How to Logon with Domain Credentials to a Server in a Workgroup

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Version 1.0

Authentication Overview

Basically when you logon to a Windows Server you can logon locally using a local username and password or you can use a username and password from Active Directory when your server is joined into a domain. What if your server belongs to a workgroup and you need to logon with your domain credentials? That's what this paper is all about.

Our goal is to logon with our domain credentials even when the server is not a member of the domain. The tool used to accomplish this task is pGina. pGina is an Open Source Windows Authentication and Access Management tool to logon with a username using a backend of your choice. For example the backend can be a LDAP Server or a RADIUS Server.

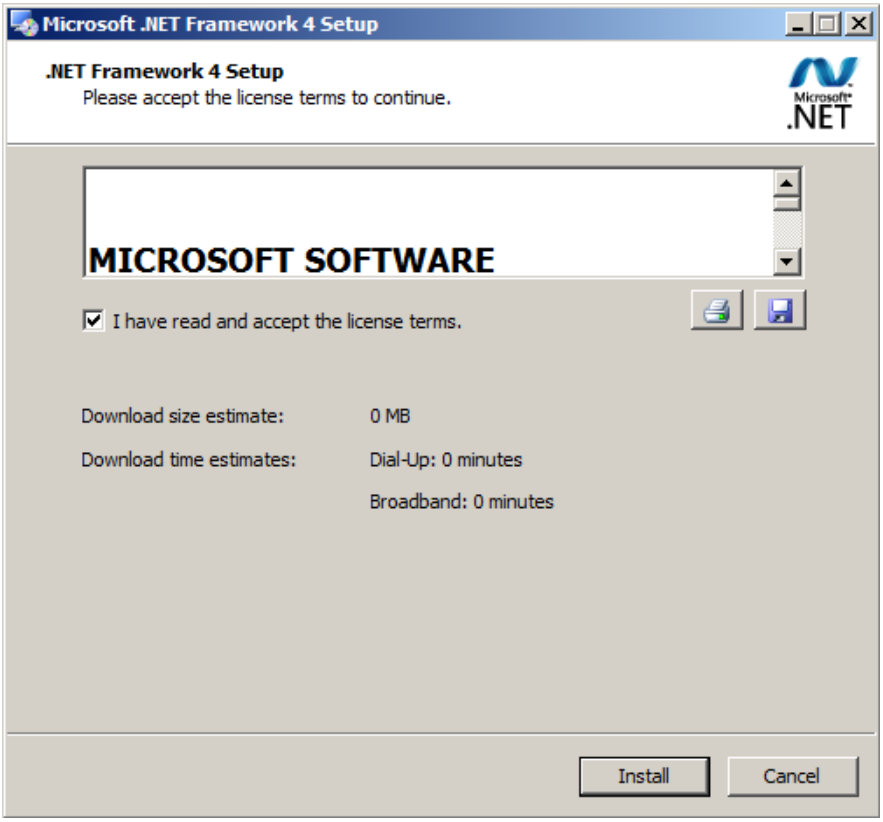
In the next two sections you can find the procedure how to logon to a server in a workgroup with your domain credentials if the backed authentication server is a LDAP server. In the second part you can find the procedure how to logon to a server in a workgroup with your domain credentials if the backed authentication server is a RADIUS server.

pGina Installation Task List

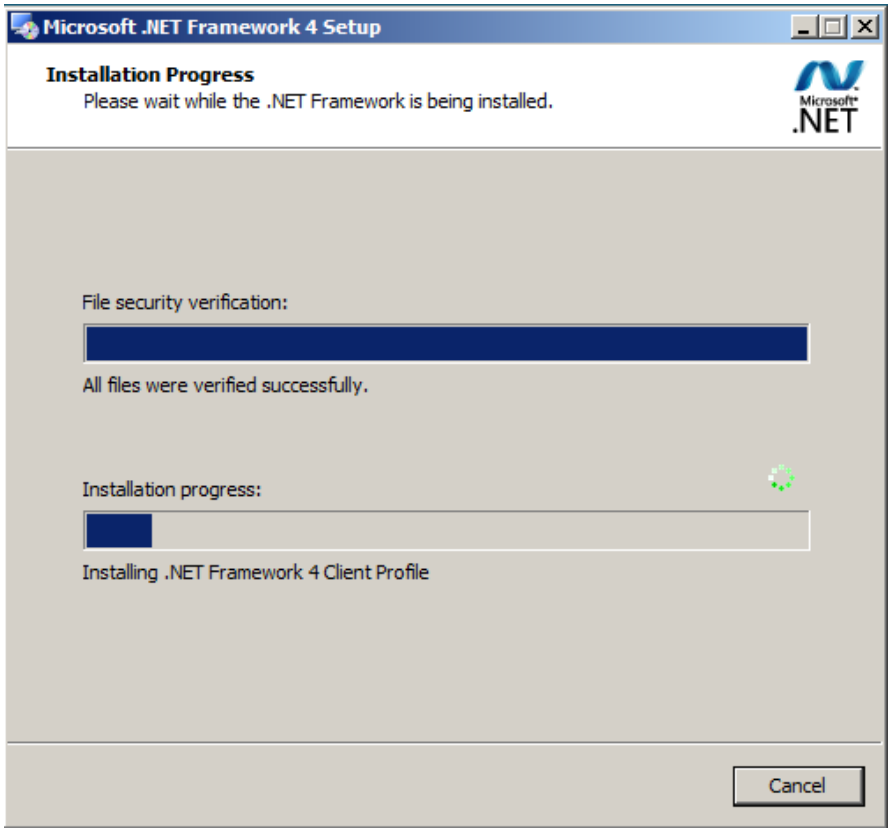
- △ Install .NET Framework 4.0
- △ Install VC++ 2012 Redistributable
- △ Install pGina

Install .NET Framework 4.0

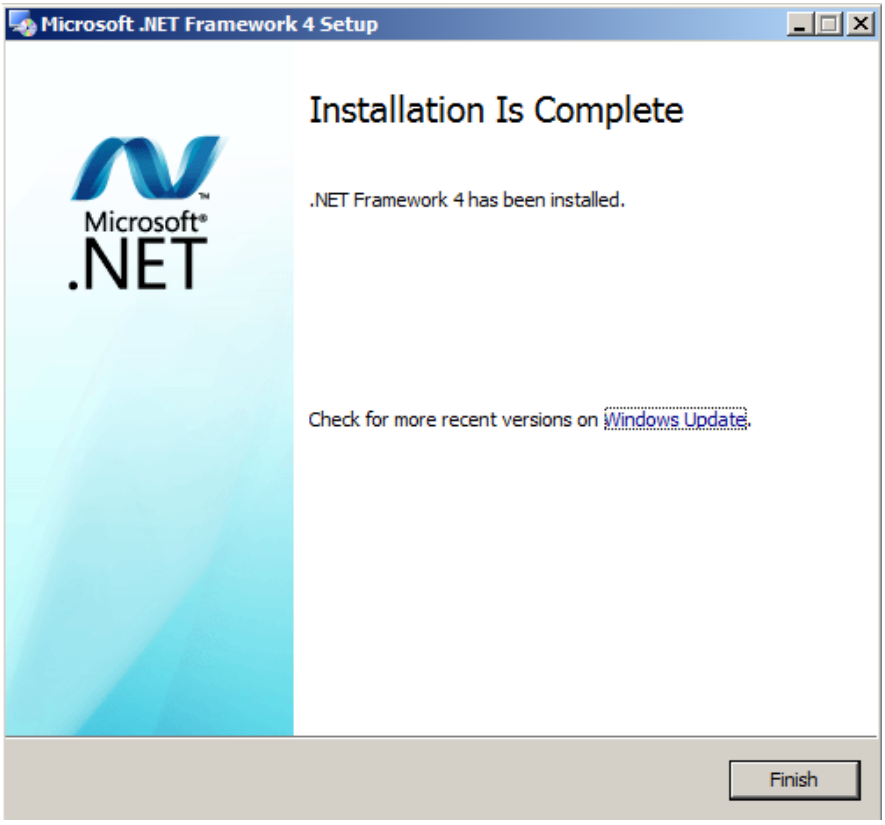
- Double click on your .NET Framework 4 file to launch the installation process



- On the **.NET Framework 4 Setup** page, select I have read and accept the license terms and click Install
- The installation progress starts

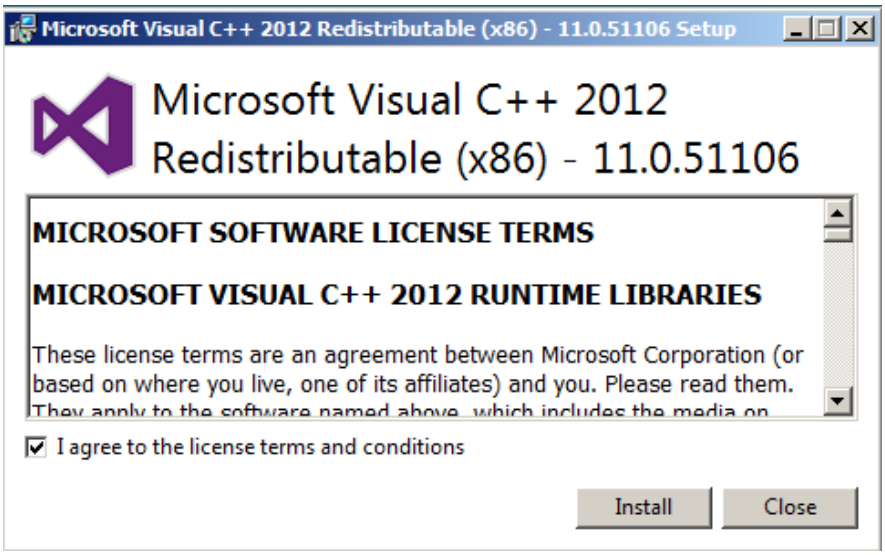


- On the **Installation Is Complete** page, click Finish

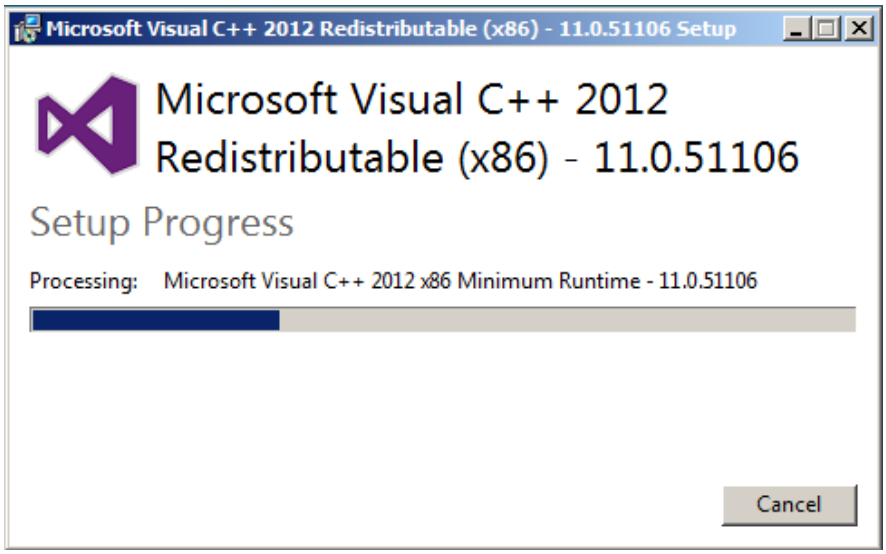


Install VC++ 2012 Redistributable

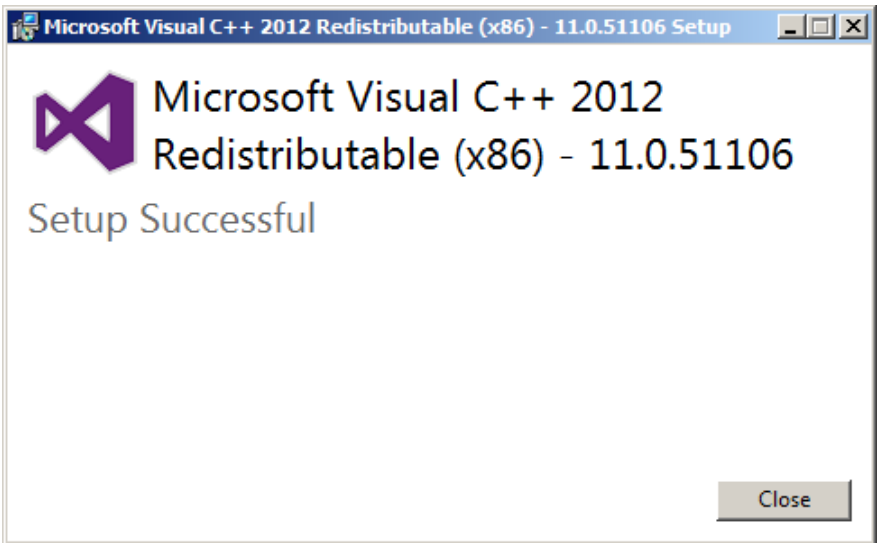
- Double click on your Visual C++ 2012 Redistributable File to launch to installation process



- Select I agree to the license terms and conditions and click Install
- The Setup process starts

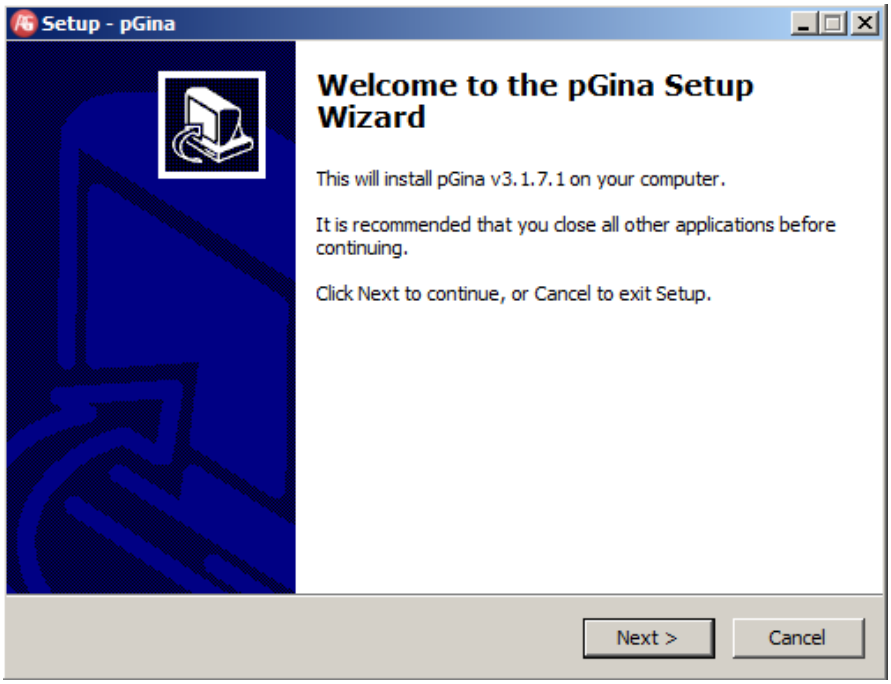


- On the **Setup Successful** page click Close

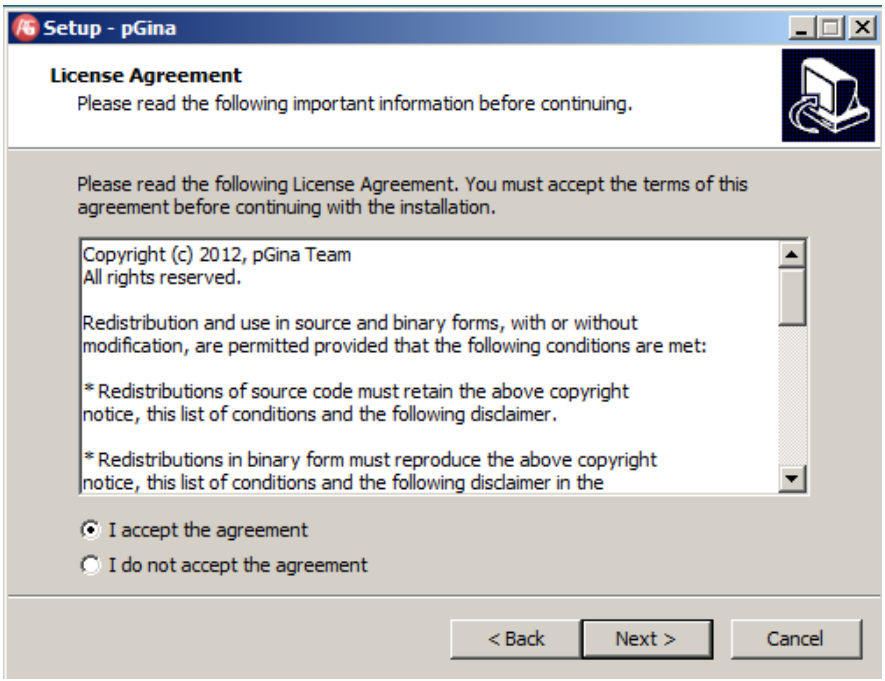


Install pGina

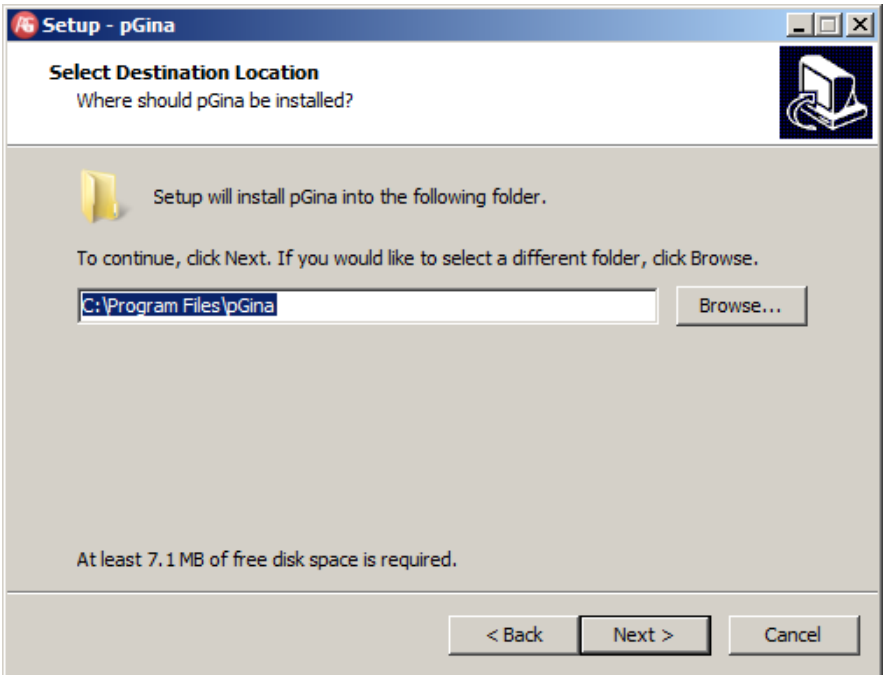
- Double click on your pGina installation file to launch the process
- On the **Welcome to the pGina Setup Wizard** page, click Next



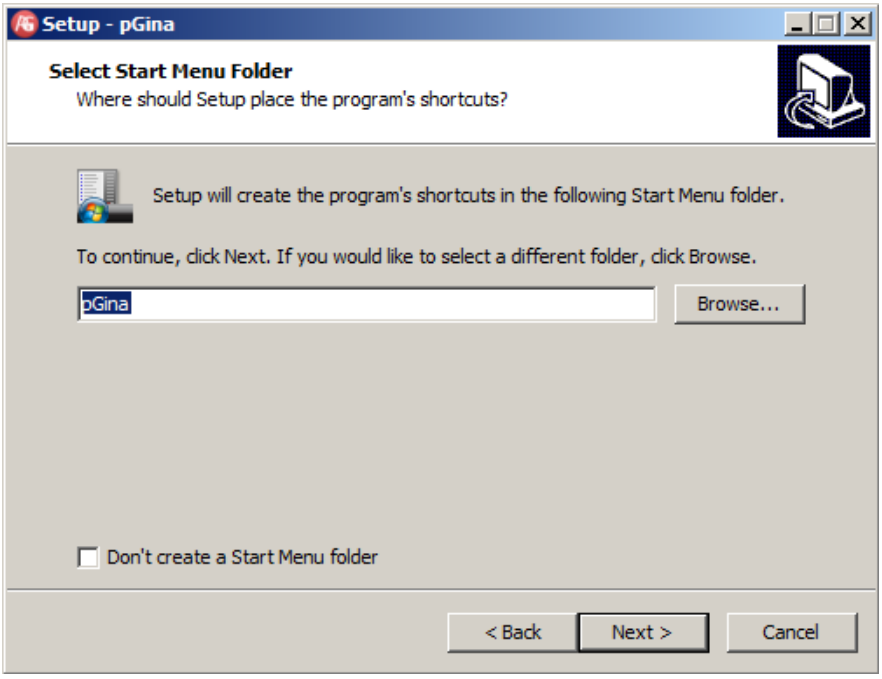
- On the **License Agreement** page, select I accept the agreement and click Next



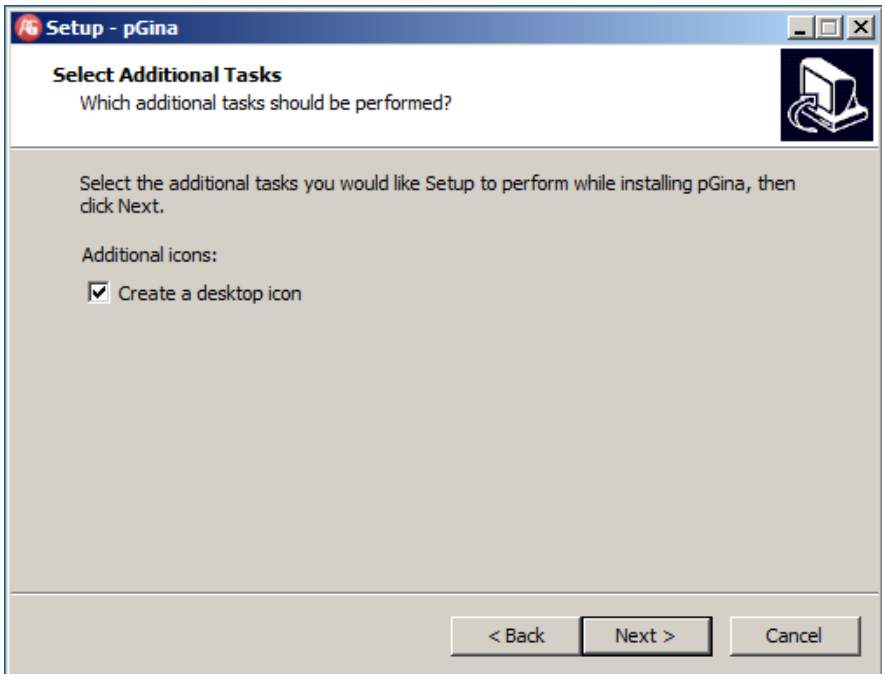
- On the **Select Destination Location** page, click Next



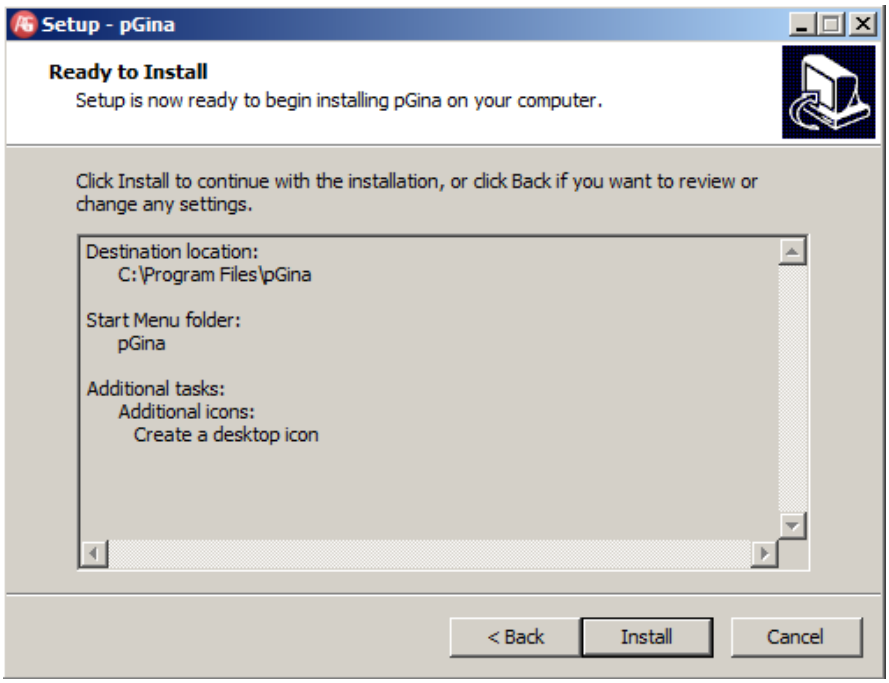
- On the **Select Start Menu Folder** page, click Next



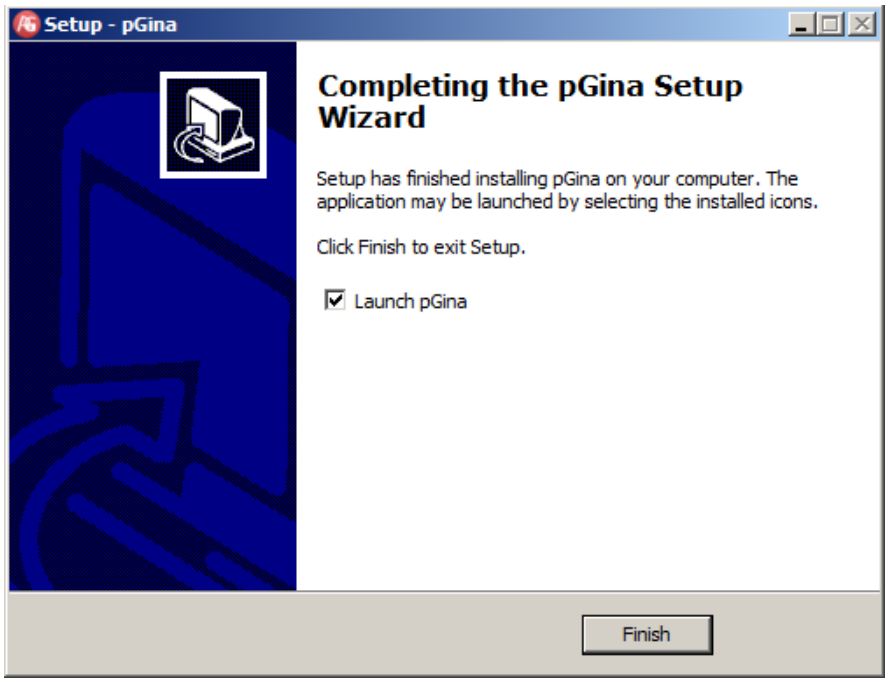
- On the **Select Additional Tasks** page, select Next



- On the **Ready to Install** page, click Install



- On the **Completing the pGina Setup Wizard** page, click Finish



After installation, a pGina service is created and runs under System account.

LDAP Authentication

How it works

pGina captures the user his credentials, makes a connection to your LDAP server and verifies if the user exists in Active Directory and that the password is correct. pGina also verifies if the user is a member of a specific group. This group can be specified in the authorization process. If authentication is successful, pGina creates a local user account on the workgroup server with the same username/password as your domain user and adds the user account into a security group

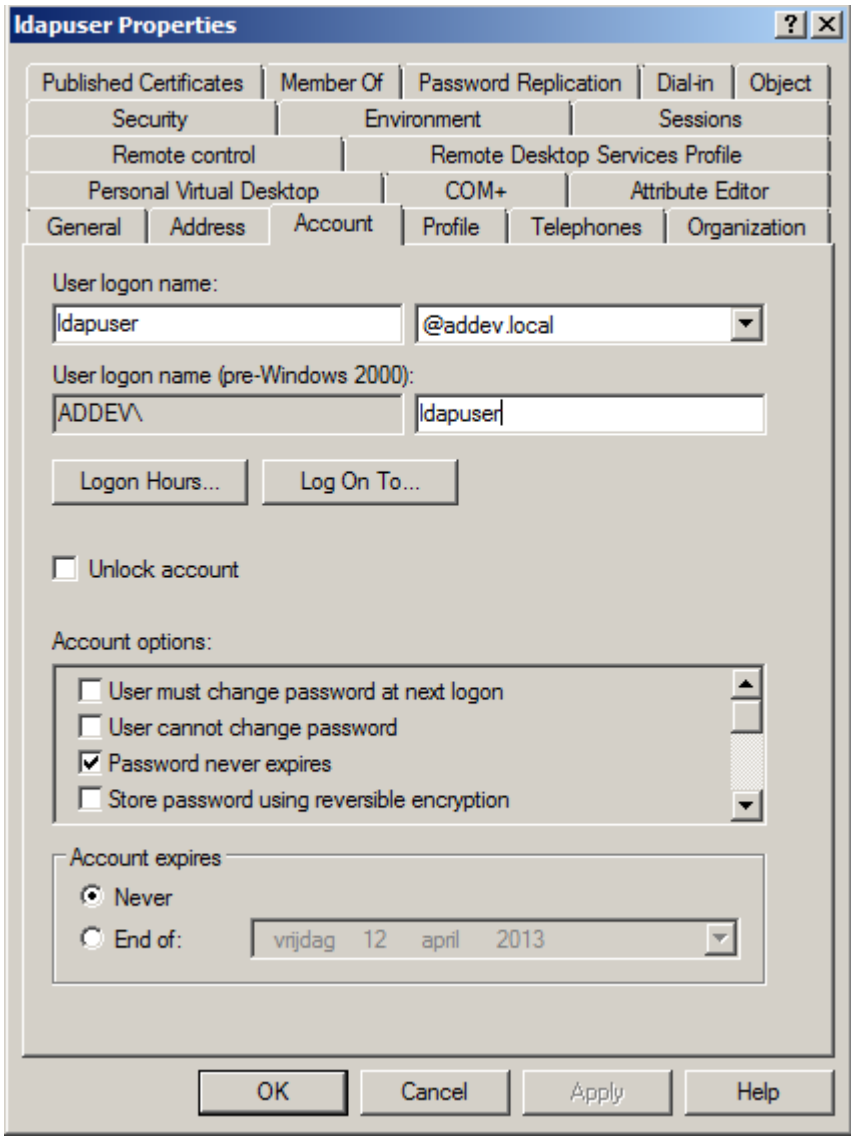
defined in the gateway process. When the user logs off, the local user account and his profile are deleted from your workgroup server.

LDAP Authentication Task List

- △ Create a LDAP user account
- △ Create and configure your LDAP Administrators group in Active Directory
- △ Configure pGina
- △ Configure LDAP plugin
- △ Configure Local Machine plugin
- △ Simulate your connection
- △ Logon
- △ LDAP Authentication Debug

Create a LDAP user account

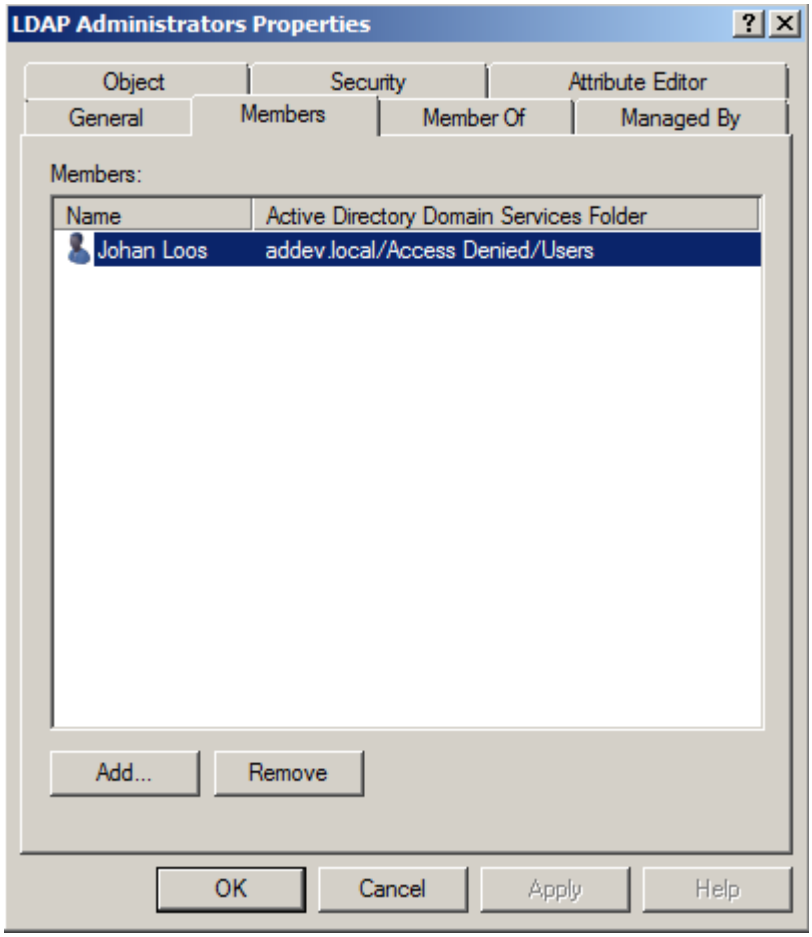
- Open **Active Directory User and Computers** from **Administrative Tools**
- Create a new user account which can be used to perform LDAP queries



Create and configure your LDAP Administrators group in Active Directory

All members of this group are allowed to logon into a server in a workgroup via LDAP.

- Open **Active Directory Users and Computers** from **Administrative Tools**
- Create a new group and add to required users on the Members tab



Configure pGina

Before you can logon with your domain credentials, you need to configure some plugins. pGina delegates the logon process to plugins. Depending on the type of backend you choose. In our example the backend server is a LDAP server. The process is done in three stages:

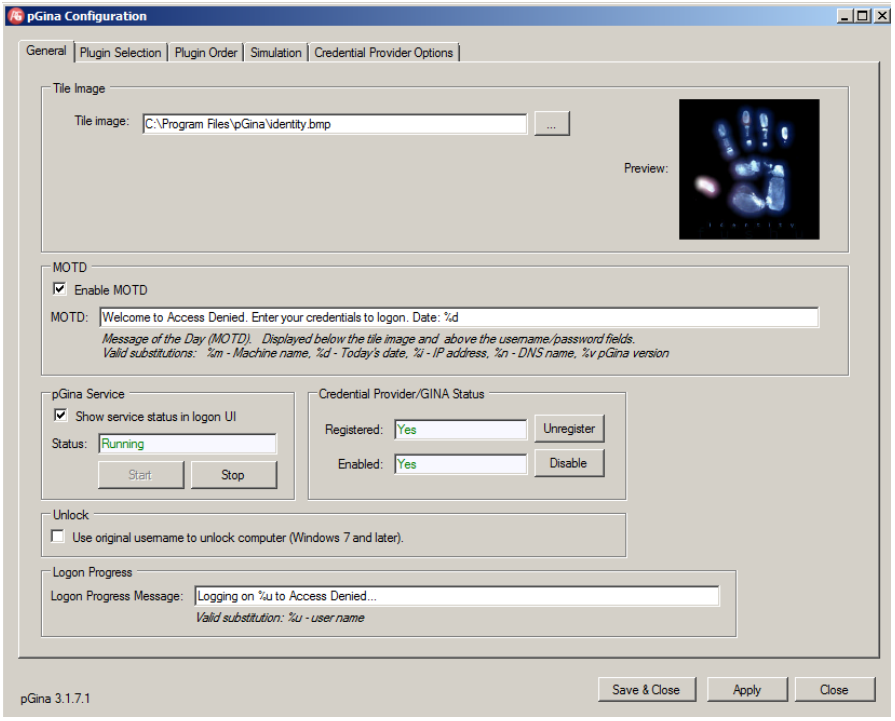
Authentication: This process validates the credentials of the user account

Authorization: This process determines if the user is allowed to access resources. This is done via group membership

Gateway: This process can be used to provide account management

- On the **General** page, configure the following settings
  - You can select a bitmap Tile Image which is displayed in the logon screen
  - You can enable the Message of the Day (MOTD). This message is displayed in the logon screen

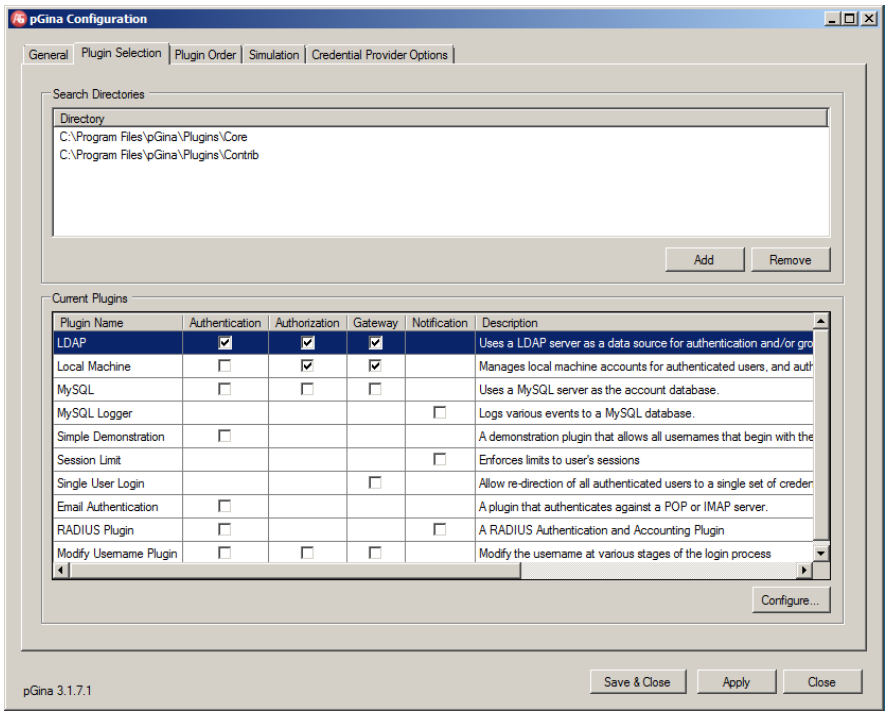
- You can also specify a Logon Progress Message which is displayed when the user is successful authenticated



- Click Apply and click Save & Close

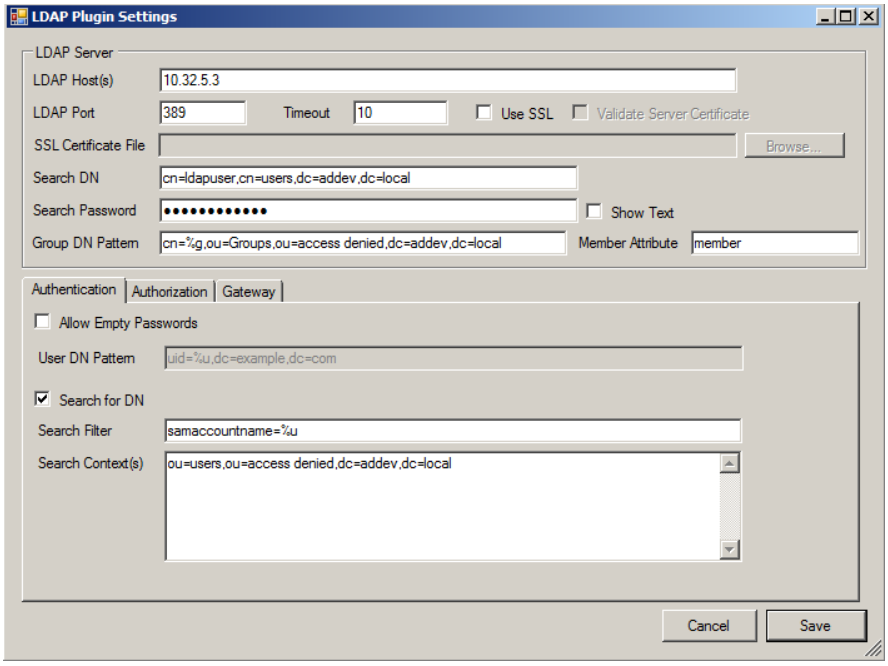
Configure LDAP plugin

- On the **Plugin Selection** page, select the LDAP Plugin
- Select Authentication, Authorization, and Gateway checkbox and click on Configure

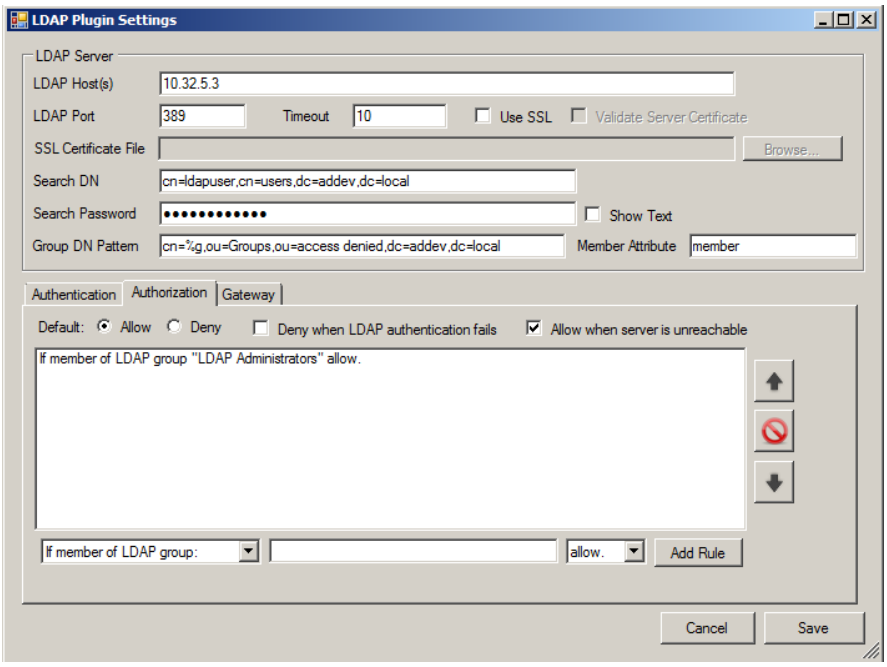


- On the **Authentication** page, select the following

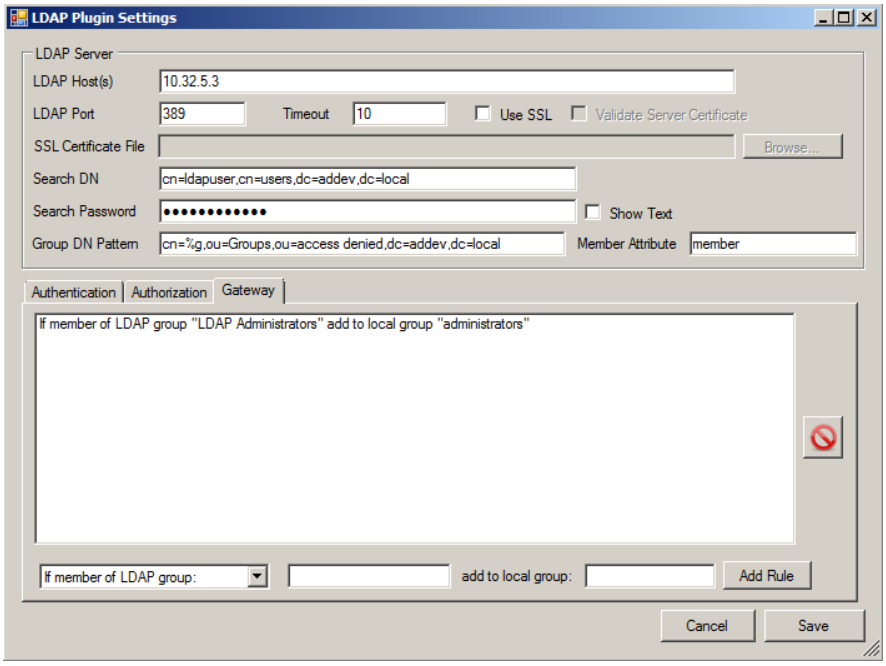
- In the LDAP Hosts field, type the IP address or FQDN of your LDAP Servers (Active Directory Domain Controllers)
- In the LDAP Port field, type the port where your LDAP server is listening on (389, or 636 for SSL)
- You can check the Use SSL field to perform authentication over SSL. Be sure that your domain controller has a trusted certificate and that the certificate of the Root CA is available on this server
- In the Search DN field, type the Distinguish name of the account which is used to bind/connect to your LDAP server. This account is also used to search in Active Directory when you launch a LDAP query
- In the Search Password field, type the password of your Search DN account
- In the Group DN Pattern field, type the Distinguish Name of the location when converting a group name to a LDAP DN
- In the Member Attribute field, type the LAP attribute used to store group members. If you are using the object class groupOfNames ,then type member
- Search for DN and Search Contexts to look for an account in the location you specify. In my case, I look for the samaccountname username for the location specified in Context value. You can add more contexts if you want to search in several locations in Active Directory



- On the **Authorization** page, select the following
  - If member of LDAP Group: Type a group which currently exists in Active Directory to authorize users from Active Directory. If the user is a member of the security group LDAP Administrators (which is available in Active Directory) then access is allowed.



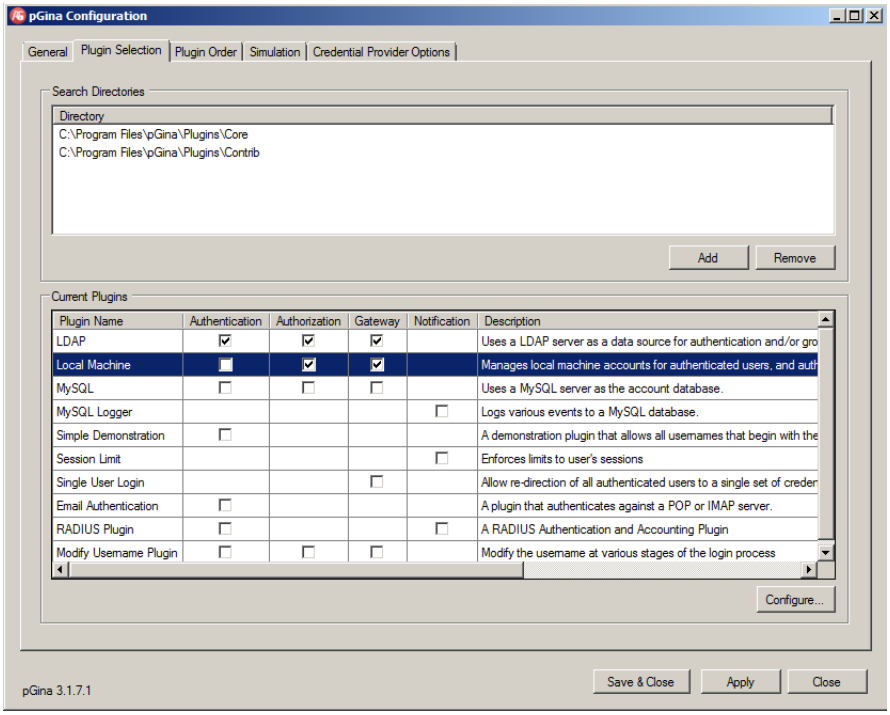
- On the **Gateway** page, select the following
  - If member of LDAP group: Verify if the user is a member of this group and add this user into a local group which exists on the local machine



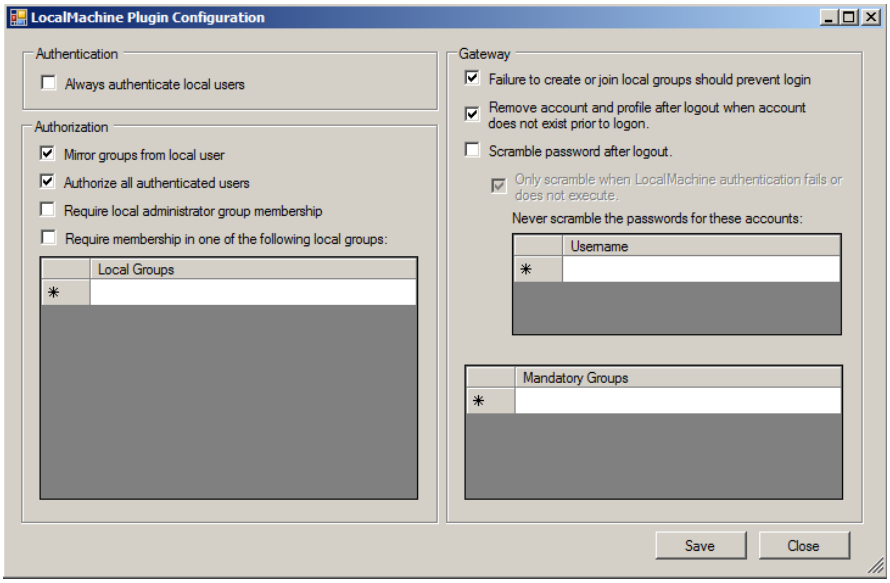
- Click Save

Configure Local Machine plugin

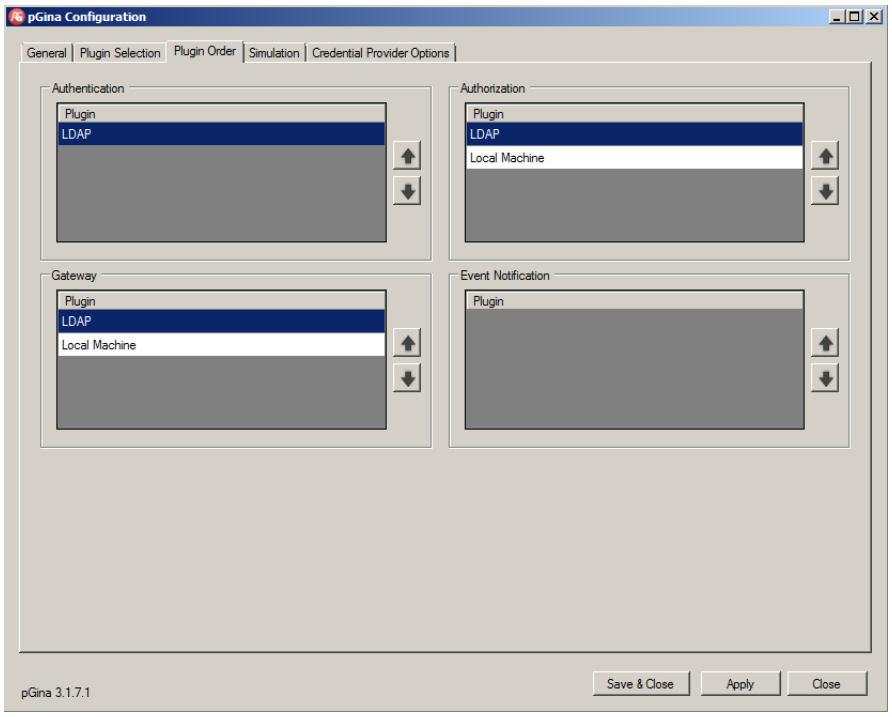
- On the **Plugin Selection** page, Select the Local Machine Plugin
- Select Authorization, Gateway, and click on Configure



- On the **LocalMachine Plugin Configuration** page, select the following
  - Authorize all authenticated users: All authenticated users will be authorized
  - Remove account and profile after logout: When the user logs off, the plugin deletes the user account and the profile from that server

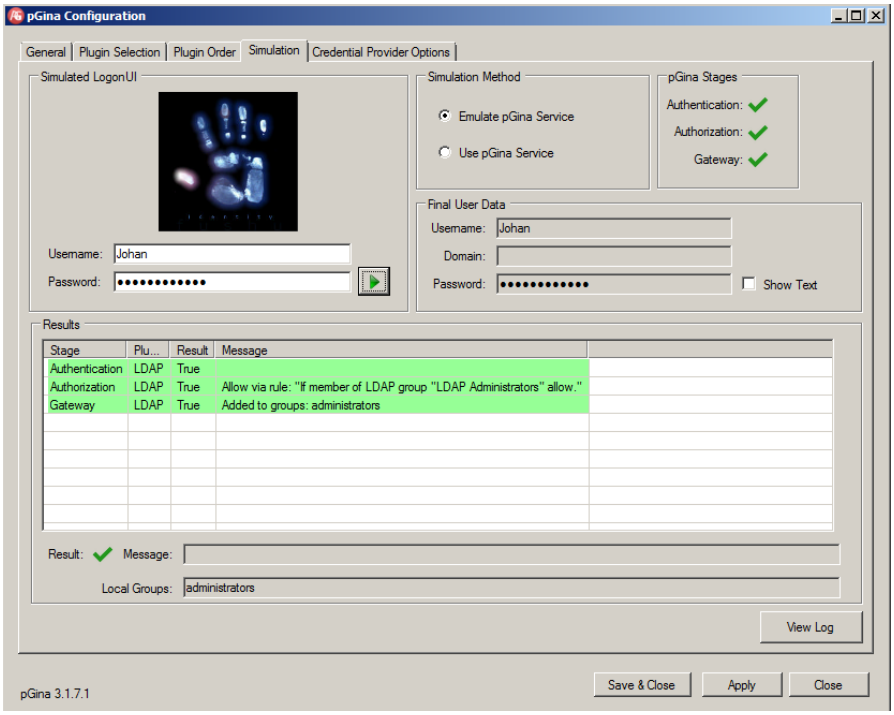


- Click Save
- On the **Plugin Order** page, move the plugins in the correct order



Simulate your connection

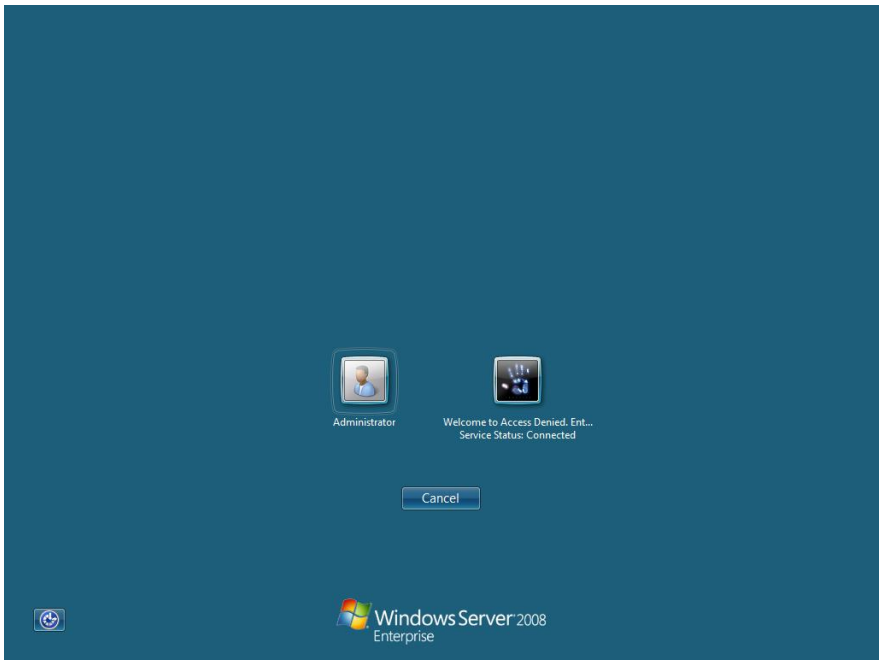
- On the **Simulation** page, type a username and password of the account which you want to use to logon and click on the Play button



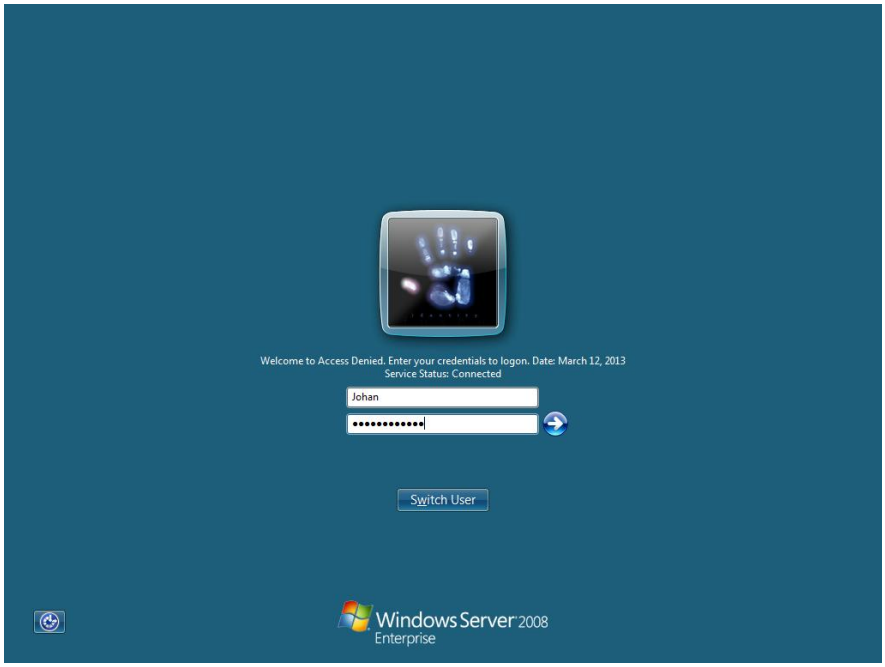
- The result are displayed in the Result pane
- Click Save & Close

Logon

- On your logon screen press CTRL+ALT+DEL and select switch user



- Type your domain credentials to logon



- Press Enter to logon
- You are now logged on the your workgroup server and member of the local administrators group

LDAP Authentication Debug

- pGina binds a LDAP connection to our LDAP server using our user ldapuser

```
Frame 8: 126 bytes on wire (1008 bits), 126 bytes captured (1008 bits) on interface 0
Ethernet II, Src: Vmware_65:25:d3 (00:0c:29:65:25:d3), Dst: Vmware_16:09:96 (00:0c:29:16:09:96)
Internet Protocol Version 4, Src: 10.32.5.11 (10.32.5.11), Dst: 10.32.5.3 (10.32.5.3)
Transmission Control Protocol, Src Port: 49178 (49178), Dst Port: ldap (389), Seq: 1, Ack: 1, Len: 72
Lightweight Directory Access Protocol
  LDAPMessage bindRequest(121) "cn=ldapuser,cn=users,dc=addev,dc=local" simple
    messageID: 121
    protocolOp: bindRequest (0)
      bindRequest
        version: 3
        name: cn=ldapuser,cn=users,dc=addev,dc=local
        authentication: simple (0)
          simple: 61636365737364656e696564
    [Response In: 9]
```

- Bind connection successfully

```
Frame 9: 76 bytes on wire (608 bits), 76 bytes captured (608 bits) on interface 0
Ethernet II, Src: Vmware_16:09:96 (00:0c:29:16:09:96), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
Internet Protocol Version 4, Src: 10.32.5.3 (10.32.5.3), Dst: 10.32.5.11 (10.32.5.11)
Transmission Control Protocol, Src Port: ldap (389), Dst Port: 49178 (49178), Seq: 1, Ack: 73, Len: 22
Lightweight Directory Access Protocol
  LDAPMessage bindResponse(121) success
    messageID: 121
    protocolOp: bindResponse (1)
      bindResponse
        resultCode: success (0)
        matchedDN:
        errorMessage:
    [Response To: 8]
    [Time: 0.000702000 seconds]
```

- Lookup for the user (Johan) who is logging on

```
Frame 13: 5162 bytes on wire (41296 bits), 5162 bytes captured (41296 bits) on interface 0
Ethernet II, Src: Vmware_16:09:96 (00:0c:29:16:09:96), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
Internet Protocol Version 4, Src: 10.32.5.3 (10.32.5.3), Dst: 10.32.5.11 (10.32.5.11)
Transmission Control Protocol, Src Port: ldap (389), Dst Port: 49178 (49178), Seq: 2943, Ack: 183, Len: 5108
[2 Reassembled TCP Segments (8006 bytes): #11(2920), #13(5086)]
Lightweight Directory Access Protocol
  LDAPMessage searchResEntry(122) "CN=Johan Loos,OU=Users,OU=Access Denied,DC=addev,DC=local" [1 result]
    messageID: 122
    protocolOp: searchResEntry (4)
      searchResEntry
        objectName: CN=Johan Loos,OU=Users,OU=Access Denied,DC=addev,DC=local
        attributes: 34 items
    [Response To: 10]
    [Time: 0.000867000 seconds]
Lightweight Directory Access Protocol
  LDAPMessage searchResDone(122) success [1 result]
    messageID: 122
    protocolOp: searchResDone (5)
      searchResDone
        resultCode: success (0)
        matchedDN:
        errorMessage:
    [Response To: 10]
    [Time: 0.000867000 seconds]
```

- User found

```
Frame 16: 76 bytes on wire (608 bits), 76 bytes captured (608 bits) on interface 0
Ethernet II, Src: Vmware_16:09:96 (00:0c:29:16:09:96), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
Internet Protocol Version 4, Src: 10.32.5.3 (10.32.5.3), Dst: 10.32.5.11 (10.32.5.11)
Transmission Control Protocol, Src Port: ldap (389), Dst Port: 49178 (49178), Seq: 8051, Ack: 274, Len: 22
Lightweight Directory Access Protocol
  LDAPMessage bindResponse(123) success
    messageID: 123
    protocolOp: bindResponse (1)
      bindResponse
        resultCode: success (0)
        matchedDN:
        errorMessage:
    [Response To: 15]
    [Time: 0.000721000 seconds]
```

- Verify if the group exists in Active Directory

```
Frame 25: 995 bytes on wire (7960 bits), 995 bytes captured (7960 bits) on interface 0
Ethernet II, Src: Vmware_16:09:96 (00:0c:29:16:09:96), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
Internet Protocol Version 4, Src: 10.32.5.3 (10.32.5.3), Dst: 10.32.5.11 (10.32.5.11)
Transmission Control Protocol, Src Port: ldap (389), Dst Port: 49178 (49178), Seq: 16145, Ack: 706, Len: 941
Lightweight Directory Access Protocol
  LDAPMessage searchResEntry(127) "CN=LDAP Administrators,OU=Groups,OU=Access Denied,DC=addev,DC=local" [1 result]
    messageID: 127
    protocolOp: searchResEntry (4)
      searchResEntry
        objectName: CN=LDAP Administrators,OU=Groups,OU=Access Denied,DC=addev,DC=local
        attributes: 17 items
    [Response To: 24]
    [Time: 0.000234000 seconds]
Lightweight Directory Access Protocol
  LDAPMessage searchResDone(127) success [1 result]
    messageID: 127
    protocolOp: searchResDone (5)
      searchResDone
        resultCode: success (0)
        matchedDN:
        errorMessage:
    [Response To: 24]
    [Time: 0.000234000 seconds]
```

- Group found

```
⊞ Frame 27: 77 bytes on wire (616 bits), 77 bytes captured (616 bits) on interface 0
⊞ Ethernet II, Src: Vmware_16:09:96 (00:0c:29:16:09:96), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
⊞ Internet Protocol Version 4, Src: 10.32.5.3 (10.32.5.3), Dst: 10.32.5.11 (10.32.5.11)
⊞ Transmission Control Protocol, Src Port: ldap (389), Dst Port: 49178 (49178), Seq: 17086, Ack: 779, Len: 23
⊟ Lightweight Directory Access Protocol
  ⊟ LDAPMessage bindResponse(128) success
      messageID: 128
    ⊟ protocolOp: bindResponse (1)
      ⊟ bindResponse
          resultCode: success (0)
          matchedDN:
          errorMessage:
      [Response To: 26]
      [Time: 0.000751000 seconds]
```

- Verify if the user is a member of the LDAP Administrators group

```
⊞ Frame 33: 233 bytes on wire (1864 bits), 233 bytes captured (1864 bits) on interface 0
⊞ Ethernet II, Src: Vmware_65:25:d3 (00:0c:29:65:25:d3), Dst: Vmware_16:09:96 (00:0c:29:16:09:96)
⊞ Internet Protocol Version 4, Src: 10.32.5.11 (10.32.5.11), Dst: 10.32.5.3 (10.32.5.3)
⊞ Transmission Control Protocol, Src Port: 49178 (49178), Dst Port: ldap (389), Seq: 963, Ack: 25162, Len: 179
⊟ Lightweight Directory Access Protocol
  ⊟ LDAPMessage searchRequest(131) "cn=LDAP Administrators,ou=Groups,ou=access denied,dc=addev,dc=local" baseObject
      messageID: 131
    ⊟ protocolOp: searchRequest (3)
      ⊟ searchRequest
          baseObject: cn=LDAP Administrators,ou=Groups,ou=access denied,dc=addev,dc=local
          scope: baseObject (0)
          derefAliases: neverDerefAliases (0)
          sizeLimit: 0
          timeLimit: 0
          typesOnly: False
        ⊟ Filter: (member=CN=Johan Loos,OU=Users,OU=Access Denied,DC=addev,DC=local)
          ⊟ filter: equalityMatch (3)
            ⊟ equalityMatch
                attributeDesc: member
                assertionValue: CN=Johan Loos,OU=Users,OU=Access Denied,DC=addev,DC=local
          attributes: 0 items
      [Response In: 34]
```

- User is member of this group

```
⊞ Frame 27: 77 bytes on wire (616 bits), 77 bytes captured (616 bits) on interface 0
⊞ Ethernet II, Src: Vmware_16:09:96 (00:0c:29:16:09:96), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
⊞ Internet Protocol Version 4, Src: 10.32.5.3 (10.32.5.3), Dst: 10.32.5.11 (10.32.5.11)
⊞ Transmission Control Protocol, Src Port: ldap (389), Dst Port: 49178 (49178), Seq: 17086, Ack: 779, Len: 23
⊟ Lightweight Directory Access Protocol
  ⊟ LDAPMessage bindResponse(128) success
      messageID: 128
    ⊟ protocolOp: bindResponse (1)
      ⊟ bindResponse
          resultCode: success (0)
          matchedDN:
          errorMessage:
      [Response To: 26]
      [Time: 0.000751000 seconds]
```

- Unbind the connection with the LDAP server

```
⊞ Frame 35: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
⊞ Ethernet II, Src: Vmware_65:25:d3 (00:0c:29:65:25:d3), Dst: Vmware_16:09:96 (00:0c:29:16:09:96)
⊞ Internet Protocol Version 4, Src: 10.32.5.11 (10.32.5.11), Dst: 10.32.5.3 (10.32.5.3)
⊞ Transmission Control Protocol, Src Port: 49178 (49178), Dst Port: ldap (389), Seq: 1142, Ack: 26105, Len: 12
⊟ Lightweight Directory Access Protocol
  ⊟ LDAPMessage unbindRequest(132)
      messageID: 132
    ⊟ protocolOp: unbindRequest (2)
        unbindRequest
```

RADIUS Authentication

How it works

pGina captures the user his credentials, and verifies if the password is correct. If authentication is successful, pGina creates a local user account on the server and adds the user account into a security group specified in the gateway process. When the user logs off, the local user account and profile are deleted from that server.

Authentication between the RADIUS client and RADIUS server is done via PAP. The RADIUS client (our server) uses the shared key to encrypt the password of the user account and sends it to the RADIUS server.

You can also use IPSec to secure authentication traffic between the RADIUS client and RADIUS server.

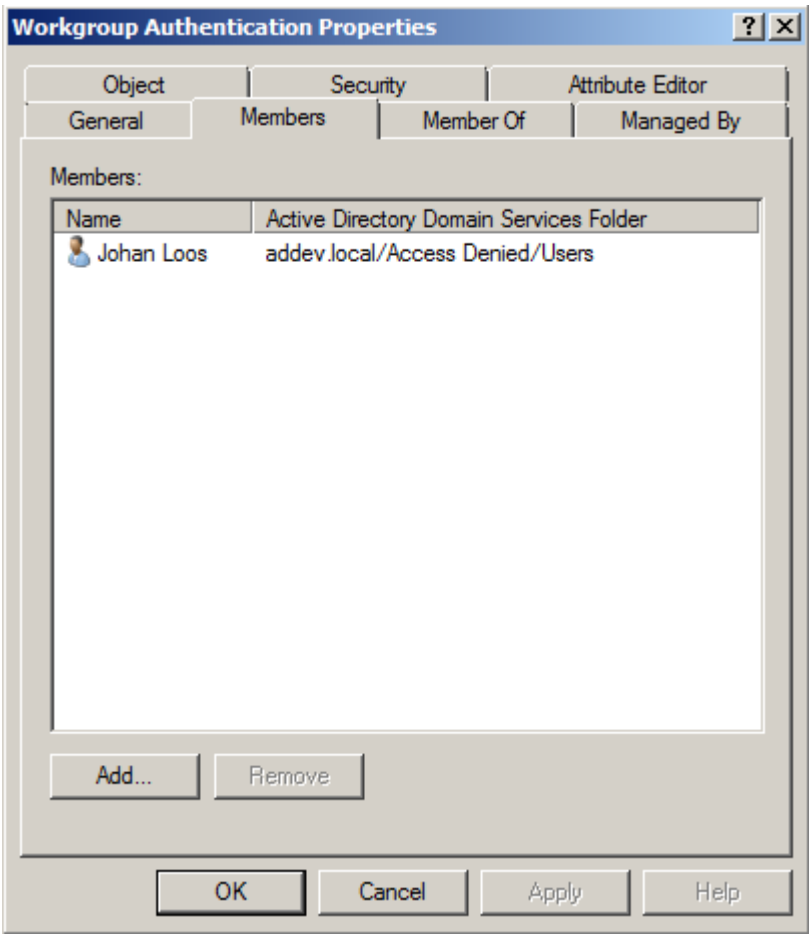
RADIUS Authentication Task List

- △ Create and configure your RADIUS Authentication group in Active Directory
- △ Configure pGina
- △ Configure LDAP plugin
- △ Configure LocalMachine plugin
- △ Configure your server as a RADIUS client on Windows Server 2012 NPS
- △ Create a Network Policy on Windows Server 2012 NPS
- △ Logon
- △ RADIUS Authentication Debug

Create and configure your RADIUS Authentication group in Active Directory

All members of this group are allowed to logon into a server in a workgroup via RADIUS.

- Open **Active Directory Users and Computers** from **Administrative Tools**

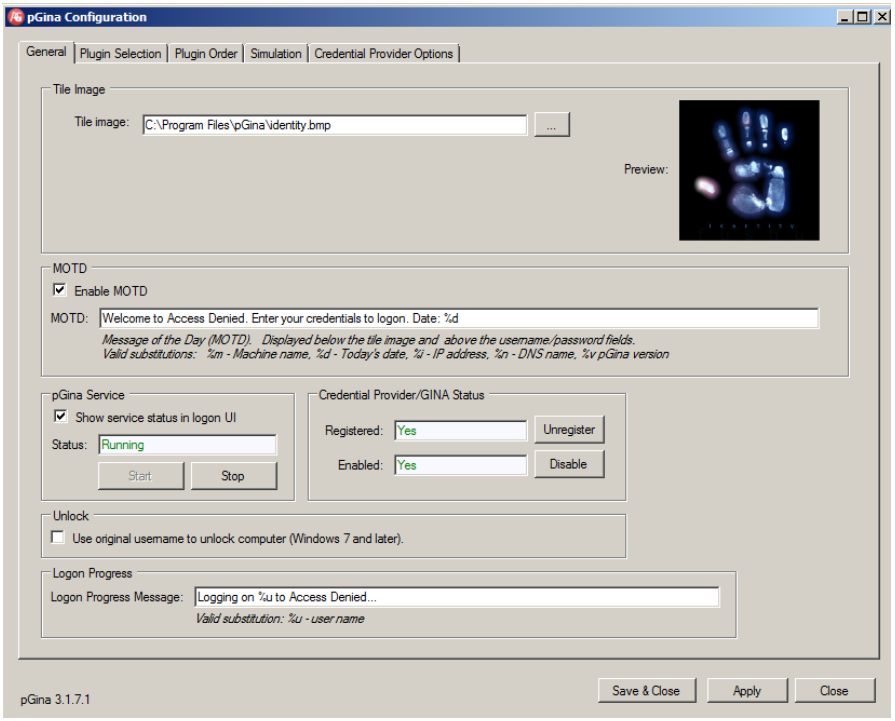


- Click OK

Configure pGina

Before you can logon with your domain credentials, you need to configure some plugins. pGina delegates the logon process to plugins. Depending on the type of backend you choose. In our example the backend server is a RADIUS server.

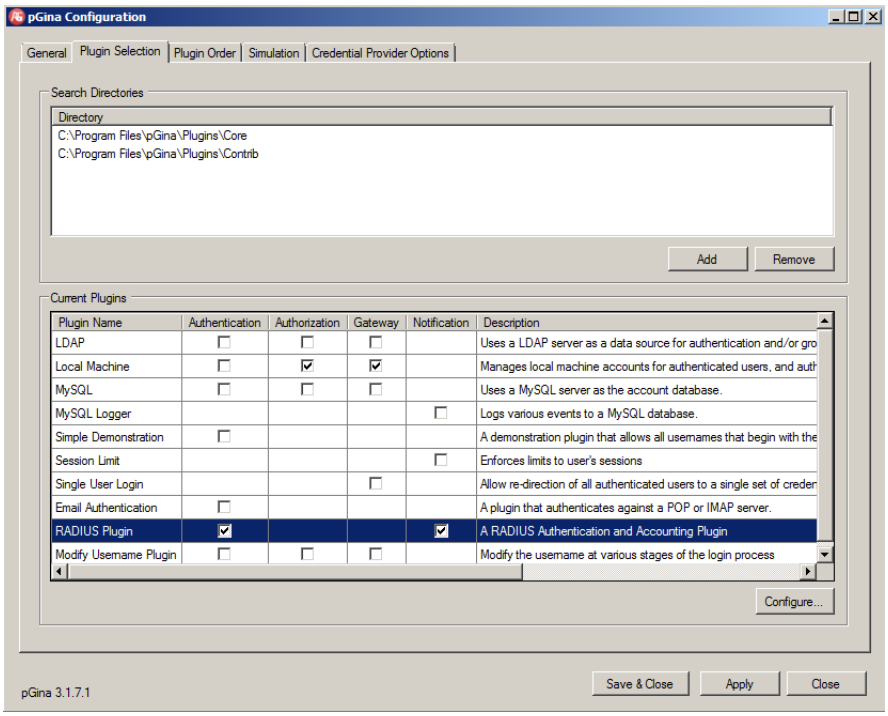
- On the **General** page, configure the following settings
  - You can select a bitmap Tile Image which is displayed in the logon screen
  - You can enable the Message of the Day (MOTD). This message is displayed in the logon screen
  - You can also specify a Logon Progress Message which is displayed when the user is successful authenticated



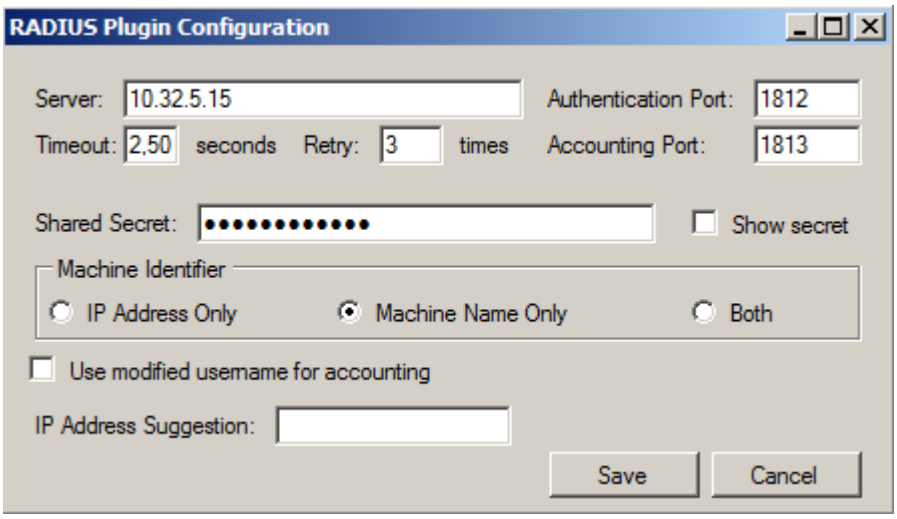
- Click Apply and click Save & Close

Configure RADIUS plugin

- On the **Plugin Selection** page, select the RADIUS Plugin
- Select Authentication, Notification, and click on Configure



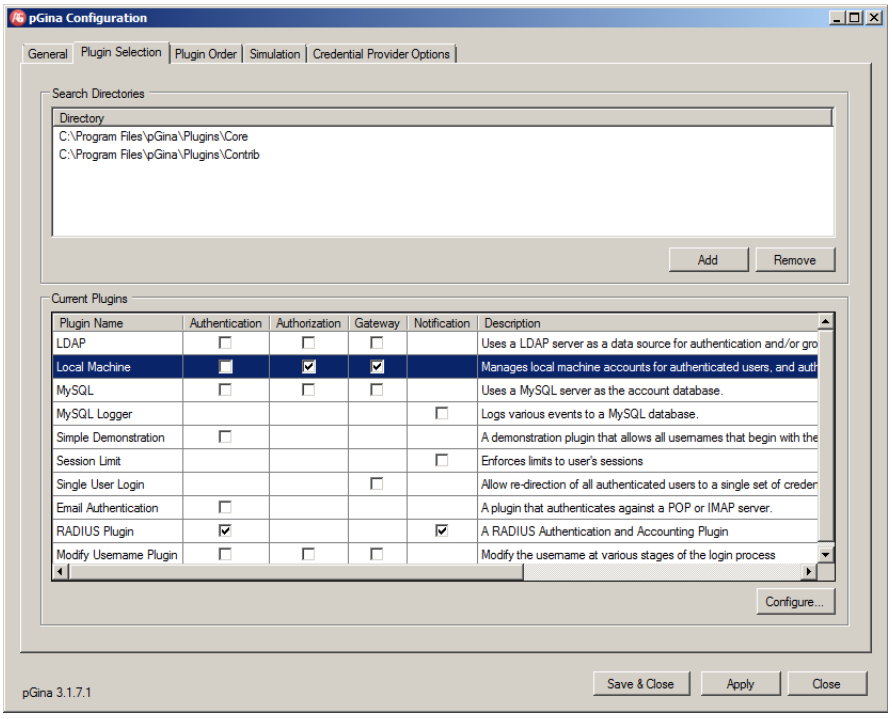
- On the **RADIUS Plugin Configuration** page, configure the following:
  - Server: The IP address of your RADIUS Server
  - Shared Secret: Secret used to communicate with the RADIUS Server
  - Machine Identifier: Select an identifier, for example Machine Name Only



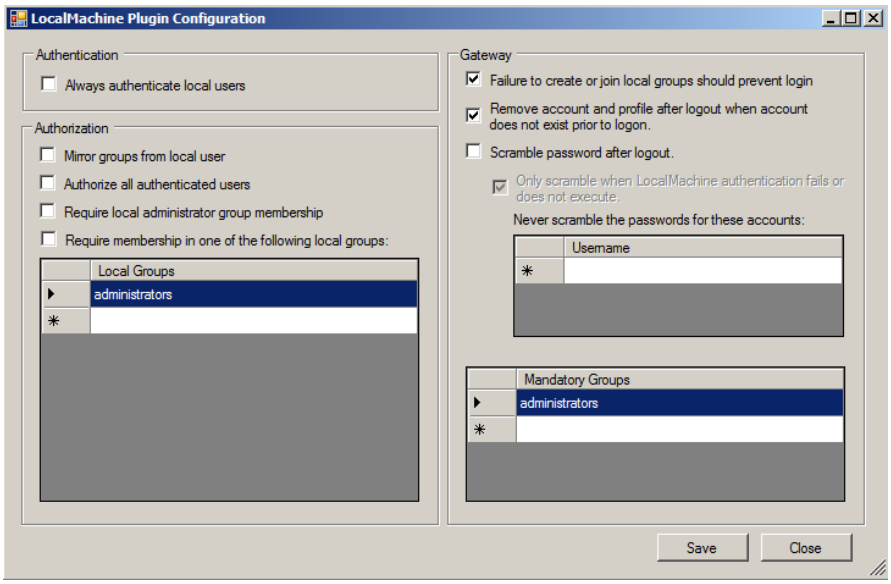
- Click Save

Configure LocalMachine plugin

- On the **Plugin Selection** page, select the Local Machine Plugin
- Select Authorization, Gateway, and click on Configure



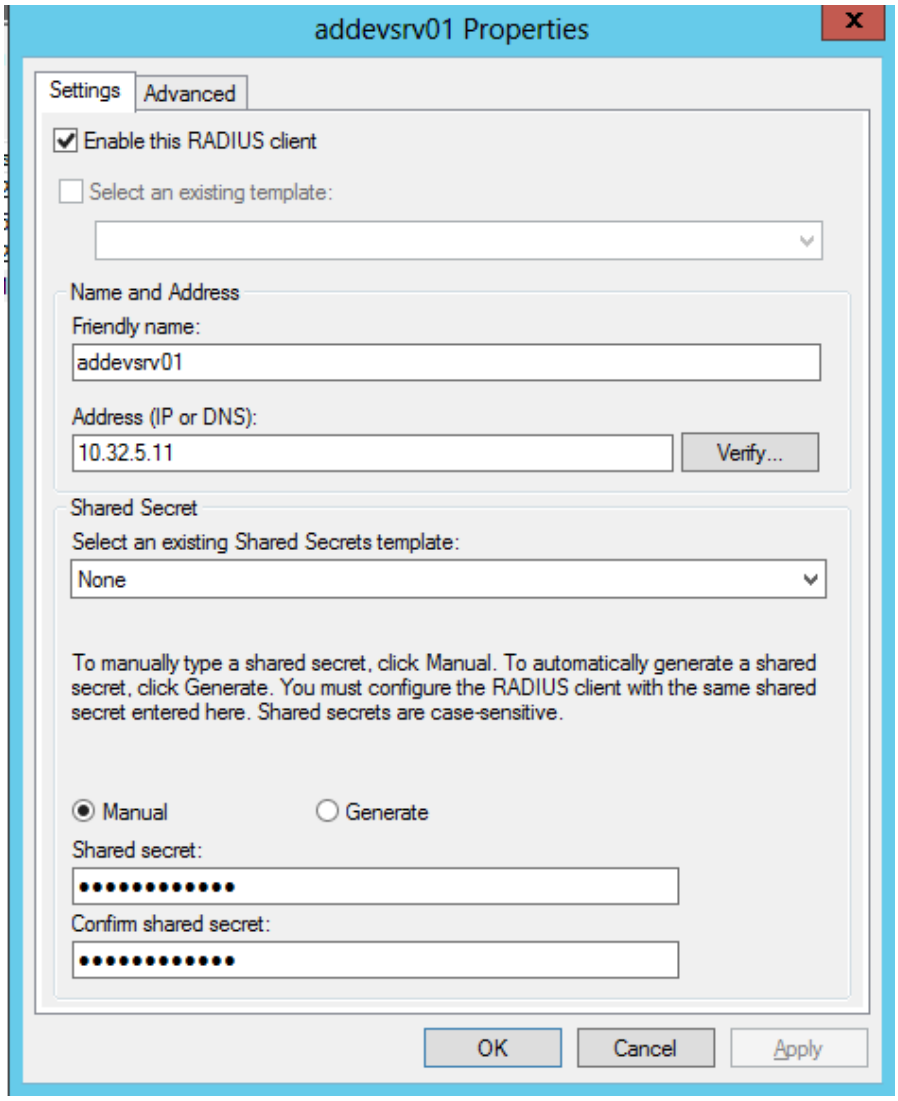
- On the **LocalMachine Plugin Configuration** page, select the following
  - Remove account and profile after logout: When the user logs off, the plugin removes the user account from the group below, deletes the user account and the profile from the server
  - Mandatory Groups: The user account is added to the groups in the list



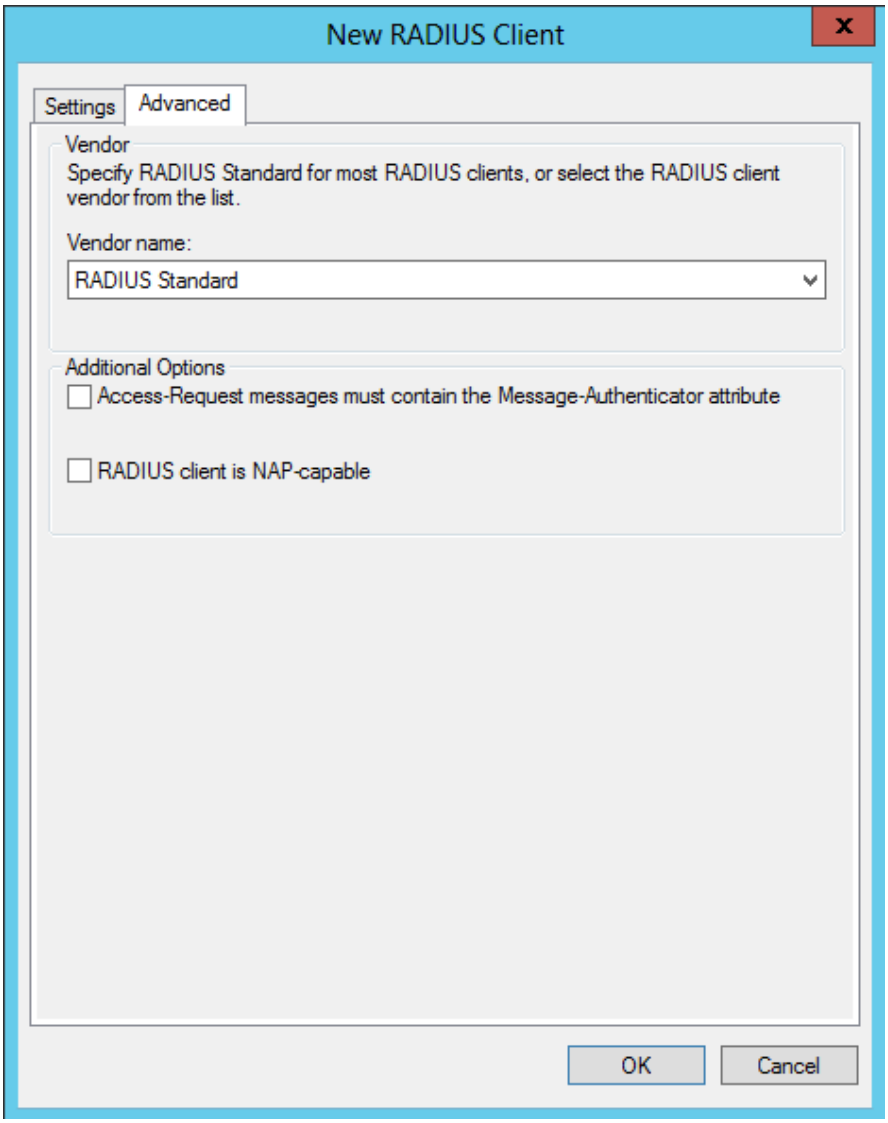
- Click Save

Configure your server as RADIUS client on Windows Server 2012 NPS

- Open **Network Policy Server** from **Administrative Tools**
- Expand RADIUS Clients and Servers, right click on **RADIUS Clients** and select **New RADIUS Client**
- On the **New RADIUS Client** dialog box, specify a friendly name and IP address



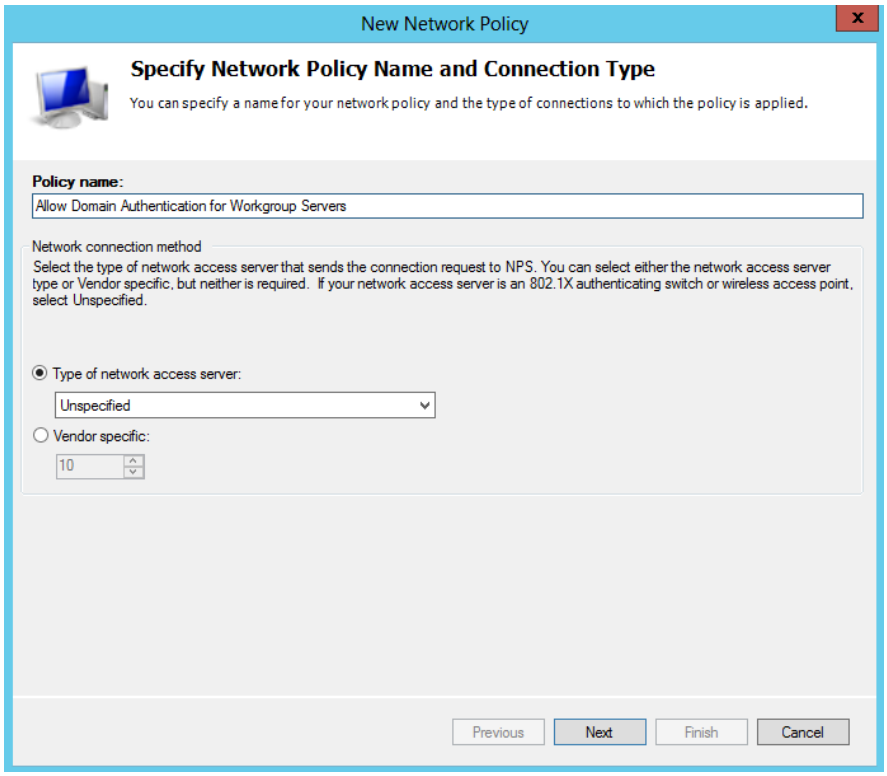
- Click on **Advanced**, uncheck or check the required options



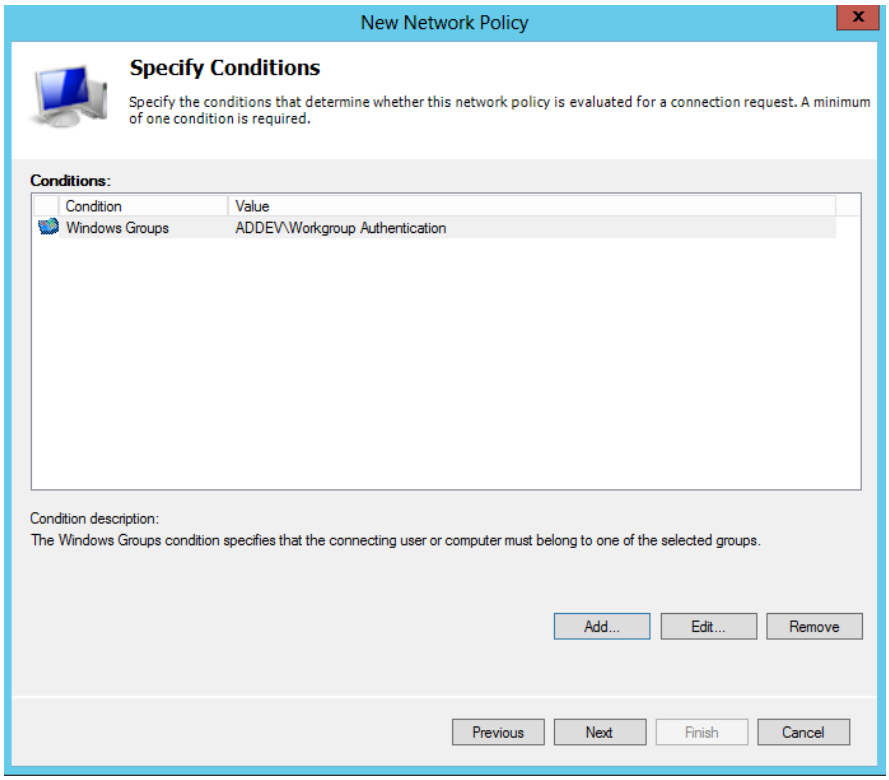
- Click **OK**

Create a Network Policy on Windows Server 2012 NPS

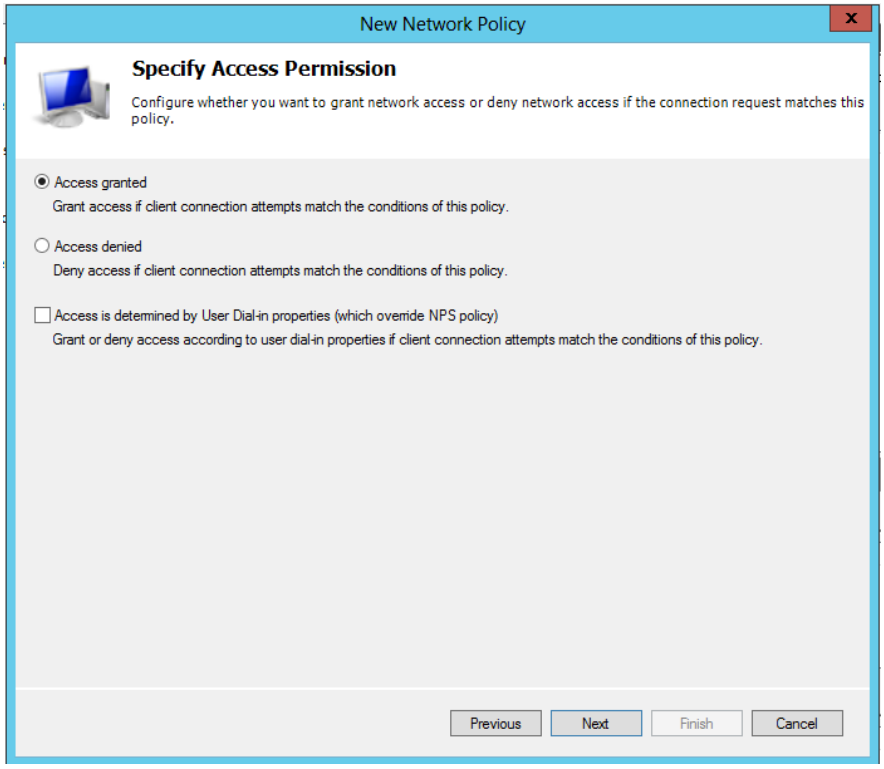
- From the **Network Policy Server Console**, right click on **Network Policies** and select **New**
- On the **Specify Network Policy Name and Connection Type** page, type a name for your policy and click **Next**



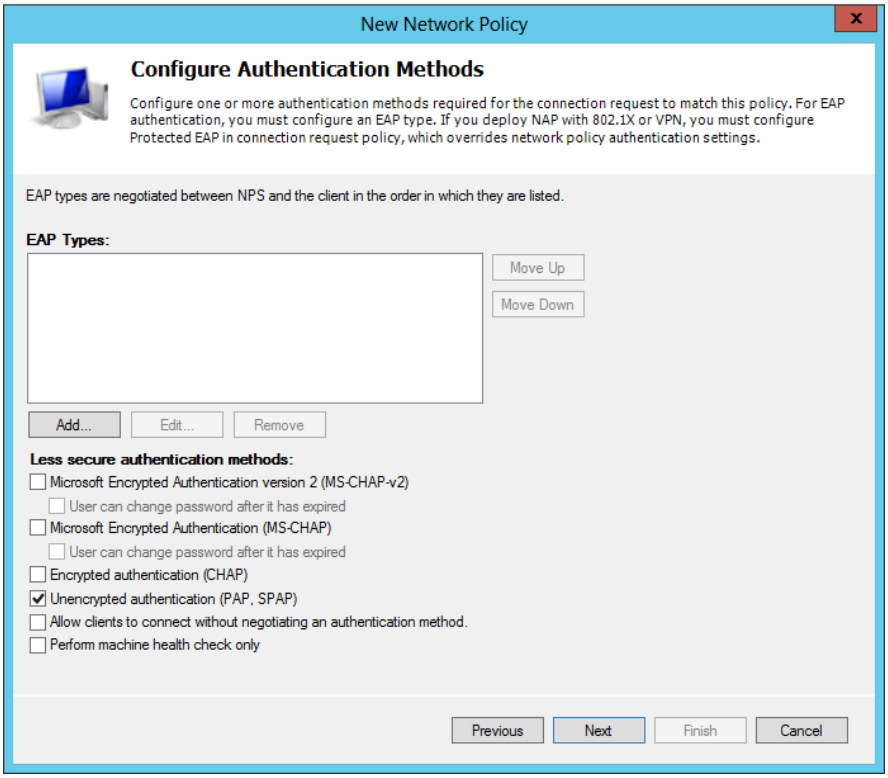
- On the **Specify Conditions** page, click **Add**
- From the **Select Condition** dialog box, add the following Windows Groups *Workgroup Authentication*, and click **Next**



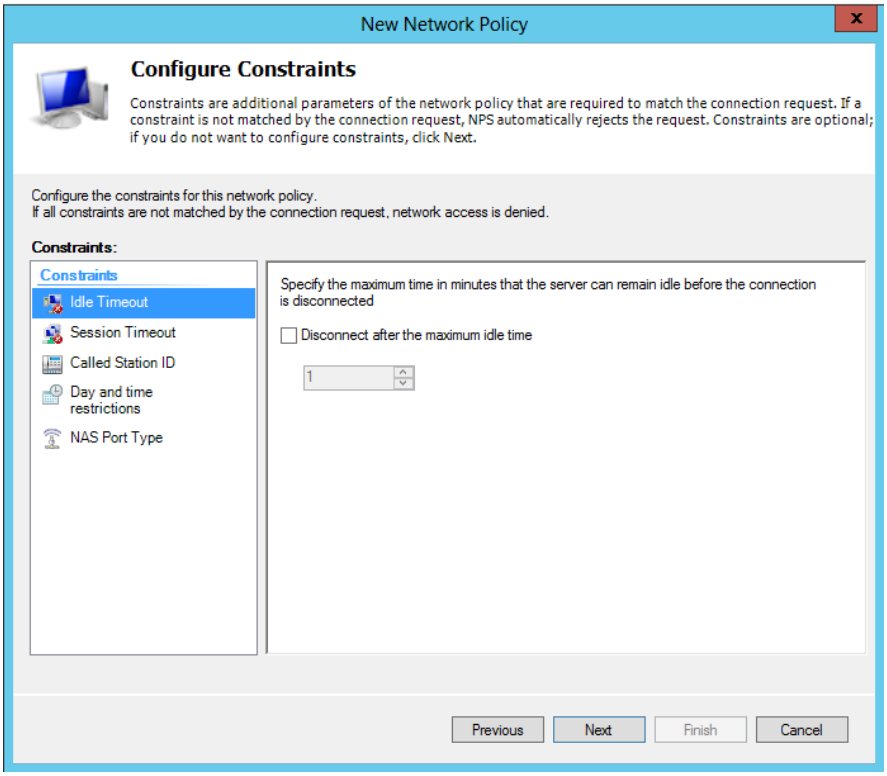
- On the **Specify Access Permissions** page, select **Access Granted** and click **Next**



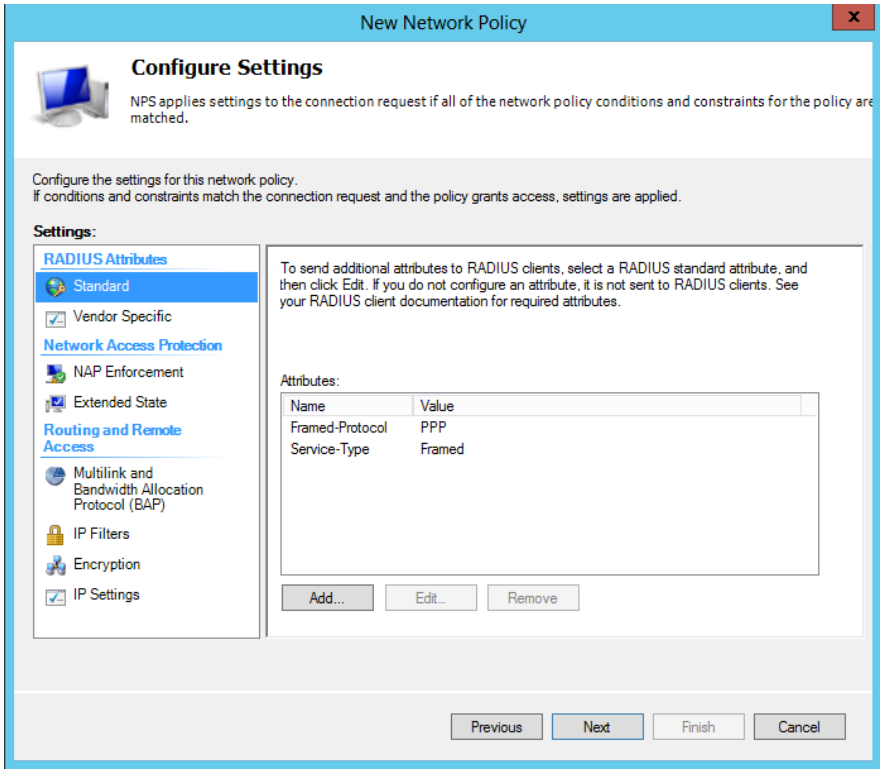
- On the **Configure Authentication Methods** page, clear all authentications methods and select only **Unencrypted Authentication (PAP,SPAP)** and click **Add**



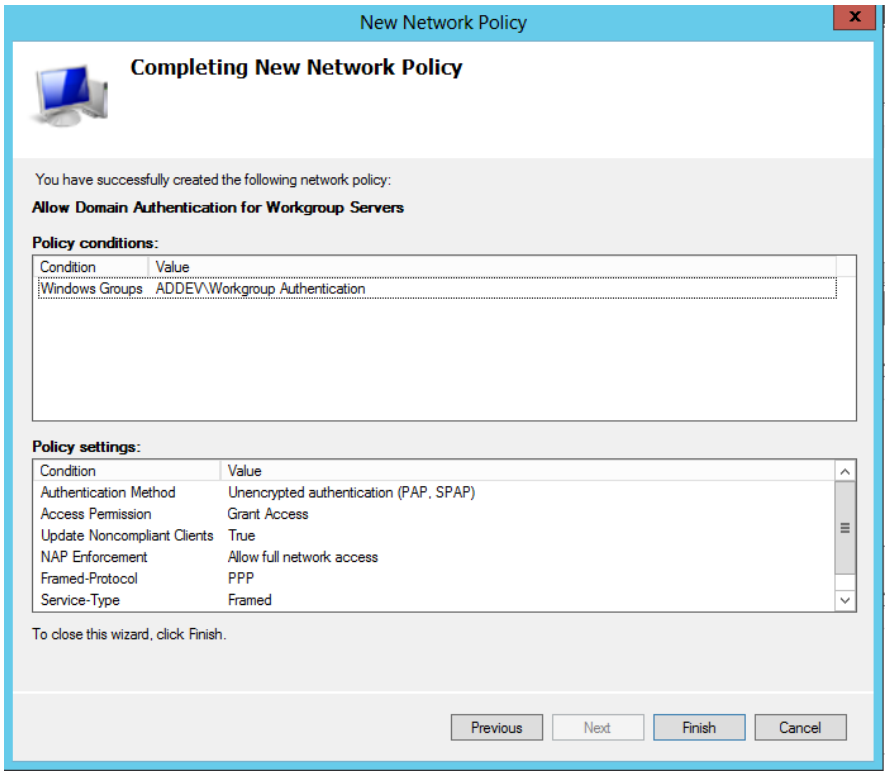
- On the **Configure Constraints** page, click **Next**



- On the **Configure Settings** page, click Next

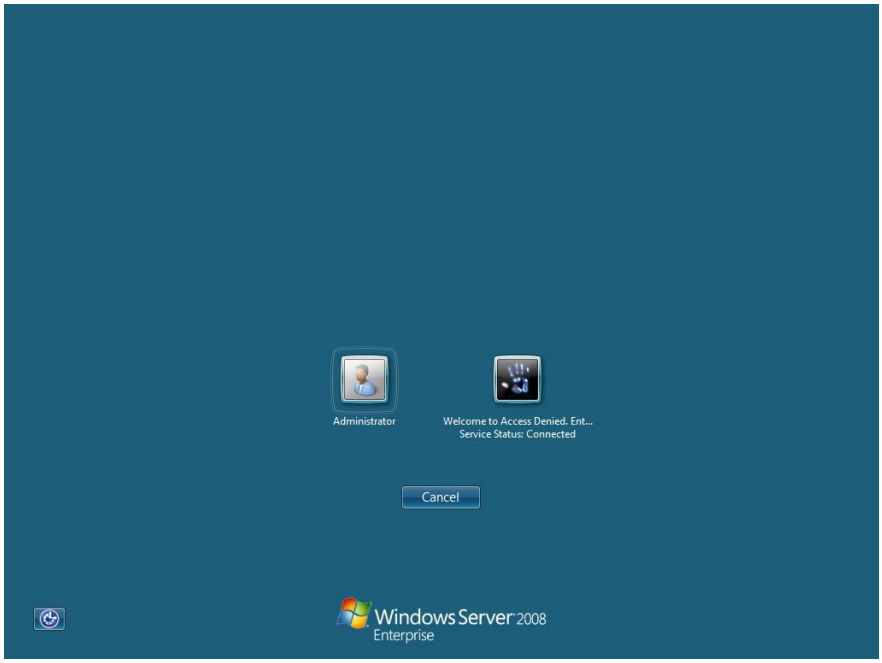


- On the **Completing New Network Policy** page, click **Finish**

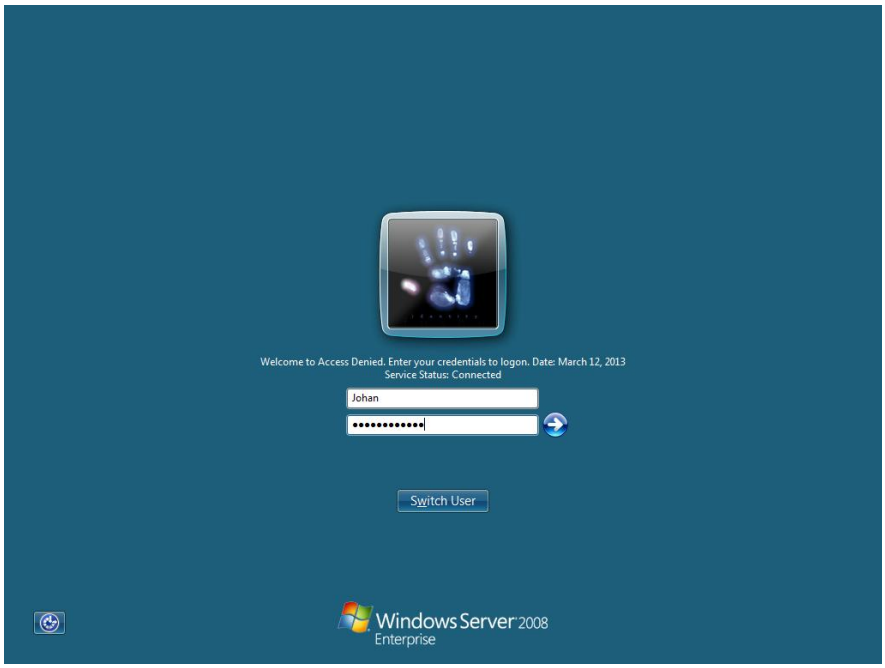


Logon

- On your logon screen press CTRL+ALT+DEL and select switch user



- Type your domain credentials to logon



- Press Enter to logon
- You are now logged on the workgroup server and member of the local administrators group

RADIUS Authentication Debug

- RADIUS client sends Accept-Request authentication request

```
⊞ Frame 1: 99 bytes on wire (792 bits), 99 bytes captured (792 bits) on interface 0
⊞ Ethernet II, Src: Vmware_65:25:d3 (00:0c:29:65:25:d3), Dst: Vmware_98:b6:2c (00:0c:29:98:b6:2c)
⊞ Internet Protocol Version 4, Src: 10.32.5.11 (10.32.5.11), Dst: 10.32.5.15 (10.32.5.15)
⊞ User Datagram Protocol, Src Port: 65107 (65107), Dst Port: radius (1812)
⊟ Radius Protocol
    Code: Access-Request (1)
    Packet identifier: 0xef (239)
    Length: 57
    Authenticator: 37c01e1252d7882df4c7338cffdfe8f9
    [The response to this request is in frame 15]
  ⊟ Attribute Value Pairs
    ⊟ AVP: l=7  t=User-Name(1): johan
        User-Name: johan
    ⊟ AVP: l=18  t=User-Password(2): Encrypted
        User-Password (encrypted): cad797f6e9f69a404cad3672006a042d
    ⊟ AVP: l=12  t=NAS-Identifier(32): ADDEVSRV01
        NAS-Identifier: ADDEVSRV01
```

- RADIUS server sends Accept-Accept request

```
⊞ Frame 15: 120 bytes on wire (960 bits), 120 bytes captured (960 bits) on interface 0
⊞ Ethernet II, Src: Vmware_98:b6:2c (00:0c:29:98:b6:2c), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
⊞ Internet Protocol Version 4, Src: 10.32.5.15 (10.32.5.15), Dst: 10.32.5.11 (10.32.5.11)
⊞ User Datagram Protocol, Src Port: radius (1812), Dst Port: 65107 (65107)
⊟ Radius Protocol
    Code: Access-Accept (2)
    Packet identifier: 0xef (239)
    Length: 78
    Authenticator: e832bad3141462d58a317189a753bc99
    [This is a response to a request in frame 1]
    [Time from request: 0.004139000 seconds]
  ⊟ Attribute Value Pairs
    ⊞ AVP: l=6  t=Framed-Protocol(7): PPP(1)
    ⊞ AVP: l=6  t=Service-Type(6): Framed(2)
    ⊞ AVP: l=46  t=Class(25): 3b32043800000137000102000a20050f0000000000000000...
```

Encrypting RADIUS traffic with IPSec Task List

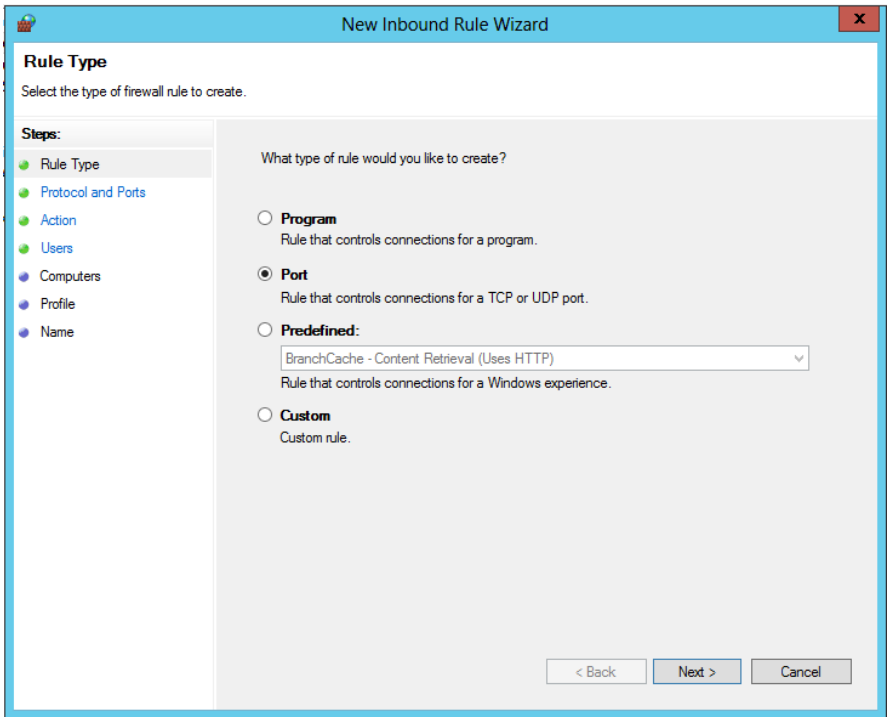
You can use IPSec to further encrypt authentication traffic.

- △ Create an Inbound rule on your RADIUS server
- △ Create a Connection Security Rule on your RADIUS server (NPS Server)

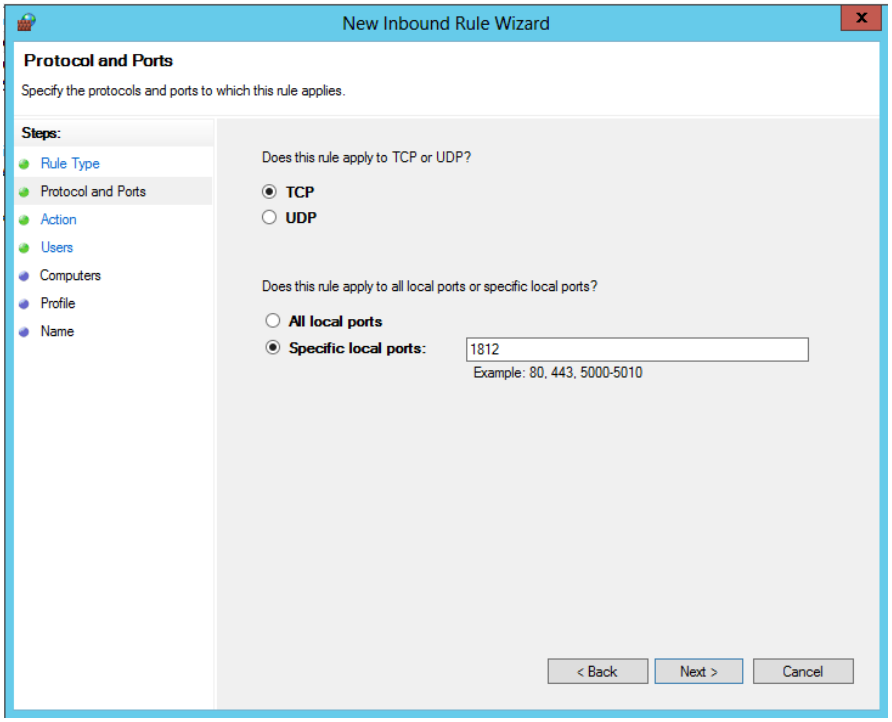
- △ Create a Connection Security Rule on your RADIUS client (workgroup server)
- △ Monitor Security Associations

Create an Inbound rule on your RADIUS server

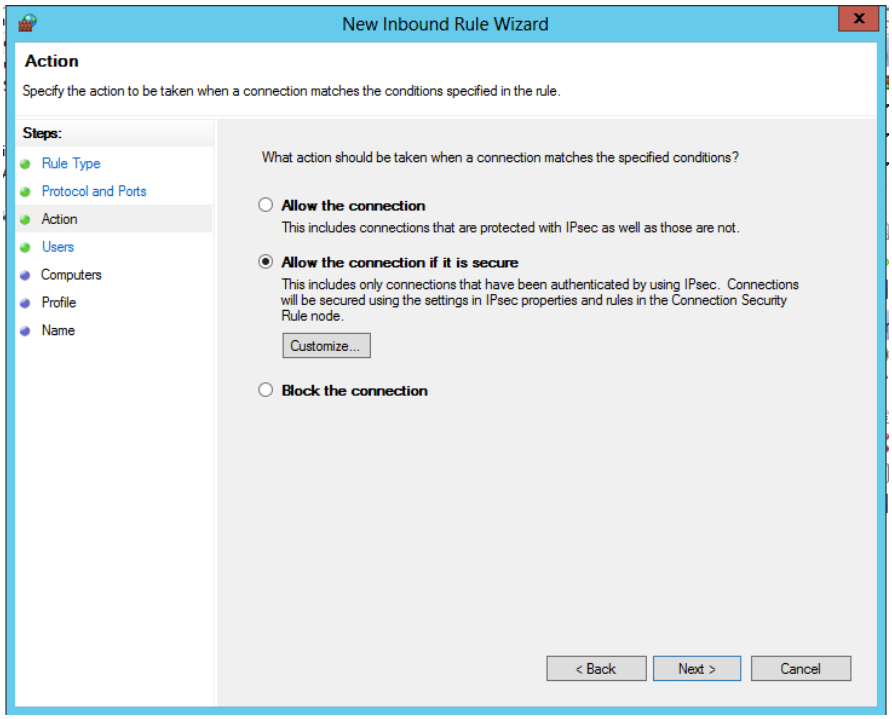
- Open **Windows Firewall with Advanced Security** from **Administrative Tools**
- Right click on Inbound Rule and select New Rule
- On the **Rule Type** page, select Port and click Next



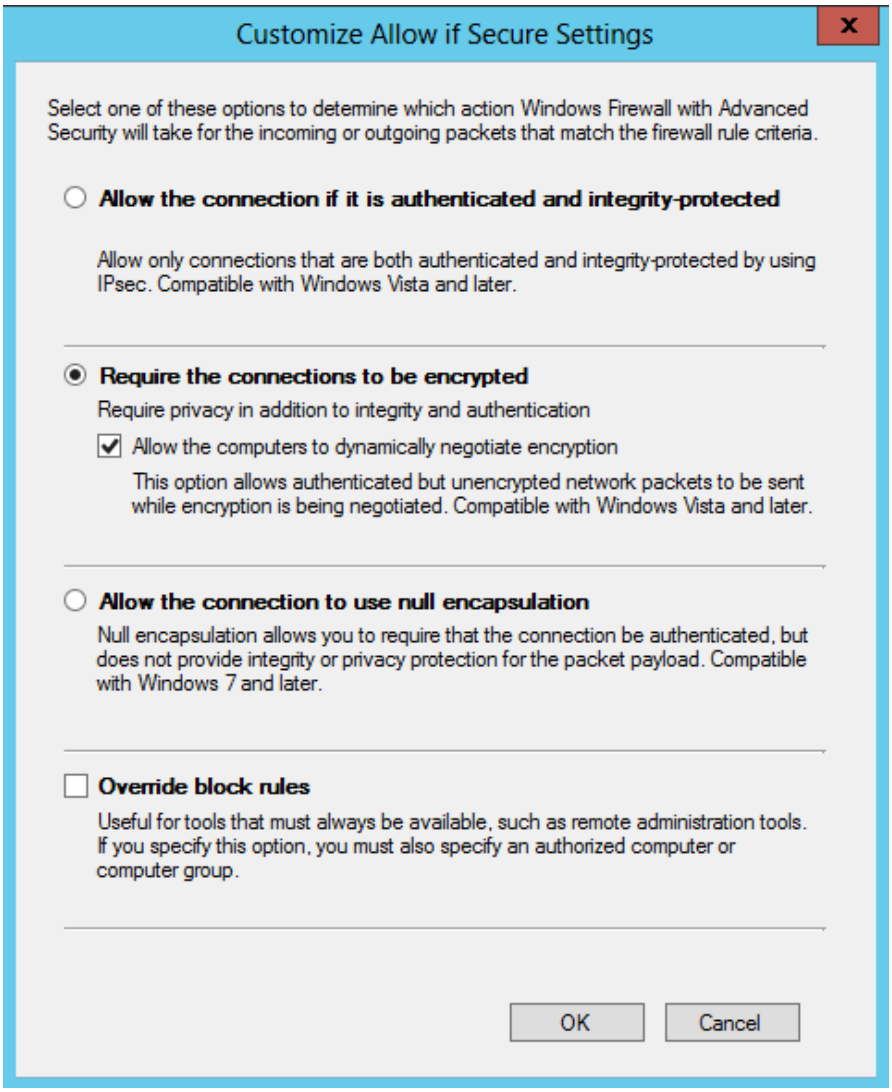
- On the **Protocols and Port** page, select Specific local ports and type 1812



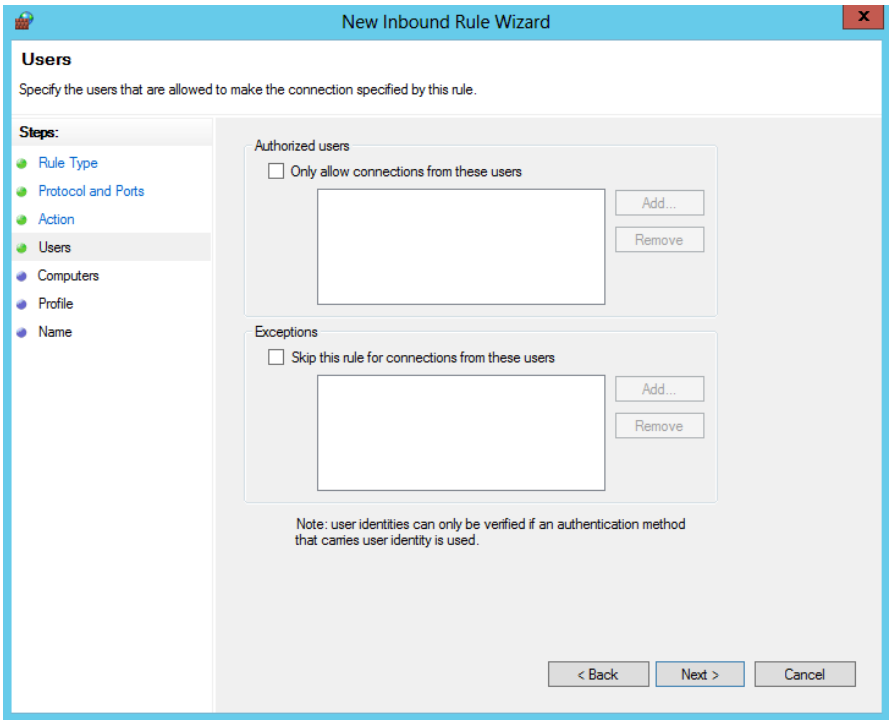
- On the **Action** page, select Allow the connection if it is secure and click Customize



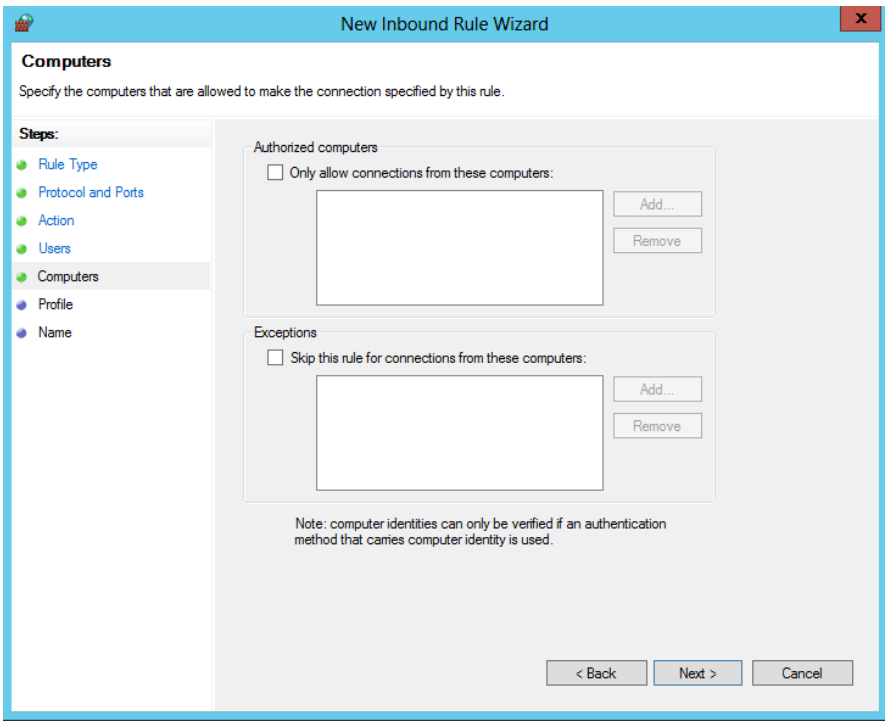
- On the **Customize Allow if Secure Settings** page, select Require the connection to be encrypted and select Allow the computers to dynamically negotiate encryption and click OK



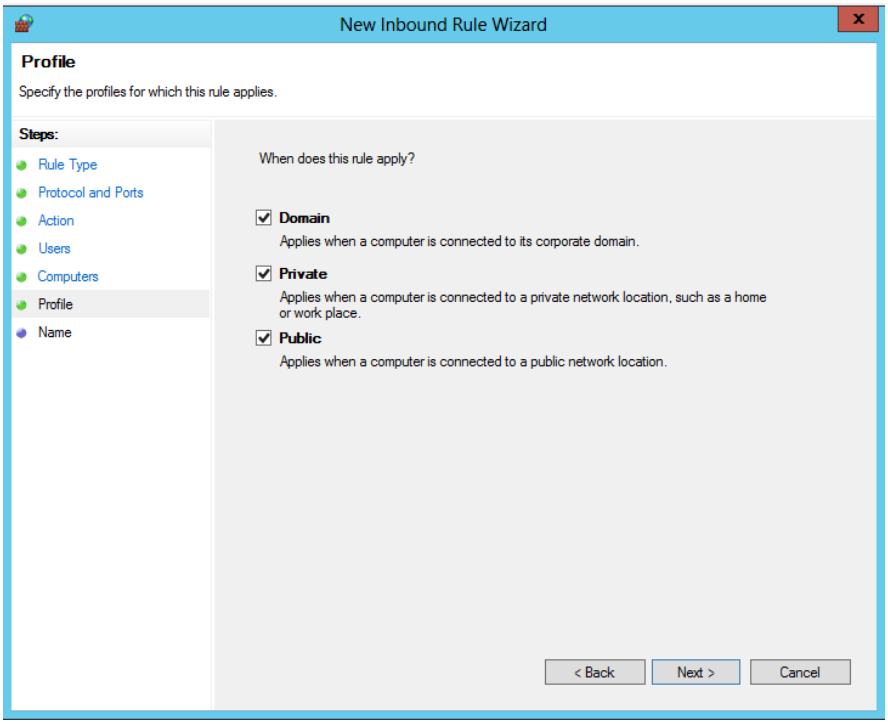
- On the **Users** page, click Next



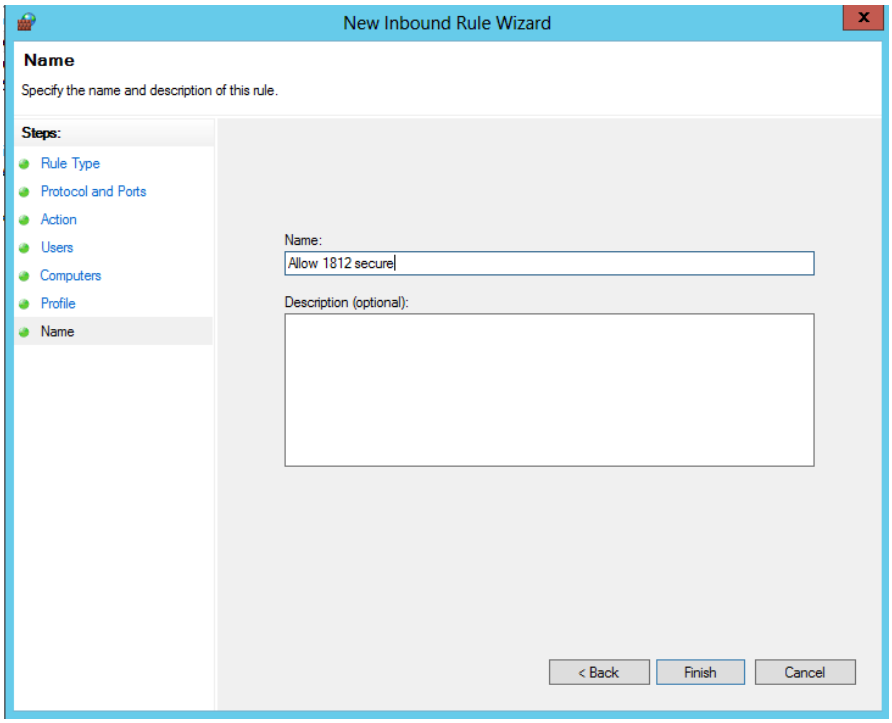
- On the **Computers** page, click Next



- On the **Profile** page, click Next

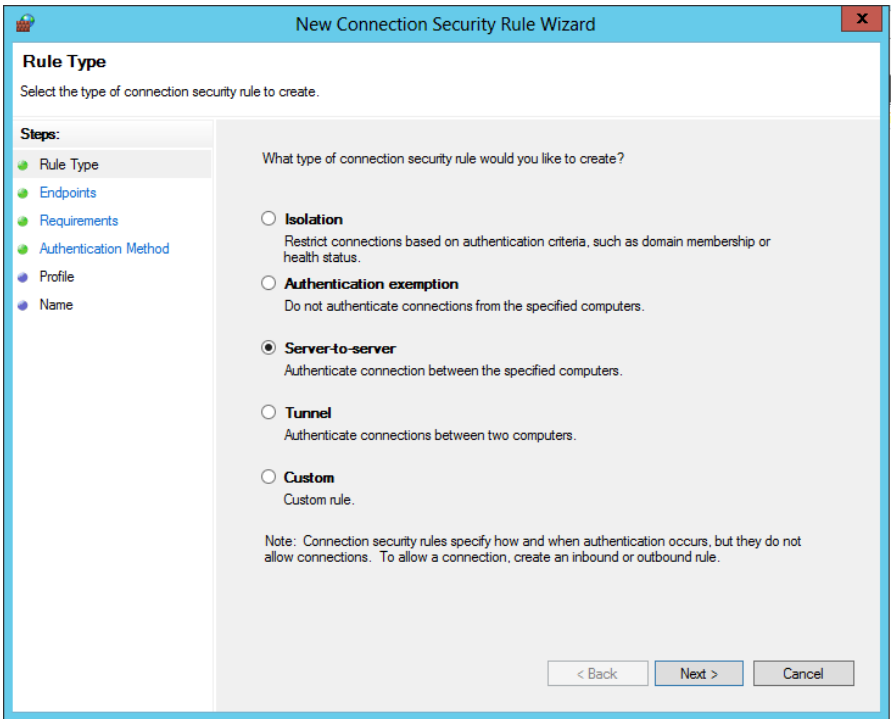


- On the **Name** page, type a name for your rule and click Finish

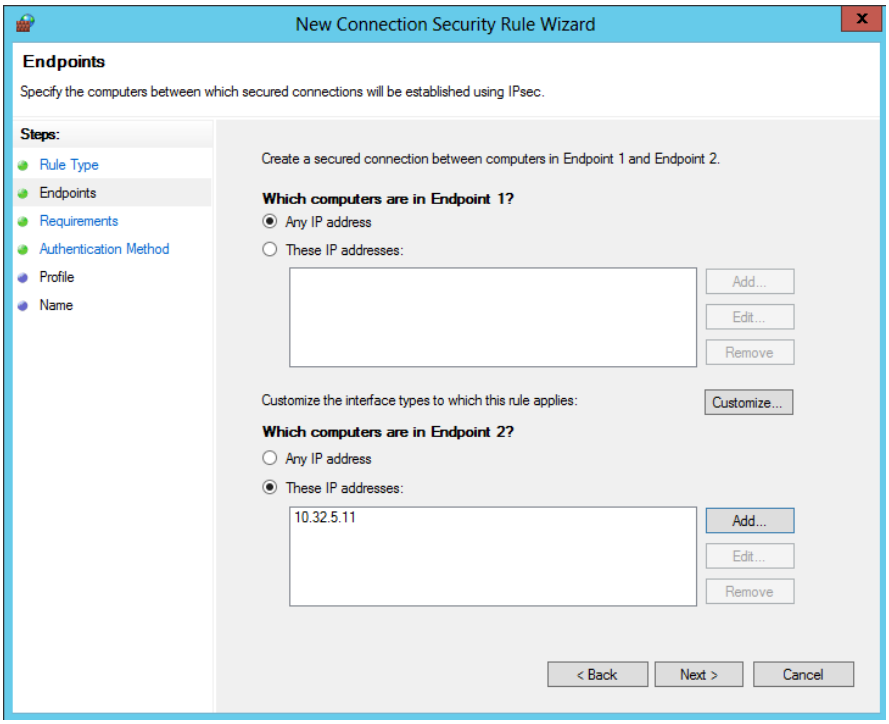


Create a Connection Security Rule on your RADIUS server (NPS Server)

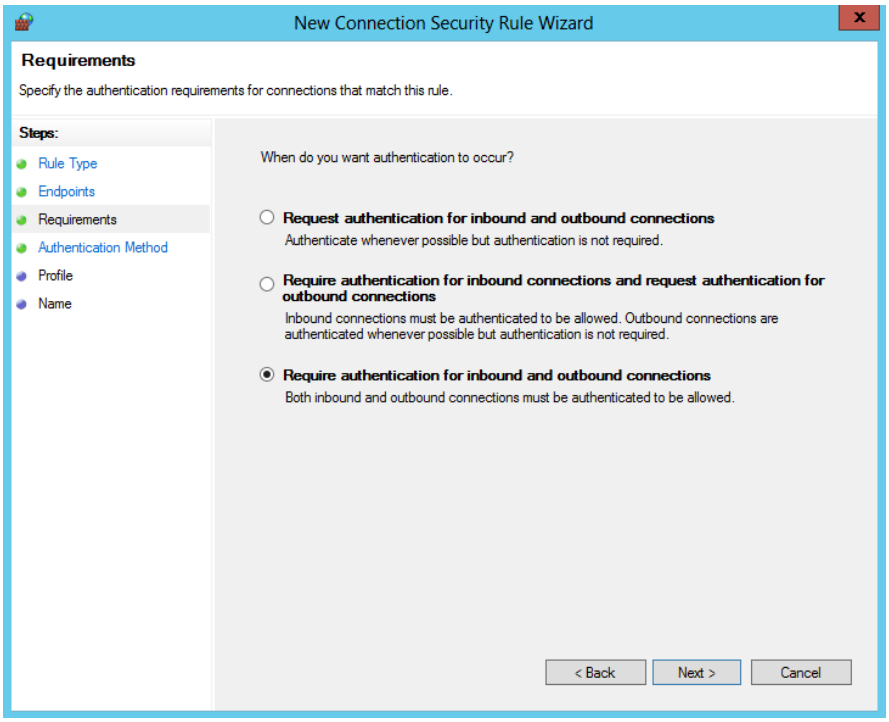
- Right click on Connection Security Rules and select New Rule
- On the **Rule Type** page, select Server-to-server and click Next



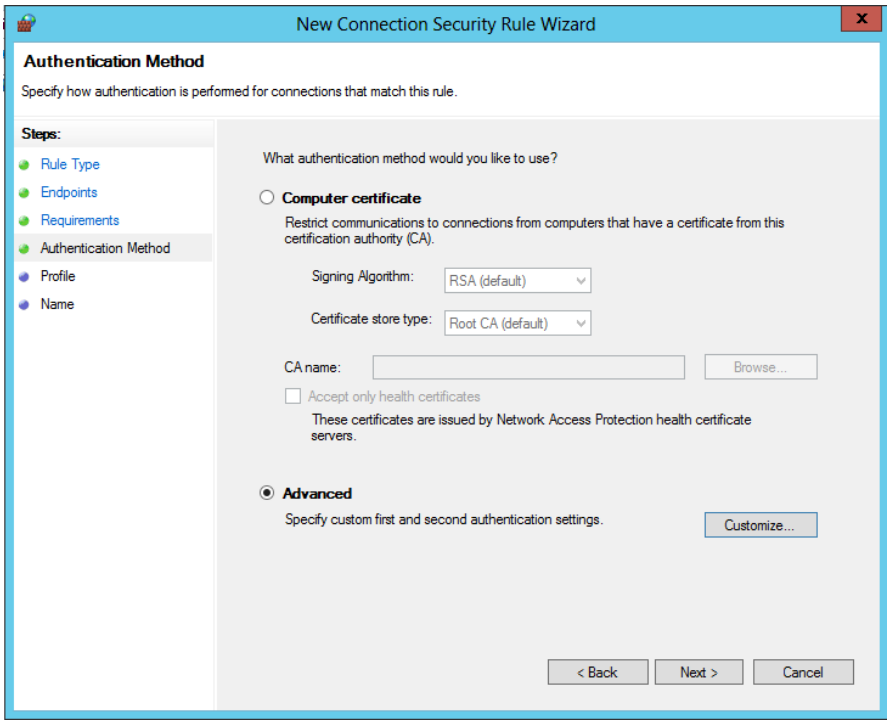
- On the **Endpoints** page, add the IP address of your workgroup server, and click Next



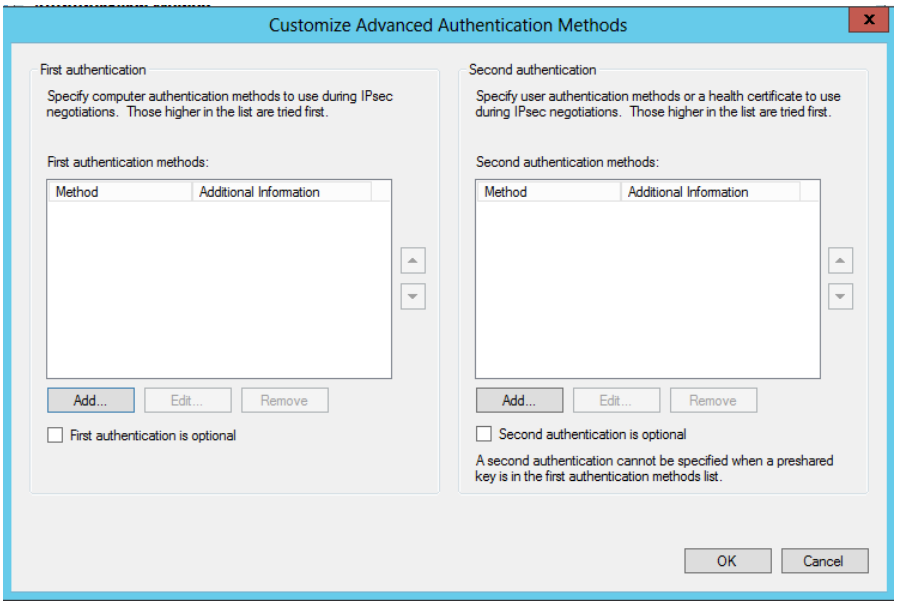
- On the **Requirements** page, select Require authentication for inbound and outbound connections, and click Next



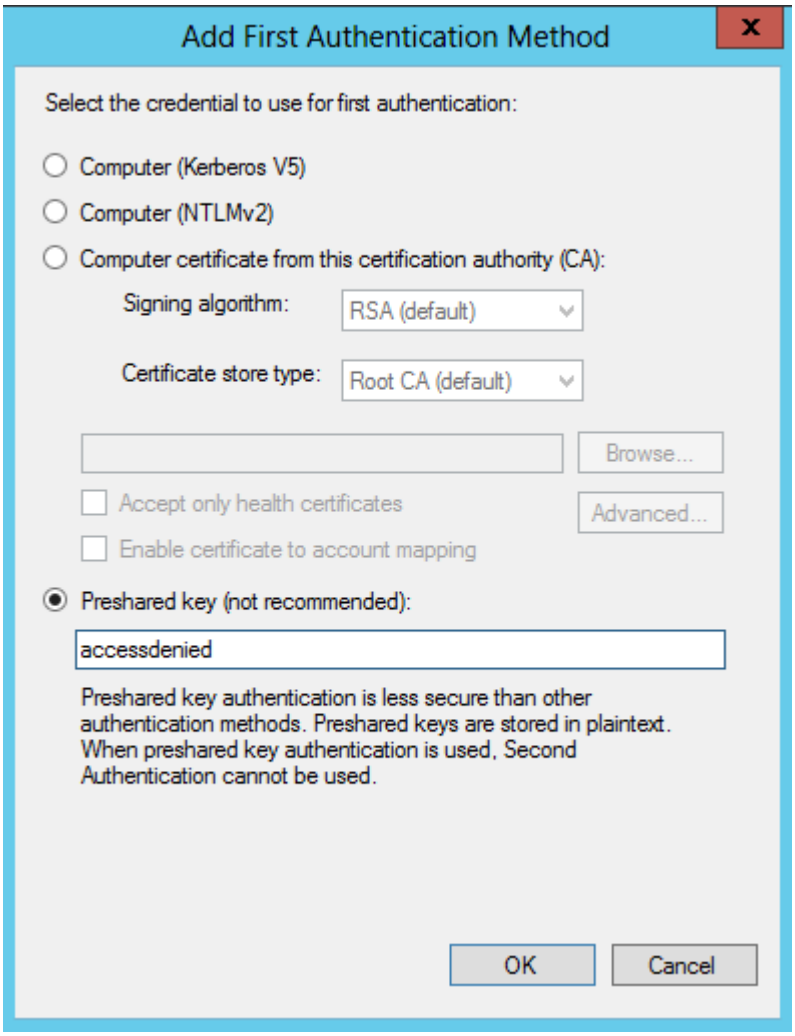
- On the **Authentication Methods** page, select Advanced and click Customize



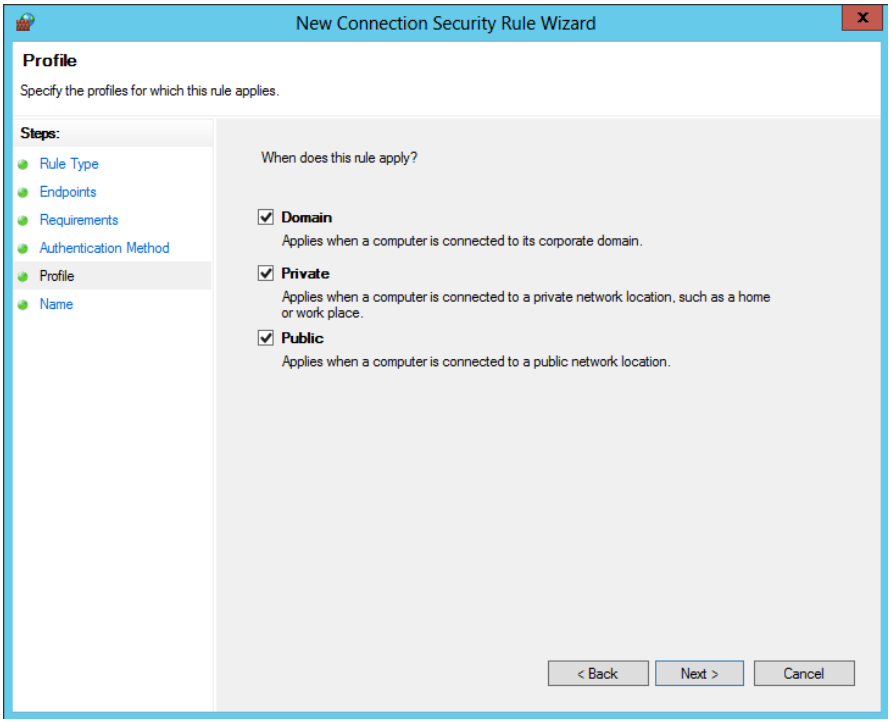
- On the **Customize Advanced Authentication Methods** page, click Add



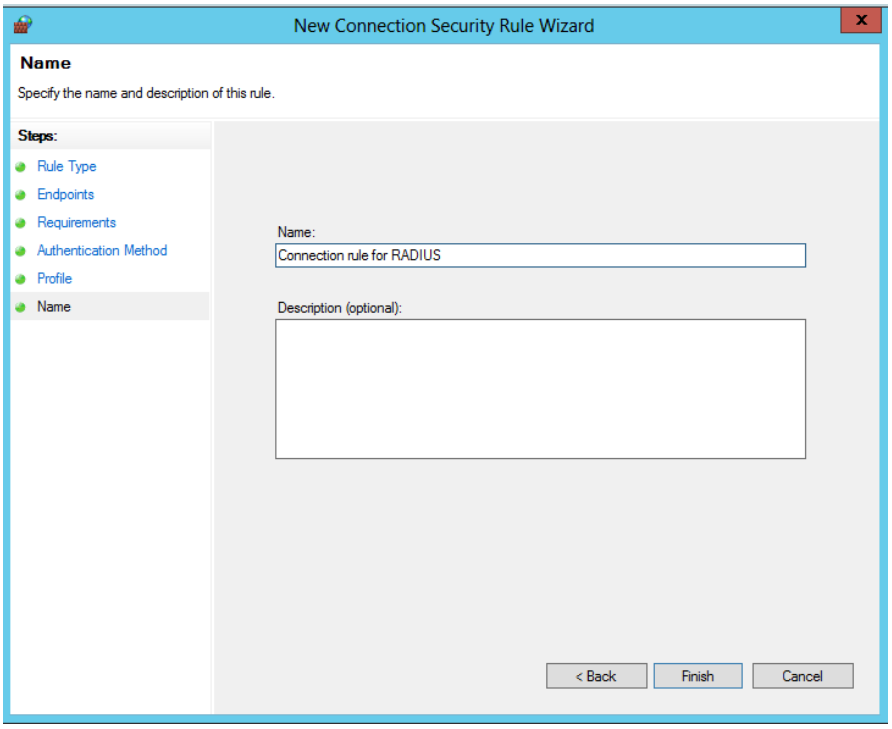
- On the **Add First Authentication Method** page, select Preshared key and type a pre-shared key



- Click multiple times OK and click Next
- On the **Profile** page, click Next

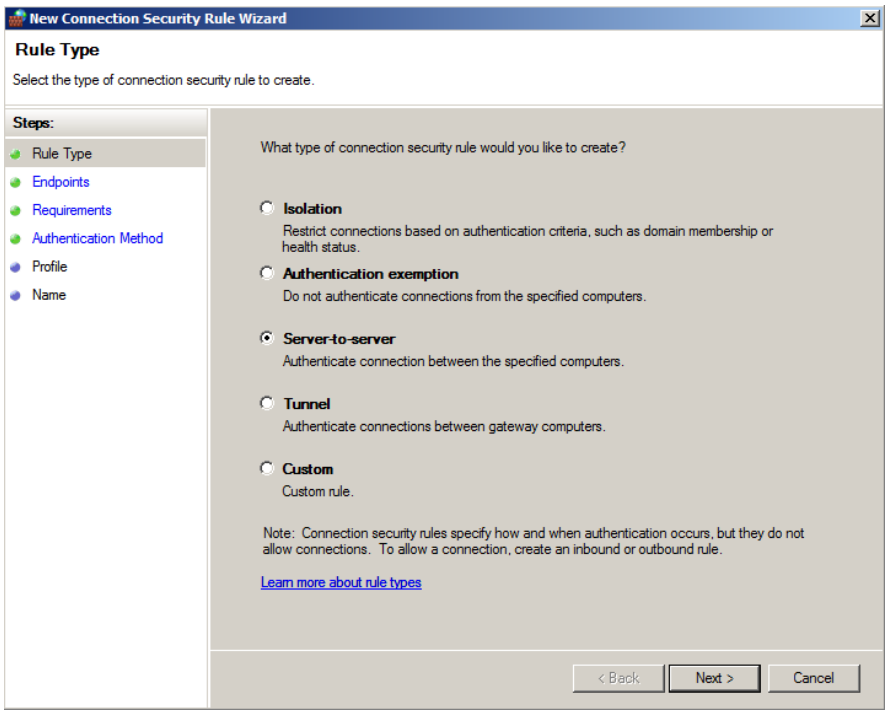


- On the **Name** page, type a name and click Finish

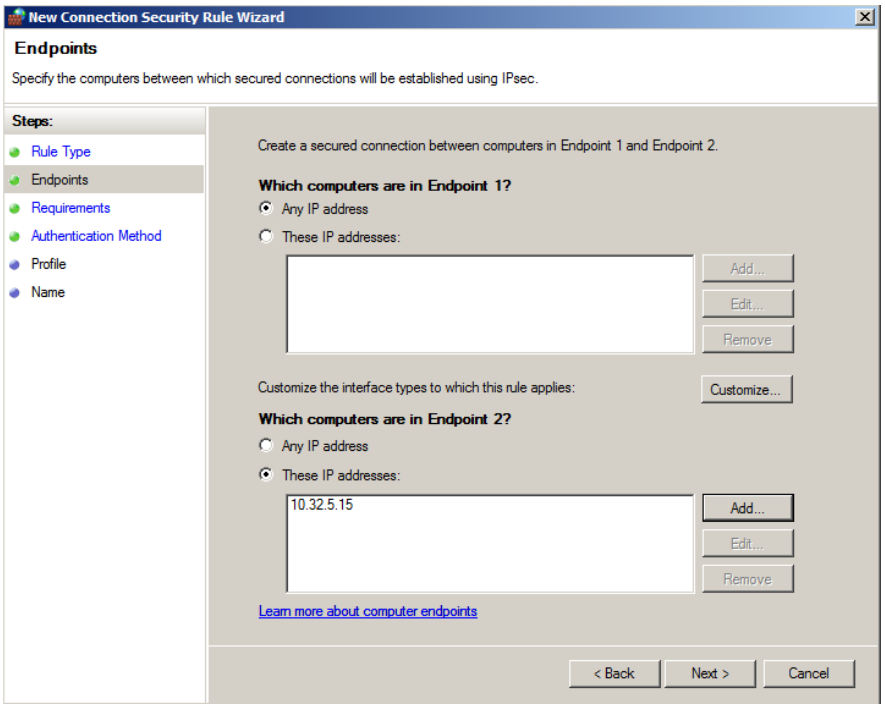


Create a Connection Security Rule on your RADIUS client (workgroup server)

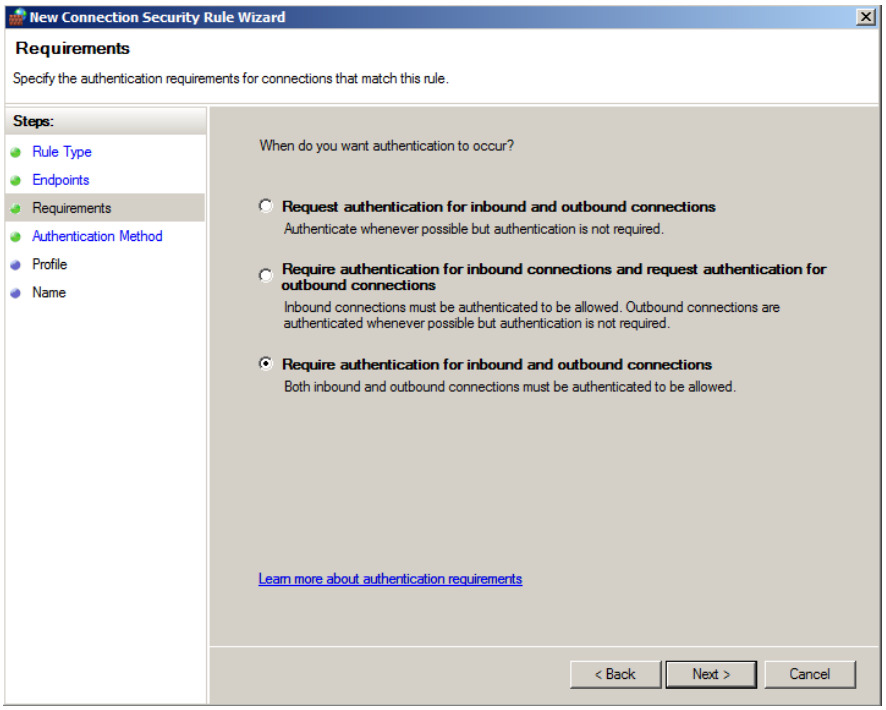
- Right click on Connection Security Rules and select New Rule
- On the **Rule Type** page, select Server-to-server and click Next



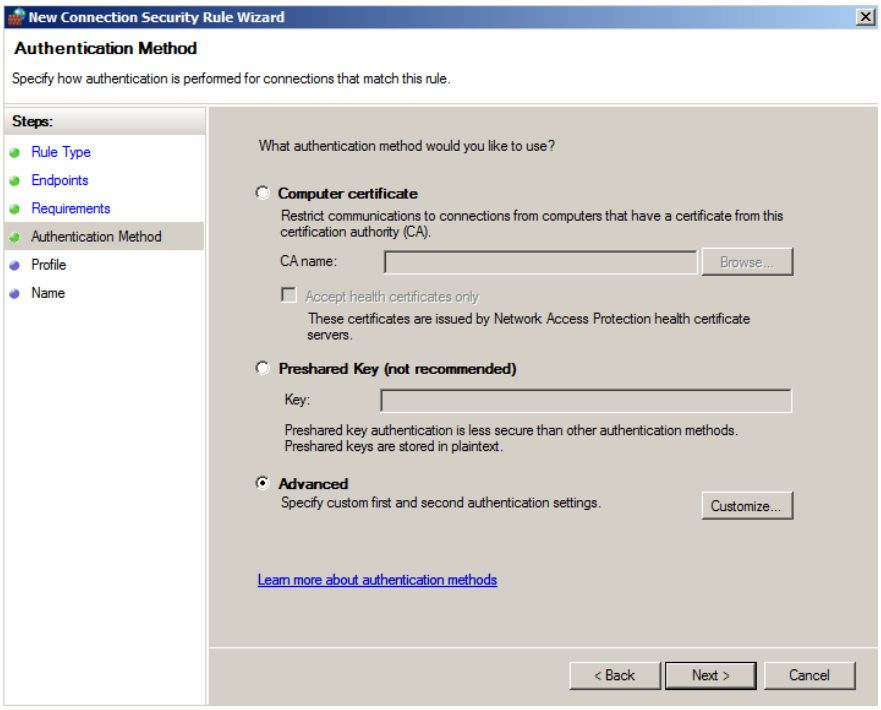
- On the **Endpoints** page, add the IP address of your workgroup server, and click Next



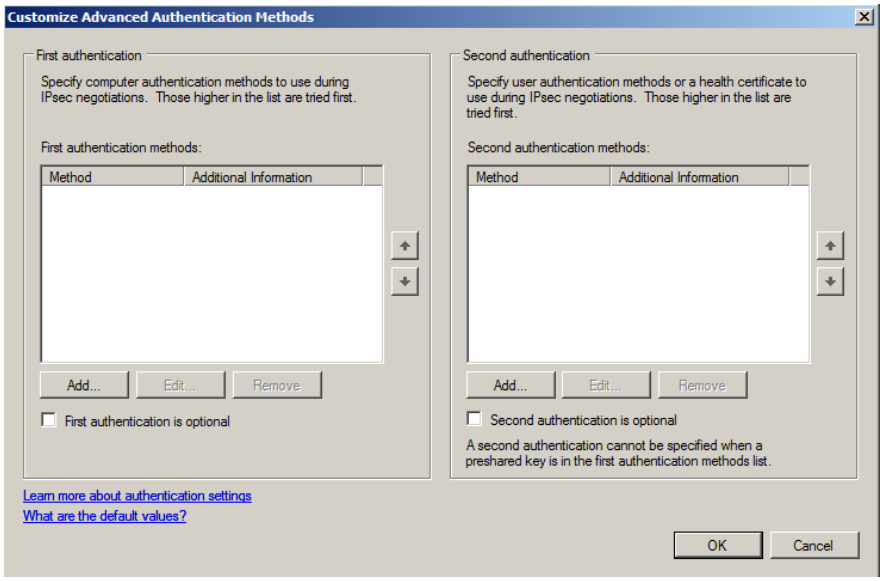
- On the **Requirements** page, select Require authentication for inbound and outbound connections, and click Next



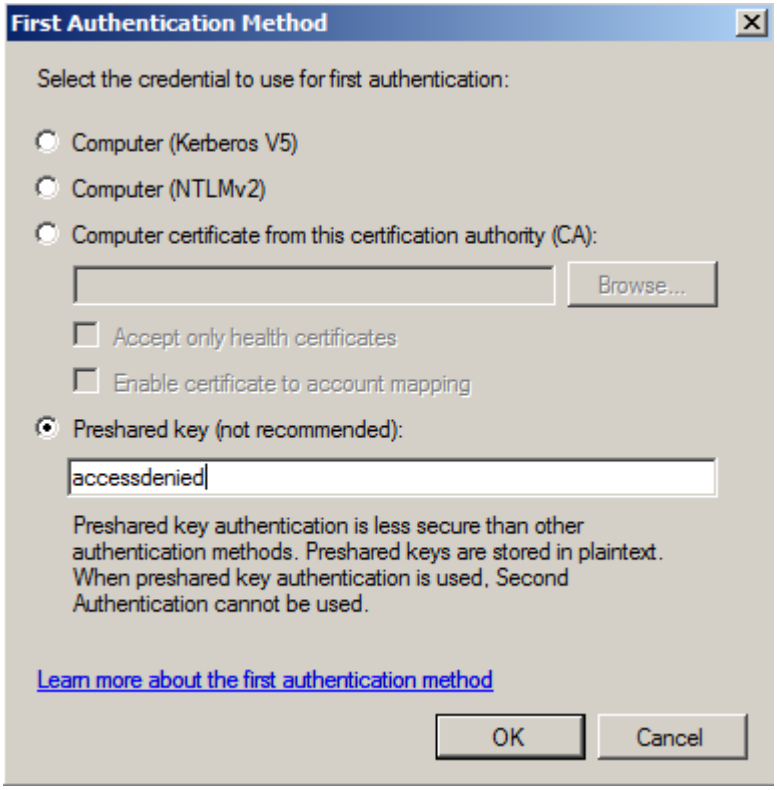
- On the **Authentication Methods** page, select Advanced and click Customize



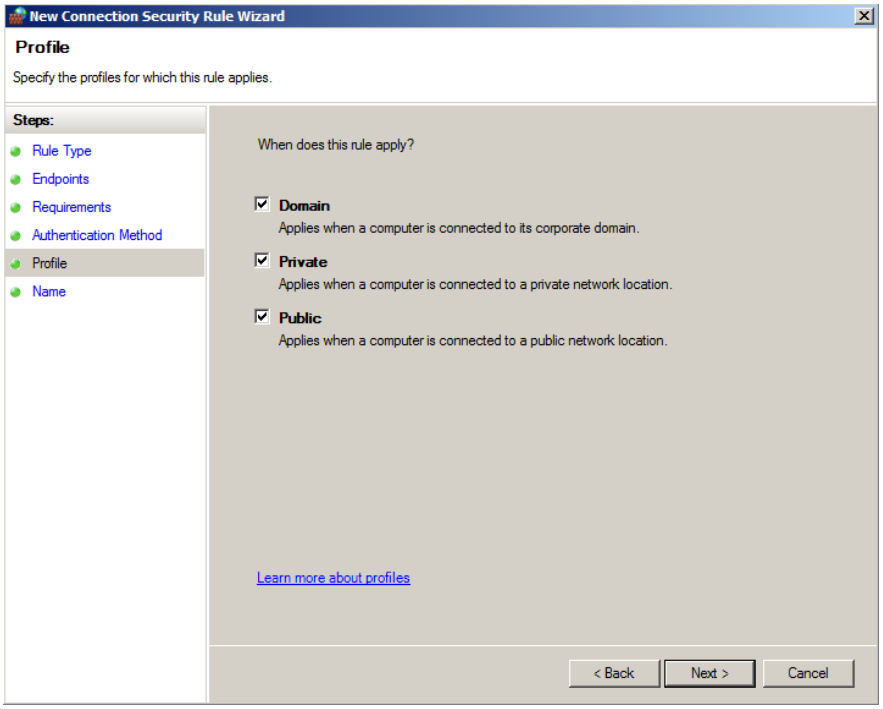
- On the **Customize Advanced Authentication Methods** page, click Add



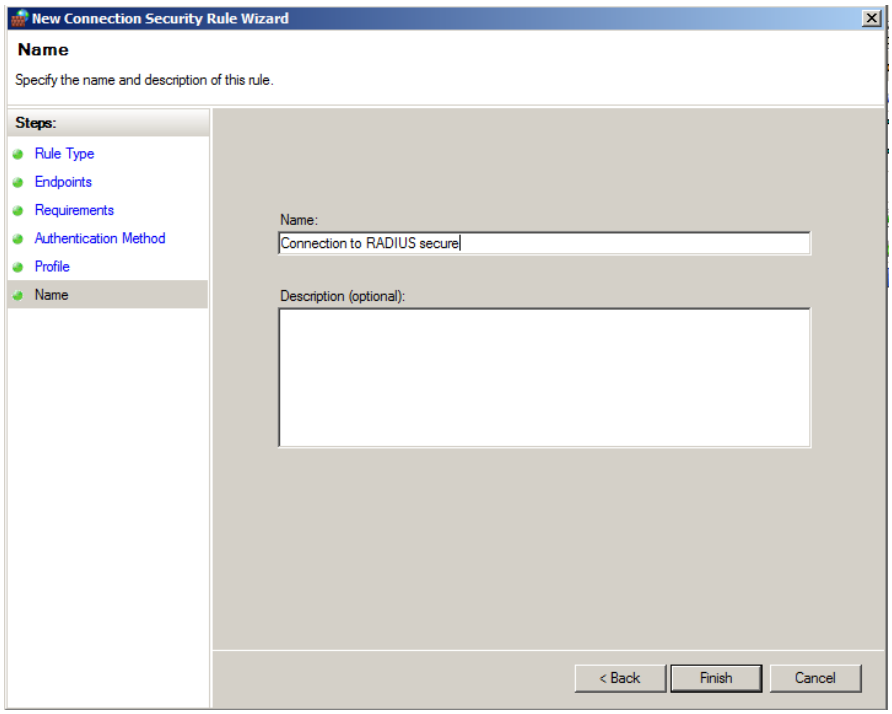
- On the **Add First Authentication Method** page, select Preshared key and type a pre-shared key



- Click multiple times OK and click Next
- On the **Profile** page, click Next

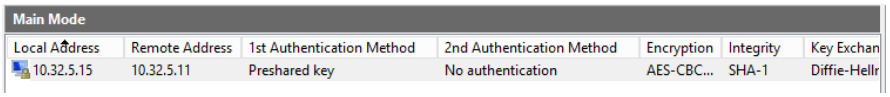


- On the **Name** page, type a name and click Finish



Monitor Security Associations

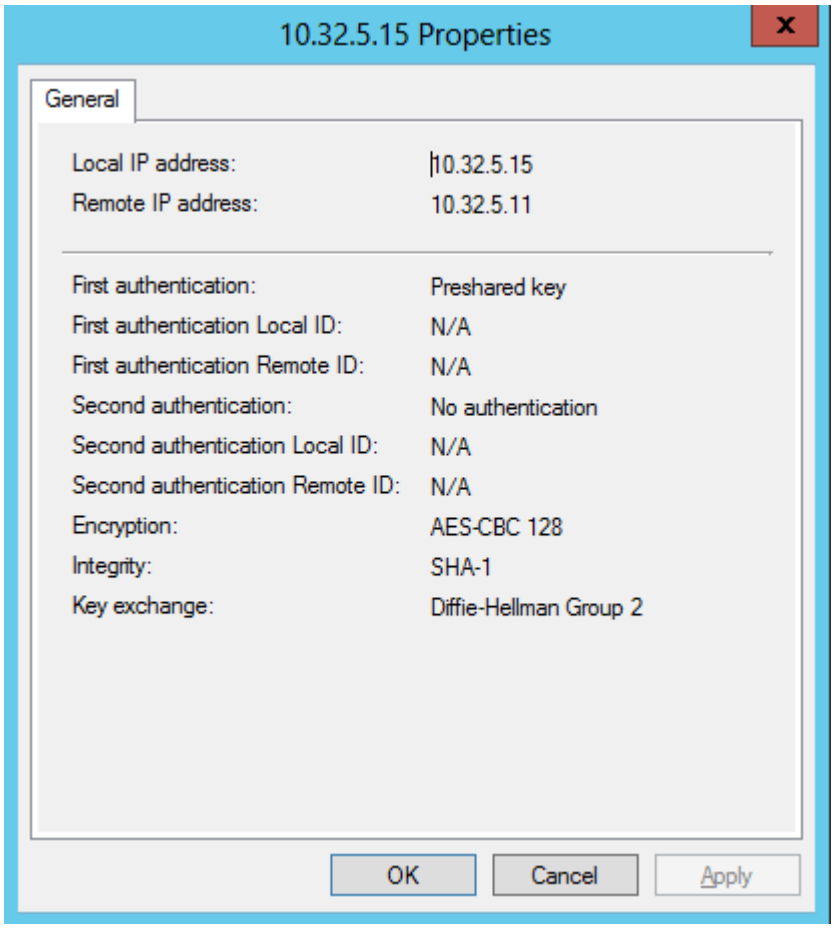
- On your RADIUS server, expand **Monitoring | Security Associations | Main Mode**
- When the RADIUS client initiates a secure connection to the RADIUS server, a security association is created.



Main Mode

Local Address	Remote Address	1st Authentication Method	2nd Authentication Method	Encryption	Integrity	Key Exchan
10.32.5.15	10.32.5.11	Preshared key	No authentication	AES-CBC...	SHA-1	Diffie-Hellr

- IPSec Main Mode Security Association between RADIUS server and RADIUS client



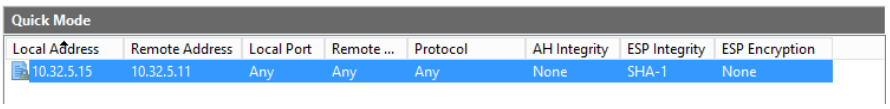
- ISAKMP Key Exchange in Wireshark

```
⊞ Frame 3: 310 bytes on wire (2480 bits), 310 bytes captured (2480 bits) on interface 0
⊞ Ethernet II, Src: Vmware_65:25:d3 (00:0c:29:65:25:d3), Dst: Vmware_98:b6:2c (00:0c:29:98:b6:2c)
⊞ Internet Protocol Version 4, Src: 10.32.5.11 (10.32.5.11), Dst: 10.32.5.15 (10.32.5.15)
⊞ User Datagram Protocol, Src Port: isakmp (500), Dst Port: isakmp (500)
⊟ Internet Security Association and Key Management Protocol
    Initiator cookie: 04f34e64c143319f
    Responder cookie: 0000000000000000
    Next payload: Security Association (1)
    Version: 1.0
    Exchange type: Identity Protection (Main Mode) (2)
  ⊞ Flags: 0x00
    Message ID: 0x00000000
    Length: 268
  ⊞ Type Payload: Security Association (1)
  ⊞ Type Payload: Vendor ID (13) : MS NT5 ISAKMPOAKLEY
  ⊞ Type Payload: Vendor ID (13) : RFC 3947 Negotiation of NAT-Traversal in the IKE
  ⊞ Type Payload: Vendor ID (13) : draft-ietf-ipsec-nat-t-ike-02\n
  ⊞ Type Payload: Vendor ID (13) : Microsoft L2TP/IPSec VPN Client
  ⊞ Type Payload: Vendor ID (13) : Unknown Vendor ID
  ⊞ Type Payload: Vendor ID (13) : Microsoft Vid-Initial-Contact
  ⊞ Type Payload: Vendor ID (13) : Unknown Vendor ID
```

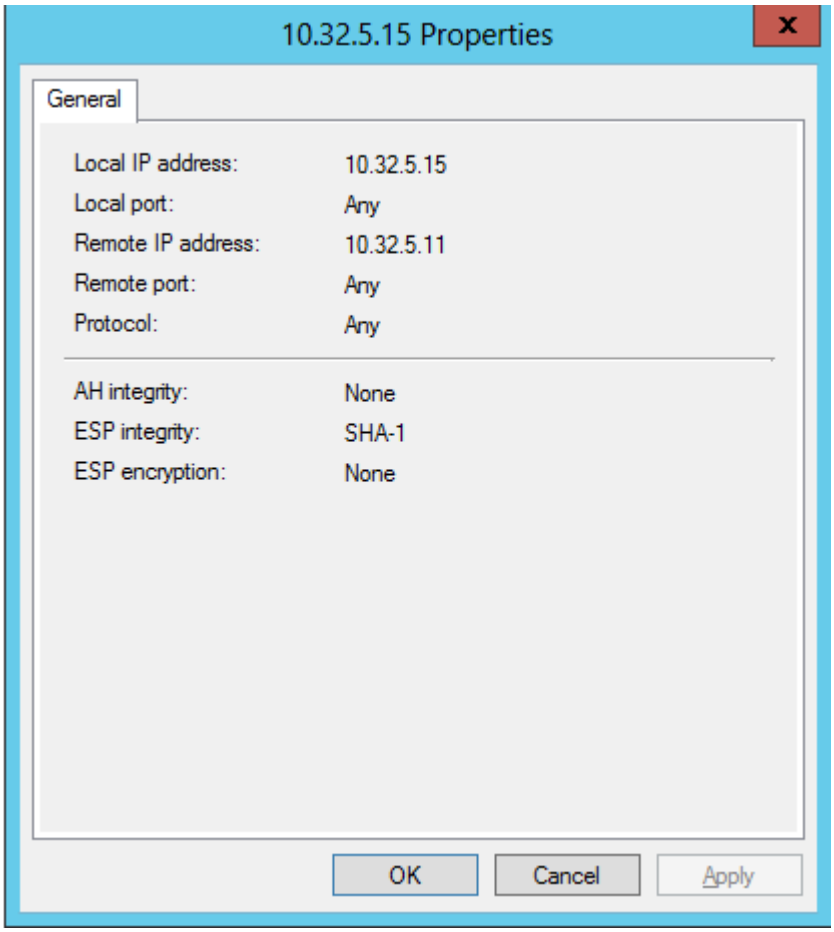
- ESP encrypted packets in Wireshark

```
⊞ Frame 79: 142 bytes on wire (1136 bits), 142 bytes captured (1136 bits) on interface 0
⊞ Ethernet II, Src: Vmware_98:b6:2c (00:0c:29:98:b6:2c), Dst: Vmware_65:25:d3 (00:0c:29:65:25:d3)
⊞ Internet Protocol Version 4, Src: 10.32.5.15 (10.32.5.15), Dst: 10.32.5.11 (10.32.5.11)
⊟ Encapsulating Security Payload
    ESP SPI: 0x38e226cc (954345164)
    ESP Sequence: 1
```

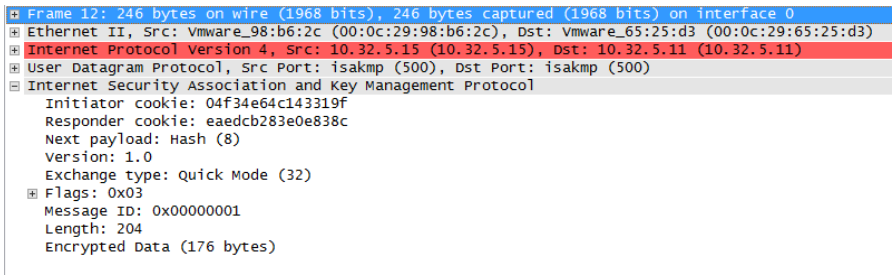
- Expand **Monitoring | Security Associations | Quick Mode**



- IPSec Quick Mode Security Association between RADIUS server and RADIUS client



- ESP encrypted packets in Wireshark

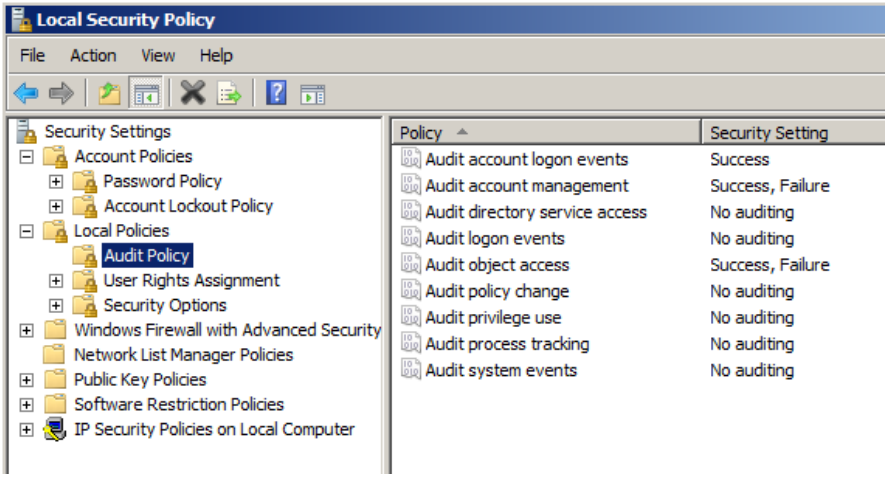


Authentication traffic is now encrypted by IPSec between the RADIUS server and RADIUS client.

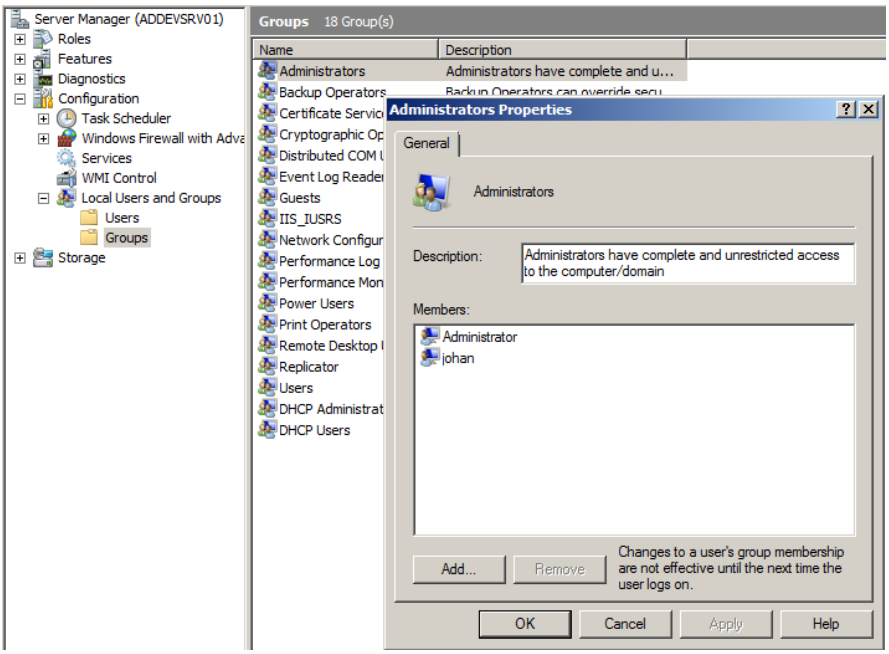
Auditing

To view auditing information on account management (create/delete user account), configure your server via a local group policy to Audit Account Management Events for Success and Failure.

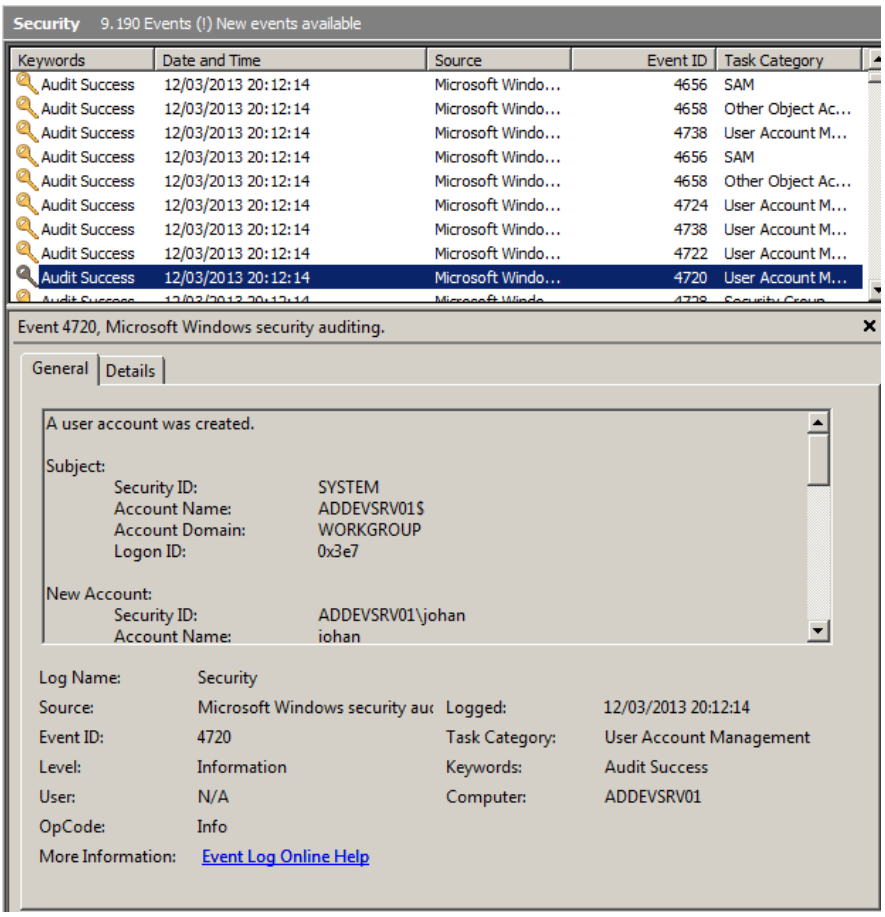
- Open **Local Security Policy** from **Administrative Tools**
- Navigate to **Security Settings | Local Policies | Audit Policy**



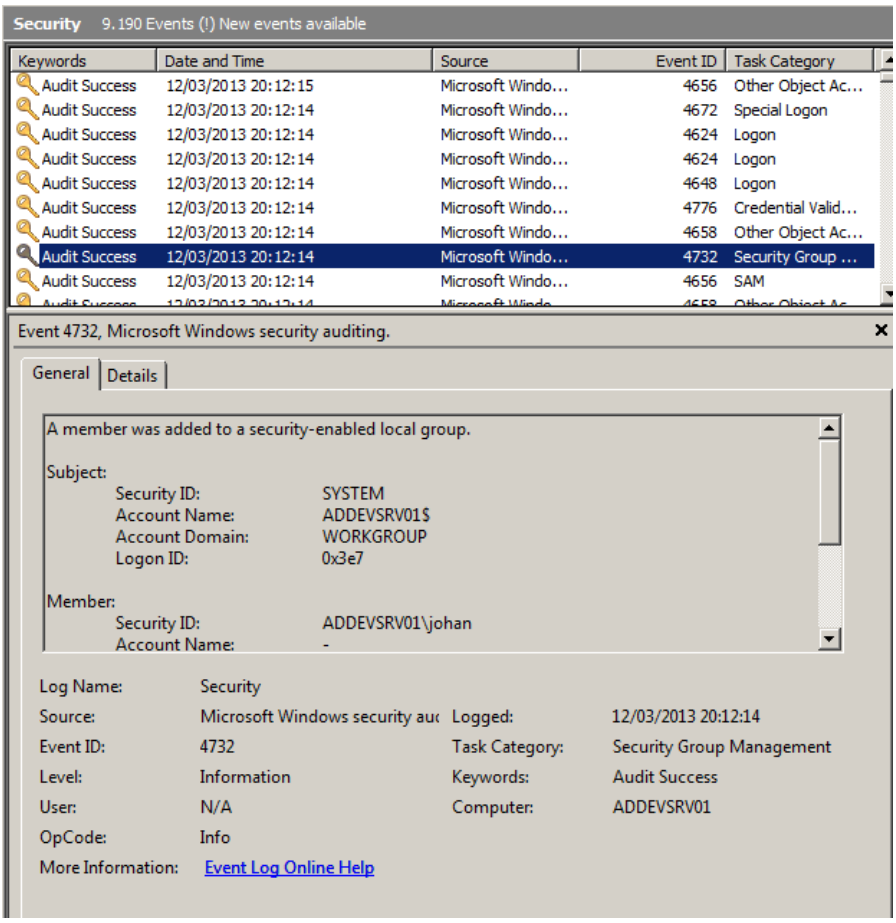
- If your authentication was done via LDAP or RADIUS, the user is added into the local group which you have specified above.



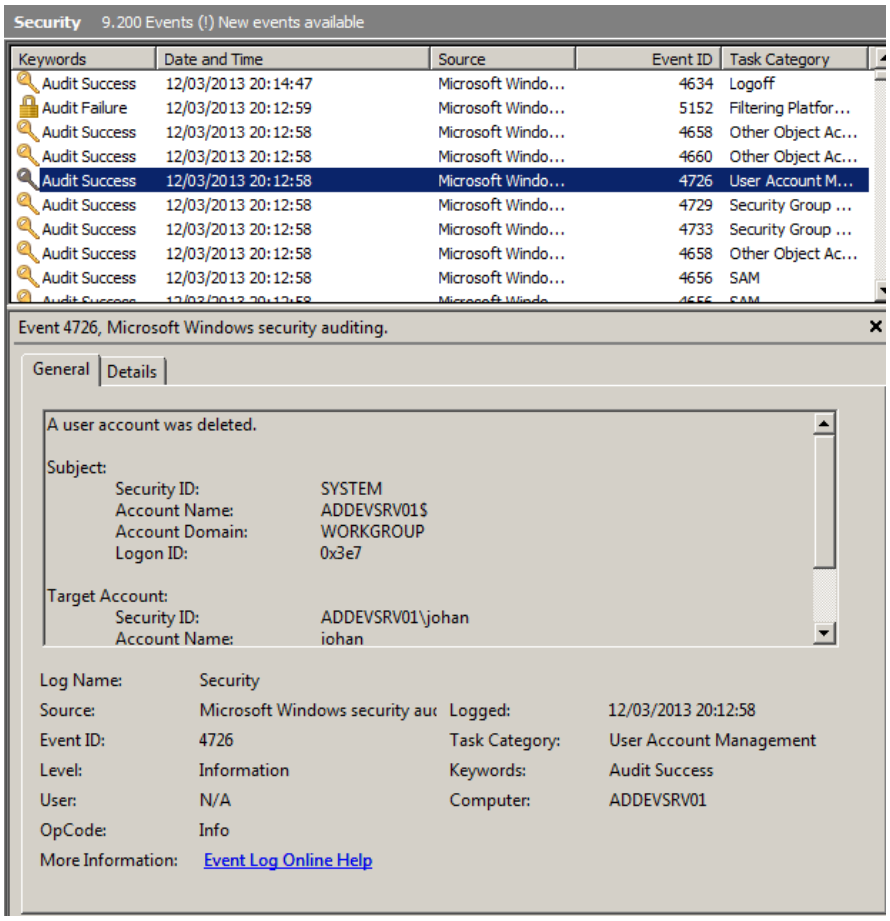
- User account is created on the workgroup server



- User account is added to a local group on the workgroup server

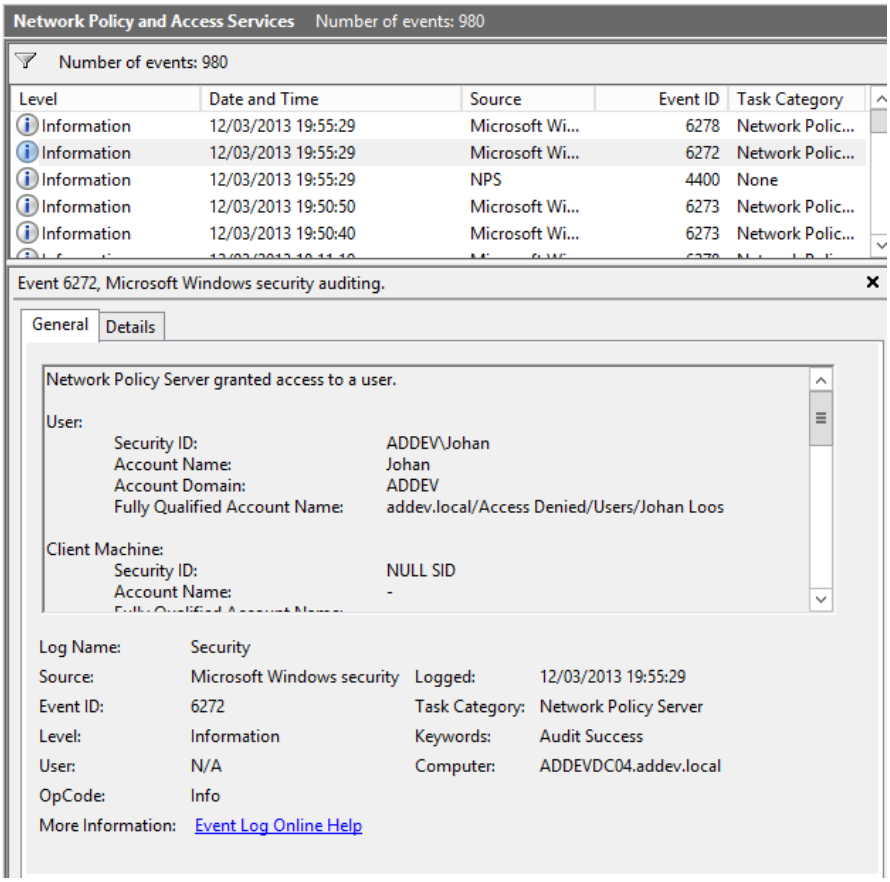


- User account is deleted (when you log off) on the workgroup server

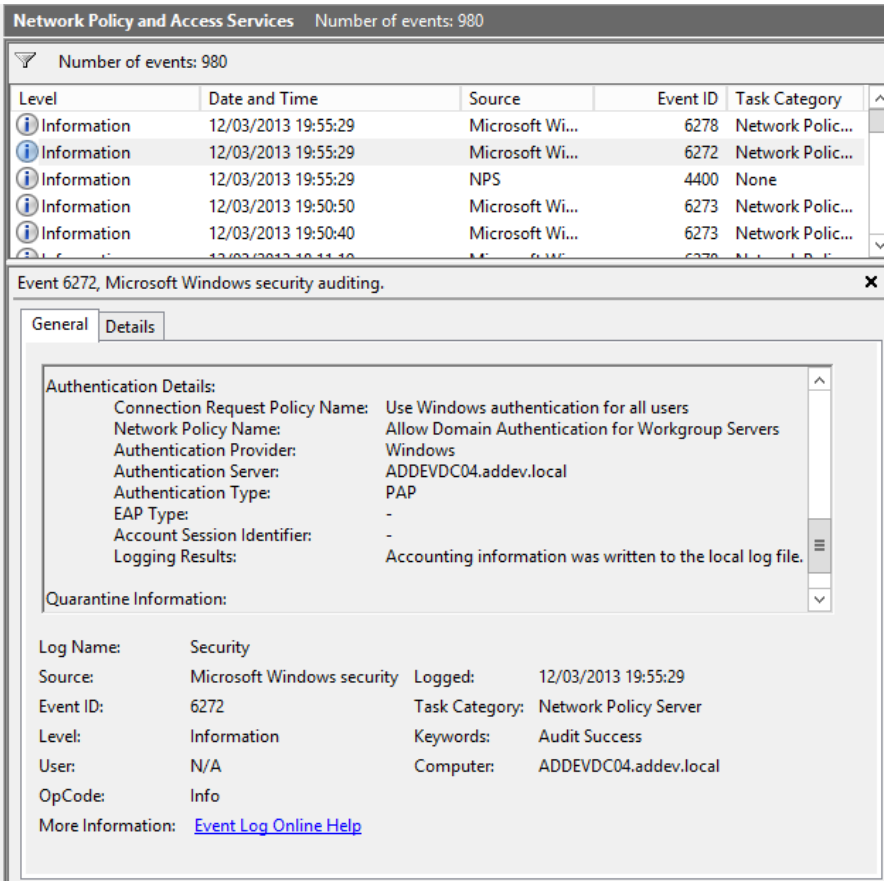


Logging information retrieved from your NPS Server:

- The user has been granted access to the network



- Authentication is done via the policy we have created above



Appendix A

IP address	Name	Server	Note
10.32.5.3	ADDEVDC01	Domain Controller	Member of Active Directory
10.32.5.15	ADDEVDC04	Network Policy Server	Member of Active Directory
10.32.5.11	ADDEVSRV01		Workgroup

URL: http://pgina.org/

Version used: 3.1.7.1 BETA