NOKIA

Q1 Agent C2.1 User Manual

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Contents

1 About this manual

This manual instructs how to install and operate Q1 Agent C2.1. For operating Q1 Agent it is assumed that the user belongs to the Q1 Agent Admin group.

Once installed, Q1 Agent can be used as a Q1 mediator: Q1 Agent collects fault management information from Q1 polling devices, such as DCN Adapter C3.0 and C4.0 and Nokia AXC, and delivers this information to an upper-level management system, such as Nokia NetAct, for further network monitoring.

1.1 Summary of changes

Changes in Q1 Agent C2.1

Q1 Agent C2.1 contains the following new functionality:

- Network Test (NWT)
- Automatic Backup
- Editing PM Jobs.

1.2 Where to find more information

DCN Adapter C4.0

For information on DCN Adapter C4.0, refer to the following documents:

- *DCN Adapter C4.0 User Guide*
- *DCN Adapter C4.0 Installation Guide*.

DCN Adapter C3.0

For information on DCN Adapter C3.0, refer to the following documents:

- *DCN Adapter C3.0 User Guide*
- *DCN Adapter C3.0 Installation Guide*.

AXC

For information on AXC, refer to *Nokia AXC User Manual*.

Nokia NetAct

For information on integrating Q1 Agent to Nokia NetAct, refer to *Integrating Transmission Agents to NetAct*. See also *Cellular Transmission Management Principles* and *Fixed Network Management Principle*s.

For troubleshooting instructions, see *Troubleshooting Transmission Agent Problems*.

NMS/10

For information on integrating Q1 Agent to NMS/10, refer to *NMS/10 SR C6.1 User Manual*.

Network Elements and Node Managers

For information on individual Nokia network elements and their node managers, consult the relevant *User Manual* for the network element or node manager concerned.

2 Introduction to Q1 Agent

Q1 Agent C2.1 is an application used for remote network monitoring, configuration, and data collection. Q1 Agent collects alarm and performance data from network elements (NE) through remote pollers. It has an Open Northbound Interface (ONI) and is compatible with Nokia NetAct platform, NMS/10 and 3rd-party management platforms.

2.1 System architecture

Q1 Agent C2.1 is used as a mediator between Nokia Q1-managed network elements and the supervising network management system. The agent is installed in its own PC and there can be one Q1 Agent per workstation. When the network grows, new agents can be added to the system. The agent is run as a Windows system service.

Q1 Agent C2.1 is connected to Q1 management buses through remote pollers. A TCP-based communication protocol is used for communication between the remote pollers and Q1 Agent.

Q1 Agent has an Open Northbound Interface and is compatible with Nokia NetAct, NMS/10 and 3rd-party management platforms. One agent can be shared by several network management systems.

2.1.1 Q1 Agent with NetAct

NetAct can be integrated with Q1 Agent to receive fault, topology, performance and inventory data of Q1 nodes managed by Q1 Agent.

Q1 Agent uses the SNMP protocol for communicating the alarm data to NetAct.The currently supported remote pollers are:

- DCN Adapter (DCN-A) C3.0 and C4.0
- AXC.

DCN-A unit has 3 buses for connecting network elements and AXC has 1 bus for this purpose. DCN-A and AXC support two Q1 protocols: the older Nokia TMS protocol and the newer version, Nokia Q1 protocol.

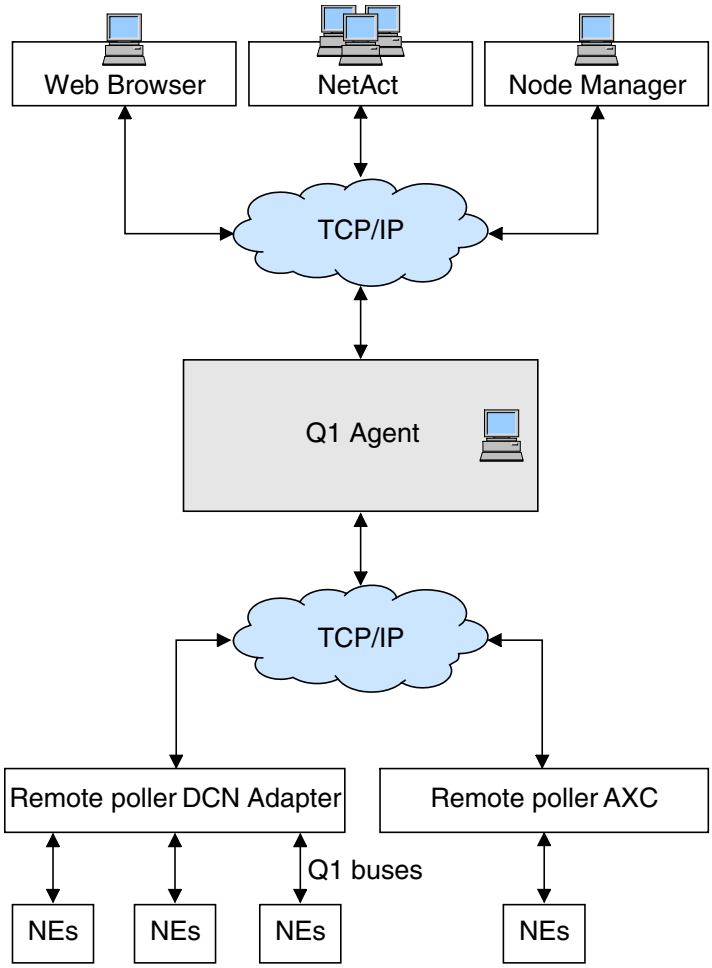

Figure 1. Q1 Agent with NetAct

2.1.2 Q1 Agent with NMS/10

NMS/10 can be integrated with Q1 Agent to receive fault, topology, performance and inventory data of Q1 nodes managed by Q1 Agent.

The currently supported remote pollers are:

- DCN Adapter (DCN-A) C3.0 and C4.0.

DCN-A unit has 3 buses for connecting network elements. DCN-A supports two Q1 protocols: the older Nokia TMS protocol and the newer version, Nokia Q1 protocol.

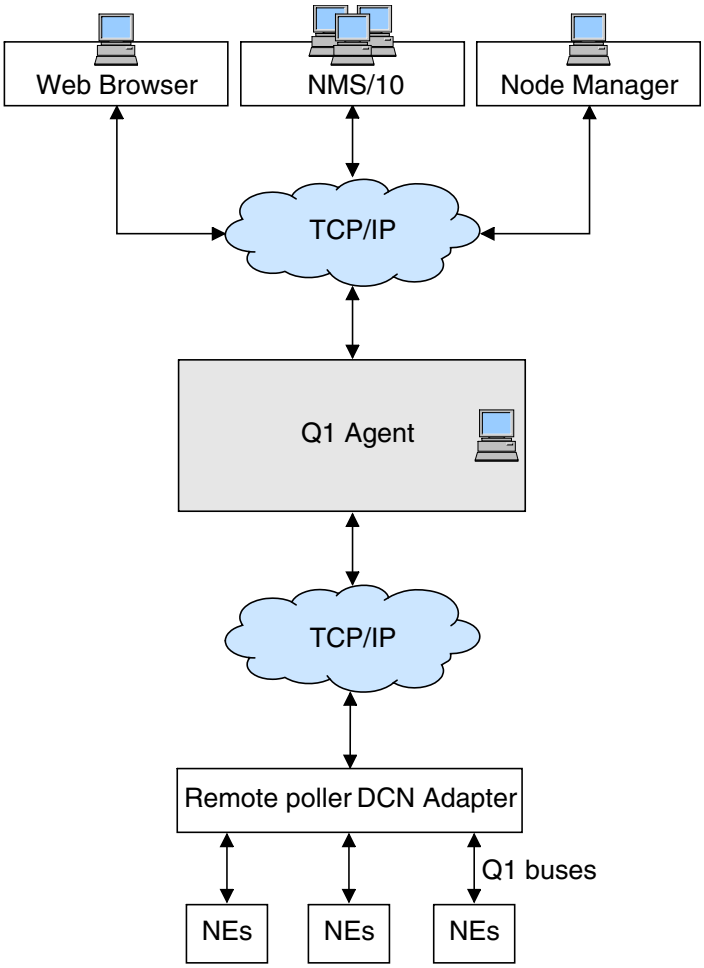

Figure 2. Q1 Agent with NMS/10

2.1.3 Q1 Agent in multivendor networks

Q1 Agent can be used in multivendor networks. The following figure illustrates one possible setup in a multivendor network:

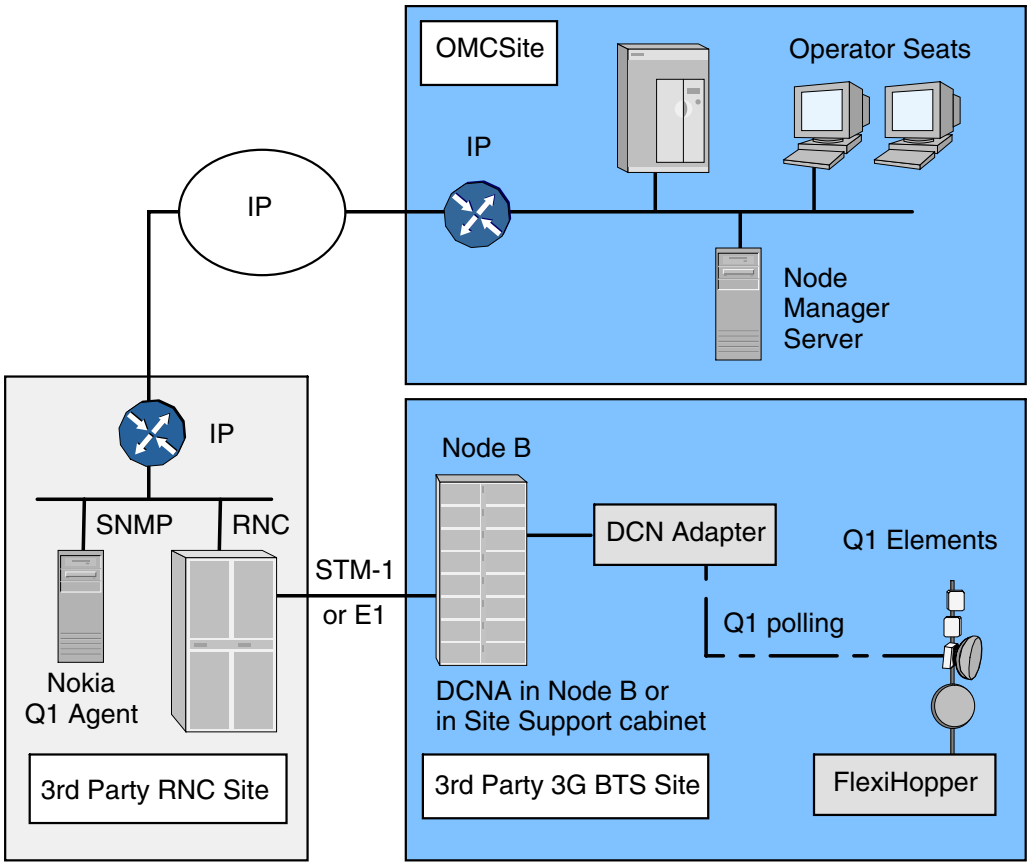

Figure 3. Q1 Agent in a multivendor network

2.2 Features

Q1 Agent can be used for monitoring alarms from Nokia's fixed access equipment and cellular transmission equipment. Q1 Agent supports remote pollers for collecting fault and performance management data. The main features of Q1 Agent are:

- Adding buses, nodes, FEs, node types, stations and managers
- Viewing buses, nodes, FEs, node types, stations and managers
- Editing buses, nodes, FEs, node types, stations and managers
- Deleting buses, nodes, node types, stations and managers
- Fault Management (FM)
- Performance Management (PM)

- Inventory Management (IM)
- Network Test (NWT)
- Forwarding data to a higher-level network management system
- Updating the node information configured in Q1 Agent to the Node Manager Server database
- Starting and stopping buses
- Sending Q1 menu commands to nodes
- Scanning the network
- Configuring the agent settings (including disk space limitation, display time format, navigation)
- Creating and restoring backups
- Alarm filtering.

Note

The new features in Q1 Agent C2.1, such as Network Test and the use of protected buses, are supported by DCN Adapter C4.0. DCN Adapter C3.0 does not support these features.

2.3 User interface

The user interface (UI) window of Q1 Agent C2.1 consists of the following areas:

- header
- navigation area
- data area.

When you log into agent, the Version, Title, Vendor, and Build Label information is displayed.

Header

The header at the top of the window contains the following links:

- Buses
- Nodes

- Stations
- Managers
- Settings
- FM
- PM
- IM
- NWT
- Logout
- Help.

All the above links are visible only when the license for all features is available. (See Chapter 5 ‘License management’.)

The links change the contents of the navigation area and data area. For example, if you click the **Buses** link, the operations you can perform on buses are listed in the navigation area. The selected link is highlighted.

Navigation area

The navigation area on the left of the window contains operations you can perform on the objects selected in the header. For example, if you click the **Buses** link in the header, the navigation area displays the following operations: Add, View, Edit, and Delete. The contents of the data area depend on the selected operation in the navigation area. The selected operation is highlighted.

Data area

The data area is the main area of the window and it is situated on the right. There are different views that may open in the data area, depending on the selection in the navigation area or the last action performed on the previous view. For example, if you select the **Buses** link in the header and then click the **Add AXC** link in the navigation area, the **Add AXC Bus** view is displayed in the data area. This view allows you to define parameters for the AXC bus you wish to add.

Tip

Q1 Agent is best viewed with the PC display set to 1024 by 768 pixels.

2.4 User rights

At Q1 Agent installation, the setup automatically creates two user groups:

- Q1 Agent Admins
- Q1 Agent Users.

The Q1 Agent Admins have full rights, whereas the Q1 Agent Users have read-only rights.

For instructions on how to define user rights, see Section 3.2.3 Adding users to the Q1 Agent user groups.

3 Installing

This chapter provides information on:

- system requirements
- installing Java (TM) 2 runtime environment
- installing Q1 Agent
- uninstalling Q1 Agent
- upgrading Q1 Agent
- manually starting and stopping the service
- adding users to the Q1 Agent user groups.

The software products to be installed can be found on the Q1 Agent CD-ROM. For more information about the contents of the CD-ROM, refer to Chapter 7.

3.1 System requirements

Q1 Agent is installed in a dedicated Windows 2000 Server Edition with Service Pack 4 or Windows Server 2003 Enterprise edition with Service Pack 1 or Windows Server 2003 Standard Edition with Service Pack 1 PC.

Table 1 presents the hardware requirements.

Table 1. Hardware requirements for the Q1 Agent C2.1 installation

Hardware	Requirements
PC	Pentium-compatible processor, 1000 MHz CPU clock speed

Table 1. Hardware requirements for the Q1 Agent C2.1 installation

Hardware	Requirements
Memory (minimum)	512 MB of RAM
Hard disk space (minimum)	8 GB
Peripherals	CD-ROM drive, mouse, keyboard, display

Table 2 presents the software components that must be installed before the Q1 Agent installation.

Table 2. Software requirements for the Q1 Agent C2.1 installation

Software	Requirements
Operating system	Windows 2000 Server Edition with Service Pack 4 or Windows Server 2003 Enterprise Edition with Service Pack 1 or Windows Server 2003 Standard Edition with Service Pack 1
JRE	Java (TM) 2 runtime environment, Standard Edition, version 1.4.2
Internet browser	Internet Explorer 6.0 with SP1
Internet Information Service (IIS)	IIS version 5.0 for Windows 2000 (IIS version 6.0 for Windows 2003) with FTP Server Component installed

3.2 Creating and managing Q1 Agent user groups and users

Q1 Agent users and groups must be created manually. They are created and managed with the Computer Management tool. To start the program, log in as administrator and select **Start → Settings → Control Panel → Administrative Tools → Computer Management**.

The Q1 Agent admins have full access rights, whereas Q1 Agent users have read-only rights. Local administrators always have full access rights.

3.2.1 Creating Q1 Agent user groups

To create Q1 Agent Admins and Q1 Agent Users groups, follow the instructions below.

To create Q1 Agent user groups

1. Expand **Local Users and Groups** and click **Groups**.
2. Click **Action** → **New Group**.

   New Group dialog box opens.
3. Type `Q1 Agent Admins` in the **Group name** field and click **Create**.
4. Click **Action** → **New Group**.

   New Group dialog box opens.
5. Type `Q1 Agent Users` in the **Group name** field and click **Create**.

3.2.2 Creating users

Follow the instructions below to create users.

To create users

1. Expand **Local Users and Groups** and click **Users**.
2. Click **Action** → **New User**.

   New User dialog box opens.
3. Fill in the fields and click **Create**.

If the new user is an administrator, add the user to the Q1 Agent Admins group. Otherwise, add the user to the Q1 Agent Users group. For instructions on adding users to groups, see the following section.

3.2.3 Adding users to user groups

New users are assigned to groups after they have been created. The instructions below show how to add users to the Q1 Agent Admins group and the Q1 Agent Users group.

To add users to the Q1 Agent Admins group

1. Expand **Local Users and Groups** and click **Groups**.
2. Right-click the Q1 Agent Admins group in the pane on the right and click **Add to Group**.

   Q1 Agent Admin properties dialog box opens.
3. Click **Add**.

   The **Select Users, Computers, or Groups** dialog opens.
4. Enter the user name of the admin user in the **Enter the object names to select** box and click **OK**.

To add users to the Q1 Agent Users group

1. Expand **Local Users and Groups** and click **Groups**.
2. Right-click the Q1 Agent Users group in the pane on the right and click **Add to Group**.

   Q1 Agent Users properties dialog box opens.
3. Click **Add**.

   The **Select Users, Computers, or Groups** dialog opens.
4. Enter the user name of the user in the **Enter the object names to select** box and click **OK**.

3.3 Installing Java (TM) 2 runtime environment

Java (TM) 2 runtime environment, Standard Edition, version 1.4.2 (or later) is required before installing Q1 Agent.

Prerequisites

- You have the Java (TM) runtime environment software on the Q1 Agent CD-ROM.
- All system requirements are fulfilled (refer to Section 3.1).

- Windows 2000 Server Edition with Service Pack 4, Windows Server 2003 Enterprise Edition with Service Pack 1 or Windows Server 2003 Standard Edition with Service Pack 1 has been installed.
- You have installed an FTP system component of Windows 2000 server and Windows Server 2003 from **Control Panel → Add/Remove Programs → Add/Remove Windows Components**.
- You are familiar with using Windows 2000 and Windows 2003.
- You must have administrator rights.

Note

Install Java (TM) 2 runtime environment in the default directory. Otherwise the Q1 Agent installation will fail.

To install Java (TM) 2 runtime environment

1. Close all other applications before starting the installation.
2. Insert the CD-ROM into the drive.
3. Click **Start → Settings → Control Panel → Add/Remove Programs**. Select **Add New Programs** and click **CD or Floppy**. Click **Next**. Click **Browse**, find the CD-ROM drive and look for the file `j2re-1_4_2-windows-i586.exe`. Double-click the file.
4. Click **OK** to start the installation program.
5. Follow the on-screen instructions.
6. Reboot the Q1 Agent PC.

3.4 Installing Q1 Agent

Prerequisites

- You have the Q1 Agent C2.1 software on CD-ROM.
- All system requirements are fulfilled (see Section 3.1).
- Windows 2000 Server Edition has been installed with Service Pack 4 or Windows Server 2003 Enterprise Edition has been installed with Service Pack 1 or Windows Server 2003 Standard Edition with Service Pack 1.

- You have installed an FTP system component.
- You are familiar with using Windows 2000 and Windows 2003.
- You must have administrator rights.
- You have installed Java (TM) 2 runtime environment, Standard Edition, version 1.4.2 in its default directory (see Section 3.3).
- The Q1 Agent C2.1 PC must have a fixed IP address if it is going to be accessed remotely from other machines.

To install Q1 Agent

1. Close all other applications before starting the installation.
2. Insert the CD-ROM into the drive.
3. If autoplay function is activated, the installation program starts automatically.

   Or:

   If the installation does not start automatically, click **Start** → **Settings** → **Control Panel** → **Add/Remove Programs**. Select **Add New Programs** and click **CD or Floppy**. Click **Next**. Click **Browse**, find the CD-ROM drive and look for the file `Q1AgentSetup.exe`. Double-click the file.
4. Click **OK** to start the installation program.
5. Follow the on-screen instructions.
6. Choose **Custom** as the installation type to change the Q1 Agent installation directory. Choosing **Typical** installs Q1 Agent in the default directory.

If Windows Installer 2.1 is not found in the PC, the Q1 Agent setup will automatically install it. A reboot may be required to complete the installation. After the reboot, the Q1 Agent setup continues automatically.

License

Licman (License Manager) is copied along with the Q1 Agent installation. This is required to transfer the license from one PC to another.

Virtual directory

Create a virtual directory for NetAct for PM files export with the name Q1APM and the path as:

```
C:\Program Files\Nokia\Q1Agent\www\q1\Result Files
```

This path is valid when the result file directory is set to q1. If its value is changed to some other value, say q2, then this path must be manually changed to:

```
C:\Program Files\Nokia\Q1Agent\www\q2\Result Files
```

The virtual folder must be manually deleted when Q1 Agent is uninstalled.

To create a virtual directory

1. Log in to Q1 Agent PC as administrator.
2. Create a new directory called `Result Files` under the directory `C:\Program Files\Nokia\Q1Agent\www\q1` if the directory does not exist already.
3. Select **Start** → **Settings** → **Control Panel** → **Administrative Tools** **Internet Services Manager** (or **Internet Information Services Manager** if you are using Windows 2003).
4. Highlight **Default FTP Site** and select **Action** → **New** → **Virtual Directory**.
5. In Virtual Directory Creation Wizard
    1. Click **Next**.
    2. Add Q1APM as alias name and click **Next**.
    3. Click Browse and browse to the directory `C:\Program Files\Nokia\Q1Agent\www\q1\Result Files` and click **OK**.
    4. Click **Next**.
    5. Select **Read** and click **Next**.
    6. Click **Finish**.

Startup

Q1 Agent starts automatically after the installation. This may take a while depending on the size of configuration. Before that, if you try to start the Q1 Agent user interface, you will get the default error message of the web browser.

3.5 Uninstalling Q1 Agent

To uninstall Q1 Agent

1. Stop the Q1 Agent service. See Section 3.8.
2. Click **Start → Settings → Control Panel → Add/Remove Programs.**
3. Select **Nokia Q1 Agent C2.1** and click the **Remove** button.
4. Follow the on-screen instructions.
5. Reboot the Q1 Agent PC after uninstallation.

The uninstallation does not remove data, backup, result (PM), Nee configuration, and log files. These must be manually deleted, if necessary.

3.6 Upgrading Q1 Agent

3.6.1 Upgrading from Q1 Agent C1.0 to Q1 Agent C2.1

To upgrade Q1 Agent

1. Stop the Q1 Agent service. See Section 3.8.
2. Make a copy of the `<Q1Agent Installed Directory>\data\q1\repository.dbl` file.
3. Uninstall Q1 Agent C1.0 from **Add/Remove Programs**.
4. Uninstall the previous version of Java (TM) 2 runtime environment (JRE1.3.x), if it still exists in the Q1 Agent PC.
5. Install the new version of Java (TM) 2 runtime environment (1.4.2), if not installed before.
6. Install Internet Explorer 6.0 (or later) with Service Pack 1, if not installed before.
7. Install FTP Server system component, if not installed before.

8. Reboot the PC if not rebooted after the Internet Explorer update.
9. Install Q1 Agent C2.1.
10. Take a backup of Q1 Agent C2.1.

3.6.2 Upgrading from Q1 Agent C2.0 to Q1 Agent C2.1

To upgrade Q1 Agent

1. Stop the Q1 Agent service. See Section 3.8.
2. Make a copy of the `<Q1Agent Installed Directory>\data\q1\repository.dbl` file.
3. Uninstall Q1 Agent C2.0 from **Add/Remove Programs**.
4. Install Java (TM) 2 runtime environment (1.4.2), if not installed before.
5. Install Internet Explorer 6.0 (or later) with Service Pack 1 (or later), if not installed before.
6. Install FTP Server system component, if not installed before.
7. Reboot the PC if not rebooted after the Internet Explorer update.
8. Install Q1 Agent C2.1.
9. Take a backup of Q1 Agent C2.1.

Note

Upgrading from Q1 Agent C2.0 to Q1 Agent C2.1 will not restore PM jobs.

3.6.3 Upgrading from Q1 Agent C2.0 + OSS_CD_0706 to Q1 Agent C2.1

To upgrade Q1 Agent

1. Stop the Q1 Agent service. See Section 3.8.

2. Make a copy of the `<Q1Agent Installed Directory>\data\q1\repository.dbl` file.
3. Uninstall OSS_CD_0706 from **Add/Remove Programs**.
4. Uninstall Q1 Agent C2.0 from **Add/Remove Programs**.

   There is no need to reboot the PC.
5. Install Q1 Agent C2.1.
6. Take a backup of Q1 Agent C2.1.

Note

Upgrading from Q1 Agent C2.0 + OSS_CD_0706 to Q1 Agent C2.1 will not restore PM jobs.

3.6.4 Upgrading from Q1 Agent C2.0 + OSS_CD_0796 to Q1 Agent C2.1

To upgrade Q1 Agent

1. Stop the Q1 Agent service. See Section 3.8.
2. Make a copy of the `repository.dbl`, `counters.dbl` and `RadiosFlexiBuses.dbl` files from the `<Q1Agent Installed Directory>\data\q1\` folder.
3. Uninstall OSS_CD_0796 from **Add/Remove Programs**.

Note

Do not reboot the PC even if the uninstallation asks for it. If the PC is rebooted, the PM schedules will be lost.

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4. Uninstall Q1 Agent C2.0 from **Add/Remove Programs**.
5. Install Q1 Agent C2.1.
6. Take a backup of Q1 Agent C2.1.

3.6.5 Upgrading from Q1 Agent C2.0 + OSS_CD_0796 + OSS_CD_0888 to Q1 Agent C2.1

To upgrade Q1 Agent

1. Stop the Q1 Agent service. See Section 3.8.
2. Make a copy of the `repository.dbl`, `counters.dbl` and `RadiosFlexiBuses.dbl` files from the `<Q1Agent Installed Directory>\data\q1\` folder.
3. Uninstall OSS_CD_0888 from **Add/Remove Programs**.
4. Uninstall OSS_CD_0796 from **Add/Remove Programs**.

Note

Do not reboot the PC even if the uninstallation asks for it. If the PC is rebooted, the PM schedules will be lost.

5. Uninstall Q1 Agent C2.0 from **Add/Remove Programs**.
6. Install Q1 Agent C2.1.
7. Take a backup of Q1 Agent C2.1.

3.6.6 Upgrading from Q1 Agent C2.0 + OSS_CD_0888 to Q1 Agent C2.1

To upgrade Q1 Agent

1. Stop the Q1 Agent service. See Section 3.8.
2. Make a copy of the `<Q1Agent Installed Directory>\data\q1\repository.dbl` file.
3. Uninstall OSS_CD_0888 from **Add/Remove Programs**.
4. Install Q1 Agent C2.1.
5. Take a backup of Q1 Agent C2.1.

3.6.7 Using Bus Editor Tool (OSS_CD_0489) with Q1 Agent C2.1

To use Bus Editor Tool (OSS_CD_0489) with Q1 Agent C2.1

1. Install Q1 Agent C2.1.
2. Install OSS_CD_0489 (Q1 bus editor tool).
3. Take a backup of the current configuration using **Create Backup** available in the **Settings** link.
4. Open the Bus Editor Tool.

   Give the `backup.xml` file as the input from `<Q1Agent Installed Directory>/www/q1/backup/<backup folder>/backup.xml`
5. Change the required bus attributes using the Bus Editor Tool.
6. Restore the backup where the changes were made.

3.7 Migrating Q1 Agent C2.0 from Windows 2000 PC to Q1 Agent C2.1 in Windows 2003 PC

Q1 Agent C2.1 can be run both in Windows 2000 and in Windows 2003 environments. If you decide to migrate Q1 Agent C2.0 running in Windows 2000 to Q1 Agent C2.1 running in Windows 2003, then follow the instructions below.

Source path

The source path of the Q1 Agent C2.0 backup in a Windows 2000 PC is:

```
<Q1Agent Installed Directory>/www/q1/backup
```

Destination path

The destination path of the Q1 Agent C2.1 backup in a Windows 2003 PC is:

```
<Q1Agent Installed Directory>/www/q1/backup/
```

To migrate Q1 Agent C2.0 from Windows 2000 to Q1 Agent C2.1 in Windows 2003

1. Take a backup of Q1 Agent C2.0.

   The backup will have an (.xml) file.

2. Install Q1 Agent C2.1 in Windows 2003.

3. Create a <new folder> in the destination path mentioned above.

4. Copy manually the .xml file from the source path to the <new folder> created at the destination path and rename the .xml file name as `backup.xml`.

5. Copy manually the `counters.dbl` and `RadiosFlexiBuses.dbl` from the `<Q1Agent Installed Directory>/data/q1` folder of the Q1 Agent C2.0 PC and place it in the <new folder> at the destination path.

   Do this step only if OSS_CD_0796 is installed in Q1 Agent C2.0. This step is required to get the PM jobs from Q1 Agent C2.0.

6. After logging into Q1 Agent C2.1, restore the backup from **Settings** → **Backup** → **Restore** → **<new folder>**

3.8 Manually starting and stopping the service

Q1 Agent is automatically started after the installation.

If necessary, you can manually start and stop the Q1 Agent service from **Start** → **Settings** → **Control Panel** → **Administrative Tools** → **Services** → **Nokia Q1 Agent**.

The startup may take a while depending on the size of configuration.

Note

Changing the system time while Performance Management (PM) schedules are running will disturb the PM schedules. If the system time zone is changed then the Q1 Agent service must be restarted.

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4 Working with Q1 Agent

4.1 Logging into Q1 Agent

You can log into Q1 Agent either locally or remotely.

Prerequisites

- Q1 Agent has been installed.
- You know the URL (the host name and/or the IP address) of the machine where Q1 Agent has been installed.
- Users have been added to existing user groups (see Section 3.2.3).
- Q1 Agent must have a fixed IP address if it is going to be used remotely from other machines (DHCP disabled). Otherwise, with frequently changing addresses, it may be difficult to access Q1 Agent from NMS/10 or NetAct.

To log into Q1 Agent

1. Start Q1 Agent, if it has not started automatically: select **Start** → **Settings** → **Control Panel** → **Administrative Tools** → **Services** → **Nokia Q1 Agent**.

2. Open Internet Explorer. Type the Q1 Agent URL in the Address field:

   `http://<address>:10080/`

   where `<address>` refers to the PC where Q1 Agent is installed. The address can be either the host name or the IP address in dotted form: for example, 192.0.2.236. The host name can be found, for example, by executing the `ipconfig /all` command at the Command Prompt.

   Type `http://localhost:10080` to login if the Q1 Agent is running on the local machine

3. Press **Enter**.

   The Nokia Q1 Agent Login page opens.

4. In the Login area, fill in the **Username** and **Password** fields.

   If you are not a local user, you need to provide the domain information, too, in the **Username** field: <domain_name>/<username>. In addition, you (or your user group) must have the right to access the computer from the network. Select **Start → Settings → Control Panel → Administrative Tools → Local Security Policy → Local Policies → User Rights Assignment → Access this computer from the network**. Add the access right for the desired users and user groups.

5. Click the **Login** button.

   The Q1 Agent application starts.

For information on how to log out, see Section 4.13 ‘Logging out’.

4.2 Buses

Q1 Agent supports remote pollers for collecting Fault Management (FM) and Performance Management (PM) data.

The supported remote pollers are:

- DCN Adapter (DCN-A) C3.0 and C4.0
- AXC.

DCN-A has 3 buses for connecting network elements and AXC has 1 bus for this purpose.

Q1 Agent allows you to add, view, edit, delete, start and stop the management buses. When you stop a bus, it is disconnected from the remote poller but remains in the agent configuration.

You can also copy a bus for creating a new one with the same information.

4.2.1 Adding buses

You can add AXC or DCN-A management buses used between remote pollers and network elements, and define the parameters of the remote pollers.

4.2.1.1 Adding AXC buses

You can add AXC buses used between remote pollers and network elements, and define the parameters of the remote pollers.

To add an AXC bus

1. In the header, click the **Buses** link.

   The Type, Range, and Status filters along with the **Show** button are displayed in the data area.

   In the navigation area, the following items are displayed: the View, Edit, and Delete links and the Add title. The Add title contains links for adding the following buses: AXC and DCN-A.

2. In the navigation area, click the **AXC** link.

   The **Add AXC Bus** view is displayed in the data area.

3. Define the parameters presented in the table below for the bus.

4. Click the **Add** button to add the bus.

   Or click the **Reset Form** button if you wish to reset the values to the initial ones.

Table 3. AXC bus parameters

Parameter	Description
General	
Bus Type	The bus type is AXC or DCN-A.This is a read-only parameter.
Bus Name	The descriptive name of the bus. The name can be up to a maximum of 80 characters.
Bus Number (1-)	The unique number of the Q1 bus. Bus numbers 0 and 254 are reserved for internal use. The agent gives as the default value the first free bus number, starting from 1. The maximum value is 999999999.
Default Station	

Table 3. AXC bus parameters (Continued)

Parameter	Description
Default Station (for Nodes)	The default station is used, when you scan the network and add the found nodes to the Q1 Agent configuration. If you add the nodes and select the Bus Default value, Q1 Agent uses this bus-specific station. If you change the default station number when you edit the buses, it does not have an effect on the nodes that have been scanned earlier and have already been added to the configuration. The new default station is used only for those nodes that are scanned after the change.
Remote Poller	
Host Name or IP Address	The host name or IP address of the remote poller in dotted decimal format. The name can be of any length.
Port Number (0 - 65535)	The number of the TCP port which the remote poller is listening to. The value can be 0 - 65535. The default port is 27500.
User Name	The user name for accessing the remote poller. The name can be of any length.
Password	The password for accessing the remote poller. Case sensitivity of the password depends on the remote poller. The name can be of any length.
Serial Channel	
Serial Channel Speed	Select the serial channel speed from the list. The speed can be 300, 600, 1200, 2400, 4800, 9600, or 19200 bit/s. The default value is 9600 bit/s. The Serial Channel Speed value in Q1 Agent must be the same as given in the node.
Limits for Polling	
Retry Count	The maximum retry count for fault polling commands can be 0 - 10. The default retry count for fault polling is 1.
Packet Limit	The maximum number of sending and receiving transactions during one command iteration. The default value is 1000. The minimum value is 0. The maximum value is 100000, although in practice values larger than 1000 - 2000 should not be needed.
Empty Packet Limit	The empty packet limit is the maximum acceptable number of empty packets from the NE during one polling command iteration. The default value is 200. The minimum value is 0. The maximum value is 100000, although in practice values larger than 1000 - 2000 should not be needed.
Limits for Pipe	
Retry Count	Maximum retry count for commands passed through the fault poller can be 0 - 10. The default retry count is 3.
Packet Limit	The maximum number of sending and receiving transactions during one command iteration. The default value is 1000. The minimum value is 0. The maximum value is 100000, although in practice values larger than 1000 - 2000 should not be needed.

Table 3. AXC bus parameters (Continued)

Parameter	Description
Empty Packet Limit	The empty packet limit is the maximum acceptable number of empty packets from the NE during one polling command iteration. The default value is 200. The minimum value is 0. The maximum value is 100000, although in practice values larger than 1000 - 2000 should not be needed.
Timeouts for Polling	
First Character Timeout (milliseconds)	First character timeout specifies in milliseconds the maximum time allowed to elapse between transmitting a Q1 command packet to a network element and receiving the first character of the response packet. The timeout can be 0 - 60000 (= 1 minute). The default value is 500 ms.
Inter-Character Timeout (milliseconds)	The timeout between characters of a response packet in milliseconds. The timeout can be 0 - 60000 (= 1 minute). The default value is 100 ms.
Command Timeout (milliseconds)	The maximum time allowed for executing one complete Q1 command transaction. The timeout can be 0 - 3600000 (= 1 hour). The default value is 0 ms (= no timeout).
Timeouts for Pipe	
First Character Timeout (milliseconds)	First character timeout specifies in milliseconds the maximum time allowed to elapse between transmitting a Q1 command packet to a network element and receiving the first character of the response packet. The timeout can be 0 - 60000 (= 1 minute). The default value is 500 ms.
Inter-Character Timeout (milliseconds)	The timeout between characters of a response packet in milliseconds. The timeout can be 0 - 60000 (= 1 minute). The default value is 100 ms.
Command Timeout (milliseconds)	The maximum time allowed for executing one complete Q1 command transaction. The timeout can be 0 - 3600000 (= 1 hour). The default value is 0 ms (= no timeout).
Delays for Polling	
Inter-Packet Delay (milliseconds)	The minimum delay between two packets. Using a non-zero inter-packet delay should be avoided because it slows down polling and causes delay to the detection and reporting of fault state changes in NEs. The delay can be 0 - 60000 (= 1 minute). The default value is 0.
Empty Packet Delay (milliseconds)	The time that must pass between receiving a Q1 Data Transfer Command reply packet without payload data and transmitting the next data transfer command packet to the element. The delay can be 0 - 60000 (= 1 minute). The default value is 100 ms.
Command Delay (milliseconds)	The minimum delay between two Data Transfer commands. The delay can be 0 - 60000 (= 1 minute). The default value is 0.
Delays for Pipe	

Table 3. AXC bus parameters (Continued)

Parameter	Description
Inter-Packet Delay (milliseconds)	The minimum delay between two packets. Using a non-zero inter-packet delay should be avoided because it slows down polling and causes delay to the detection and reporting of fault state changes in NEs. The delay can be 0 - 60000 (= 1 minute). The default value is 0.
Empty Packet Delay (milliseconds)	The time that must pass between receiving a Q1 Data Transfer Command reply packet without payload data and transmitting the next data transfer command packet to the element. The delay can be 0 - 60000 (= 1 minute). The default value is 100 ms.
Command Delay (milliseconds)	The minimum delay between two Data Transfer commands. The delay can be 0 - 60000 (= 1 minute). The default value is 0.
Scheduling	
Clock Refresh Interval (minutes)	The refresh rate for real time clocks of E generation NEs can be from 0 minutes to 7 days. The default value is 6 x 60 = 600 minutes. If the value is 0, the clock is not refreshed.
Connection Loss Threshold	The number of allowed command failures before the connection to an NE is considered lost. The threshold can be 0 - 10. The default value is 4.
Consistency Check Unit	The unit for fault status consistency checking. The unit can be NE or FE.
Consistency Check Count per Cycle	This parameter specifies the number of fault status consistency checks performed per one fault polling cycle. The consistency check count can be 1 - 100. The default value is 1 (NE) per cycle.
Lost Check Count per Cycle	The number of NEs (previously reported as disconnected) that are polled for existence after every fault polling cycle. The lost check count can be 0 - 10. The default value is 1.
Cycle Target Time (seconds)	The time that must pass between starting one fault polling cycle and starting the next fault polling cycle. The cycle target time can be 0 - 86400 (= 24 hours). The default value is 0.
Consistency Check Fraction (0-100)	The consistency check fraction is the proportion of the free polling cycle time that is used for fault status consistency checking. It can be 0 - 100%. The default value is 0 (%).
Lost Check Fraction (0-100)	The lost check fraction is the proportion of the time that is used for checking connection to NEs that were previously reported as disconnected. The lost check fraction can be 0 - 100%. The default value is 0 (%).
Idle Fraction (0-100)	The idle fraction is the proportion of the time left that is used for keeping the poller idle. It can be 0 - 100%. The default value is 100%.

Accuracy of all time values depends on the remote poller. For example, if inter packet delay is 110 ms, the remote poller may round it to the nearest hundred (in this case to 100).

For detailed information on the Q1 bus parameters, refer to Appendix A ‘Q1 bus parameters’.

4.2.1.2 Adding DCN-A buses

You can add DCN-A buses used between remote pollers and network elements, and define the parameters of the remote pollers.

To add a DCN-A bus

1. In the header, click the **Buses** link.

   The Type, Range, and Status filters along with the **Show** button are displayed in the data area.

   In the navigation area, the following items are displayed: the View, Edit, and Delete links and the Add title. The Add title contains links for adding the following buses: AXC and DCN-A.

2. In the navigation area, click the **DCN-A** link.

   The **Add DCN-A Bus** view is displayed in the data area.

3. Define the parameters for the bus.

   The parameters for DCN-A buses are the same as for the AXC buses except for those given in the table below. For the rest of the parameters, see Section 4.2.1.1 ‘Adding AXC buses’. For detailed information on the Q1 bus parameters, see Appendix A ‘Q1 bus parameters’.

Table 4. DCN-A bus parameters

Parameter	Description
Remote Poller	
Poller Bus Number (0-2)	The number of the Q1 bus in the remote poller host. Notice that the bus numbering in the poller host is independent of the bus numbering in Q1 Agent.
Secondary Channel in Use	Check to use Protected Mode (so as to make the bus protected). Checking this does not make the bus protected if the DCNA does not have protected cables.
Delays for Polling	

Table 4. DCN-A bus parameters (Continued)

Parameter	Description
Switch Delay	Minimum delay after switching direction.
Delays for Pipe	
Switch Delay	Minimum delay after switching direction.

4. Click the **Add** button to add the bus.

   Or click the **Reset Form** button if you wish to reset the values to the initial ones.

4.2.2 Viewing buses

You can view the details of the defined management buses that are used between the remote pollers and network elements.

To view the buses

1. In the header, click the **Buses** link or, if you have already selected the **Buses** link, you can click the **View** link in the **Buses** field on the left.

   The **View Buses** view is displayed in the data area.

   In the data area also the Type, Range, and Status filters and the **Show** button are displayed.

2. Enter or select filter values and click the **Show** button. (See Section 4.11 ‘Filters’.)

   The filters, the Show button, the filtered bus records (see Table 5), and navigation buttons are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

Table 5. View Buses

Column	Description
Bus Type	The type of the management bus. The types are: AXC or DCN-A.
Bus Name	The descriptive name of the Q1 bus
Bus Number	The unique number of the Q1 bus

Table 5. View Buses (Continued)

Column	Description
Protected	The protection status can be: •*Yes* - Bus is protected. •*No* - Bus is unprotected.
Status	The bus status can be: •*Running* - Connection to the remote poller is working. •*Stopped* - No connection to the remote poller; the agent does not try to re-establish the connection. •*Stopped, Restarting* - No connection to the remote poller; the agent tries to re-establish the connection. •*Starting...* - Connection to the remote poller is being established.
Last Activity	The last time there was any activity on the bus, for example, the remote poller heartbeat or any commands. The used time zone is displayed in parentheses. For defining the time zone, refer to Section 4.6.2 'Preferences' and Section 4.6.2.3 'Time zones'.

3. To display detailed information of a bus, click the bus name in the **Bus Name** column.

   The **View DCNA Bus** view or the **View AXC Bus** view is displayed, containing the status and parameters of the selected bus. For detailed information on the parameters, see Section 4.2.1 'Adding buses'.

4. Click **Refresh** if you wish to update the view.

5. You can disconnect the bus from the remote poller by clicking the **Stop** button.

   The bus is disconnected but remains in the agent configuration. For more information about stopping and starting a bus, refer to Section 4.2.5 'Stopping and starting buses'.

6. If you want copy the bus for creating a new bus with the same information, click **Copy**.

   Q1 Agent copies the information and displays it in the **Add DCNA Bus** view or in the **Add AXC Bus** view, depending on the selected bus. The agent gives the new bus the next free number. For the parameters of the copied bus and for adding it to the agent, see Section 4.2.1 'Adding buses'.

4.2.3 Editing and copying buses

You can edit the details of the defined management buses that are used between the remote pollers and network elements. You can also copy the information and use it for creating new buses.

To edit the buses

1. In the header, click the **Buses** link.

   The View, Edit and Delete links, and the Add title are displayed in the navigation area.

2. In the navigation area, click the **Edit** link.

   In the data area, the Type, Range, and Status filters and the **Show** button are displayed.

3. Enter or select filter values and click the **Show** button. (See Section 4.11 ‘Filters’.)

   Filters, the **Show** button, the filtered bus records, and the navigation buttons are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

   The **Select Bus to Edit** view is displayed. It contains a table that has the same columns as the **View Buses** table. The statistics of the number of buses displayed and the total number of filtered buses is displayed above the table.

4. To edit the parameters of a bus, click the bus name in the **Bus Name** column.

   Depending on your selection, the **Edit DCNA Bus** view or the **Edit AXC Bus** view is displayed, containing parameters of the selected bus. For detailed information on the parameters, see Section 4.2.1 ‘Adding buses’

5. After editing the parameters, click the **Update** button to save the new information.

   Or click the **Reset Form** button if you wish to reset the edited values to the initial values.

6. To copy the bus for creating a new bus with the same information, click **Copy**.

   Q1 Agent copies the information and displays it in the **Add DCNA Bus** view or in the **Add AXC Bus** view, depending on the selected bus. The agent gives the new bus the next free number. For the parameters of the copied bus and for adding it to the agent, see Section 4.2.1 ‘Adding buses’.

7. Click **Refresh** if you wish to refresh the displayed view.

8. You can disconnect the bus from the remote poller by clicking the **Stop** button.

The bus is disconnected, but remains in the agent configuration. For more information about stopping and starting a bus, refer to Section 4.2.5 ‘Stopping and starting buses’.

4.2.4 Deleting buses

You can delete buses or a group of buses.

To delete a bus

1. In the header, click the **Buses** link.

   The View, Edit and Delete links, and the Add title are displayed in the navigation area.

2. In the navigation area, click the **Delete** link.

   In the data area, the Type, Range, and Status filters and the **Show** button are displayed.

3. Enter or select filter values and click the **Show** button. (See Section 4.11 'Filters'.)

   Filters, the **Show** button, the filtered bus records, and the navigation buttons are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

   The **Select Bus(es) to Delete** view is displayed. It contains a table that has the same columns as the **View Buses** table. The statistics of the number of buses displayed and the total number of filtered buses are displayed above and below the table.

4. To select the bus to be deleted, click the bus name in the **Bus Name** column.

   Depending on your selection, the **Delete DCNA Bus** view or the **Delete AXC Bus** view is displayed, containing the status and parameters of the selected bus. For detailed information on the parameters, see Section 4.2.1 ‘Adding buses’.

5. To delete the bus, click the **Delete** button.

   All the nodes on the bus and the current alarms will be deleted. The alarm history remains unchanged.

To delete a group of buses

1. In the header, click the **Buses** link.

   The View, Edit and Delete links, and the Add title are displayed in the navigation area.

2. In the navigation area, click the **Delete** link.

   In the data area, the Type, Range, and Status filters and the **Show** button are displayed.

3. Enter or select filter values and click the **Show** button. (See Section 4.11 'Filters'.)

   Filters, the filtered bus records, and the navigation buttons are displayed in the data area along with the **Continue** and **Reset Form** buttons. (See Section 4.6.2.4 ‘Navigating’.)

   The **Select Bus(es) to Delete** view is displayed containing a table that has the same columns as the **View Buses** table. The statistics of the number of buses displayed and the total number of filtered buses are displayed above and below the table.

4. Select the bus records to be deleted. (See Section 4.12 'Using the Group Add, Edit, Delete or Update function'.)

5. Click the **Continue** button.

   The **Confirm Bus(es) Deletion** view is displayed containing a table that has the same columns as the **View Buses** table.

   If you click **Reset Form**, selections will be cleared.

6. To delete the bus records, click the **Delete** button.

   The **Select Bus(es) to Delete** view is displayed in the data area. The message “Bus(es) deleted successfully” is displayed above the filters if the bus(es) deletion was successful. If not, an error message is displayed above the filters.

4.2.5 Stopping and starting buses

You can stop and start buses. You can access these functions through the views for viewing, editing, or deleting buses:

- **Buses** → **View** → **Bus Name** → **Stop** or **Start**
- **Buses** → **Edit** → **Bus Name** → **Stop** or **Start**
- **Buses** → **Delete** → **Bus Name** → **Stop** or **Start**

The last case is explained below in more detail.

A bus can have the following statuses:

- *Running* - Connection to the remote poller is working.
- *Stopped* - No connection to the remote poller; the agent does not try to re-establish the connection.
- *Stopped, Restarting* - No connection to the remote poller; the agent tries to re-establish the connection.

  Pollers are sending heartbeats with the interval of 10 minutes, and if Q1 Agent does not receive that, the bus is set to the *Stopped, Restarting* state. There is an attempt to start the bus every 3rd minute.
- *Starting...* - Connection to the remote poller is being established.

When the bus status is *Running*, the **Stop** button is displayed in the data area and you can use it for stopping the bus. When the status is *Stopped, Restarting*, Q1 Agent tries to start the bus. When the status is *Stopped*, the **Start** button is displayed and you can use it for starting the bus.

To stop and start a bus

1. In the header, click the **Buses** link.

   The View, Edit and Delete links, and the Add title are displayed in the navigation area.

2. In the navigation area, click the **Delete** link.

   In the data area, the Type, Range, and Status filters and the **Show** button are displayed.

3. Enter or select filter values and click the **Show** button. (See Section 4.11 'Filters'.)

   The filtered buses and the navigation buttons are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.) The **Select Bus to Edit** view is displayed containing a table which has the same columns as the **View Buses** table. Statistics of the number of buses displayed and the total number of filtered buses are displayed above the table.

4. To select the bus, click its name in the **Bus Name** column.

   Depending on your selection, the **Delete DCNA Bus** view or the **Delete AXC Bus** view is displayed, containing the status and parameters of the selected bus. For detailed information on the parameters, see Section 4.2.1 ‘Adding buses’.

5. If the bus status is Running, you can disconnect the bus from the remote poller by clicking the **Stop** button.

   The bus is disconnected, but remains in the agent configuration. The **Stop** button is replaced by the **Start** button.

6. Click **Refresh** if you wish to refresh the displayed view.

7. If you want to start the stopped bus, click the **Start** button.

   The bus status is changed to *Starting.../Running* and the **Stop** button is displayed.

4.3 Nodes

Q1 Agent C2.1 collects alarm and performance data from network nodes and functional entities (FE) through remote pollers (DCN-A and AXC), and mediates between the nodes and the supervising network management systems.

You can add nodes and functional entities to Q1 Agent, and define their attributes and topology.

You can edit and view information about the nodes, and delete the nodes. You can also send Q1 menu commands to nodes.

Network scan is the easiest way to find out which network elements (NE) are on the management network. Before scanning the network, you must add all the necessary buses. To check if the network scan is complete, you can display the scanning status. To see the scanning results, you can view the log. You can also use the log for adding nodes to configuration.

Node managers installed in a Node Manager Server can be used for configuring network elements through Q1 Agent and, on the other hand, the node information configured in Q1 Agent can be updated in the Node Manager Server database. When you add a node, you can select a Node Manager Server for it.

4.3.1 Adding nodes

You can add nodes (network elements, NE) and functional entities (FE) to the agent. Before you can add a node, you must add a bus, station, and node type for it.

If you have a Node Manager Server with GCS (Nokia's General Communication Service) connected to Q1 Agent, you can select it for the node. You must add the Node Manager Server to the agent first.

You can use the network scan to find out which network elements (NE) are on the management network. Before scanning the network, you must add all the necessary buses.

You can also use the network scanning log for adding nodes.

To add a node to the agent

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

   In the data area, the following items are displayed: Bus, Address, Type, Station, FM, PM filters and the **Show** button.

2. In the **Nodes** field, click the **Node** link under the Add title.

   The **Add Node** view is displayed in the data area.

3. Define the parameters for the nodes. See the table below.

4. Click **Add** to add the node.

   Or click the **Reset Form** button, if you wish to reset the values to the initial ones.

Note

Adding FE0 of the node to Q1 Agent puts all other FEs in the fault polling mode.

Table 6. Node parameters

Parameter	Description
NE Attributes	
Bus	Select the bus for the node from the **Bus** list.
Q1 Address	The Q1 address of the network element (node). The Q1 address of an NE can be 0...4094.

Table 6. Node parameters (Continued)

Parameter	Description
Generation	The network element generation. The generation can be D/ND or E.
Software ID	The software id of the node.
Polled	To add the NE to fault management polling, click **Polled**.
NE Topology	
Node Name	The node name is the identifier of the node for node managers. The node names are transferred to NetAct in the network topology upload. The same names should also be transferred to the Node Manager Server which is used for running the node managers. For instructions, see Section 4.3.10 ‘Updating the Node Manager Server database’. The maximum length of the node name is 32 characters. Single quotation marks are not allowed in the name. The node name must be unique within one Node Manager Server. Q1 Agent generates node names automatically.
Node Manager Server	The name of the manager server which has been configured as a Node Manager Server. To find out the names, see Section 4.5.2 ‘Viewing managers’. If you do not wish to define a Node Manager Server for the node, select N/A.
Node Type	Node types are used to define the type of the node for a supervising management system, for example, NetAct. Before you can select a node type, you have to add it to Q1 Agent, if it does not exist.
Station Number	Stations are used for grouping Q1-managed network elements (nodes). Each node belongs to a station. Select a station for the node. Before you can select a station, you have to add it to Q1 Agent.
System Distinguished Name	Distinguished name (DN) is the name of a managed object which consists of a sequence of the relative distinguished names of its superiors in the naming tree, starting at the root and working to the managed object to be identified. The node DN is a read-only parameter.

Table 6. Node parameters (Continued)

Parameter	Description
FE Attributes	
FE Number	The number of the functional entity. When you add a node, Q1 Agent adds functional entity 0 automatically. The FE number can be 0 - 254.
FE Name	In the **FE Name** box, give a descriptive name for the FE.

4.3.2 Adding FEs

You can select a node to which you want to add a functional entity (FE), and define the functional entity (FE) attributes. Before you can add a functional entity, you must add a node for it.

You can use the network scan to find out which network elements (NE) are on the management network. Before scanning the network, you must add all the necessary buses.

You can also use the network scanning log for adding nodes.

To add a funtional entity to a node

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **FE** link under the **Add** title.

   The Select Node table is displayed in the data area. It contains Bus, Address, Type, Station, FM, PM filters and the **Show** button.

3. Enter a filter condition and click the **Show** button. (See Section 4.11 'Filters'.)

   A list of configured nodes is displayed, along with information on the total number of nodes and the number of nodes currently displayed.

4. Select the node to which you want to add the FE by clicking the appropriate link in the **FE Name** column.

   The **Add Functional Entity** view is displayed. It contains the attributes of the selected node. For the attributes, see Section 4.3.1 ‘Adding nodes’. All other fields are not editable, except **FE** and **FE Name**.

5. Fill in the **FE** number. The number can be 0...254. Q1 Agent gives the next free number as the default value.

6. In the **FE Name** box, fill in a descriptive name for the functional entity.

7. Click **Add** to add the functional entity.

   A new **Add Functional Entity** view is displayed. You can use this view for adding a new functional entity. Q1 Agent gives the next free FE number as the default value for the new FE.

   Or click the **Reset Form** button, if you wish to rest the edited values to the initial values.

4.3.3 Viewing node and FE details

You can view the details of the defined nodes and functional entities.

To view the nodes and FEs

1. In the header, click the **Nodes** link or, if you have already selected **Nodes** in the header, you can click the **View** link in the **Nodes** field on the left.

   In the data area, the following items are displayed: Bus, Address, Type, Station, FM, PM, filters and the **Show** button.

2. Enter or select filter values and click the **Show** button. (See Section 4.11 'Filters'.)

   Filters, the **Show** button, the filtered nodes, and the navigation buttons are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

   In the data area, the **Nodes** view is displayed. It contains a table with the following columns: Bus, Address, FE, FE Name, Type, Station ID, Station Name, Software ID, NM Server, FM, PM, and IM. The FM, PM, IM column entries are disabled. Statistics of the number of nodes displayed and the total number of filtered nodes are displayed above and below the table. The columns and their descriptions are presented in Table 7 (View Nodes).

3. Click a functional entity in the **FE Name** column.

   The **View Node/FE Details** view is displayed. It contains the attributes of the selected node. For the attributes, see Section 4.3.1 ‘Adding nodes’. The view contains also the **Edit** and **Delete** buttons which you can use for moving to the corresponding views.

Table 7. View Node/FE Details

Column	Description
Bus	The bus number of the node.
Address	The Q1 address (number 0-4094). A unique identifier of the managed element within one Q1 bus.
FE	The integer value of the functional entity (0) of the node.
FE Name	The name of the functional entity of the node.
Type	The node type.
Station ID	The station number.
Station Name	The station name of the node.
Software ID	The software ID of the node.
NM Server	The name of the Node Manager Server.
FM	Check box to select whether Fault Polling is on/off for the node. If the check box is checked, then Fault Polling is on for the node. If not, Fault Polling is off for the node. The check box is by default not editable.
PM	Check box to display whether the PM collection is on/off for the node. The check box is by default not editable.
IM	Check box to display whether the node is configured for IM upload or not. The check box is by default not editable.

4.3.4 Editing node and FE details

You can edit the details of the defined nodes and functional entities.

To edit the nodes

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Edit** link.

In the data area, the following items are displayed: Bus, Address, Type, Station, filters, and the **Show** button.

3. Enter or select filter values and click the **Show** button. (See Section 4.11 ‘Filters’.)

   Filters, the **Show** button, the filtered nodes, the navigation buttons, the **Update** button and the **Reset Form** button are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

   The **Edit Node(s)** view is displayed. It contains a table with the following columns: Bus, Address, FE, FE Name, Type, Station ID, Station Name, Software ID, NM Server, FM All, PM, and IM. The PM and IM column entries are disabled. Statistics of the number of nodes displayed and the total number of filtered nodes are displayed above and below the table. The columns and their descriptions are as follows:

Table 8. Edit Node/FE Details

Column	Description
Bus	The bus number of the node.
Address	The Q1 address (number 0-4094). A unique identifier of the managed element within one Q1 bus.
FE	The integer value of the functional entity (0) of the node.
FE Name	The name of the functional entity of the node. Notice that changing the FE name of a node whose alarm already exists in Current Alarms does not change the FE Name of the node in the Alarm list.
Type	The node type.
Station ID	The station number.
Station Name	The station name of the node.
Software ID	The identifier of the network element software.
NM Server	The name of the Node Manager Server.

Table 8. Edit Node/FE Details (Continued)

Column	Description
FM All	Check box to select whether the node is enabled or disabled for FM. If the check box is checked, the node is FM enabled. If not, the node is FM disabled.
PM	Check box to display whether the node is enabled or disabled for PM. The check box is by default not editable.
IM	Check box to display whether the node is enabled or disabled for IM.The check box is by default not editable.

4. Click a functional entity in the **FE Name** column.

   The **Edit Node/FE Details** view is displayed. It contains the attributes of the selected node. For the attributes, see Section 4.3.1 ‘Adding nodes’.

5. You can edit the following parameters: **Generation, Polled, Node Manager Server, Node Type, Station Number**, and **FE Name**.

6. Click **Update** to save the changes.

   Or:

   Click the **Reset Form** button if you wish to reset the edited values to the initial values.

   Or:

   You can update the FM status of a group of nodes at the same time (see Section 4.12 'Using the Group Add, Edit, Delete or Update function').

   The FM status of the node is displayed through the check box associated with each node. If the check box is checked, the node is enabled for fault management. If it is unchecked, the node is not polled for FM. Thus, if you want to enable FM for the node, tick the check box. If you want to disable FM for the node, un-tick the check box. You can select or unselect all the nodes using the **FM All** check box.

   Finally click the **Update** button.

   The nodes are updated with the changes, and the view with updated values is displayed.

4.3.5 Deleting nodes

To delete a node

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Delete** link.

   In the data area, the following items are displayed: Bus, Address, Type, Station filters and the **Show** button.

3. Enter or select filter values and click the **Show** button. (See Section 4.11 ‘Filters’.)

   Filters, the **Show** button, the filtered node records, the navigation buttons, the **Continue** button and the **Reset Form** button are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

   The **Select Node(s) to Delete** view is displayed. It contains a table with the following columns: Bus, Address, FE, FE Name, Type, Station ID, Station Name, Software ID, NM Server, and Delete All. Statistics of the number of nodes displayed and the total number of filtered nodes are displayed above and below the table. The columns and their descriptions are as follows:

Table 9. Select Node(s) to Delete

Column	Description
Bus	The bus number of the node.
Address	The Q1 address (number 0-4094). A unique identifier of the managed element within one Q1 bus.
FE	The integer value of the functional entity (0) of the node.
FE Name	The name of the functional entity of the node.
Type	The node type.
Station ID	The station number.
Station Name	The station name of the node.

Table 9. Select Node(s) to Delete (Continued)

Column	Description
Software ID	The identifier of the network element software.
NM Server	The name of the Node Manager Server.
Delete All	The check box is used for selecting nodes for deletion. (Each of the nodes is associated with a check box in each row.)

4. Click a functional entity in the **FE Name** column.

   The **Select Node(s) to Delete** view is displayed. When a node is deleted, all its functional entities and the current alarms will be deleted at the same time. The alarm history remains unchanged.

5. Click **Delete** to delete the node.

   Or:

   You can delete a group of nodes at the same time (see Section 4.12 'Using the Group Add, Edit, Delete or Update function'): Select the node records you want to delete by ticking the check boxes associated with each node. Ticking the check box means you selected the node for deletion. You can use the **Delete All** check box to select or unselect all the check boxes in the column.

6. Click the **Continue** button.

   The **Confirm Node(s) Deletion** view is displayed in the data area along with the selected nodes, the navigation buttons and the **Delete** button.

7. Click the **Delete** button for deleting the nodes.

   The **Select Node(s) to Delete** view is displayed. The message “Node(s) deleted successfully” is displayed if the nodes are successfully deleted. If the deletion failed, an error message is displayed.

4.3.6 Changing station for a group of nodes

To change the station for a group of nodes

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Change Station** link.

   In the data area, the following items are displayed: Bus, Address, Type, Station filters and the **Show** button. (See Section 4.11 ‘Filters’.)

3. Enter or select filter values and click the **Show** button.

   Filters, the **Show** button, the filtered nodes, the navigation buttons, the **Select Station** list box, the **Update** button, and the **Reset Form** button are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

   The **Change Station** view is displayed. It contains a table with the following columns: Bus, Address, FE, FE Name, Type, Station ID, Station Name, Software ID, NM Server, and Change All. Statistics of the number of nodes displayed and the total number of filtered nodes are displayed above and below the table. The columns and their descriptions are as follows:

Table 10. Node Change Station

Column	Description
Bus	The bus number of the node.
Address	The Q1 address (number 0-4094). A unique identifier of the managed element within one Q1 bus.
FE	The integer value of the functional entity (0) of the node.
FE Name	The name of the functional entity of the node.
Type	The node type.
Station ID	The station number.
Station Name	The station name of the node.
Software ID	The identifier of the network element software.
NM Server	The name of the Node Manager Server.
Change All	The check box is used for selecting the nodes for which the station is to be changed. (Each of the nodes is associated with a check box in each row.)

4. Select the nodes for updating (see Section 4.12 'Using the Group Add, Edit, Delete or Update function').

5. Select a station number from the **Select Station** list box. This list box contains all the station numbers.

6. Click the **Update** button.

   The nodes are updated with the newly selected station number.

   If the **Reset Form** button is clicked, the values are reset to the initial values.

4.3.7 Changing Node Manager Server for a group of nodes

To change the Node Manager Server for a group of nodes

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Change NM** link.

   In the data area, the following items are displayed: Bus, Address, Type, Station, filters, and the **Show** button. (See Section 4.11 ‘Filters’.)

3. Enter or select filter values and click the **Show** button.

   Filters, the **Show** button, the filtered nodes, the navigation buttons, the **Select Node Manager Server** list box, the **Update** button, and the **Reset Form** button are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.)

   The **Change Node Manager Server** view is displayed. It contains a table with the following columns: Bus, Address, FE, FE Name, Type, Station ID, Station Name, Software ID, NM Server, and Update All. Statistics of the number of nodes displayed and the total number of filtered nodes are displayed above and below the table. The columns and their descriptions are as follows:

Table 11. Node Change NM

Column	Description
Bus	The bus number of the node.
Address	The Q1 address (number 0-4094). A unique identifier of the managed element within one Q1 bus.
FE	The integer value of the functional entity (0) of the node.

Table 11. Node Change NM (Continued)

Column	Description
FE Name	The name of the functional entity of the node.
Type	The node type.
Station ID	The station number.
Station Name	The station name of the node.
Software ID	The identifier of the network element software.
NM Server	The name of the Node Manager Server.
Update All	The check box is used for selecting the nodes for which the Node Manager Server is to be changed. (Each of the nodes is associated with a check box in each row.)

4. Select the nodes for updating (see Section 4.12 'Using the Group Add, Edit, Delete or Update function').

5. Select a Node Manager Server name from the **Select Node Manager Server** list box.

   The **Select Node Manager Server** list box contains all the Node Manager Server names.

6. Click the **Update** button.

   The nodes are updated with the change requested. The **Node Change NM** view is displayed with updated values.

   If the **Reset Form** button is clicked, the values are reset to the initial values.

4.3.8 Sending Q1 menu commands to nodes

You can send Q1 menu commands to nodes.

To send Q1 menu command to a node

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Send Command** link.

   The **Send Command to Node** view is displayed in the data area.

3. Select the bus of the node from the **Bus** list.

4. Fill in the Q1 Address of the node in the **Address** box. The address can be 0...4094.

5. Give the functional entity number in the **FE** box. The number can be 0...254.

6. Enter the Q1 menu command in the **Command** box, for example, `m:4,1`. Only menu commands are supported. Machine commands (k commands) are not supported. For more information about the commands, refer to the documentation of the corresponding network elements.

7. Click **Send Command.**

   In the Answer box, either a reply from the node or an error message is displayed.

4.3.9 Scanning the network

Network scan is the easiest way to find out which network elements (NE) are on the management network. Before scanning the network, you must add all the necessary buses. After that you can define the buses and addresses where to query for the NEs.

To start the network scan, follow the procedure 'To start network scanning' below. To check if the network scan is complete, you can display the scanning status. To see the scanning results, you can view the log.

You can also use the log for adding the nodes that were found during network scanning to the Q1 Agent configuration.

Notice the following:

- When the protection mode of a node is changed, the node should be rescanned and added to Q1 Agent.
- If any schedule items are configured, then they must be removed and the counter scan must be done for that node again. The schedule item must be recreated.

To start network scanning

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **New Scan** link under the **Network Scan** title.

   The **Network Scan** view is displayed in the data area. It contains a list of the buses that are configured in Q1 Agent. The bus type, name, and number is given in the list. For more information on these parameters, see Section 4.2.1 ‘Adding buses’.

3. In the **Addresses** box, give the address range to be scanned on the bus. The Q1 address of an NE can be 0...4094. You can give the address range separated by hyphens or commas, for example, 1,2,3,4,5,6,7,9 or 1-10,11-20. You can give address ranges to be scanned for several buses at the same time.

4. Click the **Start Network Scan** button.

   The Scan Status link is displayed under the Network Scan title in the navigation area when the scanning tasks have been started. The Scan Status link is also displayed if there are previous scanning results (a scanning task has been started earlier and the results have not been removed).

   A new scanning task can be started even if the previous ones are still being executed.

5. Click the **Scan Status** link to display the **Network Scan Status** view.

   This view shows when the scan is complete. For more information on the view, see the procedure ‘To display the network scanning status’ below.

6. To see the scanning results, you can view the log. For instructions, see the procedure ‘To display the network scanning log’ further below.

Tip

Older network elements (the D/ND generation, for example, DN2, TRU cards) do not identify the generation ID query. This causes command retries and slows down the scanning process. If you want to speed up the process, you can define a smaller retry count value for the pipe. For editing the bus parameters, see Section 4.2.3 ‘Editing and copying buses’ and Section 4.2.1 ‘Adding buses’ (Limits for Pipe, Retry Count).

To display the network scanning status

To check if the network scan is complete, you can display the scanning status.

1. In the header, click the **Nodes** link.

The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Scan Status** link under the **Network Scan** title. The **Scan Status** link is displayed under the **Network Scan** title in the navigation area when the scanning tasks have been started (a scanning task has been started and the results have not been removed).

   The **Network Scan Status** view is displayed in the data area. The number of running/finished network scanning tasks (that have not been removed) is displayed above the status table. The table contains the following status information of all the scanning tasks that have not been removed:

Table 12. Network Scan Status

Column	Description
Status	The scanning status can be: •*Running* •*Finished* •*Error* (Scanning could not be finished because of a serious error, for example, connection to the remote poller is lost or the bus was deleted from the configuration.)
Bus	The bus number.
Addresses	The Q1 addresses are sorted in ascending order and all redundant information is removed. This does not affect the network scan results.
Total	The total number of addresses given when starting the scanning task.
Found	The number of nodes that have been found.
Not Found	The number of nodes that have not been found.
Remaining	Remaining number of nodes to be scanned.
Action	The Action column contains the **Remove** button.

3. Click **Refresh** if you wish to see the most up-to-date scanning status.

   When the scanning is complete, the Log link is displayed in the navigation area. The Log link is also displayed if there are previous scanning results (a scanning task has been started earlier and the results have not been removed).

4. Click the **Remove** button if you wish to delete the scanning results of a task or stop a scanning task in the **Network Scan Status** view. The results of the removed scanning task, if any, will not be displayed in the **Network Scan Log** view.

5. In the navigation area, click the **Scan Log** link to display the scanning results. The Scan Log link is displayed when the scanning results are ready.

   The **Network Scan Log** view is displayed.

To display the network scanning log

To see the scanning results, you can view the scanning log. You can also use the log for adding nodes to Q1 Agent configuration.

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Scan Log** link under the **Network Scan** title. The Scan Log link appears after a network scan and shows the list of nodes scanned under a particular bus. If there are no scanned results then the message “No network scan results available” is displayed.

   The **Network Scan Log** view is displayed. The view contains two tables. The first table includes the scanning results, that is, the network elements found on the management network. The second table contains the nodes configured in Q1 Agent. If you remove all started scanning tasks in the **Network Scan Status** view, there is only one table with the configured nodes.

Table 13. Network Scan Log (scanning results)

Column	Description
Clear All/Select All	The first column contains buttons for selecting nodes to be added to the Q1 Agent configuration. For more information, see the following step.
Bus	The unique number of the Q1 bus.
Address	The Q1 address of the network element (node). The Q1 address of an NE can be 0...4094.
FE	The number of the functional entity.
FE Name	The name of the functional entity.

Table 13. Network Scan Log (scanning results) (Continued)

Column	Description
Type	The node type. If the node type is unknown, it is displayed in red colour. If you wish to add the node to the Q1 Agent configuration and use this node type, add the node type to Q1 Agent. When you add the node type, use the node type name displayed in this column. If you do not add the unknown node type to Q1 Agent, it will be displayed as `UNKNOWN` when the node is added to Q1 Agent configuration using this view.
Generation	The identifier of the network element generation. The generation can be D/ND or E.
Software ID	The identifier of the network element software.

3. You can select nodes to be added to the Q1 Agent configuration by clicking the corresponding check boxes in the scanning results table or, if you wish to add all the found nodes, click **Select All**. If you wish to clear all the selected boxes, click **Clear All**. The selection of nodes can be done for FE=0, that is, Node. All the FEs shown in the user interface for selected nodes are added to Q1 Agent Configuration.

4. Define the following attributes for the selected nodes:

Table 14. Attributes for selected nodes

Attribute	Description
Override existing values	If the node already exists in the Q1 Agent configuration, its attributes will be replaced with the new values, that is, with the values given in the Attributes for Selected Nodes boxes and with the values of the found nodes (except for the bus number, address and FE). If you wish to replace the existing values, click **Override existing values**. If you wish to add the nodes to the Q1 Agent configuration and make sure that the existing values are not changed, do not check this box.
Polled	To add the node to fault management polling, click **Polled**.
Node Name Prefix	Node managers installed in a Node Manager Server can be used for configuring NEs through Q1 Agent and, on the other hand, the node information configured in Q1 Agent can be updated in the Node Manager Server database. One Node Manager Server can be connected to several Q1 Agents. Each Q1 Agent must have a unique node name prefix within one Node Manager Server. The maximum length of the node name prefix is 16 characters. Single quotation marks are not allowed in it. Q1 Agent gives the IP address of the agent PC as the default value for the node name prefix.
Node Manager Server	Select a Node Manager Server for the node. If you do not wish to define a Node Manager Server for the node, select **N/A**.
Station Number	Select a station for the node. If you select the Bus Default value, Q1 Agent uses the bus-specific station for the added nodes. You can define the bus-specific stations when you add or edit the buses.

5. To add the selected nodes to the Q1 Agent configuration, click **Add Selected**.

   The added nodes are transferred from the first table to the second one.

6. If you wish to add some other nodes with different attributes, repeat the steps, starting from step 3, selecting the nodes.

If you add all the found nodes to the configuration, the **Scan Status** and **Scan Log** links are deleted from the navigation area and only the configuration table is displayed in the **Network Scan Log** view.

Table 15. Q1 Agent configuration table

Column	Description
Bus	The unique number of the Q1 bus.
Address	The Q1 address of the network element (node). The Q1 address of an NE can be 0...4094.
FE	The number of the functional entity.
FE Name	The name of the functional entity.
Type	The node type.
Generation	The identifier of the network element generation. The generation can be D/ND or E.
Polled	Whether the node is included in fault management polling. The value is Yes or No.
Station	The station number.
Station Name	The station name of the node.
Software ID	The identifier of the network element software.
Node Manager Server	The name of the Node Manager Server. If the Node Manager Server is not defined, the value is N/A.

4.3.10 Updating the Node Manager Server database

Node managers installed in a Node Manager Server are used for configuring NEs through Q1 Agent. On the other hand, the node information configured in Q1 Agent can be updated to the node manager database so that the node manager can open connections to these nodes.

If the Q1 Agent configuration contains any nodes which already have information in the node manager's database, all the old configuration information of this agent is deleted from the database and replaced with the new information. If the Q1 Agent configuration does not include any nodes of this manager, the manager's database will remain the same.

Notice that updating the Node Manager Server database may take a long time when the configuration is large.

To update the Node Manager Server database

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Update NM Server** link.

   The **Update Node Manager Server** view is displayed in the data area. It contains a table with the following columns:

Table 16. Updating the Node Manager Server

Column	Description
Action	Contains the buttons for starting the upload.
Name	The name of the Node Manager Server.
Host:Port	The host name or IP address of the Node Manager Server and the GCS port number.
Started	When the Node Manager Server database update has been started.
Duration	For how long has the Node Manager Server database update lasted.
Status	The update status can be: •*Initializing* •*Waiting* (The Node Manager Server is busy or not responding while Q1 Agent is waiting for it to become available. Q1 Agent tries to contact the server 10 times and after an attempt waits about 30 seconds.) •*Connecting* •*Writing request* •*Reading answer* •*OK* •*Interrupted* (A system reset or a similar action is going on.) •*Failed* (An error has occurred in handling the request.) •*Failed* + an error message from the Node Manager Server (An error in the information sent to the server, for example, the node name is not unique.)
Nodes	The number of nodes in the current Q1 Agent configuration for this node manager.

3. Click the **Start** button to start the upload. If there are more than one Node Manager Server in the Q1 Agent configuration, the **Start All** button is displayed. If you wish to start the database update for all defined Node Manager Servers, click **Start All**.

4. Click **Refresh** if you wish to see the most up-to-date information

4.3.11 Working with node types

Node types are used to define a product family for a supervising management system, for example, NetAct.

You can add, view, edit, and delete node types. Before you add a node, you must add a node type for it.

To add a node type to the agent

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Types** field, click the **Add** link.

   The **Add Node Type** view is displayed in the data area.

3. Fill in the **Number** for the node type. Q1 Agent gives the next free number as the default value. The maximum value is 999999999.

4. Type a name for the node type in the **Name** box. The length of the name can be up to 80 characters.

5. Click **Add** to add the node type.

   A new **Add Node Type** view is displayed. You can use this view for adding a new node type. Q1 Agent gives the next free number as the default value for the new node type.

   Or click the **Reset Form** button if you wish to reset the values to the initial ones.

To view the node types

1. In the header, click the **Nodes** link.

The Nodes and Types fields are displayed in the navigation area.

2. In the **Types** field, click the **View** link.

   The **View Node Types** view is displayed in the data area. It contains the numbers and names of the node types. The total number of the node types configured in Q1 Agent is displayed above the table.

3. In the **Name** column, click a node type name.

   The **View Node Type** view is displayed. It contains the number and name of the selected node type. The view contains also the **Edit** and **Delete** buttons which you can use for moving to the corresponding views. If the node type is internal and cannot be edited or deleted, these buttons are not displayed.

To edit the node types

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Types** field, click the **Edit** link.

   The **Select Node Type to Edit** view is displayed in the data area. It contains a list of the numbers and names of the configured node types. The total number of the node types configured in Q1 Agent is displayed above the table.

3. Click a node type name in the **Name** column.

   If the selected node type is an internal type, it will display an error message "This node type is an internal type. It cannot be edited." Otherwise the **Edit Node Type** view is displayed. It contains the number and name of the selected node type.

4. You can edit the **Name** of the node type. The length of the name can be up to 80 characters.

5. Click **Update** to save the changes.

   Or click the **Reset Form** button if you wish to reset the edited values to the initial values.

To delete a node type

Caution

If you delete a node type, the nodes associated with it will no longer have a valid type; when you view the nodes, the deleted node type will be displayed as UNKNOWN. Before deleting a node type check that there are no nodes associated with the node type.

1. In the header, click the **Nodes** link.

   The Nodes and Types fields are displayed in the navigation area.

2. In the **Types** field, click the **Delete** link.

   The **Select Node Type to Delete** view is displayed.

   If the selected node type is an internal type, it will display an error message "This node type is an internal type. It cannot be deleted." Otherwise the **Delete Node Type** view is displayed. It contains the number and name of the selected node type.

3. Click a node type name in the **Name** column.

   The **Delete Node Type** view is displayed. It contains the number and name of the selected node type.

4. Click **Delete** to delete the node type.

4.4 Stations

Stations are used for grouping Q1-managed network elements (nodes). Each node belongs to a station. The system distinguished name (SDN) of the station indicates the NetAct hierarchy location of the nodes in the station. It is needed for communicating with NetAct.

You can add stations, view, edit, and delete them. Before you can add a node, you must add a station for it.

The Agent Station is a NetAct topology object that represents the Q1 Agent itself. You can edit the details of the Q1 Agent station.

In NetAct, the Agent Station reperesents the Q1 Agent itslef. Other stations are added as different objects. The Station SDN determines the location of the object in the topology hierarchy.

The Agent Station and all other stations are shown under the Q1 Agent object in NMS/10.

4.4.1 Adding stations

To add a station to the agent

1. In the header, click the **Stations** link.

   The Add, View, Edit, Delete, and Agent Station links are displayed in the navigation area.

2. In the navigation area, click the **Add** link.

   The **Add Station** view is displayed in the data area.

3. Define the following parameters for the stations:

Table 17. Station parameters

Parameter	Description
Station Number	The number of the station. Q1 Agent gives the next free number as the default value.
Station Name	The descriptive name of the station.
System Distinguished Name	The station's SDN is usually the SDN of the RNC or AXC that is located on the same site as the Q1-managed network elements. For more information about SDN, see the Glossary.

4. Click **Add** to add the station.

   A new **Add Station** view is displayed. You can use this view for adding a new station. Q1 Agent gives the next free number as the default station number.

   Or click the **Reset Form** button if you wish to reset the values to the initial ones.

4.4.2 Viewing stations

To view the stations

1. In the header, click the **Stations** link or, if you have already selected **Stations** in the header, you can click the **View** link in the **Stations** field on the left.

   The **View Stations** table is displayed in the data area. The total number of the stations configured in Q1 Agent is displayed above the table. The table contains the following columns:

Table 18. View Stations

Column	Description
Station Number	The number of the station.
Station Name	The descriptive name of the station.
System Distinguished Name	The station's SDN is usually the SDN of the RNC or AXC that is located on the same site as the Q1-managed network elements. For more information about SDN, see the Glossary.

2. In the **Station Name** column, click a station name.

   The **View Station** view is displayed. It contains the number, name, and the system distinguished name of the selected station. The view contains also the **Edit** and **Delete** buttons which you can use for moving to the corresponding views.

4.4.3 Editing stations

To edit the stations

1. In the header, click the **Stations** link.

   The Add, View, Edit, Delete, and Agent Station links are displayed in the navigation area.

2. In the navigation area, click the **Edit** link.

The **Select Station to Edit** view is displayed in the data area. It contains a list of the configured stations with the same columns as the View Stations table. The total number of the stations configured in Q1 Agent is displayed above the table.

3. Click a station in the **Station Name** column.

   The **Edit Station** view is displayed. It contains the attributes of the selected station. For the attributes, see the View Stations table in Section 4.4.2 ‘Viewing stations’.

4. You can edit the **Station Name** and **System Distinguished Name** parameters.

5. Click **Update** to save the changes.

   Or click the **Reset Form** button if you wish to reset the edited values to the initial values.

4.4.4 Deleting stations

To delete the stations

1. In the header, click the **Stations** link.

   The Add, View, Edit, Delete, and Agent Station links are displayed in the navigation area.

2. In the navigation area, click the **Delete** link.

   The **Select Station to Delete** view is displayed in the data area. It contains a list of the configured stations with the same columns as the View Stations table. The total number of the stations configured in Q1 Agent is displayed above the table.

3. Click a station in the **Station Name** column.

   The **Delete Station** view is displayed. It contains the attributes of the selected station. For the attributes, see the View Stations table in Section 4.4.2 ‘Viewing stations’.

4. Click **Delete** to delete the station.

   If you delete a station that contains nodes, the nodes will be transferred to the Agent Station.

4.4.5 Working with Agent Station

In NetAct, the Agent Station is a NetAct topology object that represents the Q1 Agent itself. You can edit the details of the Q1 Agent station.

In NMS/10, the Agent Station and all other stations are shown under the Q1 Agent object.

To edit the Q1 Agent station

1. In the header, click the **Stations** link.

   The Add, View, Edit, Delete, and Agent Station links are displayed in the navigation area.

2. In the navigation area, click the **Agent Station** link.

   The **Agent Station** view is displayed. It contains the following attributes of the Q1 Agent station:

Table 19. Agent station parameters

Parameter	Description
Station Number	The number of the Q1 Agent station is 0. This is a read-only parameter.
Station Name	The descriptive name of the Q1 Agent station.
System Distinguished Name	The name of a managed object which consists of a sequence of the relative distinguished names of its superiors in the naming tree, starting at the root and working to the managed object to be identified. The default DN of the Q1 Agent Station is PLMN-PLMN/Q1A-1. If there are more than one Q1 Agents, each must have unique SDN. For example, PLMN-PLMN/Q1A-x (x = 1,2,3...)

3. You can edit the **Station Name** and **System Distinguished Name** attributes.

4. Click **Update** to save the changes.

   Or click the **Reset Form** button if you wish to reset the edited values to the initial values.

4.5 Managers

You can define the used Northbound Interface for Q1 Agent by selecting manager capabilities. You can also view and edit information about the managers, and delete the manager capability. The topology manager and fault manager capabilities can be in the same server. Node Managers are usually installed in a separate server.

Fault Manager

Fault Manager is the Network Management System where the Q1 alarm data is forwarded.

The Network Management system (NetAct or NMS/10) must be defined as **Fault Manager** in Q1 Agent. The port used for listening to SNMP requests is 8085.

Topology Manager

Topology Manager is the Network Management System which receives the Q1 network hierarchy or topology from Q1 Agent.

The Network Management System (NetAct or NMS/10) must be defined as **Topology Manager** in Q1 Agent. The topology file transfer mechanism used in Q1 Agent is the NX2S interface defined by Nokia.

Node Manager Server

Node Manager Server is a PC where the Q1 Node Manager applications are installed.

The **Node Manager Server** must be configured in Q1 Agent so that it can update the GCS database on the remote Node Manager Server with all connection details of Q1 network elements configured to the agent. More than one Node Manager Servers can be added in Q1 Agent. Each node in Q1 Agent will be assigned to any one of the Node Manager Servers.

Node Managers installed in a Node Manager Server can be used for configuring network elements through Q1 Agent and, on the other hand, the node information configured in Q1 Agent can be updated in the Node Manager Server database. Adding Node Manager Server as a manager enables the possibility to update the GCS database in the Node Manager Server via the Update Node Manager Server function. See Section 4.3.10 Updating the Node Manager Server database.

4.5.1 Adding managers

You can add managers to Q1 Agent. The managers are used for defining the Northbound Interface for Q1 Agent. The topology manager and fault manager capabilities can be in the same server.

To add a Node Manager Server to the agent

1. Find out:
   - the name of the Node Manager Server
   - the host name or IP address of the Node Manager Server
   - the GCS port number. The default value is 2344.

   For more information, see Section 4.5.2 ‘Viewing managers’.
2. Check that the GCS of the Node Manager Server has no restrictions on remote database access or add the IP address of the Q1 Agent computer to the allowed clients' list. For instructions, see *General Communication Service GCS User Manual,* Section 6.3, ‘Configuring GCS Remote Database Update’.
3. In the header, click the **Managers** link.

   The Add, View, Edit, and Delete links are displayed in the navigation area.
4. In the navigation area, click the **Add** link.

   The **Add Manager** view is displayed in the data area.
5. Select **Node Manager Server**.
6. Click **Continue**.

   The **Manager Attributes** view for adding a Node Manager Server is displayed.
7. Define the following parameters for the Node Manager Server:

Table 20. Node Manager Server attributes

Parameter	Description
Manager	
Manager Name	The name of the Node Manager Server must be unique. The manager name should not contain any of the following characters: **: , = * ? " & _**

Table 20. Node Manager Server attributes (Continued)

Parameter	Description
Host	The host name or IP address of of the Node Manager Server in dotted decimal format.
GCS	
Port Number	The GCS port number can be 0 - 65535. The default value is 2344.

8. Click **Add** to add the manager.

   Or click the **Reset Form** button if you wish to reset the values to the initial ones.

To add a topology manager to the agent

1. In the header, click the **Managers** link.

   The Add, View, Edit, and Delete links are displayed in the navigation area.

2. In the navigation area, click the **Add** link.

   The **Add Manager** view is displayed in the data area.

3. Select **Topology Manager**.

4. Click **Continue**.

   The **Manager Attributes** view for adding a topology manager is displayed.

5. Define the parameters for the topology manager. See the table below.

6. To allow the FTP server polling, click **Polling Enabled**.

7. Click **Add** to add the manager.

   The status of FTP server polling and possible errors in it are displayed in the Polling Status field.

   Or click the **Reset Form** button if you wish to reset the values to the initial ones.

Table 21. Topology manager attributes

Parameter	Description
Manager	
Manager Name	The name of the topology manager must be unique. The manager name cannot contain any of the following characters: **: , = * ? " &**
Host	The host name or IP address of of the topology manager server in dotted decimal format.
FTP	
Agent Identifier	When Q1 Agent is added to NetAct, NetAct generates the global identifier for Q1 Agent. This parameter identifies the NX2S interface for the agent in NetAct. Q1 Agent is added to NMS/10 with a `Selection Name`. Agent Identifier should be same as the `Seletion Name` in NMS/10.
Directory	The directory of the FTP server which contains the NX2S import and export directories polled by Q1 Agent. If you leave this box empty, Q1 Agent uses your default login directory in the FTP server.
User Name	The user name for accessing the FTP server.
Password	The password for accessing the FTP server.
Polling Interval	The rate in seconds for polling the NX2S request file in the FTP server's NX2S export directory.
Polling Enabled	FTP server polling.
Polling Status	The status of the FTP server polling and possible errors in it are displayed in this field after you have added the topology manager to the agent. The status can be: •*Polling* - The FTP server polling is enabled and the agent tries to establish connection to the FTP server. •*Not polling* - The FTP server polling is not enabled. •*Error: <error text>* - An error in the FTP server. *<error text>* displays a detailed error message. The error text should give a hint to resolve the error. Check the FTP server's availability, its IP address, username and password, directory names (the `import/export` directories should exist), and the access rights to the directories and request file. If files with the same name already exist in the NetAct and NMS/10 import directory, then Q1 Agent fails to import files, and instead logs an error message into the log file.

To add a fault manager to the agent

1. In the header, click the **Managers** link.

   The Add, View, Edit, and Delete links are displayed in the navigation area.

2. In the navigation area, click the **Add** link.

   The **Add Manager** view is displayed in the data area.

3. Select **Fault Manager**.

4. Click **Continue**.

   The **Manager Attributes** view for adding a fault manager is displayed.

5. Define the parameters for the fault manager. See the table below.

6. Click **Add** to add the manager.

   Or click the **Reset Form** button if you wish to reset the values to the initial ones.successfully

   Notice that Q1 Agent uses port 8085 for listening to SNMP requests.

Table 22. Fault manager attributes

Parameter	Description
Manager	
Manager Name	The name of the fault manager must be unique. The manager name cannot contain any of the following characters: : , = * ? " &
Host	The host name or IP address of of the fault manager server in dotted decimal format.
SNMP	

Table 22. Fault manager attributes (Continued)

Parameter	Description
Read SNMP Community String	Agent community names serve as a shared password for all the agents belonging to the same community. A community is a group of hosts to which a computer running an agent belongs. Communities are identified by a community name. The SNMP management clients must pass this community name as part of an SNMP request to an agent. With the Read Only access the SNMP management clients can only view the contents of the agent MIBs. They cannot perform any set operations: They can, for example, view the nodes and alarms, but they cannot enable/disable the management status of any nodes and they cannot add/delete nodes. The default value for the Read Community is `public`.
Write SNMP Community String	The Read/Write access gives the SNMP management clients total access to the agent´s MIB. The default value for the Write Community is `private`.
Notification Type	Traps (SNMP v1 and SNMP v2c) refer to different types of the SNMP protocol that is used in communication between an agent and a network management system. Select the notification type: **•v1 Trap** **•v2c Trap** **•None**
Notify SNMP Community String	Q1 Agent sends this information in traps to the fault manager which uses it for identifying the sending subsystem. The default value is Q1.
Capabilities	
Enable Sending PM Traps	A facility to enable or disable sending PM traps. You can tick the check box to enable sending PM traps, un-tick the check box to disable sending PM traps.
Enable Sending IM Traps	A facility to enable or disable sending IM traps. You can tick the check box to enable sending IM traps, un-tick the check box to disable sending PM traps.

4.5.2 Viewing managers

To view a manager

1. In the header, click the **Managers** link or, if you have already selected **Managers** in the header, you can click the **View** link in the **Managers** field on the left.

   The **View Managers** view is displayed in the data area. The total number of the managers configured in Q1 Agent is displayed above the table. The View Managers table contains the following columns:

Table 23. View Managers

Column	Description
Manager Name	The name of the manager.
Host	The host name or IP address of of the Node Manager Server in dotted decimal format.
Node Manager Server	Whether the Node Manager Server is enabled or disabled.
Topology Manager	Whether the topology manager is enabled or disabled.
Fault Manager	Whether the fault manager is enabled or disabled.

2. In the **Manager Name** column, click a manager name.

   The **View Manager** view is displayed. It contains the parameters of the selected manager. For the parameters, see Section 4.5.1 ‘Adding managers’. The view contains also the **Edit** and **Delete** buttons which you can use for moving to the corresponding views.

4.5.3 Editing managers

To edit a manager

1. In the header, click the **Managers** link.

   The Add, View, Edit, and Delete links are displayed in the navigation area.

2. In the navigation area, click the **Edit** link.

   The **Select Manager to Edit** view is displayed in the data area. The total number of the managers configured in Q1 Agent is displayed above the table. The table contains the same columns as the View Managers table. For more information, see Section 4.5.2 ‘Viewing managers’.

3. In the **Manager Name** column, click a manager name.

   The **Edit Manager** view is displayed. It contains the parameters of the selected manager.

4. If you wish to add a manager capability for the selected manager, tick the corresponding box: **Node Manager Server**, **Topology Manager**, or **Fault Manager**.

5. Click **Add**.

The corresponding parameter boxes are displayed in the data area.

6. If you wish to remove a manager capability from the selected manager, check the corresponding box: **Node Manager Server**, **Topology Manager**, or **Fault Manager**.

7. Click **Remove**.

   The corresponding parameter boxes disappear from the data area.

8. You can edit all the other parameters except the name of the manager. For the parameters, see Section 4.5.1 ‘Adding managers’.

9. Click **Update** to save the changes. Or click the **Reset Form** button if you wish to reset the edited values to the initial values.

   The addition or removal of a manager capability becomes valid only after updating the changes.

4.5.4 Deleting managers

To delete a manager

1. In the header, click the **Managers** link.

   The Add, View, Edit, and Delete links are displayed in the navigation area.

2. In the navigation area, click the **Delete** link.

   The **Select Manager to Delete** view is displayed in the data area. The total number of the managers configured in Q1 Agent is displayed above the table. The table contains the same columns as the View Managers table. For the table, see Section 4.5.2 ‘Viewing managers’.

3. In the **Manager Name** column, click a manager name.

   The **Delete Manager** view is displayed. It contains the parameters of the selected manager. For the parameters, see Section 4.5.1 ‘Adding managers’.

4. To delete the manager, click **Delete**.

4.6 Settings

The **Settings** link in the agent header allows you to:

- view the summary of configurations and activities (see Section 4.6.1)
- set preferences (see Section 4.6.2)
- back up agent configurations (see Section 4.6.3)
- view and install the license (see Section 5).

4.6.1 Summary

You can use the **Summary** link to view the Configuration Summary table. This contains the number of the defined buses, nodes, functional entities, node types, stations, and managers.

In the Active Sessions table you can see the user and the last activity time of the active browser sessions.

The Last Activity column contains the used time zone.

4.6.2 Preferences

You can use this view for defining the agent settings. This includes setting:

- alarm limit and alarm cancel limit for disk free space
- displayed date and time format
- time zone
- maximum number of records to be displayed in the data area (to ease navigation)
- number of minutes after which result files are created
- number of minutes after which result files are deleted
- directory where the result files are placed
- directory where the cache files are placed.

Section 4.6.2.1 ‘Defining the agent settings’ below describes how to set these definitions. More details are given in:

- Section 4.6.2.2 ‘Date and time format’
- Section 4.6.2.3 ‘Time zones’
- Section 4.6.2.4 ‘Navigating’

A read-only field ‘Next Result File Creation Time’, which shows the time when the next result file will be created, is displayed in the Q1 Agent time zone format.

4.6.2.1 Defining the agent settings

To define the agent settings

1. In the header, click the **Settings** link.

   The Summary, Preferences, Backup, Schedule Backup, and License links are displayed in the navigation area.

2. Click the **Preferences** link. In the **Alarm Limit** box, give the limit for the free disk space reserved for alarms. The value is given in megabytes. The default value is 50 MB.

   When the disk space is running out and decreases below the given alarm limit, an alarm is sent.

3. In the **Alarm Cancel Limit** box, give the limit after which a cancel for the alarm is sent. The default value is 55 MB.

   When the disk space increases and exceeds the given cancel limit, the alarm is cancelled. The alarm cancel limit must be higher than the alarm limit. If the cancel limit is less than the alarm limit, or if either of the values is 0, the free disk space is not checked.

4. In the **Date Format** box, enter the format for displaying dates in the Q1 Agent computer. The default setting is ISO-8601 which displays the date in the `yyyy-MM-dd` format, where `yyyy` is the year, `MM` the month and `dd` the day. You can also use the `dd.MM.yyyy` format for giving the date. For more about the date and time formats, see Section 4.6.2.2 ‘Date and time format’.

5. In the **Time Format** box, enter the format for displaying time in the Q1 Agent computer. The default setting is ISO-8601 which displays the time in the `HH:mm:ss` format, where `HH` is the hours, `mm` the minutes and `ss` the seconds. For more about the date and time formats, see Section 4.6.2.2 ‘Date and time format’.

6. In the **Time Zone** box, enter the zone used for displaying time in the Q1 Agent computer. The default time used is UTC. You can study the possible time zones that you can enter in this box by clicking the **List of time zone identifiers** link at the bottom of the **Preferences** view. The Time Zones table is displayed. For more about the time zones, refer to Section 4.6.2.3 ‘Time zones’.

7. In the **Records per View** box, enter the maximum number of records you want to display in the data area.

   If the number of records is high, you may prefer to have the data displayed on several pages. This allows you to use the navigation buttons to view the different pages of records. (For more information, see Section 4.6.2.4 ‘Navigating’.)

   Navigation buttons are available only for those result views that display large amounts of data in the data area.

8. In **File Creation Period**, enter the number of minutes after which you want the result files to be created. The minimum value for this parameter is 10 minutes.

   Initially this parameter is set to a default value of 30. As this value is configured at the startup of Q1 Agent, the time at which the files are created will be exactly 30 minutes after the start of Q1 Agent. In case this parameter is changed in between, then the result files can be expected after the set minutes have elapsed from the time of change.

   This parameter cannot be changed when schedule items for PM have been configured in Q1 Agent.

   A file may not be created after an FCP (File Creation Period) has elapsed, in case all counter values of the interval have not been accumulated to be presented in the file.

   If there are more than one schedule items in Q1 Agent and these are configured to run at the same time, it is possible that a result file will have more PM data from one of the schedule items than the others. This depends on how much data could be collected for each schedule item before the FCP could occur.

   If the FCP (File Creation Period) occurs before the entire data relevant to an interval could not be collected, then this interval (counters) information is recorded into the next result file.

9. In **File Storing Period**, enter the number of minutes after which you want a result file to be deleted.

Initially this parameter is set to a default value of 1440 (a day = 24h x 60 min = 1440 min). With the default value, File Deletion Scheduler will run for the first time the next day at the time when Q1 Agent was started. Then onwards it runs every day at the same time. Result files are deleted when the difference between the File Deletion Scheduler run time and the time stamp in the result file name is greater than FSP.

In case this parameter is changed to value P, then the result files will be monitored after the P minutes. (This parameter cannot be changed after the schedule items for PM have been configured in Q1 Agent). The minimum value for this parameter is 10 minutes. A result file can be available at most for (2 x P-1) minutes. This happens when the result file is created just after the File Deletion Scheduler has run.

For example: When Q1 Agent is started (with FSP value as 1440) at 2004:12:15 10:00:00 AM, FSP will run for every 1440 minutes interval. If a file is created at 2004:12:15 11:00:00 AM, then this file will not be deleted when FSP runs at 2004:12:16 10:00:00 AM. It will be deleted the next time when FSP runs at 2004:12:17 10:00:00 AM.

The files which do not conform to the result file naming convention, if found in the Result File Directory, will not be deleted.

10. In **Result File Directory**, enter the directory under which you want the result files to be placed.

    The configured directory is created under the following absolute directory:

    ```
    ..q1agent\dist\www\..
    ```

    For example, if the field contains ‘test’, a new directory is created:

    ```
    ..q1agent\dist\www\test\Result Files\
    ```

    ‘Result Files’ after ‘test’ is appended by the Q1 Agent for better understandability.

    This parameter cannot be changed after the schedule items for PM have been configured in Q1 Agent.

    When this parameter is changed, the files already existing remain in the previous directory. They are not deleted.

    A directory is created only when the first result file is created after the change.

    The FTP server having the virtual directory mapping to the Result File Directory must be updated for the Performance Manager to be able to retrieve the result files.

11. In **Cache File Directory**, enter the directory under which you want the cache files to be placed.

    The configured directory is created under the following absolute directory:

    `..q1agent\data\..`

    For example, if the field contains 'test', a new directory is created, if the directory does not already exist, depending upon the operation being performed (e.g. HW upload / PM counter scan):

    `..q1agent\data\test\Nee Configuration Files\pm\`

    or

    `..q1agent\data\test\Nee Configuration Files\hw\`

    '`Nee Configuration Files\hw`' or '`Nee Configuration Files\pm`' after '`test`' is appended by the Q1 Agent for better understandability.

    This parameter cannot be changed after the schedule items for PM have been configured in Q1 Agent.

    When this parameter is changed, the files already existing remain in the previous directory. They are not deleted.

12. You can use the **Configuration Comment** box for comments. The maximum number of characters is 256.

13. To save the information, click **Update**.

    Or click the **Reset Form** button if you wish to reset the values to the initial ones.

4.6.2.2 Date and time format

In the **Date Format** box of the **Preferences** view, you can enter the format for displaying dates in the Q1 Agent computer. The default setting is ISO-8601 which displays the date in the `yyyy-MM-dd` format, where `yyyy` is the year, `MM` the month, and `dd` the day. You can also use the `dd.MM.yyyy` format for giving the date.

In the **Time Format** box, you can define the format for displaying time in the Q1 Agent computer. The default setting is ISO-8601 which displays the time in the `HH:mm:ss` format, where `HH` is the hours, `mm` the minutes, and `ss` the seconds.

You can also specify the date and time format using a pattern string. In this pattern, all ASCII letters are reserved as pattern letters, which are defined in the following table.

Table 24. Date and time format pattern

Symbol	Description	Presentation	Example
G	era	(text)	AD
y	year	(number)	1966
M	month of a year	(text & number)	July & 07
d	day of a month	(number)	10
h	hour in am/pm (1 ~ 12)	(number)	12
H	hour of a day (0 ~ 23)	(number)	0
m	minute of an hour	(number)	30
s	second of a minute	(number)	55
S	millisecond	(number)	978
E	day of a week	(text)	Tuesday
D	day of a year	(number)	189
F	day of a week in a month	(number)	2 (2nd Wed in July)
w	week of a year	(number)	27
W	week of a month	(number)	2
a	am/pm marker	(text)	PM
k	hour of a day (1 ~ 24)	(number)	24
K	hour in am/pm (0 ~11)	(number)	0
z	time zone	(text)	Pacific Standard Time
'	escape marker for text	(delimiter)	
“	single quote	(literal)	'

The count of the pattern letters determine the used format:

- (text) If there are 4 or more letters in the text, use the full form.
- (text) If there are less than 4 letters in the text, use the short or abbreviated form, if one exists.
- (number) Number means the minimum number of digits. If the number is shorter, it is zero-padded to this lenght. Years are handled specially: If the count of 'y' is 2, the year will be truncated to 2 digits.
- (text & number) If the count is 3 or more, use text; otherwise use number.

Any characters in the pattern that are not in the range of [‘a’...’z’] and [‘A’...’Z’] will be treated as quoted text. For instance, characters like ‘#’ and ‘:’ will appear in the resulting time text even if they are not in single quotes.

Table 25. Examples (U.S. Locale)

Format pattern	Result
"yyyy.MM.dd G ‘at’ hh:mm:ss z"	1966.07.10 AD at 15:08:56 PDT
"EEE, MMM d, "yy"	Wed, July 10, '66

4.6.2.3 Time zones

You can define the time zone used for displaying time in the Q1 Agent computer (in the Active Sessions table of the Q1 Agent startup view, in the Last Activity column of the View Buses, Select Bus to Edit, and Select Bus to Delete tables; in the time stamps of alarms in the View Current Alarms and View Alarm History tables).

The default time used is UTC.

PM (Performance Management) uses system time zone for collecting the performance data, but it uses UTC time zone for MIB-related functionality.

Note

If the system time zone is changed then the Q1 Agent service must be restarted.

You can define your own time zone, using the following syntax:

```
GMT[+|-]hh[[:]mm]
```

For example, `GMT+14:00`.

When you use this syntax for creating your own time zone, daylight saving time is not applied.

Q1 Agent C2.1 supports, however, several local time zones. Click the **List of time zone identifiers** link at the bottom of the **Settings** → **Preferences** view to display a table of the time zones.

You can give the time zone, using the following syntax:

```
Continent/Capital_City
```

For example, with the definition `America/Los_Angeles` you can get the U.S. Pacific Time. The time zone identifiers that correspond to this syntax are listed in the ID column of the table.

4.6.2.4 Navigating

The number of records to be viewed can be configured in the settings page as a configurable parameter. This parameter **Records per View** can be assigned the number of records per view, for example, 30. Then all the views show only 30 records per view.

In order to view the remaining records you can use the navigation buttons.

Table 26. Navigation buttons

Button	Button Label	Description
First	|<<	Navigate to the first set of records.
Previous	<	Navigate to previous set of records.
Next	>	Navigate to next set of records.
Last	>>|	Navigate to the last set of records.

The navigation buttons are enabled if there are more views to be found in the direction pointed by the navigation button. Naturally each button is disabled if there is nothing further to navigate in that direction.

The navigation feature helps you to display a limited number of records in a single view. You can use navigation buttons in each of the views to view the rest of the filtered records.

For example, if you set a filter in such a way that there are more than 100 nodes which satisfy the filter condition, and if you then set the **Records per View** value to 30 records in the **Preferences** view, in that case when you click the **Show** button, 30 filtered records are displayed in the data area with the navigation buttons. To view the next set of 30 nodes, you can click the **Next** button, and to view the last set of nodes, you can click the **Last** button. Similarly, to view the first set of records, click the **First** button, and if you want to view the previous records, click the **Previous** button.

4.6.3 Backups

You can create a backup copy of the active configuration, restore a backup configuration, and delete a backup configuration.

4.6.3.1 Creating a configuration backup

To create a configuration backup

1. In the header, click the **Settings** link.

   The Preferences link and the Backup title are displayed in the navigation area. The Backup title contains the Create, Restore, and Delete links.

2. In the navigation area, click the **Create** link.

   The **Backup Agent Configuration** view is displayed in the data area. The previously created backup folders are listed in the Backup Folders field.

3. In the **Enter the BackUp Folder Name** box, fill in the unique name of the backup folder. The name can contain up to 50 alphanumeric characters, including the underscore (_) and space characters.

4. Click **Backup**.

   Q1 Agent displays the address (the name of the absolute path) where the backup folder has been saved. It also displays the name of the created backup copy and the creation time in the Backup Folder list.

   Or click the **Reset Form** button if you wish to reset the new values to the initial values.

   This BackUp folder contains three files named as follows: `backup.xml`, `counters.dbl`, and `radioflexibusesmap.dbl`, respectively. Performance Configuration data is also saved in the file `counters.dbl`.

4.6.3.2 Restoring a configuration backup

To restore the agent configuration

1. Before restoring the current configuration with the existing backup copy, you should take a backup of the current configuration. This is because Q1 Agent C2.1 clears the current configuration, when a backup is restored. See Section 'Creating a configuration backup'.

2. In the header, click the **Settings** link.

   The Preferences link and the Backup title are displayed in the navigation area. The Backup title contains the Create, Restore, and Delete links.

3. In the navigation area, click the **Restore** link.

The **Restore Agent Configuration** view is displayed in the data area. The created backup folders are listed in the **Backup Folders** field.

4. Select the backup configuration that you wish to restore in the **Select to Restore** column.

5. Click **Restore**.

   The Node, Bus, and Station configurations as well as PM configurations are restored.

   Or:

   Click the **Reset Form** button if you wish to reset the edited values to the initial values.

4.6.3.3 Restoring a configuration backup taken in Q1 Agent C2.0

In Q1 Agent C2.1 it is possible to restore a configuration backup taken in Q1 Agent C2.0.

Source path

The source path of the Q1 Agent C2.0 backup in a Windows 2000 PC is:

```
<Q1Agent Installed Directory>/www/q1/backup
```

Destination path

The destination path of the Q1 Agent C2.1 backup in a Windows 2000 or Windows 2003 PC is:

```
<Q1Agent Installed Directory>/www/q1/backup/
```

To restore a backup from Q1 Agent C2.0 to Q1 Agent C2.1

1. Take a backup of Q1 Agent C2.0.

   The backup will have an .xml file.

2. Install Q1 Agent C2.1.

3. Create a <new folder> in the destination path with the folder name same as the (.xml) file name taken from the source path.

4. Copy manually the .xml file from the source path and copy it in the destination path's newly created folder and rename the .xml file as `backup.xml`.

5. Restore the backup from **Settings** → **Backup** → **Restore** → **<new folder>** in Q1 Agent C2.1.

6. Repeat the steps 3 and 4 for all .xml files in the source path.

4.6.3.4 Deleting a configuration backup

To delete the configuration backup from the agent disk

1. In the header, click the **Settings** link.

   The Preferences link and the Backup title are displayed in the navigation area. The Backup title contains the Create, Restore, and Delete links.

2. In the navigation area, click the **Delete** link.

   The **Delete Configuration Backup** view is displayed in the data area. The created backup folders that are on the agent disk are listed in the Backup Folders field.

3. In the **Delete All** column, check the folder you wish to delete.

4. Click **Delete**.

   Or click the **Reset Form** button if you wish to reset the edited values to the initial values.

4.6.4 Scheduling backups

Q1 Agent allows you to set schedules for automatic backups of configuration data. These schedules are restored automatically across Q1 Agent restarts.

4.6.4.1 Adding schedule to the backup

You can configure scheduled backups. This is done by adding a schedule to the backup.

To add a schedule to the backup

1. In the header, click the **Settings** link.

   The Summary, Preferences, BackUp, ScheduleBackUp, and License titles are displayed in the navigation area. The ScheduleBackUp contains the Add Schedule and View Schedule links.

2. In the navigation area, click the **Add Schedule** link.

   The **Backup Schedule** view is displayed. The view contains parameters for creating a schedule. The parameters that are necessary for configuring a schedule are presented in the following table:

Table 27. Parameters for configuring a scheduled backup

Parameter	Description
Start Date	Start date, that is, the date on which the Backup Schedule should start. Start Date should be on or after the current date (today's date). Select using the calendar beside the Start Date text box.
Stop Date	Stop date, that is, the date on which the Backup Schedule should stop. Stop Date should be after the Start Date. Select using the calendar beside the Stop Date text box.
Hours	Time in hours when the Backup Schedule should start.
Minutes	Time in minutes when the Backup Schedule should start.
Interval	The frequency at which the Backup Schedule should be running. Specified in minutes.
Everyday	Check box to check all the days (selection / de-selection of all other day check boxes).
Monday	Check box to select Monday.
Tuesday	Check box to select Tuesday.
Wednesday	Check box to select Wednesday.
Thursday	Check box to select Thursday.
Friday	Check box to select Friday.
Saturday	Check box to select Saturday.
Sunday	Check box to select Sunday.

3. Enter values for each parameter. All parameters are mandatory.

4. Click **Add to Schedule**.

When the schedule item is successfully created, the **Backup Schedule** view is displayed in the data area with the message “Schedule Item added successfully.”

Note

Backup schedule naming follows the following naming convention: `YYYYMMDD.HHMMSS` (local timestamp is used).

4.6.4.2 Viewing the backup schedule items

To view the backup schedule items

1. In the header, click the **Settings** link.

   The ScheduleBackUp title contains the View Schedule link.

2. Click the **View Schedule** link.

   The following items along with the data are displayed in the data area: Start Date, Stop Date, Start Hour, Start Minute, Interval, and Selected days.

4.6.4.3 Deleting the backup schedule

To delete the backup schedule

1. In the header, click the **Settings** link.
2. In the navigation area, click the **View Schedule** link.

   The configured schedule on the data area is displayed.

3. To delete the schedule, click **Delete Schedule**.

   When the schedule is successfully deleted, the view schedule data area displays the message “Schedule stopped successfully”.

4.7 FM (Fault Management)

Q1 Agent collects fault management data from network elements through remote pollers (DCN Adapter and AXC). The fault management data can be forwarded to an upper-level management system, such as NetAct.

With Q1 Agent you can manage faults by:

- viewing current alarms
- viewing the alarm history
- filtering alarms.

When you add or edit nodes, you can include them in fault management polling. You can also add nodes to Q1 Agent configuration by using the **Network Scan Log** view under the **Add Nodes** link of the user interface.

Q1 Agent alarms in NMS/10

In NMS/10 you can see alarms forwarded by Q1 Agent by selecting 'Current Event List' or 'Historical Event List' popup menu items.

Q1 Agent alarms in NetAct

In NetAct you can see the alarms forwarded by Q1 Agent in Alarm Viewer and Alarm History. The format of the alarm number from Q1 Agent is:

```
8xxx PLMN-PLMN/Q1A-x/Q1N-x/FUE-x/SB-x
```

where:

`Q1A-x` = the agent originating the alarm

`Q1N-x` = the node originating the alarm

`FUE-x` = the functional entity originating the alarm

`SB-x` = the supervision block originating the alarm.

Notice also the following type of alarm:

```
8168 PLMN-PLMN/Q1A-1/Q1P-p80/FUE-0/SB-0 EQUIPMENT DOOR OPEN
```

where:

`Q1P` = the alarm is related to a poller

`p80` = the poller is added to the BUS 80 in Q1 Agent configuration

(`p0` = Agent internal alarm)

4.7.1 Viewing current alarms

You can view the current node alarms sorted by the alarm severity, occurrence time, fault code, or bus number.

To view the current node alarms

1. In the header, click the **FM** link.

   The Current Alarms and Alarm History links are displayed in the navigation area. In the data area, the following items are displayed: Bus, Address, FE, SB, FC filters, the **Show** button, Time Zone, Sort By, Refresh and Refresh icon.

2. In the navigation area, click the **Current Alarms** link.

   The **Current Alarms** view is displayed in the data area.

3. Enter the filter values and click the **Show** button. (See Section 4.11 ‘Filters’.)

   Filtered alarms and navigation buttons are displayed in the data area. (See Section 4.6.2.4 ‘Navigating’.) The Current Alarms table is displayed in the data area. The number of filtered alarms is displayed along with the total number of filtered alarms above and below the table.

4. You can sort the information displayed in the table either by selecting the criterion in the **Sort By** box or clicking the corresponding link of the table titles. The criteria are:

   - Severity
   - Time
   - Fault Code (FC)
   - Bus Number (Bus).

5. You can enter the time zone used in time stamps of alarms in the **Time Zone** box. The default time is UTC. You can define your own time zone, using the following syntax:

   `GMT[+|-]hh[[:]mm]`, for example, `GMT+14:00`.

   If you create your own time zone, daylight saving time is not applied. Q1 Agent C2.1 supports, however, several local time zones. For more information about the time zones, refer to Section 4.6.2.3 ‘Time zones’.

   The time zone settings given in the **Current Alarms** view are valid only as long as this view is open. When you move to some other view and return back to the **Current Alarms** view, the time zone given in Section 4.6.2 ‘Preferences’ is displayed.

6. You can use the **Auto Refresh** box to define the time in seconds after which the alarm table is updated automatically.

7. Click the **Refresh** icon or the **Show** button if you wish to update the view with the given settings.

The table in the **Current Alarms** view includes the following columns:

Table 28. View Current Alarms

Column	Description
Bus	The unique number of the Q1 bus.
Addr	The address of the node.
FE	The functional entity of the node.
SB	The supervision block.
FC	The fault code number.
Severity	The colour of the bell indicates the severity of the alarm: • gray = unclassified • red = critical • orange = major • yellow = minor • blue = warning The unclassified alarms are displayed as ‘major’ in NetAct.
FE Name	The name of the functional entity to which the node belongs. FE Name can sometimes be N/A indicating that the FE name was not set for the node/FE. To avoid such a scenario ensure that the node/FE has valid names before scanning and adding it to Q1 Agent.
Time	The occurrence time of the alarm.
Description	The alarm description.

Address 65534

When there is a loss of connection between a poller and a node, the loss of supervision connection alarm is raised on the 65534 address. Internal alarms on q1 bus (such as configuration error and fault in installation of equipment) are also reported on this bus.

These alarms are shown in NetAct and NMS/10 on the Q1 Agent object and the format is `PLMN-PLMN/Q1A-x/Q1P-pw/FUE-y/SB-z` where `w` represents the bus number in Q1 Agent.

Address 65535

When there is a loss of connection between Q1 Agent and a poller, the loss of supervision connection alarm is raised on the 65535 address with the bus number the same as in Q1 Agent. Also agent internal alarms such as 'Upper alarm limit exceeded' are raised on this address with bus 0.

These alarms are shown in NetAct and NMS/10 on the Q1 Agent object and the format is `PLMN-PLMN/Q1A-x/Q1P-aw/FUE-y/SB-z` where `Q1P` indicates that this alarm is related to poller and `w` represents the bus number in Q1 Agent.

When there is a loss of connection between the Q1 Agent and the poller, the Loss of supervision connection alarm is raised internally by the Q1 Agent within 15 minutes after the poller is disconnected from the network. To receive this alarm within five minutes, set the **BusIdleTimeLimitNormal** property to "false" in the `<Q1Agent Install Directory>\etc\config\ watchdog.properties` file before starting the Q1 Agent service. The alarm appears in Current Alarms.

4.7.2 Viewing alarm history

You can view the alarm history sorted by the event type, alarm severity, occurrence time, fault code, or bus number. The maximum size of the alarm history table is 10000 alarm events.

Caution

When you stop and start Q1 Agent, the alarm history is cleared. Before stopping and starting the agent, make sure you do not lose any important data.

To view the alarm history

1. In the header, click the **FM** link.

   The Current Alarms and Alarm History links are displayed in the navigation area.

2. In the navigation area, click the **Alarm History** link.

   In the data area, the following items are displayed: Bus, Address, FE, SB, MC, Alarm Type filters, the **Show** button, Time Zone, Sort By, Refresh and Refresh icon.

3. Enter or select filter values and click the **Show** button. (See Section 4.11 'Filters'.)

The filtered alarm records and the navigation buttons are displayed in the data area. (See Section ‘Navigating’.) The **Alarm History** view is displayed in the data area. The number of filtered alarms is displayed along with the total number of filtered alarms above and below the table.

4. You can sort the information displayed in the table either by selecting the criterion in the **Sort By** box or clicking the corresponding link of the table titles. The criteria are:

   - Event Type (Type)
   - Severity
   - Time
   - Fault Code (FC)
   - Bus Number (Bus).

5. You can enter the time zone used in time stamps of alarms in the **Time Zone** box. The default time is UTC. You can define your own time zone, using the following syntax:

   `GMT[+|-]hh[[:]mm]`, for example, `GMT+14:00`.

   If you create your own time zone, daylight saving time is not applied. Q1 Agent C2.1 supports, however, several local time zones. For more information about the time zones, refer to Section 4.6.2.3 ‘Time zones’.

6. You can use the **Auto Refresh** box to define the time in seconds after which the alarm table is updated automatically.

7. Click the **Refresh** icon if you wish to update the view with the given settings.

The table in the **Alarm History** view includes the following columns:

Table 29. View Alarm History

Column	Description
Bus	The unique number of the Q1 bus.
Addr	The address of the node.
FE	The functional entity of the node.
SB	The supervision block.
FC	The fault code number.

Table 29. View Alarm History (Continued)

Column	Description
Type	The event type can be: • Alarm • Cancel • Disturbance (= a fault that was active for a short time) • Warning (Only the E generation devices generate warnings which are stored in the alarm history but not displayed in the current alarms.)
Severity	The colour of the bell indicates the severity of the alarm: • gray = unclassified • red = critical • orange = major • yellow = minor • blue = warning The unclassified alarms are displayed as 'major' in NetAct.
FE Name	The name of the functional entity to which the node belongs.
Time	The occurrence time of the alarm.
Description	The alarm description.

4.7.3 Filtering alarms

You can edit Alarm Filtering definitions. An Alarm Filtering definition includes:

- Filter Check
- Expression
- Comment.

Filter Check

The filter can restrict alarms according to the defined expression, when the **Filter Check** option is checked. Both NMS and web browser clients use the alarm filtering functionality.

Filters can be added and modified. These are permanently saved into the Q1 Agent repository and can be accessed later.

When the filter is changed, a cancel alarm is immediately sent to those active alarms which do not satisfy the new filter criteria. The ones that do satisfy the new criteria will remain in Q1 Agent. Similarly, the newly created alarms will be forwarded if they pass the new filter condition.

Expression

A filter definition consists of one or more logical statements that have the following format:

- key = value

Here ‘key’ is BUS, ADDRESS, etc. and ‘value’ is the value that must be fulfilled. Multiple values can be separated with a comma (not alarm types, NE generations, or fault severities). A range of values can be given with a hyphen (-) or comma (,) as a separator. The range of values can be used only with numeric values.

The allowed values are defined for their respective parameters in the table given below.

Table 30. Allowed values in filter definition parameters

Parameter	Allowed values	Key
Bus number	Positive number	BUS
Address	0 - 4094, 65534, 65535	ADDRESS
FE number	0 - 254	FE
SB number	0 - 254	SB
Fault code	0 - 271	FC
Alarm type	ALARM, CANCEL, WARNING, DISTURBANCE	TYPE
NE generation	E, NONE	GENERATION
Fault severity	CRITICAL, MAJOR, MINOR, WARNING, UNCLASSIFIED	SEVERITY

Multiple logical statements can be grouped together using logical operators. Parentheses can be used to group the logical statements.

The following logical operators can be used:

Table 31. Logical operators

Operator	Description
NOT	Logical statement after NOT must be false.
AND	Logical statements on both sides of AND must be true.
OR	Logical statement on either side of OR must be true.

- All operators such as 'or', 'not' and 'and' in the alarm filtering functionality must have space separating them at both the ends and keywords/values.
- Severity status and FE status are not supported for alarm filtering in Q1 Agent.
- Disturbance alarms are not shown in the current alarms. They are shown only in the History Alarms.
- The **Alarm Filter** in the **FM** link does not accept an empty filter condition. Ticking or un-ticking the **Filter** check box makes the filter active or inactive.
- In the Alarm Filter functionality, the expression enclosed in left and right brackets is evaluated first from left to right of the expression.
- Alarms on bus 0 are displayed in the current alarms list irrespective of the filter condition.

Comment

A comment is an ASCII format text description about the filter. The comment is only informative and it can be left empty. It can also be divided into multiple lines. White spaces (space, TAB, etc.) are removed from the beginning and end of the comment text.

Example 1

```
BUS = 1
```

All the alarms raised on BUS 1 will be shown and all other alarms will be discarded.

Example 2

```
NOT BUS = 1
```

Alarms raised on all buses except BUS 1 will be shown and the alarms raised on BUS 1 will be discarded.

Example 3

```
( BUS = 1,3,5-7 AND ADDRESS = 100 OR BUS = 4 ) AND FC = 200
```

The alarm passes the filter if:

a. the bus is 1, 3, 5, 6, or 7 AND the address is 100 AND the fault code is 200

or

b. the bus is 4 AND the fault code is 200.

The filter definition cannot be arbitrarily complex. There is a limit of 200 levels of nesting for the definition. The depth of a filter is the maximum nesting level of the match expressions used in the definition. For example, the depth of the following definition is two:

```
TYPE=ALARM OR FC=15
```

By comparison, the level depth of the following definition is five:

```
NOT ( TYPE=ALARM OR ( TYPE=CANCEL AND FC=5-6 AND BUS=5 ) )
```

The depth can also be defined as the longest path from root to a leaf in the syntax tree. The syntax tree for the above definition is visualized in the following figure.

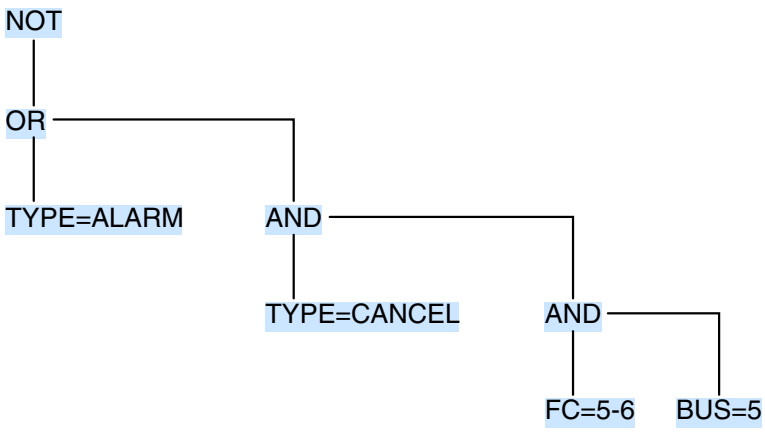

Figure 4. The syntax tree of a filter definition

Alarms that cannot be filtered

Not all alarms can be filtered. Alarms raised on Bus 0 are internal alarms, so they are not applicable for filtering.

4.7.4 Q1 Agent internal fault codes

Q1 Agent forwards fault information to higher level management systems. The fault information contains Fault Code, Fault Text, Address, FE Number, and SB Number. Q1 Agent uses virtual FEs to report the internal faults. The following table describes the internal alarms generated by Q1 Agent.

Table 32. Q1 Agent internal fault codes

Fault Code	Fault Text	Description of the fault code
186	Configuration Error	A remote poller fails to respond to the commands sent to it.
241	Upper alarm limit exceeded	Low disk space.
202	Loss of supervision connection	A bus is stopped due to an error.
267	License expired	The license has expired.
268	License will expire in near future	The license is about to expire.

4.7.5 DCN Adapter internal fault codes

The following table presents the DCN Adapter internal faults as seen in Q1 Agent.

Table 33. DCN Adapter internal faults as seen in Q1 Agent

FE	Fault Code	Description in protocol	Description in Q1 Agent
5	241	Network has too many faults, poller can not provide cancels for all alarm events.	Upper alarm limit exceeded.
6	206	Poll cycle time exceeded.	Congestion.
10	142	FE database overflow, Q1 bus has too many devices.	Fault in installation of equipment.
9	186	Invalid E generation answers, device does not conform to Nokia Q1 specification or transmission error undetected by parity checks.	Configuration Error.
11	128	Faults reserved for poller active in device.	Fault in equipment.
0	200	Loss of primary supervision connection (connection still in secondary connection).	Loss of primary supervision connection.
0	201	Loss of secondary supervision connection.	Loss of secondary supervision connection.
0	202	Loss of supervision connection.	Loss of supervision connection.

4.8 PM (Performance Management)

Q1 Agent C2.1 supports performance data collection from ND generation nodes as well as from E generation nodes. The nodes supported for PM data collection include FIU19, FIU19E, IFUE, FlexiHopper, and MetroHopper. (For the complete list of supported nodes, see Appendix D.)

Q1 Agent also allows collecting performance data from other nodes such as DMR using the Manual Configuration feature.

PM data collection from ND generation nodes

The performance data from ND generation devices is done using menu commands supported by the network elements. In ND generation nodes the `m:8` series of commands are usually used to retrieve the statistics information from the node.

The ND generation nodes have G.821 class counters. Adaptations API [IM Lib] retrieves the counters and Q1 Agent C2.1 executes the commands and maintains the result of the upload into configuration files.

PM data collection from E generation nodes

E generation nodes are the new nodes which support `k` series of commands along with the conventional `m` commands uniformly across all the E generation nodes for node management and control. The PM Adaptations API, a component of [IM Lib], is used to retrieve the information about the counters supported by E generation devices.

Q1 Agent C2.1 collects the performance data by reading from either the 15 minutes history or 24 hour history based on the interval selected.

Example: For reading the PM counter values the following command can be used:

```
k:15,1,SB,FirstMC,LastMC,operation,TimeStamp
```

where:

`Operation`: 1 for 15 minutes history and 2 for 24 hours history.

`Timestamp`: A 64-bit integer presented as decimal ASCII specifying that only measurements more recent than this timestamp are to be returned. This is UTC value. When collecting PM data, Q1 Agent and the poller must be synchronized with time to get the solution working. To synchronize the time between Q1 Agent and the pollers, NTP must be in use (see Section 4.8.2 Synchronizing the time between Q1 Agent and the pollers). 24 hours PM counters will be ready by 00:00:00 UTC. Hence the start time of the schedule should be before 00:00:00 UTC.

4.8.1 Counters collected by Q1 Agent

Q1 Agent collects G.826 counters from E generation nodes. They are TT, AT, ES, SES, EB, BBE and Rx min/max levels.

Q1 Agent collects G.821 counters from ND generation nodes. They are TT, AT, ES, SES and DM.

These counters are explained below.

Background Block Errors (BBE)

Background Block Error (BBE) is an errored block that does not occur within a Severely Errored Second (SES). A block is a group of sequential bits that contain an error checking code. This counter records the number of the BBEs occurred during each time period.

Errored Seconds (ES)

An Errored Second (ES) is a one-second period with one or more errored blocks. A block is a group of sequential bits that contain an error checking code. This counter records the number of ESs during each time period. ESs are not counted during UAS. ES is a sensitive indicator of errors.

Severely Errored Seconds (SES)

A Severely Errored Second (SES) is a one-second period that contains 30% of errored blocks or a signal failure. A signal failure has occurred when the signal is replaced by the Alarm Indication Signal (AIS) during the monitored second. A block is a group of sequential bits that contain an error checking code. A SES is also an ES. This counter records the number of SESs during each time period. SES gives an indication of the proportion of the time when the number of errors has been very large.

Total Time (TT)

The time passed since the last reset of the counter.

Available Time (AT)

AT is the time, when the connection of a certain level has been available. The connection is unavailable when the bit error ratio (BER) in each second is worse than 1*(1/1000) for a period of ten consecutive seconds. If Available Time < Total Time there have been major problems in the connection.

Degraded Minutes

This counter is updated when BER is greater than 1*(1/1000000) during one minute. If there are severely errored seconds during the minute, those seconds are not calculated for the one-minute period. It means that the measured time can be more than one minute.

Errored Block

Errored block (EB) is a block in which one or more bits are in error.

Rx level min

Minimum received signal level.

Rx level max

Maximum received signal level.

Note

For Metrohub, G826 and RX level counters are collected from outdoor units.

4.8.2 Synchronizing the time between Q1 Agent and the pollers

A prerequisite for collecting PM data is that the time between Q1 Agent and the poller are synchronized. This is achieved with the use of NTP.

For synchronizing the clocks, you first need to set up an NTP server so as to synchronize the Q1 Agent PC with an external time source, after which you need to synchronize the time of the DCN Adapter to the NTP server.

To configure Q1 Agent to act as an NTP client

1. Change the server type to NTP:
   - Click **Start** → **Run**. Type `regedit`, and then click **OK**.
   - Locate and then click the following registry subkey: `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Parameters\Type`
   - In the right pane, right-click **Type**, and then click **Modify**.
   - In the Edit Value field, type `NTP` in the Value data box, and then click **OK**.
2. Enable NTP Server:

- Locate and then click the following registry subkey:

  `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpServer`

- In the right pane, right-click **Enabled**, and then click **Modify**.
- In the Edit DWORD Value field, type `1` in the Value data box, and then click **OK**.

3. Specify the time sources:

   - Locate and then click the following registry subkey:

     `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Parameters\NtpServer`

   - In the right pane, right-click **NtpServer**, and then click **Modify**.
   - In the Edit Value field, type `Peers` in the Value data box, and then click **OK**.

     Notice that `Peers` (IP Address of the Windows 2000 Server PC) is a placeholder for a space-delimited list of peers from which your computer obtains time stamps.

4. Quit Registry Editor.
5. At the command prompt, type the following command and press **ENTER**:

   ```
   net stop w32time && net start w32time
   ```

   The Windows Time service is restarted.

To synchronize DCN Adapter to the NTP server

1. In the DCN Adapter enter the following command:

   ```
   # sh time
   ```

   This command shows the current date and time of the DCN Adapter.

2. Compare the current date and time of both the DCN Adapter and the NTP server.

   If the current date and time in DCNA is greater than that in NTP server, then set the time of DCNA to a value equal to that of the NTP server as follows:

   ```
   # set time YYYY-MM-DD hh:mm[:ss]
   ```

3. Enter the following command:

```
# set ntp <NTP Server IP>
```

DCN Adapter is synchronized with the NTP server.

Note

DCN Adapter always displays GMT time. Therefore, make sure the Time Zone in the NTP server is set as GMT.

4.8.3 Overview of the tasks needed for collecting PM data

The following figure illustrates the workflow of the tasks needed for collecting performance data:

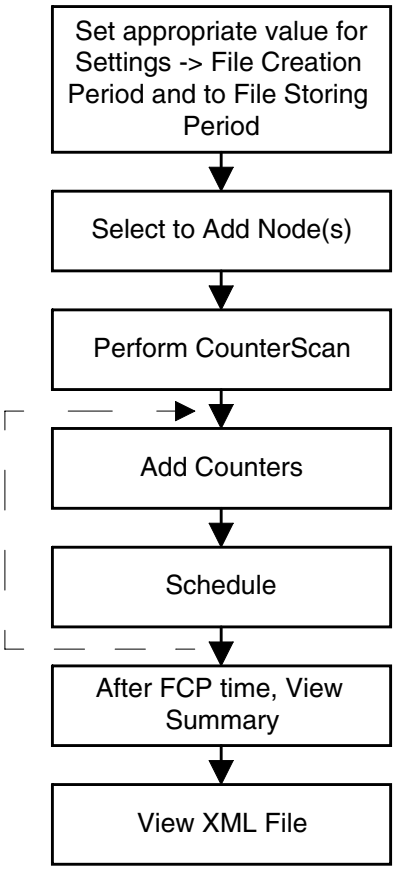

Figure 5. Workflow for Performance Management

Note

For ND generation devices, the data collected for the two intervals just before and after editing the PM job will not contain correct values.

For instructions on how to collect and view performance data, see

- Section 4.8.4 Working with schedule items
- Section 4.8.5 Viewing the summary of PM measurements
- Section 4.8.6 Collecting PM data for E generation nodes when there is a loss of connection to a bus

4.8.4 Working with schedule items

Performance Management in Q1 Agent is handled by means of schedule items. A schedule item is a logical container for all the node counters added for PM data collection. PM data is thus collected from the counters added to a schedule item. You can have several schedule items, since Q1 Agent handles more than one schedule item at a time.

You can create, view, edit, and delete schedule items.

4.8.4.1 Creating schedule items

There are two ways of adding schedule items:

a. See Topic ‘Adding nodes to a schedule item’

b. See Topic ‘Manual configuration of nodes’.

You can add either E or ND generation nodes to a schedule item, but both cannot be added in the same schedule item. For ND generation nodes, all counters of a unit should be added to the same schedule item, that is, counters of the same unit should not be added to different schedule items.

If a schedule item has been added with those nodes or buses which do not respond or with those which do not exist in network, then the result files generated will not contain data from such nodes.

Adding nodes to a schedule item

The link **Add Schedule** under **Schedule Items** displays a list of all the nodes in Q1 Agent based on the filter condition entered. You can add a single or group of nodes to a schedule item.

Before configuring a node for PM using Schedule Item, ensure that the node has a node type. If no node type is present, then you must assign an appropriate node type to it. The node type must not be unknown.

To add nodes to a schedule item

The link **Add Schedule** under **Schedule Items** displays nodes based on the filter condition entered and allows selection of nodes for PM data collection.

1. In the header, click the **PM** link.

   The Add Schedule, View Schedule, Edit Schedule, and Delete Schedule links under Schedule Items as well as the Summary link under Measurements are displayed in the navigation area.

2. In the navigation area, click the **Add Schedule** link.

   The Bus, Address, Type, and Station filters along with the **Show** button are displayed in the data area.

3. Enter appropriate filter criteria and click the **Show** button. (See Section 4.11 ‘Filters’.)

   The following items are displayed in the data area: filters, the **Show** button, the **Overwrite Cache** check box, a list of nodes obtained based on the filter condition, navigation buttons, the **Add Counters** button, the **Manual Configuration** button, and the **Reset Form** button.

   The following table is displayed with each row representing a node detail.

Table 34. Schedule Item Add Parameters

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node, usually zero.
Node Name	The descriptive name of the node.
Station ID	The station number of the node.
Station Name	The station name of the node.
Software ID	The software id of the node.
Type	The node type.
Generation	The identifier of the network element generation. The generation can be ND or E.
Add All	All the nodes can be selected or unselected at a time.

4. Consider whether to tick the **Overwrite Cache** check box or not.

   The Overwrite Cache option is used when the **Add Counters** button is clicked. Retrieving the counters from nodes is a time-consuming operation. Therefore, Q1 Agent stores internally the counters retrieved for each of the nodes.

   If there is a change in the configuration for any of the nodes which were scanned for counters earlier, then you should tick the **Overwrite Cache** check box. The **Overwrite Cache** selection causes the update of cache so as to maintain latest information about the counters supported by each of the selected nodes.

If the configuration of a node which was scanned for counters earlier is used for PM data collection without selecting **Overwrite Cache**, the results can be inappropriate.

For **Manual Configuration of Schedule Items**, this parameter is ignored.

If the node configuration is inconsistent, an error message is displayed when adding that node to a schedule item.

5. Select all the nodes for which you want to retrieve counters values.

   You can tick or un-tick the check box associated with each node at any time before clicking the **Add Counters** button. If you tick the check box, it means you have selected the node.

   If the navigation buttons are enabled, you can use the navigation buttons to view all the nodes and select the appropriate ones. For manual configuration, only one node can be selected.

6. After one or more nodes are selected, click the **Add Counters** button to retrieve counters belonging to the selected nodes.

   Q1 Agent verifies from the node whether the interface is in use when PM counters are scanned from that node.

   Or:

   Click the **Manual Configuration** button to enter the counter information manually for the selected node.

   Or:

   Click the **Reset Form** button to reset the selected values to the initial state.

   The **Reset Form** button can be used to reset the selections only in the current data area. Once you click a navigation button, Q1 Agent saves them temporarily and you cannot reset them. But you can always unselect and click a navigation button to save.

7. Click the **Add Counters** button.

   The **Counter Scan Status** view is displayed. A new link **Status** is created under the **Add Schedule** link in the navigation area.

Viewing the counter scan status

After selecting nodes and clicking the **Add Counters** button you can view the counter retrieval status of the nodes. (See Topic ‘Adding nodes to a schedule item’ above.)

To view the counter scan status

1. Click the **Status** link under Schedule Items in the navigation area.

   The Status link is displayed when the counter scan process is in progress. It remains displayed until any of the following takes place: nodes or buses of currently selected nodes are deleted, the counter scan is stopped, nodes are selected and the **Add Counters** button is clicked again, or Q1 Agent is restarted.

   The finished and unfinished counter retrieval details of the nodes is displayed in the Performance Counter Retrieval Status table. The table contains the following status information of all the nodes. The nodes are grouped and accounted per bus. (See Table 35.)

   Q1 Agent creates and manages cache files created during the counter scan.

   The directory where the cache files are stored is a configurable parameter and is defined by the Nee Configuration Directory parameter in the **Settings** → **Preferences** view.

   If nodes or FEs were modified, the PM cache files are not deleted. The PM cache files are deleted only when nodes or buses were deleted.

2. Click **Refresh** if you wish to see the latest counter retrieval status.

   When the counter retrieval is successfully performed, the **Counters** link is displayed in the navigation area. To view the counters retrieved, see Topic 'Viewing and adding counters to a schedule item' below.

Table 35. Performance Counter Retrieval Status

Column	Description
Bus	The bus number of the node.
Selected	The number of nodes selected for each bus.

Table 35. Performance Counter Retrieval Status (Continued)

Column	Description
Completed	The number of nodes for which counters have been retrieved.
Remaining	The number of nodes for which counters retrieval is still pending or is going on.
Status	The counter retrieval status can be: • *Running* – Indicates that the counter scan is ongoing on one or more of the nodes under the bus. • *Done* – Indicates that the counter retrieval for all the nodes under this bus has been successfully performed. • *Error* – Could happen when an unsupported node is selected, the counter scan was stopped, or one of the buses or nodes which was selected for counter scan was deleted, or if there are network connection problems.

At most 20 buses are scanned at a time for the counter information from the nodes. If more than 20 buses are configured for the counter scan, then 20 buses are randomly selected, and the counter scan is similarly continued for the remaining buses until all the buses are scanned.

Viewing and adding counters to a schedule item

To view and add counters to a schedule item

1. In the header, click the **PM** link.

   The following items are displayed in the navigation area: the Add Schedule, View Schedule, Edit Schedule, and Delete Schedule links under Schedule Items, and the Summary link under Measurements.

2. Click the **Counters** link under the Add Schedule link.

   The Counters link is displayed when the counter retrieval has been successfully completed for the selected nodes. The counters are displayed in the data area along with the following items: Bus, Address, FE, SB, Measurement Type filters, the **Show** button, and navigation buttons.

Table 36. Filter Parameters

Column	Description
Bus	A text box which accepts bus number range (for example: 1-10,12-14).
Address	A text box which accepts node address range (for example: 1-10).
FE	A text box which accepts FE range (for example: 1,10,12).
SB	A text box which accepts SB range (for example: 1-14).
Measurement Type	A list box which contains measurement type entries. Measurement types supported in Q1 Agent are G.821, G.826, and RXLevel. You can select a single value from the list (for example: RXLevel).

3. Select or enter filter values. Then click the **Show** button. (See Section 4.11 'Filters'.)

   The counters corresponding to the filter condition are displayed. (See Section 4.6.2.4 'Navigating').

4. Select the counters by ticking in the check boxes associated with each of the counters.

   All the counters can be selected or deselected by ticking or un-ticking the **Add All** check box.

   For ND generation nodes, a counter cannot be selected to a new schedule item if the same counter has already been added in another schedule item. Q1 Agent displays an error message and lets you choose counters again. Because the counters are read and re-set during the PM data collections, the values retrieved could be inconsistent if two or more schedule items have the same counter.

5. Click the **Continue** button to configure a schedule item.

   The **Schedule Items** view is displayed (see Topic 'Setting the schedule').

Table 37. Counters for nodes

Column	Description
Bus	The bus number of the node.
Address	The Q1 Address of the node.
FE	The functional entity of the node.
SB	The supervision block of the FE.
Unit	The unit to which the counter belongs. This has a value only in case of a DN2 node.
Measurement Type	Measurement type of the counter.
MC Description	Description of the Measurement Code.
Add All	A check box to select or un-select all the check boxes.

Manual configuration of nodes

Schedule items can also be configured manually in Q1 Agent. You can also add unsupported nodes like DMR for Performance Management in Manual Configuration. (The manual configuration feature has been tested with DN2, DM2, DB 2B, and DMR 18-38W only.)

Q1 Agent tries to collect the PM data from the unsupported nodes by applying the PM data collection techniques used with the supported nodes.

To manually add a node to a schedule item

1. In the header, click the **PM** link.

   The Add Schedule, View Schedule, Edit Schedule, and Delete Schedule links under Schedule Items as well as the Summary link under Measurements are displayed in the navigation area.

2. In the navigation area, click the **Add Schedule** link.

   The Bus, Address, Type, and Station filters along with the **Show** button are displayed in the data area.

3. Enter appropriate filter criteria and click the **Show** button. (See Section 4.11 ‘Filters’.)

The following items are displayed in the data area: filters, the **Show** button, the **Overwrite Cache** check box, a list of nodes obtained based on the filter condition, navigation buttons, the **Add Counters** button, the **Manual Configuration** button, and the **Reset Form** button. (See Section 4.6.2.4 ‘Navigating’).

The following table is displayed with each row representing a node detail.

Table 38. Schedule Item Add Parameters

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node, usually zero.
Node Name	The descriptive name of the node.
Station ID	The station number of the node.
Station Name	The station name of the node.
Type	The node type.
Generation	The identifier of the network element generation. The generation can be ND or E.
Add All	All the nodes can be selected or unselected at a time.

4. Select a node and click the **Manual Configuration** button.

The **Add Counter(s) Manually** view is displayed in the data area. The parameters in this page will depend on the generation of the node selected. If the node generation is ND, then FE, Command, and Format parameters are displayed. If the node generation is E, then FE, SB, and MC parameters are displayed.

Table 39. Manual Configuration Parameters

Parameter	Description
FE	FE number to which the PM command needs to be executed.
SB	SB number to which the PM command needs to be executed.

Table 39. Manual Configuration Parameters (Continued)

Parameter	Description
MC	Measurement Code of the counter.
Command	The command used for PM data retrieval, for example: `m:8,1,0` for DMR
Format	The format used for PM data parsing, for example: NDTT for Total Time for an ND generation device.

5. Configure ND generation devices.

   - Enter the following information:
     - **FE** = FE number
     - **Command** = one or more command. For example: `m:8,1,0`
     - **Format** = one or more of the following formats: `NDTT; NDAT; NDES; NDSES; NDDM`.

       The command entered in the command text box is directed to the specified FE. For ND generation devices the FE is usually **0**. For performance counters, `m:8` series of commands are used.

       For nodes like DMR the commands, including the reset command, must be entered together separated by "`;`". In **Format**, more than one formats are separated by "`;`".

       For nodes like DN2, which has multiple nodes, the commands must be entered row after row by clicking the **More** button. **FE**, **Command**, and **Format** must be entered for each of the counter to be retrieved. The last command for a particular unit must be appended with the reset command. The reset command is not associated with any corresponding format. Ensure that the reset command of a unit occurs as the last command to be executed, so that the reset happens only after the counter values have been obtained.

       For examples, see Topic 'Examples of manual configuration of a node' below.

   - Click the **Schedule** button.

     All the entered fields are validated. If the validation is successful, the **Schedule** view is displayed in the data area (see Section 'Setting the schedule').

6. Configure E generation devices.

- Enter the following information:
  - **FE** = FE number
  - **SB** = SB number
  - **MC** = MC number, which determines the type of counter you want to retrieve: **1** = TT, **2** = AT, **3** = ES, **4** = SES, **5** = BBE, **6** = EB, 401 = Rx min, 402 = Rx max.

    For examples, see Topic 'Examples of manual configuration of a node' below.

  The node, FE, SB, and MC should be known before configuring a schedule item manually.

  Unlike for ND generation nodes, no more than one **FE**, **SB**, or **MC** value can be entered in a single text box.

  Counter values are retrieved from either 15 minute history or 24 hour history depending on the interval of the schedule item.

  In case invalid FE, SB, or MC values are entered, an appropriate error message is displayed.

- Click **More** if you want to add more data.

  Clicking the **More** button creates another row for entering data in the **FE**, **SB**, and **MC** fields. Fill in the required information in these fields.

- Click the **Schedule** button.

  All the entered fields are validated. If the validation is successful, the **Schedule** view is displayed in the data area (see Section 'Setting the schedule').

Examples of manual configuration of a node

ND generation:

DMR18-38W nodes:

- The command `m:8,1,0` retrieves counter values, whereas the command `m:8,1,1` is used to reset the PM counters. If all the counter values are required to be fetched then the following values are entered:
  - **FE = 0**
  - **Command** = `m:8,1,0;m:8,1,1`
  - **Format** = `NDTT;NDAT;NDES;NDSES;NDDM`
- The following options can also be entered:

- If only the Total Time counter is to be collected then the **Format** value would be `NDTT` and the **Command** value would be `m:8,1,0;m:8,1,1`
- If only the Available Time counter is to be collected then the **Format** value would be `NDAT` and the **Command** value would be `m:8,1,0;m:8,1,1`

DN2 nodes:

- The FE, Command, Format values are entered in consecutive rows.

  For example:

  FE `0` **Command** `m:8,1,1,3` **Format** `NDTT`

  Click the **More** button.

  FE `0` **Command** `m:8,1,1,4` **Format** `NDAT`

  Click the **More** button.

  FE `0` **Command** `m:8,1,1,5` **Format** `NDES`

  Click the **More** button.

  FE `0` **Command** `m:8,1,1,6` **Format** `NDSES`

  Click the **More** button.

  FE `0` **Command** `m:8,1,1,7;m:8,1,1,1` **Format** `NDDM`

  Notice that the reset command `m:8,1,1,1` should always follow the last command for the counter requested for a particular unit. In the above example the unit number is 1. Similarly the **FE**, **Command** and **Format** can be entered for various units of the node.

- Click the **Schedule** button to schedule the schedule item.

E generation devices:

MetroHub nodes:

- The values **FE = 1**, **SB = 48**, **MC = 1** will result in the following: the Total Time counter value is retrieved for SB 48 and FE 1 from the history.

Setting the schedule

Once you have selected the nodes, counters, and other details for a schedule item either by manual configuration or by counter scan, you can create a schedule when the PM data collection has to take place.

To set the schedule for PM data collection

1. Make sure that the **Schedule** view is open under the **Add Schedule** link.

   This view will open after you have clicked the **Schedule** button in the Add Counters manually page or after you have clicked the **Continue** button in the Add Counters page.

   In this view the statistics of the selected counters and parameters to create a schedule are displayed. The details of the parameters necessary to configure a schedule are presented in the following table:

Note

24h PM data in node is available at 0:00 in UTC time.

Table 40. Schedule Items Schedule view

Parameter	Description
Schedule Name	The name of the schedule. This parameter is optional.
Start Date	Start date, that is, the date on which the PM data collection should start. Start Date should be on or after current date (today's date). Select using the calendar beside the Start Date text box.
Stop Date	Stop date, that is, the date on which the PM data collection should stop. Stop Date should be after Start Date. Select using the calendar beside the Stop Date text box.
Hour	Time in hours when the PM data collection should start.
Minutes	Time in minutes when the PM data collection should start.
Duration	The duration (in minutes) of the schedule item for which the PM data is to be collected. It is a multiple of interval. If the interval is 24 hours, there is no need specify the duration.
Interval	The frequency at which PM data is collected. Valid values are 15 minutes or 24 hours.
Everyday	Check box to check all the days (selection / de-selection of all other day check boxes).
Monday	Check box to select Monday.
Tuesday	Check box to select Tuesday.
Wednesday	Check box to select Wednesday.
Thursday	Check box to select Thursday.

Table 40. Schedule Items Schedule view (Continued)

Parameter	Description
Friday	Check box to select Friday.
Saturday	Check box to select Saturday.
Sunday	Check box to select Sunday.

2. Enter values for each of the parameters. All parameters are mandatory.

   - **Hour** and **Minute** fields are used only for start date, and not for the rest of the days selected. From then on the PM data collection is dependent upon the interval.
   - The day corresponding to **Start Date** should be ticked.
   - If a day beyond the **Stop Date** or **Duration** value is selected, Q1 Agent ignores it. For example, if every day is selected, then only the days which lie between the start date and the stop date, or the duration time, are considered.
   - The **Duration** value should be a multiple of interval. In case of 24 hours history (Interval Value = 24 hours) the Duration value is '0' and it cannot be changed.
   - **Interval** will be shown as drop-down box in which either "15 minutes" or "24 hours" can be selected. If 24 hours is selected, the **Duration** value will set to "0" and **Duration** will be taken as the difference between **Start Date** and **Stop Date**. Based on the **Interval** value, it will be decided whether to read 24-hours history or 15-minutes history.

     When Interval is 15 minutes, the Stop Date or Duration value, whichever is less, is considered. When Interval is 24 hours, only the Stop Date value is considered.

     If Interval is set to 15 minutes, PM data collection can be configured up to a maximum of 1 year duration, that is, up to 525600 minutes. However, if the interval is 24 hours, there is no such limit. PM data is continuously collected.
   - Select the date using the calendar, since entering the value manually could result in an inappropriate format.

3. Click the **Add to Schedule** button.

   When the schedule item is created successfully, the **Schedule Items** view is displayed in the data area with the message "Schedule Item added successfully".

4. PM schedules are automatically saved when the PM job is created. PM data collection continues with the restart of Q1 Agent service and result files are created with the missing data.

   If the Q1 Agent service is stopped for more than 4 hours then, when the service is restarted, PM jobs with 15 minutes interval collect the records for the recent 4 hours (that is, 16 records).

4.8.4.2 Viewing schedule items

You can view the configured schedule items.

To view schedule items

1. In the header, click the **PM** link.

   The following items are displayed in the navigation area: the Add Schedule, View Schedule, Edit Schedule, and Delete Schedule links under Schedule Items, and the Summary link under Measurements.

2. In the navigation area, click the **View Schedule** link.

   The following items are displayed in the data area: **Start Date**, **Stop Date**, **Schedule Name, Duration**, **Interval** filters, the **Show** button, and the schedule data. The **Save** button and the navigation buttons are also displayed. (See Section 4.11 ‘Filters’ and Section 4.6.2.4 ‘Navigating’).

Table 41. Filter Parameters

Column	Description
Start Date	Start date, that is, the date on which the PM data collection should start. The start date should be after the current date (today’s date). Select using the calendar beside the **Start Date** text box.
Stop Date	Stop date, that is, the date on which the PM data collection should stop. The stop date should be after the start date. Select using the calendar beside the **Stop Date** text box.
Schedule Name	The name of the schedule provided by the user.
Duration	A text box that accepts duration in minutes (for example: 15).
Interval	A text box that accepts interval (in minutes).

By default all the schedule items are displayed, unlike in other views, even before entering filter values and clicking the **Show** button.

In this view, range is not accepted in the **Duration** and **Interval** fields of the filter.

Q1 Agent removes those schedule items whose stop date has expired. The removal takes place within an hour after the expiry.

3. In case you want to filter data, select or enter the filter values, then click the **Show** button.

   The filtered schedule item data is displayed in the data area, instead of the entire schedule item data. (See Section 4.11 ‘Filters’ and Section 4.6.2.4 ‘Navigating’).

Table 42. Schedule Items view

Column	Description
Schedule ID	The schedule id of the schedule item.
Schedule Name	The name of the schedule.
Start Date	Start date, that is, the date on which the PM data collection should start. The start date should be after the current date (today’s date). Select using the calendar beside the **Start Date** text box.
Stop Date	Stop date, that is, the date on which the PM data collection should stop. The stop date should be after the start date. Select using the calendar beside the **Stop Date** text box.
Day	The days for which the schedule item was configured.
hh:mm	The hours and minutes at which the schedule item is supposed to start collecting PM data.
Duration	The duration (in minutes) of the schedule item for which the PM data is to be collected. It is a multiple of interval. If the interval is 24 hours, then the duration is 0.
Interval	The interval of the schedule item at which times the PM data is collected.

4. To view the counters for a specific schedule item, click the number under the Schedule Id column in that row. (See Topic ‘Viewing schedule item details’ below.)

Viewing schedule item details

You can view all the counters configured for a schedule item by clicking **Schedule Id** in the **Schedule Items** view under the **View Schedule** link. The following fields are displayed in the data area: Bus Number, Address, FE, FE Name, SB, Measurement Type, and MC Description.

Table 43. Schedule Item View Details

Column	Description
Bus	The bus number of the node.
Address	The Q1 Address of the node.
FE	The functional entity of the node.
FE Name	Descriptive name of the functional entity.
SB	The supervision block of the FE.
Unit	The unit to which the counter belongs. This has a value only in case of a DN2 node.
Measurement Type	Measurement type of the counter.
MC Description	Description of the measurement code.

4.8.4.3 Editing schedule items

Scheduled PM jobs can be edited. You can delete and add nodes from the PM job without deleting the whole PM job.

Adding nodes to the scheduled PM job

You can add newly configured nodes to the PM schedule without any change in the schedule.

To add nodes to the scheduled PM job

1. In the header, click the **PM** link.

   The following items are displayed in the navigation area: the Add Schedule, View Schedule, Edit Schedule, and Delete Schedule links under Schedule Items, and the Summary link under Measurements. In the navigation area, under the title Edit Schedule, the Add and Delete links are displayed.

2. Click the **Add** link in the navigation area.

   The following items are displayed in the data area: Schedule Name, Start Date, Stop Date, Duration, Interval filters, the Show button, and the schedule data.

3. To filter data, select or enter the filter values and click **Show**. The filtered schedule item data is displayed in the data area instead of the entire schedule item data. (See Section 4.11 ‘Filters’ and Section 4.6.2.4 ‘Navigating’).

Table 44. Schedule Items view

Column	Description
Schedule ID	The schedule id of the schedule item.
Schedule Name	The schedule name of the schedule item.
Start Date	Start date, that is, the date on which the PM data collection should start. The start date should be after the current date (today’s date). Select using the calendar beside the **Start Date** text box.
Stop Date	Stop date, that is, the date on which the PM data collection should stop. The stop date should be after the start date. Select using the calendar beside the **Stop Date** text box.
Day	The days for which the schedule item was configured.
hh:mm	The hours and minutes at which the schedule item is supposed to start collecting PM data.
Duration	The duration (in minutes) of the schedule item for which the PM data is to be collected. It is a multiple of interval. If the interval is 24 hours, then the duration is 0.
Interval	The interval of the schedule item at which times the PM data is collected.

4. To add new nodes to the PM job, click on the number in the Schedule ID column.

   The Add nodes page opens. The Bus, Address, Type, and Station filters as well as the Show button are displayed in the data area.

5. Enter the appropriate filter criteria and click **Show**.

   The following items are displayed in the data area: filters, the Show button, the Overwrite Cache check box, a list of nodes obtained based on the filter condition, navigation buttons, the Add Nodes to Schedule Name button and the Reset Form button.

   The following table is displayed with each row representing a node detail:

Table 45. Schedule Item Add Nodes

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node, usually zero.
Node Name	The descriptive name of the node.
Station ID	The station number of the node.
Station Name	The station name of the node.
Software ID	The software ID of the node.
Type	The node type.
Generation	The identifier of the network element generation. The generation can be ND or E.
Add All	All the nodes can be selected or unselected at a time.

6. Optionally, you can check the Overwrite Cache check box.

7. Select the desired nodes to be added to the current PM job and click **Add Nodes to SID-*** (* refers to the selected SID to edit).

   The **Counter Scan** view is displayed.

   Or, to reset the selected values to the initial state, click **Reset Form**. For more information on viewing the Counter Scan Status, see section 4.8.4.1 ‘Creating schedule items’.

8. Wait until the counter scan is completed. When a counters link becomes available, click the link.

9. Select or enter the filter values and click **Show**.

   The counters corresponding to the filter condition are displayed. (See Section 4.11 ‘Filters’ and Section 4.6.2.4 ‘Navigating’).

10. Select the counters by checking the check boxes associated with each counter. To select on deselect all the counters, check or uncheck the Add All check box.

11. Click **Add to Schedule**.

    If the schedule is successfully added, the message “Schedule edited successfully” is displayed. The newly added nodes are shown in the **Scheduled Items** view under the **View Schedule** link.

Deleting nodes from a scheduled PM job

You can delete nodes from the PM schedule without any change in the schedule.

To delete nodes from a scheduled item

1. In the header, click the **PM** link.

   The Add and Delete links are displayed in the navigation area under the title Edit schedule

2. In the navigation area, click the **Delete** link.

   The following items are displayed in the data area: **Start Date**, **Stop Date**, **Duration**, **Interval** filters, the Show button, and the schedule data.

3. In the schedule data, click the schedule number in the Schedule ID column from which the node or nodes are to be deleted.

   The **Edit Schedule Items** view is displayed. The data area displays a table which contains scheduled node details in the particular PM job. The table contains the following columns:

Table 46. Edit Schedule Items View

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node, usually zero.
FE Name	The Functional Entity name of the node.
Node Name	The descriptive name of the node.
Type	The node type.
Station ID	The station number of the node.
Station Name	The station name of the node.
Software ID	The software ID of the node.
NM Server	The Node Manager Server name.
Edit All	All the nodes can be selected or unselected for deletion at a time.

4. Select the node or nodes to be deleted and click **Delete**.

If the node is successfully deleted, the message “Schedule Edited successfully” is displayed.

4.8.4.4 Deleting schedule items

Schedule items can be manually deleted.

To delete a schedule item

1. In the header, click the **PM** link.

   The following items are displayed in the navigation area: the Add Schedule, View Schedule, Edit Schedule, and Delete Schedule links under Schedule Items, and the Summary link under Measurements.

2. In the navigation area, click the **Delete Schedule** link.

   The following items are displayed in the data area: **Start Date**, **Stop Date**, **Schedule Name, Duration**, **Interval** filters, the **Show** button, and the schedule data. (See Section 4.11 ‘Filters’ and Section 4.6.2.4 ‘Navigating’).

Table 47. Filter Parameters

Column	Description
Start Date	Start date, that is, the date on which the PM data collection should start. The start date should be after the current date (today’s date). Select using the calendar beside the **Start Date** text box.
Stop Date	Stop date, that is, the date on which the PM data collection should stop. The stop date should be after the start date. Select using the calendar beside the **Stop Date** text box.
Schedule Name	The name of the schedule provided by the user.
Duration	A text box that accepts duration in minutes (for example: 15).
Interval	A text box that accepts interval (in minutes).

3. In case you want to filter data, enter the filter values, then click the **Show** button.

   The filtered schedule item data is displayed in the data area. You can use the navigation buttons to view all the schedules. (See Section 4.11 ‘Filters’ and Section 4.6.2.4 ‘Navigating’).

Table 48. Delete Schedule Items view

Column	Description
Schedule Id	The schedule Id of the schedule item.
Start Date	Start date, that is, the date on which the PM data collection should start. The start date should be after the current date (today's date). Select using the calendar beside the **Start Date** text box.
Stop Date	Stop date, that is, the date on which the PM data collection should stop. The stop date should be after the start date. Select using the calendar beside the **Stop Date** text box.
Day	The days for which the schedule item was configured.
hh:mm	The hours and minutes at which the schedule item is supposed to collect PM data.
Duration	The duration (in minutes) of the schedule item for which the PM data is to be collected.
Interval	The interval of the schedule item at which times the PM data is collected.
Delete All	A check box to select or un-select all the schedule items for deletion.

4. To select a schedule for deletion, tick the check box associated to the schedule item.

   Or, if you want to select or unselect all schedule items for deletion, tick the **Delete All** check box.

5. Click the **Continue** button.

   A Confirm Schedule Items Deletion view is displayed.

   Or, if you want to re-select schedule items for deletion, click the **Reset Form** button.

6. To confirm the deletion of the selected schedule items, click the **Delete** button.

   The selected schedule items are deleted.

4.8.5 Viewing the summary of PM measurements

You can view the summary of the PM measurements.

To view the summary of PM measurements

1. In the header, click the **PM** link.

   The following items are displayed in the navigation area: the Add Schedule, View Schedule, Edit Schedule, and Delete Schedule links under Schedule Items, and the Summary link under Measurements.

2. In the navigation area, click the **Summary** link.

   The following items are displayed in the data area: File Name, File Size, Date and Last Modified Time along with a list of the PM data result files created.

3. To display the content of a file, click on the name of the file.

   A new browser window opens presenting the data in XML format. The total size of the entire files and the number of files created are also displayed.

   The counters in the result file are grouped according to the protection mode. If the protection mode is single G.826 counters of FlexBus and RxLevel counters of OU are grouped under OU. If the protection mode is 1IU+2OU or 2IU+2OU no grouping is done.

4.8.6 Collecting PM data for E generation nodes when there is a loss of connection to a bus

E generation nodes maintain the history of PM data up to 16 records. This is why it is possible for Q1 Agent to collect PM data from E nodes even for the period when there is a loss of connection to poller bus. By contrast, this is not possible for D/ND generation nodes as they do not maintain the history of PM data.

When an E generation node is configured under a schedule item in Q1 Agent but there is a loss of connection between Q1 Agent and the poller bus under which this node exists, you can ensure PM data collection by following the procedure below.

To collect PM data for E generation nodes when there is a loss of connection to a bus

1. Re-establish a connection between the Q1 Agent and bus where the loss of connection occurred.

After the connection is re-established, Q1 Agent collects PM data for all the node's under this bus for the connection loss period.

2. Set the PM data collection either for (a) 15 minutes interval or (b) for 24 hours.

   a. Set the PM data collection for 15 minutes interval.

      Consider the following:

      - If there is a loss of connection, Q1 Agent stores the time stamp at which the loss of connection happened. After the connection is re-established Q1 Agent sends this time-stamp to get all the records till now and populates all the records.
      - The node will maintain history data of the maximum of 16 records, that is, the maximum of 4 hours data for 15 minutes history.
      - If the loss of connection period exceeds 4 hours, that means the node will clear the oldest history record for 15 minutes, in which case Q1 Agent will not be able to collect this record, and this record will be populated by empty data and the time stamp will be incremented every 15 minutes. From this point on, if the connection is still not established, then for every 15 minutes a record will be populated with empty data and the time stamp will be incremented.

        For example: if the loss of connection is for 6 hours, then the records for the first 2 hours will be populated with empty data and the remaining of 4 hours data will be populated with the data.
      - If there are other nodes under different poller(s) for which there is no loss of connection but which are configured in the same schedule item above, then their data will be stored until the connection is re-established for the poller for which a loss of connection occurred.
      - The result file will not be created for this schedule item until the connection re-establishes, but if the connection-loss period exceeds 4 hours then result file will be created with the oldest record. In such a case the node having the loss of connection with poller will have empty data and the remaining nodes will have the data. The start times in the result files will help you to know the recorded time stamps.

- If the connection is re-established, then the result file created after this will contain all the records for the connection loss period.
- If the loss of connection happens before mid-night (for example at 22:30), and the next day is not selected for PM data collection for this schedule, then if the connection is re-established after 3 hours (at 01:00) then the first 6 records will be populated and the remaining 6 records will be ignored as they fall under the skipped day.

b. Set the PM data collection for 24 hours.

Consider the following:

- If there is a loss of connection, Q1 Agent stores the time stamp at which the loss of connection happened. After the connection is re-established Q1 Agent sends this time-stamp to get all the records till now and populates all the records.
- The node will maintain data of 16 records, which means it will maintain 16 days of data.
- If there is a loss connection to the poller at the time when the schedule for 24 hours is configured to run, then this interval data is collected the next day when the schedule runs. This time the two records will be collected. The result file created after the schedule item has run will contain the two intervals of data.
- If there is a loss of connection above 16 days, then the oldest record will be populated with empty data.
- If the connection-loss period is 4 days, for example, and the day 2 is not selected for PM data collection, then in the result file this 2nd day record will be skipped and the remaining records will be filled with data.

4.9 IM (Inventory Management)

Q1 Agent supports collection of hardware information from ND generation as well as from E generation nodes (see Glossary). The nodes supported for IM data collection include FIU19, FIU19E, IFUE, FlexiHopper, MetroHopper, and MetroHub. (For the complete list of supported nodes, see Appendix E.)

Inventory Management in Q1 Agent is handled by means of a schedule item. A schedule item is a logical container for all the node(s) added for IM data collection. IM data is thus collected from the node(s) added to a schedule item. There can be only one schedule item at a time. You can add node(s), view node(s), change schedule, and delete node(s) from the schedule item.

4.9.1 Adding a schedule item

You can create a schedule item for IM data collection by adding node(s) to a schedule item and scheduling the Inventory Upload.

You can add E or ND or both generation nodes to a schedule item.

The **Add Nodes** view is displayed. This view displays a list of all the nodes in Q1 Agent based on the filter condition entered. You can add a single or a group of nodes to a schedule item.

To add nodes to a schedule item

1. In the header, click the **IM** link.

   The Add, Edit, and Status links are displayed in the navigation area.

   If a schedule item already exists, then the **Add** link will not be displayed. Instead, the **Edit** link should be used to change the schedule, add nodes to the schedule item, and to delete nodes from the schedule item. If you delete all the nodes from the schedule item, then the schedule item will be removed and the **Add** link will appear in the navigation area for adding a schedule item again.

2. In the navigation area, click the **Add** link.

   The Bus, Address, Type, and Station filters along with the **Show** button are displayed in the data area.

3. Enter appropriate filter criteria and click the **Show** button. (See Section 4.11 ‘Filters’.)

   The following items are displayed in the data area: filters, the **Show** button, a list of nodes obtained based on the filter condition, navigation buttons, the **Continue** and the **Reset Form** button.

   The following table is displayed with each row representing a node detail.

Table 49. Schedule Item Add Nodes

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node, usually zero.

Table 49. Schedule Item Add Nodes (Continued)

Column	Description
FE Name	The descriptive name of the node.
Type	The node type.
Station ID	The station number of the node.
Station Name	The station name of the node.
Add All	All the nodes can be selected or unselected at a time.
Software ID	The identifier of the network element software.

4. Select all the nodes for which you want to retrieve the HW information.

   You can tick or un-tick the check box associated with each node at any time before clicking the **Continue** button. If you tick the check box, it means you have selected the node.

   If the navigation buttons are enabled, you can use the navigation buttons to view all the nodes and select the appropriate ones.

5. After one or more nodes are selected, click the **Continue** button to confirm the selection of nodes.

   Or:

   Click the **Reset Form** button to reset the selected values to the initial state.

   The **Reset Form** button can be used to reset the selections only in the current data area. Once you click a navigation button, Q1 Agent saves them temporarily and you cannot reset them. But you can always unselect and click a navigation button to save.

   The selected node(s) are added to the schedule item. The **Schedule Inventory Upload** view is displayed.

To schedule the Inventory Upload

1. After selecting nodes and clicking the **Continue** button in the **Add Nodes** view, you can view the **Schedule Inventory Upload** view.

   The Start Time (hh:mm) and Day drop boxes along with the **Submit** button are displayed in the data area.

2. Select a proper time and day from the drop boxes and click the **Submit** button to schedule the IM process.

Once the node(s) are scheduled for execution the **Add** link is removed and the **Edit IM Configuration** view is displayed. (For more details see Section 4.9.2 'Editing the schedule item'.)

3. To view the status of the upload, click the **Status** link. For more details check the IM Upload Status.

4.9.2 Editing the schedule item

You can add node(s), delete, or change the schedule using the Edit feature.

To edit the schedule item

1. In the header, click the **IM** link.
2. In the navigation area, click the **Edit** link.

   The **Edit IM Configuration** view is displayed.

   If the schedule is already added, then the following items are displayed in the data area: a list of nodes added to the schedule, navigation buttons, the **Continue**, **Add Nodes**, **Change Schedule** and the **Reset Form** buttons are displayed.

   The following table is displayed with each row representing a node detail.

Table 50. Schedule Item Edit Nodes

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node, usually zero.
FE Name	The descriptive name of the node.
Type	The node type.
Station ID	The station number of the node.
Station Name	The station name of the node.
Delete All	All the nodes can be selected or unselected at a time.
Software ID	The identifier of the network element software.

You can now delete nodes, add nodes, and change the schedule. (See the procedures below.)

To delete node(s) from the schedule item

1. Select the node(s) by appropriately checking the check box against each node.

2. Click the **Continue** button.

   The **Confirm Node Deletion** view is displayed. The following items are displayed in the data area: a list of node(s) selected for deletion navigation buttons and the **Delete** button.

   The following table is displayed with each row representing a node detail.

Table 51. Confirm Node Deletion

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node, usually zero.
FE Name	The descriptive name of the node.
Type	The node type.
Station ID	The station number of the node.
Station Name	The station name of the node.
Software ID	The identifier of the network element software.

3. Click the **Delete** button to confirm the deletion process.

Notice that node(s) cannot be deleted if the upload is in progress.

To add node(s) to the schedule item

1. Click the **Add Nodes** button to add node(s) to the existing list of nodes.

   (If the upload is in progress when the **Add Nodes** button is clicked, then the following error message is displayed: “Upload in progress, you cannot add nodes”.)

The **Add Nodes** view will be displayed containing the Bus, Address, Type, and Station filters along with the **Show** button in the data area.

2. Enter the filter criteria and click the **Show** button.

   A list of nodes will be displayed. From this list, nodes can be selected and added to the existing list of nodes with the help of check boxes and navigation buttons.

3. Click the **Continue** button to add the selected nodes to the working set.

   The **Schedule Inventory Upload** view will be displayed from where the schedule can be configured. (For scheduling, see the procedure 'Scheduling the Inventory Upload' in Section 4.9.1.)

To change the schedule

- Click the **Change Schedule** button in the Edit page to reschedule IM upload for the existing nodes.

  (If the upload is in progress when the **Change Schedule** button is clicked, then the following error message is displayed: "Upload in progress, you cannot change schedule".)

  The Schedule Inventory Upload page will be displayed from where the schedule can be configured. (For scheduling, see the procedure 'Scheduling the Inventory Upload' in Section 4.9.1.)

Note

IM result files will be created in the `[Install Folder]Nokia\q1agent\data\q1\hw-xml` folder.

4.9.3 Checking the Inventory Upload status

To check the Inventory Upload status

1. In the header, click the **IM** link.

2. In the navigation area, click the **Status** link.

If no upload is in progress, a message appears saying “No upload in progress”.

If the upload is in progress, the **IM Upload Status** view is displayed.

The following items are displayed in the data area: a table displaying the Upload Status along with the **Refresh** and **Stop** buttons.

In the table each row represents the status of upload process.

Table 52. Schedule Item Upload Status

Column	Description
Bus	The bus number of the node.
Selected	Number of nodes selected for IM under a particular bus.
Completed	Number of nodes whose upload is completed.
Remaining	Number of nodes undergoing upload.
Status	The status of the upload process: Running, Done or Error.

If a node configuration is changed, then that node should be removed from the schedule item. If IM upload fails, the status is shown as an error. All IM result files are deleted when a new IM upload is started.

4.10 NWT (Network Test)

Network Test is a feature that can be used to diagnose Q1 network problems. It works by sending Q1 commands to devices on Q1 bus and reporting the problems and statistics on executing those Q1 commands. The Q1 master normally does retries to hide any problems from the client. Some Q1 command options are defined to stop the master from doing retries for that command and give necessary statistics of the execution of the command to analyze the Q1 bus. The Network Test application uses these options.

The Network Test can be done on exclusively primary channel or secondary channel, or on both channels. Before starting the Network Test you need to configure the options that are used by the Q1 master (poller) while executing the Q1 command.

4.10.1 Setting the Network Test options

To set the Network Test options

1. In the header, click the **NWT** link.

   The **Set Options**, **Add Nodes**, and **Results** links are shown in the navigation area.

2. In the navigation area, click the **Set Options** link.

   The Number of Retries, Q1 Packet Timeout, Testing Options, OK, and Default buttons are displayed in the data area. For more information, see the following details:

   - **Number of Retries**: Q1 Agent sends this option as part of the network test command structure. The Q1 master uses this value to retry the command execution on Q1 Node.
   - **Q1 Packet Timeout (100 ms units)**: This value is used by the Q1 master to wait for the Q1 packet from Q1 Node.
   - **Continuous**: This option runs the network test continuously. Q1 Agent sends the commands and updates the test statistics continuously. The test will be stopped automatically once the number of rounds reaches 10000 or the user can stop the test at any point by clicking Stop Test in the user interface.
   - **Number of Test Rounds**: This option is enabled when the **Continuous** option is disabled. You can specify the number of test rounds between 1 and 10000. The test can be stopped before completing all the test rounds.
   - **Bus number for Network Test**: You need to specify the bus number for which the network test must be done.
   - **Select Channel to be Tested**: You can specify the channel to be tested (Primary or Secondary, or both). The Q1 master uses this option for the execution of the command.
   - **Select Command to be Used**: You can select the command that can be used for the network test. One of the following commands can be selected:
     - `Equipment ID`
     - `QuickPoll`

- `ProgramID`
- `DataTransfer`

The `Equipment ID`, `QuickPoll`, and `ProgramID` are packet commands. `DataTransfer` is the menu command. In this case, you can send your own command, for example - `m: 4,1`

- Menu Command to be Sent: This option is enabled for the `DataTransfer` command only.

3. Enter the appropriate filter criteria and click **OK**, or click **Default** to set the default values.

4.10.2 Adding nodes for the Network Test

To add nodes for the Network Test

1. In the header, click the **NWT** link.

   The Set Options, Add Nodes, and Results links are shown in the navigation area.

2. In the navigation area, click the **Add Nodes** link.

   The Address, Type, Station, and Show buttons are shown in the data area.

3. To filter data, select or enter the filter values and click **Show**.

   Q1 Agent sends the network test command to all the selected nodes and updates the status sent part of the response to this command.

   All the nodes are displayed in a table below the selection criteria. The following table is displayed with each row representing the details of the selected node.

Table 53. Details of the selected node

Column	Description
Bus	The bus number of the node.
Address	A unique identifier of the node in a bus.
FE	The Functional Entity number of the node.
FE Name	The descriptive name of the node.

Table 53. Details of the selected node (Continued)

Column	Description
Type	The node type.
Station ID	The station number of the node.
Station Name	The station name of the node.
Software ID	The software ID of the node.
NM Server	Node Manager Server name.
Test All	All the nodes are selected at a time.

4. Select the nodes in the Test All column. To start the network scan, click **Start Network Test**.

   Or:

   To stop the scan, click **Stop Test**.

   Or:

   For a different choice of the nodes, click **Reset Form**.

4.10.3 Showing the Network Test results

To show the results of the Network Test

1. In the header, click the **NWT** link.
2. In the navigation area, click the **Show** link.
3. The data area contains the following:
   - **Nodes** and the **Show** button:

     To see the results, select the nodes which are under network scan and click **Show**.
   - Statistics

     You can view the network test results for primary or secondary or for both. The Statistics displays counters containing the following:

- **Test/Tests**: The total number of test done so far
- **OK**: The number of times the command was successfully sent
- **Failed**: The number of failures.
  In addition, the descriptions of the failures are shown. The failure descriptions are the following:
  - Wrong address
  - Overflow errors
  - Underflow errors
  - Invalid answer data from slave
  - Packet timeouts
  - Command timeouts
  - Write failures
  - Read failures
  - Packet parity errors
  - Packet format errors
  - Too many packet transactions
  - Packet limit errors
  - Wait limit errors
  - First char timeouts
  - Char parity errors
  - Unknown errors

  The count in the Failed counter should be equal to the sum of the counts in the failure descriptions. You can also start the network test after showing the results.

- Auto Refresh

  To refresh the page and to view the latest statistics of the network scan, enter the duration in seconds.

4.10.4 Saving the Network Test results

To save the results of the Network Test

1. In the header, click the **NWT** link.
2. In the navigation area, click the **Save** link.
3. Enter the name of the file in the text box.
4. Click **Save Report to File**.

   The results can be saved in the following directory as a text file:

```
<Q1 Agent Installed Directory> /www/q1/NWT Reports>
```

4.10.5 Viewing and deleting the Network Test result files

You can view the Network Test result files, after which you can delete the files.

To view and delete the Network Test result files

1. In the header, click the **NWT** link.
2. In the navigation area, click the **View & Delete** link.

   All the saved files are displayed in the table shown below containing the following information:

Table 54. Result file information

Column	Description
File Name	The name of the saved Result file.
Created	The date of creation.
Delete All	All the files can be deleted at a time.

3. To open and to view file, click the file in the table.
4. To delete the files, click **Delete** or click **Reset Form** for a different choice.

4.11 Filters

Q1 Agent allows the use of filters (see Section 4.11.1). Filters help you to minimize the efforts in retrieving data of the desired records (buses, nodes, etc.).

You can also edit the filter definitions (see Section 4.7.3).

4.11.1 Using filters

To use filters

1. Enter the filter criteria.

   The field where the filter criteria is entered is either a text box or a list box, depending on the information type to be filtered. See the table below.

2. Click the **Show** button.

   The records that satisfy the filter criteria are displayed. By default all the records will be shown.

   The filter range can be separated by hyphens '-' or commas ','. For example, the filter value for bus can be entered as **5-10,11**. This will consider all the buses between 5 and 10, including 5 and 11.

The following table presents the filters used in Q1 Agent.

Table 55. Filters

Filter	Range	Field Type	Supports , - (Range)	Description
Bus	0-999999999	List box	Yes	Accepts bus number(s).
Bus Type	AXC, DCNA	List box	No	Allows selection of a type of bus.
Range (Bus View)	0-999999999	Text box	Yes	Accepts bus number(s).
Status (Bus View)	Running, Stopped, Starting, Stopped & Restarting	List box	No	Allows selection of a status of a bus.
Address	0-4093, 65534, 65535	Text box	Yes	Accepts node address number(s).
Type (Node View)	Supported node types (see *Q1 Agent Help*)	List box	No	Allows selection of a node type.
Station	Any positive number (less than 10 digits)	List box	No	Allows selection of a station number.
FM	Enabled, Disabled	List box	No	Allows selection of a FM state.
PM	Enabled, Disabled	List box	No	Allows selection of a PM state.

Table 55. Filters (Continued)

Filter	Range	Field Type	Supports , - (Range)	Description
FE	0-254	Text box	Yes	Accepts FE number(s).
SB	0-254	Text box	Yes	Accepts SB number(s).
Alarm Type	Alarm, Cancel, Disturbance, Warning	List box	No	Allows selection of an alarm type.
Measurement Type	G.826, G.821, RXLevel	List box	No	Allows selection of a measurement type.
Start Date	Any date after the current date selected from the calendar	Text box	No	Populated with a value when you select a date from the calendar.
Stop Date	Any date after the start date selected from the calendar	Text box	No	Populated with a value when you select a date from the calendar.
Duration	15-525600 (minutes), that is, from 15 minutes to 1 year (60x24 x 365 = 525600) for 15 minute interval. If the interval is 24 hours, duration will be zero.	Text box	No	Accepts a duration value in minutes.
Interval	15 minutes, 24 hours	List box	No	Accepts an Interval value.
Schedule Name	Name of the PM schedule present	List Box	No	Accepts a schedule name.

Calendar is a web user interface that displays a calendar and allows selection of a date.

Entering improper values (values not in range) for filters will result in an error condition and the error message is displayed.

In the text boxes where the range can be entered, you can give the range separated by hyphens or commas. For example, applying filter on address range with **1,2,3,4,5,6,7,9 or 1-10,11-20** retrieves all those nodes whose addresses are 1 to 20. This works similarly for all other filters that support range.

Example

This example illustrates how filters are set for the Node view and what kind of data is then displayed.

Table 56. Example of setting filters and values

Filter	Value selected or entered
Bus	1-10,12-16
Address	46-54,88
Type	Hopper19
Station	0
FM	Enabled
PM	Disabled

Once the filter values are entered or selected as presented in the table above, and once the **Show** button is clicked, the results are as follows:

Q1 Agent reads all the filter values and interprets them together as a logical 'AND' operation (Bus = 1-10,12-16 and Address = 46-54,88 and Type = Hopper19, etc). Q1 Agent then displays those node records which satisfy the filter criteria.

Thus, if there is a node in Q1 Agent which, for example, has Bus as 1, Address as 48, Type as Hopper19, Station as 0, FM as Enabled, and PM as Disabled, then this record is displayed, since it meets the filter criteria.

However, if there is a node in Q1 Agent which has Bus as 1, Address as 48, Type as Hopper19, but Station as 1, FM as Enabled, and PM as Disabled, then this record is not displayed, since it does not meet the filter criteria.

4.12 Using the Group Add, Edit, Delete or Update function

In views where group updating or group deleting facility exists (for example in the views Bus(es) Delete, Node(s) Delete, Update Node Manager Server, Update Station, Delete Schedule Items) a check box is provided in the last column of the table. This can be used for selecting or un-selecting a group of records (nodes, buses, etc.) in the view.

Each of the records displayed is associated with a check box in the last column of the table. The selection or de-selection of the records is temporarily saved into Q1 Agent. (See Section 4.6.2.4 ‘Navigating’). The selections are only related to the current Q1 Agent session.

Selections done can be viewed by revisiting the same set of records (that were previously selected or unselected).

Finally, when all the selections are done, you can click the appropriate (**Update**) button for updating the selected records into Q1 Agent, or click the **Continue** button for confirmation to delete.

In the confirmation view, if you decide not to delete, you can click on any of the links in the navigation area. Q1 Agent will ignore the deletion.

4.13 Logging out

To log out of Q1 Agent

- To log out of Q1 Agent, click **Logout** in the header.

  The agent version, title, vendor, version and build details are displayed along with a message of successful logout.

Q1 Agent C2.1 session time-out is 4 hours. When this time is exceeded, the agent logs you out and the login window is displayed. To continue the session you must log in again.

Closing down the session does not affect the agent itself. It continues running as a Windows system service. Use Windows (**Control Panel** → **Administrative Tools** → **Services**) to stop and start the agent.

Caution

When you stop and start Q1 Agent, the alarm history is cleared. Before stopping and starting the agent, make sure you do not lose any important data.

4.14 Help

To access the online help of Q1 Agent, click **Help** in the header.

5 License management

Q1 Agent C2.1 supports feature-based license management for permanent license.

When Q1 Agent is installed, initially a trial license is issued with all the features but with limited functionality: only 10 nodes can be added to IM Upload at a time and the IM upload schedule can be executed only 10 times; after that, IM Upload schedule cannot be executed until a new license is installed.

Note

Installing the license and viewing the existing license needs to be done via Q1 Agent UI. See Section 5.2 ‘Installing license into Q1 Agent C2.1’ and Section 5.3 ‘Viewing the existing license for Q1 Agent C2.1’.

Transferring an existing license from one PC to another is done via License Manager shipped with Q1 Agent. See Section 5.4 ‘Transferring an existing license for Q1 Agent C2.1’.

5.1 License types

Q1 Agent C2.1 supports two types of licenses:

- Time-based license
- Unlimited (permanent) license.

5.1.1 Time-based license

Time-based license is treated the same as trial license and has all features available for the specified number of days.

An alarm with message “License will expire in the near future” will be sent to the manager 30 days before the license expires.

When the license expires, all PM and HW schedule items will be removed from Q1 Agent, and an alarm with the message “License expired” will be sent to the manager.

When the license expires Q1 Agent user interface will show only the Settings, Logout, and Help links in the header.

With the trial license, if the number of allowed runs exceeds 10, then the IM Upload schedule cannot be added even if a time-based license for IM is issued. To get the IM functionality, a permanent license must be issued.

With the time-based license, only 10 nodes can be added for IM Upload and only 10 times schedules can be executed.

When the license expires, topology managers will revert into inactive status andthe polling will be discontinued. After installing the license into Q1 Agent C2.1, the topology managers must be updated.

To update topology managers after installing the license:

1. In the Q1 Agent C2.1 header, click the **Managers** link.

   The Managers page with a list of managers appears in the data area.

2. Click the **Edit** link in the navigation area.

   The Select Manager to Edit page appears.

3. In Select Manager to Edit page, select the topology manager to edit.

   The Edit Manager page is displayed.

4. Check the **Polling Enabled** check box and click the **Update** button.

   Polling is now enabled for the selected manager.

5. If there are more than one topology managers then repeat the above process for each manager.

5.1.2 Unlimited license (Permanent)

With unlimited license, the functionality installed will be permanent.

For this type of license, Q1 Agent C2.1 may have any one of the following features:

a. Fault and Topology Management

b. Fault, Topology and Performance Management

c. Fault, Topology and Inventory Management

d. Fault, Topology, Performance and Inventory Management

5.1.2.1 Fault and Topology Management (a)

When the license with 'Fault and Topology Management' feature is installed (see Section 5.2) into Q1 Agent C2.1, the below links will appear on the GUI of Q1 Agent C2.1:

- Bus
- Nodes
- Stations
- Managers
- Settings
- FM
- NWT
- Logout
- Help

With this license Q1 Agent C2.1 will not have the functionality for Performance Management and Inventory Management (IM Upload).

5.1.2.2 Fault, Topology and Performance Management (b)

When the license with 'Fault, Topology and Performance Management' feature is installed (see Section 5.2) into Q1 Agent C2.1, the below links will appear on the GUI of Q1 Agent C2.1:

- Bus
- Nodes
- Stations
- Managers
- Settings
- FM
- PM

- NWT
- Logout
- Help

With this license Q1 Agent C2.1 will not have the functionality for Inventory Management (IM Upload).

5.1.2.3 Fault, Topology and Inventory Management (c)

When the license with 'Fault, Topology and Inventory Management' feature is installed (see Section 5.2) into Q1 Agent C2.1, the below links will appear on the GUI of Q1 Agent C2.1:

- Bus
- Nodes
- Stations
- Managers
- Settings
- FM
- IM
- NWT
- Logout
- Help

With this license Q1 Agent C2.1 will not have the functionality for Performance Management.

5.1.2.4 Fault, Topology, Performance and Inventory Management (d)

When the license with 'Fault, Topology, Performance and Inventory Management' feature is installed (see Section 5.2) into Q1 Agent C2.1, the below links will appear on the GUI of Q1 Agent C2.1:

- Bus
- Nodes
- Stations
- Managers
- Settings

- FM
- PM
- IM
- NWT
- Logout
- Help

With this license Q1 Agent C2.1 will have all the available functionality.

5.2 Installing license into Q1 Agent C2.1

Before installing the license, notice the following:

- If the license of type (c) is installed on the license of type (b), then the Performance Management feature will get expired and all the schedules for PM will be removed.
- If the license of type (b) is installed on the license of type (c), then the Inventory Management feature will get expired and all the schedules for IM will be removed.
- If the license of type (a) is installed on the license of type either (b), (c) or (d), then the Inventory Management and Performance Management features will get expired and all the schedules for PM/ IM will be removed.
- If Q1 Agent has a temporary license with schedules configured for PM and IM, and a new license with FM+TM+PM+HW features is issued before the expiry of the current license, then the existing PM and IM schedules are not removed.

To install Q1 Agent C2.1 license

1. In the Q1 Agent UI header click the **Settings** link.
2. In the navigation area under License, click the **Install** link.

   The Install License page appears in data area. It contains the following items: Product Q1 Agent C2.1, Site Code, the Site Key text box, and the **Install New License button.** In addition the following message is displayed on the top of the page:

"To get your license, please contact Nokia Customer Services and quote the following site code. Customer services will supply a corresponding site key."

Nokia will supply a Site Key for this Site Code. This Site Key has to be entered into Site Key field of the Install License page.

3. Click the **Install New License** button.

   On successful installation a message "License set successfully!" is displayed.

   If the installation was not successful, then an error message "License updation failed!" will be displayed.

5.3 Viewing the existing license for Q1 Agent C2.1

To view the existing Q1 Agent C2.1 license

1. In the Q1 Agent UI header click the **Settings** link.

2. In the navigation area under License, click the **View** link.

   The License Details page appears in data area. It contains the following information:

   For example:

   Product: Q1 Agent C2.1

   Authorisation Status: PERMANENT LICENSE

   Authorisation Date: 2004-09-30 11:24:50 UTC

   Features Licensed: Fault, Topology, Performance and Inventory Management

5.4 Transferring an existing license for Q1 Agent C2.1

To transfer an existing Q1 Agent C2.1 license

1. Install the Q1 Agent C2.1 software to the target PC.
2. Insert a floppy disk containing NMS/10 Licence Manager in the target PC and run NMS/10 Licence Manager.
3. In NMS/10 Licence Manager, select the product the license of which you wish to manage by using the drop-down combo box.
4. Press the **Licence In** push button. The Licence Transfer dialog will be displayed.

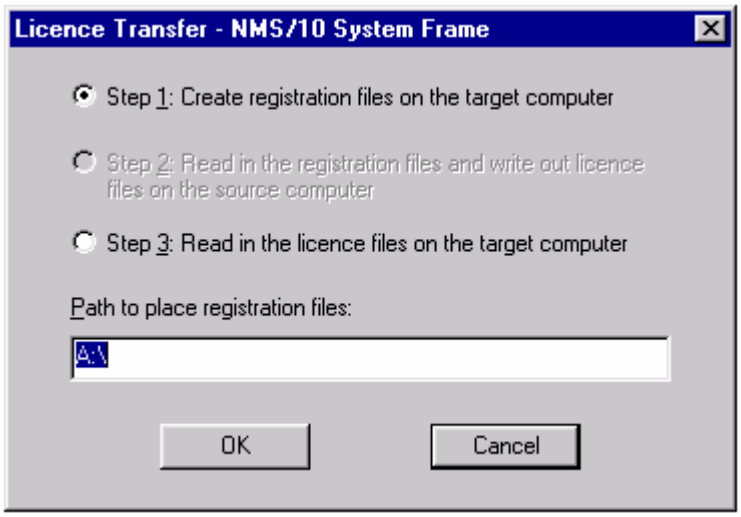

Figure 6. Licence Transfer dialog - Step 1 selected

5. In the Licence Transfer dialog, select **Step 1** and click **OK**.
6. Move the floppy disk to the source PC which has the existing license and run NMS/10 Licence Manager.
7. Select the same product the license of which you wish to manage by using the drop-down combo box.
8. Press the **License Out** push button. The Licence Transfer dialog will be displayed.

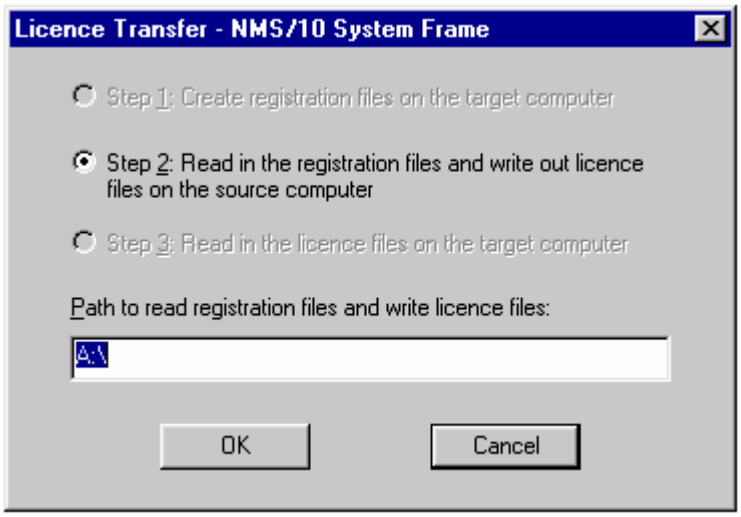

Figure 7. Licence Transfer dialog - Step 2 selected

9. In the Licence Transfer dialog, select **Step 2** and click **OK**.

10. Move the disk (which now contains the license) back to the target PC which was used to create the registration imprint file. (The disk containing the license will not transfer the license to any other PC.)

Caution

After you read the registration file and wrote the license imprint file (see Figure 7 ‘Licence Transfer dialog - Step 2 selected’), the source PC no longer has a license if originally the source PC had only one copy of the license. The only way to continue using the software is to transfer the license to the target PC which wrote the registration imprint file. If you decide to keep the license on the source PC after you have written the licence imprint file, you must complete the transfer to the target PC and then repeat the transfer process to return the license to the original PC. Do not lose or damage the disk containing the license imprint before the license transfer is completed since the original license now resides on the disk.

11. Run NMS/10 Licence Manager again on the target PC.

12. Select the same product the license of which you wish to manage by using the drop-down combo box.

13. Press the **Licence In** push button. The Licence Transfer dialog will be displayed.

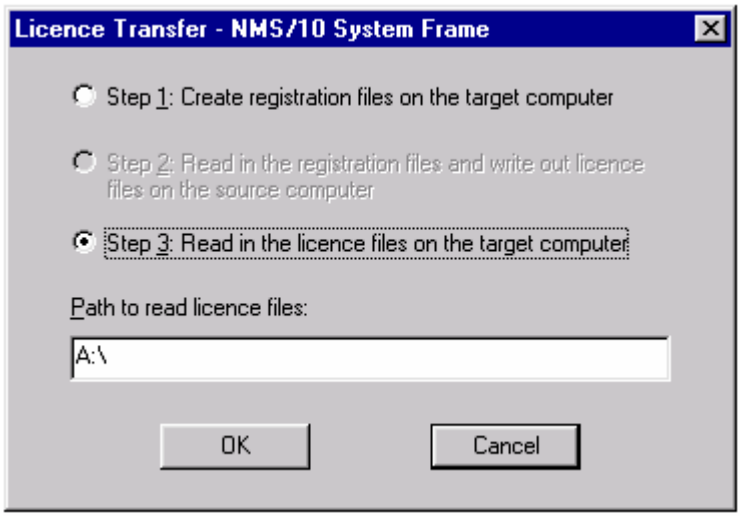

Figure 8. Licence Transfer dialog - Step 3 selected

14. In the Licence Transfer dialog, select **Step 3** and click **OK**.

    The license is now transferred from the disk to the target PC.

15. Run the Q1 Agent software on the target PC. The source PC will still have the software installed, but its license copies will be reduced by one.

6 Troubleshooting

This chapter describes how to overcome problems you may face.

For further information about the possible problems, refer to the computer's Event Log or the Q1 Agent log files.

6.1 Problems at installation and startup

Table 57. Troubleshooting: installation and startup

Problem	Reason	Solution
The Q1 Agent installation fails.	The prerequisites were not met.	Make sure your PC meets the software and hardware requirements as described in Chapter 3.1.
Q1 Agent fails to start.	Java (TM) 2 runtime environment is not installed or you have a wrong version of it.	Check that you have installed the correct version of Java (TM) 2 runtime environment.

6.2 Problems when working with Q1 Agent

Table 58. Troubleshooting: working with Q1 Agent

Problem	Solution
Some of the buttons are not displayed and the following message appears in the view: `You do not have appropriate privileges to ....`	Check that you have the administrator rights. For more information, see Section 3.2.3‘Adding users to the Q1 Agent user groups’.
When updating the Node Manager Server, the following kind of error message is displayed in the Status column of the Update Node Manager Server view: `(FAILED "Q1A1023346812365" (REASON "Failure in target syntax, check parameter names and values") (TARGET "" (TARGETID "Q1A@192.168.201.12")))` This may happen when the updated nodes are on a bus which has a large bus number and the Node Manager Server has an old GCS version.	Upgrade GCS (Nokia's General Communication Service).
No alarms are received from a faulty node.	Check that the node generation is correct. (See Section 4.3.3 ‘Viewing node and FE details’). If a D/ND generation node has been defined as an E generation node, the node cannot answer the polling commands and therefore does not send alarms. If an E generation node has been defined as a D/ND node, the new features of the E generation nodes do not work.

Table 58. Troubleshooting: working with Q1 Agent (Continued)

Problem	Solution
When updating the Node Manager Server, you receive the following kind of error message in the Status column of the Update Node Manager Server view: `(FAILED "Q1A1035562594752" (REASON "Unable to open GCS R4.1 database, because the database file (Dbs.mdb) is missing or ODBC DSN DBS32 is not set to the database.") (TARGET ""))` This may happen if something (such as PDH or SDH node managers) has been installed to the Node Manager Server after the GCS was installed.	Reinstall GCS (Nokia's General Communication Service).
Q1 Agent logs you out.	The Q1 Agent session time-out is 4 hours after which the agent logs you out. To continue the session you must log in.
PM data is not available.	The node is not connected to the network. Check that DCNA is running UTC time and NTP is configured.

6.3 Problems in using the web user interface of Q1 Agent

Table 59. Troubleshooting: using the web user interface of Q1 Agent C2.1

Problem	Reason	Solution
Clicking the **Back**, **Forward** and **Refresh** button on Internet Explorer results in a message asking the user to retry getting data or it gives a message that the page has expired.	The **Back**, **Forward** and **Refresh** button on Internet Explorer may not work properly with the Q1 Agent web user interface.	Instead of using the **Back**, **Forward** and **Refresh** button on Internet Explorer, use the links in the navigation area of Q1 Agent C2.1.
The check boxes or buttons do not respond to the user actions.	Java Script in Internet Explorer 6.0 is not enabled.	Enable Java Script in IE 6.0 by selecting **Tools** → **Internet Options** → **Security** → **Internet** → **Security Settings** → **Scripting** → **Enable Active Scripting and Java Applets**.

Table 59. Troubleshooting: using the web user interface of Q1 Agent C2.1

Problem	Reason	Solution
The indexing functionality of *Q1 Agent C2.1 Help* does not work.	Internet Explorer 6.0 Service Pack 1 is not installed.	Install Internet Explorer 6.0 Service Pack 1.
In views such as Backup, Restore, Schedule Item Summary, clicking the file names may take a long time to process and then finally Internet Explorer ends up in a non-responding state.	Opening XML files whose size is greater than 1.5 MB on the Q1 Agent PC may crash the IE browser.	Avoid opening large XML files on the Q1 Agent PC.
A new Internet Explorer window is created using the Internet Explorer that is already in use to access Q1 Agent on the same PC. This may result in access difficulties.	If both of the Internet Explorers are simultaneously used to access and modify the same Q1 Agent then it may lead to concurrent access exceptions. A new Internet Explorer window is created using the Internet Explorer that is already in use to access Q1 Agent on the same PC.	Avoid using multiple Internet Explorer windows on the same Q1 Agent session.

6.4 Problems at the topology database upload

Table 60. Troubleshooting: topology database upload

Problem	Reason	Solution
The topology upload fails with an error log message about CORBA exception (and no error log is found for the `x2stupmx` process). For example: `Error Message: An undefined CORBA related exception has occured`	The CORBA communication is not working correctly.	Perform the tasks described below.

To overcome problems with topology database upload

1. Check the naming service entries by using the following script:

   ```
   netact_start.pl tpa/tpaons -- nsconfmx list -r
   ```

2. Start the dispatcher manually by executing the following command:

```
netact_start.pl uma/umagen/gendsp -vc vc_gendsp --
aupdspmx -d -t -to
```

3. In case the topology uploader entry is missing in the naming service, use the following script:

```
netact_start.pl uma/umatkt/tktcif -vc vc_nx2s --
registerNX2SUploader.sh
```

If the problem persists, execute the following optional commands:

Optional commands to overcome problems with topology database upload

1. Enable the tracing mode for dispatcher by executing the following command:

```
netact_start.pl uma/umagen/gendsp -vc vc_gendsp --
configure_corba.sh -   configure -trace
```

2. Disable the tracing mode for dispatcher by executing the following command:

```
netact_start.pl uma/umagen/gendsp -vc vc_gendsp --
configure_corba.sh -configure
```

7 Reference

This chapter describes:

- contents of the Q1 Agent CD-ROM
- Q1 Agent C2.1 file structure.

7.1 Q1 Agent CD-ROM

The CD-ROM delivered with the Q1 Agent contains the following items:

- Q1 Agent installation file: `Q1AgentSetup.exe`
- Java (TM) runtime environment installation file:

  `j2re-1_4_2-windows-i586.exe`
- Q1 Agent `readme.txt`
- User documentation
- Adobe Acrobat Reader
- Software copyright disclaimer
- GCS R4.2 Service Pack 3.

7.2 Q1 Agent directory structure

The following directory structure will be created in the path provided during installation. By default the installation path is set to `C:\Program Files\Nokia\Q1Agent`.

Table 61. Q1 Agent directory structure

Directory	Description
`Q1Agent`	Installation directory root
`Q1Agent\app`	Java applications
`Q1Agent\bin`	Windows applications
`Q1Agent\data`	Main data directory. Notice that this directory is not automatically removed at uninstallation.
`Q1Agent\www\backup`	Backups
`Q1Agent\data\q1`	Database
`Q1Agent\etc` and subdirectories	Configuration files
`Q1Agent\etc\license`	Software license agreement text files.
`Q1Agent\lib`	Java applications
`Q1Agent\logs`	Log files. Notice that these files are not automatically removed at uninstallation.
`Q1Agent\templates` and subdirectories	Dynamic web pages
`Q1Agent\www` and subdirectories	Static web pages

Appendix A. Q1 bus parameters

This appendix gives detailed information on the Q1 bus parameters.

A.1 Remote poller parameters

A.1.1 Host-specific parameters

Host Name or IP Address

This parameter specifies the host where the remote poller is running. You can give either the host name or the IPv4 address in dotted decimal format.

Port Number

This parameter specifies the TCP port that the remote poller is listening to for incoming connections. The default port is 27500.

User Name

This parameter specifies the user name to be used when establishing connection to the management pipe server.

Password

This parameter specifies the password to be used when establishing connection to the management pipe server.

A.1.2 Bus-specific parameters

Poller Bus Number

This parameter specifies the number of the Q1 bus in the poller host. Notice that the bus numbering in the poller host is independent of the bus numbering in Q1 Agent. This parameter is not used with a remote poller supporting only one Q1 bus (for example, AXC).

Serial Channel Speed

This parameter specifies the communication speed in bits per second on the Q1 bus.

The Serial Channel Speed value must be the same as given in the node.

A.1.3 DCN Adapter-specific parameters

Secondary Channel in Use

This parameter specifies the use of Protected Mode for the Q1 buses. (Checking this does not make the bus protected, if the DCNA does not have protected cables.)

Switch Delay for Polling

This parameter specifies minimum delay after switching direction.

Switch Delay for Pipe

This parameter specifies minimum delay after switching direction.

A.2 Command execution parameters

Execution of the Nokia Q1 commands can be controlled with various parameters. The parameters can be classified as:

- limits
- timouts
- delays
- network elements
- cycle parameters

The command execution parameters can be specified separately for fault polling and commands passed through the remote poller. This way you can give smaller timeouts and retry counts for fault polling which tolerates occasional command failures, whereas command execution, for example, for element manager sessions should be very reliable.

The timeouts and delays are given in milliseconds, but the actual resolution available in the implementation might not be as accurate. Implementations should round the values up according to the supported resolution.

The timeouts and limits can be viewed as parameters specifying tolerance for transient failures. Long timeouts and large limits slow down recovery from non-transient failures. That is why you should use as short as possible timeouts and as small as possible limits. You can use the delays as troubleshooting aids, but as they slow down the operation, minimize their use.

A.2.1 Limits

Retry Count

This parameter specifies the maximum number of command retries. The exact retry mechanism varies depending on the command in question but is more or less equivalent to command packet retransmission. Value zero allows no retries, value one allows one retry and so on.

The retry count is reset if a command is transferred to another serial channel, but it is not reset, for example, after a successful retry; that is, the retry count does not specify the maximum count of consecutive retries but instead the total maximum of retries per serial channel.

For optimized operation, the retry count should vary according to the application's needs. For example, fault polling probably works quite well with 1 or 2 retries, whereas long data transfer (the element manager traffic) should probably use a larger retry count. The Q1 bus testing should use zero retry count and so on.

This parameter can be increased for better tolerance of failures. However, large retry count slows down detection of disconnected NEs. The default retry count for fault polling is 1. For commands passed through the fault poller, the default retry count is 3.

Packet Limit

This parameter specifies the limit for the transmit/receive transactions of the Q1 protocol packets. It is provided as an alternative or a complement to the command timeout and the empty packet limit for aborting a command iteration.

The limit is checked against the number of transmitted command packets. Value 1 requires that a command completes after one command packet has been transmitted (and one answer packet has been received), value 2 allows two packet transactions and so on.

The default value for this parameter is 1000.

The value should allow at least the minimum number of packet transactions required for succesful command execution. If, for example, 1K data transfer payload is sent to an element, and the default datalink packet size is used, the minimum theoretical packet count is 74 (1024/14). With a few empty answer packets and retries a more reasonable lower limit for this parameter would be 100.

The maximum value is 100000, although in practice values larger than 1000 - 2000 should not be needed.

Empty Packet Limit

This parameter specifies the criterion for aborting a data transfer command if the slave sends an excessive number of empty data transfer answer packets. Value 1 aborts command execution when only one empty answer packet has been received, value 2 when two empty packets have been received and so on.

The count is reset if the command is run to another serial channel, but the count is not reset, for example, upon reception of a non-empty answer packet; that is, it does not specify the limit for consecutive empty answer packets but instead the total limit per serial channel.

The default value for this parameter is 200. This is normally sufficient, but sometimes the required empty reply limit can be quite large. For example, when there are TMS Adapters on the bus, an empty reply limit of several hundreds might be needed. If the empty packet delay is small, it is likely that a larger empty packet limit is needed. The maximum value is 100000, although in practice values larger than 1000 - 2000 should not be needed.

A.2.2 Timouts

First Character Timeout

The first character timeout is the maximum lenght of time that is allowed to elapse between transmitting a Q1 protocol command packet and receiving the first character of the answer packet from the Q1 slave.

This timeout specifies the processing time allowed for the Q1 slave to construct the answer packet. The timeout should be measured from the end of the command packet transmission to the first indication that the Q1 slave is going to respond (that is, the start bit of the first received character). However, depending on the Q1 master implementation, the actual time can be measured as follows:

FROM:

- the start of the command packet transmission or
- the end of the command packet transmission

TO:

- the start bit of the first character of the answer packet
- the stop bit of the first character of the answer packet.

Serial driver implementations usually allow only detection of the character stop bit, but the difference is relevant only with very low bit rates. For example, with 300 bps the duration of one Q1 protocol character is approximately 37 milliseconds. The most probable implementation follows the illustration in the figure below. As serial drivers rarely allow detection of the transmission end, the transmission end is usually estimated from the transmission start, the command packet length, and the serial speed. The accuracy of this estimate is usually quite acceptable.

The Q1 protocol specifies the default timeout to be 200 ms, but this might need to be increased depending on the Q1 bus configuration and the NE response times.

Inter-character Timeout

This parameter allows you to give a tighter timeout for character reception after the first answer packet character has been received. The most probable implementation measures this time from stop bit to stop bit of consecutively received characters. In principle, the time should be measured from stop bit to start bit, but this is feasible only with hardware support for idle time detection of a serial line.

The default value is 100 ms. Usually this is sufficient as characters of a single packet are normally transmitted more or less back to back. However, the serial driver implementations and special Q1 bus structures might require increasing this value. If the Q1 bus contains TMS Branching Units (TU 21743.00/.01) used for speed conversion, there can be significant delay between characters of a single packet.

Command Timeout

This parameter specifies the maximum duration for Q1 command iteration. The timeout is measured from the start of the transmission of the first command packet, and the command iteration is aborted if the command is not complete when the timeout occurs. The default value is 0, meaning that there is no command timeout.

This parameter is provided as an alternative or a complement to the empty packet limit and the packet limit parameters for terminating a command iteration. A typical value for this parameter, when used, can be quite large (up to a minute or more, for example, when there are TMS Adapters on the bus).

A.2.3 Delays

Inter-packet Delay

This parameter specifies the minimum delay between two Q1 protocol packets. The parameter can be used to prevent too frequent transmissions.

The inter-packet delay can be necessary on the Q1 buses that have several links connected in various ways.

For example, if speed conversion with branching units is used to connect elements with lower speed to a bus whose master is operating at higher speed, the buffers in the branching unit can overflow if the inter-packet delay is not used to control the transmission frequency. Also, if some elements are directly connected and some are behind a transmission path that causes delay, it is recommended to use the inter-packet delay to ensure that all elements have processed the current command packet before the transmission of the next command packet.

The inter-packet delay can be necessary also with some old network elements.

The inter-packet delay provides a "moment of silence" on a Q1 bus. The Q1 buses are often arranged in such a way that slave answer transmissions can be received by other slaves. That is why the time should be measured either relative to the master command transmission when no slave answer is detected, or relative to the slave answer when the slave answer is detected.

When no answer data from the slave is detected, the inter-packet delay is intended to be measured from the end of transmission of one packet to the start of transmission of the next packet. When answer data from the slave is received, the delay is measured from the end of the slave answer packet to the start of transmission of the next command packet.

The default value for this parameter is 0. Using a non-zero inter-packet delay should be avoided as delay between packets slows down polling and causes delay to detection and reporting of the fault state changes in the NEs.

Empty Packet Delay

This parameter specifies the minimum delay between reception of an answer packet to a Q1 data transfer command without payload data and transmitting the next data transfer command packet.

The purpose of the empty packet delay is to reduce the load caused to a Q1 slave while the slave is constructing the answer to a data transfer command. The delay is measured from the end of reception of an empty data transfer answer packet to the start of transmission of the next data transfer command packet. The default value is 100 ms.

Command Delay

This parameter specifies the minimum delay between two data transfer commands. It is the time that must pass between ending a Q1 data transfer command and starting the next data transfer command. The delay is measured from the end of one command to the start of the next command.

Use this parameter only as a troubleshooting aid. Sometimes a delay can be needed between commands to give an NE time to recover from processing the previous command. The default value is 0 (ms).

The following figure describes the timeouts and delays:

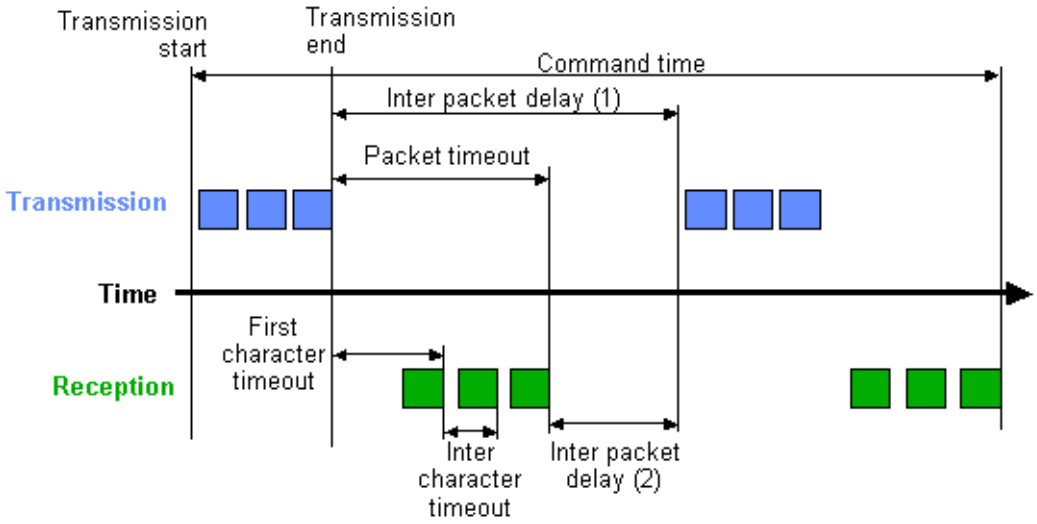

Figure 9. Timeouts and delays

A.2.4 Network elements

The Q1 address and network element generation specify the NEs to be polled for faults. This defines the fault polling mechanism to be used for the address. The generation can be:

- D/ND for old network elements (that is, TMS4 Q1 protocol elements)
- E for new network elements (that is, Nokia Q1 protocol elements)

A.2.5 Cycle parameters

Clock Refresh Interval

This parameter specifies the rate for refreshing the real time clocks of the E-generation NEs. E-generation NEs maintain a real time clock which is used for time stamping the events reported by the NEs (events from the D/ND generation NEs are time stamped at the Q1 master). To keep the clock in the E-generation NE synchronized with the poller clock, the clocks of the NEs should be periodically refreshes.

This parameter is specified in minutes. If the value is 0, refresh is disabled. The default value is 24 x 60 = 1440 minutes.

Connection Loss Threshold

This parameter specifies the number of command failures allowed before the connection to an NE is considered lost. When an NE is considered lost, it is removed from fault polling.

Connection to lost NEs is checked according to the configured lost checking settings. Increasing the connection loss threshold prevents connection loss alarms from the occasionally failing commands. However, detecting real connection loss is naturally slower. When only fault polling commands are sent to the bus, this parameter is approximately equal to the number of fault polling cycles to wait before a failing NE is considered lost.

The default value is 4.

Consistency Check Unit

This parameter specifes the unit for fault status consistency checking. The unit can be:

- NE, (one Q1 address, one network element) or
- FE, (one functional entity)

Consistency Check Count

This parameter specifies the number of fault status consistency checks performed per a fault polling cycle. Fault status consistency check cycles through the network elements being polled and performs a full fault status query for the specified number of NEs or FEs at the end of each fault polling cycle.

Lost Check Count

This parameter specifies the number of addresses per fault polling cycle that are checked for reconnection. This parameter has an effect only when there are addresses that have been considered disconnected. If reconnections are discovered, the checking is continued until the specified number of checks has failed, so this parameter specifies the maximum number of failing checks to perform per fault polling cycle.

Cycle Target Time

This parameter specifies the minimum time in seconds that must pass between fault polling cycles, that is, from the start of one fault polling cycle to the start of the next fault polling cycle.

If a fault polling cycle completes before the cycle target time is up, the leftover time is used according to target fraction settings for fault status consistency checking, checking disconnected NEs, and for idle time. If a fault polling cycle fails to complete within the target time, an internal fault is activated, and the next fault polling cycle is started immediately without performing any of the activities specified with the target fraction settings.

The default value for this parameter is 0, which disables the cycle target time altogether; that is, the next fault polling cycle is started immediately after completion of the previous cycle. In this case the target fraction settings have no effect.

The following figure presents the fault polling cycle:

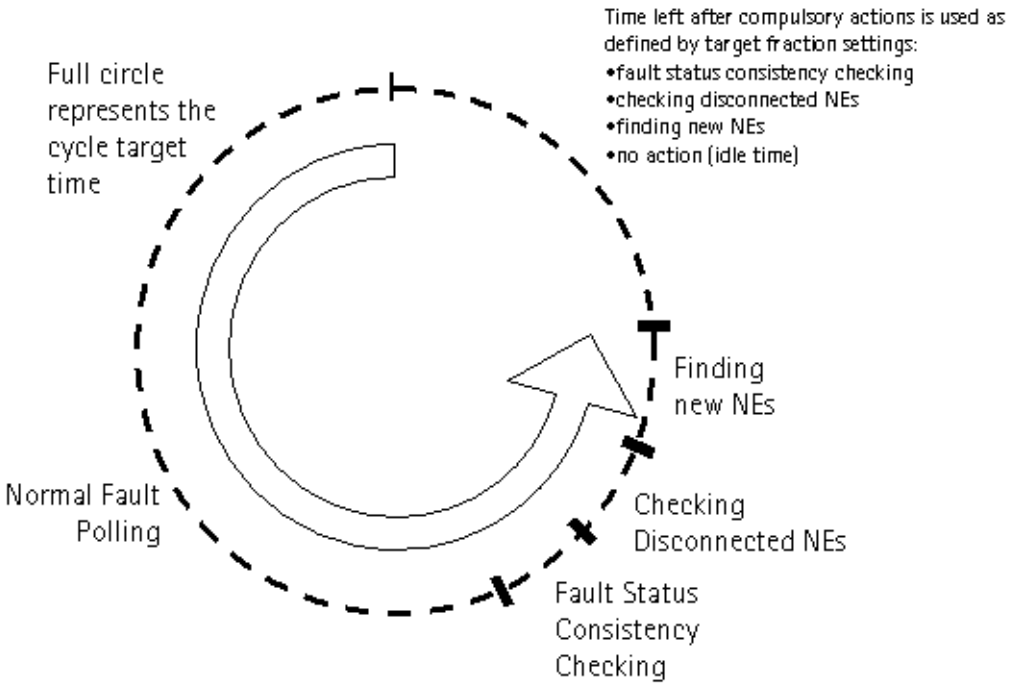

Figure 10. Fault polling cycle

Consistency Check Fraction

This parameter specifies the percentage fraction of the leftover time from the fault polling cycle that is used for fault status consistency checking. The default value is 0, that is, no time is used for fault status consistency checking.

Lost Check Fraction

This parameter specifies the percentage fraction of the leftover time from the fault pollig cycle that is used for checking disconnected addresses for reconnection. If there are no disconnected addresses, this parameter has no effect.

Idle Fraction

This parameters specifies the percentage fraction of the leftover time from the fault pollig cycle that is used for idle time. During the idle time the fault poller does not perform any polling. This does not prevent traffic from the bus: command traffic operates normally also during idle time. The default value is 100, that is, the whole leftover time from the fault polling cycle is reserved for keeping the fault poller idle.

Appendix B. Step by step: adding new nodes to the network configuration

This appendix provides step-by-step instructions for adding new AXC, DCN Adapter, or Q1 nodes to the network configuration.

Prerequisites

- Q1 Agent has been integrated with NetAct.
- Q1 Agent has an operative connection between NetAct and the AXC, DCN Adapter and Q1 nodes.
- The new node is physically connected to the Q1 management bus.
- The new node has the ‘Node Name’ and the ‘Q1 bus address’ assigned in accordance with the Q1 plan.

Tasks to be performed

The tasks to be performed include:

- adding a new station to the Q1 Agent configuration
- adding a new bus to the Q1 Agent configuration
- adding new nodes to the Q1 Agent configuration
- updating the Node Manager Server
- performing topology database upload in NetAct
- performing alarm upload in NetAct.

These tasks are described in detail in the following subsections.

The following figure presents a sample workflow for the FM and TM tasks:

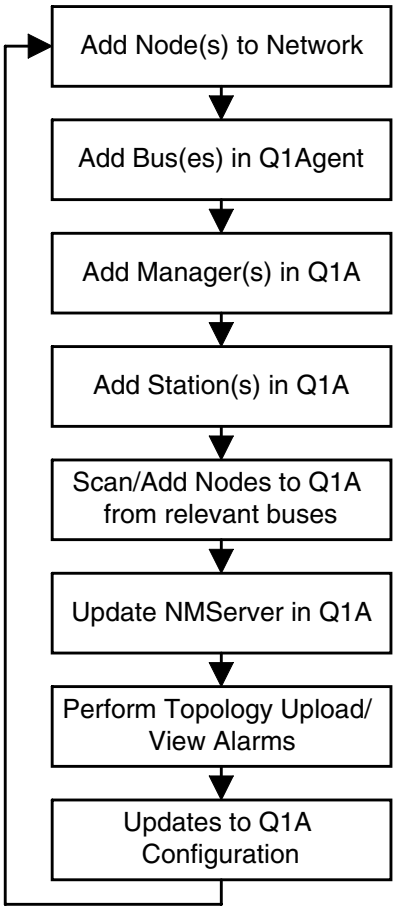

Figure 11. Workflow for the FM and TM tasks

B.1 Step 1: adding a new station to to the Q1 Agent configuration

A new station needs to be added to the Q1 Agent configuration before you can add a new AXC bus.

Stations are used for grouping Q1 nodes. Each node belongs to a station. The system distinguished name (SDN) of the station indicates the NetAct hierarchy location of the nodes in the station. The DN can be, for example, PLMN-PLMN/RNC-1/WBTS-1/AXC-1.

B.2 Step 2: adding a new bus to the Q1 Agent configuration

A new bus needs to be added to the Q1 Agent configuration before you can add a new AXC or DCN-A.

To add a new AXC bus

1. In the Q1 Agent header frame click the **Buses** link.
2. In the navigation frame, click the **AXC** link to open the **Add AXC Bus** view.
3. Fill in the values for **Bus Name**, **Bus Number**, **Station**, **Host name** or **IP Address**. Change the other values if needed.
4. Click the **Add** button to add the bus.

To add a new DCN-A bus

1. In the Q1 Agent header frame click the **Buses** link.
2. In the navigation frame, click the **DCN-A** link to open the **Add DCN-A Bus** view.
3. Fill in the values for **Bus Name**, **Bus Number**, **Host name** or **IP Address** and **Poller Bus Number**. Change the other values if needed.
4. Click the **Add** button to add the bus.

AXC and DCN Adapter send heartbeats to Q1 Agent with the interval of 10 minutes.

B.3 Step 3: adding new nodes to the Q1 Agent configuration

You can add new nodes to a new AXC or DCN-A bus or to an existing Q1 bus.

To add a new node

1. In the Q1 Agent header frame click the **Nodes** link.
2. In the navigation frame, click the **New Scan** link under the **Network Scan** title to open the **Network Scan** view.
3. In the **Addresses** box, give the address or address range to be scanned on the selected bus.

4. Click **Start Network Scan**.

5. In the navigation frame, click the **Scan Status** link under the **Network Scan** title to open the **Scan Status** view.

6. Click **Refresh** to see the most up-to-date scanning status.

7. After scanning is finished, click the **Scan Log** in the navigation frame link to display the scanning results.

8. Select Node Manager Server for the nodes. Change other values if needed.

9. To add the selected nodes to the Q1 Agent configuration, click A**dd Selected**.

B.4 Step 4: updating the Node Manager Server

After all new nodes are added to the Q1 Agent configuration, the GCS database in the Node Manager Server must be updated. This is to ensure that the node managers can be launched from the NetAct Top-Level User Interface.

To update the Node Manager Server

1. In the Q1 Agent header, click the **Nodes** link. The Nodes and Types fields are displayed in the navigation area.

2. In the **Nodes** field, click the **Update NM Server** link. The Update Node Manager Server table is displayed in the data area.

3. Click the **Start** button to start the upload.

B.5 Step 5: topology database upload

In NetAct, perform the topology upload from Network Editor (for more information, see *Network Editor Help*).

To perform topology database upload

1. Open Network Editor in NetAct.

2. In Network Editor start the topology database upload from the pop-up menu of the Q1A object.

3. After the topology database upload, select **Add Existing Child** from the pop-up menu of Q1 Agent object and/or AXC object and add the uploaded node(s) to the view. Select the correct Maintenance Regions for the nodes.

B.6 Step 6: alarm upload

Topology database upload does not bring existing alarms from nodes to NetAct. To get these alarms to NetAct, you will need to upload the alarms. This is done from the NetAct Top-Level User Interface.

To perform alarm upload

1. In NetAct open Top-Level User Interface.

2. Start the alarm upload from the pop-up menu of the Q1A object in Top-Level User Interface.

The network has now been configured for the node(s) you just added to the Q1 Agent configuration.

Appendix C. Using a standby PC to back up Q1 Agent configurations

This appendix describes the use of a standby PC for backing up Q1 Agent configurations.

Prerequisites

A standby PC is available with the following software installed:

- Windows 2000 Server Edition with Service Pack 4 or Windows Server 2003 Enterprise Edition with Service Pack 1 or Windows Server 2003 Standard Edition with Service Pack 1
- Java (TM) 2 runtime environment, Standard Edition, version 1.4.2
- Internet Explorer 6.0 with SP1 or later
- Q1 Agent C2.1
- IIS version 5.0 for Windows 2000 (IIS version 6.0 for Windows 2003) with FTP Server Component installed.

For installation instructions, see Chapter 3.

Tasks to be performed

The tasks to be performed include:

- creating and copying configuration backups
- restoring a configuration backup.

These tasks are described in the following subsections.

C.1 Creating and copying configuration backups

You should create a backup copy of the Q1 Agent PC's configuration every time the configuration is changed (buses, nodes or managers have been added, edited or deleted). Copy the backup folder to a network drive, from where it can be copied to the standby PC when needed. Note down the computer name and all network settings from the Q1 Agent PC.

To create a configuration backup

1. In the Q1 Agent header, click the **Settings** link. The Preferences link and the Backup title are displayed in the navigation area.

2. In the navigation area, under **Backup**, click the **Create** link. The **Backup Agent Configuration** view is displayed in the data area. The previously created backup folders are listed in the Backup Files field.

3. In the **Enter the backup folder name** box, fill in the unique name of the backup folder.

4. Click **Backup**.

5. Copy the backup folder to a network drive, from where it can be copied to the standby PC when needed.

C.2 Restoring a configuration backup

In case the Q1 Agent PC crashes, perform the following tasks to restore the configuration.

To restore a configuration backup to a standby PC

1. Remove the LAN cable from the crashed Q1 Agent PC.

2. Connect the LAN cable to a standby PC.

3. Stop Nokia Q1 Agent service in the standby PC from **Start** → **Settings** → **Control Panel** → **Services**.

4. Modify the standby PC's computer name and network settings so that they are the same as in the crashed PC. If asked, reboot the PC. Otherwise start the Nokia Q1 Agent service.

5. Log into Q1 Agent in the standby PC.

6. Copy a backup folder from the backup location to the Q1 Agent PC (`[Install Folder]\Nokia\Q1Agent\www\q1\backup`).

7. Restore the configuration.

   - In the Q1 Agent header, click the **Settings** link.
   - In the navigation area, click the **Restore** link.
   - Select the backup configuration that you wish to restore in the **Select to Restore** column.
   - Click **Restore**.

Appendix D. Nodes supported for PM

The following nodes are supported for performance data collection:

- FIU19
- FlexiHopper
- MetroHopper
- FXC E1/T1 (cannot exist independently)
- FXC RRI (cannot exist independently)
- IFUE
- FIU19E
- DN2
- DM2
- DB2B.

The following nodes have been tested for PM with Manual Configuration:

- DMR 18-38W
- DN2
- DM2
- DB 2B.

Appendix E. Nodes supported for IM

The following nodes are supported for inventory data collection:

- FIU19
- FlexiHopper
- MetroHopper
- FXC E1/T1
- FXC RRI
- IFUE
- MetroHub
- FIU19E
- DN2.

Glossary

15 min history	International standard measurements, near end G.826.
Agent	A software program or system that manages the operation of a particular collection of nodes (and other objects). Alarms generated by these objects are propagated to a higher-level management system (e.g. Nokia NetAct) by agents. Agents can be configured to control the objects that are to be managed.
Alarm	An event, generated by a node (or other object), that represents a fault or other occurrence that may adversely affect the performance of the network.
AXC	See *Nokia AXC*.
AT	Available Time, G.826 AT
BTS	Base Transceiver Station
CD-ROM	Compact Disc-Read-Only Memory
Counter	A counter represents a known measurement result expressing network performance.
CPU	Central Processing Unit
DCN-A	See *DCN Adapter*.
DCN Adapter	A remote poller used between Q1 Agent and network elements.
Distinguished name	Distinguished name is the name of a managed object which consists of a sequence of the relative distinguished names of its superiors in the naming tree, starting at the root and working to the managed object to be identified. For example, PLMN-1/RNC-1/DMR-1, PLMN-1/RNC-1/WBTS-1/TRE-1, PLMN-1/RNC-1/WBTS-1/AXC-1/DMR-1.
DN	See *Distinguished Name*.
Duration	The time during which the PM data is collected from the node. The duration is relative to the start time of the Schedule Item.
ES	Errored Seconds
Event	Messages from objects in a network that are being managed by agents. Alarms are events.
FC	Fault Code
FCP	File Creation Period. The time after which result file creation starts.
Fault Management (FM)	Viewing fault management status of a node, enabling and disabling fault management of a node, viewing current alarms list and viewing internal alarms list.

FSP	File Storing Period. The time until which a result file is kept after it has been created without being deleted.
FTP	File Transfer Protocol
Functional entity (FE)	An entity containing an independent part of the supervised equipment.
GB	Gigabyte
GCS	Nokia's General Communication Service GCS is a communication stack used by Nokia agents, alarm managers, node managers, and NMS/10 to communicate with Nokia's PDH/Primary Rate network elements. It is also used by MML Alarm Manager to communicate with MML network elements.
HTTP	Hypertext Transfer Protocol
HW XML files	XML files created by the HW upload process.
Infinite counters	Those counters whose value is accumulated until the next reset is done.
Interval	The time after which the PM data is collected from the nodes repeatedly.
IM	Inventory Management
IP	Internet Protocol
ISO	International Organization for Standardization
JRE	Java Runtime Environment
KB	Kilobyte
Managed object	In NetAct managed object represents a physical or logical network element, or a piece of equipment belonging to the network.
Managed object class	All managed objects of the same type are grouped together to form a class. This makes it easier for the NetAct to represent the elements in the network in a sensible way. In NetAct software, each class is represented by its own symbol or icon. These symbols can be used in the Top-level User Interface to make graphical views of the network.
MB	Megabyte
MC	Measurement Code
MHz	MegaHertz
MIB	Management Information Base
NDAT	Available time, G.821 AT

NDDM	Degraded Minutes, G.821 DM
NDES	Errored Seconds, G.821 ES
NDSES	Severely Errored Seconds, G.821 SES
NDTT	Total Time, G.821 TT
Network Element (NE)	Telecommunication system belonging to the telecommunications environment that can be managed, monitored, and controlled in a telecommunications network and that has one or more standard interfaces and is identified by a unique management address.
Node	See *Network Element (NE).*
Nokia AXC	ATM Cross-Connect. The supported version is Nokia AXC C2.0 or later.
Nokia NetAct	Nokia's NetAct Framework is an operations support system for managing networks and services. The open modular framework allows network operators to integrate other operations support systems or IT systems and applications into a single tailorable solution. Nokia NetAct consists of functionality areas, such as Monitor, which are grouped together according to the most relevant operator processes. The functionality areas comprise functionality modules that can be provided either by Nokia or a 3rd party.
Node manager	A program that understands the specific details of a particular type or family of nodes and supports the configuration and maintenance of these nodes.
OMC	Operation and Maintenance Centre
OMES	Open Measurement Standard
Open Northbound Interface (ONI)	Open interface to an upper-level network management system.
PC	Personal computer
Period	The period from a specific start time to a specific stop time until which the PM data is to be collected.
PLMN	Public Land Mobile Network
PM	Performance Management
Q1	Nokia's Proprietary Management Protocol
RAM	Random Access Memory
Remote poller	DCN Adapter (DCN-A) and AXC are used as remote pollers which collect alarms from network elements through Q1 buses and forward the alarms through the IP network to Q1 Agent.

Result Files	XML files containing the counter values.
RNC	Radio Network Controller
RTE	Runtime environment
SB	Supervision block
SDN	System Distinguished Name
SES	Severely Errored Seconds, G.826 SES
SNMP	Simple Network Management Protocol
Spanning of Result files	FCP could have occurred after more than one interval occurred and could not have been able to collect entire data in at FCP. The PM XML data overflows into the subsequent result files.
Station	Stations are used for grouping Q1-managed network elements (nodes). Each node belongs to a station.
Start Date	The date on which the PM data collection starts.
Stop Date	The date on which the PM data collection stops (in case the stop date is set to an earlier time than the start time plus the duration time).
STM	Synchronous Transport Module
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TMS	Transmission Management System for Nokia's PDH/Primary Rate Equipment
TT	Total Time, G.826 TT
UI	User Interface
UTC	Universal Time Co-ordinates
WUI	Web User Interface

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