

Configuration of redundant network cards



Installation manual for system providers

5/21/2019

Product line neo, version 6.x

The described functions can be used with the following ASC products:

EVOIPneo

EVOLUTIONneo

EVOLUTIONneo eco

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2 Introduction

2 Introduction

The following document contains instructions regarding the configuration of redundant network cards (also called *link aggregation* or *teaming*).

3 Link aggregation

Preconditions:

- Network switch with teaming function, e. g. Cisco Catalyst 2960
- 2 identical NICs
 - BCM5721 NetXtreme® Gigabit Ethernet Controller for Servers
 - Intel PRO/1000 XF/PT server adapter
- Cisco Network Assistant
(Available at: <http://www.cisco.com/en/US/products/ps5931/index.html>)

Layout:

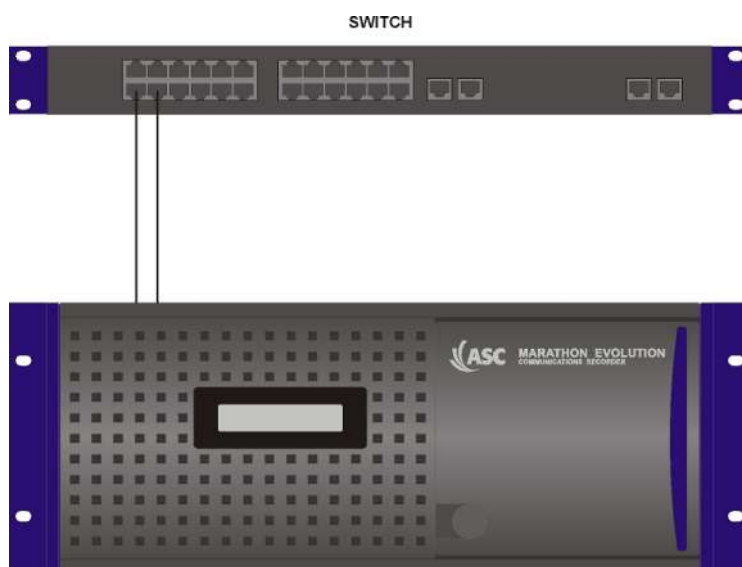


Fig. 1: Structure of NIC link aggregation



The link aggregation function can only be used for active VoIP recording solutions or for the communication network card.

Network cards which are used to operate a passive recording solution via *sniffing* cannot deploy this performance feature.

4 Link aggregation on Windows

4.1 Configure NIC Team (Microsoft Windows Server 2012 R2)



The configuration of NIC teams (Ethernet teams) can only be carried out on the local server, since the remote connection will be lost for lack of a correct network configuration according to the definition of the team.

In order to configure 2 Ethernet interfaces for one network team, proceed as follows:

1. Connect both Ethernet interfaces with the switch.
2. Open the *Server Manager* in the taskbar.

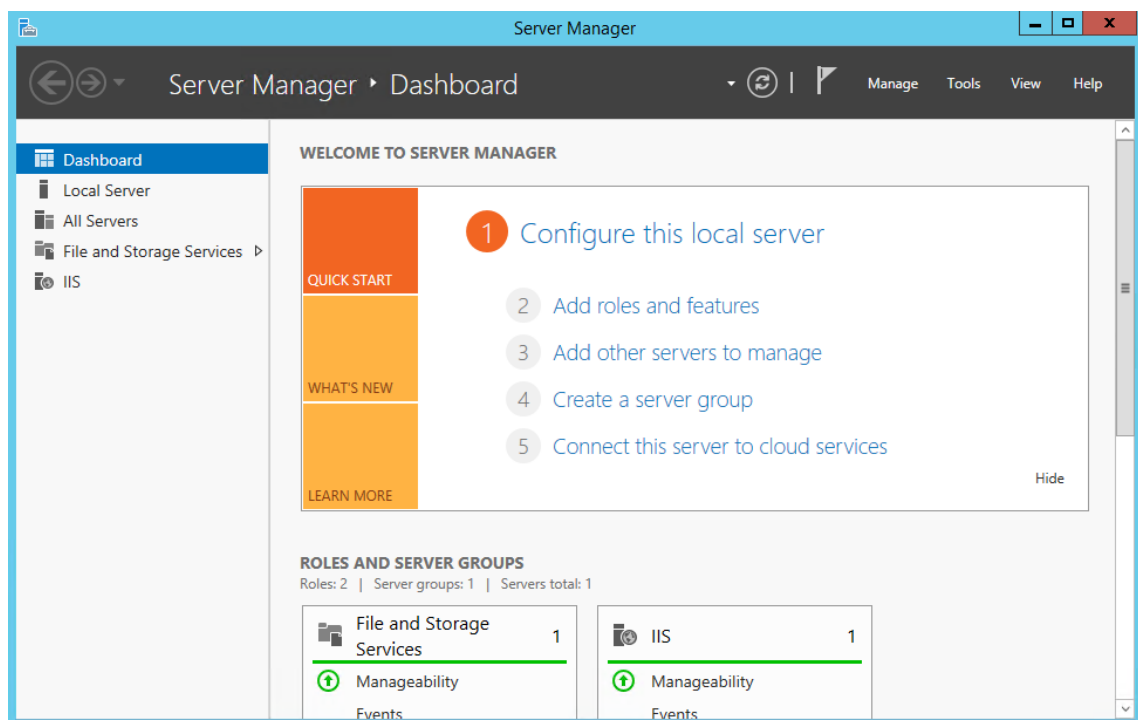


Fig. 2: Server Manager

3. Select the menu item *Local Server* in the structure view.

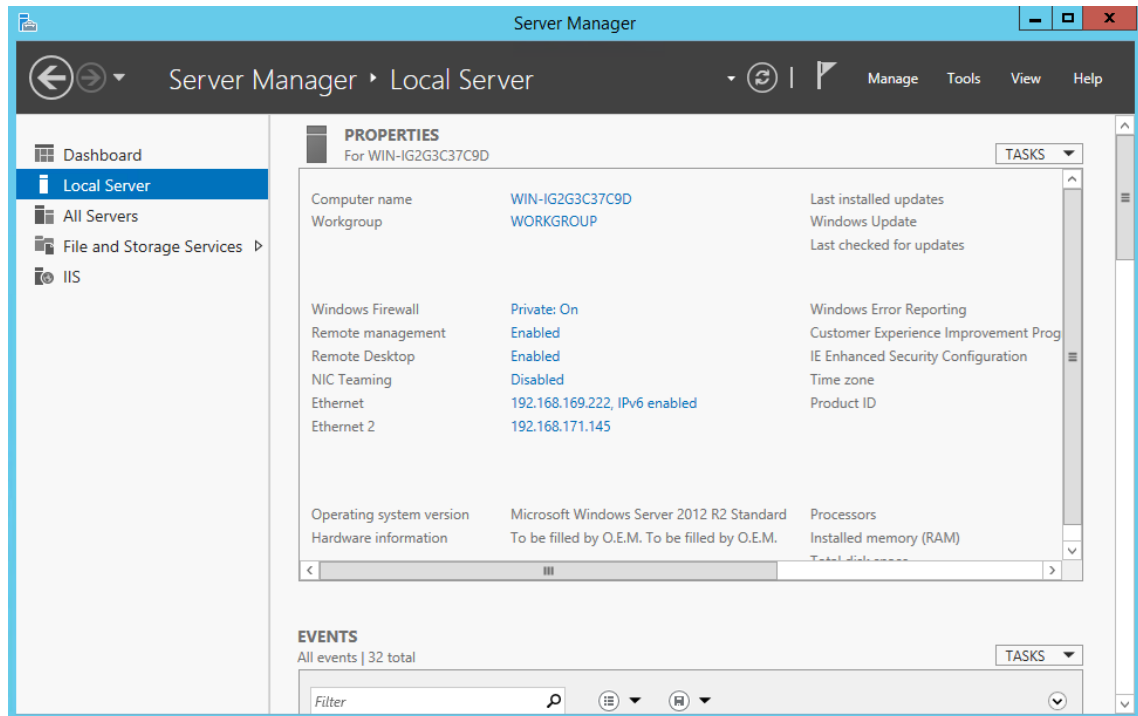


Fig. 3: Server Manager > Local Server

4. Click on *Disabled* for the entry *NIC Teaming*.
5. From the drop-down list *TASKS*, select the option *New Team*.

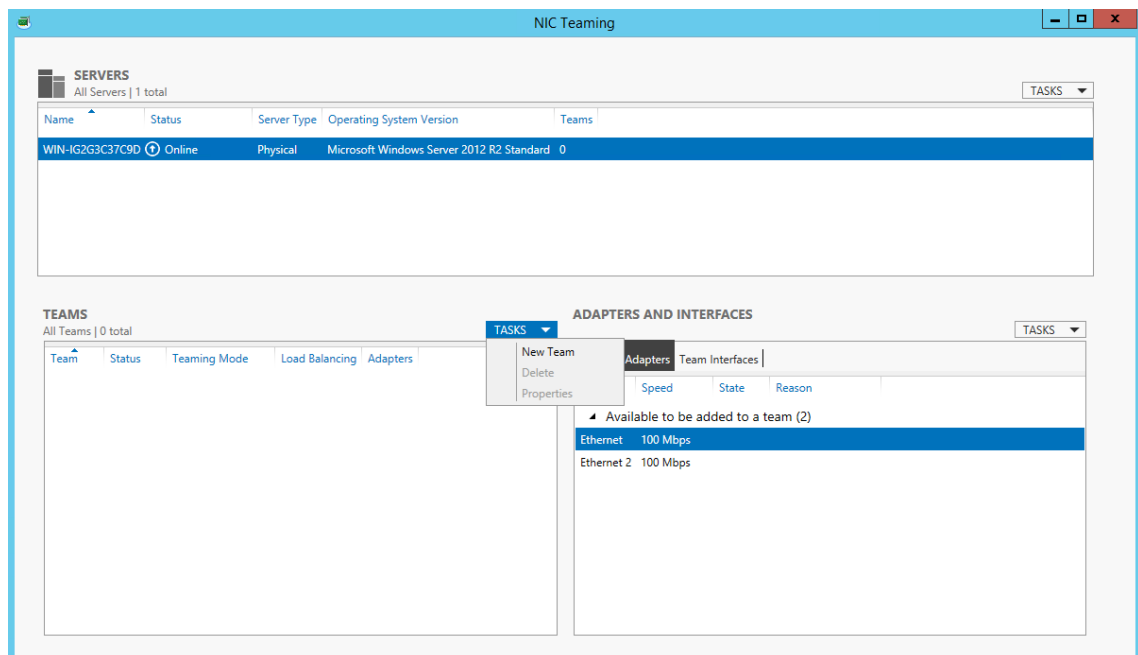


Fig. 4: NIC Teaming

6. To select 2 Ethernet interfaces as a team, activate the respective check boxes and click on the button *OK*.

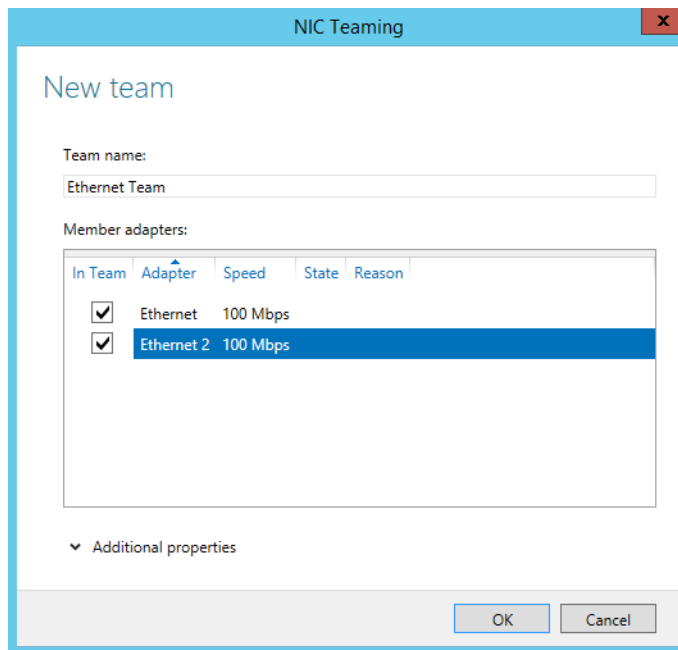


Fig. 5: NIC Teaming > New team

7. Click on *Additional properties*.
8. From the drop-down list *Teaming mode*, select the option *Switch Independent*.

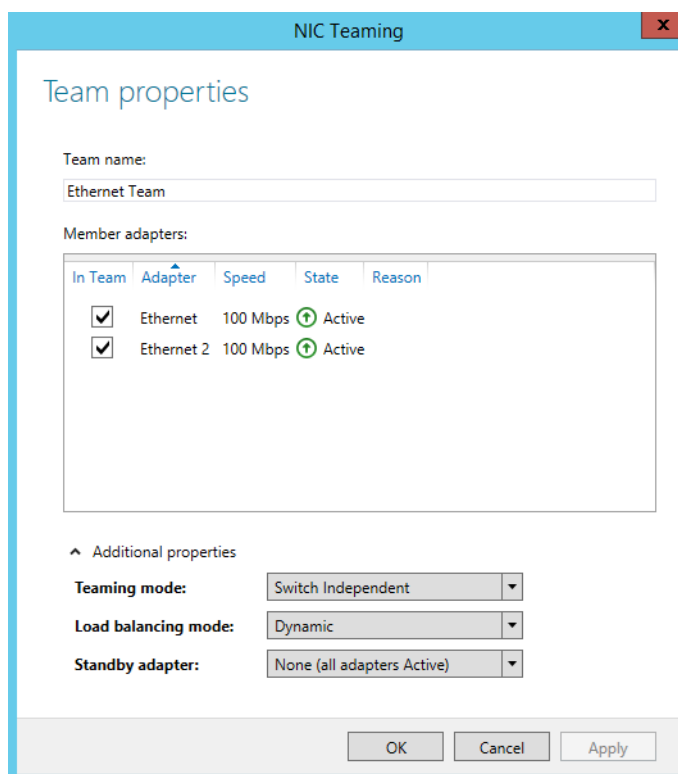


Fig. 6: NIC Teaming > Team properties

9. From the drop-down list *Load balancing mode*, select the option *Dynamic*.
10. From the drop-down list *Standby adapter*, select the option *None (all adapters Active)*.



The settings *Switch Independent*, *Dynamic* and *None (all adapters Active)* form a team independent from the switch. If one Ethernet connection fails, the recorder remains accessible via the second connection in the network.

Depending on the network architecture and the application, the settings can be adapted individual.

11. Click on the button *OK* to save the settings and to close the window.

12. The Ethernet Team has been created.

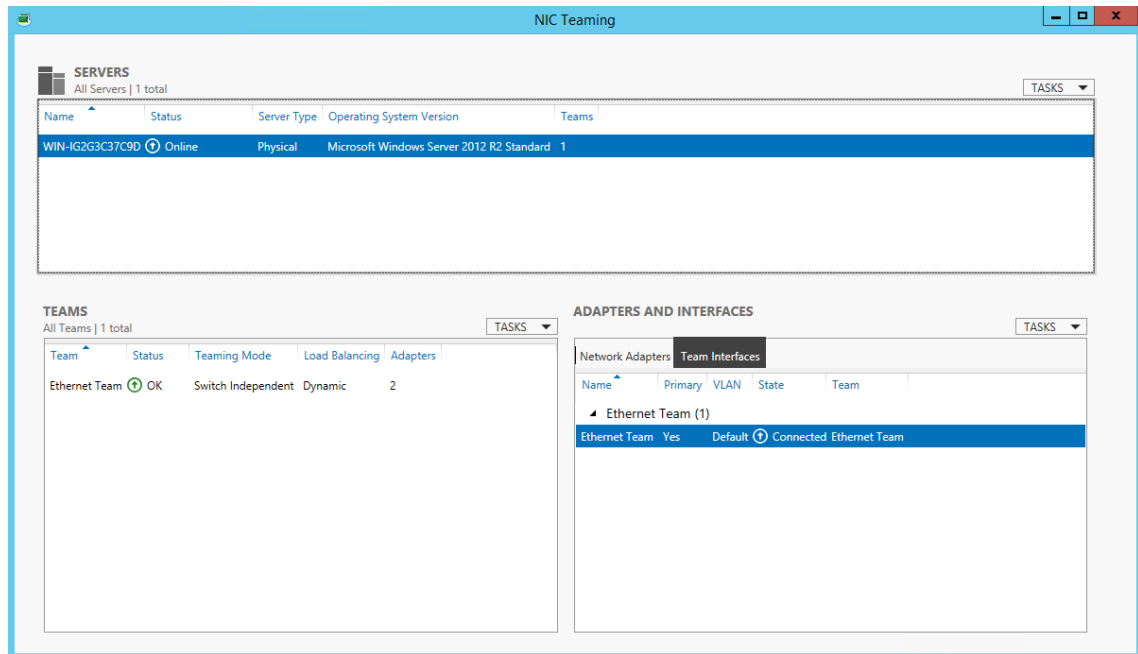


Fig. 7: Created NIC Teaming - Ethernet Team

Configure IP address of the Ethernet Team

1. In the window *Server Manager*, select the menu item *Local Server*.

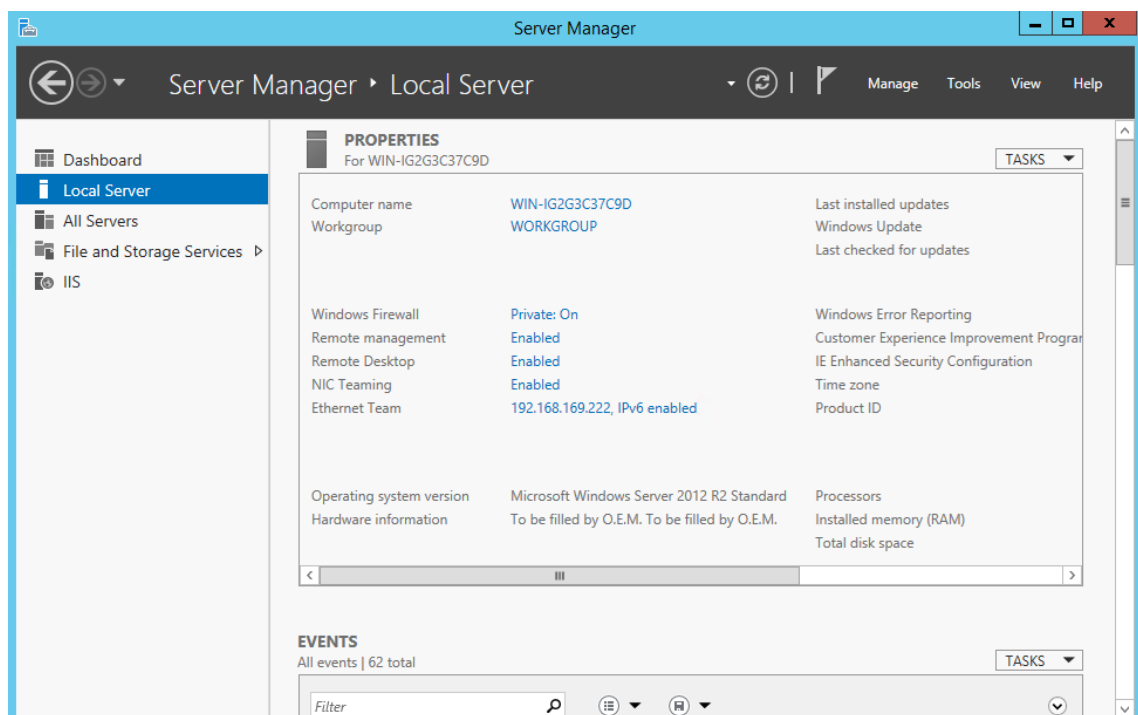


Fig. 8: Server Manager > Local Server

2. To configure the **IP address** of the Ethernet team, click on the displayed **IP** address next to *Ethernet Team* (e. g. *192.168.169.222, IPv6 enabled*).
3. Click on the respective Ethernet Team.
4. Open the context menu with a right-click.

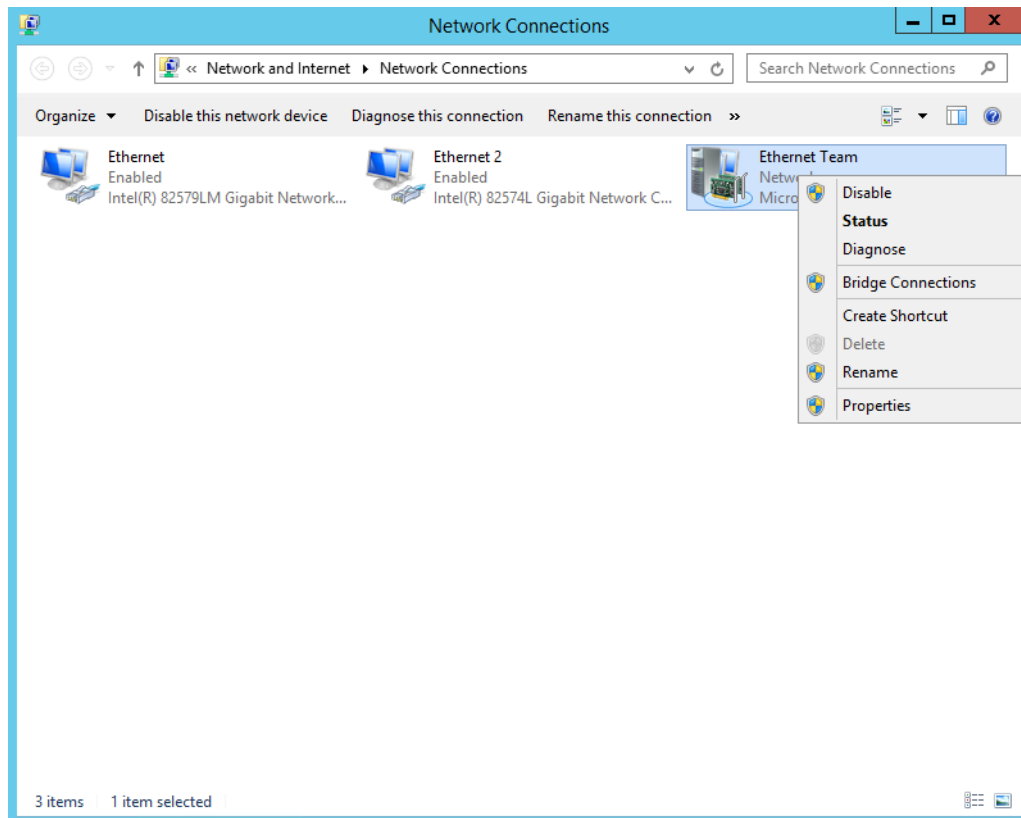


Fig. 9: Network Connections

5. Select the menu item *Properties*.
6. Click on *Internet Protocol Version 4 (TCP/IPv4)*.

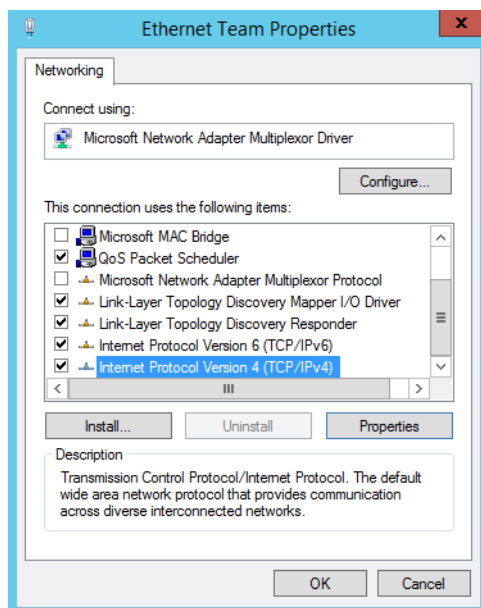


Fig. 10: Ethernet Team Properties

7. Click on the button *Properties*.
8. Select the option *Use the following IP address*.

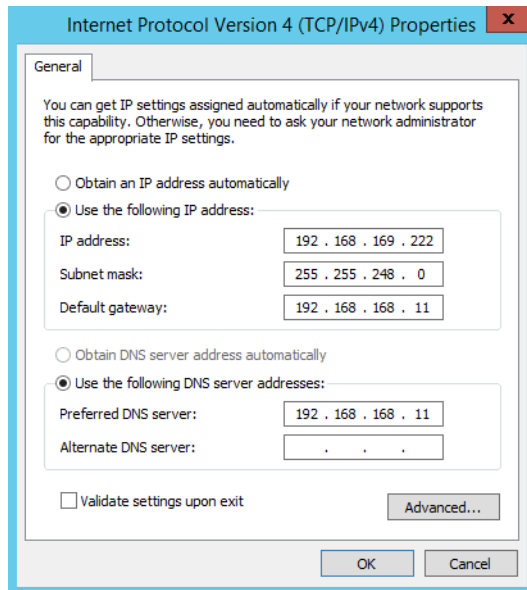


Fig. 11: Internet Protocol Version 4 (TCP IPv4) Properties

9. Enter the respective IP address in the entry field *IP address*.
10. Enter the respective IP address in the entry field *Subnet mask*.
11. Enter the respective IP address in the entry field *Default gateway*.
12. Select the option *Use the following DNS server addresses*.
13. Enter the respective IP address in the entry field *Preferred DNS server*.
14. Click on the button *OK* to save the settings and to close the window.
15. Click on the button *OK* to save the settings and to close the window.

4.2 Broadcom NICs (Microsoft Windows Server 2008 R2)

Download the appropriate Ethernet NIC NetXtreme server driver from the homepage mentioned in the following and install it.

http://www.broadcom.com/support/ethernet_nic/netxtreme_server.php

Open the Device Manager via *Start > Settings > Control Panel > System*. Select the tab *Hardware* and click on the button *Device Manager*.

Right-click on the network card you would like to install and select *Driver update*.

Select *Yes, this time only* and click on the button *Next*.



Fig. 12: Driver installation via Device Manager

Select the item *Install from a list or specific location (Advanced)* and click on the button *Next*.



Fig. 13: Selection of the source

Only select *Include this location in the search*, subsequently select the file path of the downloaded driver by clicking on the button *Browse* and then on the button *Next*.

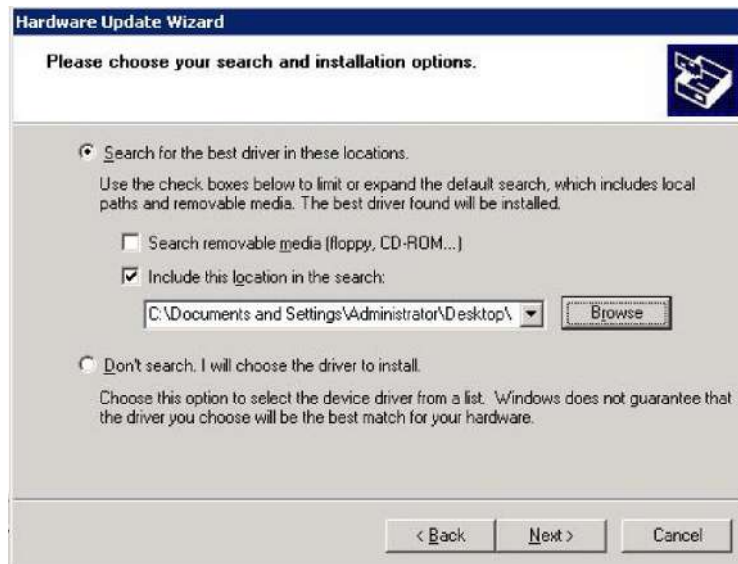


Fig. 14: Select the driver

Repeat the steps of point 1 for the second network card to enable teaming.

Download the program *Broadcom Advanced Control Suite (BACS)* from the homepage mentioned in the following and install it.

http://www.broadcom.com/support/ethernet_nic/netxtreme_server.php

Execute *Setup.exe* and confirm it by clicking on the button *Next*.



Fig. 15: Installation of BASC

In order to accept the license agreement, select *I accept the terms in the license agreement* and click on the button *Next*.

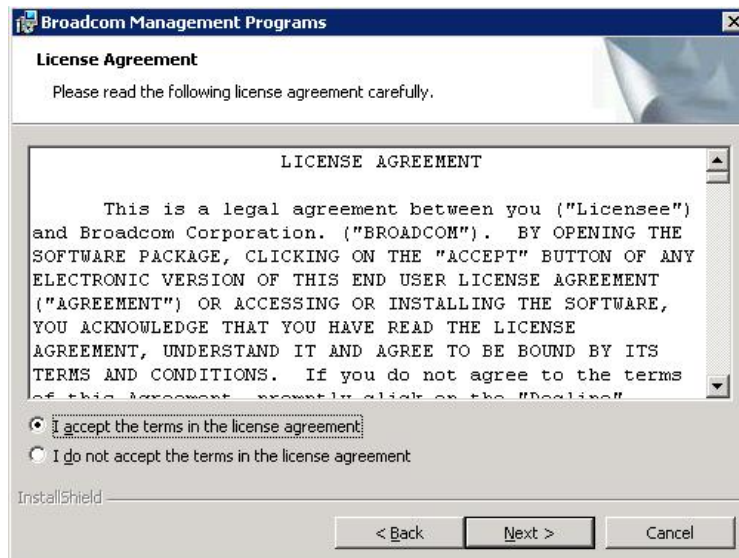


Fig. 16: Accept the license agreement

Apply the defaults and click on the button *Next*.

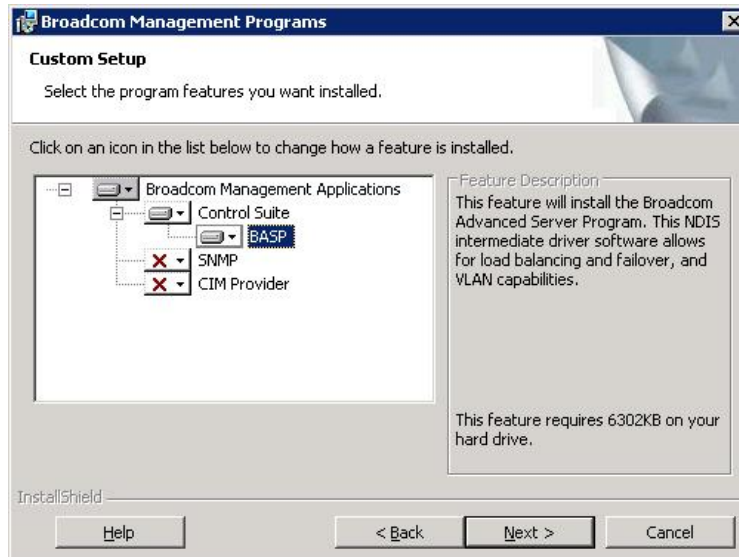


Fig. 17: Select program content

Start the installation by clicking on the button *Install*.

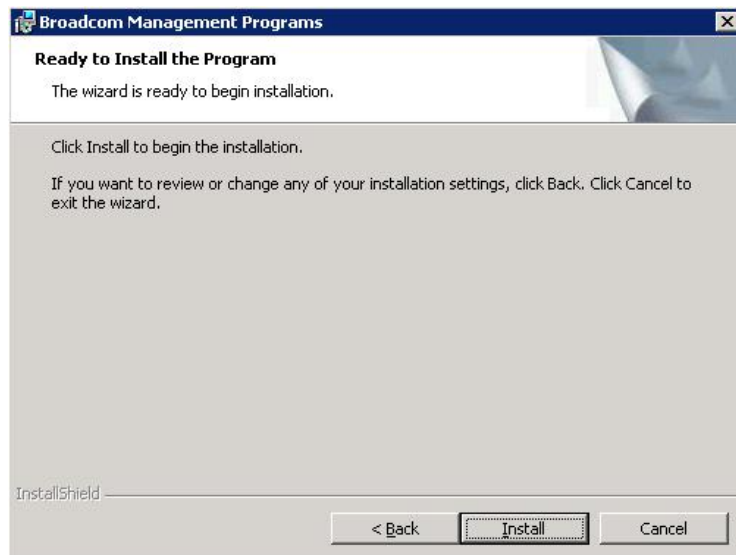


Fig. 18: Confirm installation

BASC has now been installed successfully. Click on the button OK.

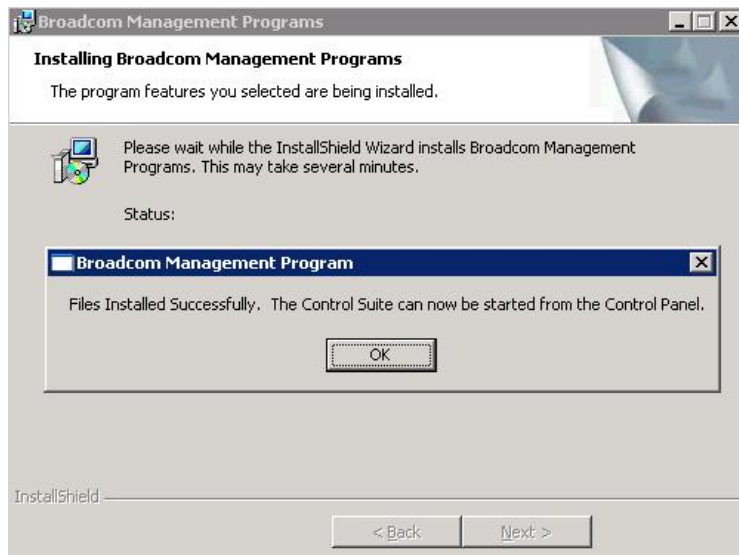


Fig. 19: Finish the installation

Start the Broadcom Advanced Control Suite (BACS).

Upon clicking on the button *TeamManagement*, the directory tree with a list of teams and NICs opens.

To create a new team, right-click on *Teams* and on *Create a Team* in the directory tree.

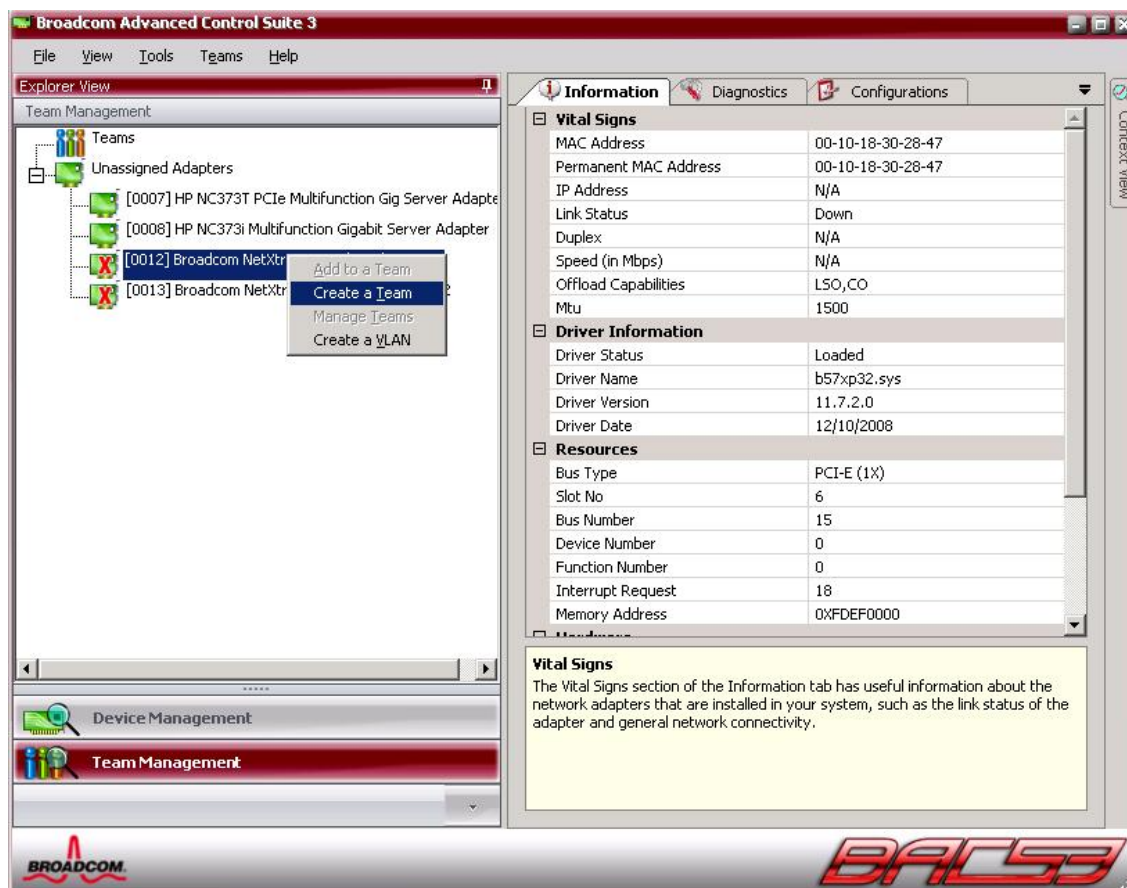


Fig. 20: Create a new team

Click on the button *Next*.

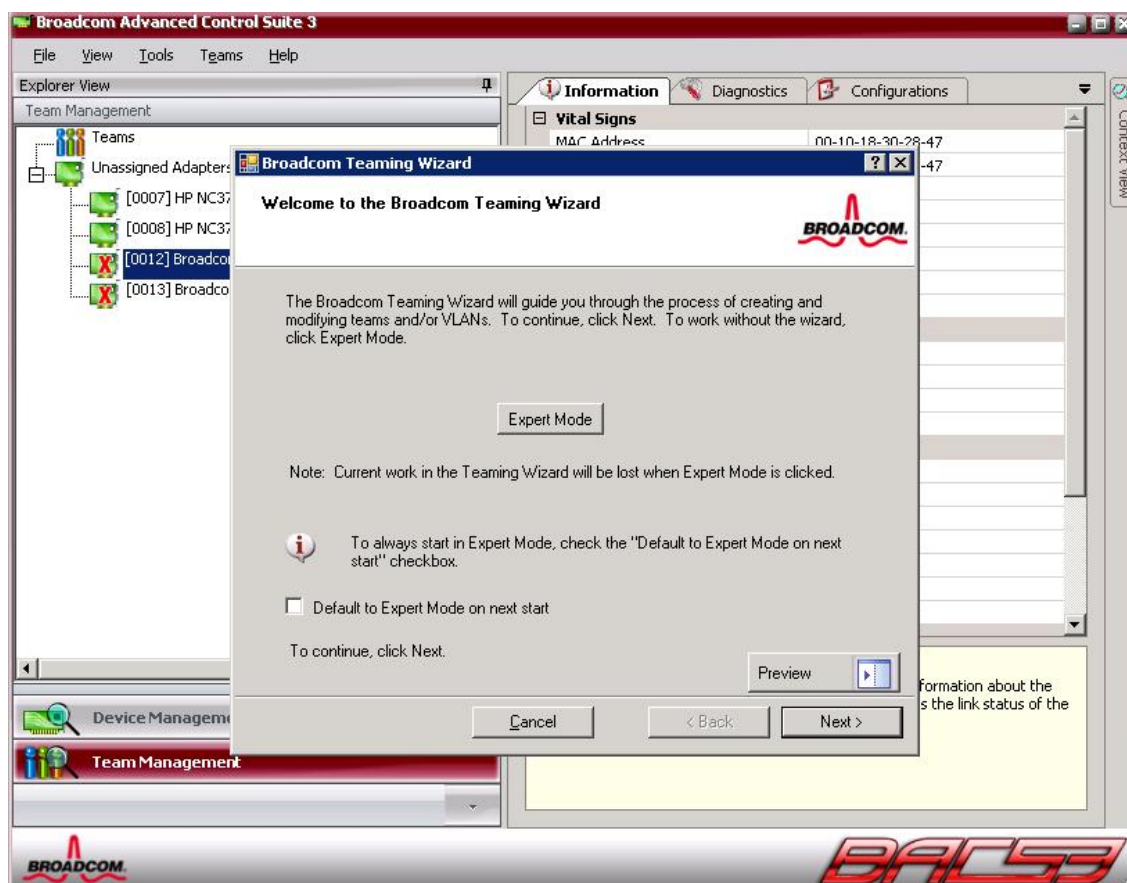


Fig. 21: Configure a team

Enter a name for the team and click on the button *Next*.

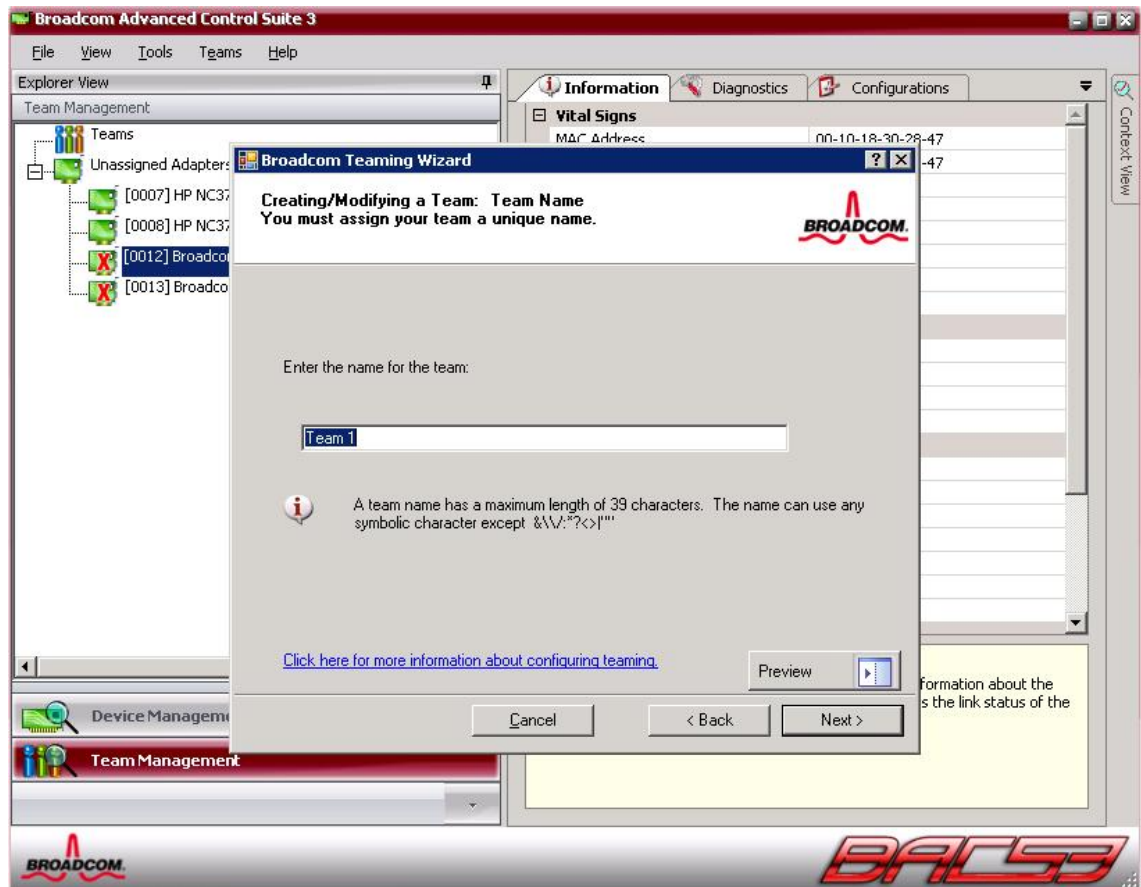


Fig. 22: Name a team

Select *802.3ad Link Aggregation using Link Aggregation Control Protocol (LACP)* and click on the button *Next*.

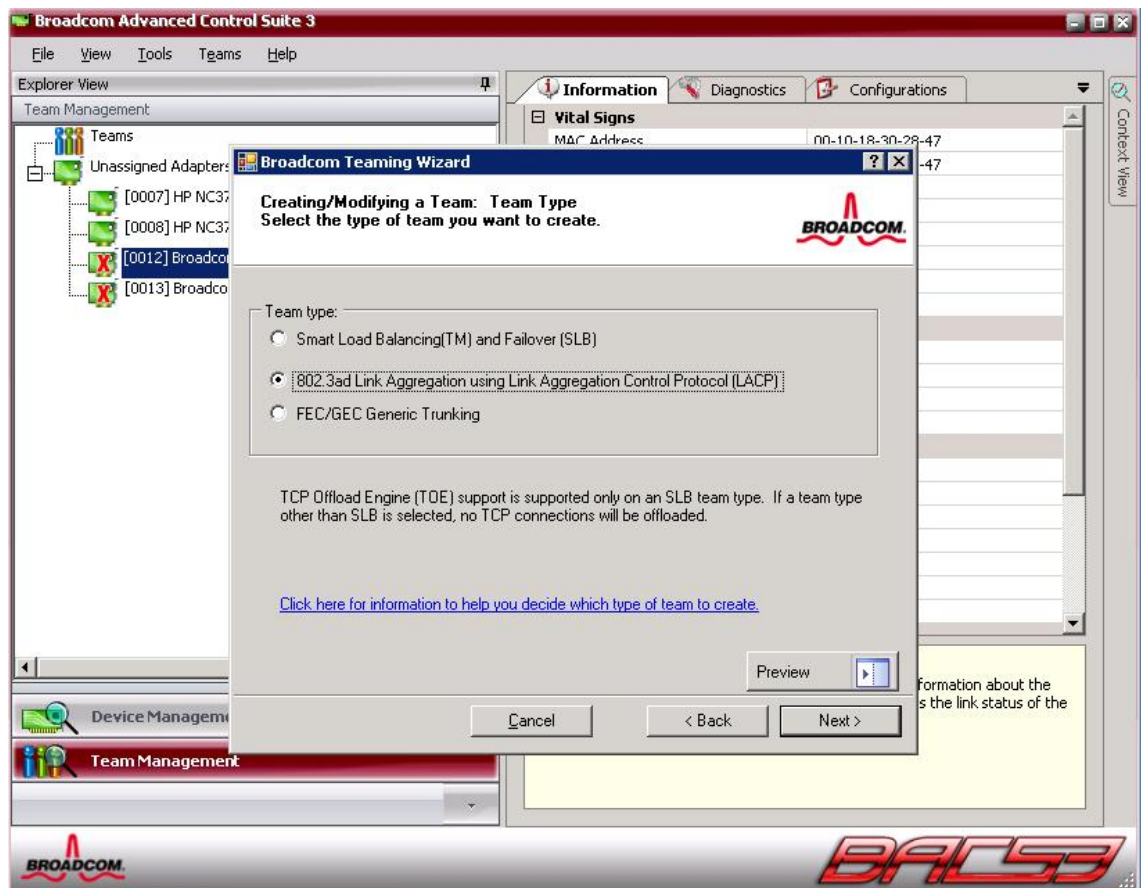


Fig. 23: Select the team mode

Consecutively mark the Broadcom NICs and add them to the team by clicking on the button *Add*. Confirm your selection by clicking on the button *Next*.

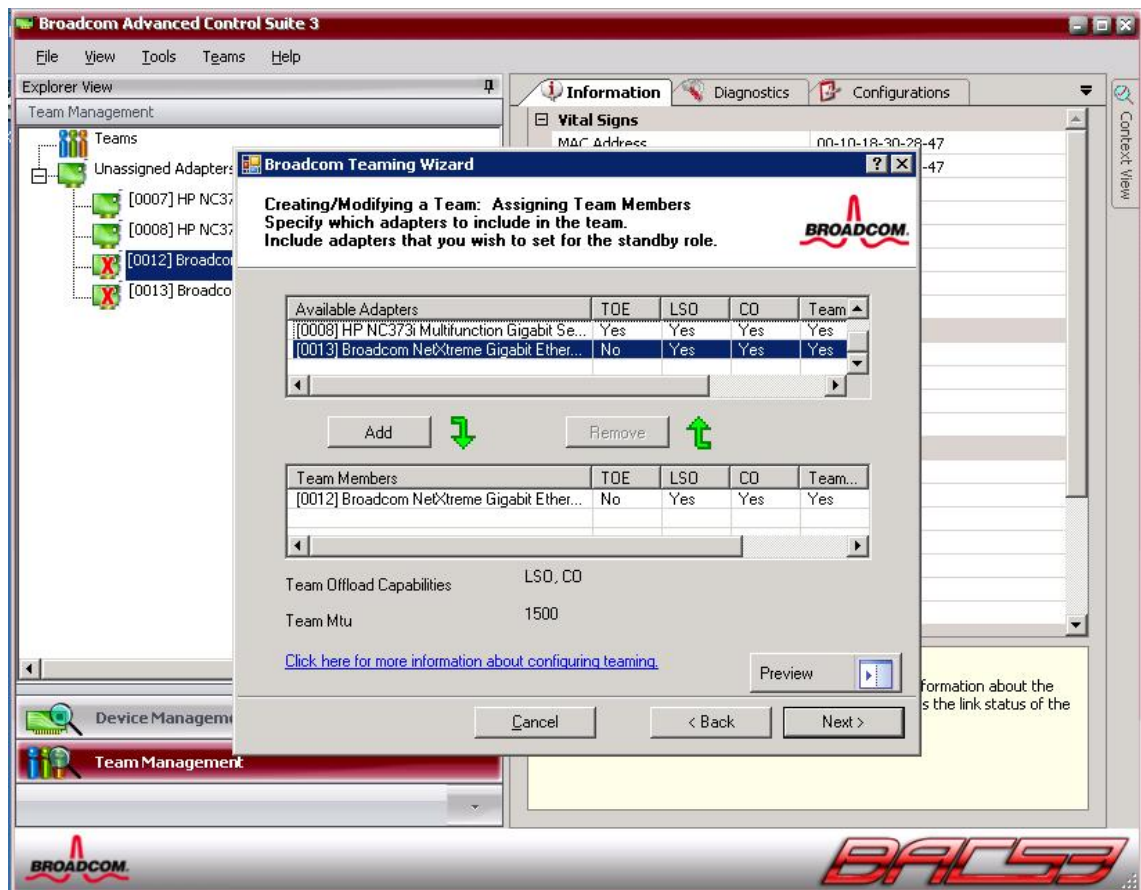


Fig. 24: Selection of the NICs

In the next window, select *Skip manage VLAN* and click on the button *Next*.

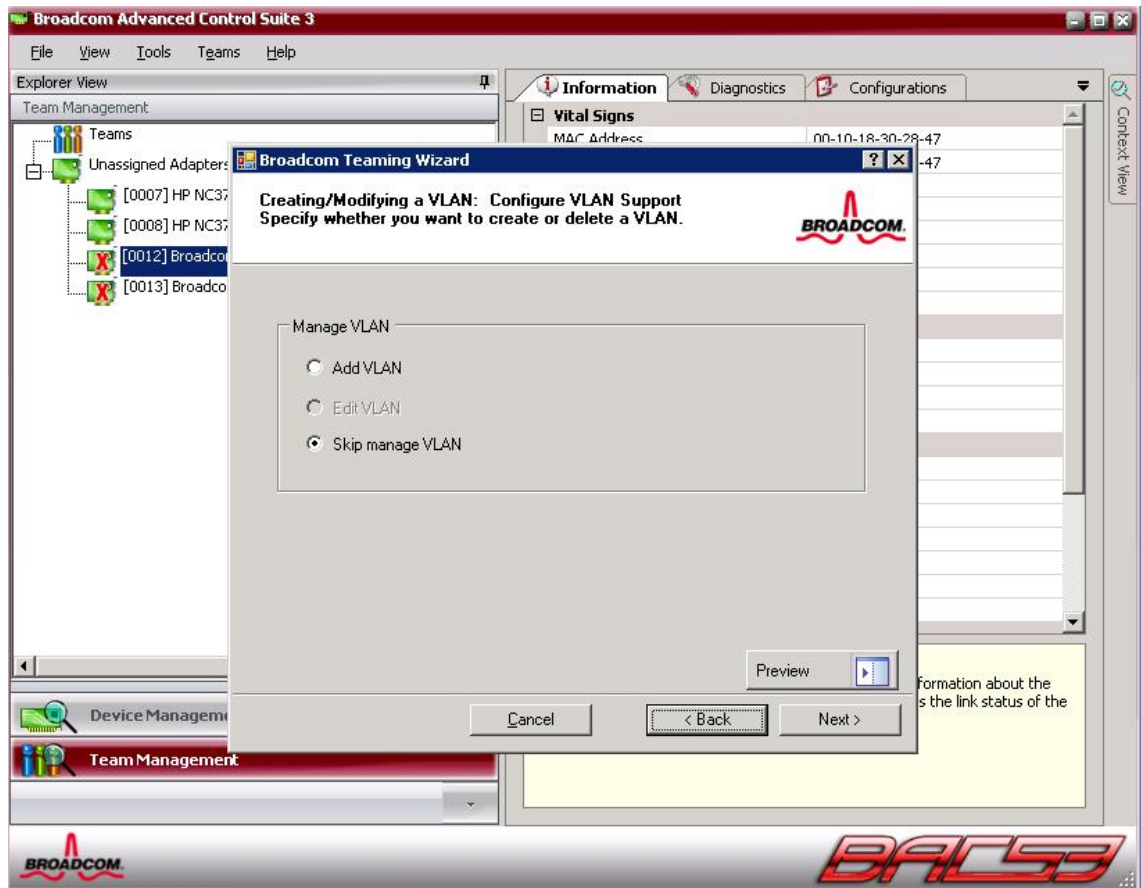


Fig. 25: Configure VLAN

Select *Commit changes to system and Exit the wizard* and click on the button *Finish*.

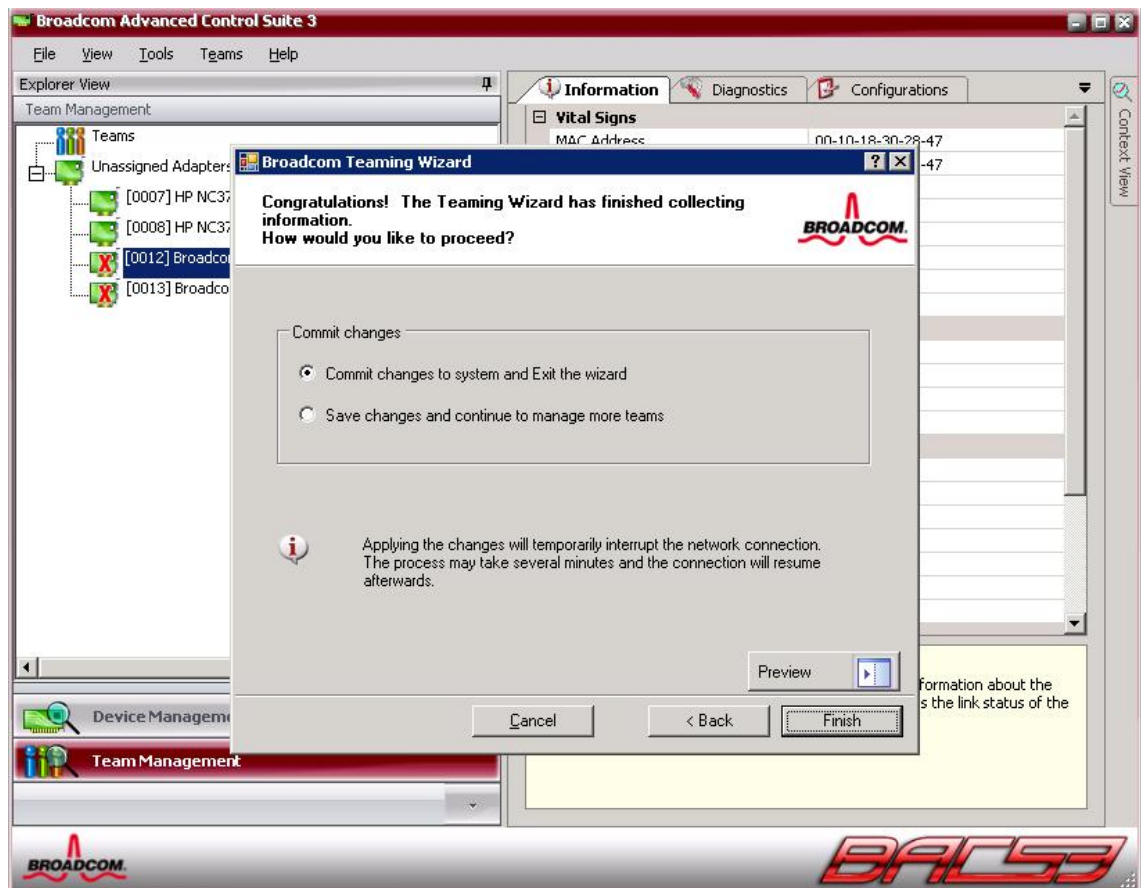


Fig. 26: Finish the configuration

Reboot the computer to apply the settings.

4.3 Intel NICs (Microsoft Windows Server 2008 R2)

Download the appropriate Intel® PRO/1000 XF server adapter driver from the homepage mentioned in the following and install it.

http://downloadcenter.intel.com/Product_Filter.aspx?ProductID=840&lang=eng

After starting the driver installation, click on the button *Next*.



Fig. 27: Start screen of the installation of the driver

In order to accept the license agreement, select *I accept the terms in the license agreement* and click on the button *Next*.

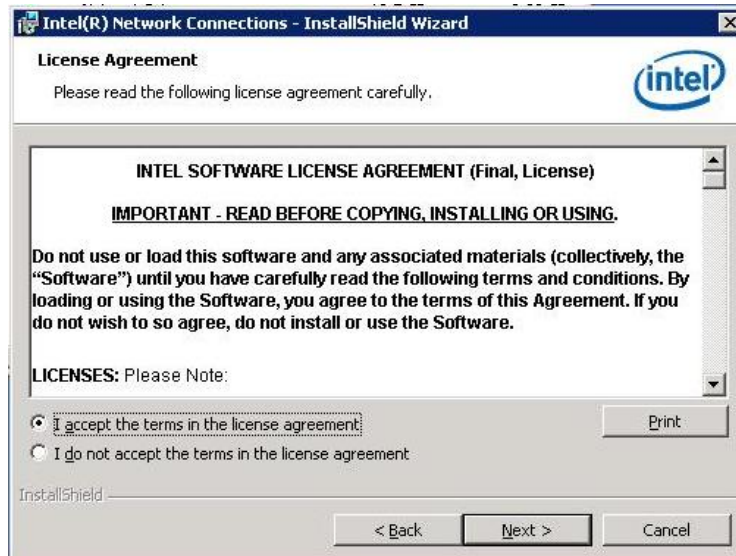


Fig. 28: Accept the license agreement

Apply the preselection of the program modules by clicking on the button *Next*.

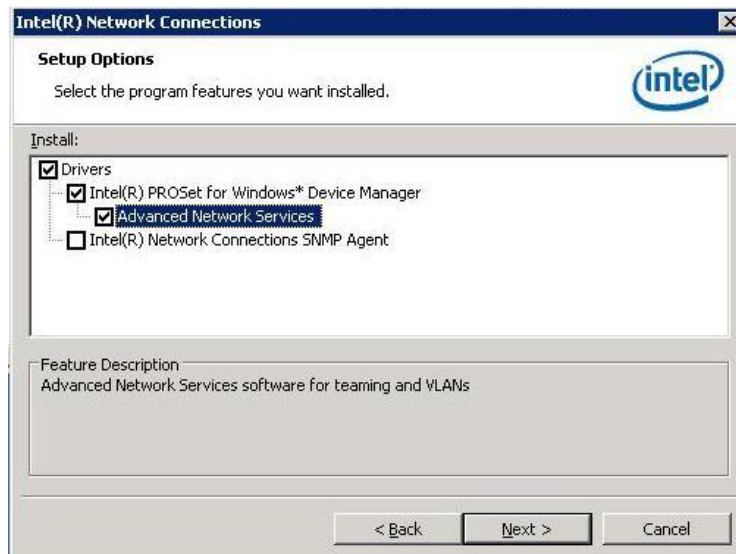


Fig. 29: Select the program modules

Start the installation by clicking on the button *Install*.

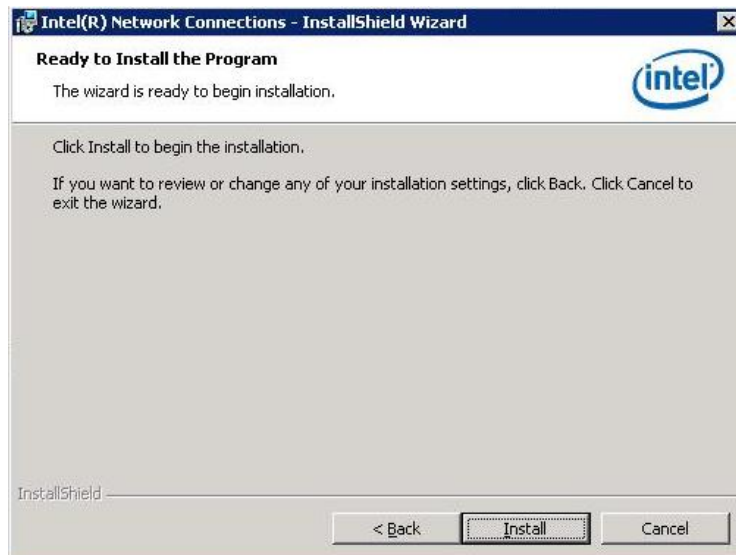


Fig. 30: Start the installation

Once the installation has been concluded, click on the button *Finish* and restart your computer.

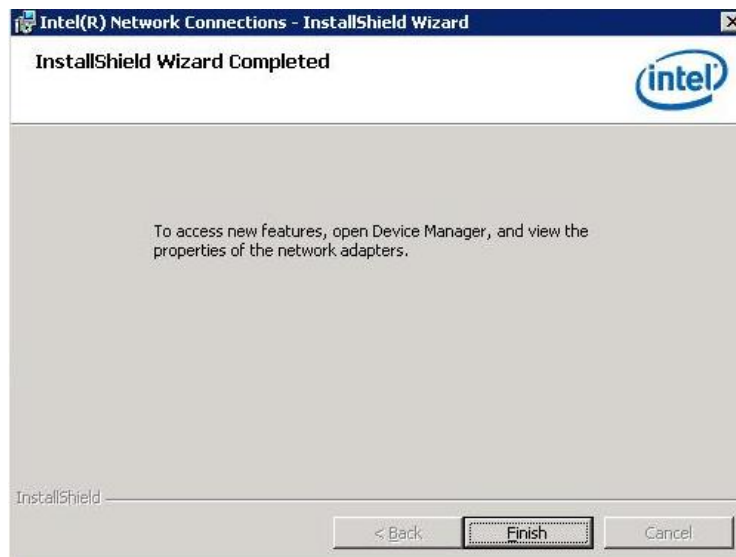


Fig. 31: Finalize the installation

Open the system settings via *Start > Settings > Control Panel > System*.

Select the tab *Hardware* and click on the button *Device Manager*.

Expand the directory tree of the Device Manager in the area *Network adapters* by clicking on +.

Right-click on the Intel PRO/1000 server adapter NIC and select the item *Properties*.

In the new window, select the tab *Teaming* and click on the button *New Team*.

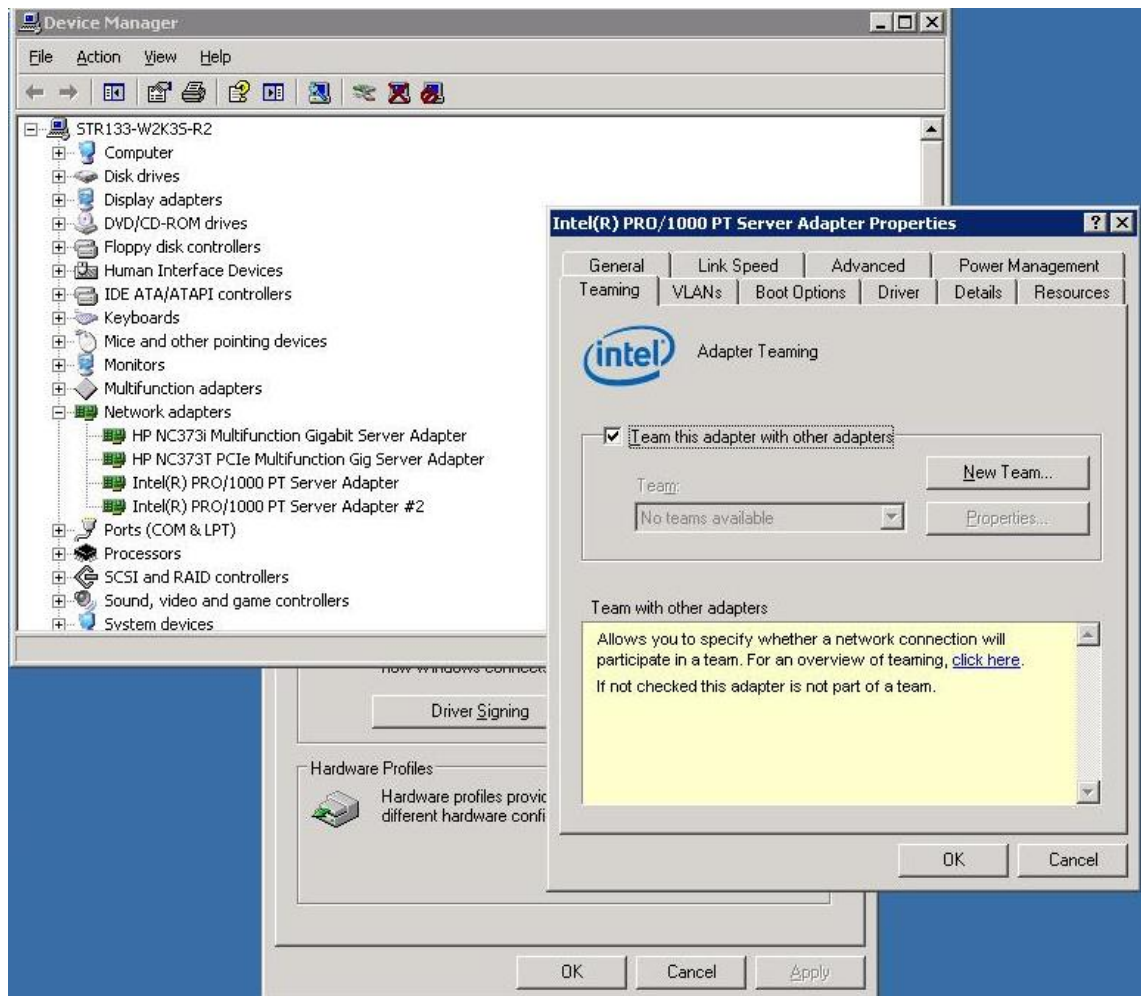


Fig. 32: Create a new teaming connection

Enter a name for the teaming connection and confirm it by clicking on the button *Next*.

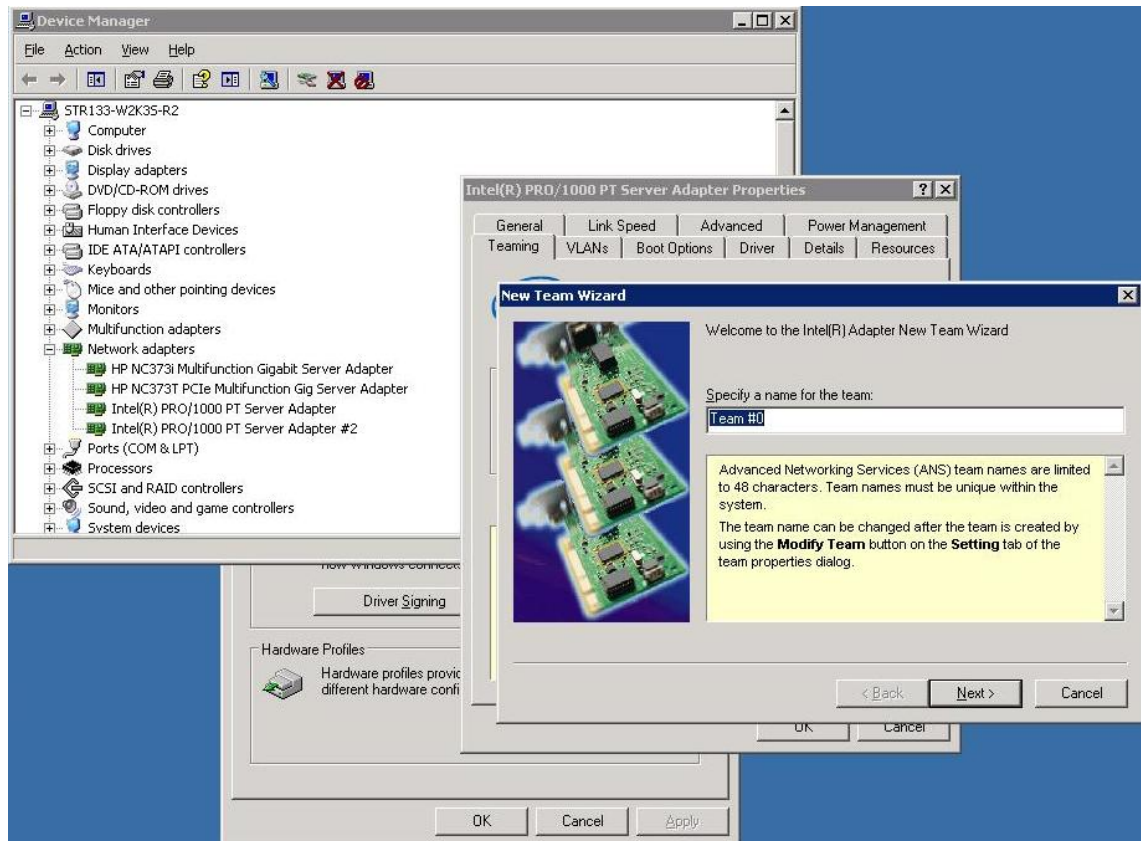


Fig. 33: Create a new teaming connection

Now select your NICs and click on the button *Next*.

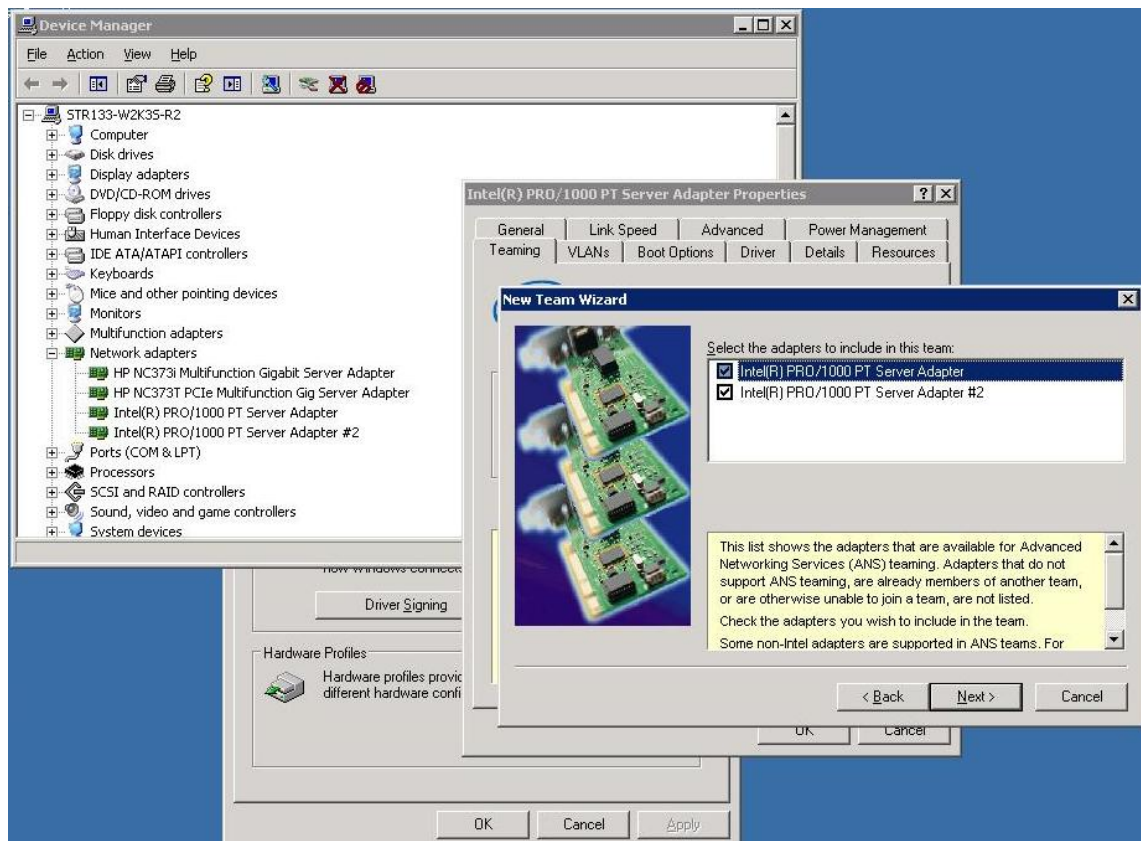


Fig. 34: Select the NICs

Select *IEEE 802.3ad Dynamic Link Aggregation* and click on the button *Next*.

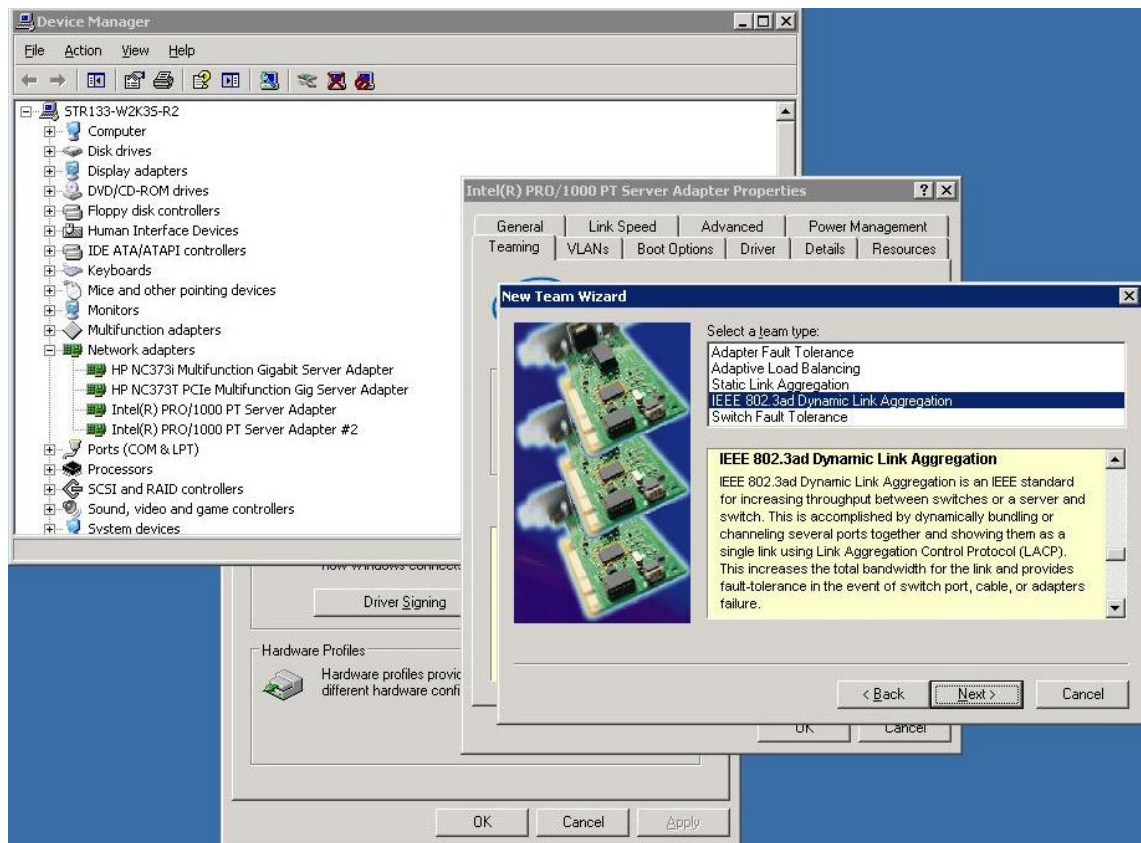


Fig. 35: Select a team

Once the configuration has been concluded, click on the button *Finish* and restart your computer.

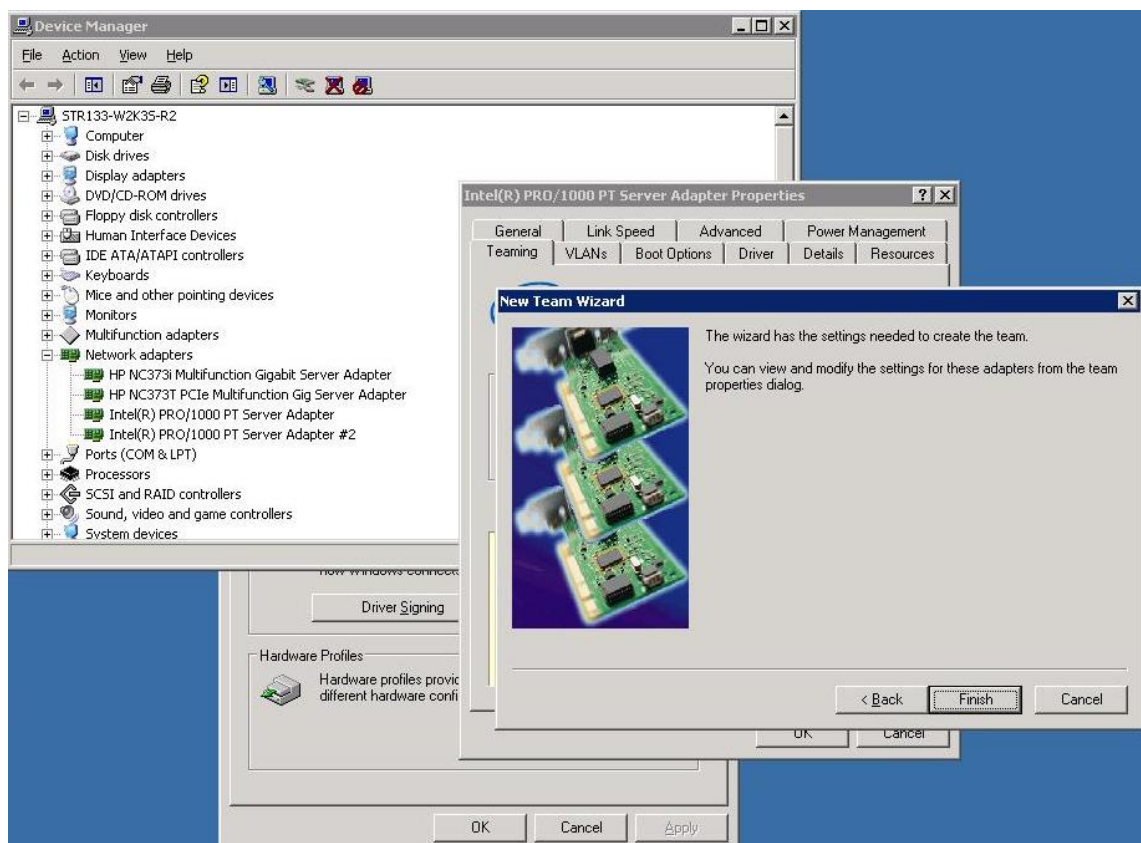


Fig. 36: Finalize the configuration

To apply the modifications (link aggregation), you have to restart your computer.

Configuration switches Cisco Catalyst 2960

Access to Cisco Catalyst 2960 via Cisco Network Assistant.

After successfully logging in, you have to configure the ports. You can find the required settings under *Configure > Ports > Etherchannels*.

Click on the button *Create*.

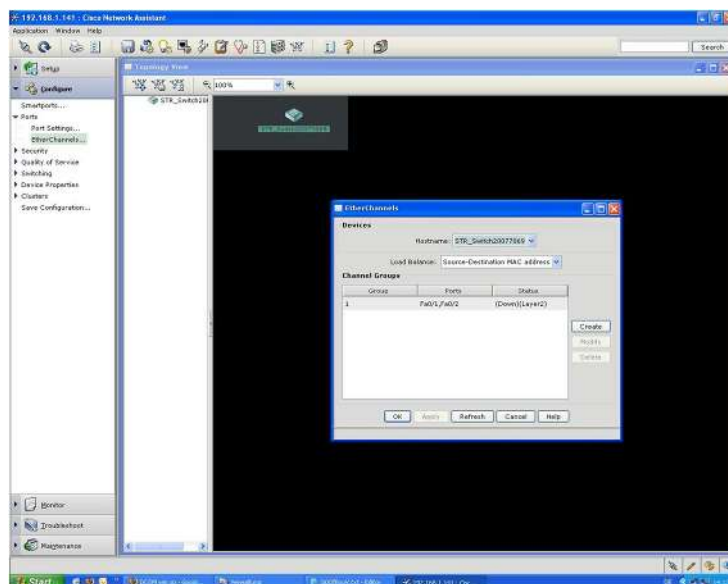


Fig. 37: Configure the ports

Select the used local ports by activating the check box in the column *In Group*.

Click on the column *Mode* of the selected used local ports and select *LACP*.

Click on the button *OK*.

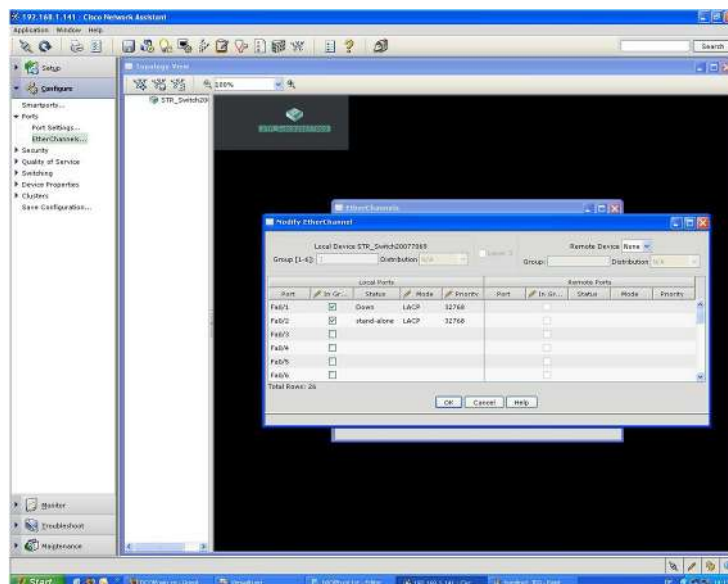


Fig. 38: Configure the ports

Configure FAST-PORT

Click on *Ports > Port Settings* in the structure view.

In the dialog window *Port Settings*, select the used local ports and click on the button *Modify*.

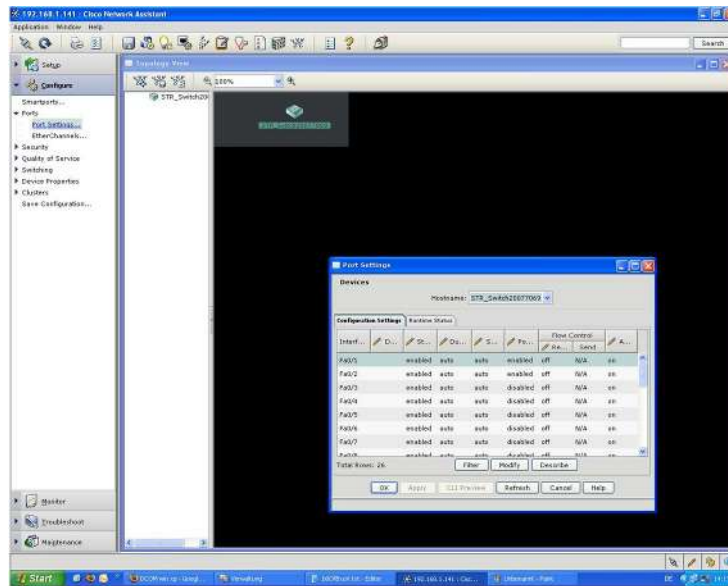


Fig. 39: Select the ports for the modification of the settings

Adjust the setting *Port Fast*: to *enable* and close the dialog window by clicking on the button OK.

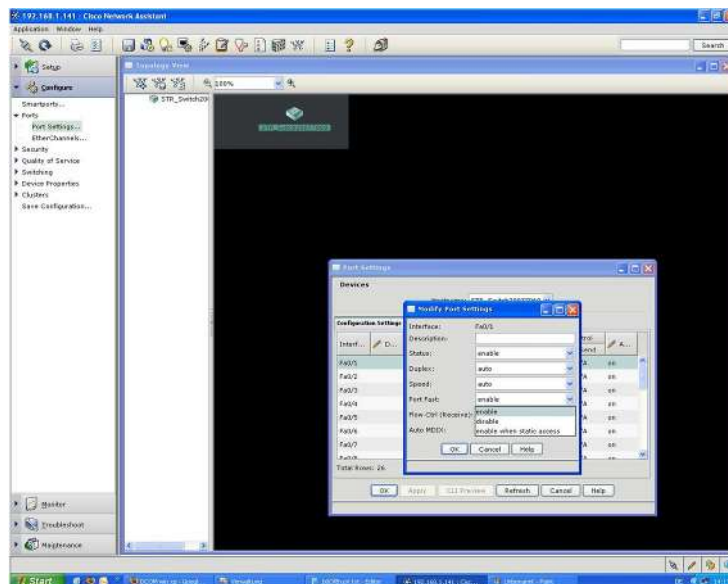


Fig. 40: Modify the setting Port Fast enable

6

QoS (Quality of Service)

QoS (Quality of Service) monitors network bandwidth and serves to prioritize data packets for safe transmission.

Configure QoS

1. Press the Windows key.
2. Open the window *Network and Sharing Center* (network connection) via *Control Panel > Network and Internet > Network and Sharing Center*.
3. Click on the connection.

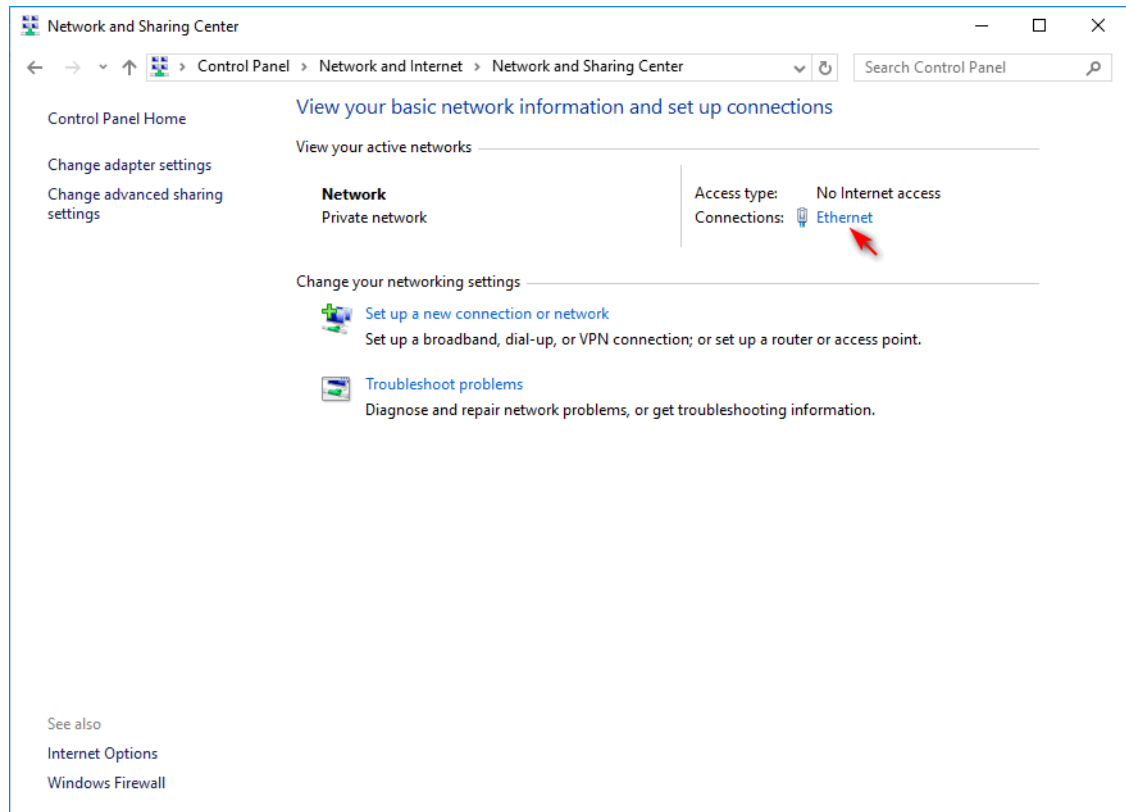


Fig. 41: Network and Sharing Center

4. Click on the button *Properties*.

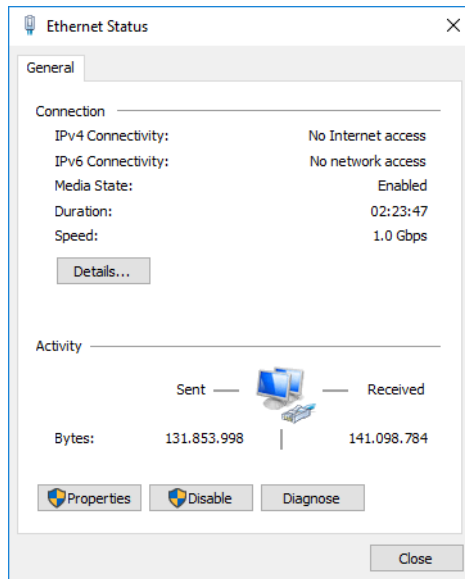


Fig. 42: Ethernet Status

5. Activate the option *QoS Packet Scheduler*.

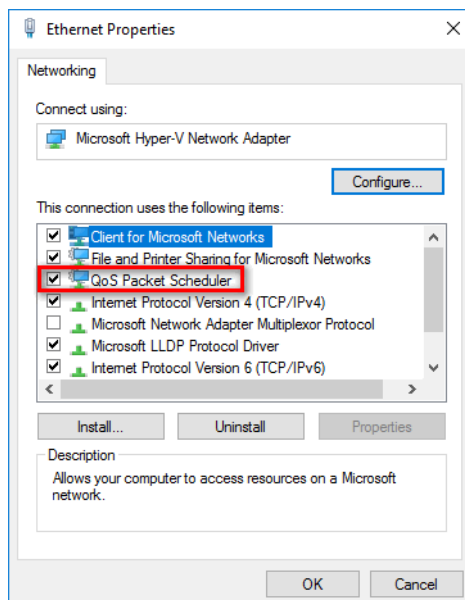


Fig. 43: Properties of Ethernet

6. Click on the button *OK* to close the window *Properties of Ethernet*.
7. Click on the button *Close* to close the window *Ethernet Status*.
8. If there are further connections, configure them as described above (click on connection *Properties* > activate option *QoS Packet Scheduler* > *OK* > *Close*)

Create policy for QoS

1. Press the Windows key.
2. Enter *gpedit.msc*.
3. In the list of search results above, right-click on *gpedit.msc*.
 - ⇒ A context menu appears.
4. Click on *Run as administrator* in the context menu.
 - ⇒ The window *Local Group Policy Editor* opens.
5. Change to the path *Computer Configuration* > *Windows Settings* > *Policy-based QoS*.

6. Right-click on *Policy-based QoS*.

⇒ A context menu appears.

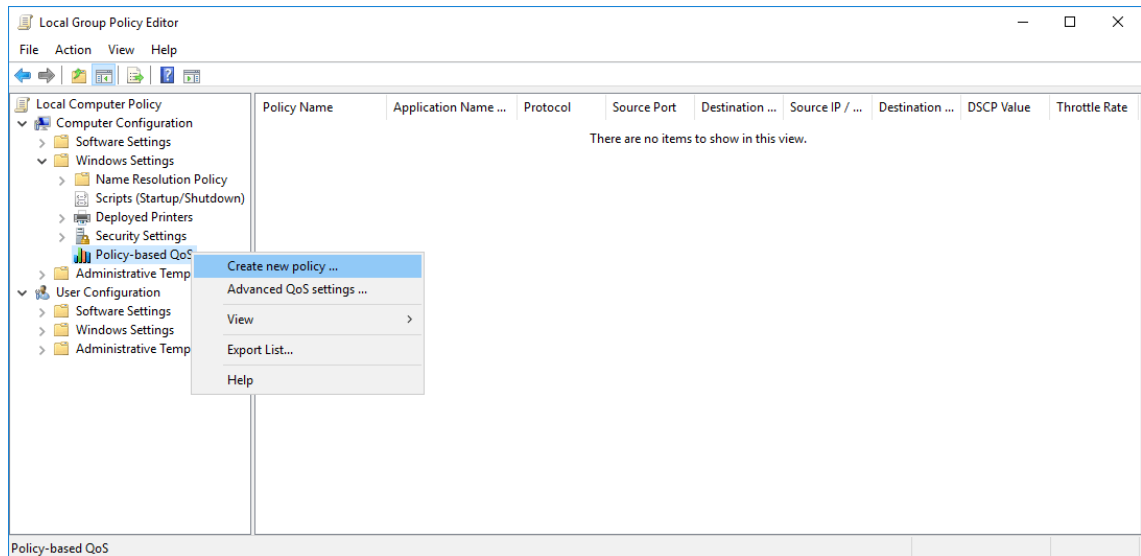


Fig. 44: Local Group Policy Editor

7. Click on the context menu *Create new policy*.

⇒ The window *Policy-based QoS* opens.

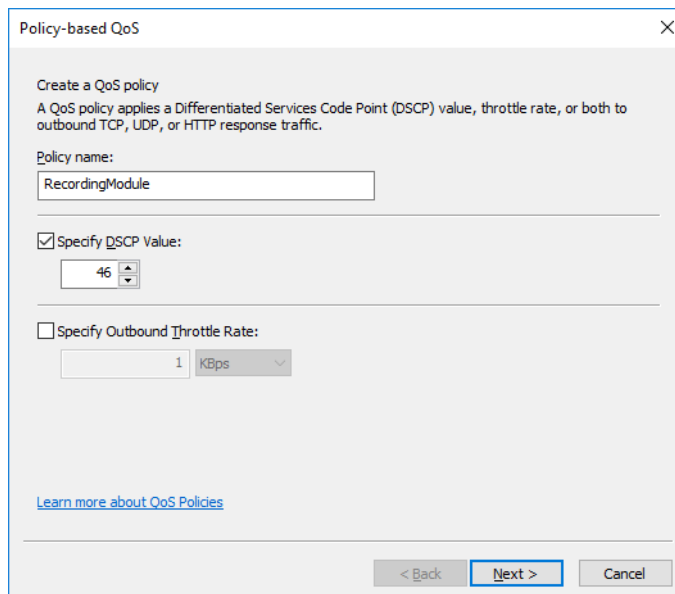


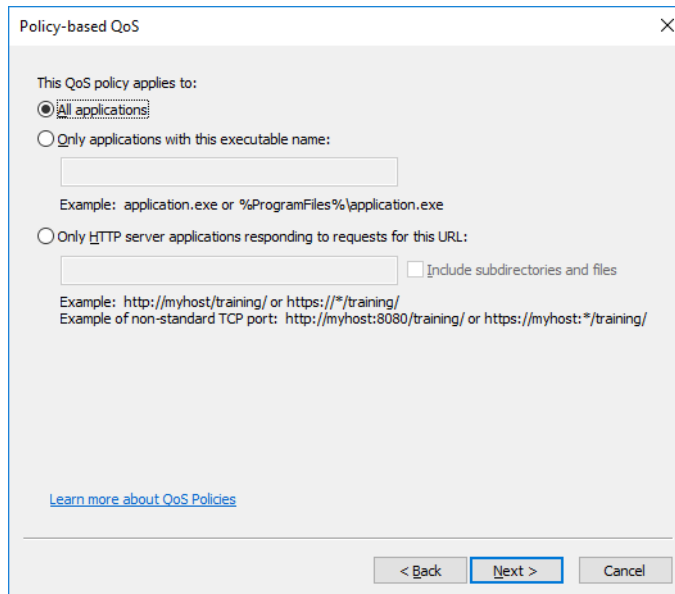
Fig. 45: Policy-based QoS

8. In the entry field *Policy name*, enter the name *RecordingModule*.

9. In the entry field *Specify DSCP Value* enter the value 46.

10. Click on the button *Next*.

11. Click on the button *Next*.



Policy-based QoS

This QoS policy applies to:

☒ All applications

☐ Only applications with this executable name:

Example: application.exe or %ProgramFiles%\application.exe

☐ Only HTTP server applications responding to requests for this URL:

Example: http://myhost/training/ or https://*/training/
 Example of non-standard TCP port: http://myhost:8080/training/ or https://myhost:*/training/

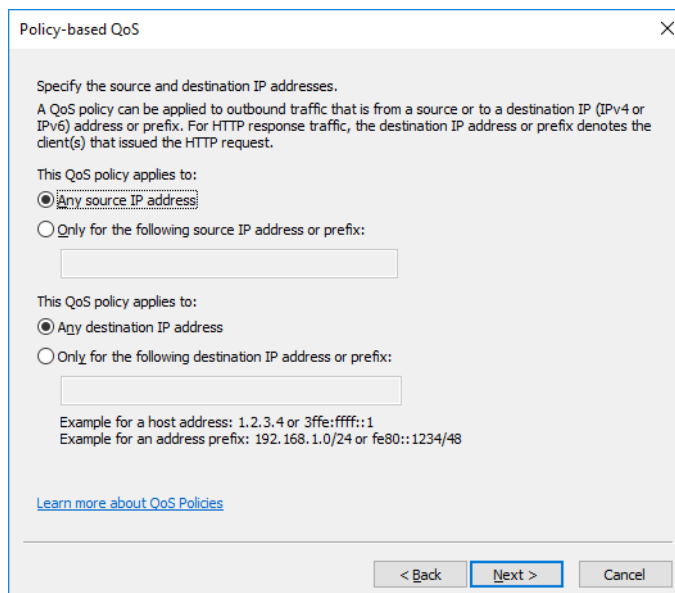
☐ Include subdirectories and files

[Learn more about QoS Policies](#)

< Back Next > Cancel

Fig. 46: Policy-based QoS

12. Click on the button *Next*.



Policy-based QoS

Specify the source and destination IP addresses.

A QoS policy can be applied to outbound traffic that is from a source or to a destination IP (IPv4 or IPv6) address or prefix. For HTTP response traffic, the destination IP address or prefix denotes the client(s) that issued the HTTP request.

This QoS policy applies to:

☒ Any source IP address

☐ Only for the following source IP address or prefix:

This QoS policy applies to:

☒ Any destination IP address

☐ Only for the following destination IP address or prefix:

Example for a host address: 1.2.3.4 or 3ffe:ffff::1
 Example for an address prefix: 192.168.1.0/24 or fe80::1234/48

[Learn more about QoS Policies](#)

< Back Next > Cancel

Fig. 47: Policy-based QoS

13. In the drop-down list *Select the protocol this QoS policy applies to*, select the entry *TCP and UDP*.

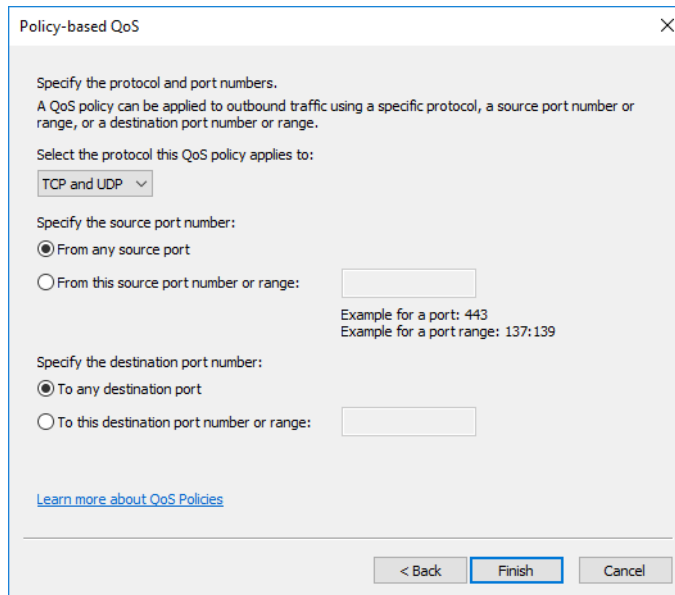


Fig. 48: Policy-based QoS

14. Click on the button *Finish*.

Check

1. Press the Windows key.
2. Enter *regedit.exe* and press the [Enter] key.
 - ⇒ The window *Registry Editor* opens.
3. Change to the path *Computer > HKEY_LOCAL_MACHINE > SOFTWARE > Policies > Microsoft > Windows > QoS > RecordingModule*.
 - ⇒ In the main view, the value *46* is displayed for *DSCP Value*.

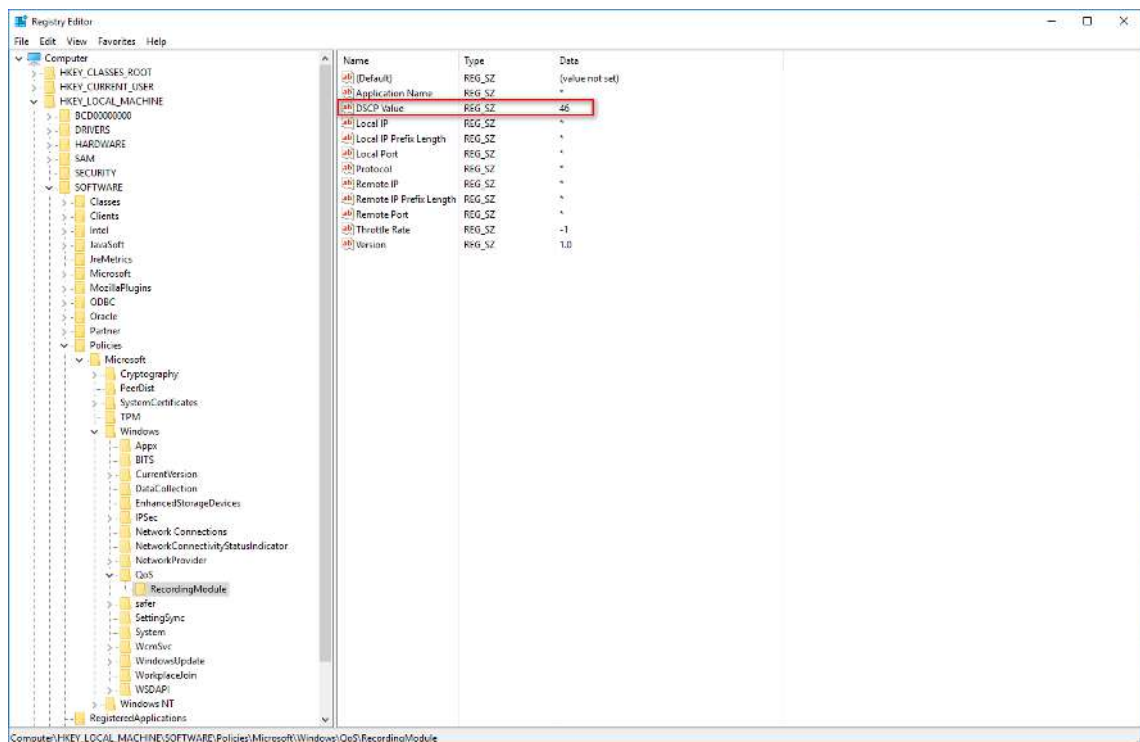


Fig. 49: Registry Editor

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Glossary

BACS

Broadcom Advanced Control Suite is an integrated service program providing information about the installed network adapters. BACS enables you to run in-detail tests, diagnoses, and analyses, to display and change property values, and to view the data traffic statistics of the separate adapters. (Source: Wikipedia 4th April 2017)

IP

Internet Protocol, basic protocol for Internet communication