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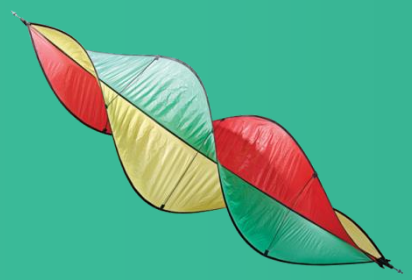
TECHNOLOGIECAMPUS GENT



Siemens Scalance S623

Overview

- Basic Configuration
- Standard mode Firewall
- Advanced Firewall
- Password Management
- Advanced Password Management
- VPN with PreShared Key
- VPN with Certificates
- Gateway-to-Gateway VPN
- VPN with User Authentication

Technology Overview

- User Authentication
  - On-device
  - Connection with RADIUS server

- VPN
  - IPsec end-to-end

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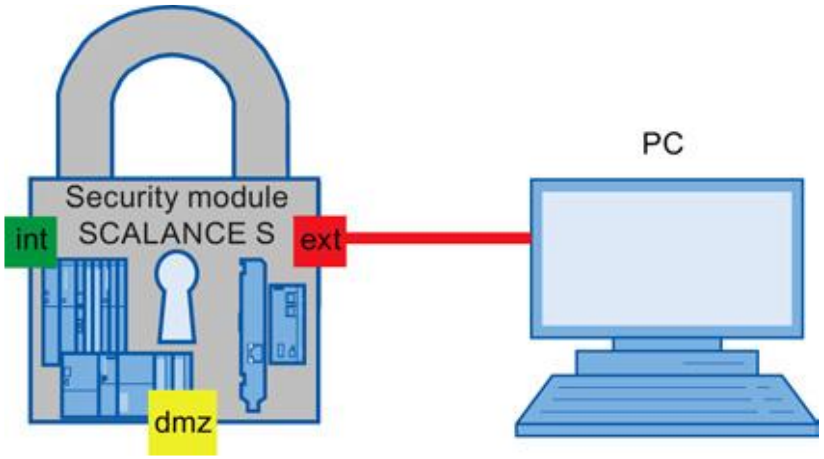
Necessary Software

- Siemens Security Configuration Tool
- Siemens SOFTNET Security Client
- Siemens Automation License Manager
- (Optional) Siemens Primary Setup Tool

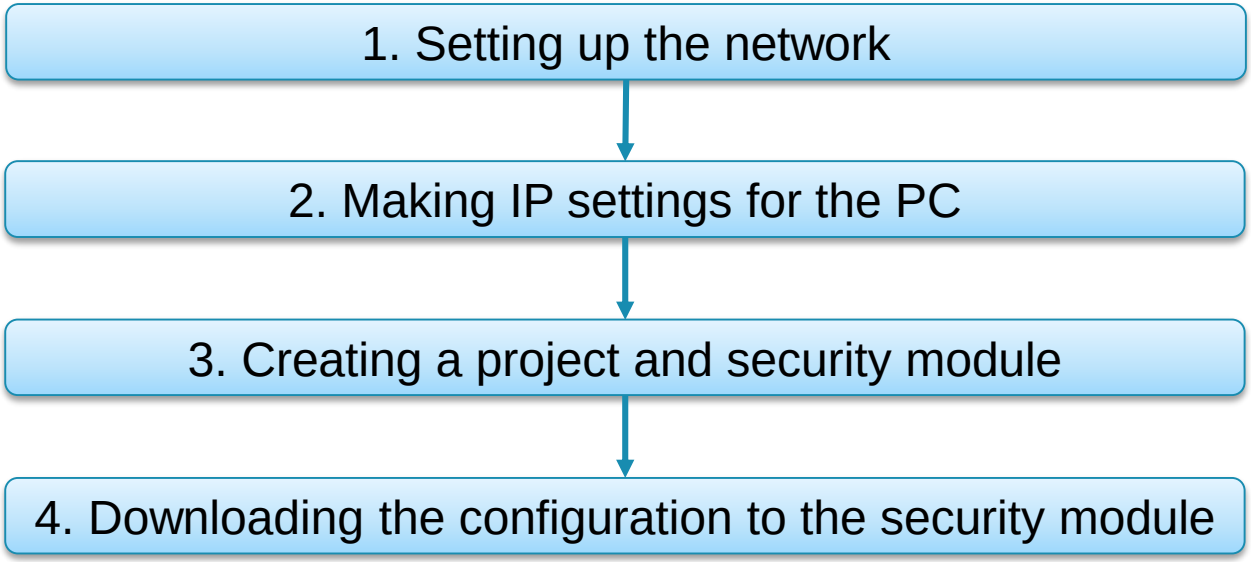
Basic Configuration



In this example we set the IP addresses of all 3 interfaces on the Scalance 623

This will demonstrate configuration steps that will be reused in every following example

Basic Configuration



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Basic Configuration

1. Setting up the network

- Connecting the external interface of the Scalance to the PC

- Scalance interfaces
  - External network

    Red marking = unprotected network area
  - Internal network

    Green marking = network protected by Scalance
  - DMZ port

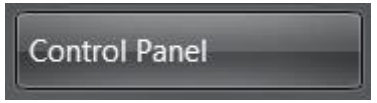
    Yellow marking = unprotected or protected network

Basic Configuration

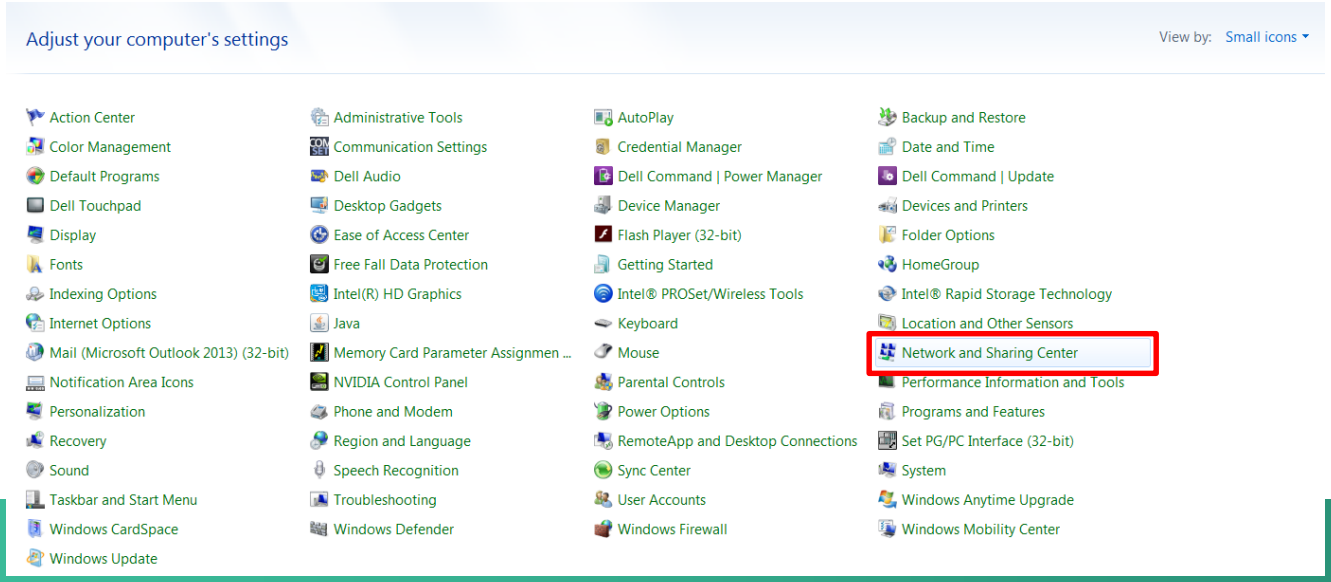
2. Making IP settings for the PC

PC	IP address	Subnet mask
PC	192.168.10.2	255.255.255.0

- Open Control Panel “Start” > “Control Panel”



- Open “Network and Sharing Center”



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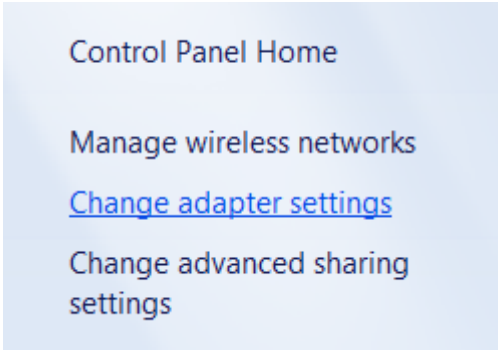
Basic Configuration

2. Making IP settings for the PC

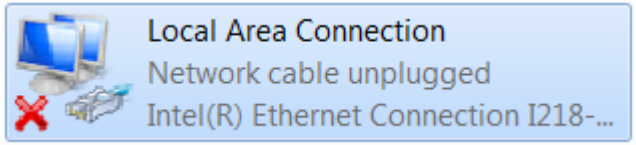
PC	IP address	Subnet mask
PC	192.168.10.2	255.255.255.0

- Select “Change adapter settings”



- Open the Local Area Connection Properties

  Doubleclick “Local Area Connection”, then click “Properties”



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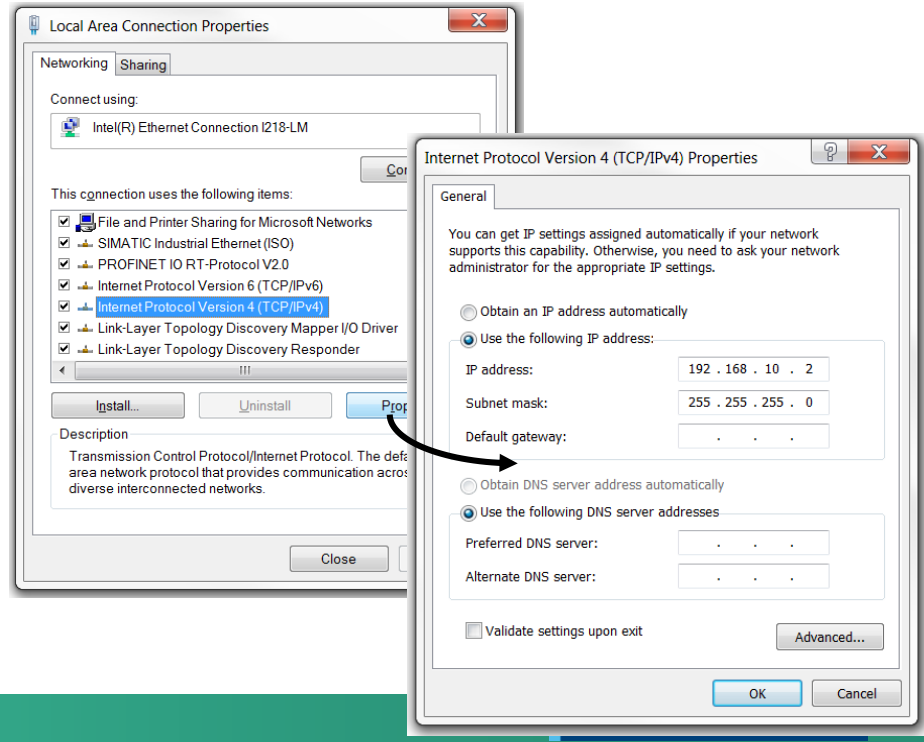
Basic Configuration

2. Making IP settings for the PC

PC	IP address	Subnet mask
PC	192.168.10.2	255.255.255.0

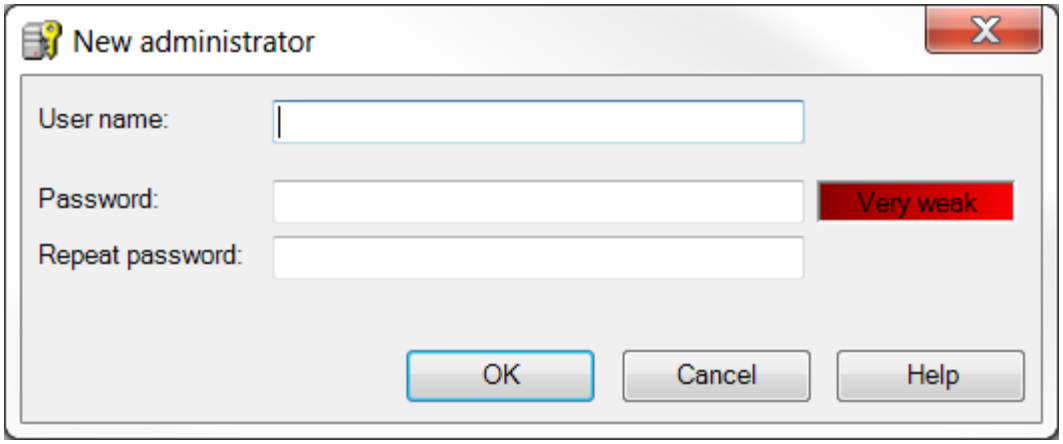
- Click the “Properties” button
- Select “Use the following IP”
- Enter the values from the table in the relevant boxes
- Close the dialogs with “Ok” and close Control Panel



Basic Configuration

3. Creating a project and security module

- Start the Security Configuration Tool
- Select the “Project” > “New...” menu command
- Create a new user
  This user is assigned the “administrator” role

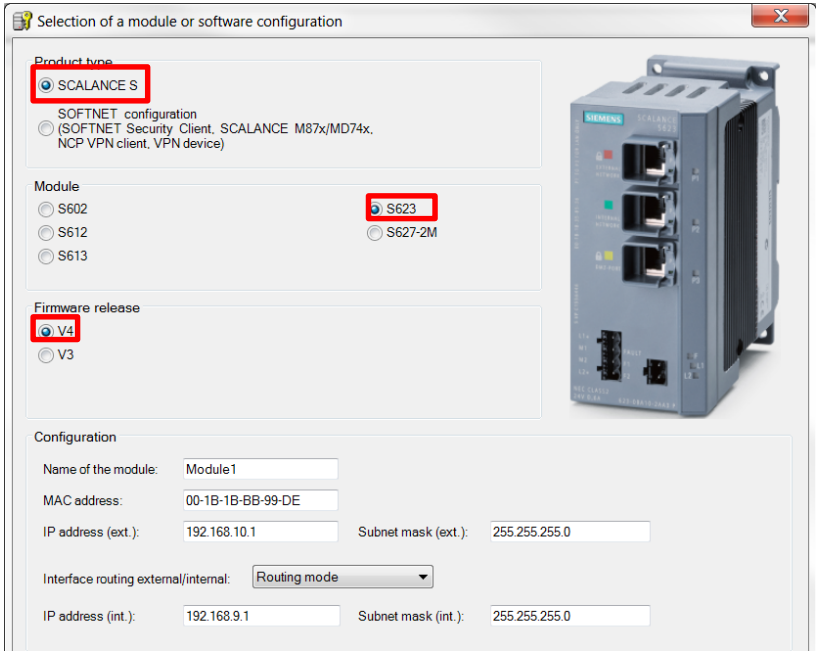


- Confirm with “OK”

Basic Configuration

3. Creating a project and security module

- In the “Product type”, “Module” and “Firmware release” areas, select the following options
  - Product type: Scalance S
  - Module: S623
  - Firmware release: V4



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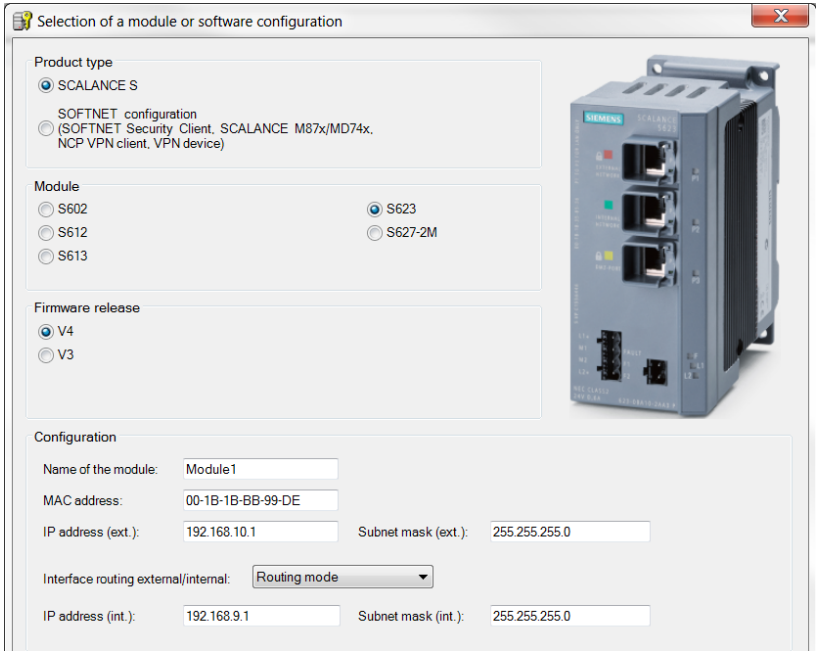
Basic Configuration

3. Creating a project and security module

- In the “Configuration” area, enter the MAC address
  The MAC address is printed on the front of the SCALANCE



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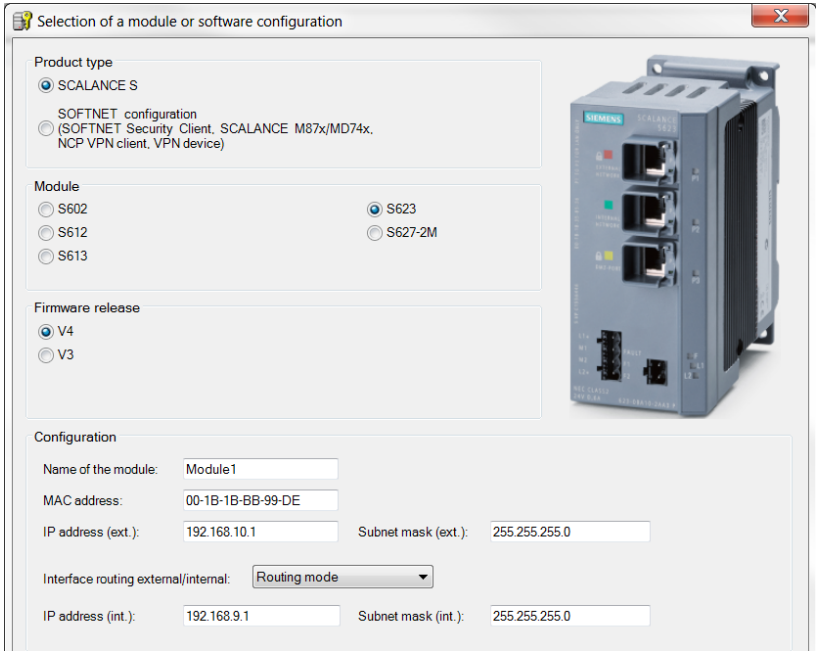
Basic Configuration

3. Creating a project and security module

- In the “Configuration” area, enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- From the drop-down list, select the “Routing Mode”
- Enter the internal IP address (192.168.9.1) and the internal subnet mask (255.255.255.0)
- Confirm with “OK”



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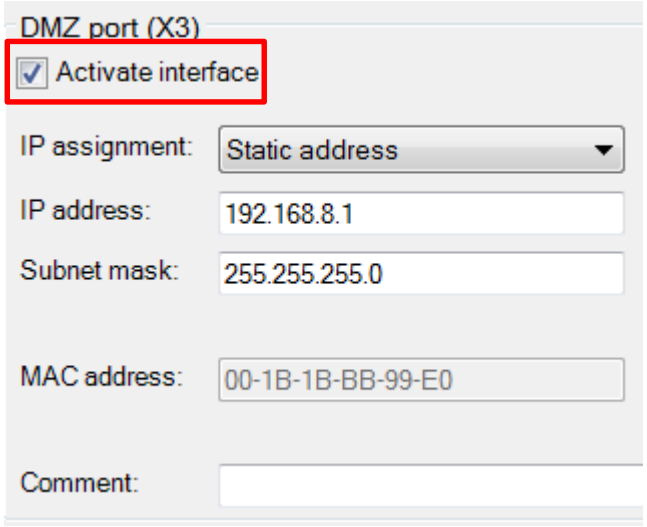
Basic Configuration

3. Creating a project and security module

- Select the security module created and select the “Edit” > “Properties” menu command, “Interfaces” tab
- Select the “Activate Interface” check box in the “DMZ port (X3)” area
- Enter the IP address (192.168.8.1) and the subnet mask (255.255.255.0) for the DMZ interface
- Confirm with “OK”



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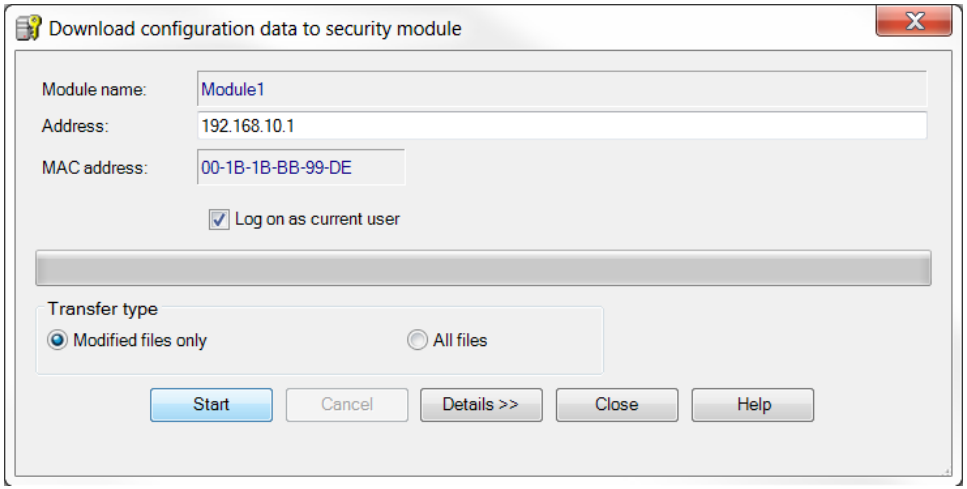
Basic Configuration

4. Downloading the configuration to the security module

- Select the “Project” > “Save” menu command
- Select the security module in the content area
- Select the “Transfer” > “To module(s)…” menu command



- Start the download with the “Start” button

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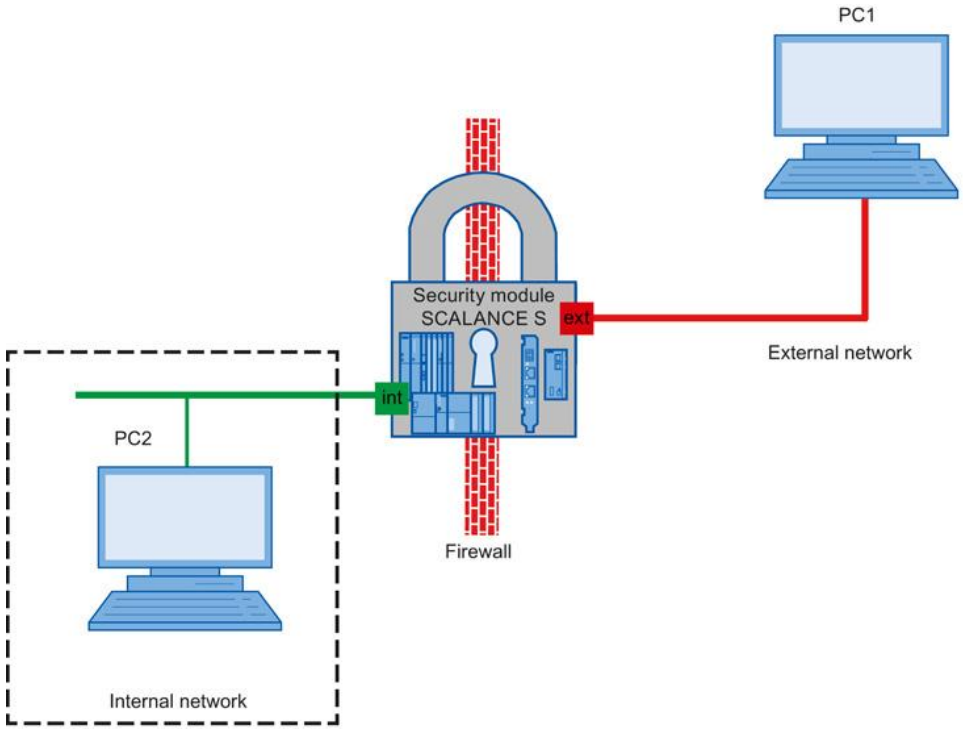
Basic Configuration

4. Downloading the configuration to the security module

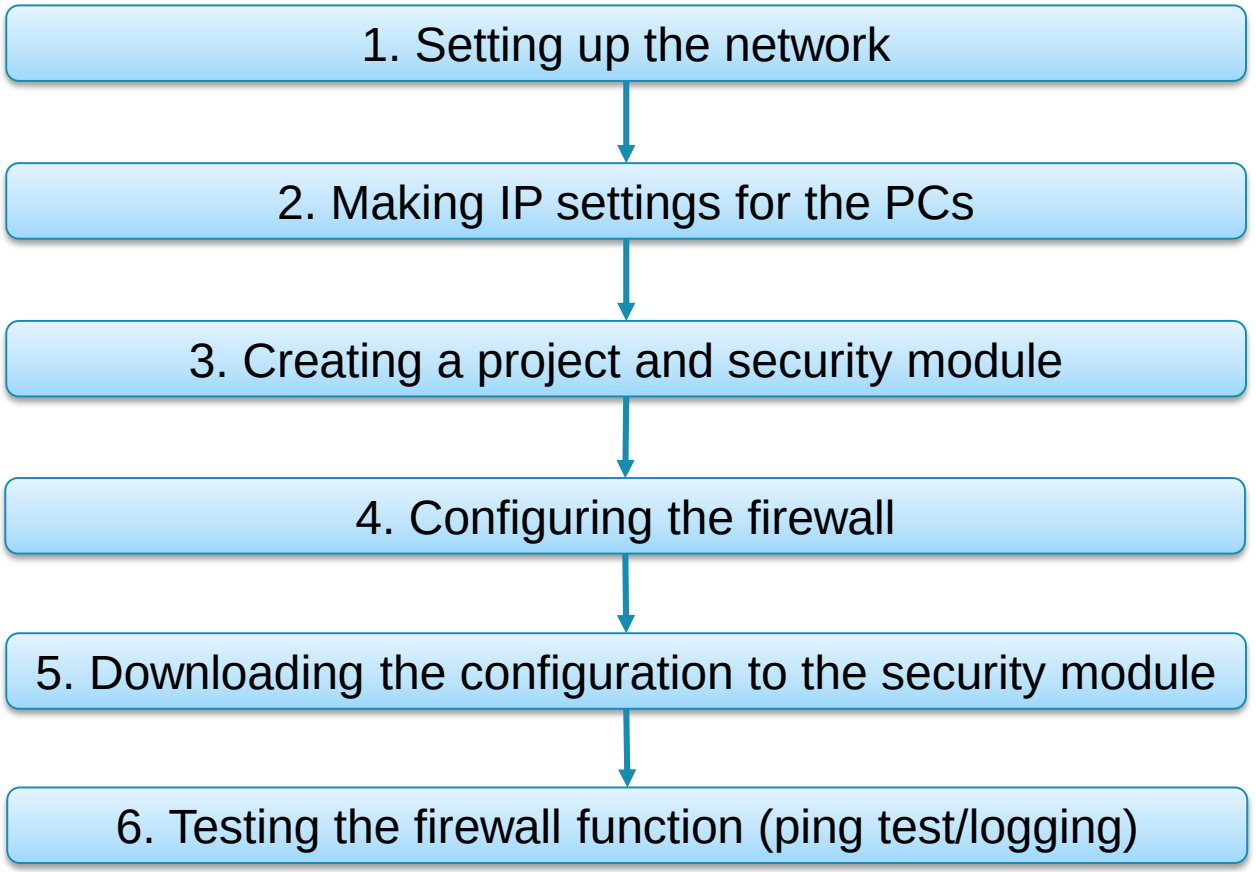
- If the download was completed successfully, the Scalance is restarted automatically and the configuration activated
- The Scalance is now in productive operation
- Configurations can be download via all interfaces
- The configured IP addresses can be modified

Standard mode Firewall



In this example, the firewall will be configured to allow IP traffic to only be initiated by the internal network

Standard mode Firewall



Standard mode Firewall

1. Setting up the network

- Reset the Scalance to factory settings by pressing the Reset button and holding it down for at least 5 seconds
- Connect the PC with the Security Configuration Tool (PC1) to the external network interface
- Connect PC2 to the internal network interface

Standard mode Firewall

2. Making IP settings for the PCs

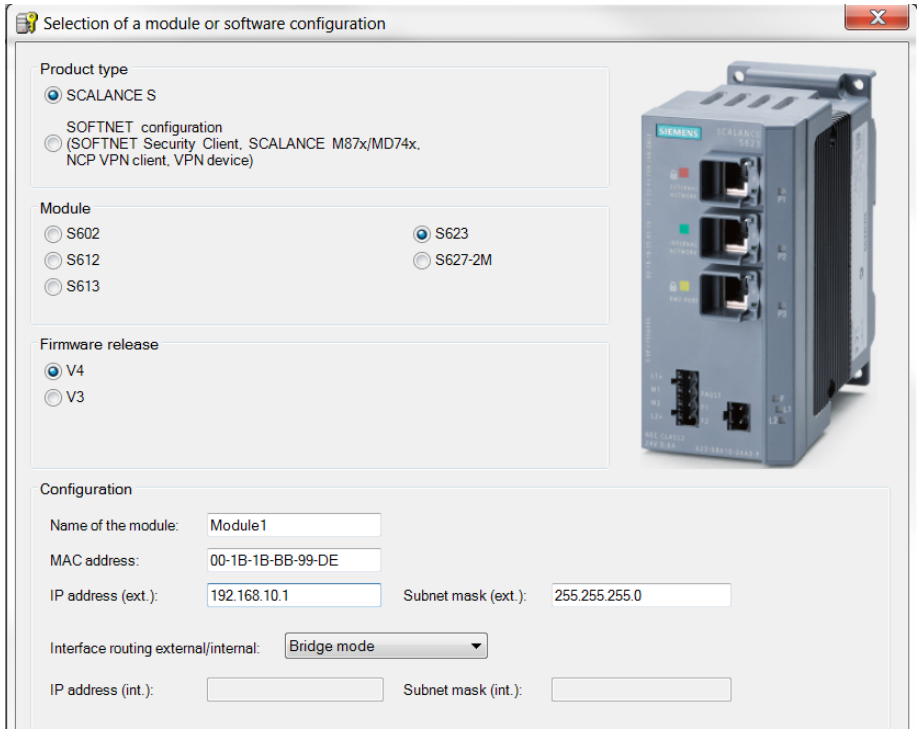
PC	IP address	Subnet mask
PC1	192.168.10.2	255.255.255.0
PC2	192.168.10.3	255.255.255.0

- Set the IP addresses of the PCs as in the table above

Standard mode Firewall

3. Creating a project and security module

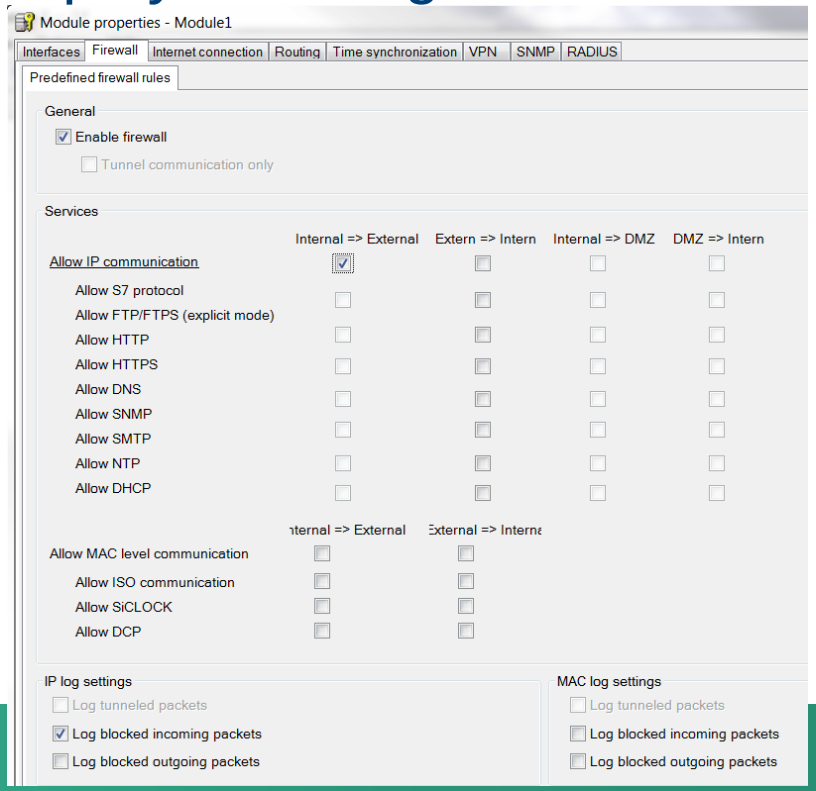
- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- Confirm with “OK”



Standard mode Firewall

4. Configuring the firewall

- Select the security module in the content area
- Select the “Edit” > “Properties…” menu command
- Select the “Firewall” tab in the displayed dialog
- Activate the settings shown in the picture
  Result: IP traffic is only initiated from the internal network
- Logging is selected to record data traffic
- Close with OK
- Save the project



Standard mode Firewall

5. Downloading the configuration to the security module

- Transfer the configuration to the security module

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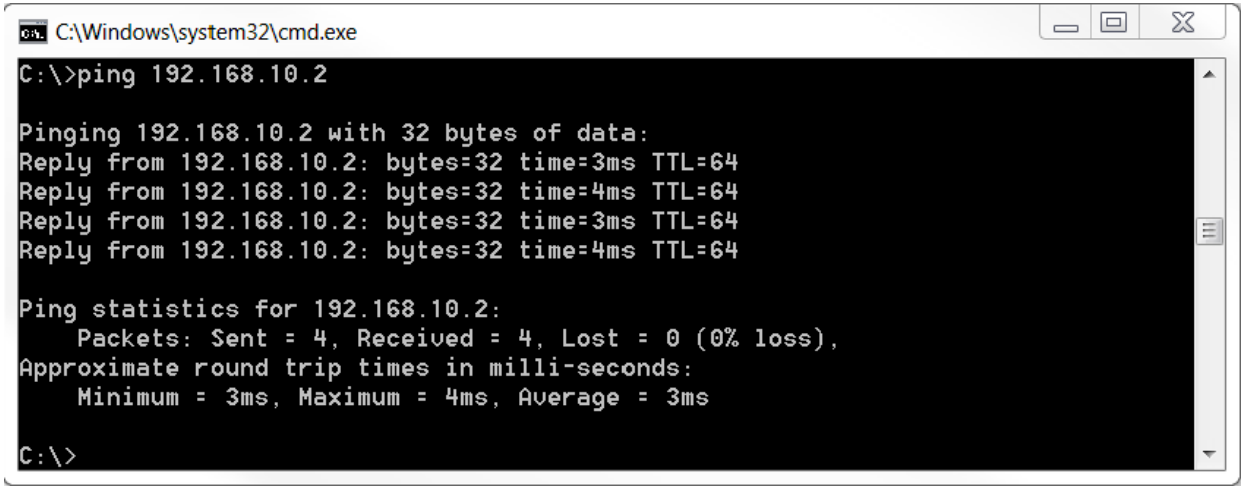
Standard mode Firewall

6. Testing the firewall function (ping test/logging)

- Open the command prompt on PC2 “Start” > ”All programs” >”Accessories” > ”Command Prompt”
- Enter the ping command from PC2 to PC1 “ping 192.168.10.2”



- All packets reach PC1

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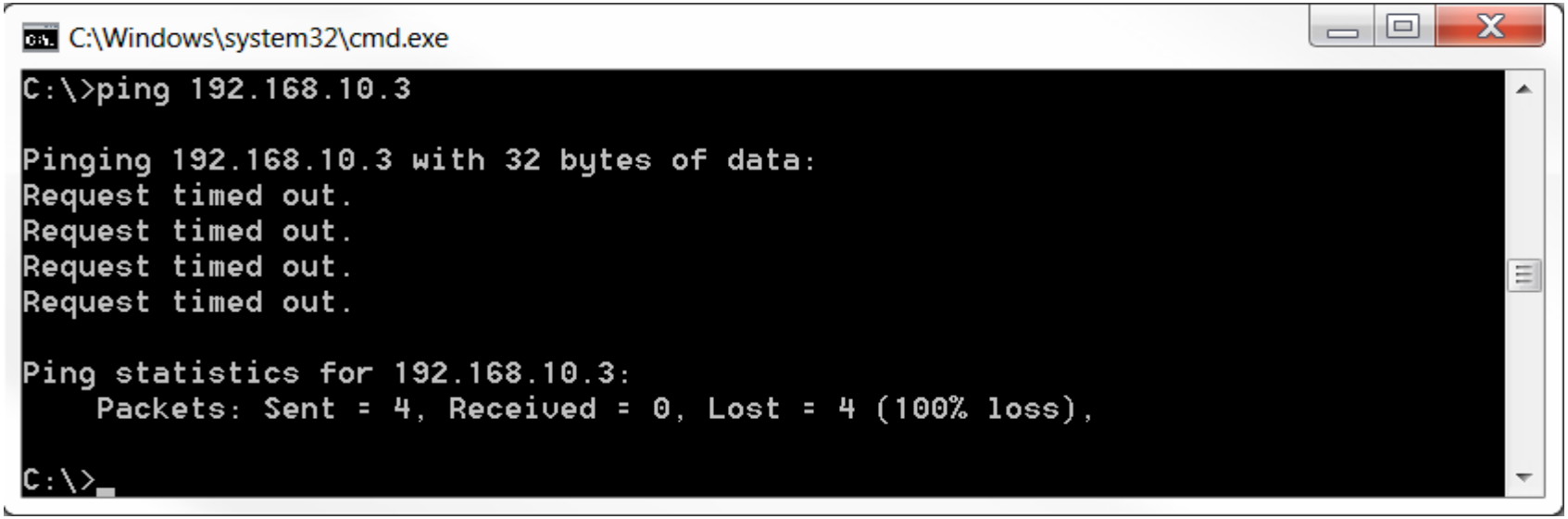
Standard mode Firewall

6. Testing the firewall function (ping test/logging)

- Open the command prompt on PC1
- Enter the ping command from PC1 to PC2 “ping 192.168.10.3”



- All packets are blocked at Scalance

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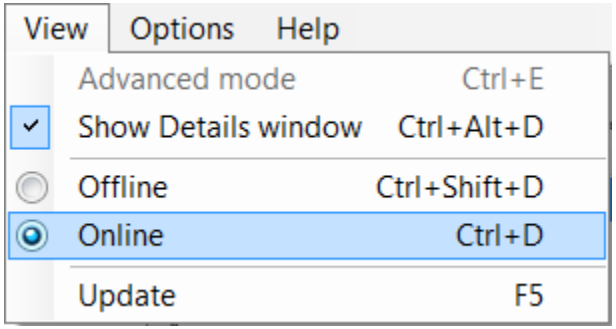
Standard mode Firewall

6. Testing the firewall function (ping test/logging)

- In the SCT change to online mode by selecting the menu option “View” > “Online”



- Select “Edit” > “View Diagnostics”
- Select the “Packet filter log” tab

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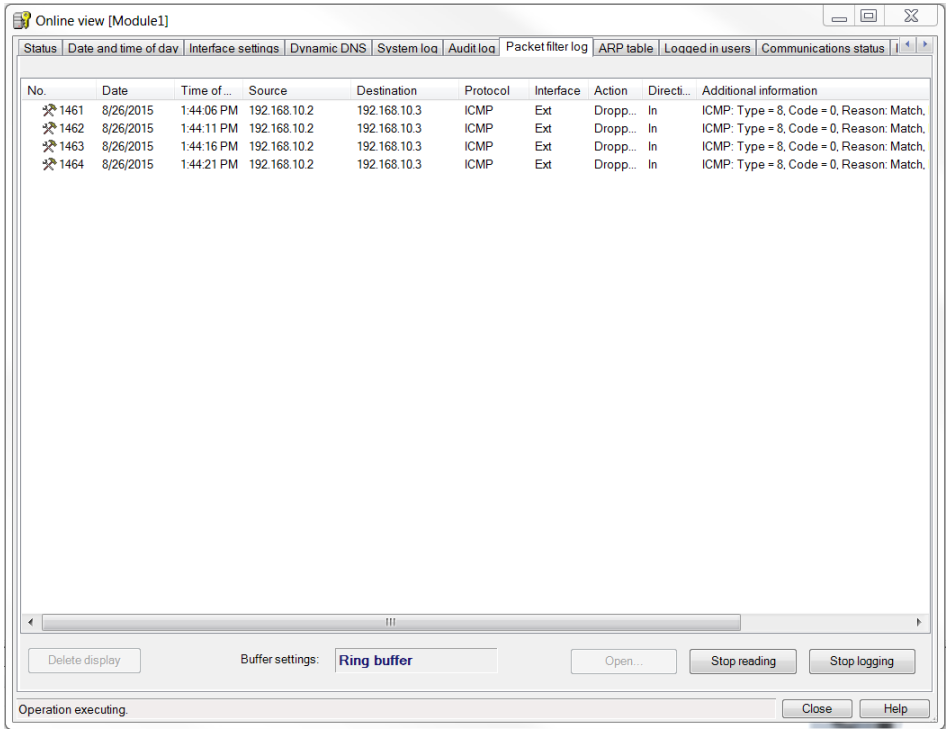
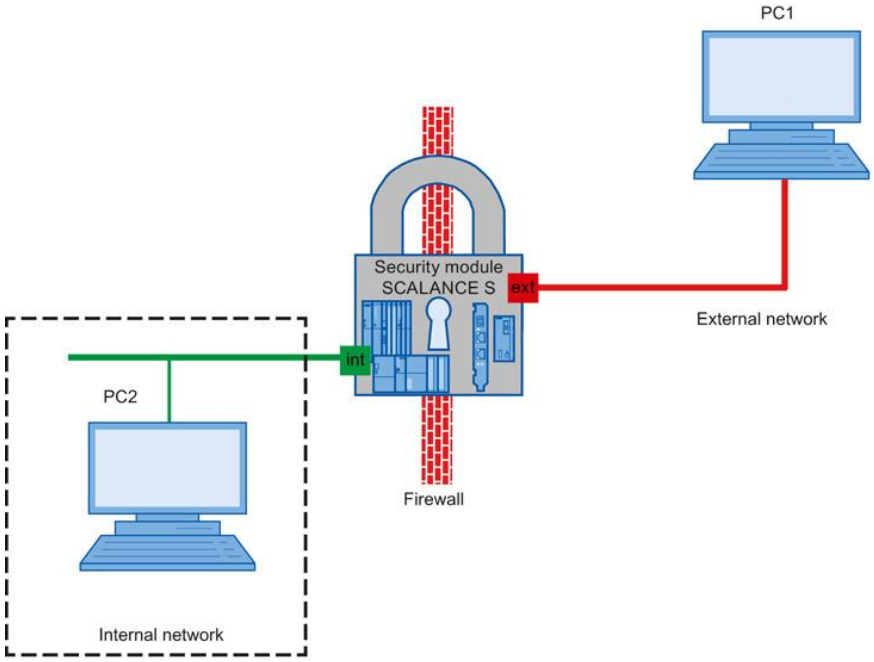
Standard mode Firewall

6. Testing the firewall function (ping test/logging)

- Click the “Start reading” button
- Acknowledge with “OK”
- Log entries are read and displayed here

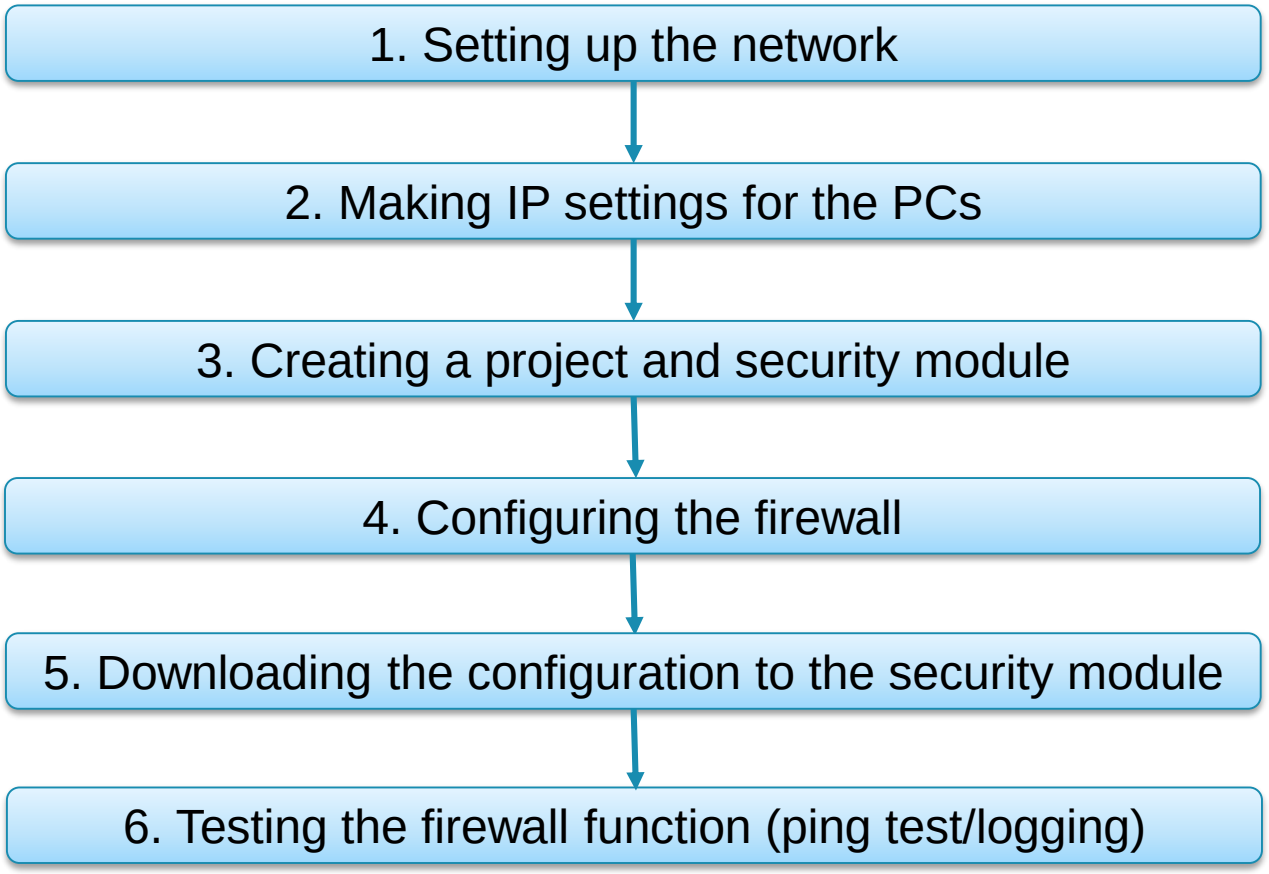


Advanced Firewall



In this example, the firewall is configured to allow IP traffic from PC2 to PC1. The packets are forwarded to the outside with an IP address translated to the IP address of the security module and a dynamically assigned port number. Only replies to these packets can enter the internal network

Advanced Firewall



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Advanced Firewall

1. Setting up the network

- Reset the Scalance to factory settings by pressing the Reset button and holding it down for at least 5 seconds
- Connect the PC with the Security Configuration Tool (PC1) to the external network interface
- Connect PC2 to the internal network interface

Advanced Firewall

2. Making IP settings for the PCs

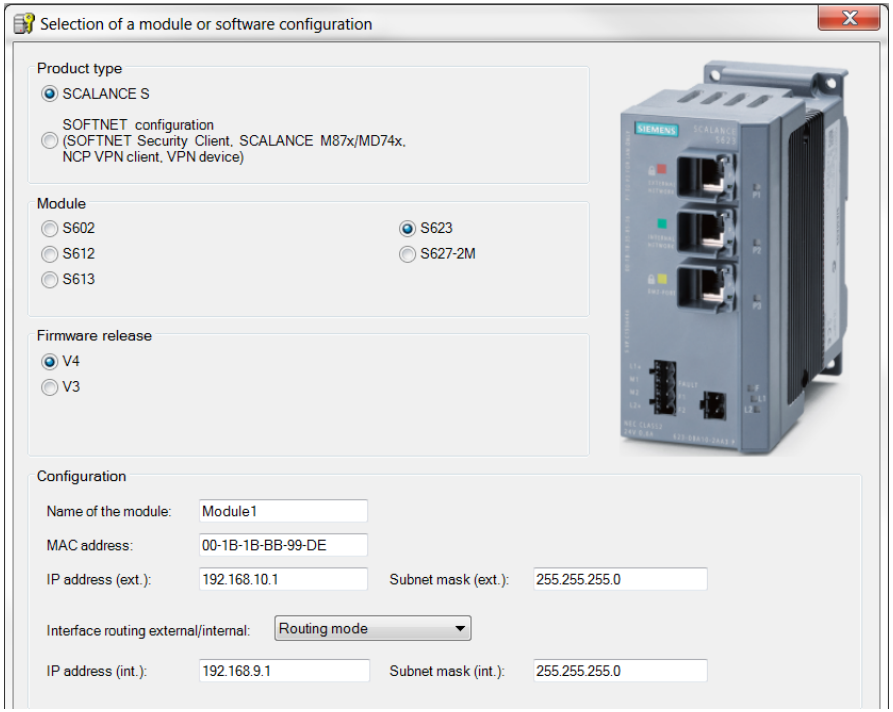
PC	IP address	Subnet mask	Default Gateway
PC1	192.168.10.2	255.255.255.0	192.168.10.1
PC2	192.168.9.2	255.255.255.0	192.168.9.1

- Set the IP addresses of the PCs as in the table above

Advanced Firewall

3. Creating a project and security module

- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- Select the “Routing mode”
- Enter the internal IP address (192.168.9.1) and subnet mask (255.255.255.0)
- Confirm with “OK”



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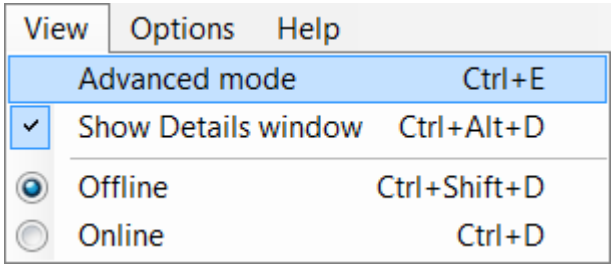
Advanced Firewall

4. Configuring the firewall

- Change the configuration view to advance mode with the menu command “View” > “Advanced Mode”



- Select the module in the content area
- Select the “Edit” > “Properties…” menu command
- Go to the “NAT/NAPT” tab

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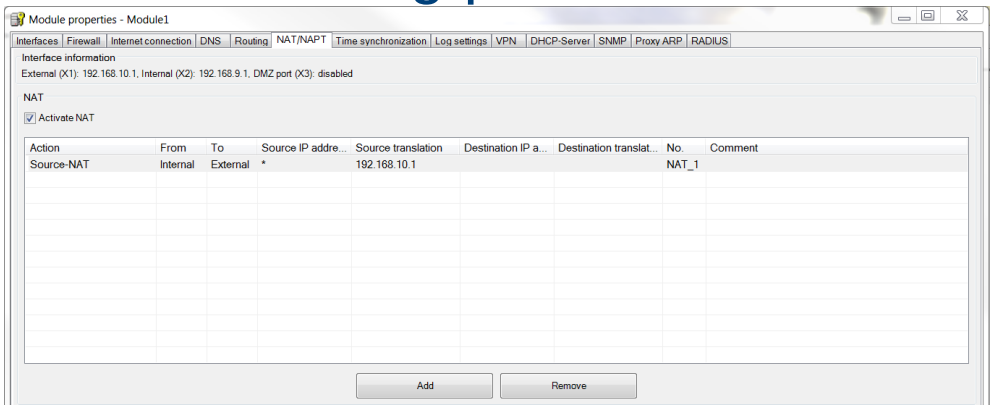
Advanced Firewall

4. Configuring the firewall

- Select the “Activate NAT” checkbox
- Click the “Add” button in the “NAT” input area
- Configure the NAT rule with the following parameters
  - Action: “Source NAT”
  - From: “Internal”
  - To: “External”
  - Source IP address: “*”
  - Source translation: “192.168.10.1
- Confirm with “Apply”



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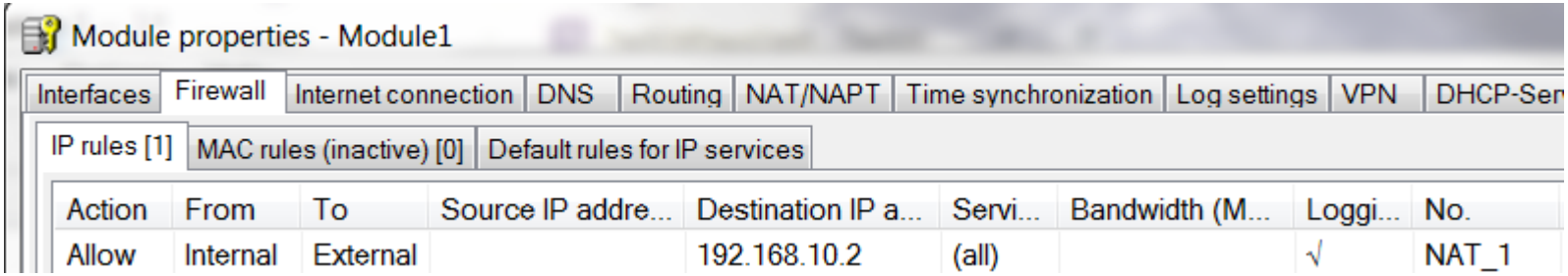
Advanced Firewall

4. Configuring the firewall

- Select the “Firewall” tab
- Expand the firewall rule created by SCT with the following
  - Destination IP address: 192.168.10.2
- Select the “Logging” check box



- Confirm with “OK”

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Advanced Firewall

5. Downloading the configuration to the security module

- Transfer the configuration to the security module

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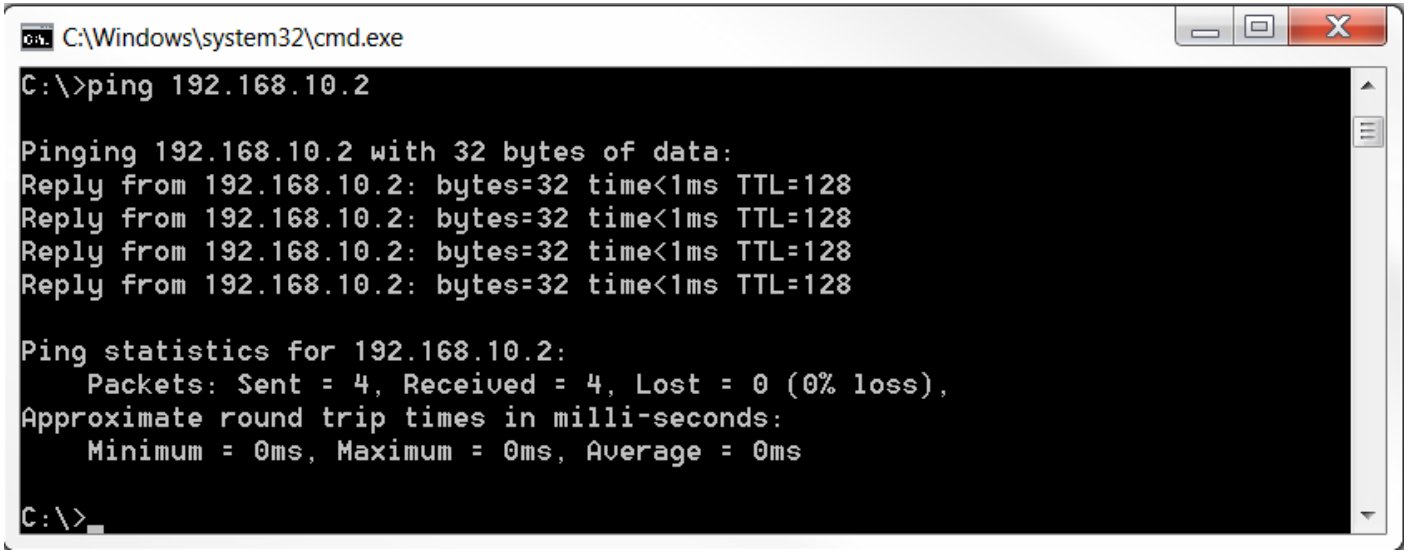
Advanced Firewall

6. Testing the firewall function (ping test/logging)

- Open the command prompt on PC2
- Enter the ping command from PC2 to PC1 “ping 192.168.10.2”



- All packets reach PC1

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Advanced Firewall

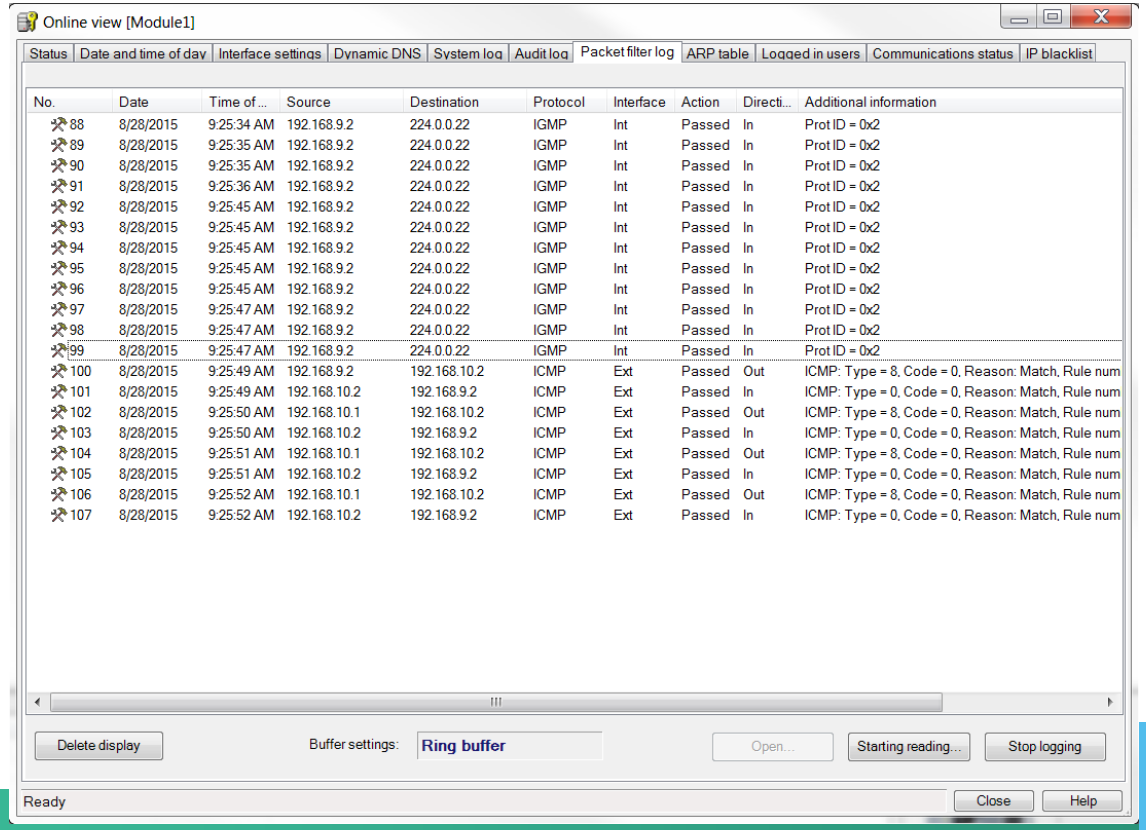
6. Testing the firewall function (ping test/logging)

- Change to online mode in the SCT with the “View” > “Online” menu command
- Select the module in the content area and the menu command “Edit” > “Online diagnostics”
- Go to the “Packet filter log” tab

Advanced Firewall

6. Testing the firewall function (ping test/logging)

- Click “Start reading…”
- Confirm the dialog with “OK”



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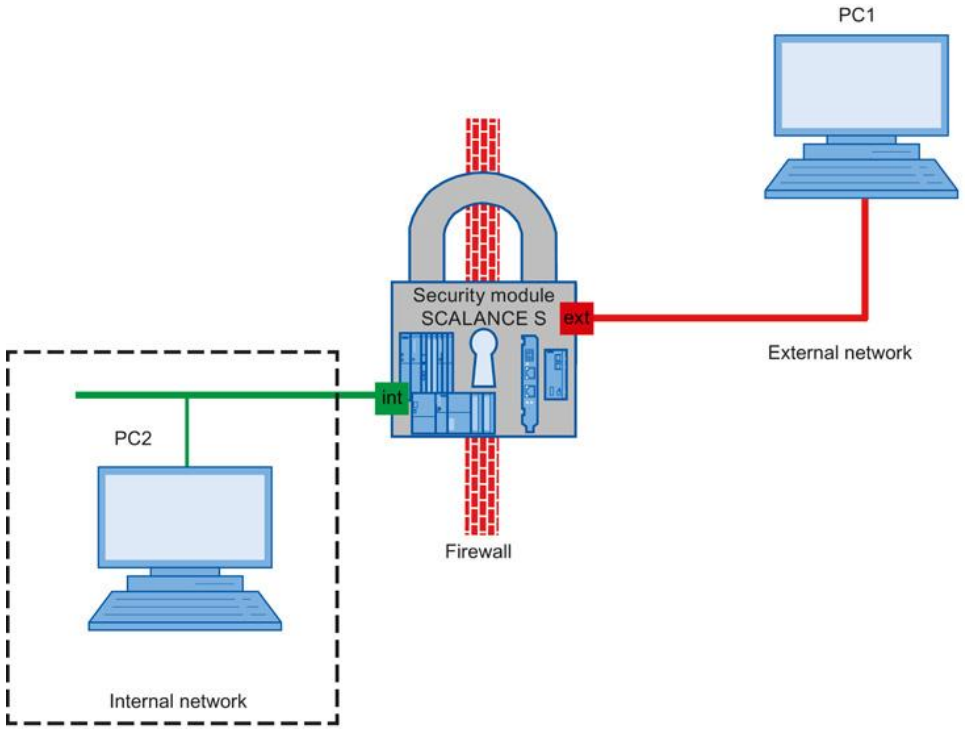
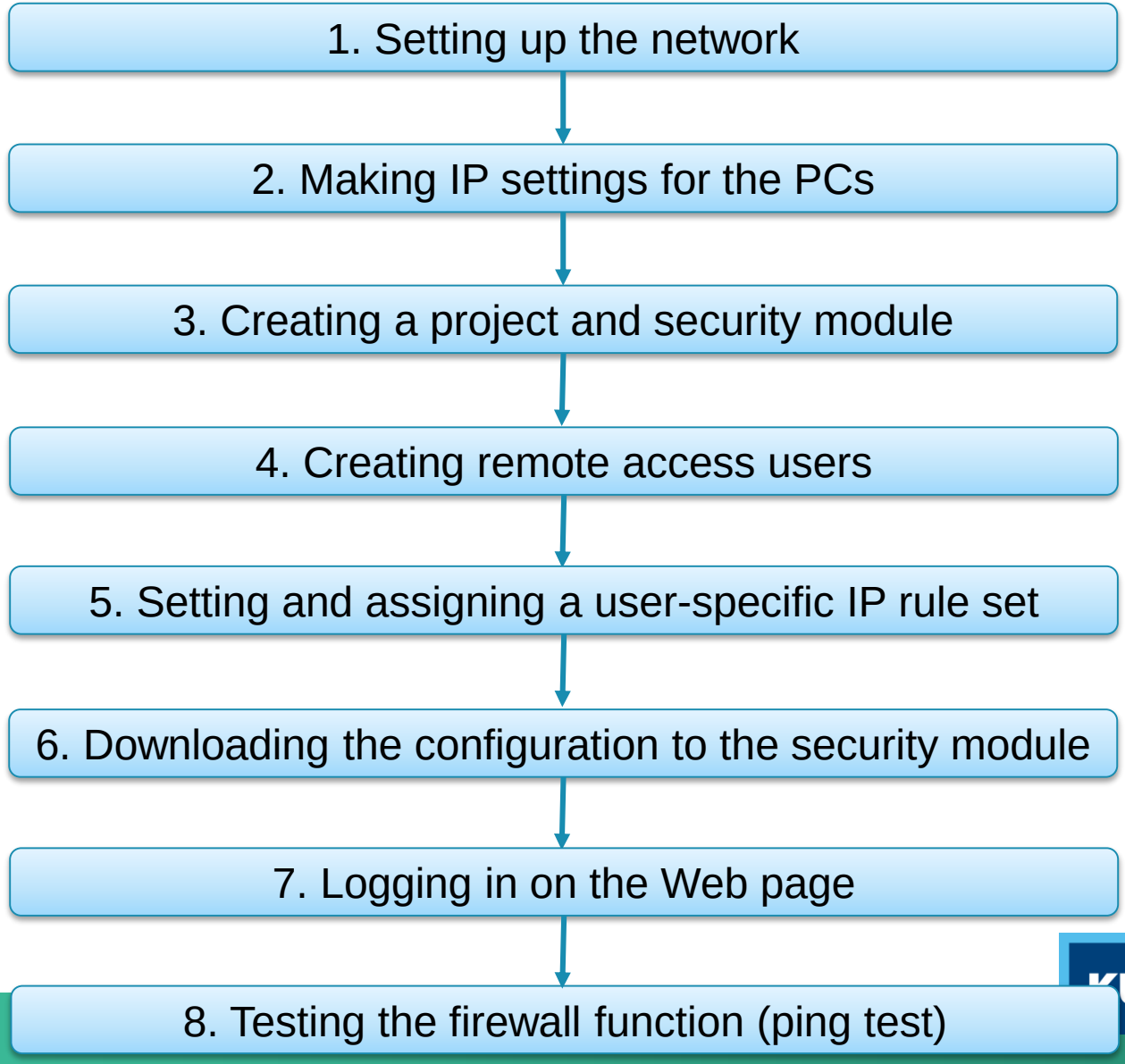
User Management



In this example, only a specific user is allowed to access PC2 in the internal network from PC1 in the external network. For other users, access is blocked

User Management



User Management

1. Setting up the network

- Reset the Scalance to factory settings by pressing the Reset button and holding it down for at least 5 seconds
- Connect the PC with the Security Configuration Tool (PC1) to the external network interface
- Connect PC2 to the internal network interface

User Management

2. Making IP settings for the PCs

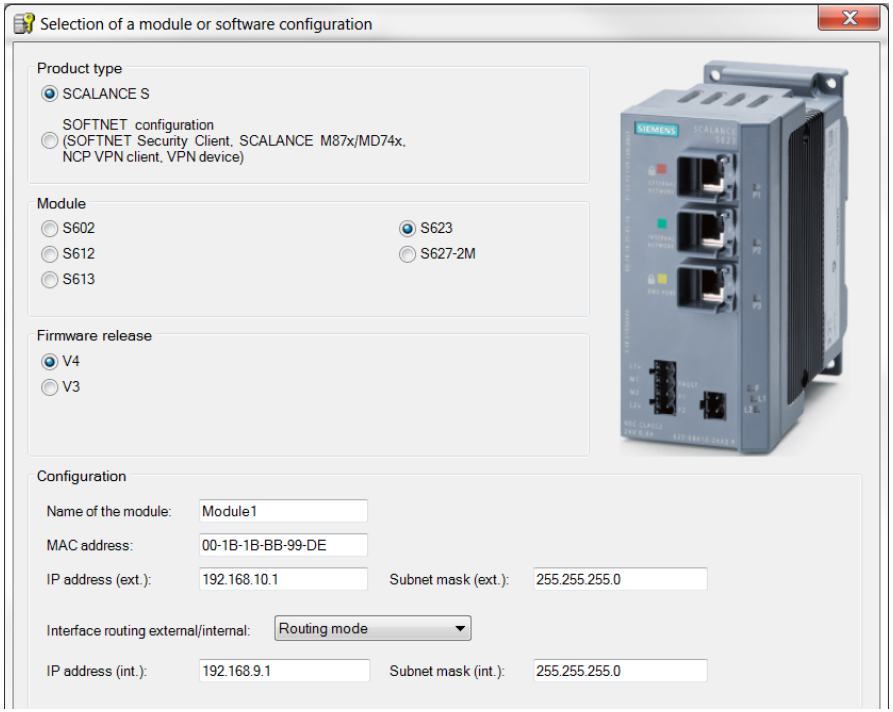
PC	IP address	Subnet mask	Default Gateway
PC1	192.168.10.2	255.255.255.0	192.168.10.1
PC2	192.168.9.2	255.255.255.0	192.168.9.1

- Set the IP addresses of the PCs as in the table above

User Management

3. Creating a project and security module

- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- Select the “Routing mode”
- Enter the internal IP address (192.168.9.1) and subnet mask (255.255.255.0)
- Confirm with “OK”



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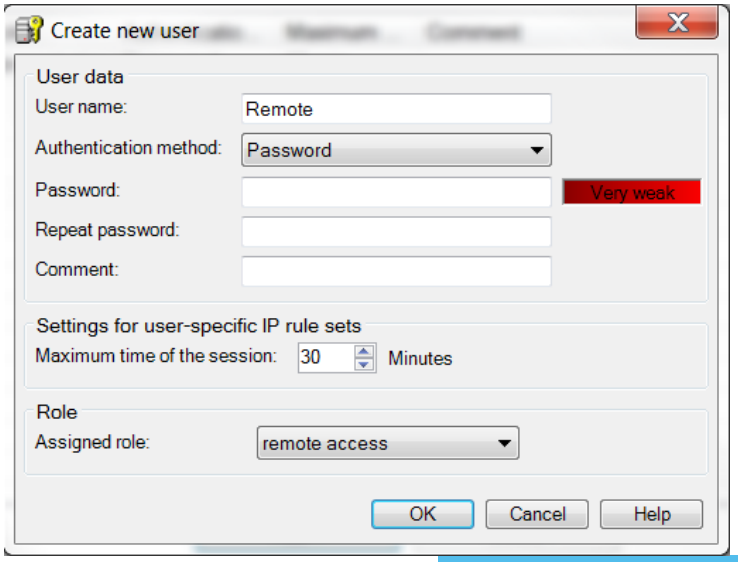
User Management

4. Creating remote access users

- Select the “Options” > “User management…” menu command
- Click the “Add…” button in the “User” tab
- Create a new user with the settings in the figure
- Confirm with “OK”



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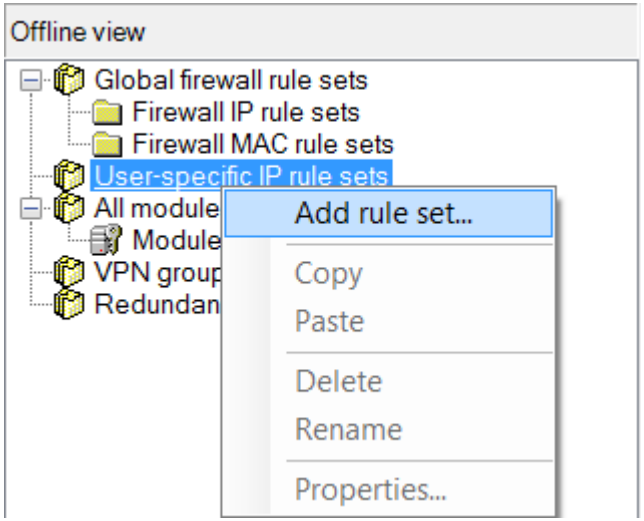
User Management

5. Setting and assigning a user-specific IP rule set

- Change the configuration to advanced mode via “View” > “Advanced Mode”
- Select the “User-specific IP rule sets” object in the navigation panel
- Select the “Add rule set…” entry in the shortcut menu



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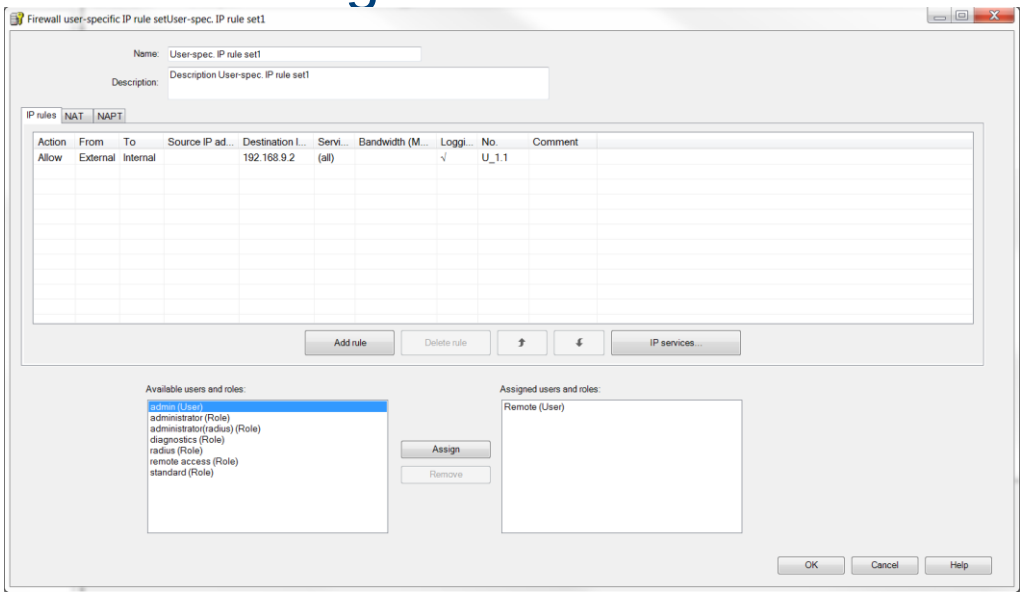
User Management

5. Setting and assigning a user-specific IP rule set

- Enter a rule in the dialog as shown below



- From the “Available users and roles” list, select the “Remote (user)” entry and click the “Assign” button
- Confirm with “OK”

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User Management

5. Setting and assigning a user-specific IP rule set

- Select the security module in the navigation panel and drag it to the newly created user-specific IP rule set

- The assignment can be checked by opening the module properties and selecting the “Firewall” tab

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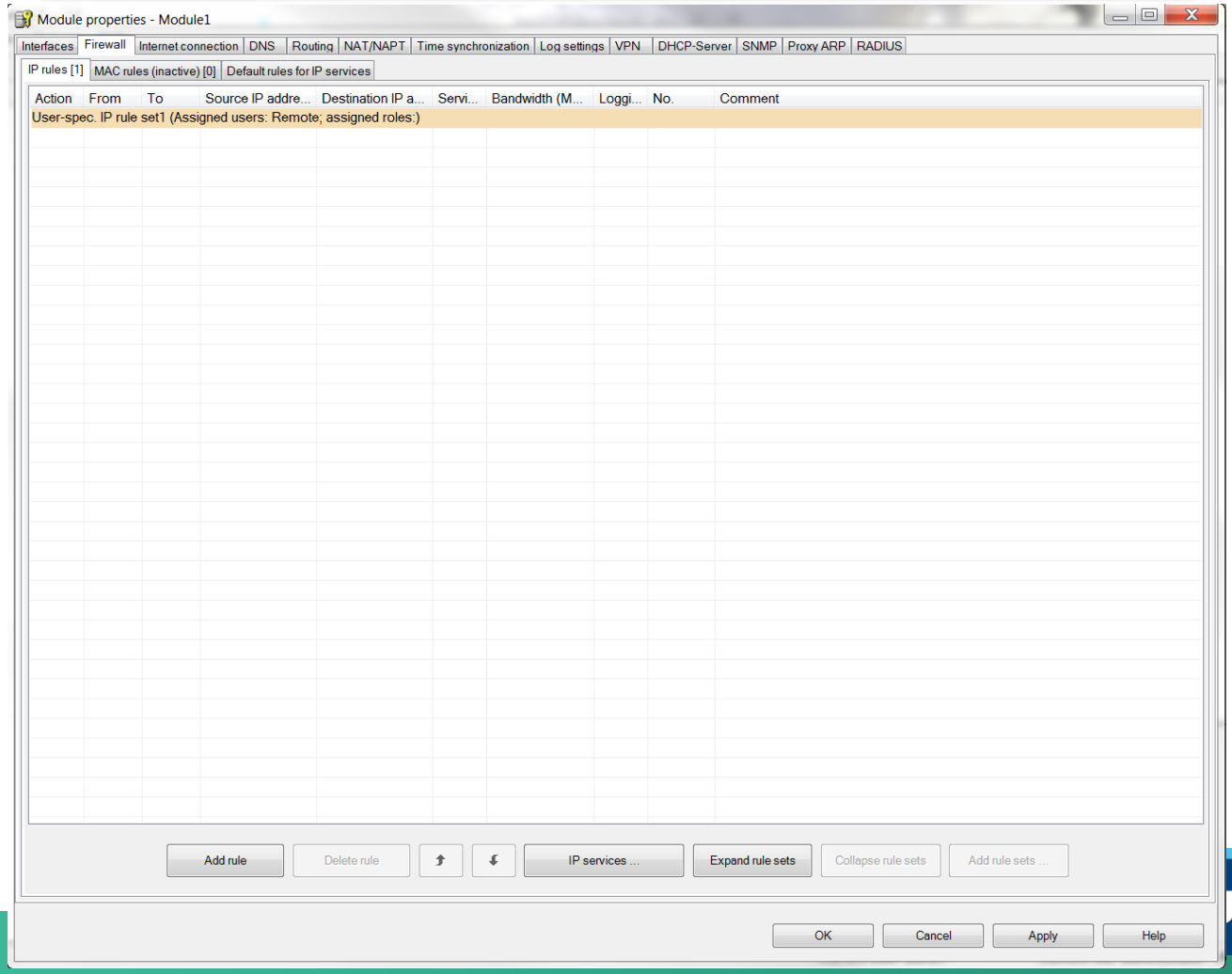
User Management

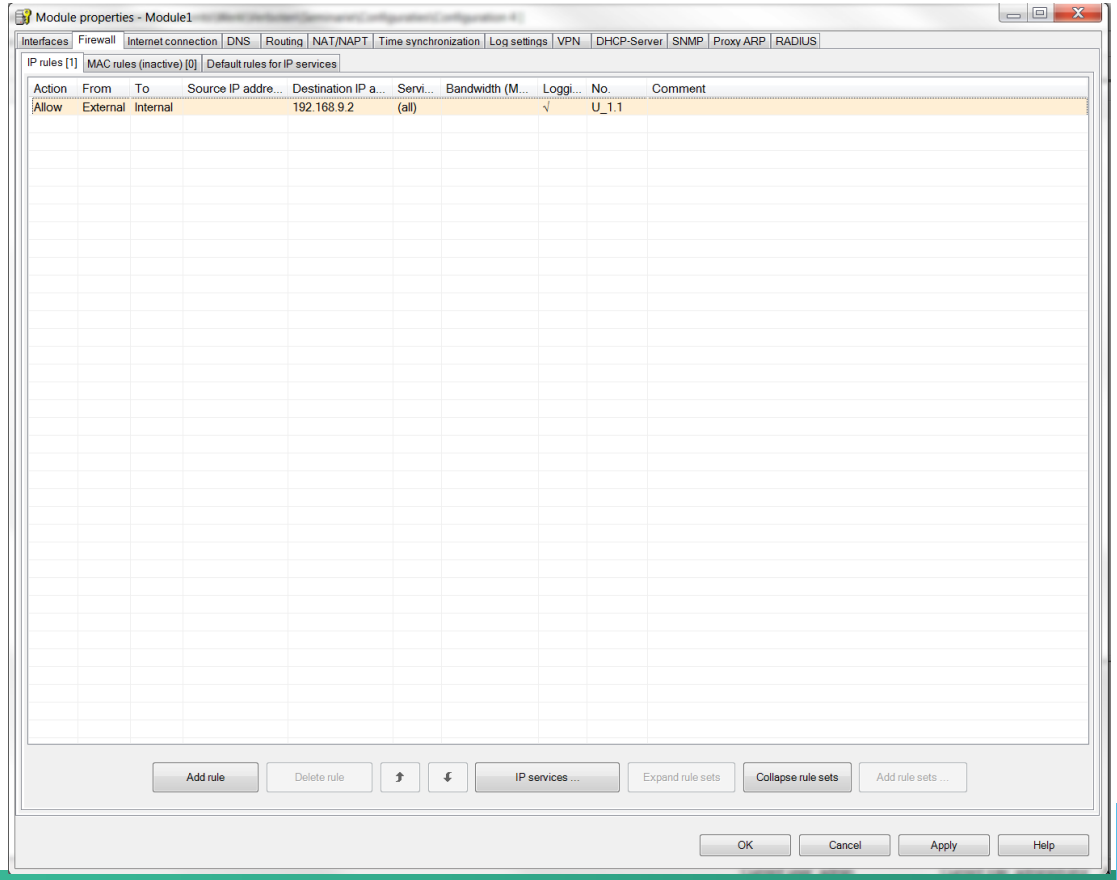
5. Setting and assigning a user-specific IP rule set



User Management

5. Setting and assigning a user-specific IP rule set

- “Expand rule set” shows the user-specific rule in detail



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User Management

6. Downloading the configuration to the security module

- Transfer the configuration to the security module

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User Management

7. Logging in on the Web page

- In the Web browser of PC1, enter the address “https://192.168.10.1”

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User Management

7. Logging in on the Web page

- If the web page does not show the login fields, try changing the language in the upper right corner

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User Management

7. Logging in on the Web page

- Enter the user name “Remote” and corresponding password and click the “Log in” button

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User Management

7. Logging in on the Web page

- The defined IP rule set is enabled for the “Remote” user.

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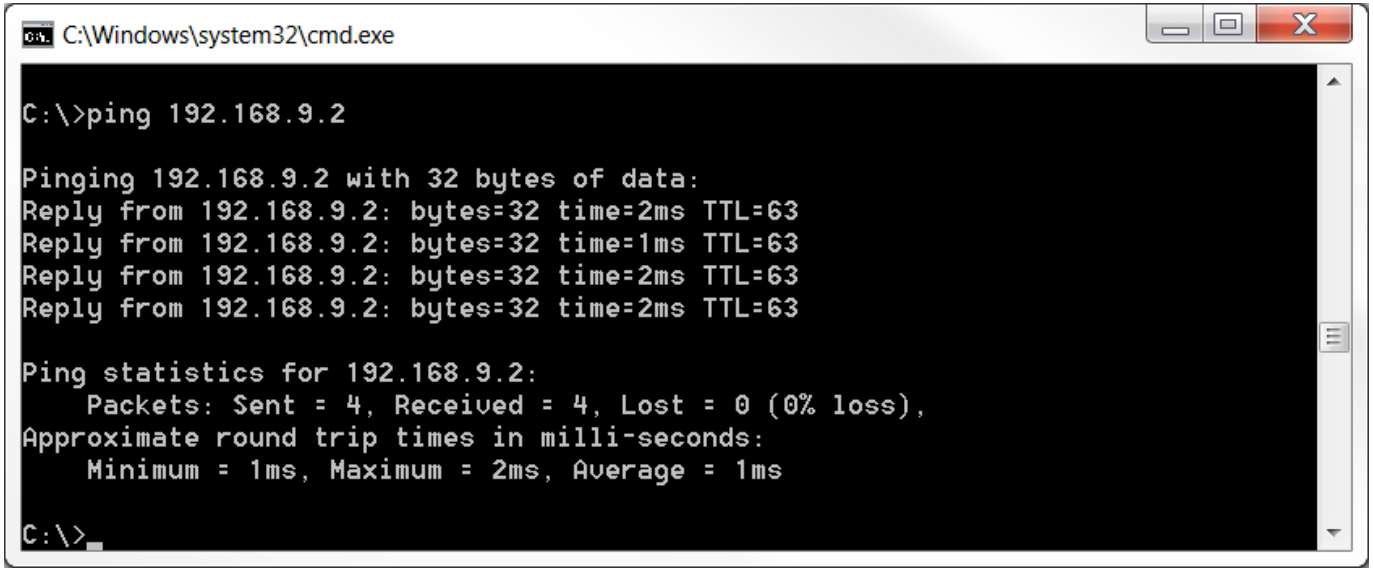
User Management

8. Testing the firewall function (ping test)

- Open the command prompt on PC1
- Enter the ping command from PC1 to PC2 “ping 192.168.9.2”



- All packets reach PC2

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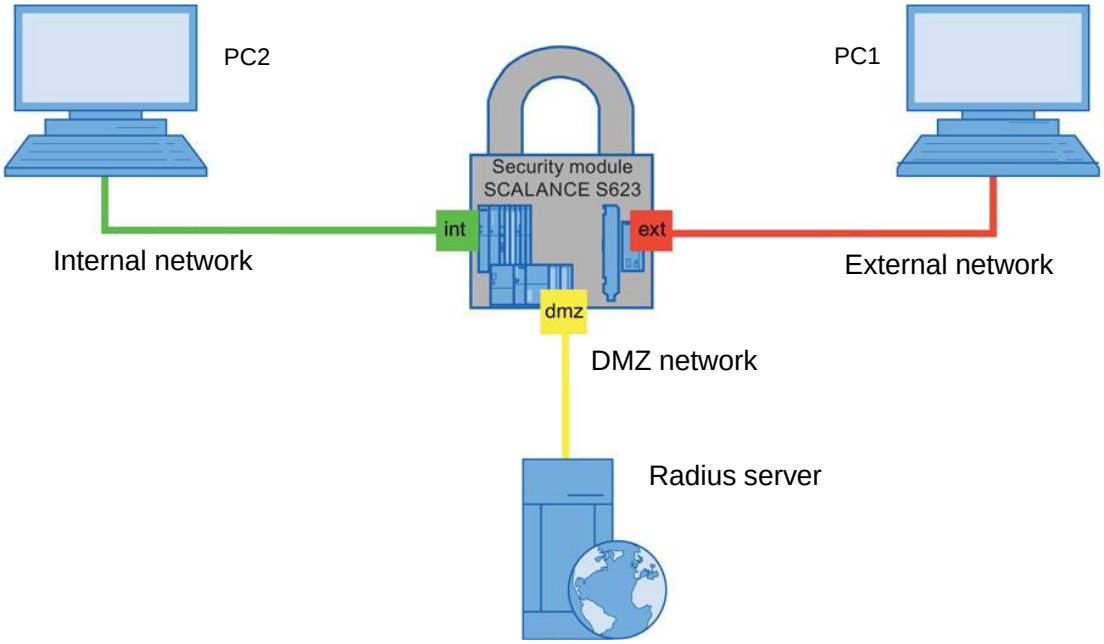
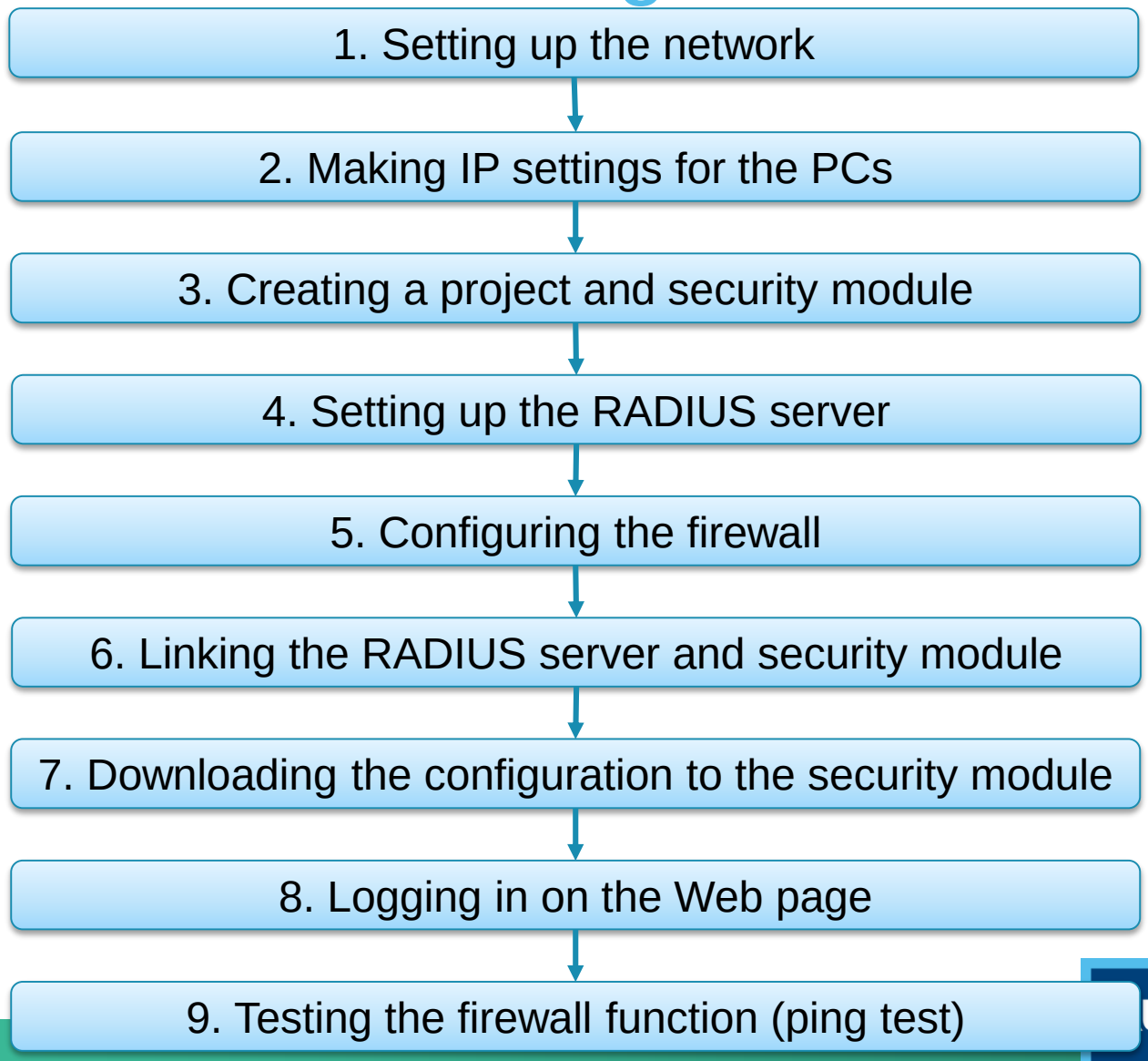
Advanced User Management



In this example, a RADIUS server is set up to manage user accounts. Only users that can authenticate to the RADIUS server can access the internal network from the external network

Advanced User Management



Advanced User Management

1. Setting up the network

- Reset the Scalance to factory settings by pressing the Reset button and holding it down for at least 5 seconds
- Connect the PC with the Security Configuration Tool (PC1) to the external network interface
- Connect PC2 to the internal network interface
- Connect the Linux PC that will be used as RADIUS server to the DMZ interface

Advanced User Management

2. Making IP settings for the PCs

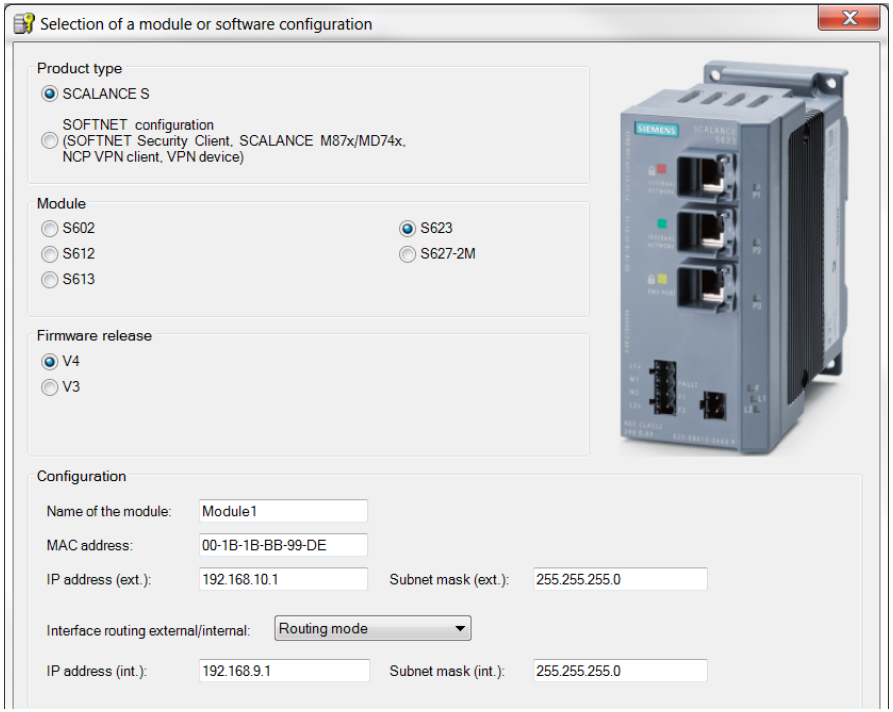
PC	IP address	Subnet mask	Default Gateway
PC1	192.168.10.2	255.255.255.0	192.168.10.1
PC2	192.168.9.2	255.255.255.0	192.168.9.1
RADIUS	192.168.8.2	255.255.255.0	192.168.8.1

- Set the IP addresses of the PCs as in the table above
- The IP address of the Linux PC is preset to the correct value

Advanced User Management

3. Creating a project and security module

- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- Select the “Routing mode”
- Enter the internal IP address (192.168.9.1) and subnet mask (255.255.255.0)
- Confirm with “OK”



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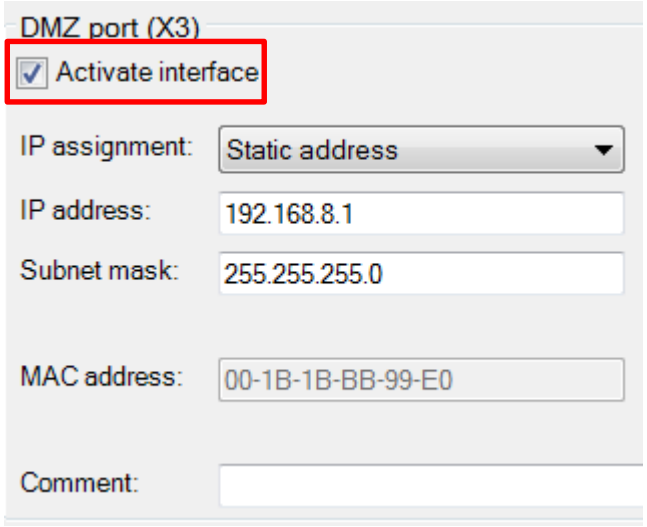
Advanced User Management

3. Creating a project and security module

- Select the security module created and select the “Edit” > “Properties” menu command, “Interfaces” tab
- Select the “Activate Interface” check box in the “DMZ port (X3)” area
- Enter the IP address (192.168.8.1) and the subnet mask (255.255.255.0) for the DMZ interface
- Confirm with “OK”



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Advanced User Management

4. Setting up the RADIUS server

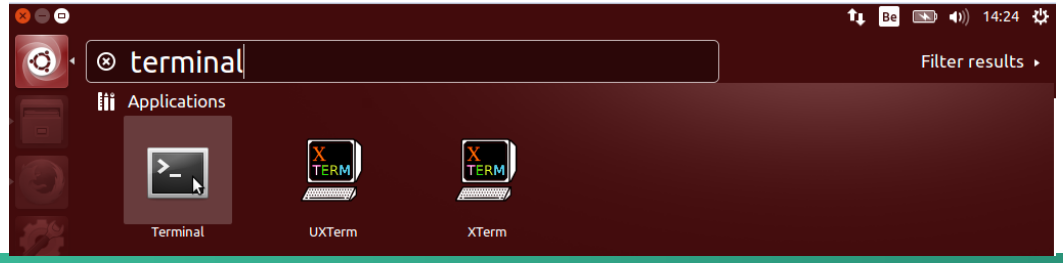
- On the Linux PC open the Web browser and go to “http://freeradius.org/download.html”
- Download version 3.0.9 of the RADIUS server

Downloads

3.0.x Series - Stable

Version 3.0.9: tar.gz (PGP Signature)
Version 3.0.9: tar.bz2 (PGP Signature)

- Open the Terminal
  Open the Dash and type “terminal”



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Advanced User Management

4. Setting up the RADIUS server

- Go to the “Downloads” map (“cd Downloads”)

```
vincent@vincent-VirtualBox:~$ cd Downloads
vincent@vincent-VirtualBox:~/Downloads$
```

- Unpack the RADIUS server (“tar zxvf freeradius-server-3.0.9.tar.gz”)

- Enter the newly made map (“cd freeradius-server-3.0.9”)

Advanced User Management

4. Setting up the RADIUS server

- Install the server with the following commands
  “./configure”
  “make”
  “sudo make install”

```
vincent@vincent-VirtualBox:~/Downloads/freeradius-server-3.0.9$ sudo make instal
l
[sudo] password for vincent:
```

The password is TBD

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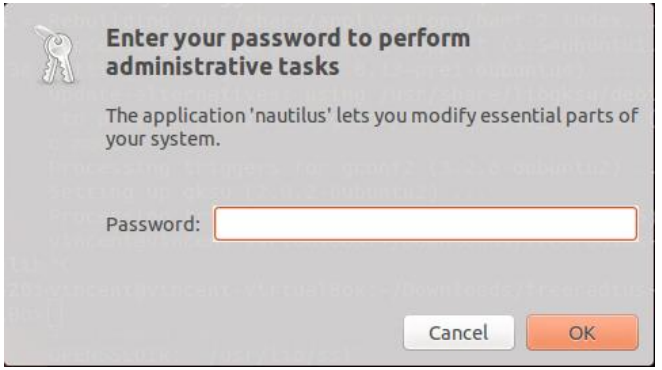
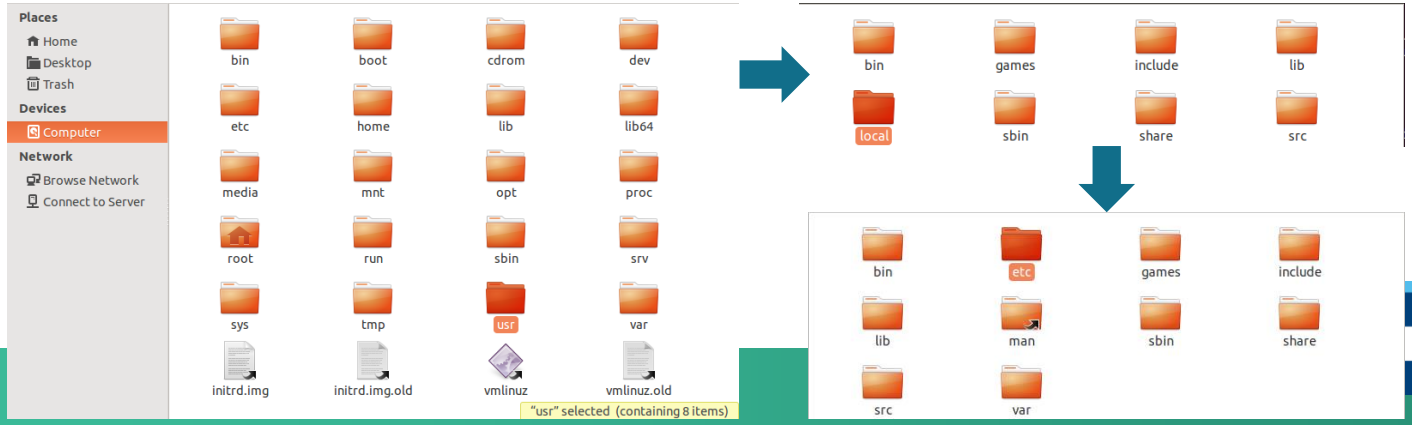
Advanced User Management

4. Setting up the RADIUS server

- The next step is to configure the clients of the server
- Open the file explorer with “gksudo nautilus” Enter the sudo password in the following prompt



- Using Nautilus browse to “Computer” > “usr” > “local” > “etc” > “raddb”



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Advanced User Management

4. Setting up the RADIUS server

- Open “clients.conf” and add a new client as in the image

```
#Scalance client for demo
client Scalance {
        ipaddr = 192.168.8.1
        secret = SiemensSecret
}
```

- Save and close the window

- Open “users” and add the following users

```
radius  Cleartext-Password := "password"

radius2 Cleartext-Password := "password2"
```

- Save and close the window

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Advanced User Management

4. Setting up the RADIUS server

- With the server installed and configured, run “sudo radiusd –X” to start the server in debug mode

```
Refusing to start with libssl version OpenSSL 1.0.1f 6 Jan 2014 0x1000106f (1.0.
1f release) (in range 1.0.1 dev - 1.0.1f release)
Security advisory CVE-2014-0160 (Heartbleed)
For more information see http://heartbleed.com
Once you have verified libssl has been correctly patched, set security.allow_vul
nerable_openssl = 'CVE-2014-0160'
```

- If this error shows up, check the OpenSSL version with “openssl version –a”
  This command should show the following date:
  ‘built on: Thu Jun 11’

```
vincent@vincent-VirtualBox:~$ openssl version -a
OpenSSL 1.0.1f 6 Jan 2014
built on: Thu Jun 11 15:28:12 UTC 2015
```

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Advanced User Management

4. Setting up the RADIUS server

- If this date is not shown update the library with the following command
  “sudo apt-get update”
  “sudo apt-get upgrade”

- If OpenSSL is correctly updated, open “radius.conf” and change the “allow_vulnerable_openssl” parameter to yes

```
allow_vulnerable_openssl = no  ⟶  allow_vulnerable_openssl = yes
```

- Save and close the window
- Try starting the server again with “sudo radiusd -X”

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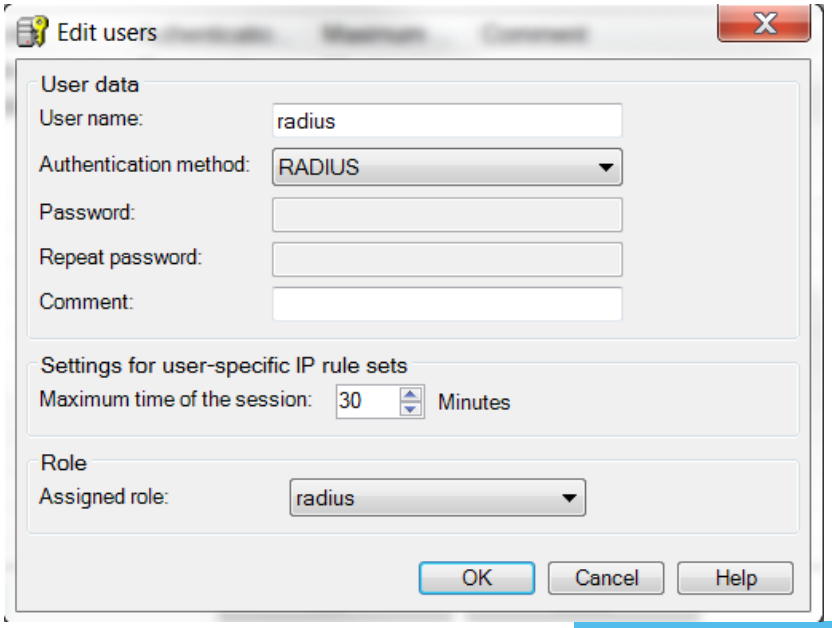
Advanced User Management

5. Configuring the firewall

- Enter “Advanced mode” in the Security Configuration Tool
- Use the menu command “Options” > “User Management“
- Create a new user with the following settings
- Confirm with “OK”



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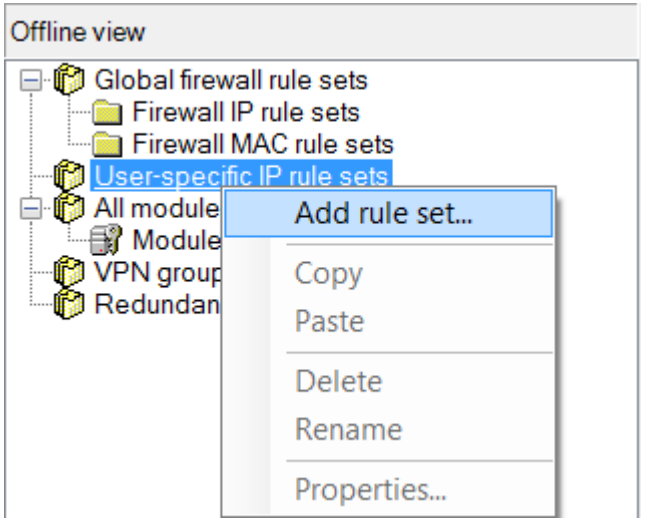
Advanced User Management

5. Configuring the firewall

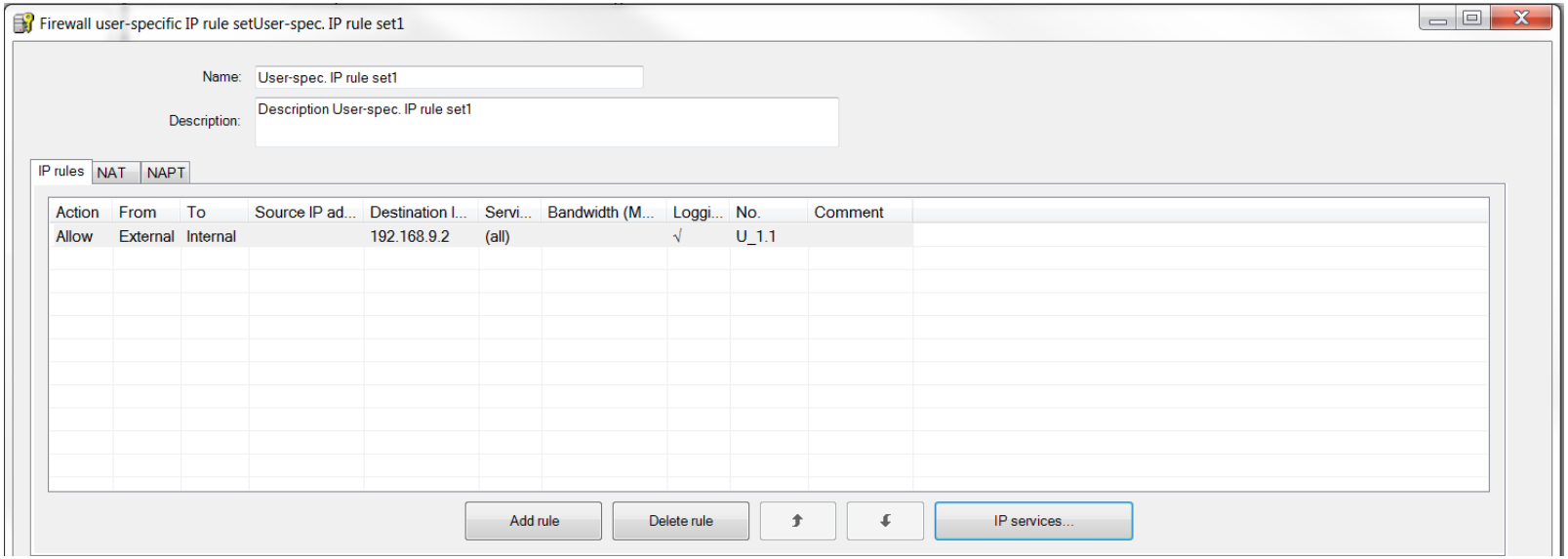
- Select the “User-specific IP rule sets” in the navigation window
- Select the “Add rule set…” option in the shortcut menu



Advanced User Management

5. Configuring the firewall

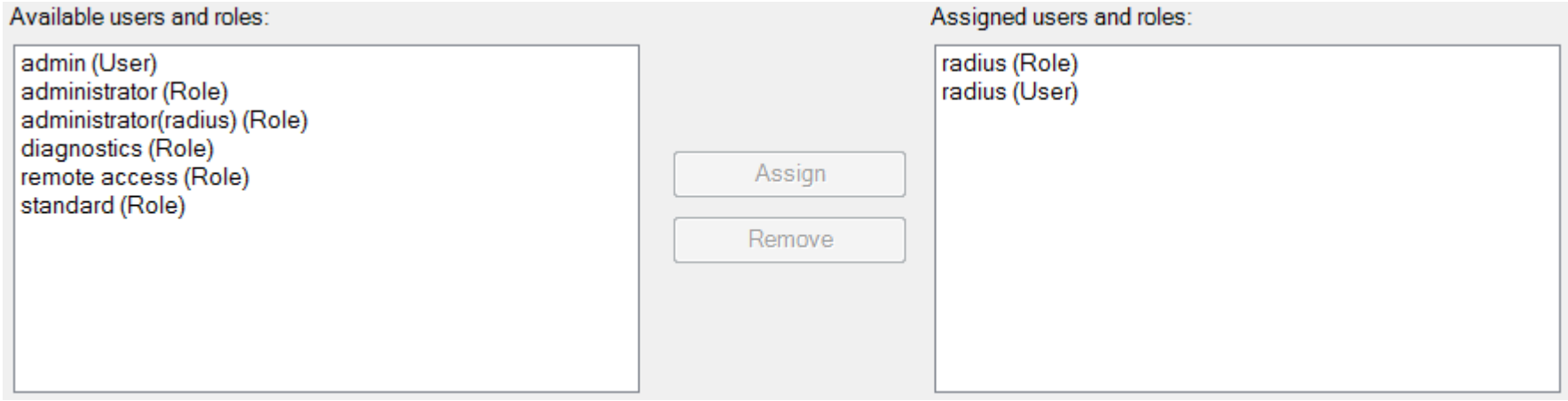
- Enter a rule in the dialog as shown below



Advanced User Management

5. Configuring the firewall

- From the “Available users and roles” list, select the “radius (user)” entry and click the “Assign” button, then select the “radius (role)” entry and click “Assign”



- Confirm with “OK”

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Advanced User Management

5. Configuring the firewall

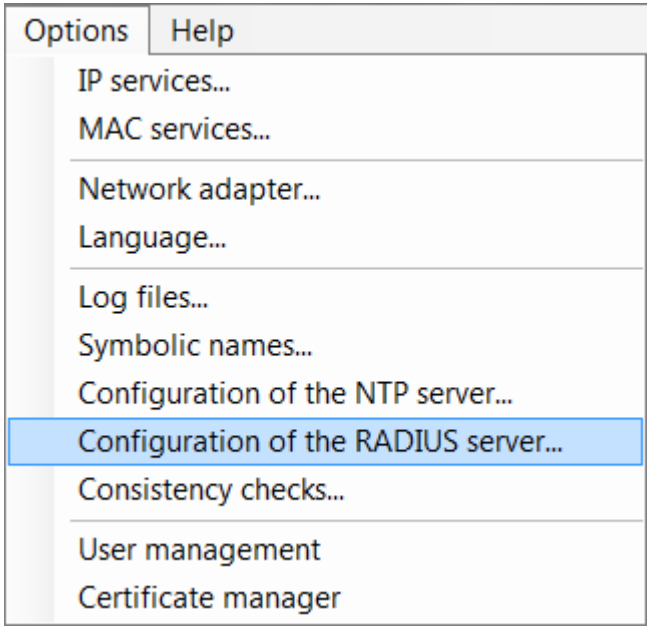
- Select the security module in the navigation panel and drag it to the newly created user-specific IP rule set

- The assignment can be checked by opening the module properties and selecting the “Firewall” tab

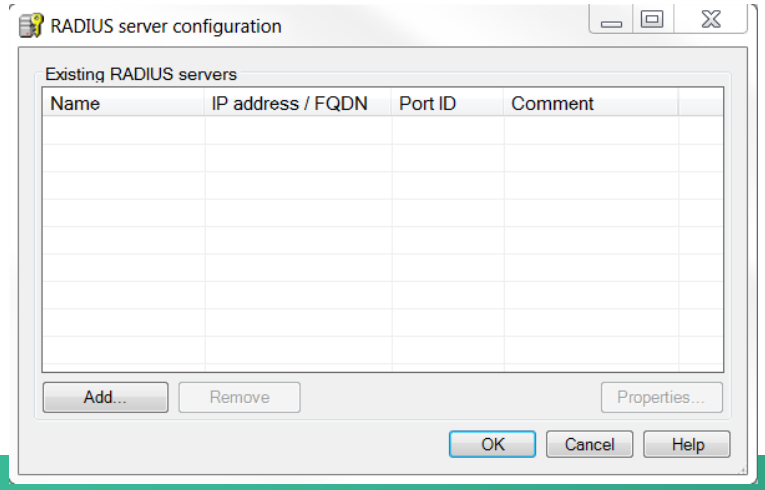
Advanced User Management

6. Linking the RADIUS server and security module

- Select the menu option “Options” > “Configuration of the RADIUS server…”



- Click the “Add…” button in the dialog



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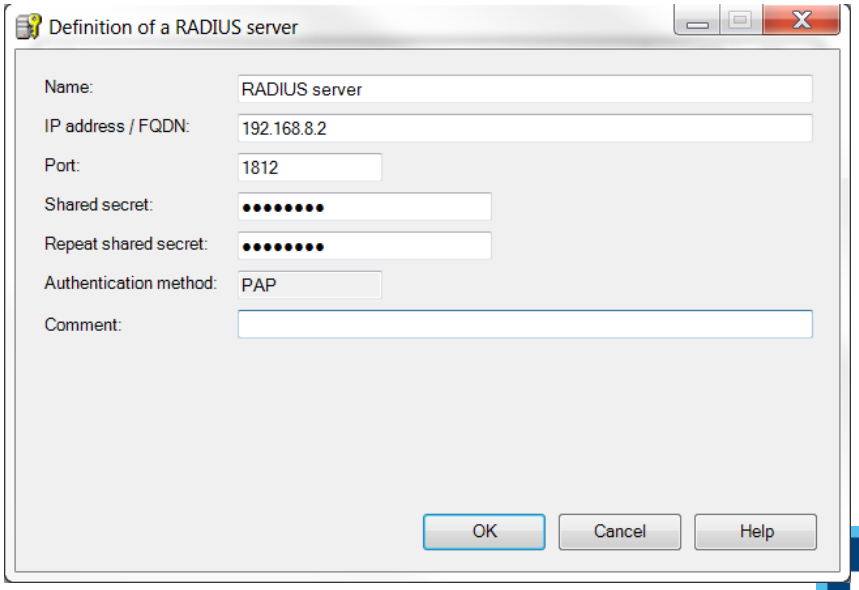
Advanced User Management

6. Linking the RADIUS server and security module

- Define the server with the following values
  - IP address/FQDN: 192.186.8.2
  - Shared secret: SiemensSecret
  - Repeat shared secret: SiemensSecret
- Confirm with “OK”



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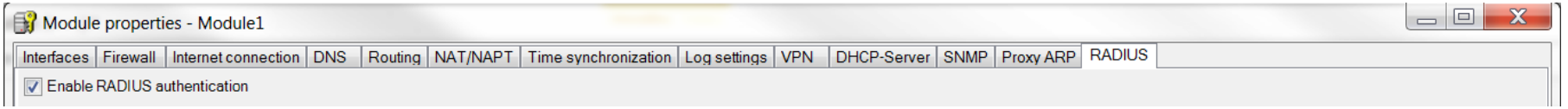
Advanced User Management

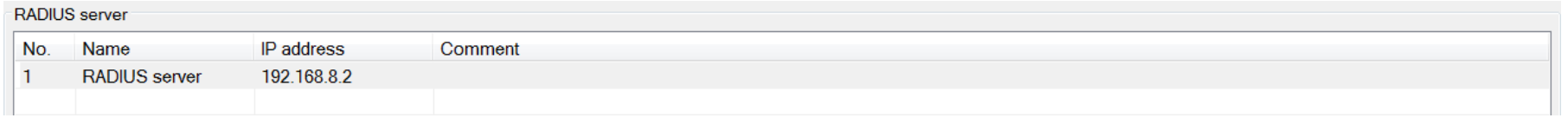
6. Linking the RADIUS server and security module

- Open the SCALANCE S module properties and go to the “RADIUS” tab



- Check the “Enable RADIUS authentication” box

- Click the “Add” button
  This adds the newly configured RADIUS server



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Advanced User Management

6. Linking the RADIUS server and security module

- In the “RADIUS setting” area, check the “Allow RADIUS authentication of non-configured users” box

- Confirm with “OK”

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Advanced User Management

7. Downloading the configuration to the security module

- Transfer the configuration to the SCALANCE S module

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Advanced User Management

8. Logging in on the Web page

- In the Web browser of PC1, enter the address “https://192.168.10.1”

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Advanced User Management

8. Logging in on the Web page

- If the web page does not show the login fields, try changing the language in the upper right corner

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Advanced User Management

8. Logging in on the Web page

- Enter the user name “radius” and corresponding password and click the “Log in” button

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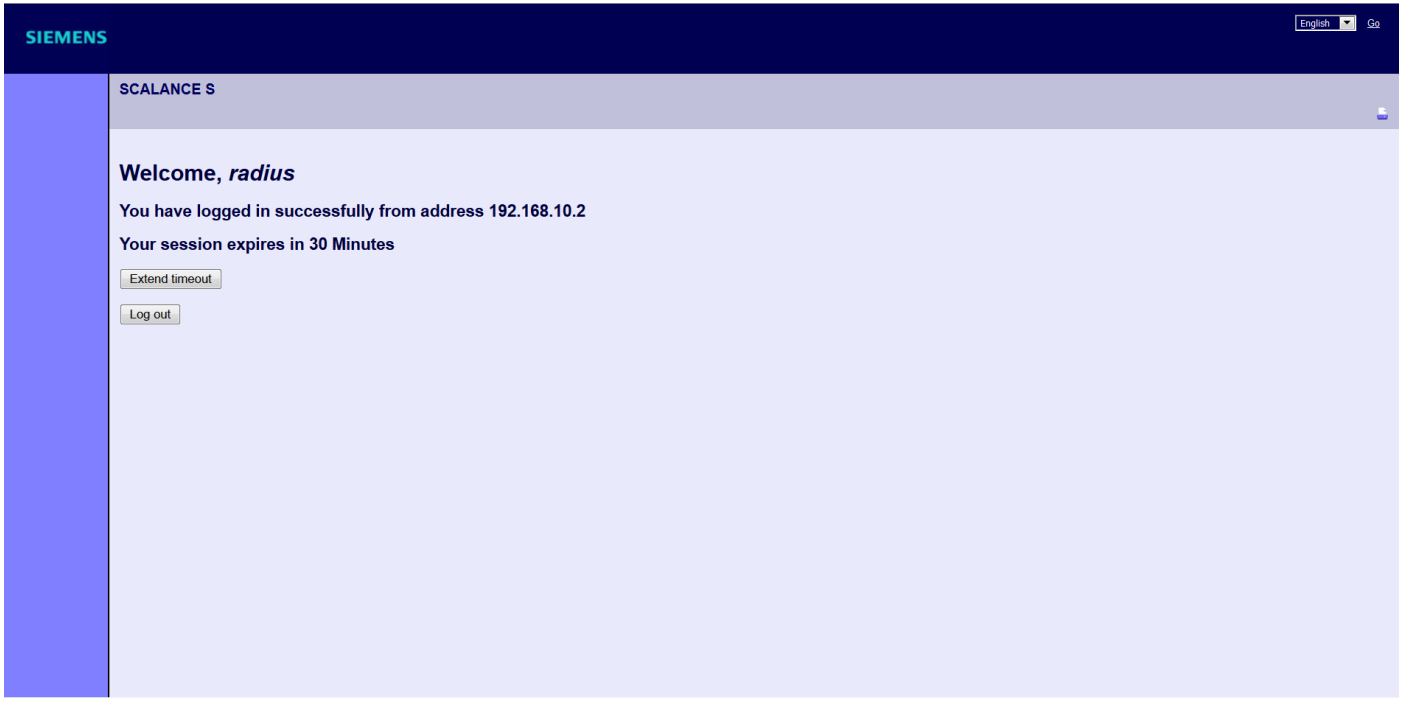
Advanced User Management

8. Logging in on the Web page

- The defined IP rule set is enabled for the “radius” user.



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Advanced User Management

8. Logging in on the Web page

- Now click the “Log out” button
- Enter the user name “radius2” and corresponding password and click the “Log in” button

Advanced User Management

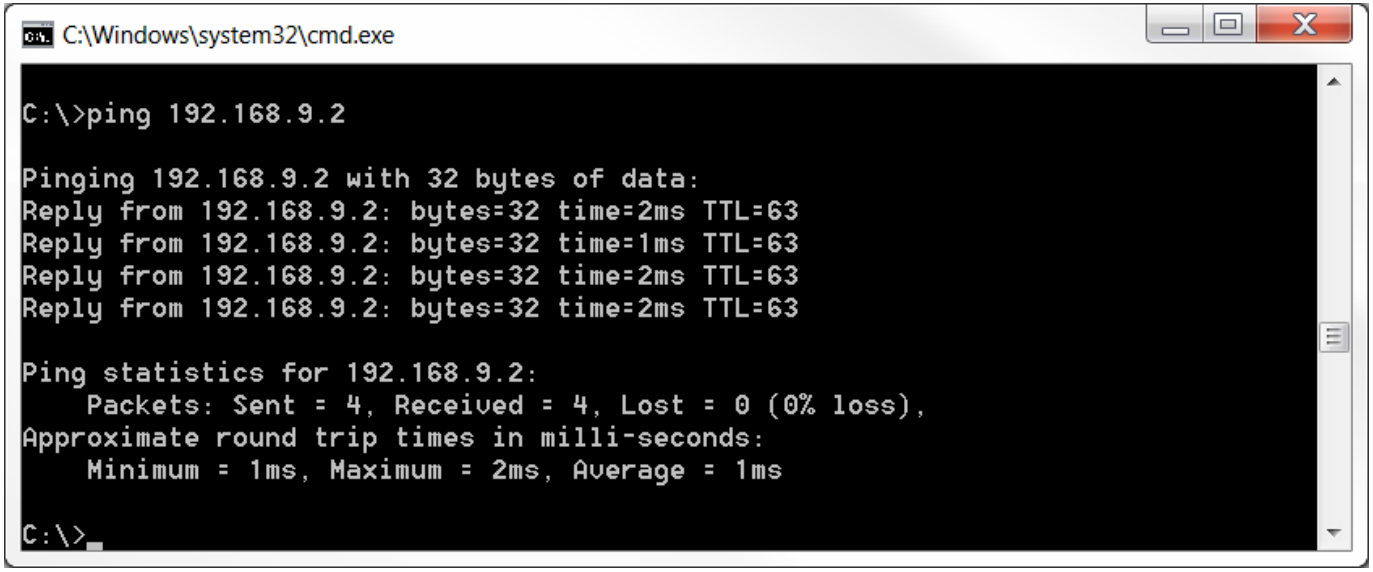
8. Logging in on the Web page

- The defined IP rule set for the “radius” role is enabled
  - ➔ Users that are not defined on the module can log in

Advanced User Management

9. Testing the firewall function (ping test)

- Open the command prompt on PC1
- Enter the ping command from PC1 to PC2 “ping 192.168.9.2”



- All packets reach PC2

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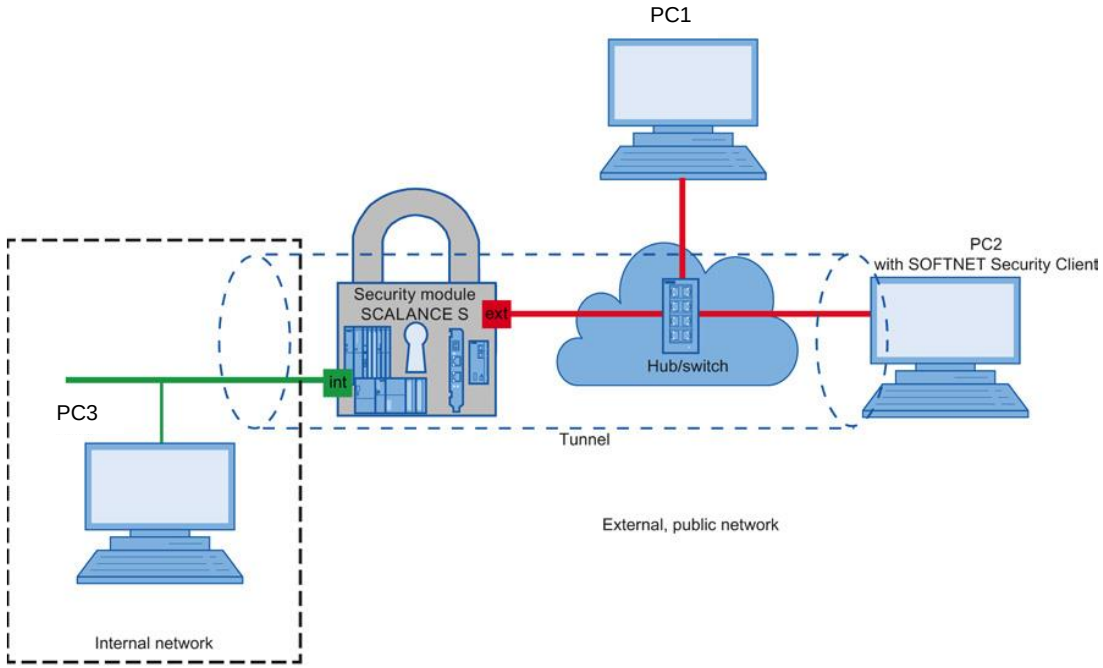
VPN with Preshared Key



In this example, a VPN tunnel is configured between a security module and the SOFTNET Security Client

With this configuration, IP traffic is possible only over the established VPN tunnel connection between the two authorized partners

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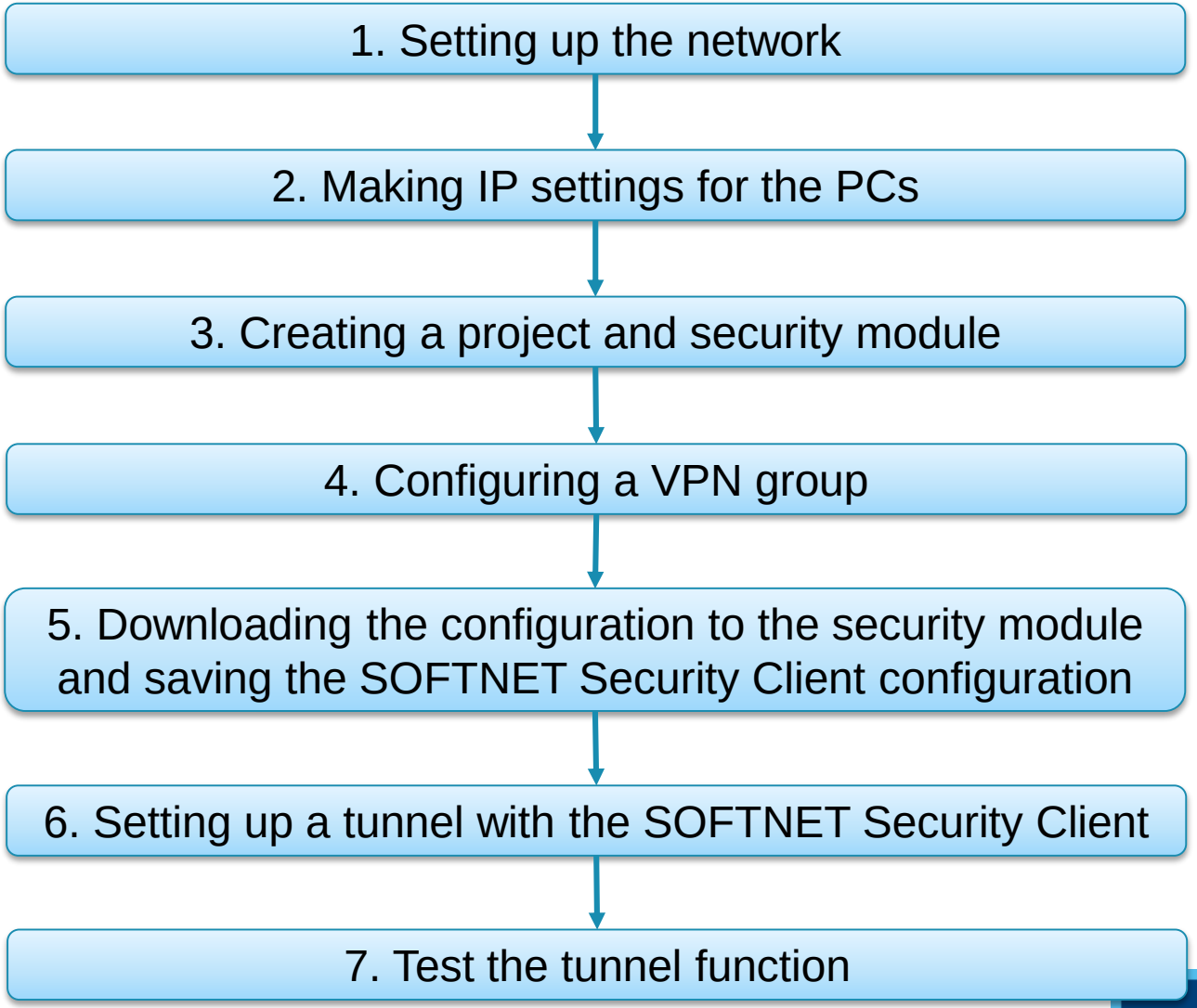
VPN with Preshared Key



VPN with Preshared Key

1. Setting up the network

- Reset the Scalance to factory settings by pressing the Reset button and holding it down for at least 5 seconds
- Connect the switch to the external network interface
- Connect the PC with the Security Configuration Tool (PC1) and the PC with the SOFTNET Security Client (PC2) to the switch
- Connect PC3 to the internal network interface

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VPN with Preshared Key

2. Making IP settings for the PCs

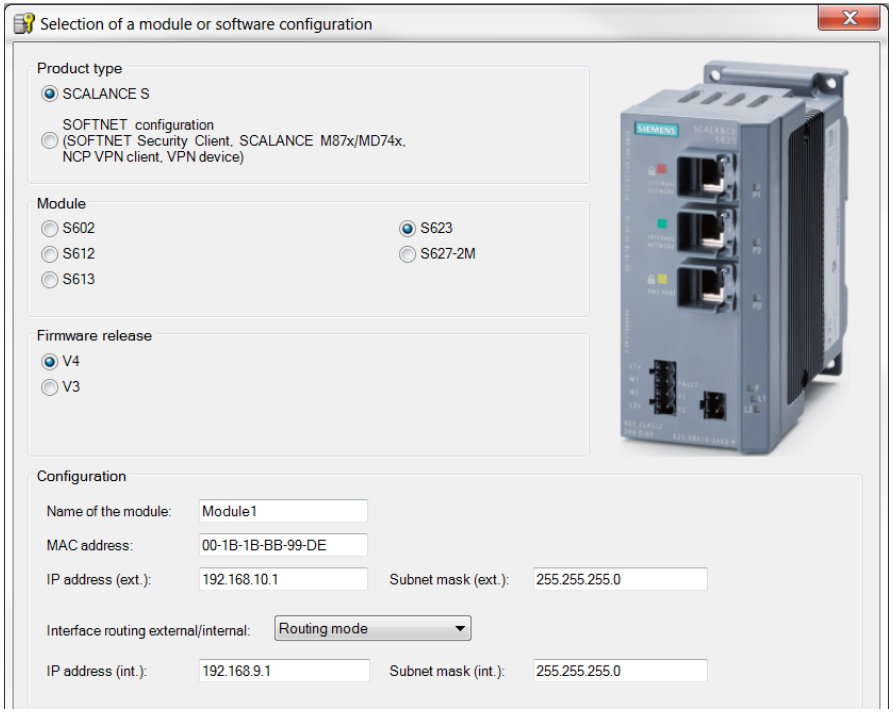
PC	IP address	Subnet mask	Default Gateway
PC1	192.168.10.2	255.255.255.0	192.168.10.1
PC2	192.168.10.3	255.255.255.0	192.168.10.1
PC3	192.168.9.2	255.255.255.0	192.168.9.1

- Set the IP addresses of the PCs as in the table above

VPN with Preshared Key

3. Creating a project and security module

- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- Select the “Routing mode”
- Enter the internal IP address (192.168.9.1) and subnet mask (255.255.255.0)
- Confirm with “OK”



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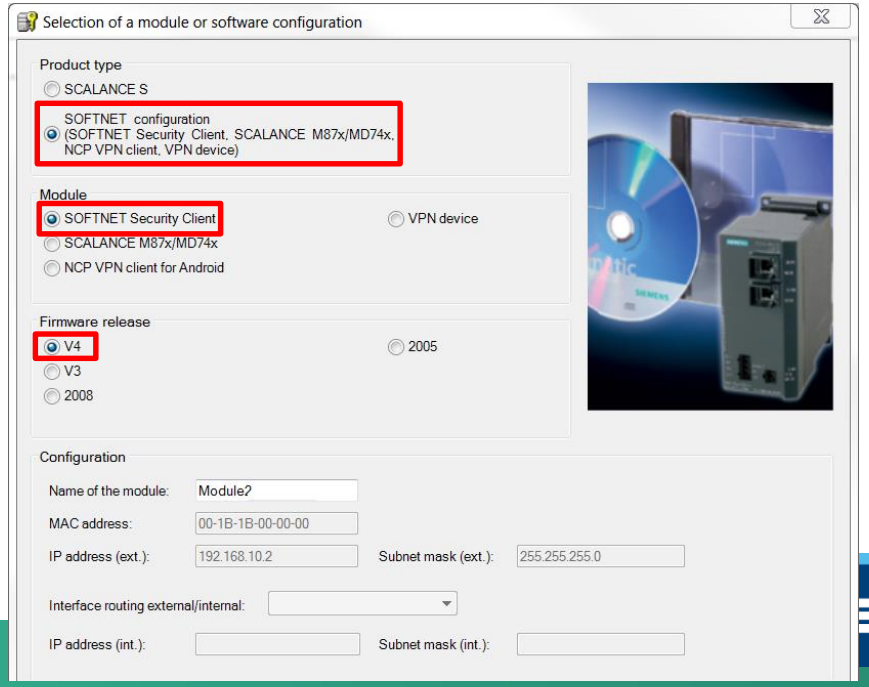
VPN with Preshared Key

3. Creating a project and security module

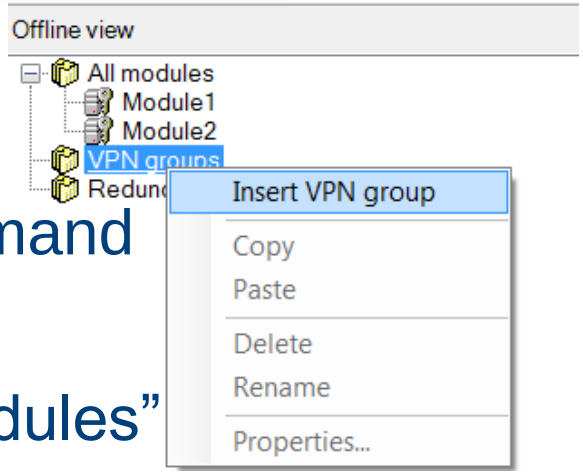
- Use the “Insert” > “Module” menu command with the following parameters
  - Product type: SOFTNET configuration
  - Module: SOFTNET Security Client
  - Firmware release: V4
- Confirm with “OK”



VPN with Preshared Key

4. Configuring a VPN group

- Select “VPN groups” in the navigation



- Select the “Insert” > “Group” menu command
- In the navigation panel, click the “All modules” entry
- Drag the Scalance S Module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue

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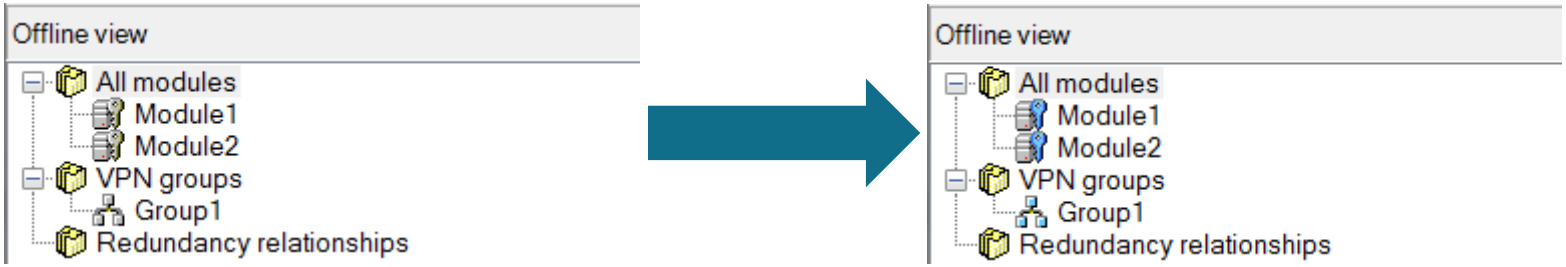
VPN with Preshared Key

4. Configuring a VPN group

- Drag the SOFTNET Security Client module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue



- Activate “Advanced Mode”

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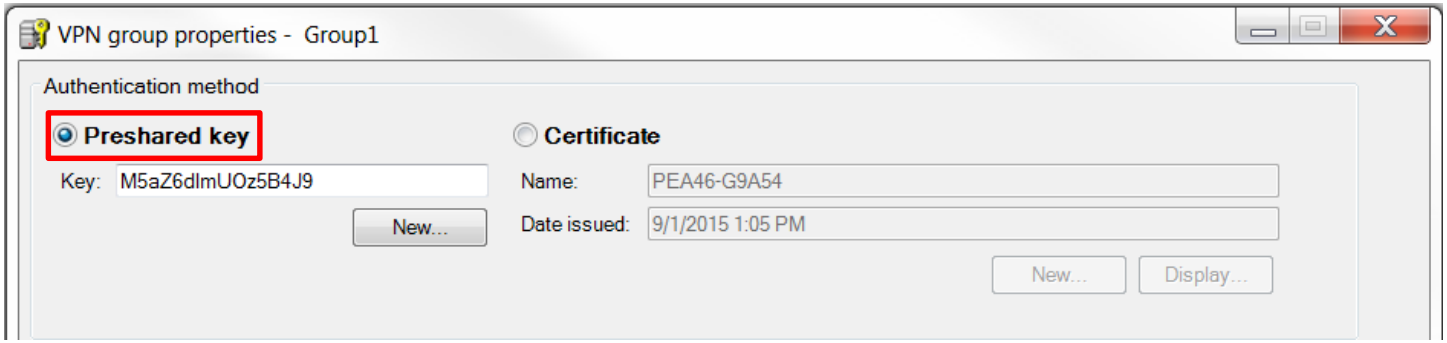
VPN with Preshared Key

4. Configuring a VPN group

- Select the VPN group “Group1” in the Navigation windows and select the menu command “Edit” > “Properties”

- Select the “Preshared key” option in the “Authentication method” area



- Confirm with “OK”

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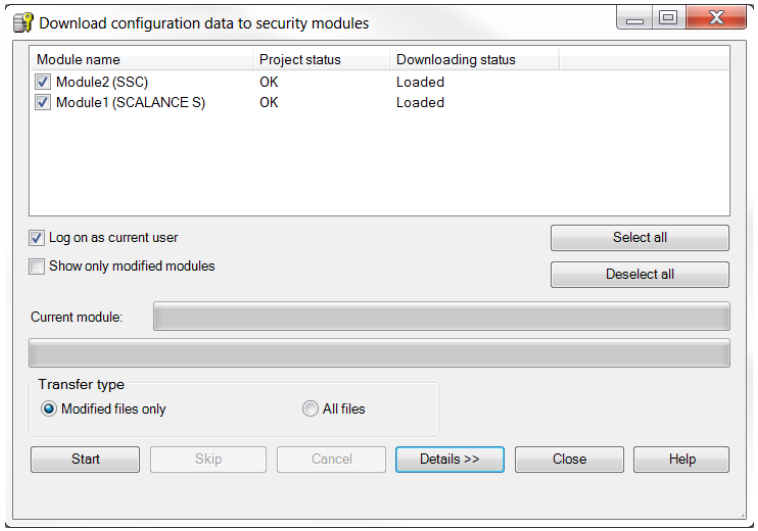
VPN with Preshared Key

5. Downloading the configuration to the security module and saving the SOFTNET Security Client configuration

- Save the project
- Use the menu command “Transfer” > “To all modules…”



- Start the download with the “Start” button

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VPN with Preshared Key

5. Downloading the configuration to the security module and saving the SOFTNET Security Client configuration

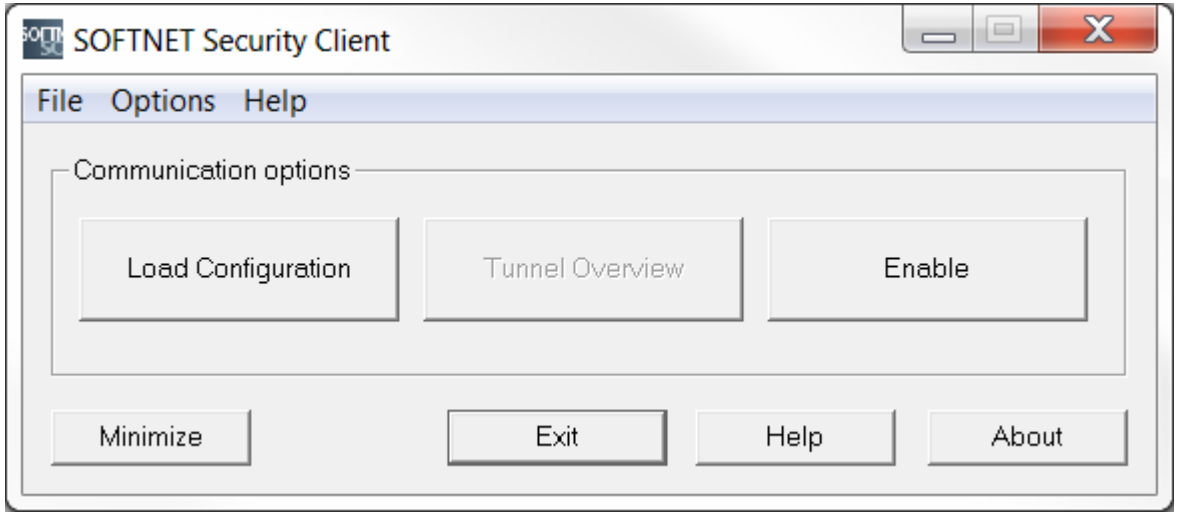
- Save the configuration file “projectname.Module2.dat” in your project folder

- Confirm the popup with “OK”

VPN with Preshared Key

6. Setting up a tunnel with the SOFTNET Security Client

- Open the SOFTNET Security Client on PC2



- Select “Load Configuration” and browse to where “projectname.Module2.dat” has been saved
- Open the configuration with the “Open” button

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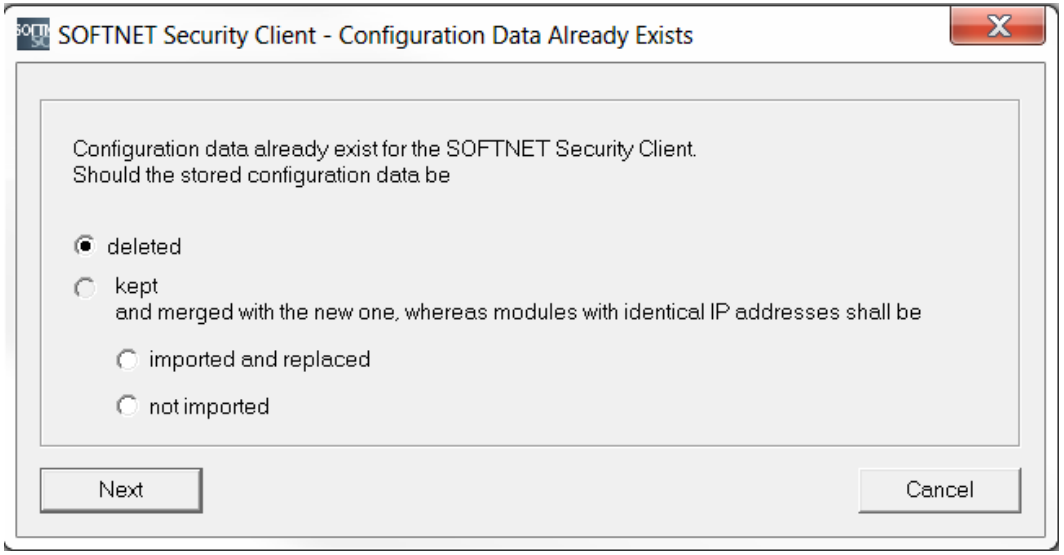
VPN with Preshared Key

6. Setting up a tunnel with the SOFTNET Security Client

- Loading a new configuration will delete any previous configurations



- When the dialog above pops up, select “deleted” and confirm with “Next”

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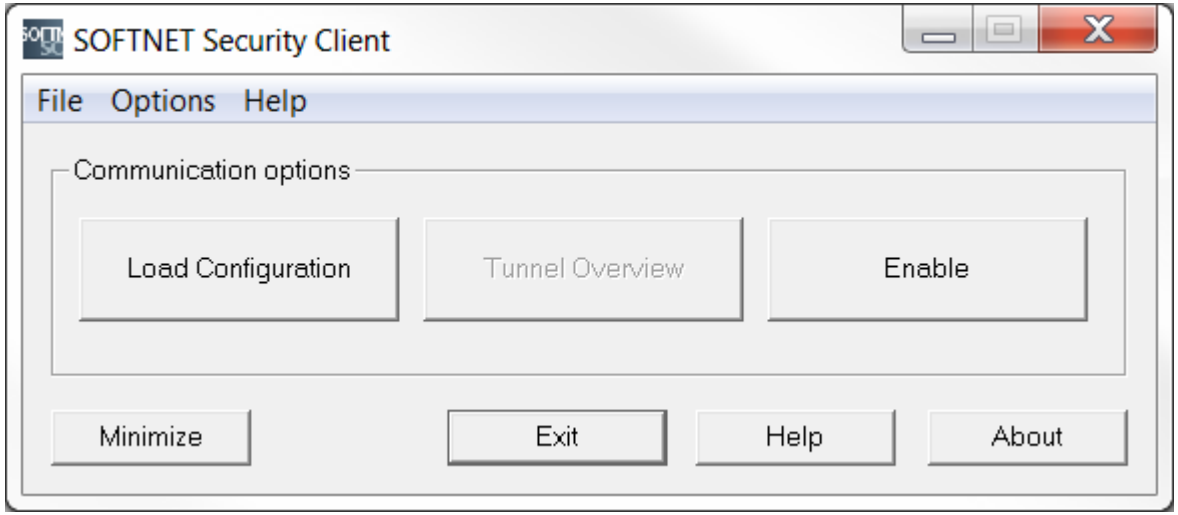
VPN with Preshared Key

6. Setting up a tunnel with the SOFTNET Security Client

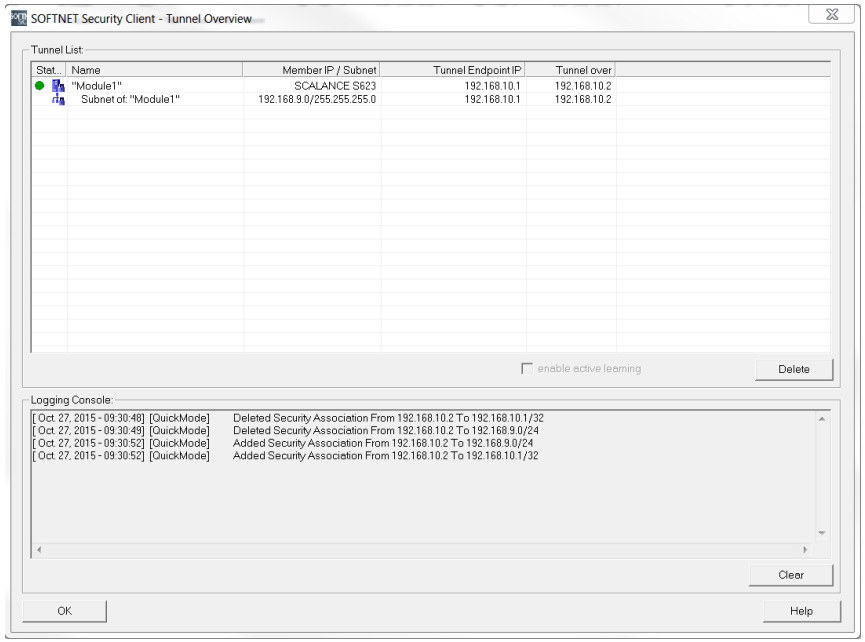
- The VPN tunnel can now be opened by clicking the “Enable” button



VPN with Preshared Key

6. Setting up a tunnel with the SOFTNET Security Client

- “Tunnel Overview” shows the status of the tunnel



- The green circle shows that the tunnel has been established

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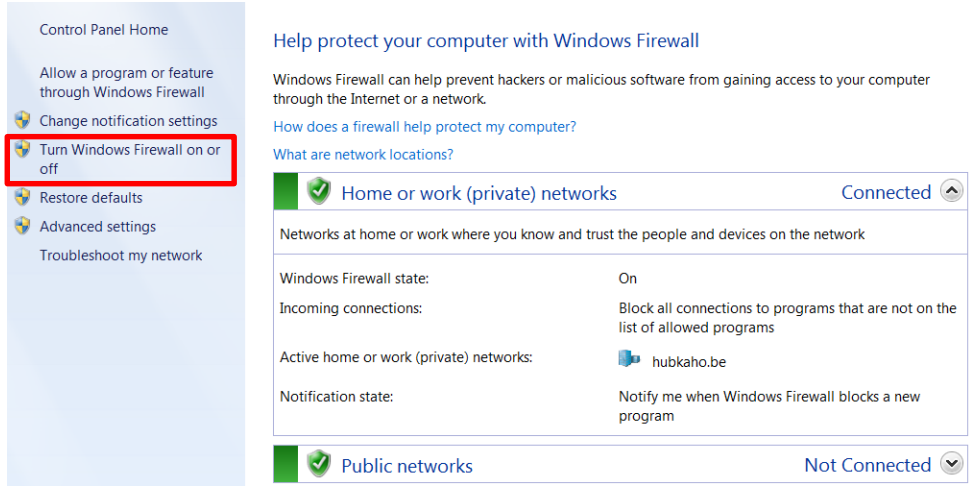
VPN with Preshared Key

6. Setting up a tunnel with the SOFTNET Security Client

- If the tunnel does not get set up, check whether the Windows Firewall has been enabled
- Open the “Control Panel” > “Windows Firewall”



- If the firewall is not enabled, click “Turn Windows Firewall on or off” and enable it

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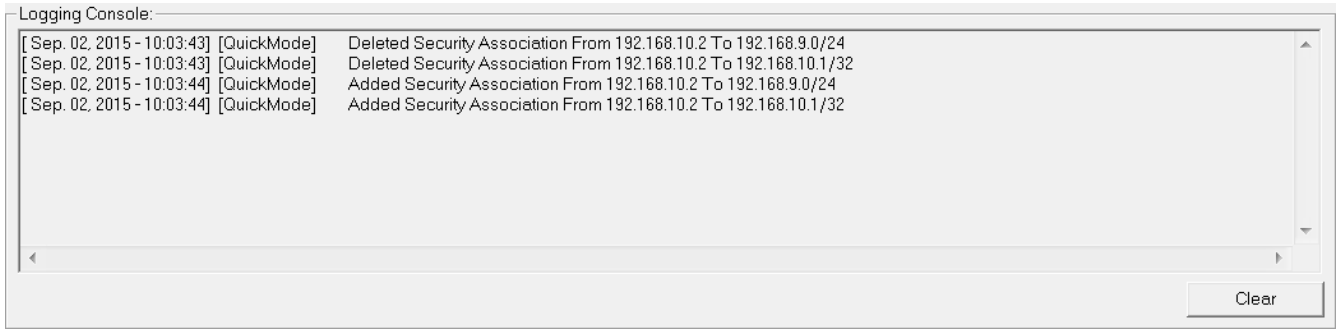
VPN with Preshared Key

6. Setting up a tunnel with the SOFTNET Security Client

- In the Logging Console, the sequence of executed connection attempts is displayed



- The SCALANCE S module and the SOFTNET Security Client have established a communication tunnel

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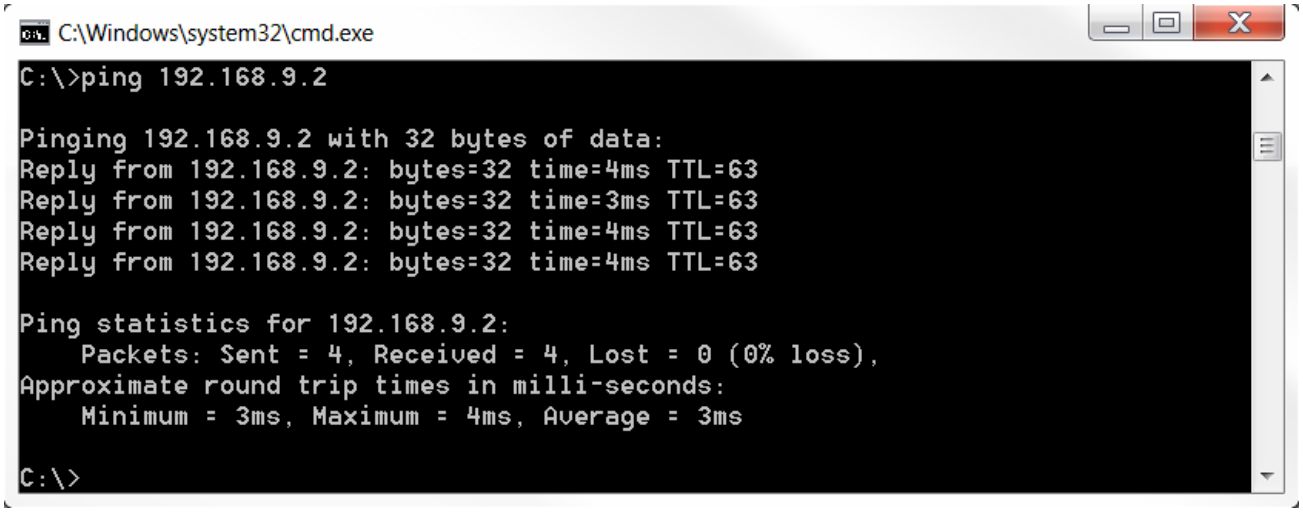
VPN with Preshared Key

7. Test the tunnel function

- Open the command prompt on PC2
- Enter the ping command from PC2 to PC3 “ping 192.168.9.2”



- All packets reach PC3 through the tunnel

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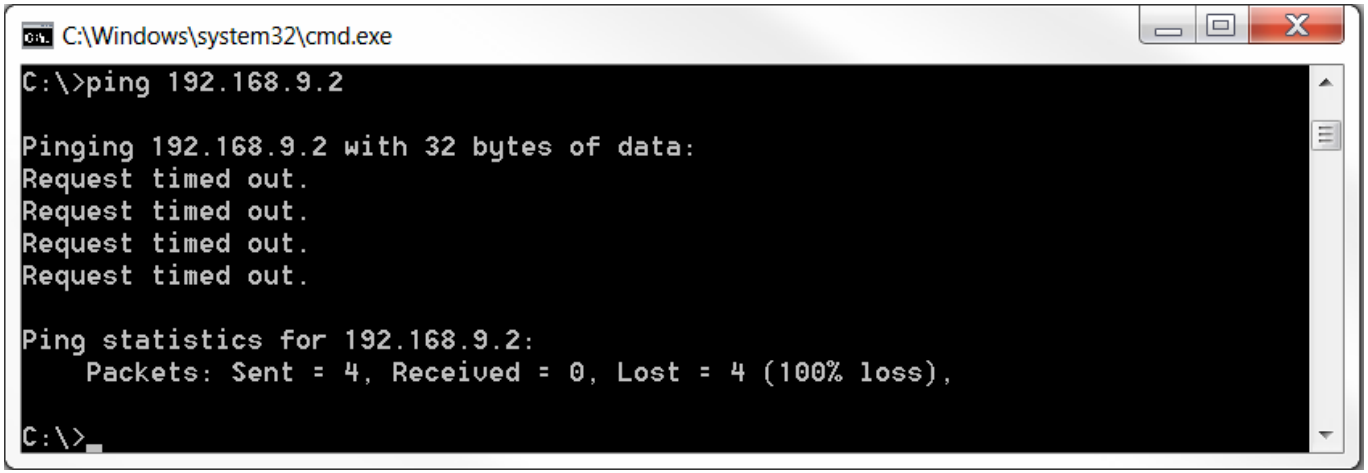
VPN with Preshared Key

7. Test the tunnel function

- Open the command prompt on PC1
- Enter the ping command from PC1 to PC3 “ping 192.168.9.2”



- The packets cannot reach PC3 since there is no tunnel communication between these two devices

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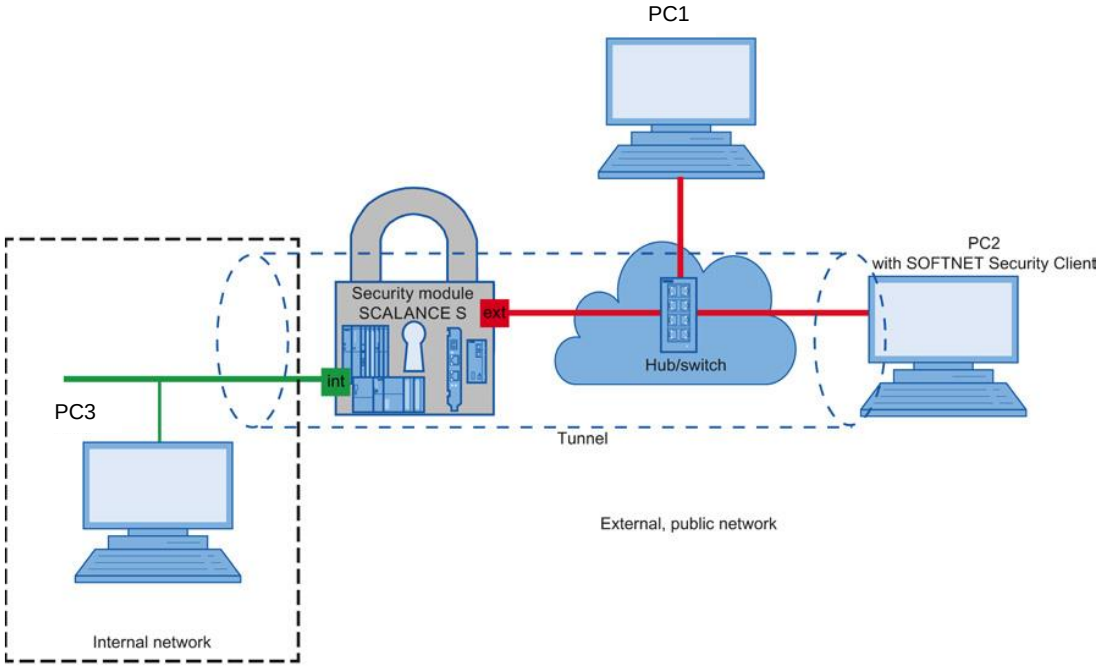
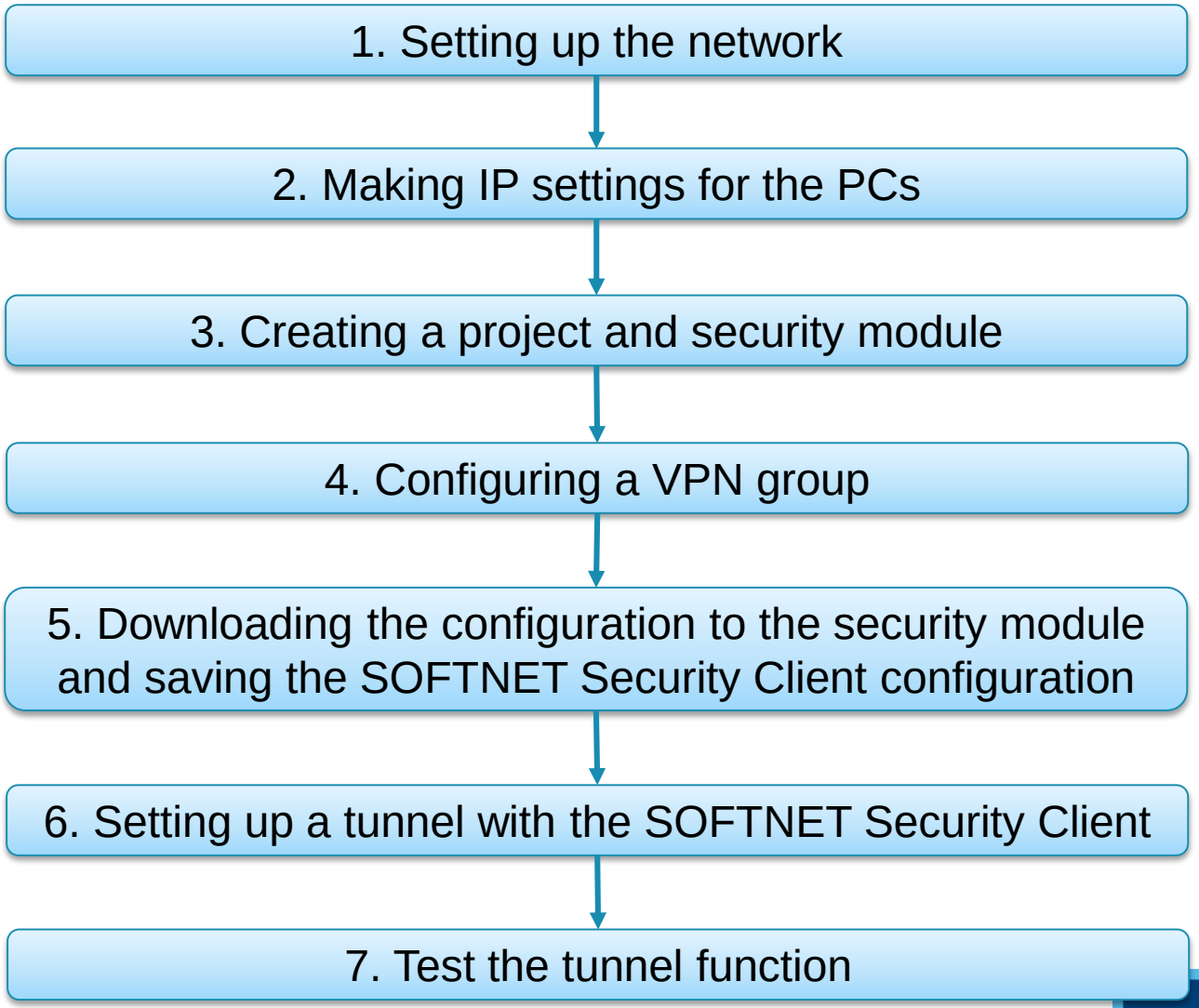
VPN with Certificates



In this example, a VPN tunnel is configured between a security module and the SOFTNET Security Client

The endpoints authenticate using certificates

VPN with Certificates



VPN with Certificates

1. Setting up the network

- Reset the Scalance to factory settings by pressing the Reset button and holding it down for at least 5 seconds
- Connect the switch to the external network interface
- Connect the PC with the Security Configuration Tool (PC1) and the PC with the SOFTNET Security Client (PC2) to the switch
- Connect PC3 to the internal network interface

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VPN with Certificates

2. Making IP settings for the PCs

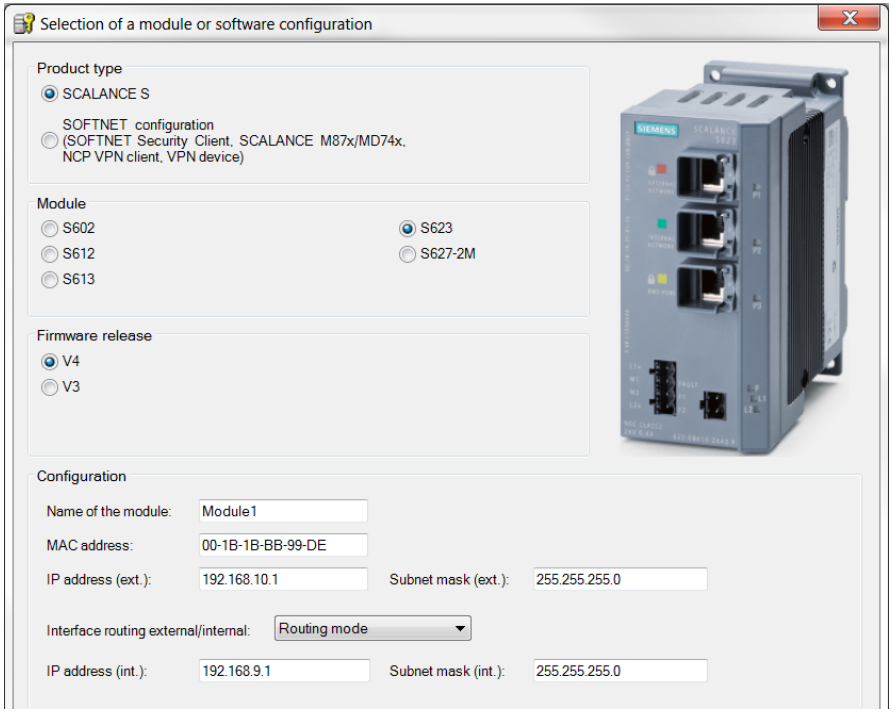
PC	IP address	Subnet mask	Default Gateway
PC1	192.168.10.2	255.255.255.0	192.168.10.1
PC2	192.168.10.3	255.255.255.0	192.168.10.1
PC3	192.168.9.2	255.255.255.0	192.168.9.1

- Set the IP addresses of the PCs as in the table above

VPN with Certificates

3. Creating a project and security module

- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- Select the “Routing mode”
- Enter the internal IP address (192.168.9.1) and subnet mask (255.255.255.0)
- Confirm with “OK”



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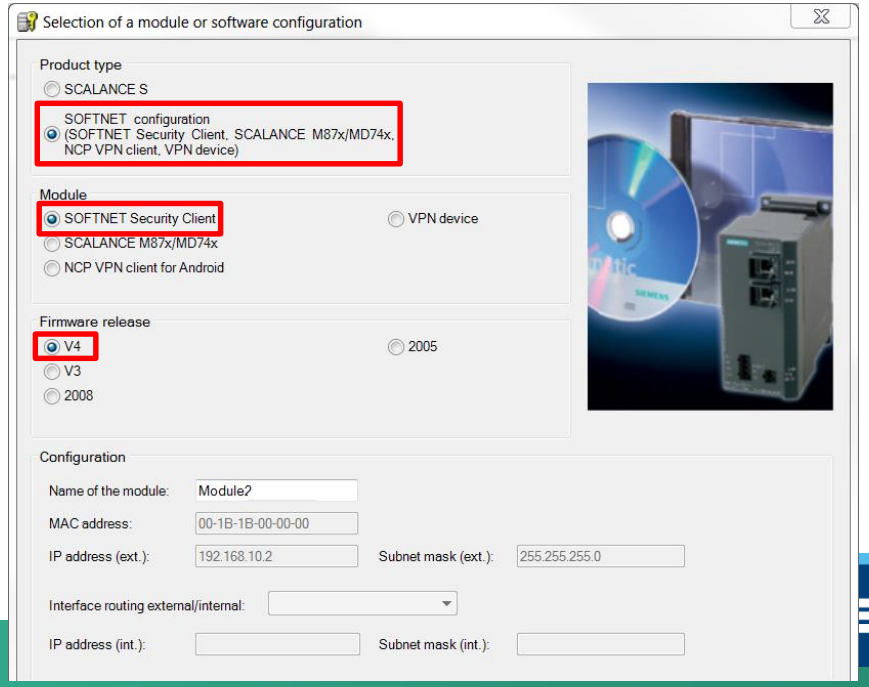
VPN with Certificates

3. Creating a project and security module

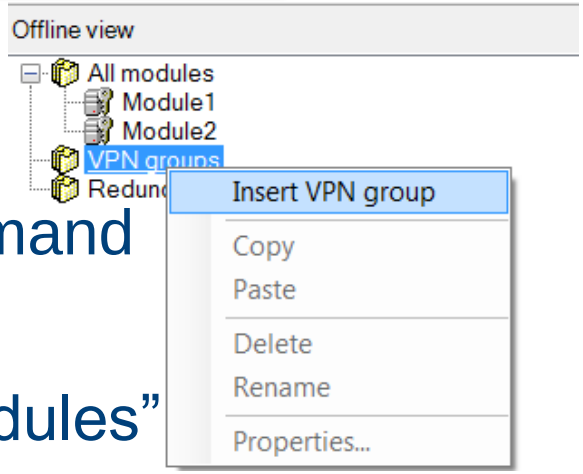
- Use the “Insert” > “Module” menu command with the following parameters
  - Product type: SOFTNET configuration
  - Module: SOFTNET Security Client
  - Firmware release: V4
- Confirm with “OK”



VPN with Certificates

4. Configuring a VPN group

- Select “VPN groups” in the navigation



- Select the “Insert” > “Group” menu command
- In the navigation panel, click the “All modules” entry
- Drag the Scalance S Module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue

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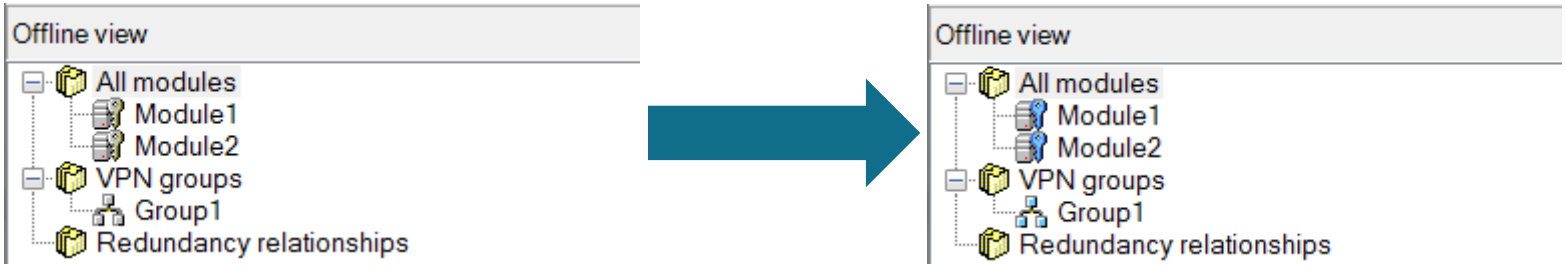
VPN with Certificates

4. Configuring a VPN group

- Drag the SOFTNET Security Client module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue



- Activate “Advanced Mode”

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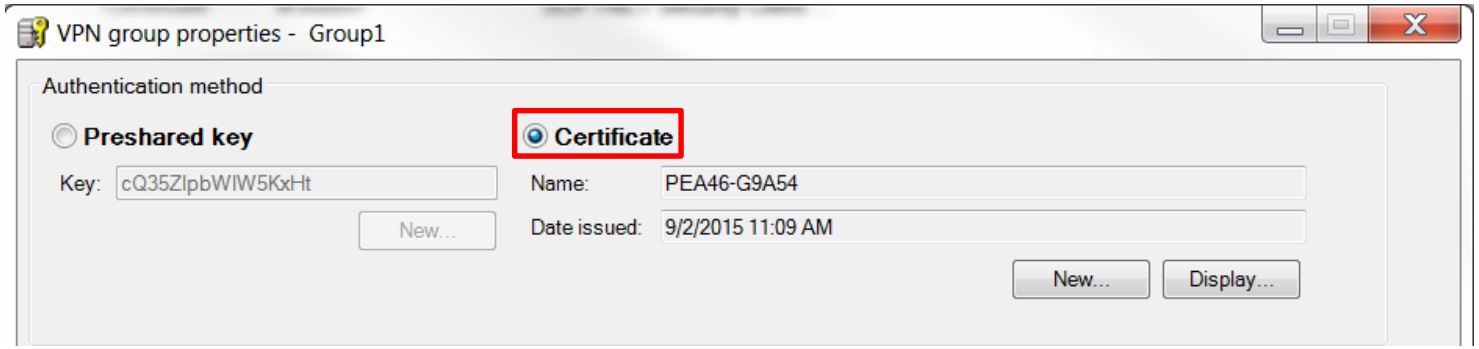
VPN with Certificates

4. Configuring a VPN group

- Select the VPN group “Group1” in the Navigation windows and select the menu command “Edit” > “Properties”

- Select the “Certificate” option in the “Authentication method” area



- Confirm with “OK”

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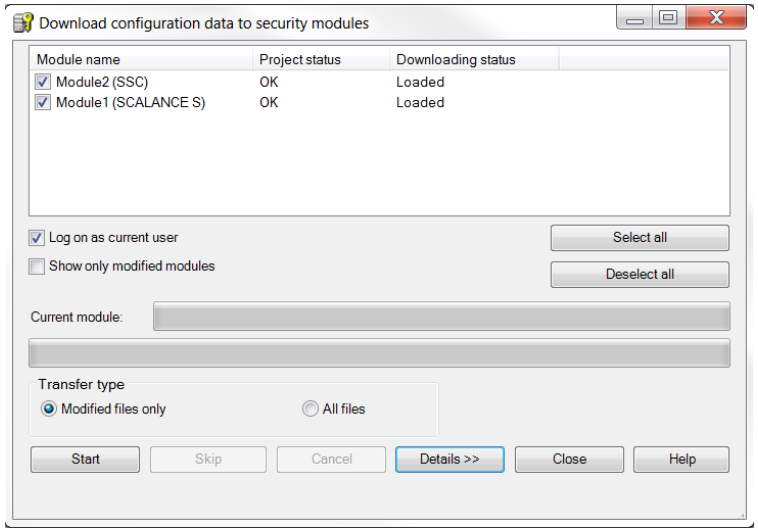
VPN with Certificates

5. Downloading the configuration to the security module and saving the SOFTNET Security Client configuration

- Save the project
- Use the menu command “Transfer” > “To all modules…”



- Start the download with the “Start” button

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VPN with Certificates

5. Downloading the configuration to the security module and saving the SOFTNET Security Client configuration

- Save the configuration file “projectname.Module2.dat” in your project folder
- Assign a password to the certificate
- Confirm the popup with “OK”

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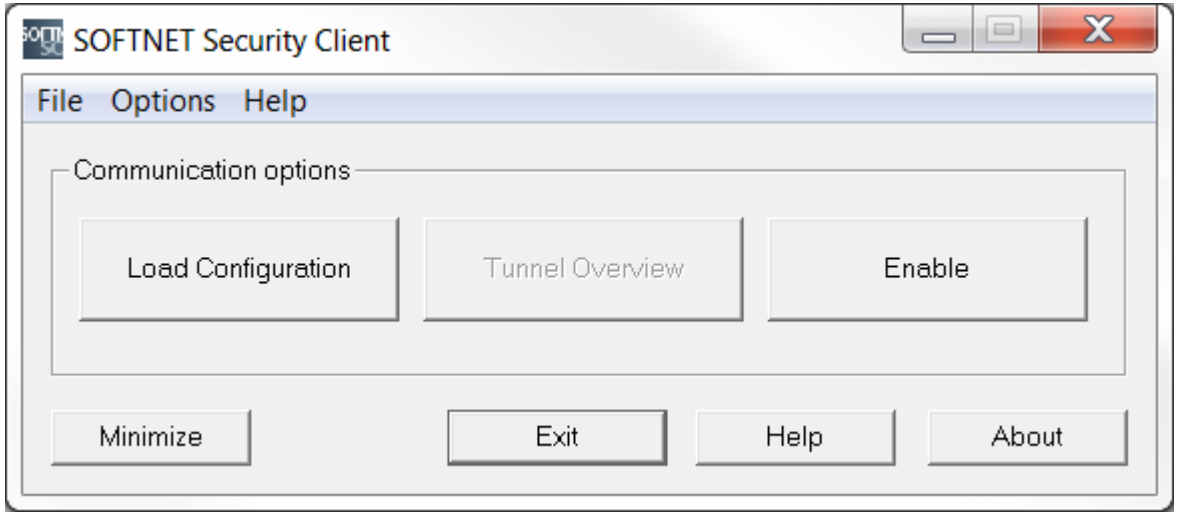
VPN with Certificates

6. Setting up a tunnel with the SOFTNET Security Client

- Open the SOFTNET Security Client on PC2



- Select “Load Configuration” and browse to where “projectname.Module2.dat” has been saved
- Open the configuration with the “Open” button

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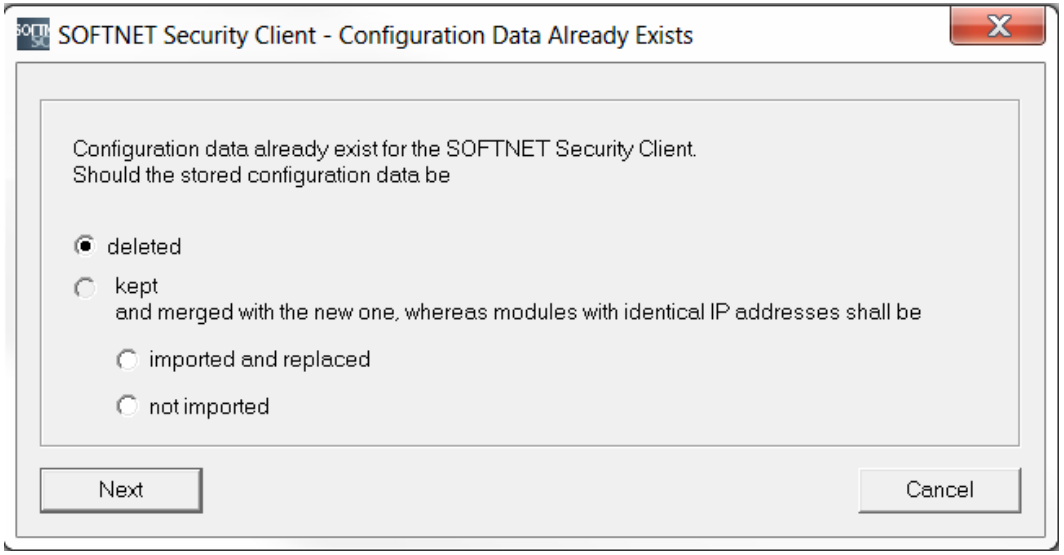
VPN with Certificates

6. Setting up a tunnel with the SOFTNET Security Client

- Loading a new configuration will delete any previous configurations



- When the dialog above pops up, select “deleted” and confirm with “Next”

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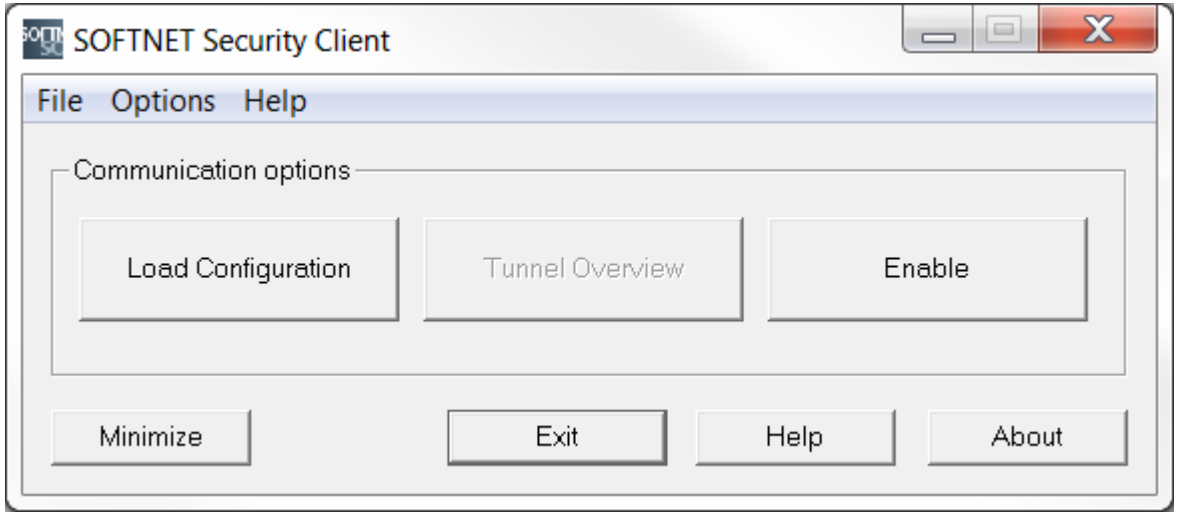
VPN with Certificates

6. Setting up a tunnel with the SOFTNET Security Client

- The VPN tunnel can now be opened by clicking the “Enable” button



- Enter the certificate password in the dialog

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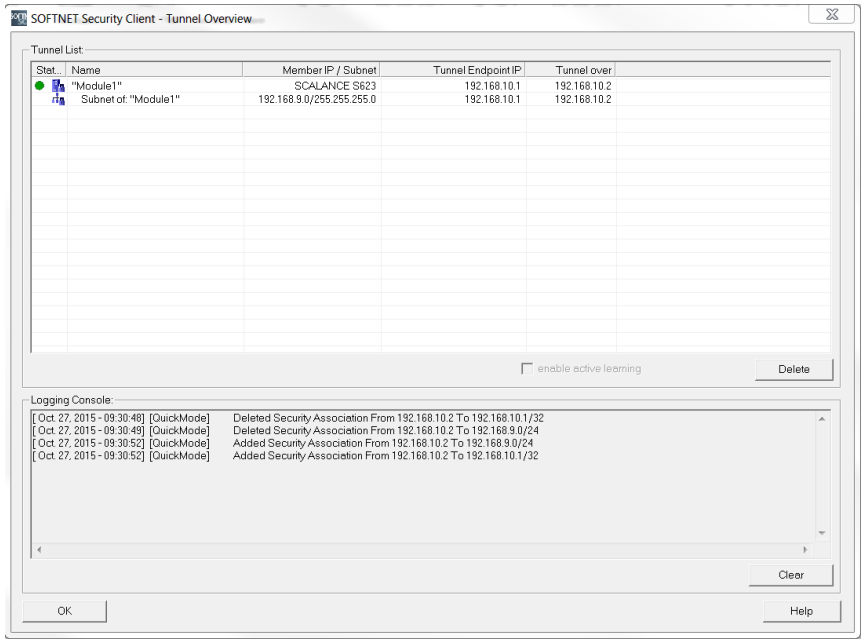
VPN with Certificates

6. Setting up a tunnel with the SOFTNET Security Client

- “Tunnel Overview” shows the status of the tunnel



- The green circle shows that the tunnel has been established

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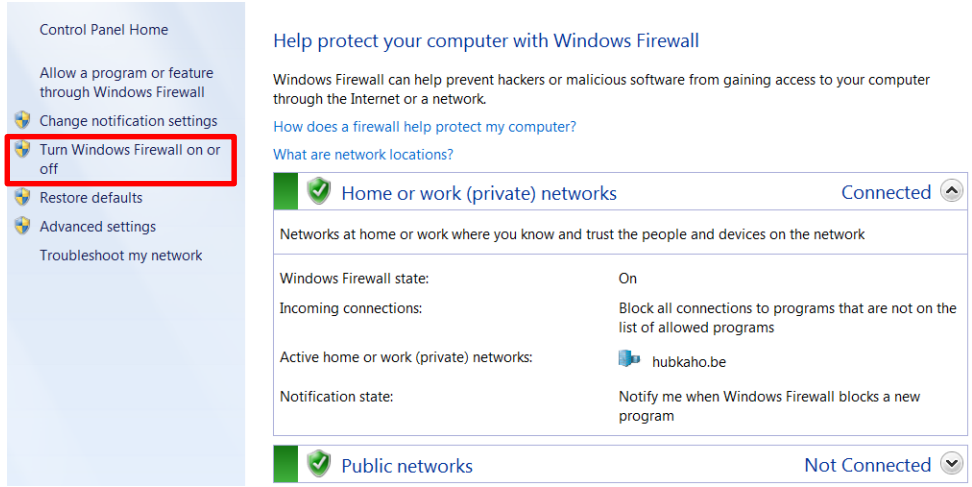
VPN with Certificates

6. Setting up a tunnel with the SOFTNET Security Client

- If the tunnel does not get set up, check whether the Windows Firewall has been enabled
- Open the “Control Panel” > “Windows Firewall”



- If the firewall is not enabled, click “Turn Windows Firewall on or off” and enable it

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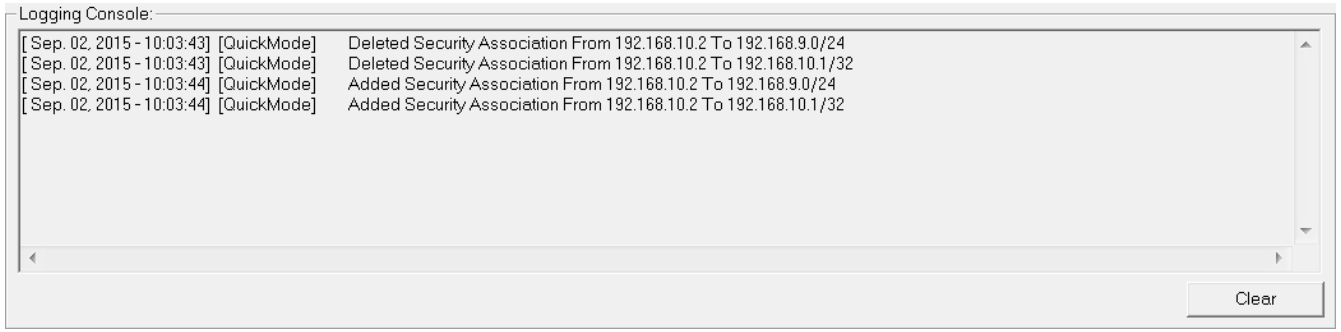
VPN with Certificates

6. Setting up a tunnel with the SOFTNET Security Client

- In the Logging Console, the sequence of executed connection attempts is displayed



- The SCALANCE S module and the SOFTNET Security Client have established a communication tunnel

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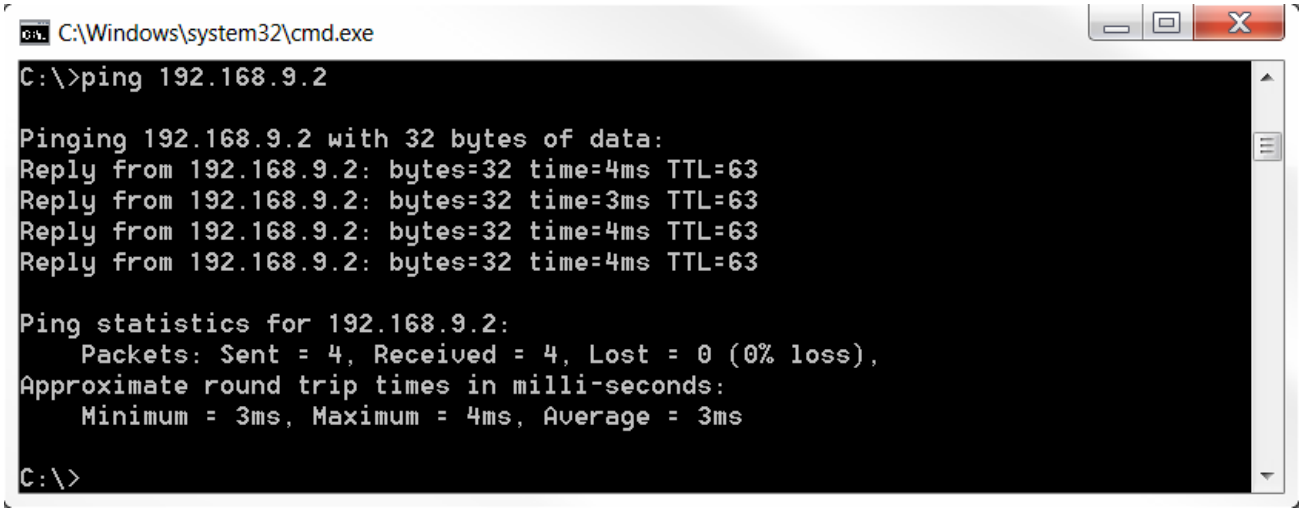
VPN with Certificates

7. Test the tunnel function

- Open the command prompt on PC2
- Enter the ping command from PC2 to PC3 “ping 192.168.9.2”



- All packets reach PC3 through the tunnel

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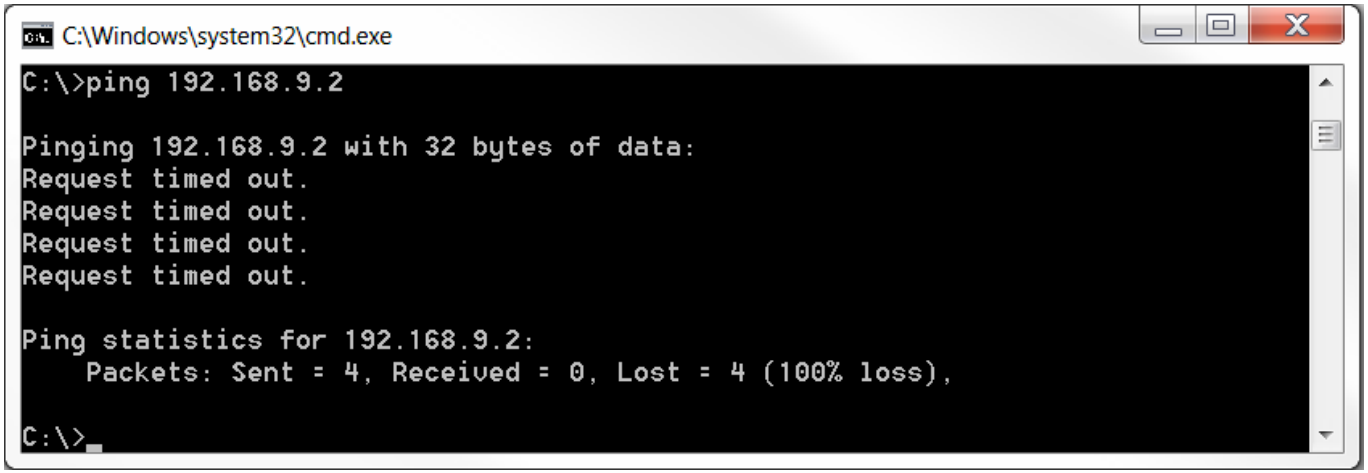
VPN with Certificates

7. Test the tunnel function

- Open the command prompt on PC2
- Enter the ping command from PC2 to PC3 “ping 192.168.9.2”



- The packets cannot reach PC3 since there is no tunnel communication between these two devices

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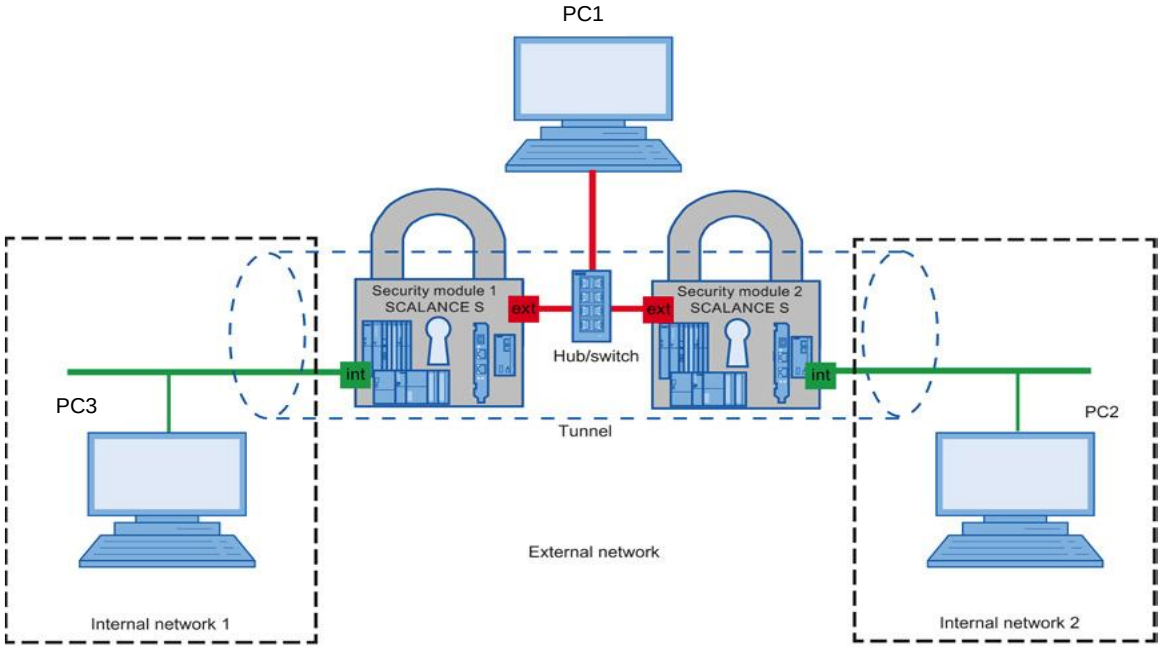
Gateway-to-Gateway with VPN



In this example, a VPN tunnel is set up between two security modules

With this configuration, IP traffic is possible only over the established tunnel connections with authorized partners

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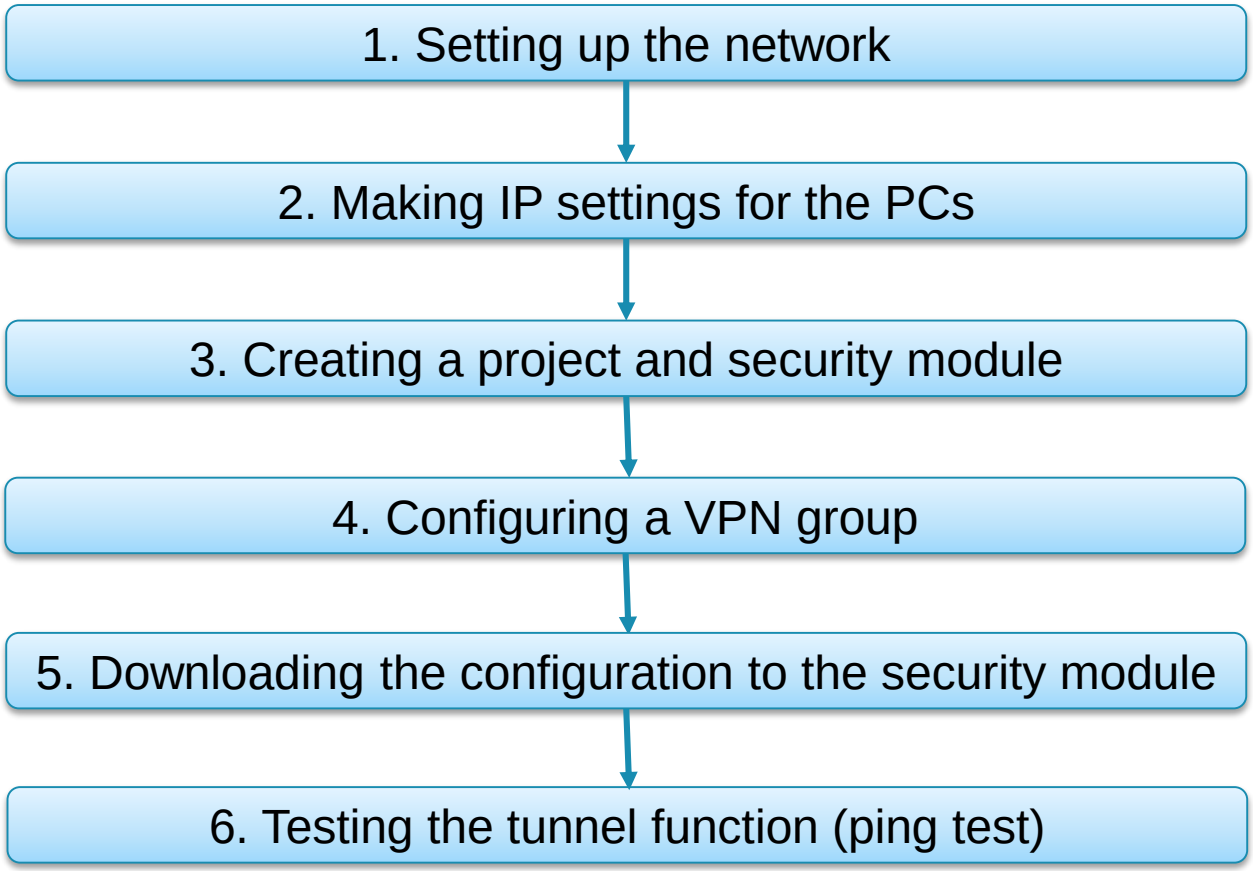
Gateway-to-Gateway with VPN



Gateway-to-Gateway with VPN

1. Setting up the network

- Connect the PC with the Security Configuration Tool (PC1) to the switch
- Connect both SCALANCE S modules to the switch through their external interface
- Connect PC2 and PC3 to the internal interface of a SCALANCE S module

Gateway-to-Gateway with VPN

2. Making IP settings for the PCs

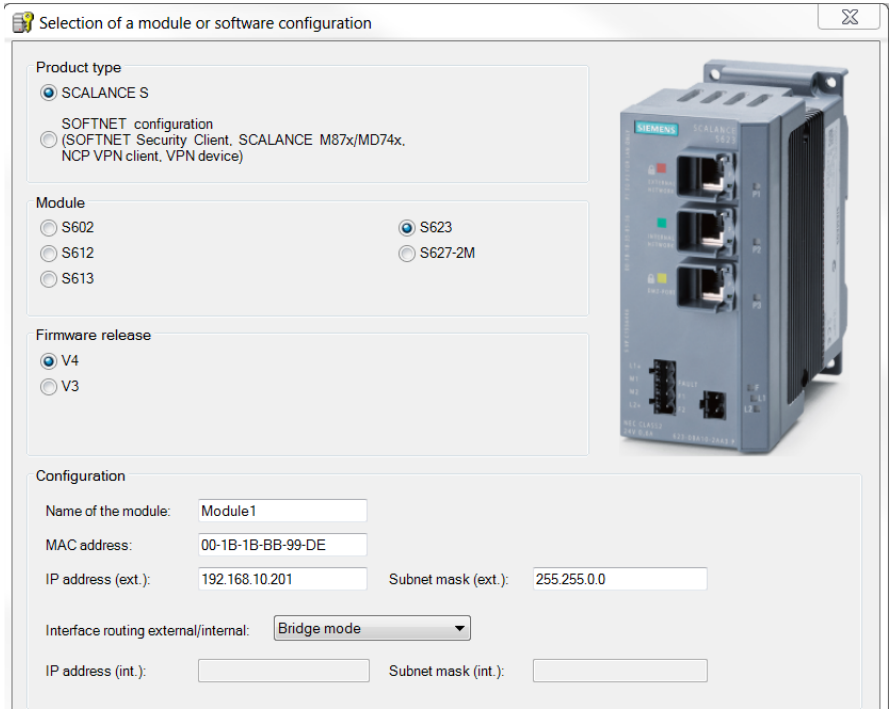
PC	IP address	Subnet mask
PC1	192.168.10.2	255.255.0.0
PC2	192.168.10.3	255.255.0.0
PC3	192.168.10.4	255.255.0.0

- Set the IP addresses of the PCs as in the table above

Gateway-to-Gateway with VPN

3. Creating a project and security module

- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.201) and the external subnet mask (255.255.0.0)
- Confirm with “OK”



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Gateway-to-Gateway with VPN

3. Creating a project and security module

- Select the menu command “Insert” > “Module”

- Select the same options as for the previous module but with the following address parameters
  - MAC address: MAC address of the module
  - IP address (ext): 192.186.10.202
  - Subnet mask (ext): 255.255.0.0

- Confirm with “OK”

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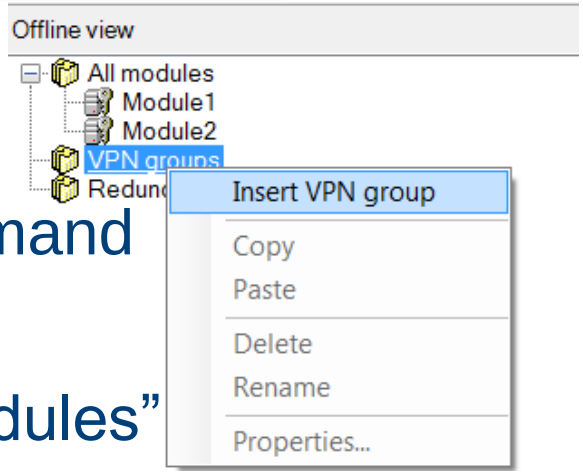
Gateway-to-Gateway with VPN

4. Configuring a VPN group

- Select “VPN groups” in the navigation



- Select the “Insert” > “Group” menu command
- In the navigation panel, click the “All modules” entry
- Drag the SCALANCE S Module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue

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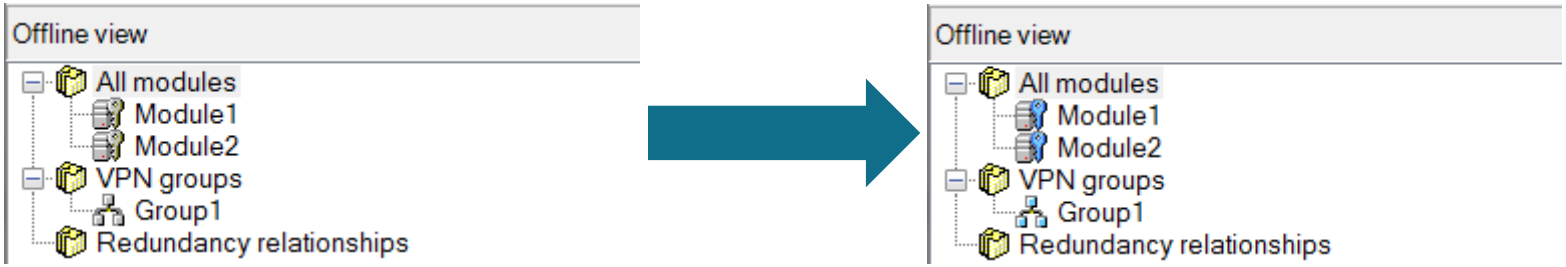
Gateway-to-Gateway with VPN

4. Configuring a VPN group

- Drag the second SCALANCE S module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue



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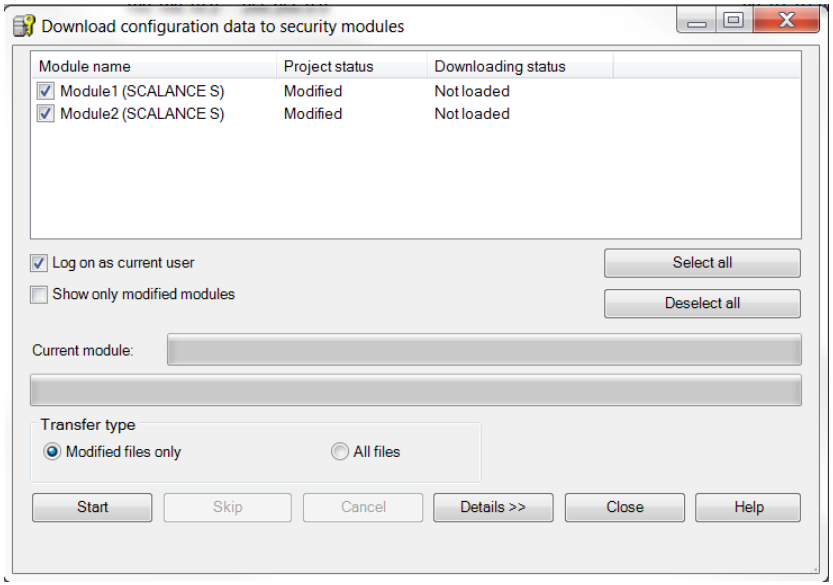
Gateway-to-Gateway with VPN

5. Downloading the configuration to the security module

- Save the project
- Use the menu command “Transfer” > “To all modules…”



- Start the download with the “Start” button

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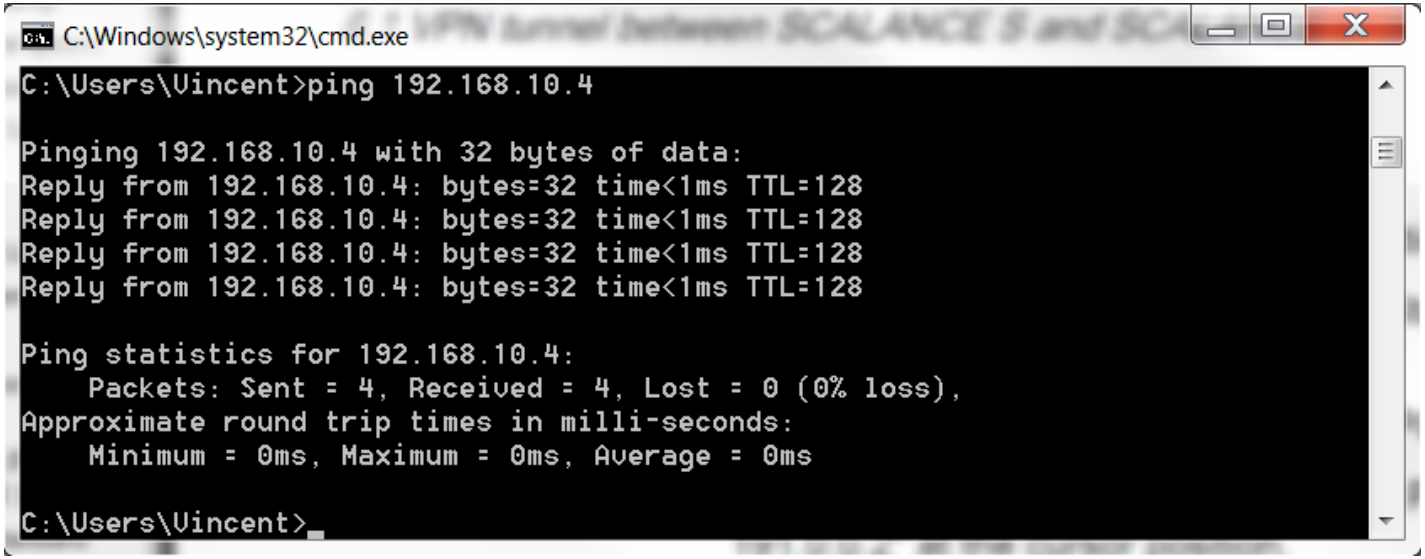
Gateway-to-Gateway with VPN

6. Testing the tunnel function (ping test)

- Open the command prompt on PC2
- Enter the ping command from PC2 to PC3 “ping 192.168.10.4”



- All packets reach PC3 through the tunnel

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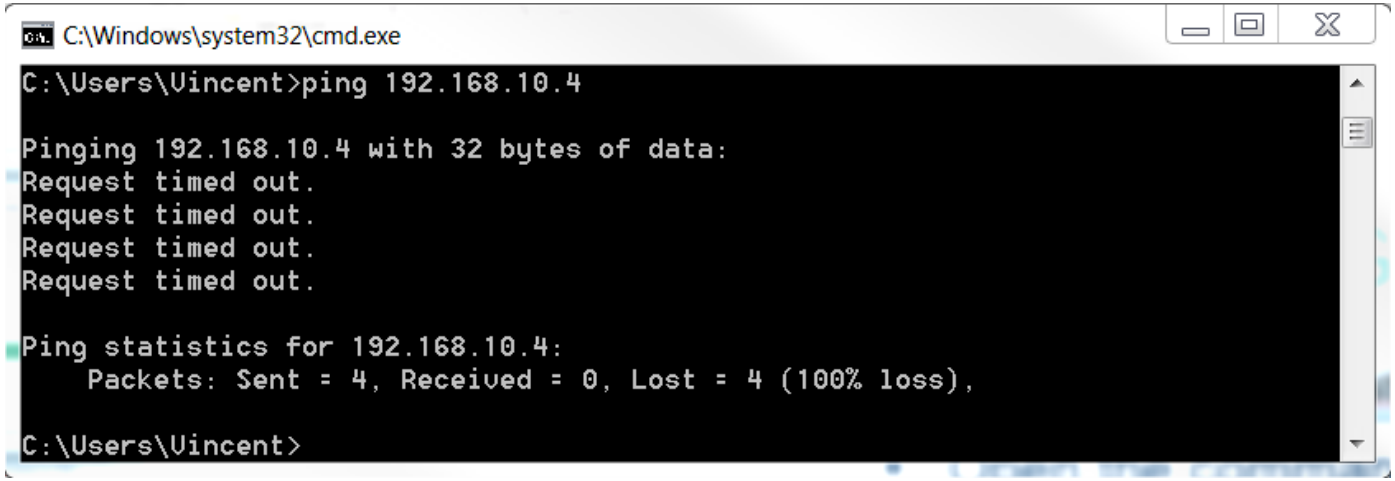
Gateway-to-Gateway with VPN

6. Testing the tunnel function (ping test)

- Open the command prompt on PC1
- Enter the ping command from PC1 to PC3 “ping 192.168.10.4”



- The packets cannot reach PC3 since there is no tunnel communication between these two devices

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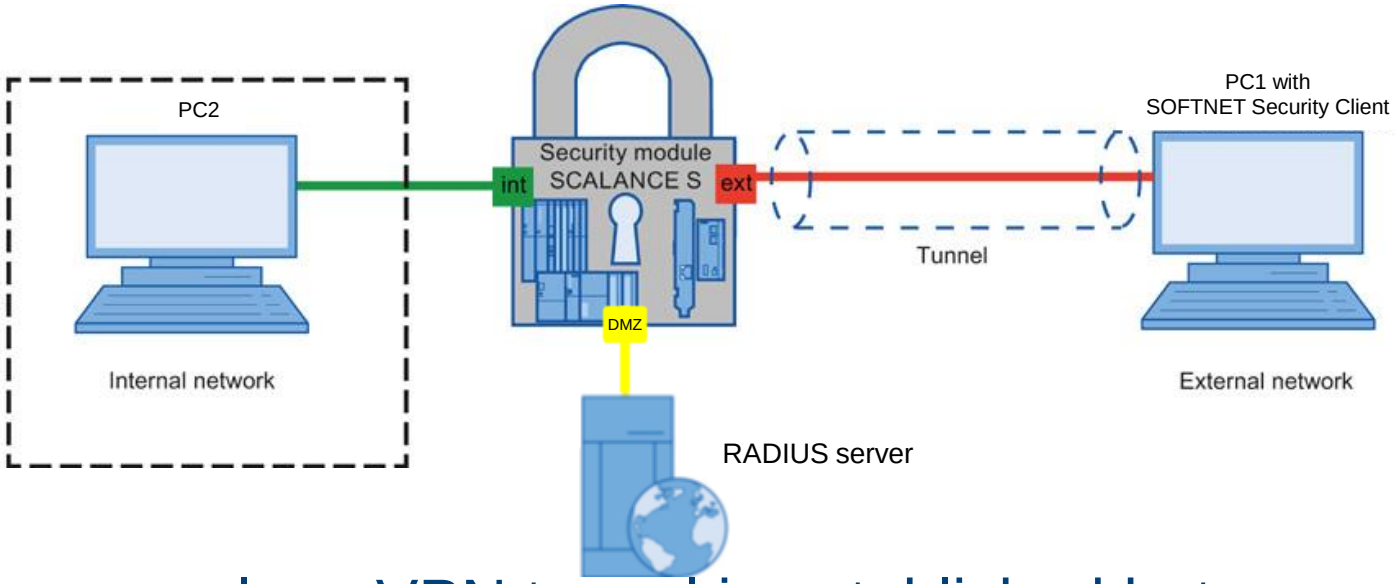
VPN with User Authentication



In this example, a VPN tunnel is established between a PC and a security module using the SOFTNET Security Client

The firewall is configured so that the access from PC1 in the external network to PC2 in the internal network is possible for a specific user only, who needs to log in at the RADIUS server

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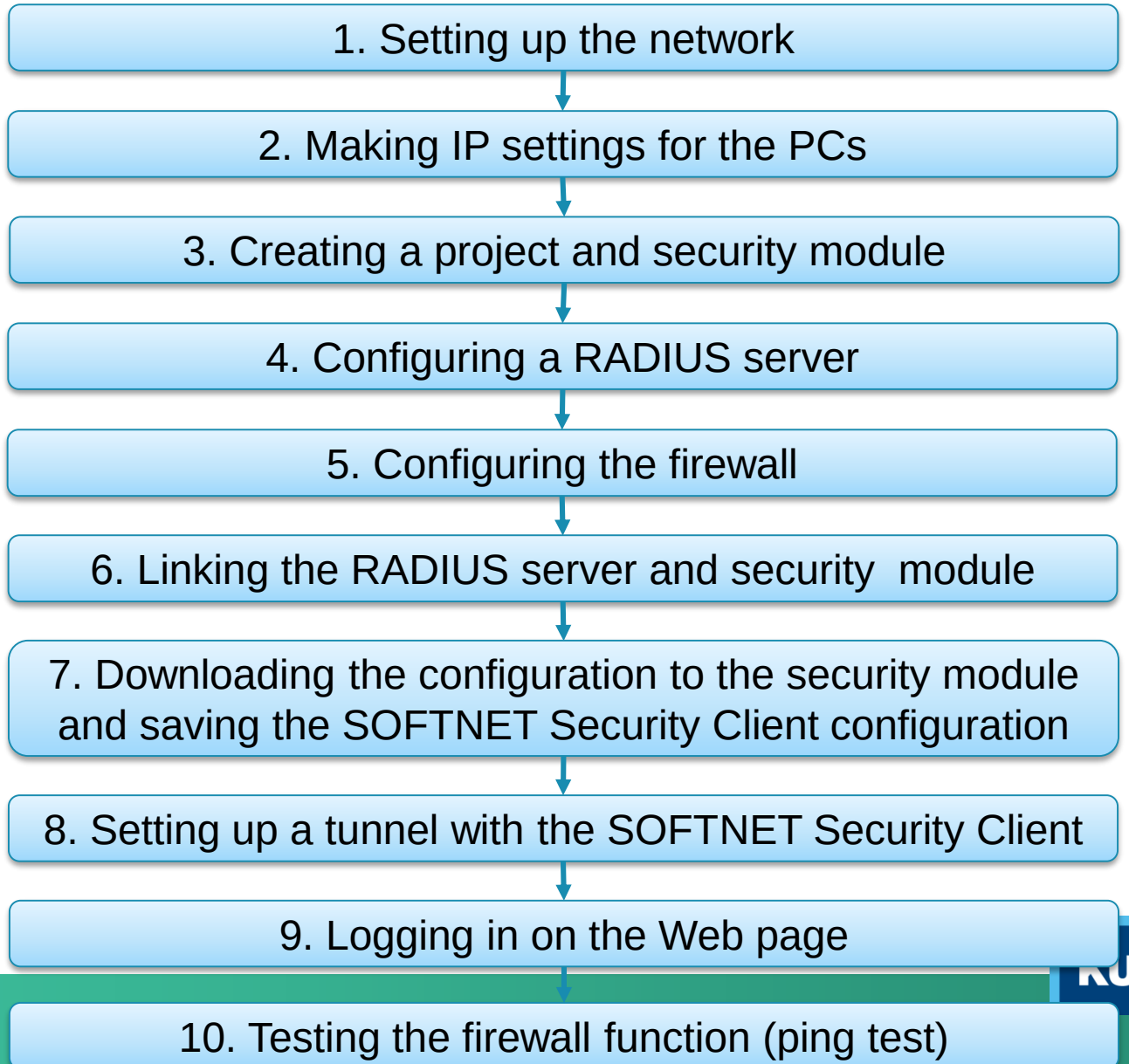
VPN with User Authentication



VPN with User Authentication

1. Setting up the network

- Reset the Scalance to factory settings by pressing the Reset button and holding it down for at least 5 seconds
- Connect the PC with the Security Configuration Tool (PC1) to the external network interface
- Connect PC2 to the internal network interface
- Connect the Linux PC that will be used as RADIUS server to the DMZ interface

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VPN with User Authentication

2. Making IP settings for the PCs

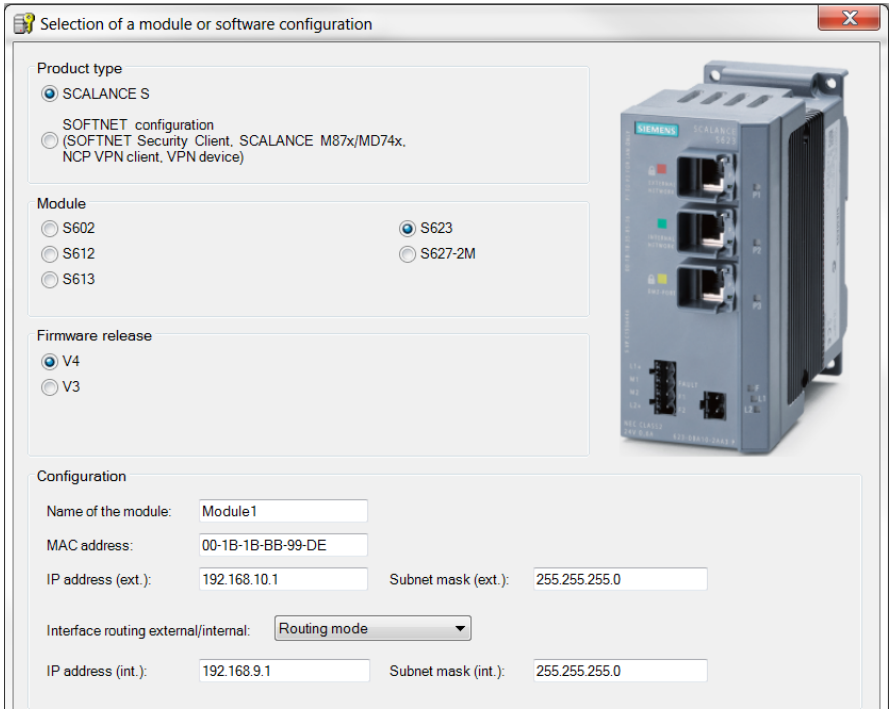
PC	IP address	Subnet mask	Default Gateway
PC1	192.168.10.2	255.255.255.0	192.168.10.1
PC2	192.168.9.2	255.255.255.0	192.168.9.1
RADIUS	192.168.8.2	255.255.255.0	192.168.8.1

- Set the IP addresses of the PCs as in the table above
- The IP address of the Linux PC is preset to the correct value

VPN with User Authentication

3. Creating a project and security module

- Create a new project
- In the “Configuration” area enter the MAC address
- Enter the external IP address (192.168.10.1) and the external subnet mask (255.255.255.0)
- Select the “Routing mode”
- Enter the internal IP address (192.168.9.1) and subnet mask (255.255.255.0)
- Confirm with “OK”



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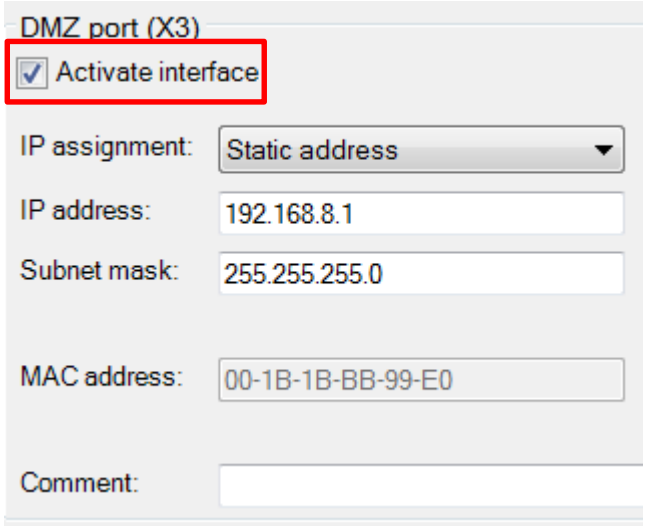
VPN with User Authentication

3. Creating a project and security module

- Select the security module created and select the “Edit” > “Properties” menu command, “Interfaces” tab
- Select the “Activate Interface” check box in the “DMZ port (X3)” area
- Enter the IP address (192.168.8.1) and the subnet mask (255.255.255.0) for the DMZ interface
- Confirm with “OK”



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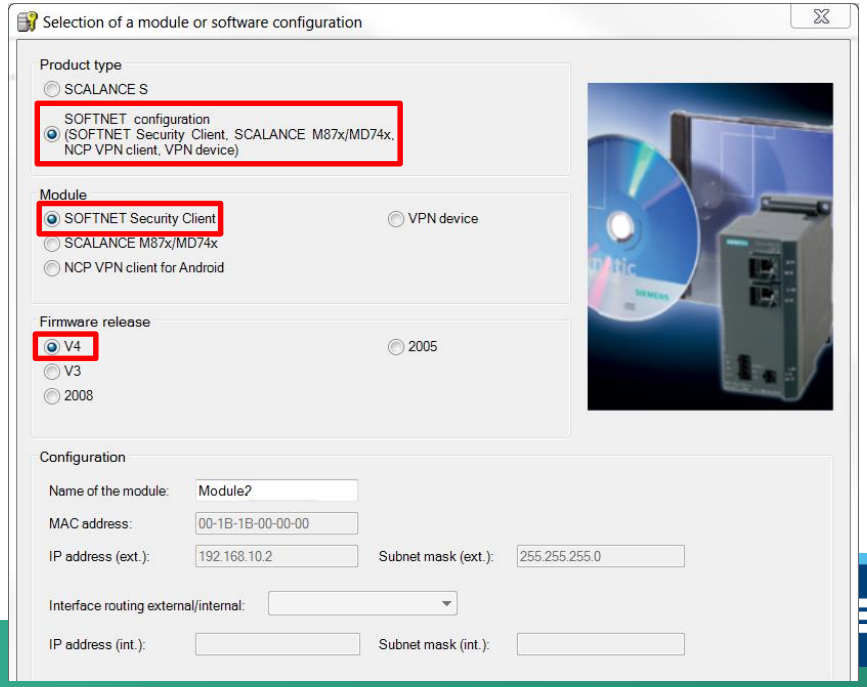
VPN with User Authentication

3. Creating a project and security module

- Use the “Insert” > “Module” menu command with the following parameters
  - Product type: SOFTNET configuration
  - Module: SOFTNET Security Client
  - Firmware release: V4
- Confirm with “OK”



VPN with User Authentication

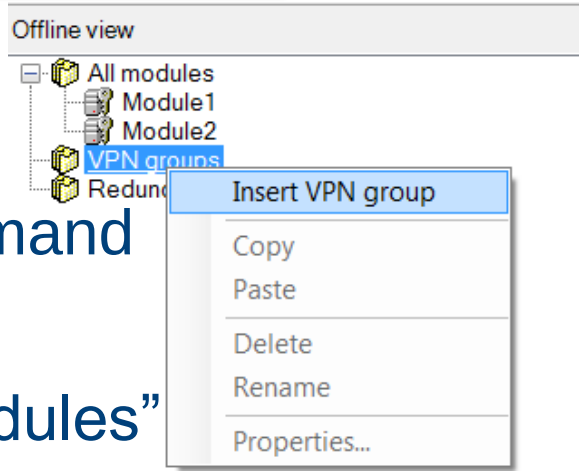
4. Configuring a RADIUS server

- We'll use the previously configured RADIUS server for this example

VPN with User Authentication

5. Configuring the firewall

- Select “VPN groups” in the navigation
- Select the “Insert” > “Group” menu command
- In the navigation panel, click the “All modules” entry
- Drag the SCALANCE S Module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue



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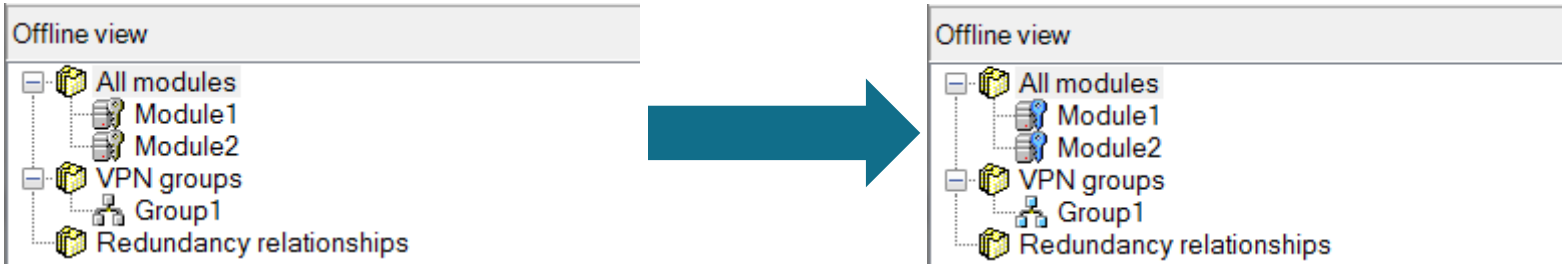
VPN with User Authentication

5. Configuring the firewall

- Drag the SOFTNET Security Client module to the VPN group “Group1” in the navigation panel
  The module is now assigned to the VPN group
  The color of the key symbol changes to blue



- Activate “Advanced Mode”

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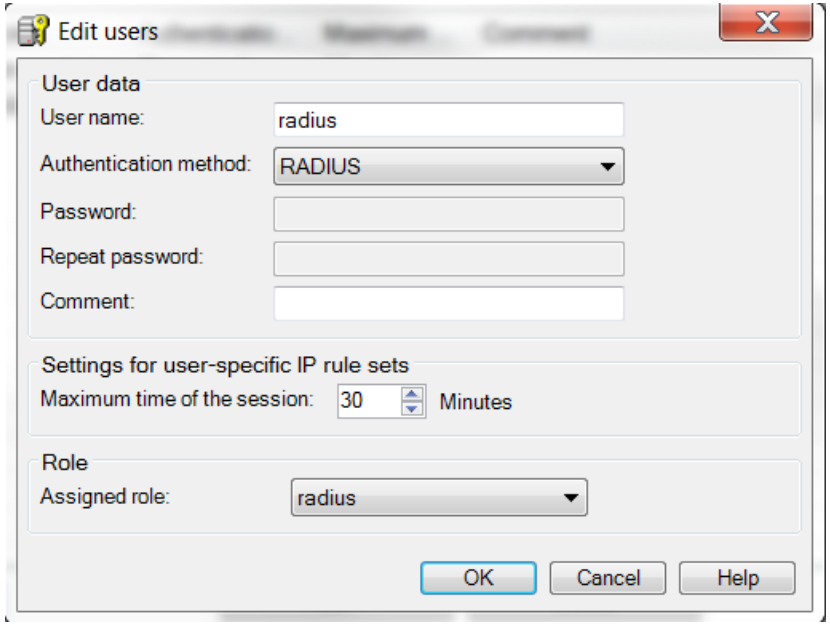
VPN with User Authentication

5. Configuring the firewall

- Use the menu command “Options” > “User Management“
- Create a new user with the following settings
- Confirm with “OK”



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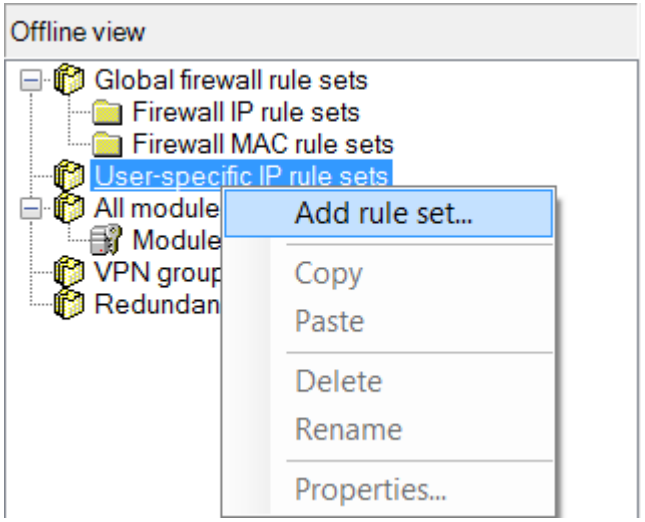
VPN with User Authentication

5. Configuring the firewall

- Select the “User-specific IP rule sets” in the navigation window
- Select the “Add rule set…” option in the shortcut menu



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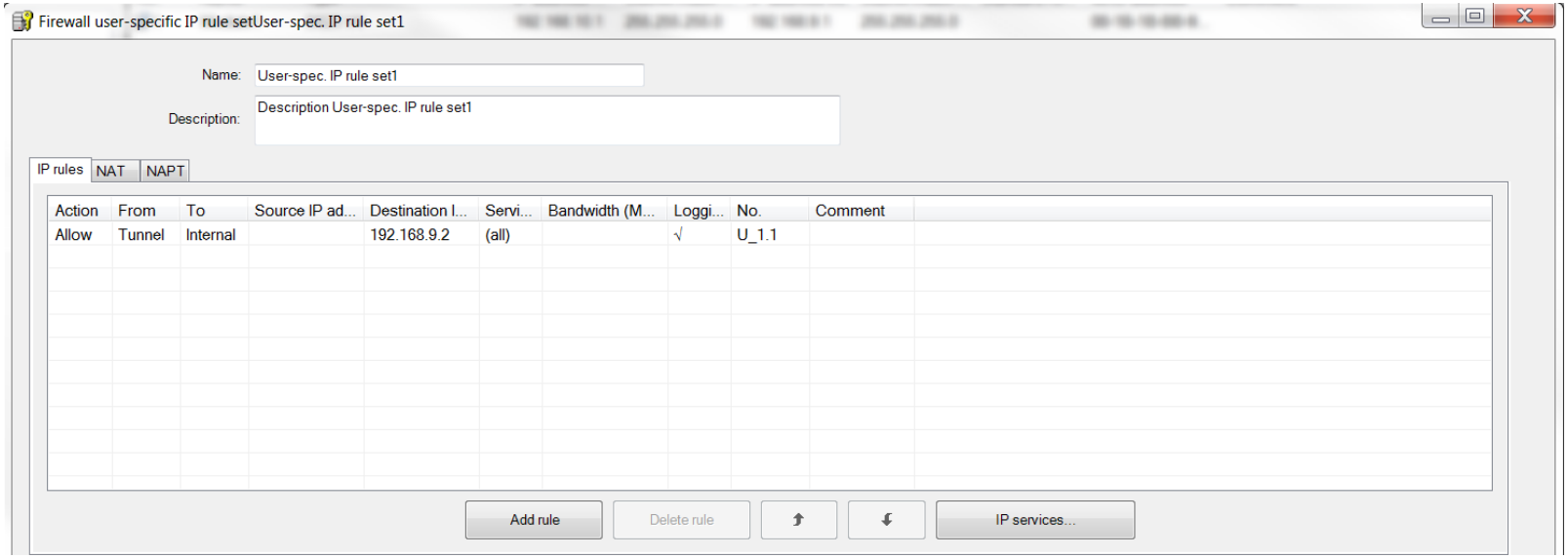
VPN with User Authentication

5. Configuring the firewall

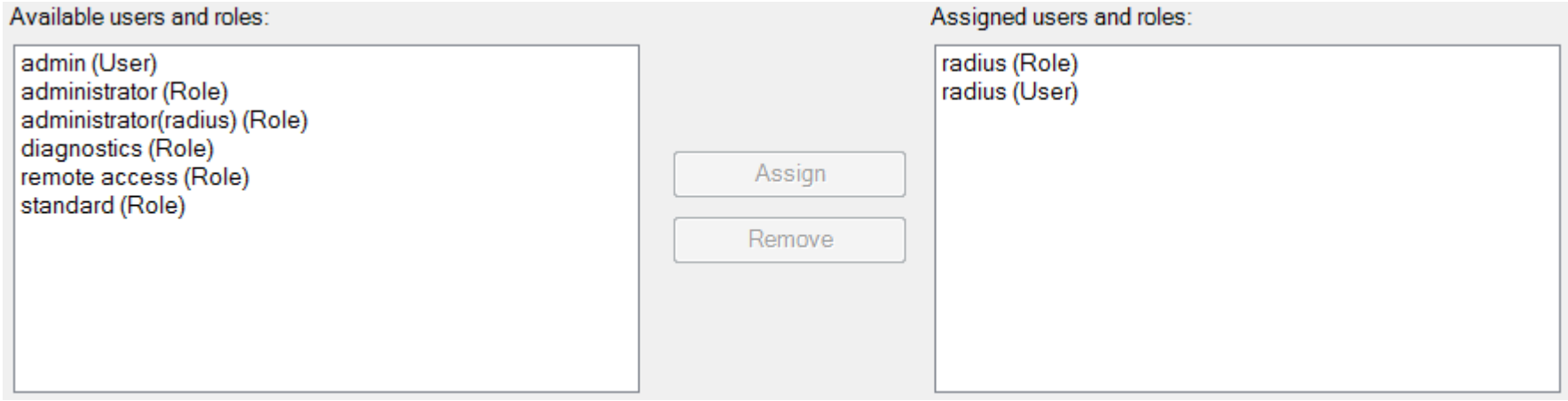
- Enter a rule in the dialog as shown below



VPN with User Authentication

5. Configuring the firewall

- From the “Available users and roles” list, select the “radius (user)” entry and click the “Assign” button, then select the “radius (role)” entry and click “Assign”



- Confirm with “OK”

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5. Configuring the firewall

- Select the security module in the navigation panel and drag it to the newly created user-specific IP rule set

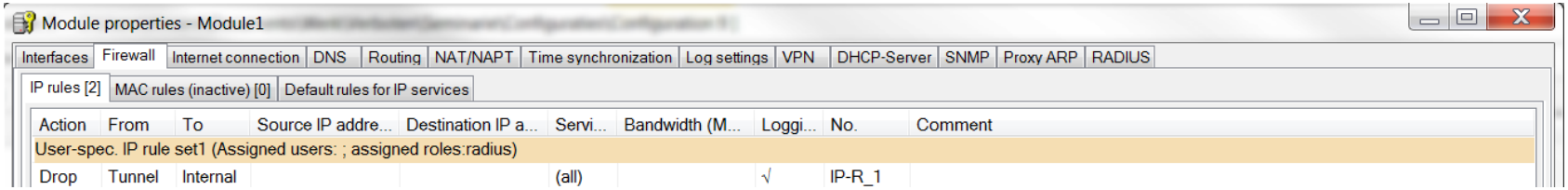
- The assignment can be checked by opening the module properties and selecting the “Firewall” tab

VPN with User Authentication

5. Configuring the firewall

- Open the properties of the SCALANCE module and go to the “Firewall” tab

- Add a firewall rule as in the image



- Confirm with “OK”

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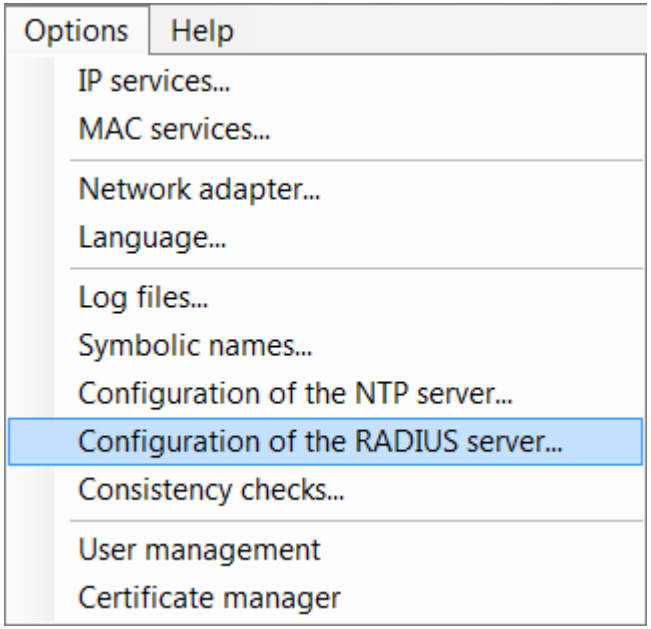
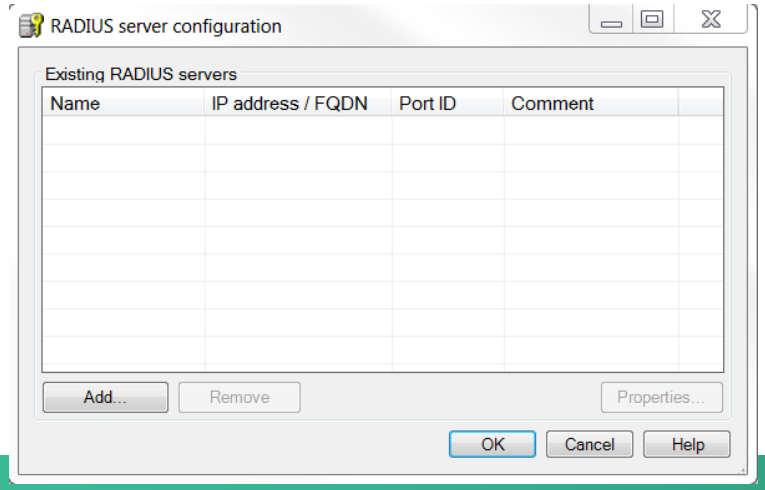
6. Linking the RADIUS server and security module

- Select the menu option “Options” > “Configuration of the RADIUS server…”



- Click the “Add…” button in the dialog



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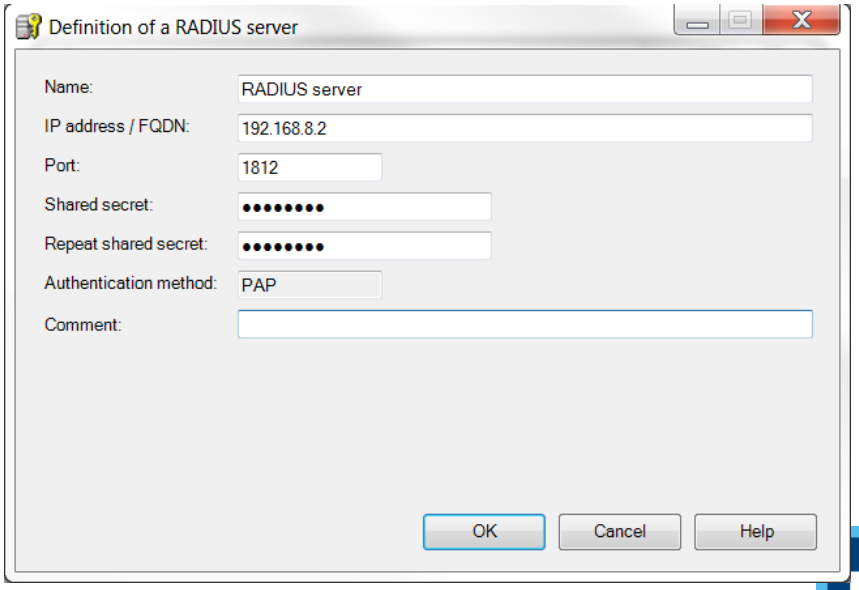
6. Linking the RADIUS server and security module

- Define the server with the following values
  - IP address/FQDN: 192.186.8.2
  - Shared secret: SiemensSecret
  - Repeat shared secret: SiemensSecret
- Confirm with “OK”



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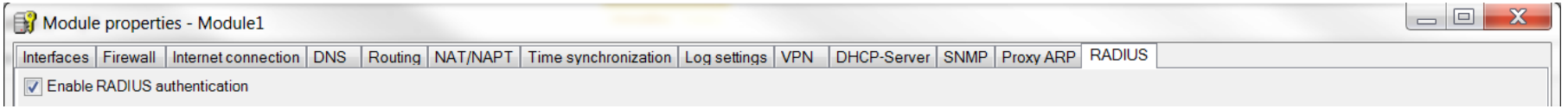
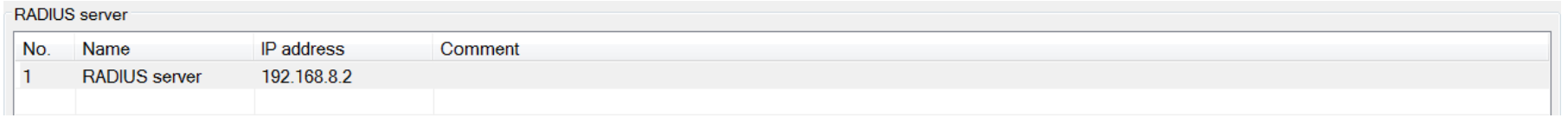
6. Linking the RADIUS server and security module

- Open the SCALANCE S module properties and go to the “RADIUS” tab



- Check the “Enable RADIUS authentication” box

- Click the “Add” button
  This adds the newly configured RADIUS server



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6. Linking the RADIUS server and security module

- In the “RADIUS setting” area, check the “Allow RADIUS authentication of non-configured users” box

- Confirm with “OK”

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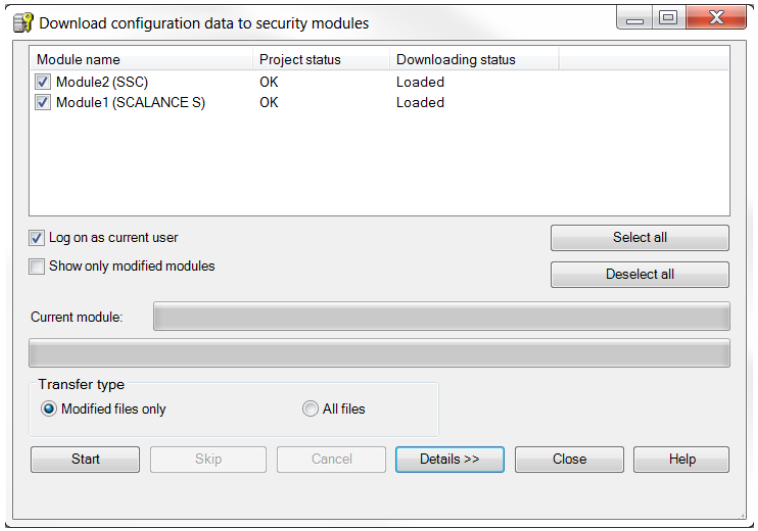
7. Downloading the configuration to the security module and saving the SOFTNET Security Client configuration

- Save the project
- Use the menu command “Transfer” > “To all modules…”



- Start the download with the “Start” button

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7. Downloading the configuration to the security module and saving the SOFTNET Security Client configuration

- Save the configuration file “projectname.Module2.dat” in your project folder
- Assign a password to the certificate
- Confirm the popup with “OK”

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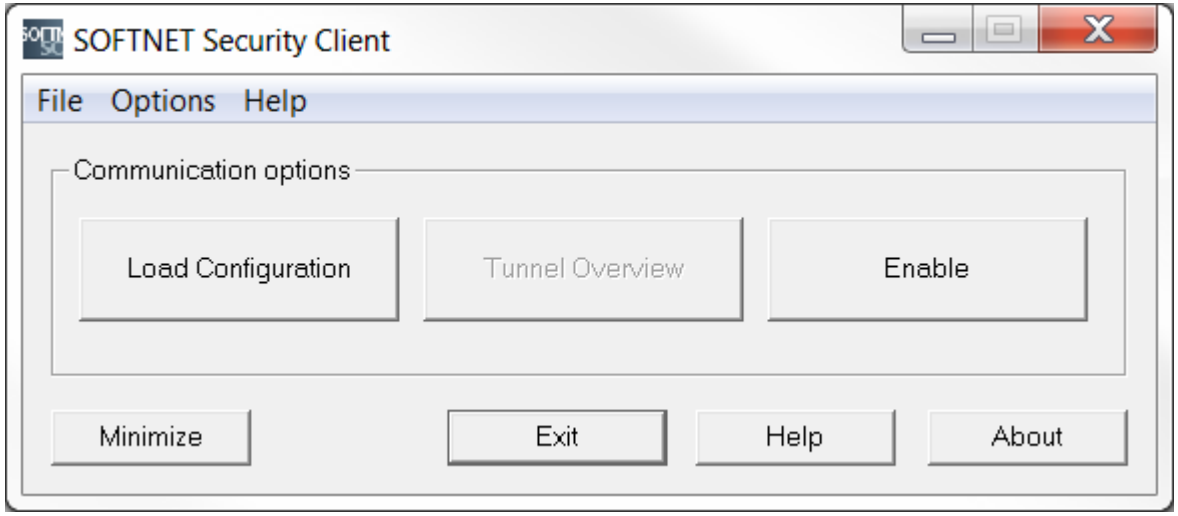
VPN with User Authentication

8. Setting up a tunnel with the SOFTNET Security Client

- Open the SOFTNET Security Client on PC2



- Select “Load Configuration” and browse to where “projectname.Module2.dat” has been saved
- Open the configuration with the “Open” button

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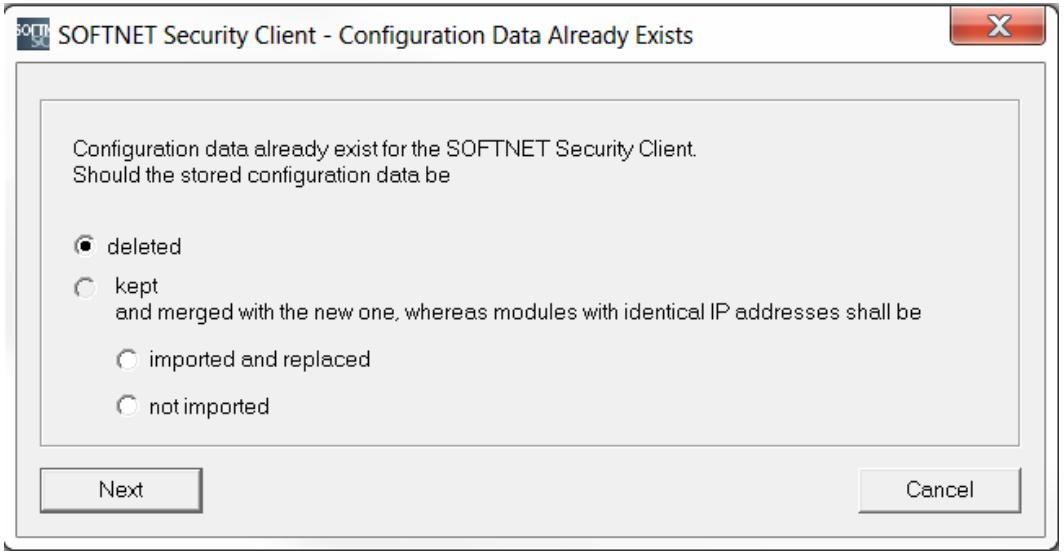
VPN with User Authentication

8. Setting up a tunnel with the SOFTNET Security Client

- Loading a new configuration will delete any previous configurations



- When the dialog above pops up, select “deleted” and confirm with “Next”

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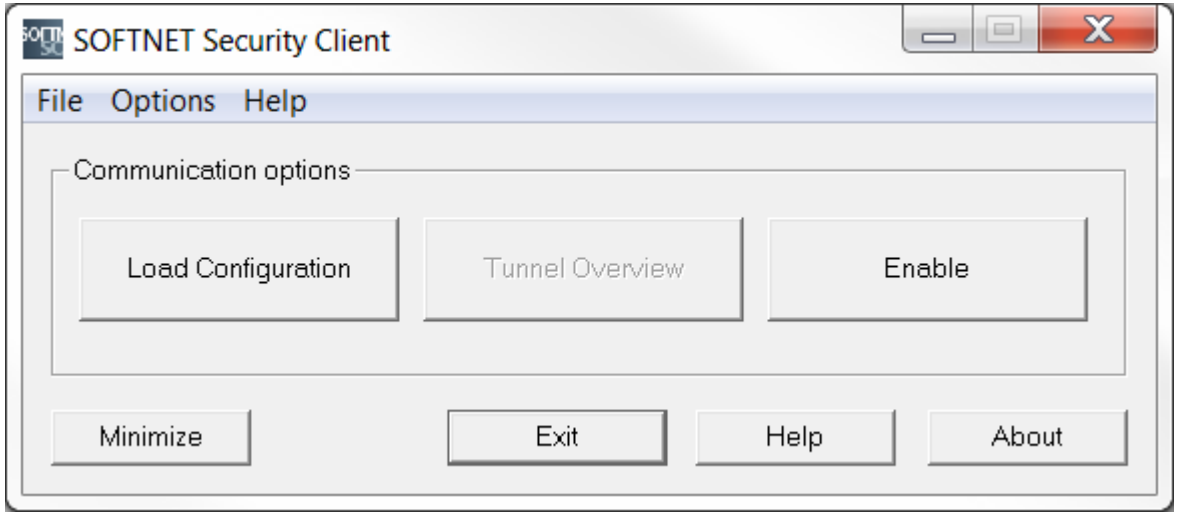
8. Setting up a tunnel with the SOFTNET Security Client

- The VPN tunnel can now be opened by clicking the “Enable” button



- Enter the certificate password in the dialog

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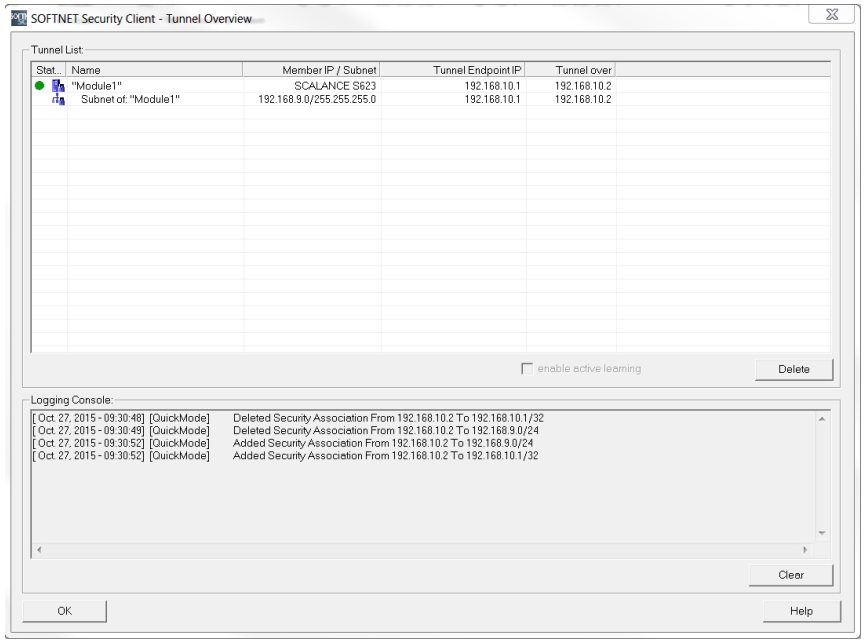
VPN with User Authentication

8. Setting up a tunnel with the SOFTNET Security Client

- “Tunnel Overview” shows the status of the tunnel



- The green circle shows that the tunnel has been established

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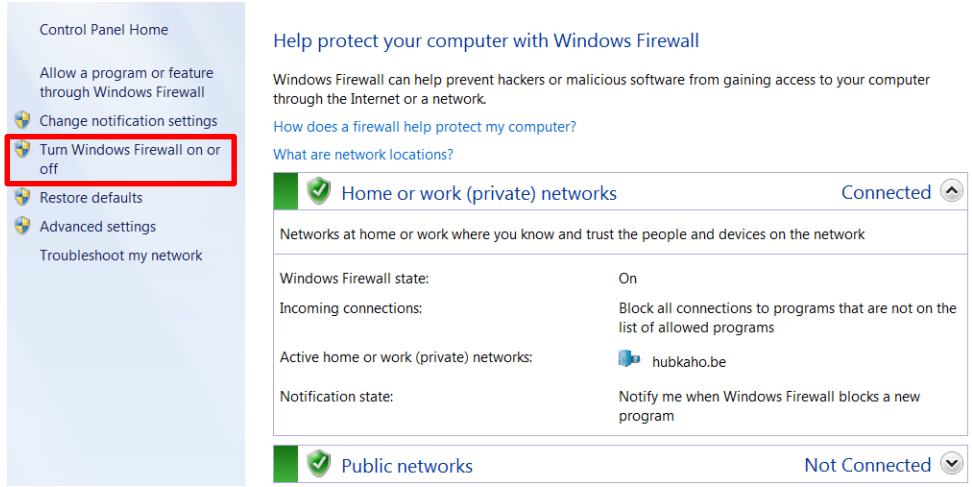
VPN with User Authentication

6. Setting up a tunnel with the SOFTNET Security Client

- If the tunnel does not get set up, check whether the Windows Firewall has been enabled
- Open the “Control Panel” > “Windows Firewall”



- If the firewall is not enabled, click “Turn Windows Firewall on or off” and enable it

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9. Logging in on the Web page

- In the Web browser of PC1, enter the address “https://192.168.10.1”

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9. Logging in on the Web page

- If the web page does not show the login fields, try changing the language in the upper right corner

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9. Logging in on the Web page

- Enter the user name “radius” and corresponding password and click the “Log in” button

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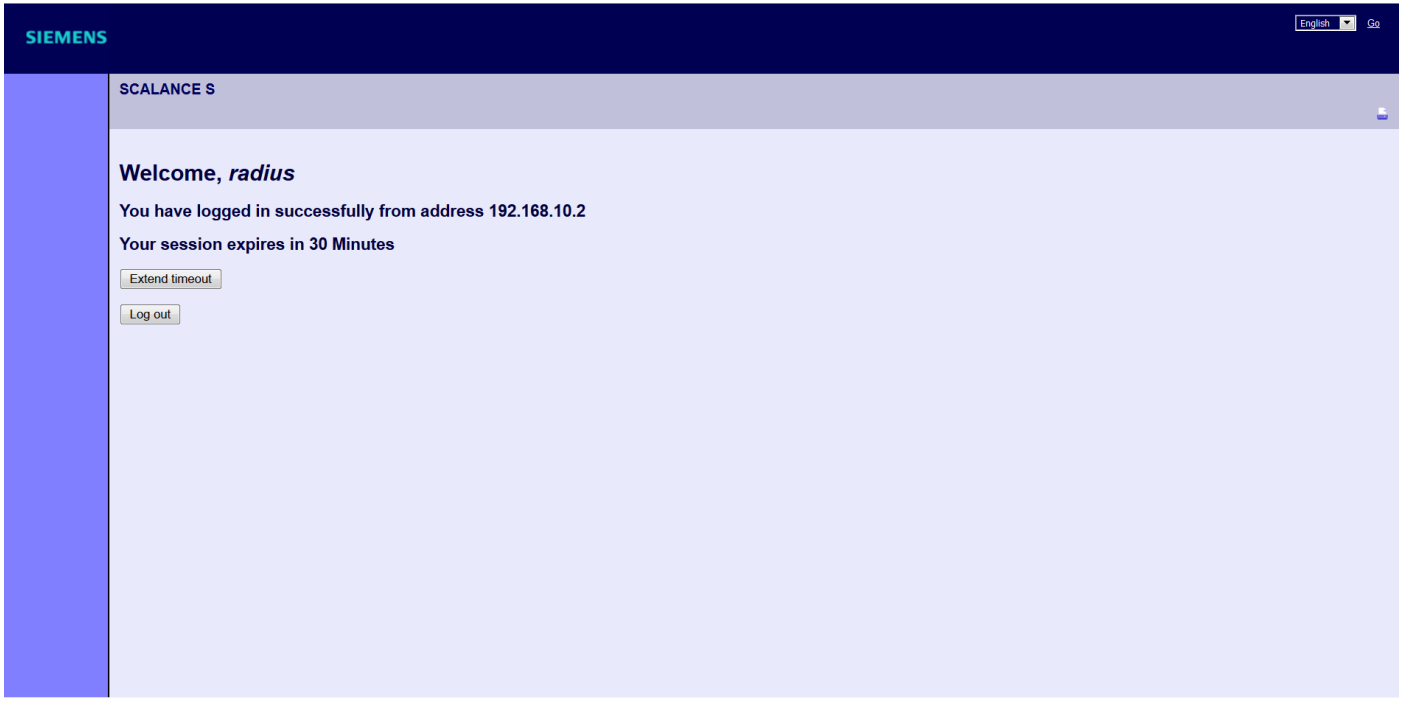
VPN with User Authentication

9. Logging in on the Web page

- The defined IP rule set is enabled for the “radius” user.



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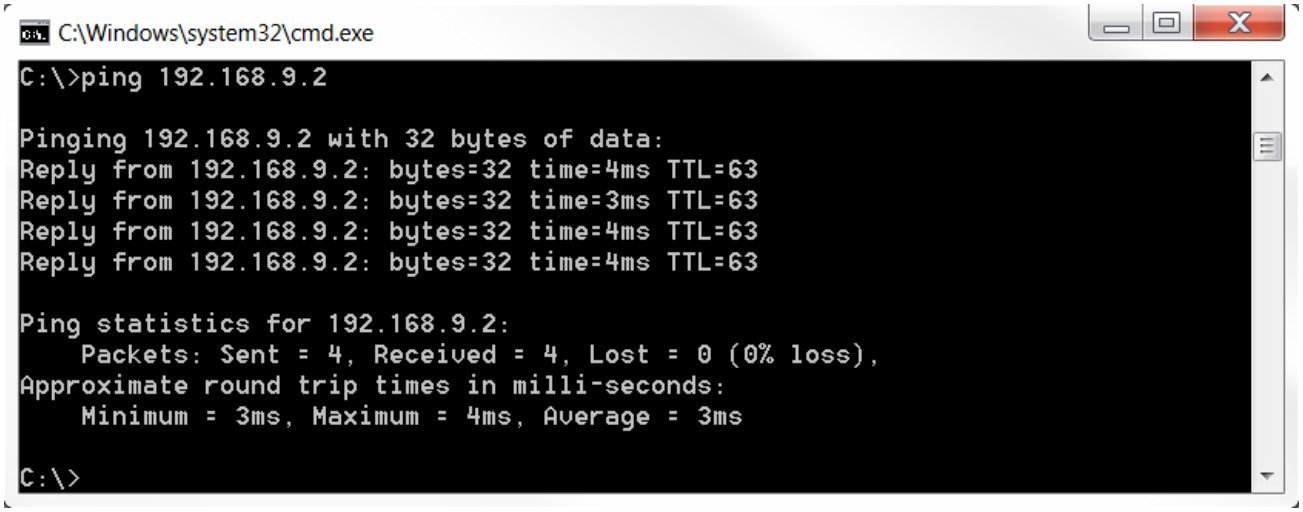
10. Testing the firewall function (ping test)

- Open the command prompt on PC1
- Enter the ping command from PC1 to PC2 “ping 192.168.9.2”



- All packets reach PC2 through the tunnel

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