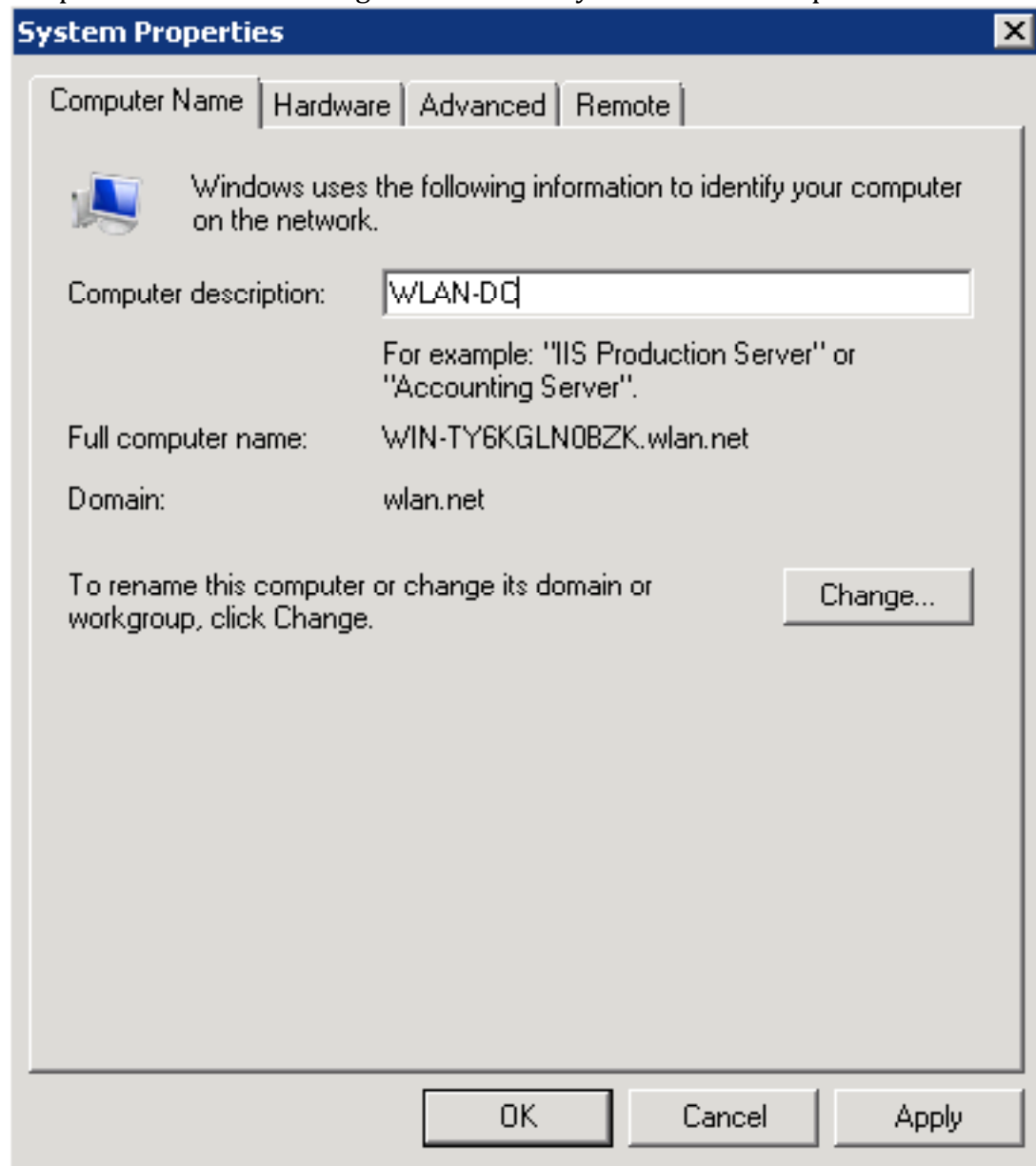
## Rename The Server

Something different about Windows 2008 Server is that the server name is auto-generated and you are not given a chance during the install to name the server so you must do **before** installing Active Directory or Certificate Services.

In the “Initial Configuration Tasks” window, click the “Provide computer name and domain” link.



Enter a Computer description and click the "Change..." button to change the computer name. I'll be using WLAN-DC as my name and description.



Enter the Computer name and click “OK” and reboot when prompted.

**Computer Name/Domain Changes** [X]

You can change the name and the membership of this computer. Changes might affect access to network resources.  
[More information](#)

Computer name:  
WLAN-DC

Full computer name:  
WLAN-DC

More...

Member of

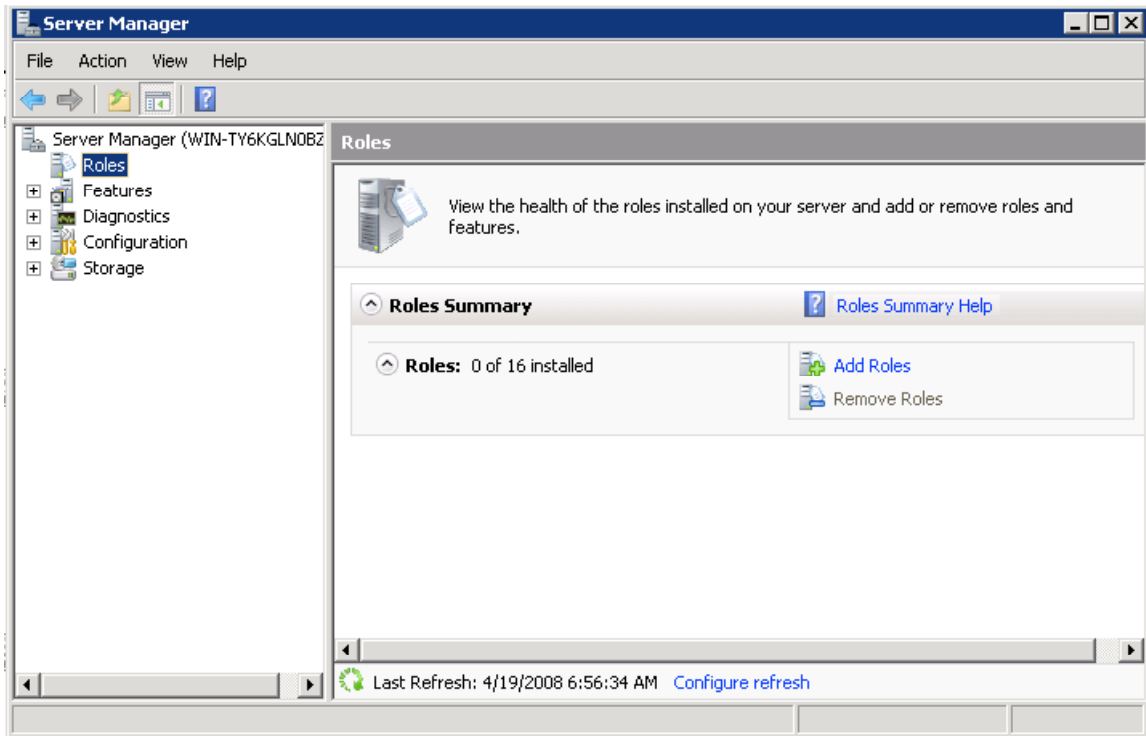
Domain:  
[ ]

Workgroup:  
WORKGROUP

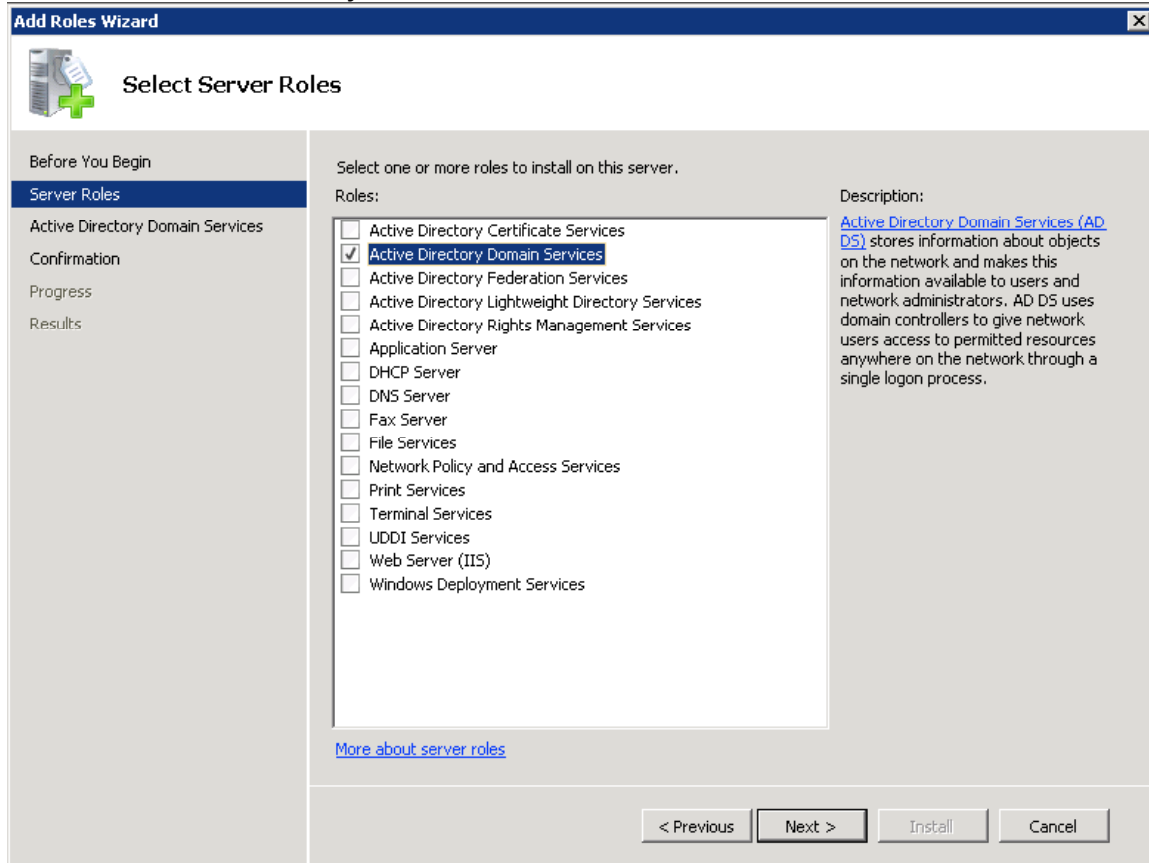
OK Cancel

### Setting Server as a Domain Controller

For this example we setup a new forest for the wlan.net domain. Server 2008 abstracts most server function into “Roles” so we’ll be adding the Active Directory Domain Services Role with the Server Manager by clicking “Roles” and clicking “Add Roles.”



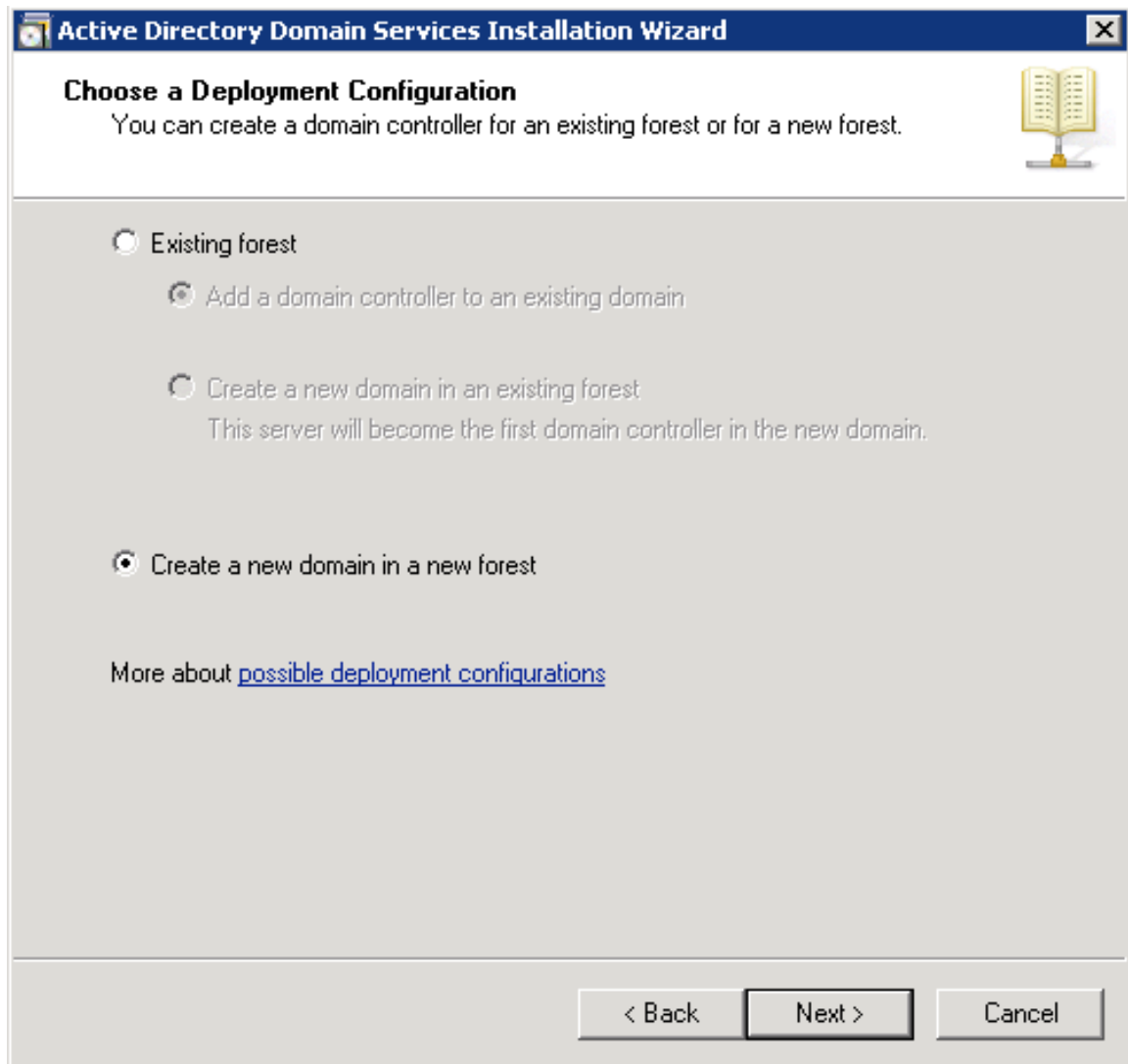
Select the Active Directory Domain Services Role.



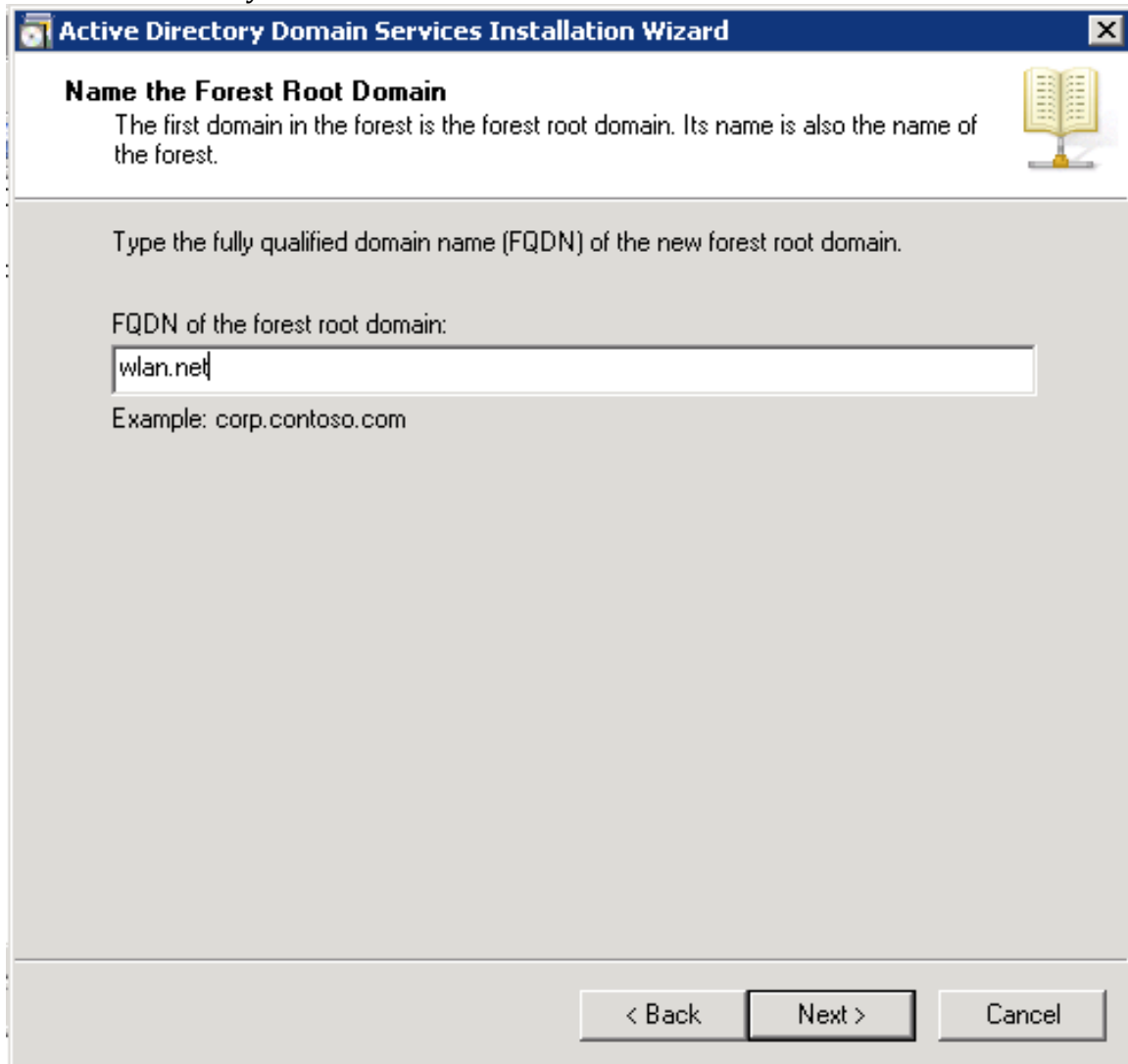
Click through the confirmation screens and click Install. You should get see an installation progress screen and finally an “installation success” message that asks you to run the command “dcpromo.exe” which will configure your domain. So click the link to run “dcpromo” or click the “Start” button, select “Run” and enter “dcpromo.exe”. You should now see the “Active Directory Domain Service” install wizard. Click “Next “ to continue.



Choose “Create a new domain in a new forest” and click “Next”.



For our example domain we'll use "wlan.net". Click "Next" and it will check to see if the name is already used on the network.



The screenshot shows a Windows dialog box titled "Active Directory Domain Services Installation Wizard". The main heading is "Name the Forest Root Domain". Below this, a text box explains: "The first domain in the forest is the forest root domain. Its name is also the name of the forest." To the right of this text is an icon of an open book. Below the explanation, there is a prompt: "Type the fully qualified domain name (FQDN) of the new forest root domain." Underneath this prompt is a text input field containing "wlan.net". Below the input field, an example is provided: "Example: corp.contoso.com". At the bottom of the dialog box, there are three buttons: "< Back", "Next >", and "Cancel".

**Active Directory Domain Services Installation Wizard**

**Name the Forest Root Domain**

The first domain in the forest is the forest root domain. Its name is also the name of the forest.

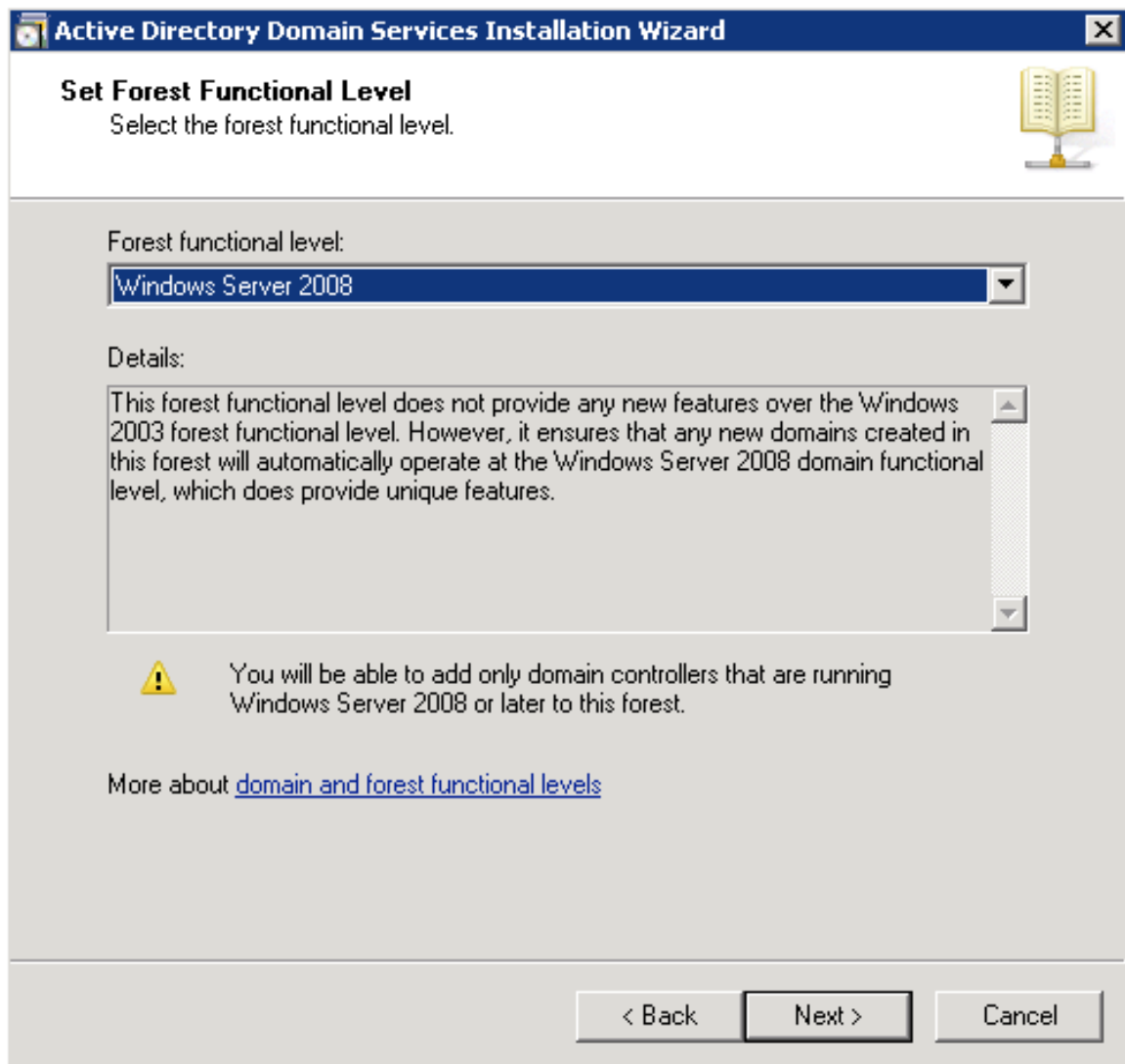
Type the fully qualified domain name (FQDN) of the new forest root domain.

FQDN of the forest root domain:

Example: corp.contoso.com

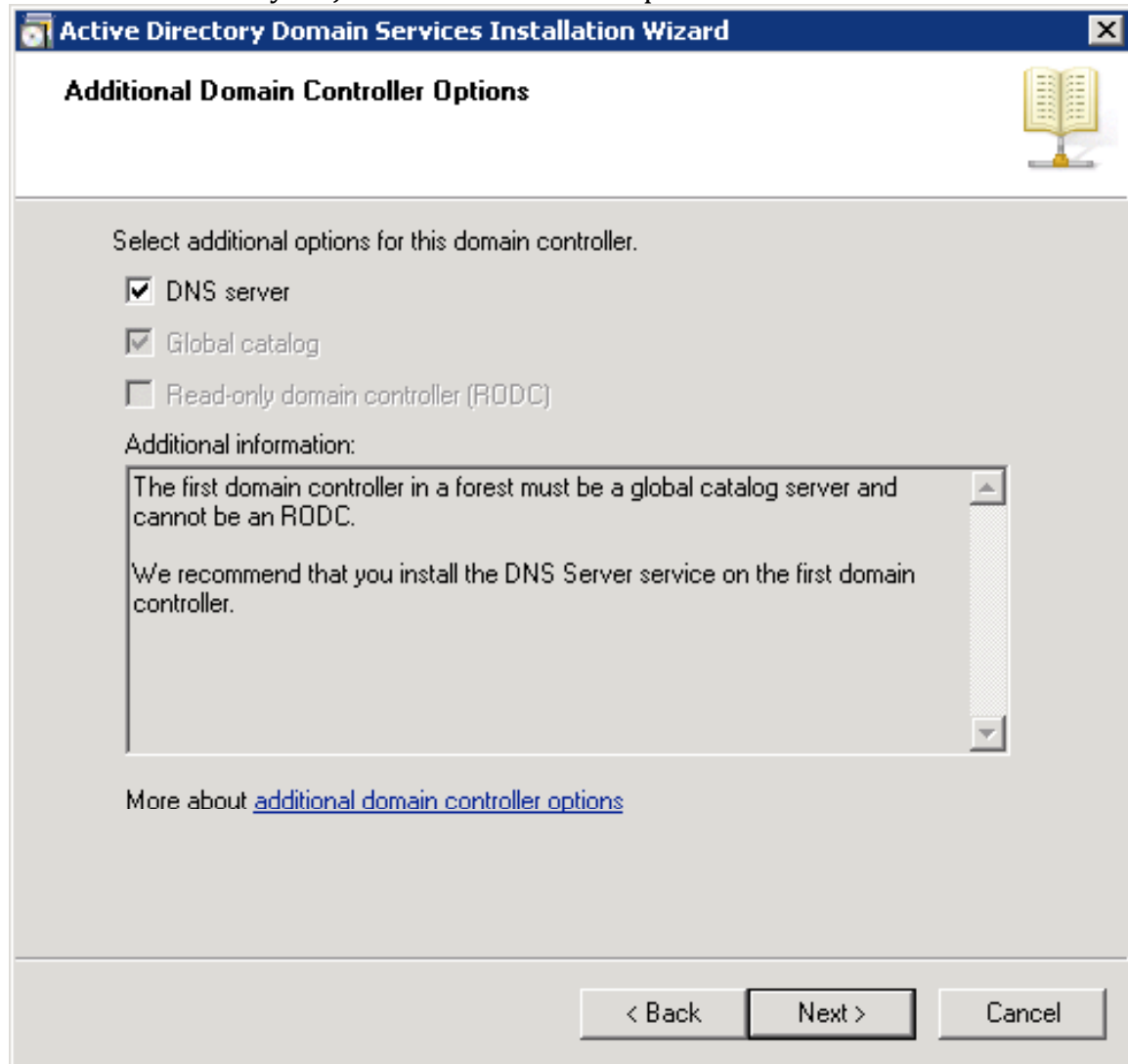
< Back    Next >    Cancel

When asked to set which “Forest Functional Level” I used the 2008 level.





The next screen you'll see is a warning that the DNS service isn't install and will offer to install it for you. Just click "Next" to accept and install.



It will display the following warning, just click "Yes" to continue.



Just accept the defaults and click “Next”.

**Active Directory Domain Services Installation Wizard**

**Location for Database, Log Files, and SYSVOL**  
Specify the folders that will contain the Active Directory domain controller database, log files, and SYSVOL.

For better performance and recoverability, store the database and log files on separate volumes.

Database folder:  
C:\Windows\NTDS

Log files folder:  
C:\Windows\NTDS

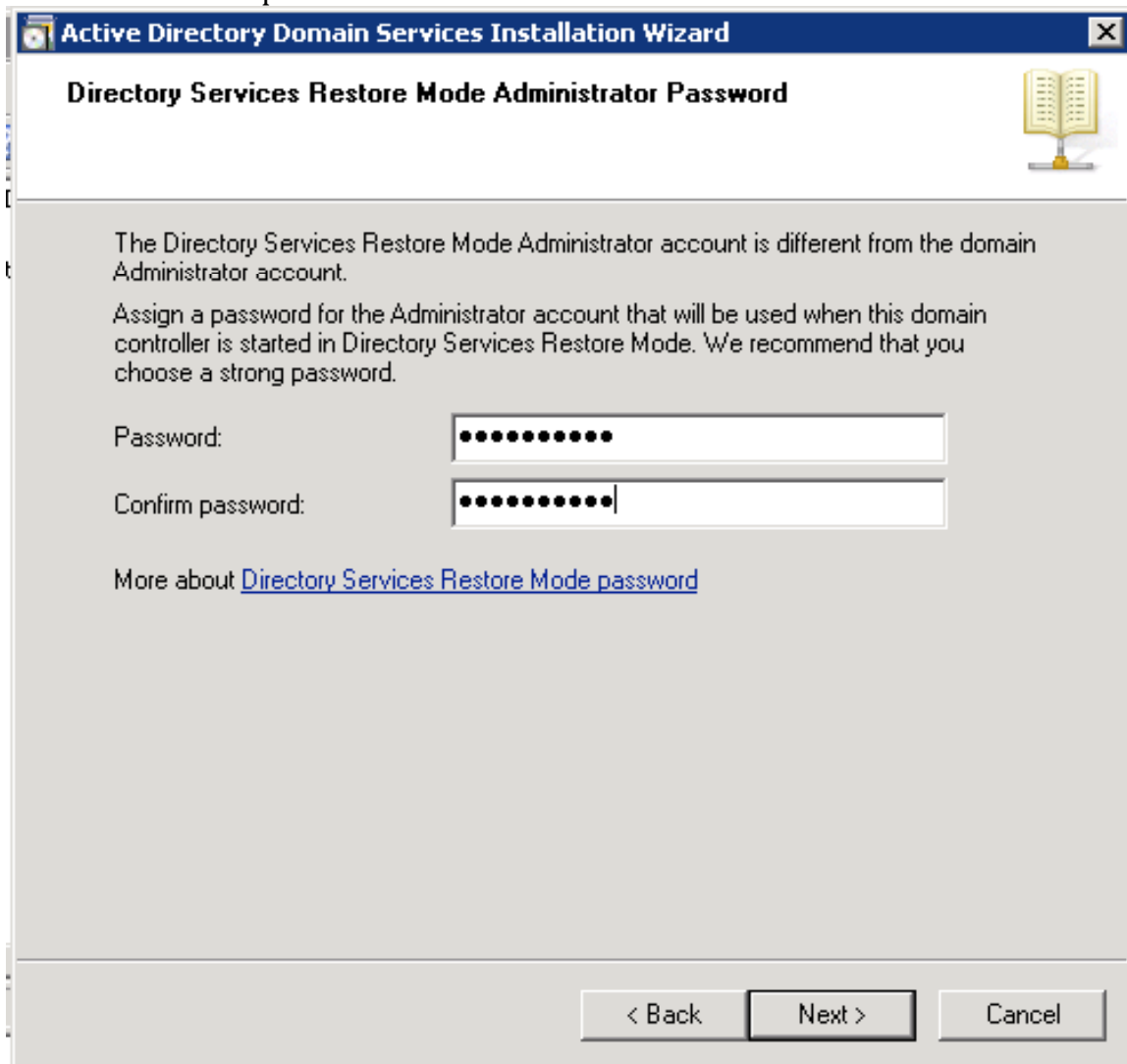
SYSVOL folder:  
C:\Windows\SYSVOL

More about [placing Active Directory Domain Services files](#)

< Back 

Now you’ll be prompted to enter a “Directory Services Restore Mode Administrator

Password”. Enter a password and click “Next”.



The screenshot shows a Windows dialog box titled "Active Directory Domain Services Installation Wizard". The main heading is "Directory Services Restore Mode Administrator Password". There is an icon of an open book in the top right corner. The text inside the dialog reads: "The Directory Services Restore Mode Administrator account is different from the domain Administrator account. Assign a password for the Administrator account that will be used when this domain controller is started in Directory Services Restore Mode. We recommend that you choose a strong password." Below this text are two input fields: "Password:" and "Confirm password:", both containing masked characters (dots). At the bottom, there is a link: "More about [Directory Services Restore Mode password](#)". At the very bottom of the dialog are three buttons: "< Back", "Next >", and "Cancel".

**Active Directory Domain Services Installation Wizard**

**Directory Services Restore Mode Administrator Password**

The Directory Services Restore Mode Administrator account is different from the domain Administrator account.

Assign a password for the Administrator account that will be used when this domain controller is started in Directory Services Restore Mode. We recommend that you choose a strong password.

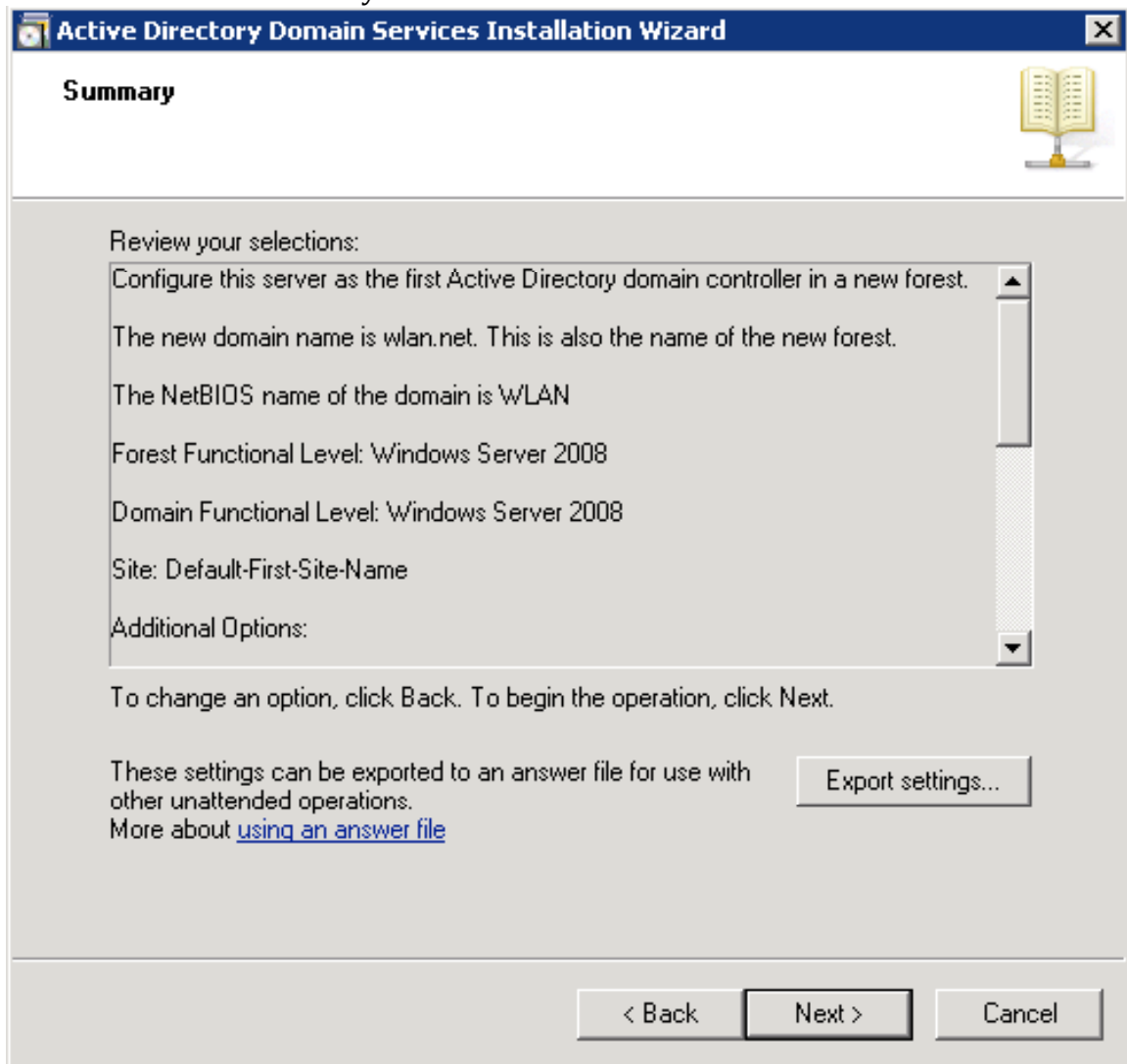
Password:

Confirm password:

More about [Directory Services Restore Mode password](#)

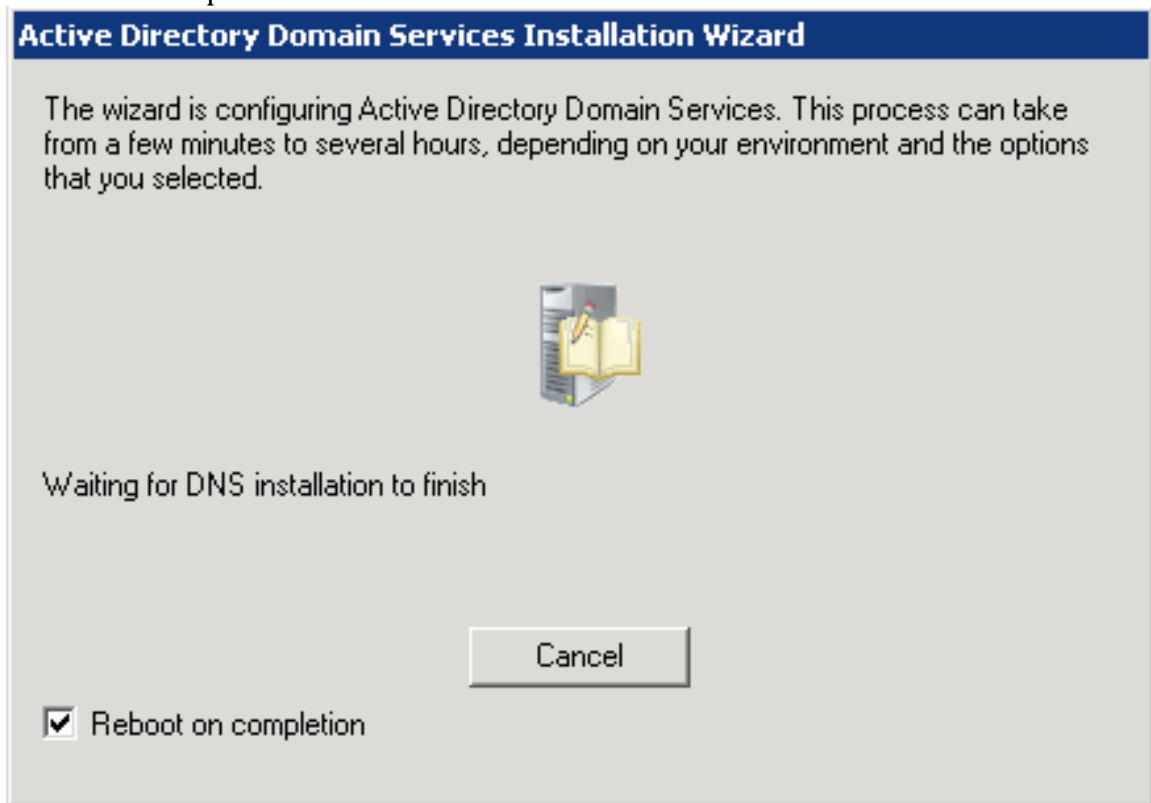
< Back    Next >    Cancel

Click "Next" at the Summary screen.



You'll now see the Installation Wizard install DNS and Active Directory. Check the "Reboot on completion" box and once the wizard finishes it'll reboot and be ready

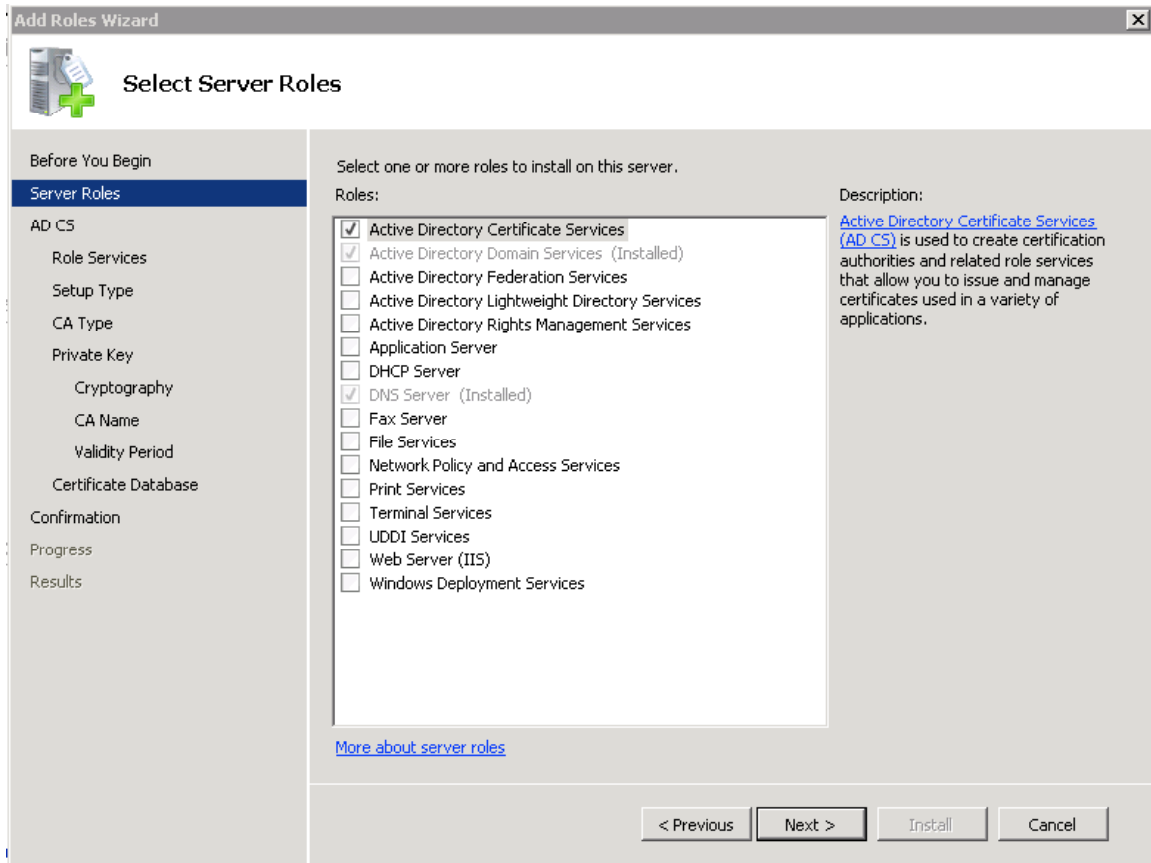
for the next step.



## Installing Certificate Services

To enable PEAP or EAP-TLS we'll need to install Certificate Services to enable a Certificate Authority (CA) to generate and sign certificates for our domain. Again, add a Role via the Server Manager and select "Active Directory Certificate Services"

and click “Next”.



Click through the conformation screen and select “Certification Authority” and “Certificate Authority Web Enrollment” which will tell you that you’ll need IIS to be installed to use the “Certificate Authority Web Enrollment”. Click “Add Required

Role Services” and click “Next” to continue.

**Add Roles Wizard**

**Select Role Services**

Before You Begin  
Server Roles  
AD CS  
**Role Services**  
Setup Type  
CA Type  
Private Key  
Cryptography  
CA Name  
Validity Period  
Certificate Database  
Confirmation  
Progress  
Results

Select the role services to install for Active Directory Certificate Services:

Role services:

- Certification Authority
- Certification Authority Web Enrollment
- Online Responder
- Network Device Enrollment Service

Description:  
[Certification Authority \(CA\)](#) is used to issue and manage certificates. Multiple CAs can be linked to form a public key infrastructure.

**Add Roles Wizard**

**Add role services and features required for Certification Authority Web Enrollment?**

You cannot install Certification Authority Web Enrollment unless the required role services and features are also installed.

Role Services:

- Web Server (IIS)**
  - Web Server
  - Management Tools
- Windows Process Activation Service**
  - Process Model
  - Configuration APIs

Description:  
[Web Server \(IIS\)](#) provides a reliable, manageable, and scalable Web application infrastructure.

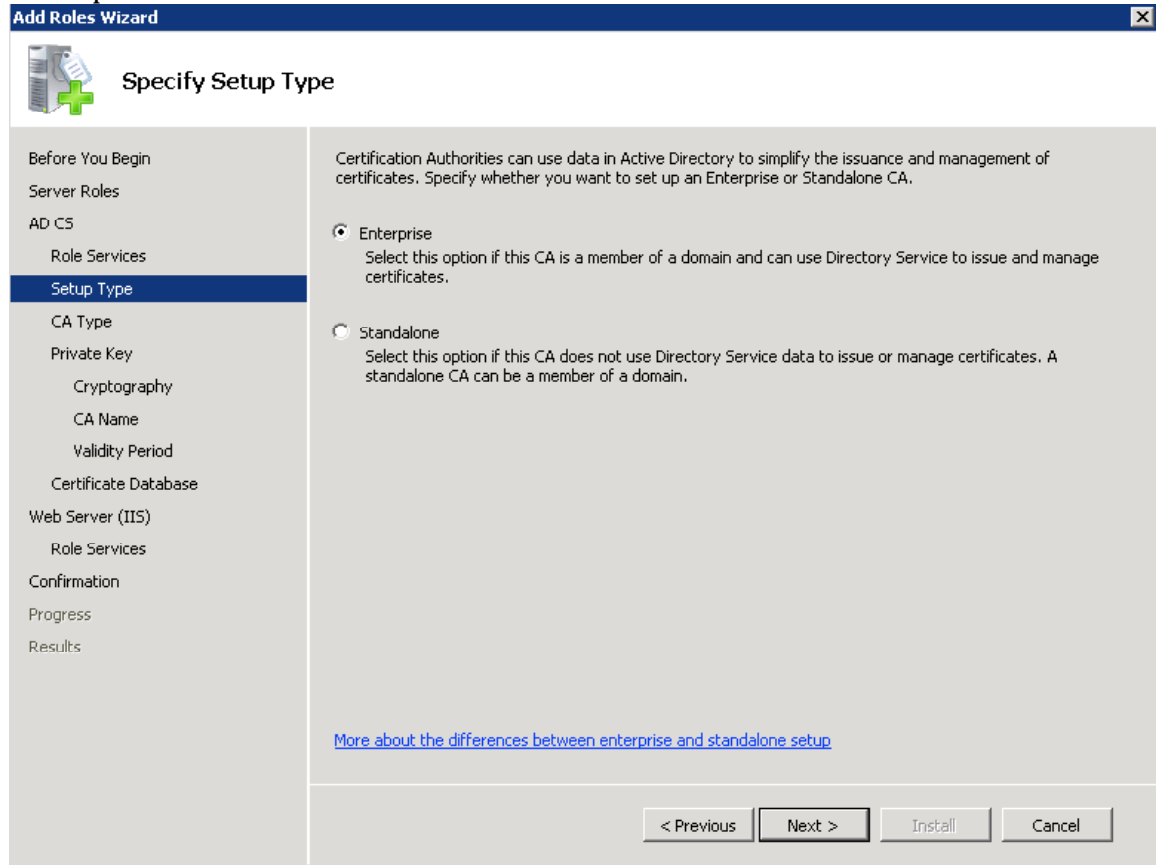
**Add Required Role Services**   **Cancel**

**Why are these role services and features required?**


< Previous   **Next >**   Install   Cancel



When prompted for which type of Certificate Authority to install, choose “Enterprise”.



**Add Roles Wizard** [X]

 **Specify Setup Type**

Before You Begin  
Server Roles  
AD CS  
  Role Services  
**Setup Type**  
  CA Type  
  Private Key  
    Cryptography  
    CA Name  
    Validity Period  
  Certificate Database  
Web Server (IIS)  
  Role Services  
Confirmation  
Progress  
Results

Certification Authorities can use data in Active Directory to simplify the issuance and management of certificates. Specify whether you want to set up an Enterprise or Standalone CA.

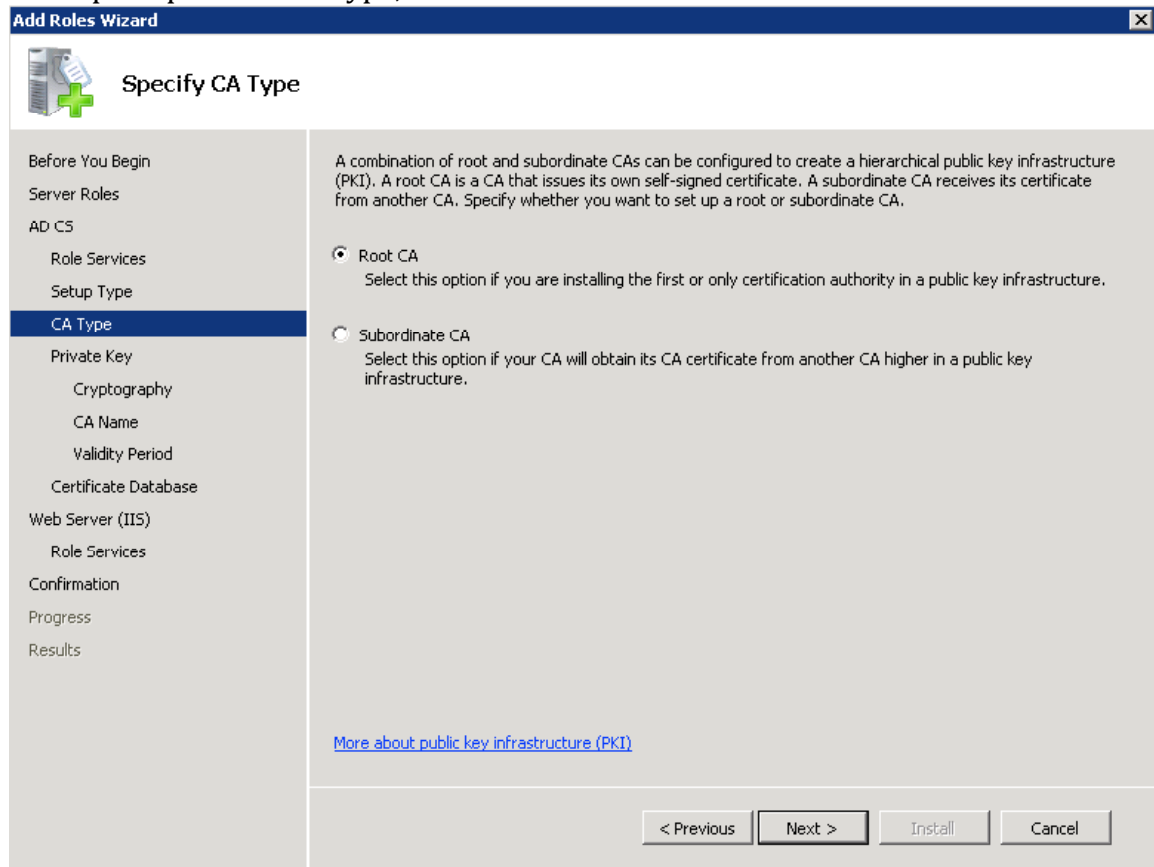
Enterprise  
Select this option if this CA is a member of a domain and can use Directory Service to issue and manage certificates.

Standalone  
Select this option if this CA does not use Directory Service data to issue or manage certificates. A standalone CA can be a member of a domain.

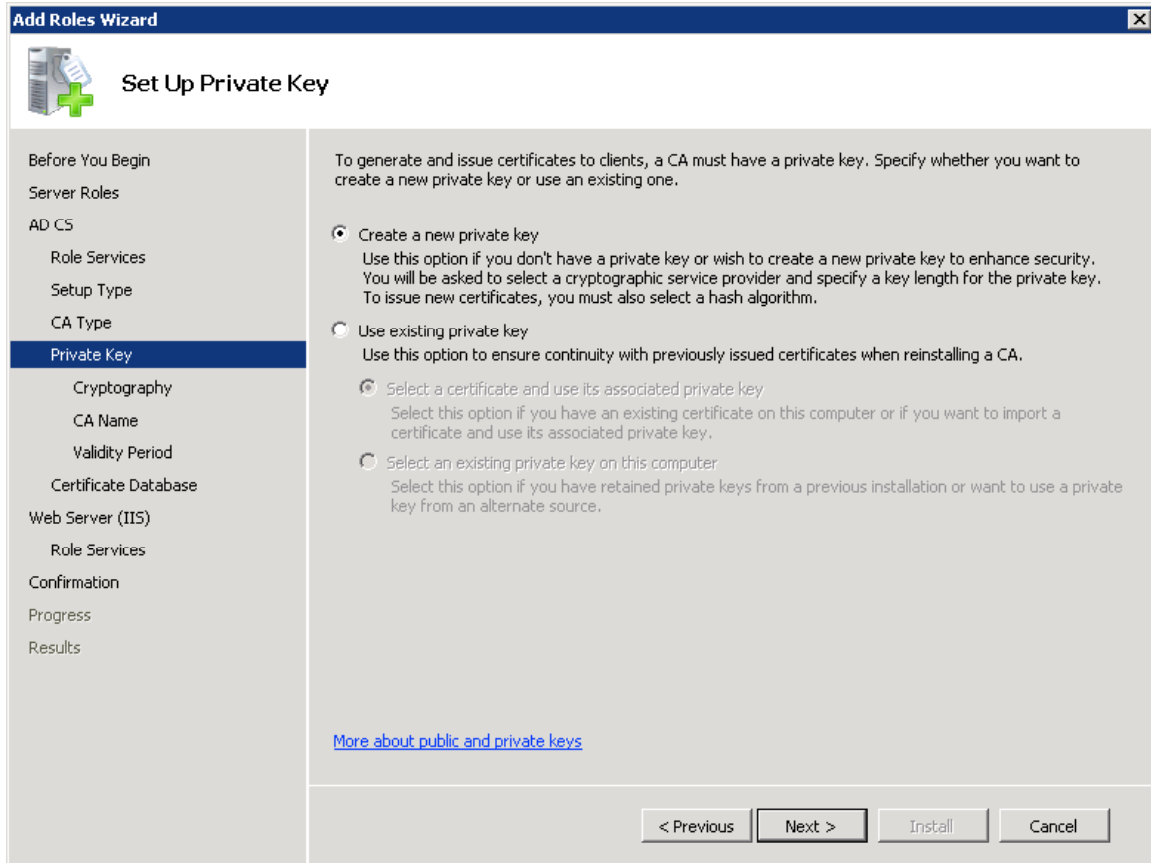
[More about the differences between enterprise and standalone setup](#)

< Previous    Next >    Install    Cancel

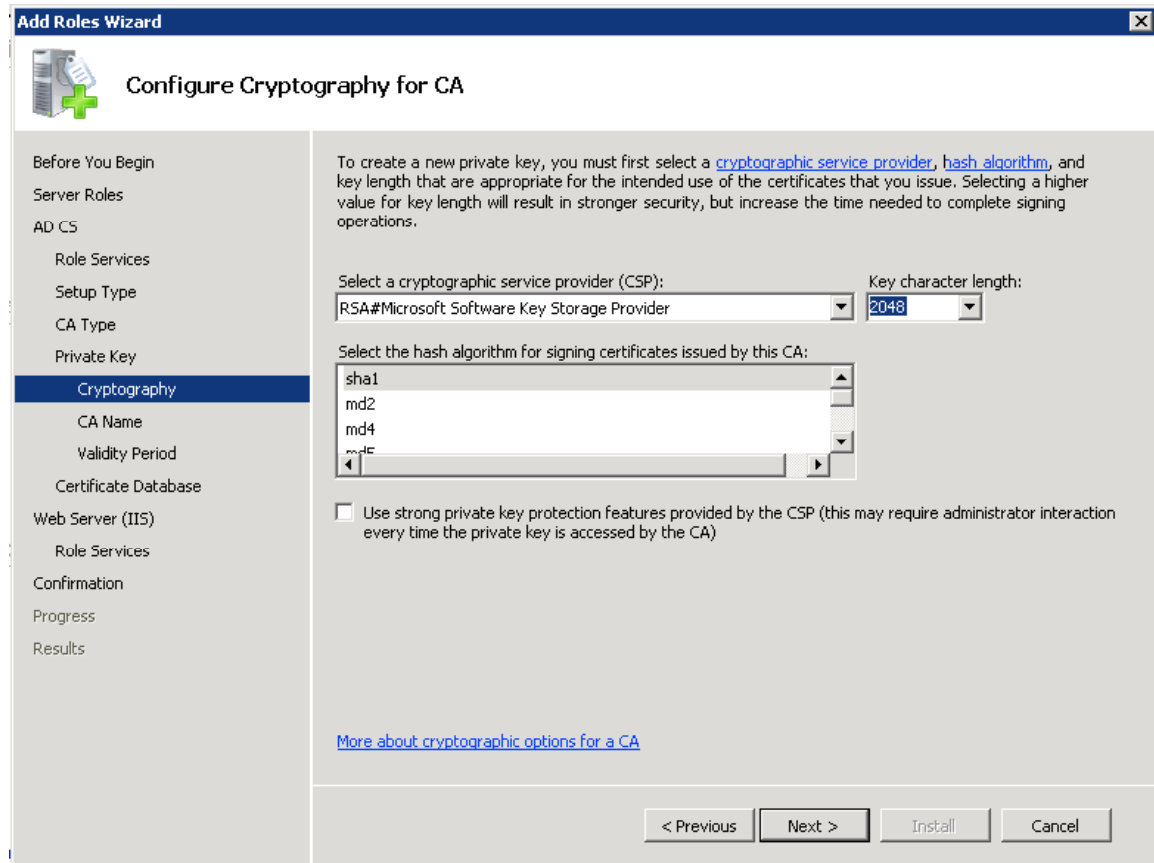
When prompted for CA Type, select “Root CA” and click “Next”.



When prompted to Set Up Private Key select “Create a new private key” and click “Next”.



When prompted to Configure Cryptography for CA, accept the defaults and click “Next” for the rest of the conformation screens.

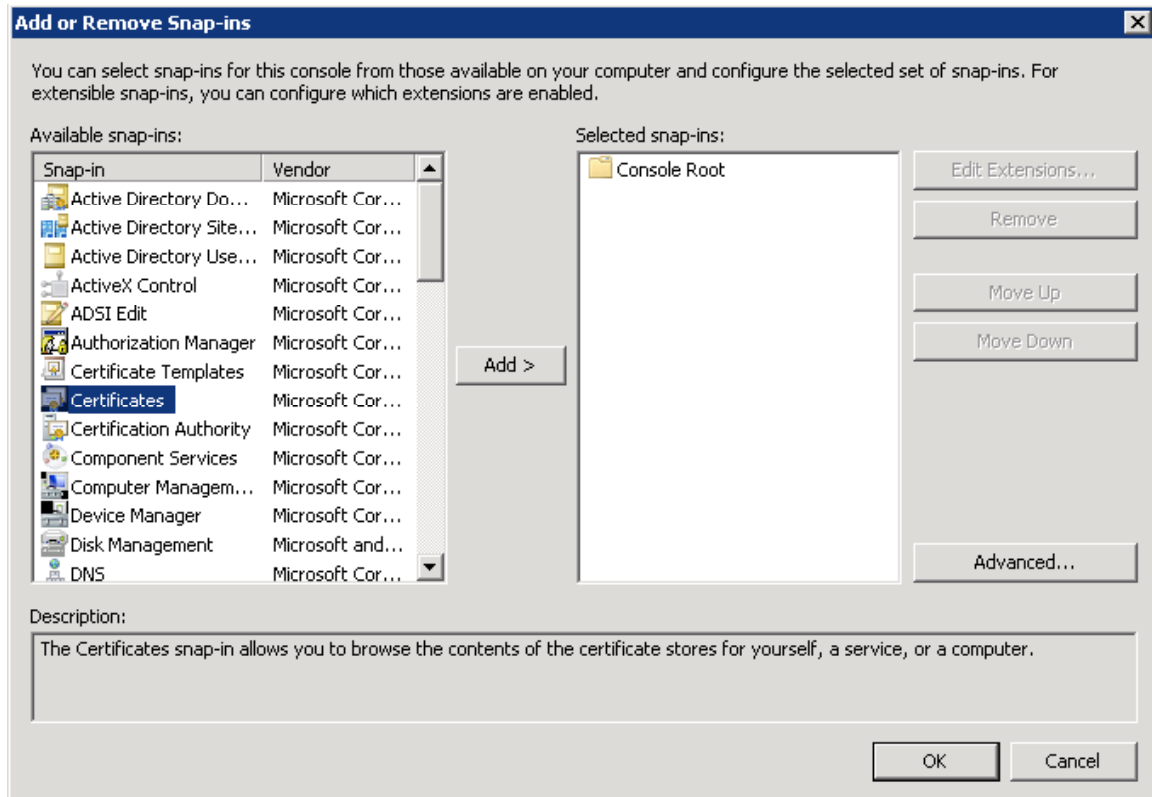


## Request Certificates (optional)

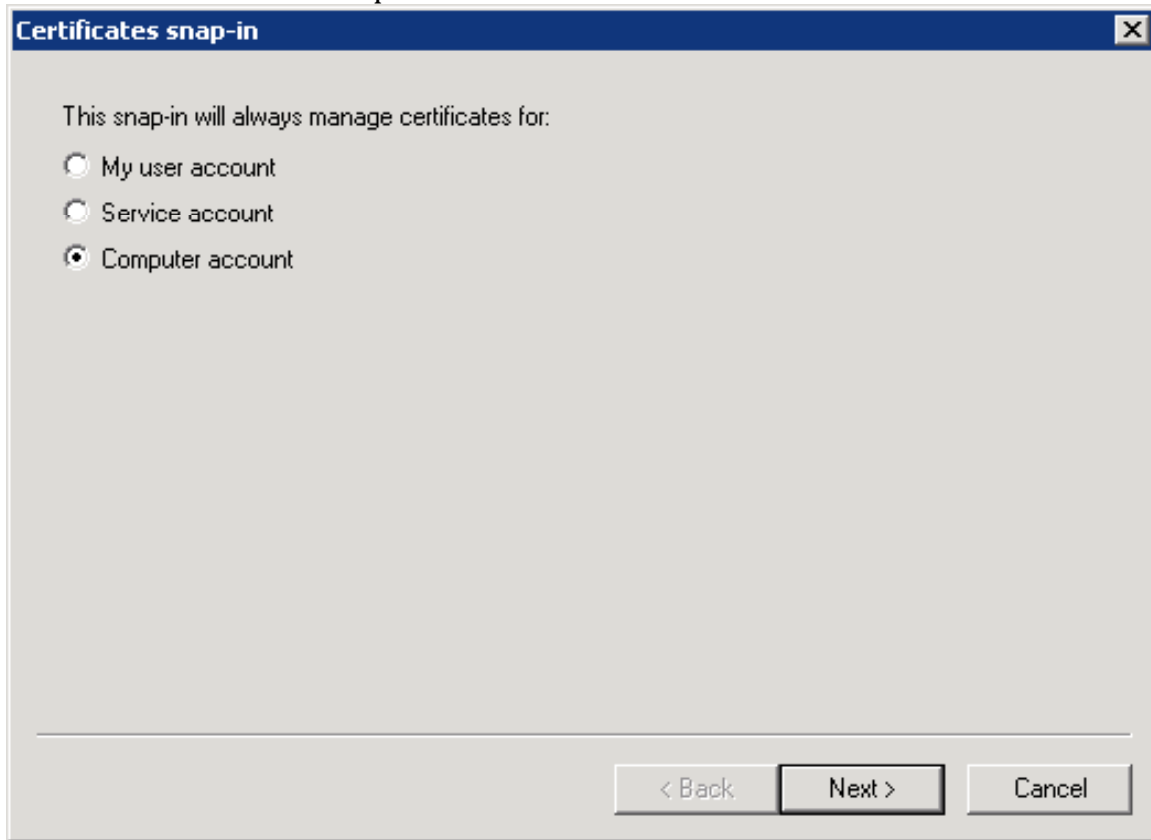
Now that we have our Certificate Authority (CA) up and running we may want to request a certificate for our Authentication Server.

We’ll create a Microsoft Management Console (MMC) that will allow us to request and install the certificate for our server. Press the “Start” button and enter “MMC” in the command field to open the MMC. Next we’ll add the Certificate (For Local Computer) snap-in by clicking “File” and choosing “Add/Remove Snap-in”. Select

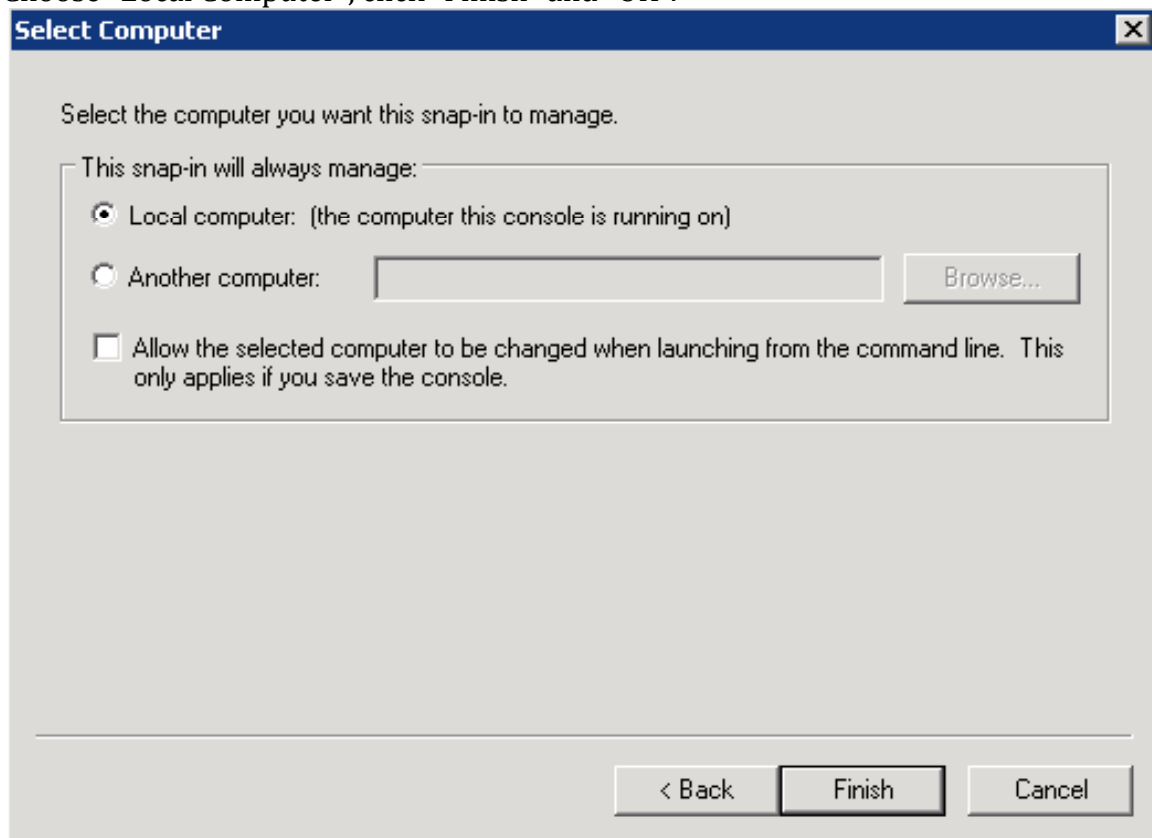
“Certificates” and click “Add”.



Now be sure to select "Computer Account" and click "Next".

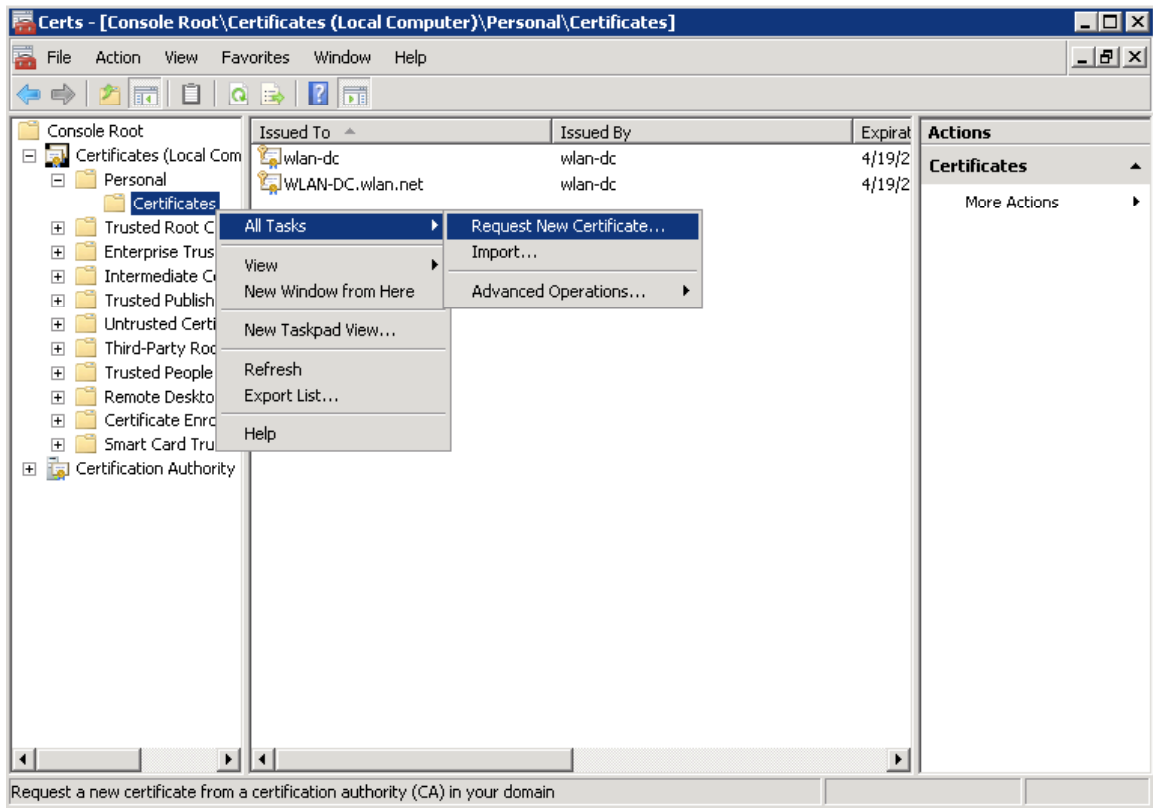


Choose “Local Computer”, click “Finish” and “OK”.



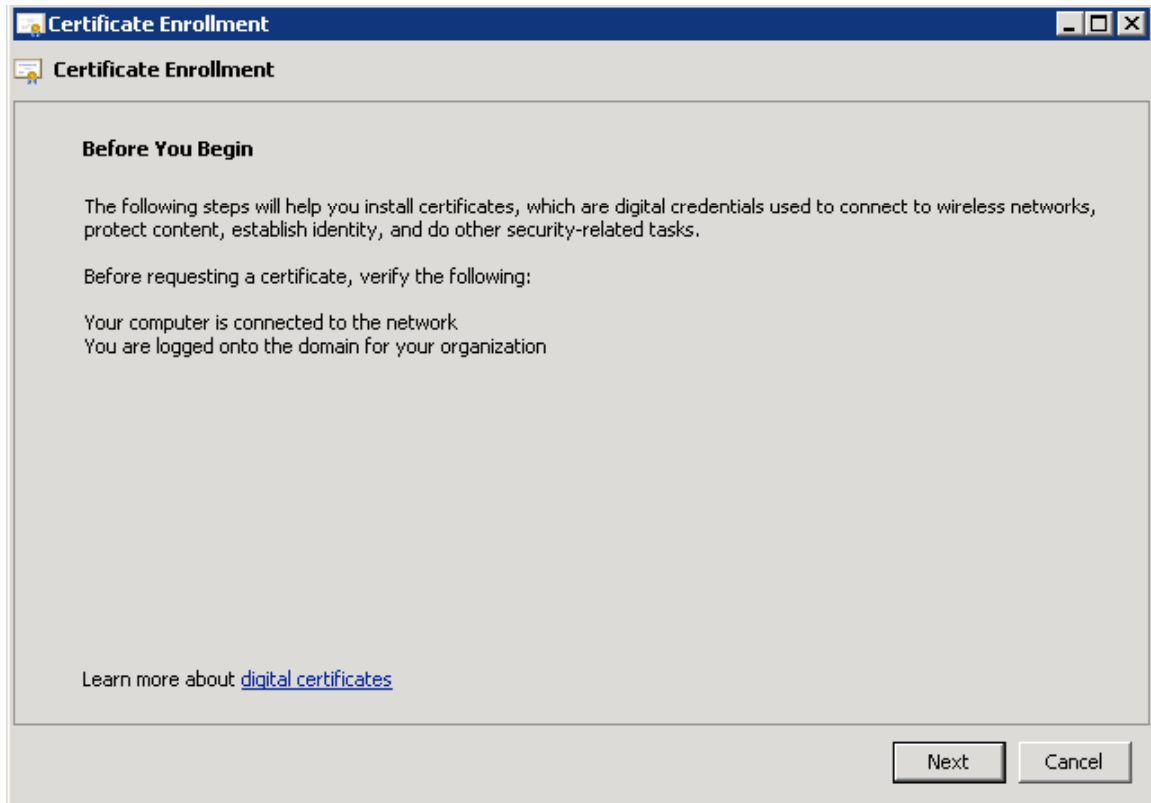
**TIP:** While you’re here you might as well add the “Certificate Authority” snap-in and save this MMC to your desktop because you’ll need it again in the future.

To request a certificate for your server (if you don’t want to use the default certificate) expand “Certificates (Local Computer Account)”, “Personal”, and right-click “Certificates” and select “All Tasks”, “Request New Certificate...”



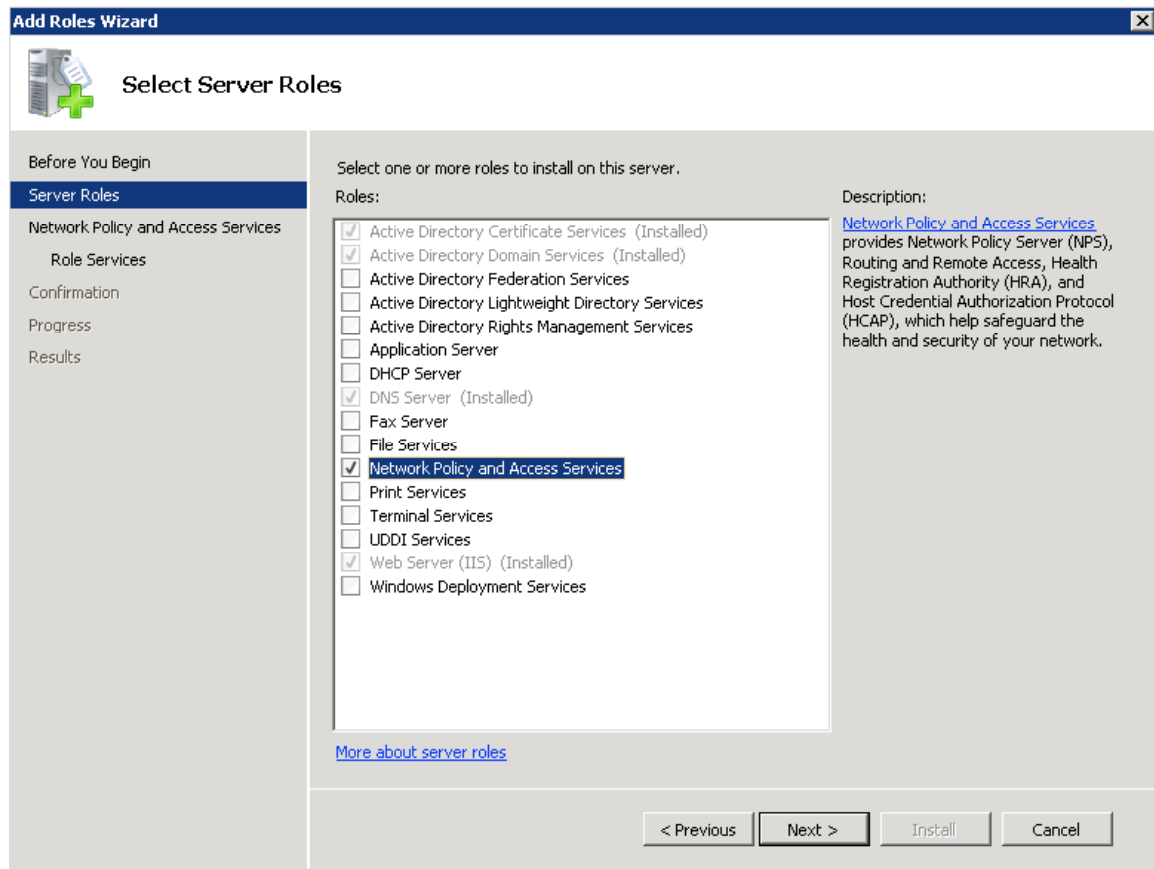
Click through the Enrollment screens choosing the settings you desire for your certificate.





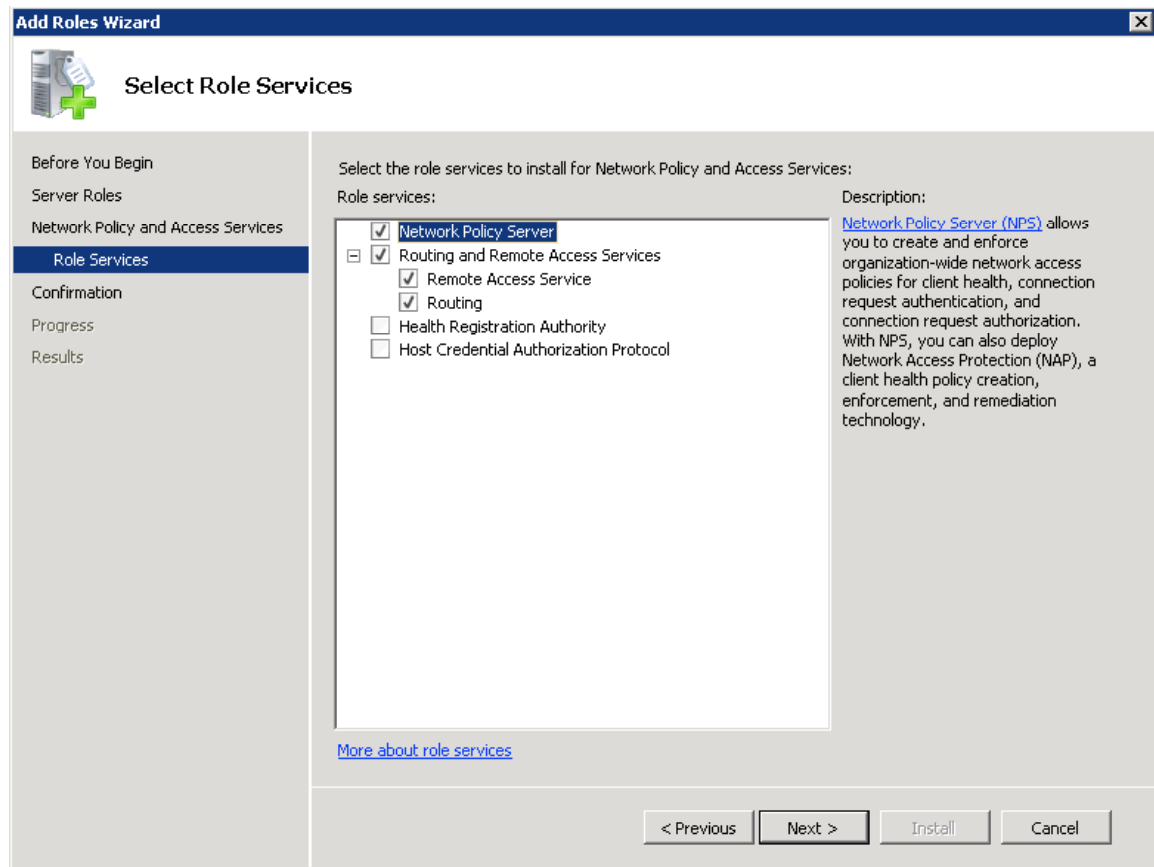
## Installing Network Policy and Access Services

In Windows 2008 Server you can no longer just install the Internet Authentication Service (IAS) and have RADIUS functionality. You must now install Network Policy and Access Services, which now include everything from earlier versions of Windows server such as RRAS/IAS/etc,... but now includes NAP (think NAC for Windows). We will be installing and configuring just enough to enable PEAP and RADIUS functionality with our Aruba controller. So once again head to the Server Manager and "Add a Role" selecting "Network Policy and Access Services" and click through the confirmation screen.



Select "Network Policy Server", "Routing and Remote Access Services", "Remote Access Service" and "Routing". Click "Next", click through the confirmation screen

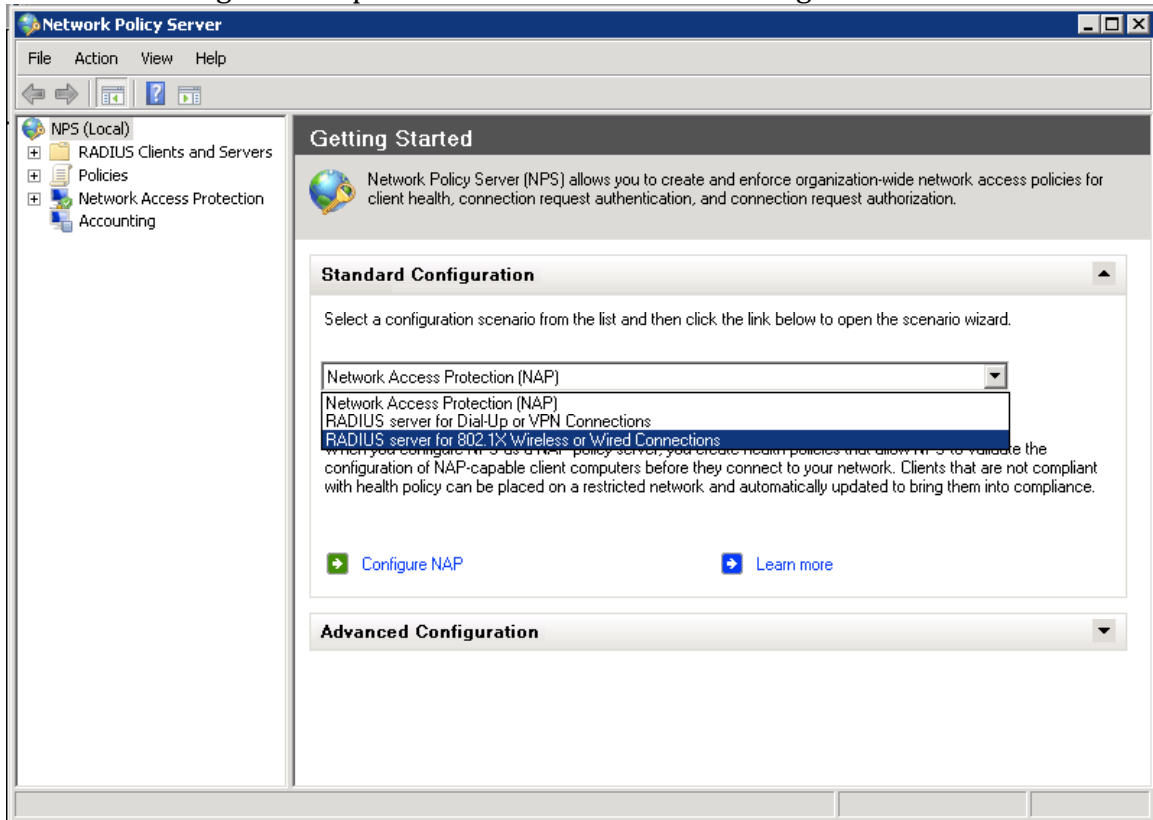
and click “Install”.



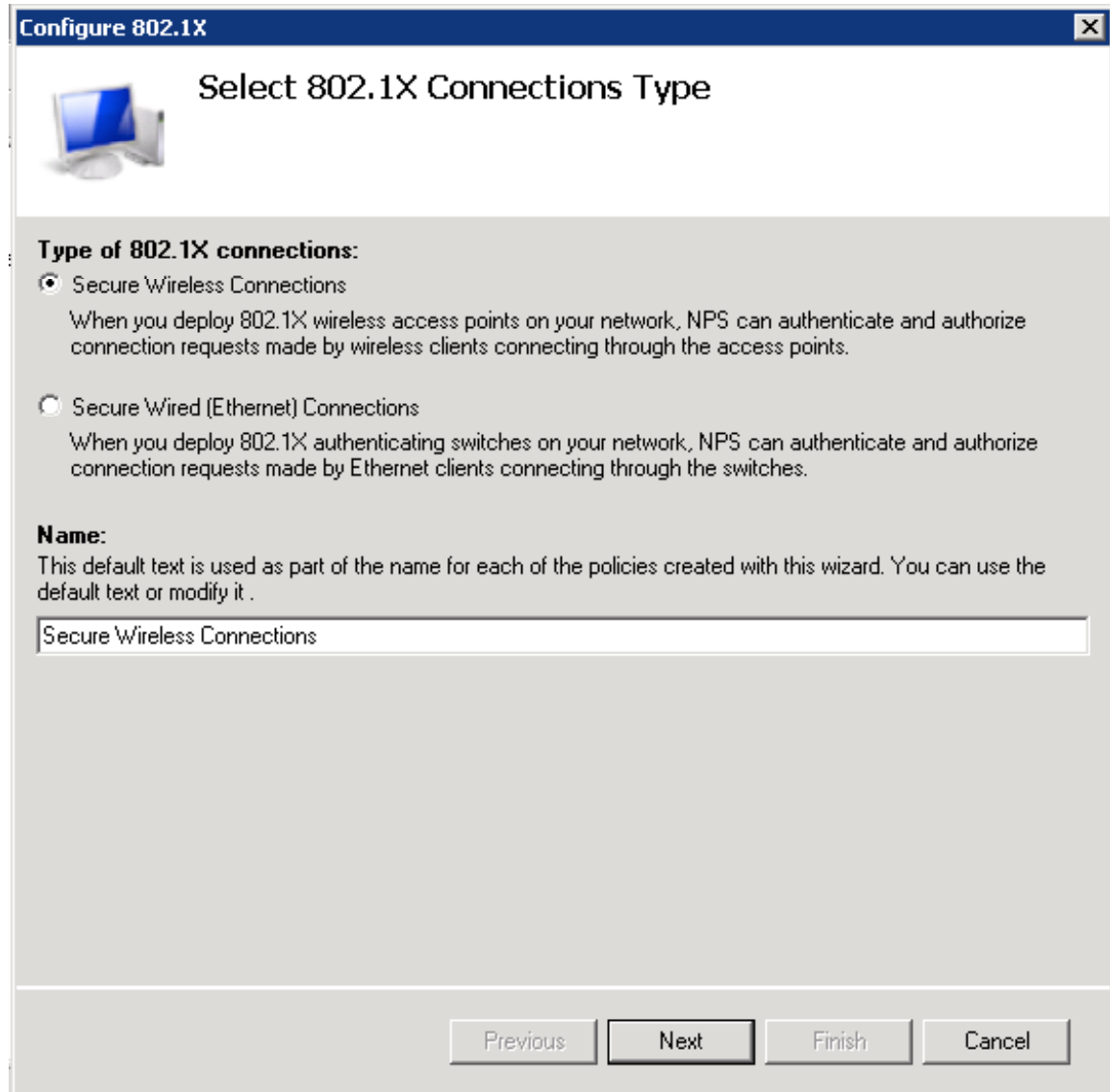
Installation will take a couple of minutes and present you with an install summary. Just click “Close”.

Now that NPS is installed, press the “Start” button and enter “nps.msc” in the command field. The NPS MMC should open up allowing you to select the “RADIUS server for 802.1X Wireless or Wired Connections” Installation Wizard from the

“Standard Configuration” pull-down menu and click “Configure 802.1X”.



From the “Select 802.1X Connections Type” page, select “Secure Wireless Connections” and click “Next”.



The screenshot shows a Windows-style dialog box titled "Configure 802.1X". The main heading is "Select 802.1X Connections Type". There is a small icon of a computer monitor and mouse to the left of the heading. Below the heading, there are two radio button options under the section "Type of 802.1X connections:". The first option, "Secure Wireless Connections", is selected. Below it is a descriptive paragraph: "When you deploy 802.1X wireless access points on your network, NPS can authenticate and authorize connection requests made by wireless clients connecting through the access points." The second option is "Secure Wired (Ethernet) Connections", with a descriptive paragraph: "When you deploy 802.1X authenticating switches on your network, NPS can authenticate and authorize connection requests made by Ethernet clients connecting through the switches." Below these options is a section labeled "Name:" with a sub-instruction: "This default text is used as part of the name for each of the policies created with this wizard. You can use the default text or modify it." Underneath this instruction is a text input field containing the text "Secure Wireless Connections". At the bottom of the dialog box, there are four buttons: "Previous", "Next", "Finish", and "Cancel". The "Next" button is highlighted with a dark border.

**Configure 802.1X**

**Select 802.1X Connections Type**

**Type of 802.1X connections:**

Secure Wireless Connections  
When you deploy 802.1X wireless access points on your network, NPS can authenticate and authorize connection requests made by wireless clients connecting through the access points.

Secure Wired (Ethernet) Connections  
When you deploy 802.1X authenticating switches on your network, NPS can authenticate and authorize connection requests made by Ethernet clients connecting through the switches.

**Name:**  
This default text is used as part of the name for each of the policies created with this wizard. You can use the default text or modify it .

Secure Wireless Connections

Previous Next Finish Cancel

From the “Specify 802.1X Switches” screen click “Add...” and enter the settings for your Aruba controller and press “OK”.

The image shows a software interface for configuring 802.1X switches. The main window is titled "Specify 802.1X Switches" and contains the following text:

RADIUS clients are network access servers, such as authenticating switches and wireless access point. RADIUS clients are not client computers.

To specify a RADIUS client, click Add.

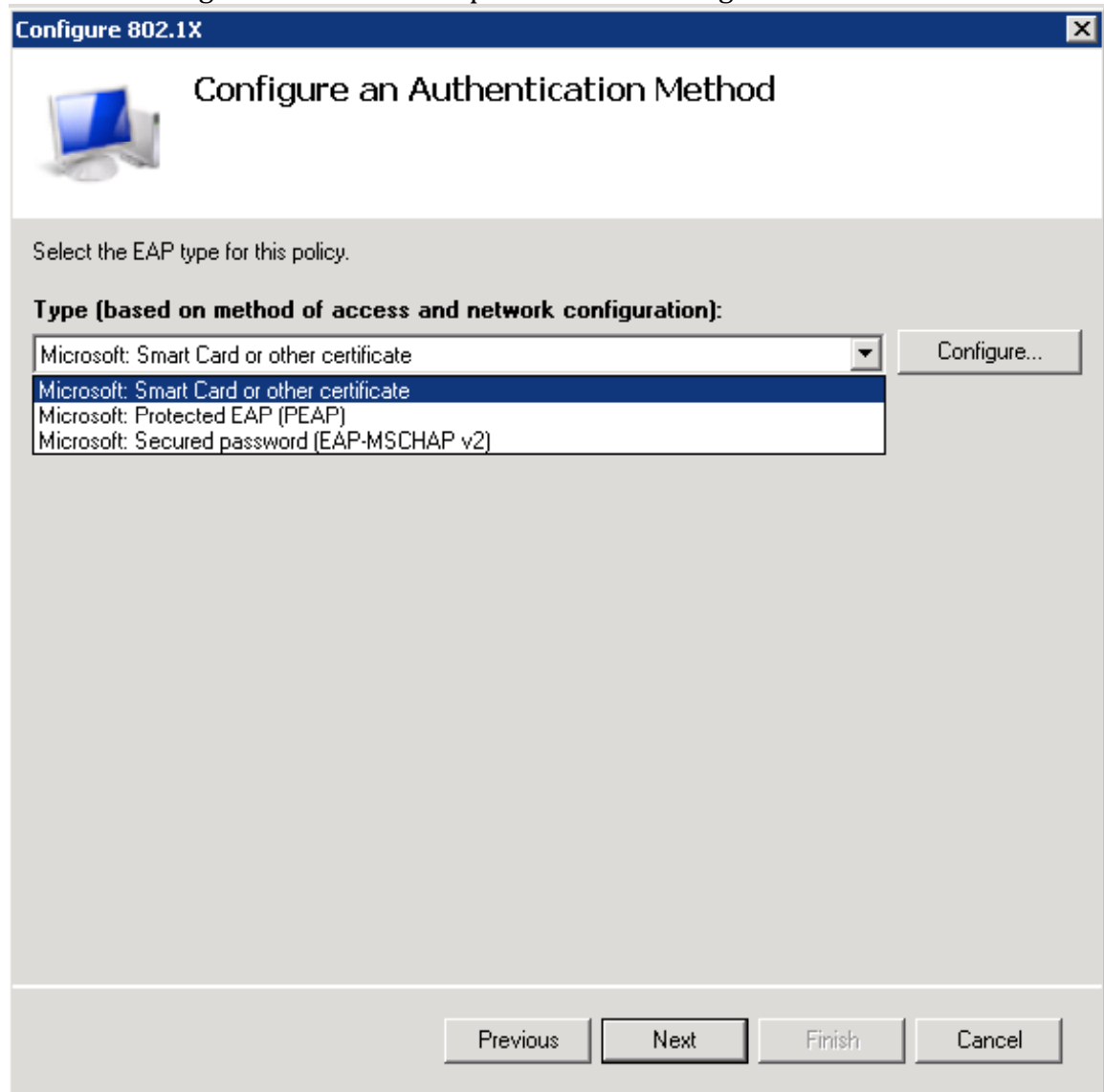
A "New RADIUS Client" dialog box is open, showing the following fields and options:

- Name and Address:**
  - Friendly name: Aruba-Master
  - Address (IP or DNS): 10.1.0.250
  - Verify... button
- Shared Secret:**
  - Instructions: To manually type a shared secret, click Manual. To automatically generate a shared secret, click Generate. You must configure the RADIUS client with the same shared secret entered here. Shared secrets are case-sensitive.
  - Radio buttons:  Manual,  Generate
  - Shared secret: [Redacted]
  - Confirm shared secret: [Redacted]

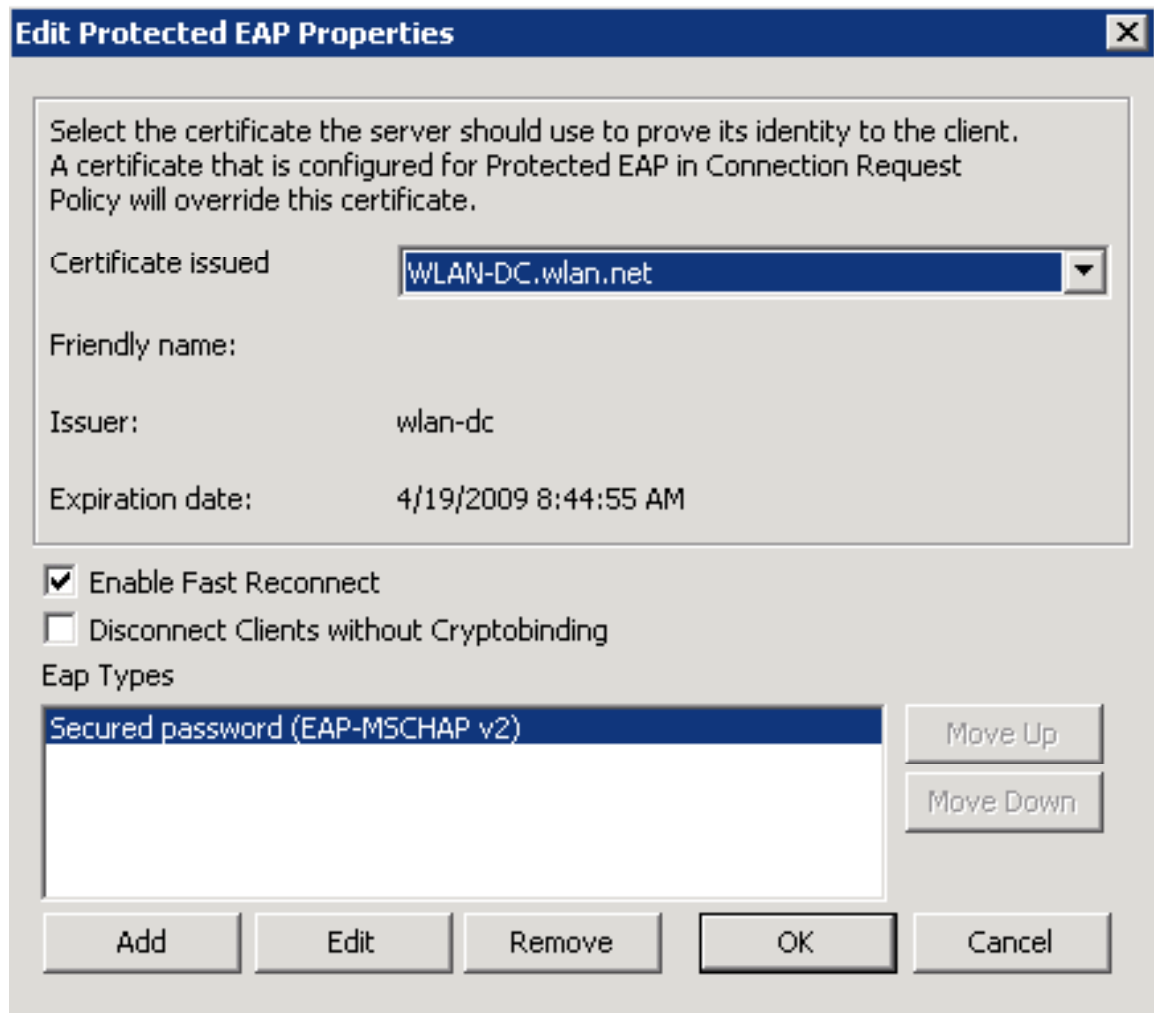
Buttons on the right side of the main window include "Add...", "Edit...", and "Remove". Buttons at the bottom of the dialog box include "OK" and "Cancel".

For the “Configure an Authentication Method” screen select “Microsoft Smart Card or other certificate” for EAP-TLS or “Microsoft Protected EAP (PEAP)” for PEAP. I

will be selecting PEAP for this example and click "Configure..."



Select the appropriate certificate to use for this server. In this case we'll use the "WLAN-DC.wlan.net" certificate and click "OK".



For the "Specify User Groups" screen select the users and/or groups you would like to allow wireless access. For this example I am allowing all of my domain users by selecting the "Domain Users" group. If I want to enforce Machine Authentication I need to add the "Domain Computers" group as well as checking the "Enforce Machine Auth" option in the dot1x policy on my Aruba controller. Click "Next" to continue.

**Note:** Groups listed here are considered as an OR statement.





### Specify User Groups

Users that are members of the selected group or groups will be allowed or denied access based on the network policy Access Permission setting.

To select User Groups, click Add. If no groups are selected, this policy applies to all users.

Groups
WLAN\Domain Users
WLAN\Domain Computers

Add...

Remove

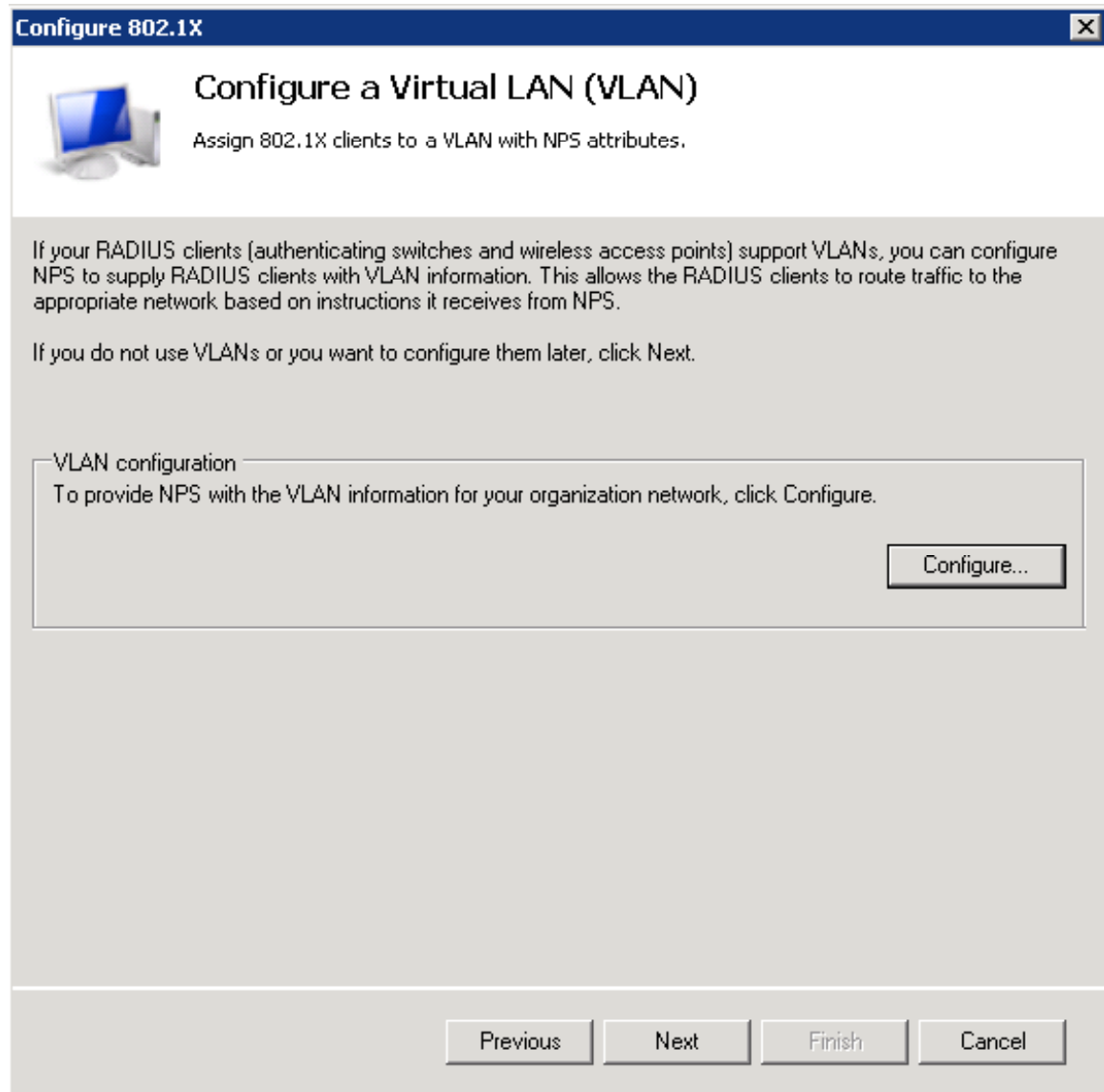
Previous

Next

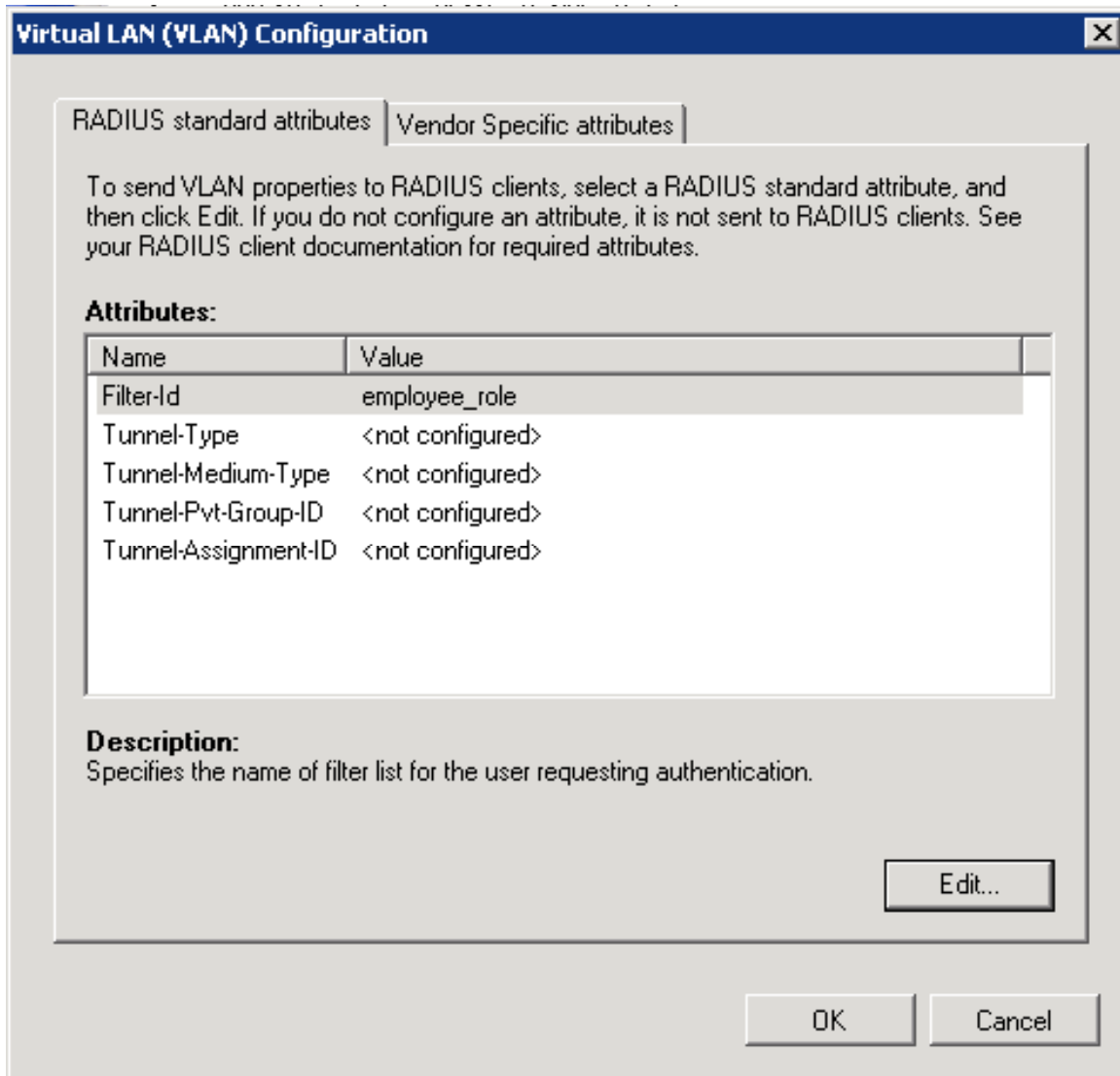
Finish

Cancel

For the next screen you can click “Next” and “Finish” or click “Configure...” to add RADIUS attributes for Server Derivation rules.



For example, you may want to map the “Domain Users” to the “employee\_role” on your Aruba controller. You could do that here with the “Filter-Id” attribute.



**Note:** There seems to be a bug in Windows if you mess with these attributes too much the “Filter-Id” attribute vanishes. If this happens cancel out of the wizard and start over.

Press “Next” and “Finish” to complete the wizard. This should now allow you to authenticate users against your Windows 2008 Server. To test your configuration, ssh to your Aruba controller and configure it to use the new RADIUS server.

```
(MC800) >en
```

```
Password:*****
```

```
(MC800) #configure terminal
```

Enter Configuration commands, one per line. End with CNTL/Z

```
(MC800) (config) #aaa authentication-server radius nps
(MC800) (RADIUS Server "nps") #host 10.1.0.236
(MC800) (RADIUS Server "nps") #enable
(MC800) (RADIUS Server "nps") #key p@ssw0rd
(MC800) (RADIUS Server "nps") #nas-identifier Aruba-Master
(MC800) (RADIUS Server "nps") #nas-ip 10.1.0.250
```

**Now test to see if everything is working properly.**

```
(MC800) #aaa test-server mschapv2 nps tobias qwerty12!@
```

Authentication successful