Microsoft Business Solutions

Installation & System Management: Microsoft® Business Solutions–Navision® Database Server

MICROSOFT BUSINESS SOLUTIONS–NAVISION

INSTALLATION & SYSTEM MANAGEMENT: MICROSOFT® BUSINESS SOLUTIONS–NAVISION® DATABASE SERVER

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PREFACE

This book is a manual for Microsoft® Business Solutions–Navision®. This program is designed to run on Navision Database Server . This book is part of a comprehensive set of documentation and Help materials for the Navision enterprise business solution.

The manual describes how to install and maintain Navision. However, we recommend that the installation and customization process is carried out with the assistance of a Microsoft Certified Business Solutions Partner representative.

You should also be familiar with the symbols and typographical conventions used in the Navision Financials manuals. In the list below, you can see how various elements of the program are distinguished by special typefaces and symbols:

Appearance	Element
Ctrl	Keys on the keyboard. They are written in small capitals.
Design	Menu items and buttons in windows. They always start with a capital letter, and the access key is underlined.
Address	Field names. They appear in medium bold and start with a capital letter.
Department	Names of windows, boxes and tabs. They appear in medium bold italics and start with a capital letter.
Hansen	Text that you must enter, for example: "...enter Yes in this field." It is written in italics.
`fin.flf`	File names. They are written with the Courier font and lowercase letters.
⬆ ⬇ ▼ ✳ ▶ ...	The special symbols that can be seen in the windows on the screen.

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Chapter 1
Installing Navision

Before installing Microsoft® Business Solutions–Navision®, you should give some consideration to the kind of installation that you want and the equipment that it requires.

When you have decided which type of installation you want and you understand the hardware and communication requirements, you can install the program.

The chapter contains the following sections:

- Choosing the Installation Type and Equipment
- Installing, Maintaining and Removing Single-Users and Clients
- Installing Navision Database Server
- License Files
- Importing a Database into Navision Database Server
- Running More than One Server

1.1 Choosing the Installation Type and Equipment

Before installing Navision, you should carefully consider the needs of your organization as this will greatly influence the type of installation you will require and the hardware that this will involve.

Single-User and Multiuser Installations

Navision can be used in single-user or multiuser installations.

Single-User

In single-user installations, all the work is done on one computer and all the information (the database) is stored on this computer. Even if you purchase several single-user installations and run each on its own computer, the entire installation is still called "single-user" because the information is stored on each individual computer and not in one centrally located database.

Multiuser

In a multiuser installation, many users share common information that is stored in one or more databases on a server. The computers that work with the data are called clients, and the way the server and the computers work together is called a client/server installation.

What You Should Know Before Installing the Program

Regardless of whether you have chosen to work in a single-user or multiuser environment, you start by purchasing the same package. The program is installed from the same CD and with the same installation wizard for both single-users and clients.

For a multiuser installation, the CD contains a Navision Database Server package that is installed only on the server computer. However, the demonstration database that comes with a single-user installation is not included in the server package. You need some of the data in the demonstration database (and you need a client or single-user to modify a database), so you must always install a single-user somewhere in the network in a multiuser installation. The simplest way to do this is to install a single-user on the same computer as the server. You can read about this on page 20. The single-user can later be converted to a client by connecting it to the server's database.

Once the program has been installed, you must customize it for your particular situation. Not all installations need the same size database. For example, a database server, which serves many users, probably needs a larger database than a single-user installation.

With Navision, you do not need to plan for the distant future when you purchase your installation or set it up. You can change or expand the installation whenever you like. To switch from a single-user to a multiuser installation, you purchase a server package and the number of session licenses that you need. You can place the database that you already have on a server so that several people can work with it. If, after a while, you need a larger database, you can expand the existing one.

Choosing Equipment

Navision does not require particularly sophisticated equipment, but as with all programs, the better your equipment, the better the results. You get the best solution with the optimal equipment and with the program settings optimized for that equipment.

This section contains a brief description of the equipment we recommend for your Navision installation. For more detailed information on the best choice of equipment, see the chapter called "Advanced Performance Issues" on page 131.

You cannot specify the optimal settings until after you have installed the program. For more information see the chapter called "System Setup" on page 25.

Choice of Computers

In a multiuser installation, you can, in principle, use the same type of computer for both the clients and the server, but there is a difference in how much CPU power, memory and disk space each will need. Details about required and recommended hardware and software, including operating system requirements, can be found in the chapter called "Advanced Performance Issues" on page 131.

Computers for Clients and Single-User Installations

Computers for clients or a single-user installation that run Windows XP, Windows 2000, Windows 98 or Windows NT must comply with the requirements specified by Microsoft. Because the client computers process the data they retrieve, they need a relatively large amount of computing power. If the client computers are too slow, they will take a long time to finish the calculations for a transaction. A slow computer working on a transaction that must update the database can delay all the other clients until it finishes.

Computers for Servers

Computers for servers that run Windows 2000 or Windows NT must comply with the requirements specified by Microsoft. Navision Database Server can also run on various UNIX machines. For more information, see page 133.

1.2 Installing, Maintaining and Removing Single-Users and Clients

Navision supports the new Microsoft Installer technology that has been introduced with Windows 2000. You use the setup program to install maintain and remove Navision. Navision can be installed as either single-user installations or as client installations in a network.

The Navision installation program also installs Commerce Portal automatically and allows you to determine whether or not the Commerce Gateway connectivity components are installed. These components must be installed with the Navision client in order for it to connect with a BizTalk server.

For more information about installing the E-commerce products see the manual, *Installation & System Management: E-Commerce Products*.

Installing Navision

Make sure that the operating system on which you will run Navision (Microsoft Windows XP, Windows 2000, Windows 98 or Windows NT) is installed on the computer. If it is not, you will have to install it before you can install Navision. If you are installing Navision from a network drive, make sure that you are connected to the network server.

Navision supports the Microsoft AutoPlay feature, so it is not necessary to click the Start button. A menu appears automatically when the CD is inserted. If you install from a network drive, type the path and name of the installation wizard on the network. Click OK to start the installation wizard. Windows XP, Windows 2000, Windows 98 and Windows NT version 4.0 (or later), allow you to use the Add/Remove Programs function under Settings, Control Panel.

Earlier Version

If you have an earlier version of the program installed on the computer you can upgrade the old installation. For more information about upgrading, see page 11.

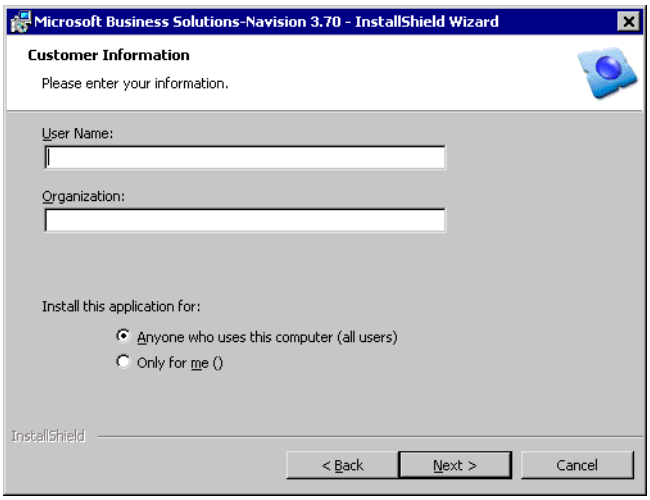
Cancelling the Installation

The installation can be cancelled at any time. If you choose to cancel the installation, a dialog box appears asking you to confirm your decision. If you click No, the installation process will continue. If you click Yes, Microsoft Installer will perform a full rollback and restore the computer to the state it was in before the installation process began. This rollback functionality is a new feature provided by Microsoft Installer.

When the installation program starts the ***Welcome*** window appears informing you that you have started the installation wizard for Navision.

Customer Information

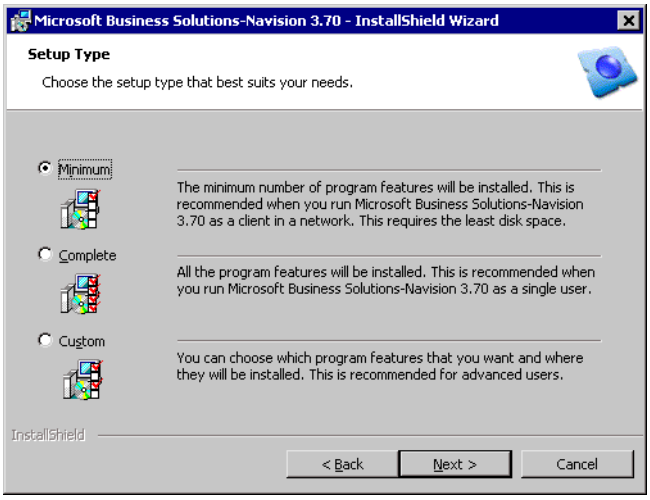
If you do not want to continue with the installation, click Cancel. To continue, click Next, and the ***Customer Information*** window appears:



You can enter your name and the name of your organization in this window. You can also specify to whom this installation belongs. The installation will also continue if you leave these fields blank. You can choose between the person who installed it and any user who logs onto this computer. This determines who is allowed to see the installation and therefore able to modify or uninstall it. It does not determine who is able to use the program from this computer.

Selecting the Installation Type

Click Next and the ***Setup Type*** window appears:



This window allows you to specify the type of installation that you want to install. You can choose between three types of installation:

- *Minimum*: this installation will only install a minimum of features (the demo database and the backup of the demo database will not be installed). This is the

recommended installation, if you want to run Navision as a *client* in a network. This installation includes the online Help.

A client can be installed as a single-user, that is, with its own database, but this is not normally done because it takes up so much extra space on the client computer.

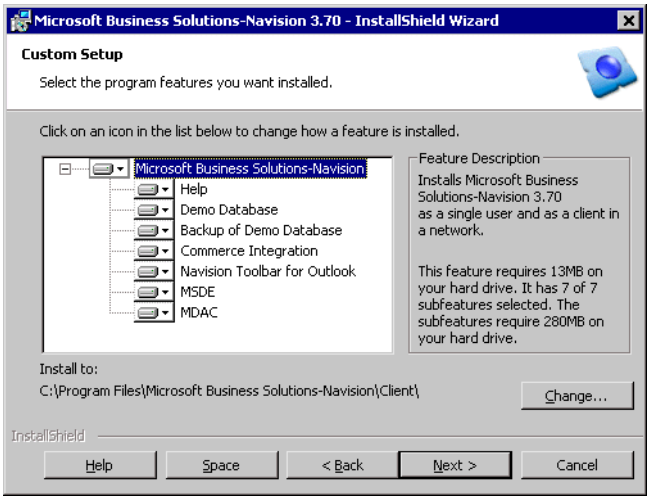
- *Complete*: this installation will install all of the program features except the Commerce Gateway connectivity components. This installation is recommended if you want to run Navision in a *single-user* environment with a local database.
- *Custom*: this installation allows you to choose which program features will be installed. This option is only recommended for advanced users.

Note

In a multiuser installation, you must always install one single-user installation in the network because the server package does not include the standard database that is part of the single-user installation. You need some of the data contained in the backup of the standard database when you create a new database. You can always turn a single-user into a client by allowing it to access the database on the server. The simplest thing to do is to install a single-user installation on the same computer as the server package. This procedure is described on page 20.

Customized Installation

If you select a complete or a minimum installation, the installation runs automatically. If you select **Custom**, the following window appears:



In the ***Custom Setup*** window, you can decide how and where each feature and sub-feature will be installed. This window is divided into three sections:

- A feature selection area where you can select the individual features and specify how each feature will be installed.
- A feature description area that displays a short description of each feature as it is selected and an estimate of how much disk space the feature requires. It also gives you an estimate of the amount of space that its subfeatures require.

- An installation location area that tells you where each feature will be installed. You are able to change the location where the installation will be installed by clicking Browse.

The ***Custom Setup*** window lists all the features that you can install:

- Help – the online Help for Navision.
- Demo Database – a Navision database that contains a demonstration company. This database will be opened automatically the first time you start Navision.
- Backup of Demo Database – a Navision backup of the demonstration database. You can restore this backup into a new database.
- Commerce Integration – the Commerce Gateway and Commerce Portal components. You must install these components if you want to run either Commerce Gateway or Commerce Portal. If you select this feature, the Microsoft .NET Framework is also installed. The .NET Framework is not removed when you uninstall the Navision client. It is given an entry of its own in the Add or Remove Programs window and you can uninstall it from there.
- Navision Toolbar for Outlook – this feature creates a toolbar in Outlook that allows you to open a Navision Contact or a Navision To-do from the corresponding Outlook item.
- MDAC – the Microsoft Data Access Components. These are operating system components that allow you to access data in the database with third-party tools.
- MSDE – the Microsoft SQL Server 2000 Desktop Engine. This a small version of SQL Server and installing it allows you to run the SQL Server Option for Navision as a stand-alone installation. This will be the local instance of SQL Server to which the demonstration database is attached.

Furthermore, MSDE:

- is not installed if SQL Server is already installed on the client computer.
- is not removed when you uninstall the Navision client. It is given an entry of its own in the Add or Remove Programs window and you can uninstall it from there.

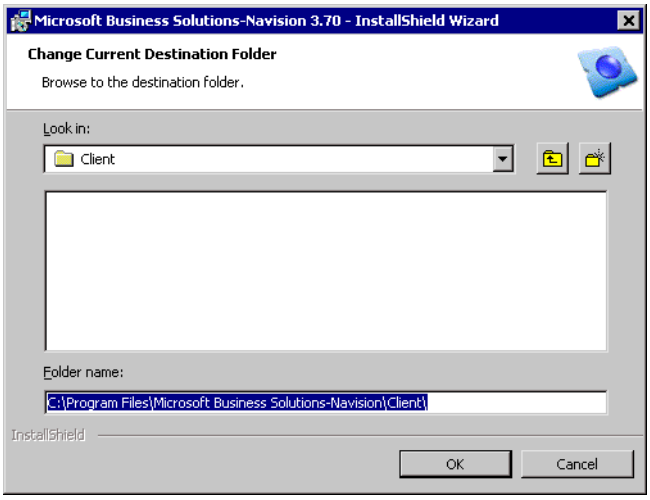
If you do not install MSDE with the client, you can install it later. However, if you then want to use the demonstration database, you must attach it manually.

All of these features are part of a complete installation.

Note

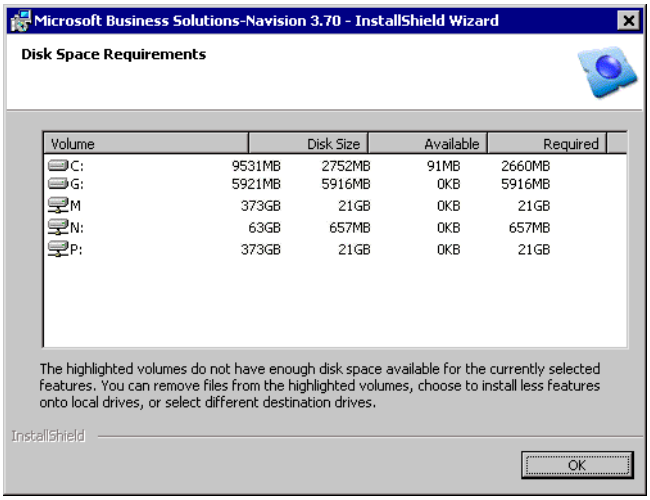
If you select one of the features, and the estimated space required is given as zero (or less than the original amount of space required), the file will not be copied to the target folder. This occurs because this feature or some of its subfeatures already exist in the target folder. This happens when you have had Navision installed before and this feature was not removed when you uninstalled the program. No database files, database backup files or license files are removed when you uninstall Navision.

When you click Browse, the following dialog box appears:

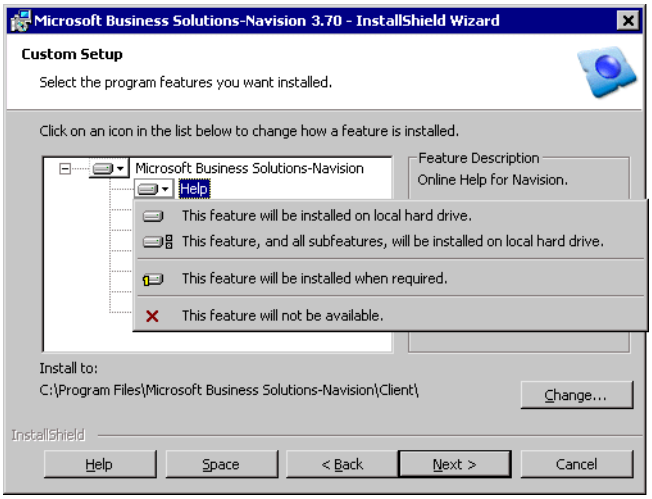


This window allows you to locate the folder you want or to create a new folder.

You can also get an overview of your disk configuration. In the ***Custom Setup*** window, click Disk Space and the following window appears informing you of how much space is available on your hard disk(s):



When you click one of the feature icons in the ***Custom Setup*** window, the following drop-down list appears displaying the options that are available for that feature:



The options are:

- This feature will be installed on your local hard drive.

- This feature and all of its subfeatures will be installed on your local hard drive.

- This feature and all of its subfeatures will be installed when it is required. Note that its subfeatures will automatically have the same option.

- The current feature and all of its subfeatures will not be installed.

If you click Help, a window containing a short explanation of the options appears.

The most common installations are Stand-alone installation and Client installation.

- A Stand-alone installation requires you to install the demo database. To do this, click the icon next to Demo Database and select the  option in the drop-down menu. The backup of the Demo Database is optional. The online Help is also optional.
- In a normal client installation you will install the online Help and ignore the other subfeatures.

Ready to Install

The ***Ready to Install the Program*** window confirms that the installation wizard now has all the information that it requires to carry out the installation process.

Click Install to start the installation. The ***Installation Progress*** window allows you to monitor the installation process and displays an overall status message that tells you what kind of action is currently being performed. Below that is a more specific description of the particular action that is being carried out, for example, the name of the file that is currently being copied. Finally, there is a progress bar that shows you the status of the installation process.

After a few minutes, the ***Installation Complete*** window appears. This window informs you that the installation has been completed successfully.

Maintaining Navision

Microsoft Installer is also used for changing, repairing and removing Navision.

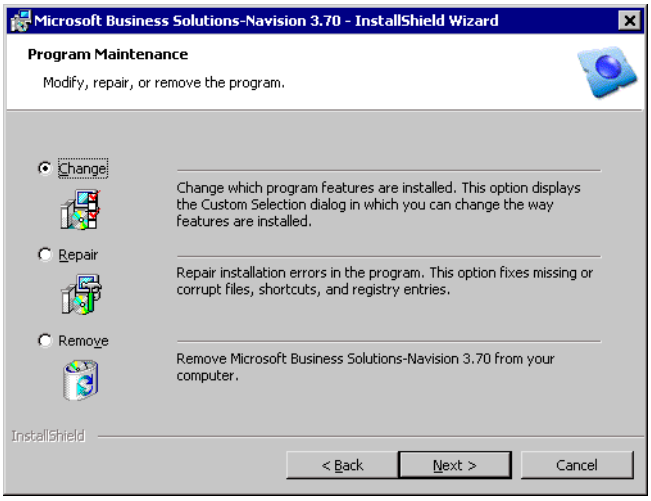
1 Open the Control Panel and select Add/Remove Programs.

2 Select Navision.

3 Click Change and the Installation Wizard opens.

The ***Maintenance Welcome*** window is similar to the ***Installation Welcome*** window and informs the user that they can now change, repair or remove the program.

4 Click Next in the ***Maintenance Welcome*** window and the ***Program Maintenance*** window appears:



This window allows you to choose between changing, repairing or removing the product installation.

Changing the Installation

If you select *Change*, the ***Custom Setup*** window appears. You are now able to select the features and subfeatures that you want to install. You are also able to uninstall all the features and subfeatures. You are not able to change the target path of the installation. You can only change the features that have been installed.

Repairing the Installation

If you select *Repair*, the Installation Wizard updates, installs or reinstalls any missing files, corrupt files, shortcuts, and registry entries. Windows Installer protects any license files, databases and database backups and will therefore not overwrite these files.

Removing the Installation

If you select *Remove*, a window appears prompting you to confirm that you want to uninstall the product.

If you choose to uninstall the product, a progress window similar to the ***Installation Progress*** window appears. You are able to cancel the uninstallation at any time. If you do so, Microsoft Installer will perform a full rollback returning the computer to the state it was in before the uninstallation process began.

When you remove the program, any databases or database backups that are stored locally will not be deleted. If you store a copy of your license file locally, it will not be deleted but the demonstration license file will be. If you want to remove these files, you will have to do it manually.

A progress window appears when you are changing, repairing or removing the program. When the process is finished an ***Installation Finished*** window appears informing you whether or not Navision has been successfully changed, repaired or removed.

Note

We recommend that you make a backup of any license files, databases and database backups that are stored locally before changing, repairing or removing the client installation.

The installation program creates a log file (an ASCII file called `delfin.log` that lists the changes made by the installation program) in the Navision folder. If you need to uninstall Navision manually, you can look in the log file to see what must be removed or changed.

Upgrading an Old Installation

If you have Navision Financials® 2.50 or earlier installed on the computer, the Installation Wizard will ask you to uninstall the old version before you can install Navision.

If you have Navision Financials 2.60 installed on the computer, the Installation Wizard will ask you if you want to upgrade the old installation or install Navision without upgrading the old installation.

Attention

The upgrade program only upgrades the client installation and not the database. To upgrade your database you must use the Upgrade Toolkit that is located on the product CD. We recommend that you do not upgrade your database without first consulting your local Microsoft Certified Business Solutions Partner.

If you have Navision Financials 2.60 installed on the computer, the Installation Upgrade Wizard will open. This wizard will guide you through the process of upgrading your installation. You can choose between three different types of upgrade:

- *Typical*: this upgrade will uninstall the old version of the program and install a new version. It will transfer any custom selections that you made in the earlier installation to the new installation. Any databases or database backups that are stored locally will not be deleted. If you store a copy of your license file locally, it will not be deleted.

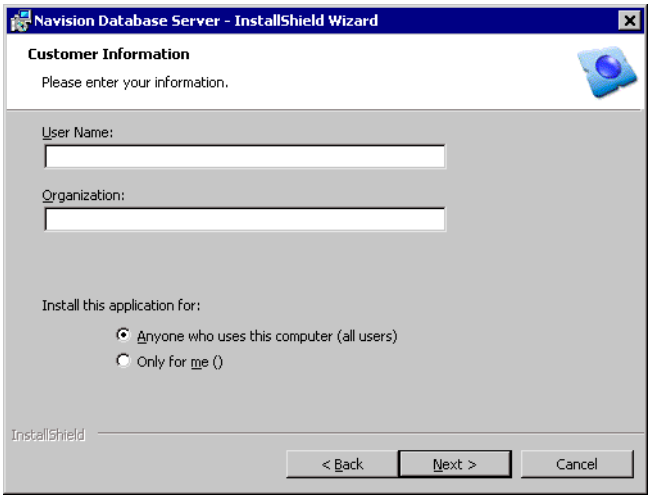
- *Custom*: this upgrade will uninstall the old version of the program and install a new version. Any databases or database backups that are stored locally will not be deleted. If you store a copy of your license file locally, it will not be deleted. When the new version is being installed the installation program will stop at the ***Custom Setup*** window. This window allows you to specify which features are installed and how they are installed. For more information about the ***Custom Setup*** window, see page 6.
- *New*: this upgrade will install Navision. It will not uninstall the old version of the program or make any changes to it.

For more information about upgrading to Navision, see the *Upgrade Toolkit* documentation on the product CD or contact your local Microsoft Certified Business Solutions Partner.

1.3 Installing Navision Database Server

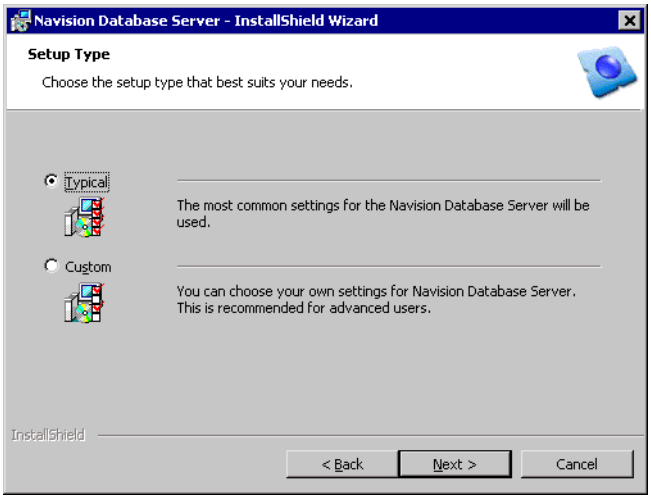
The installation wizard for Navision Database Server is like the installation wizard for Navision.

The installation process starts with a window informing you that the installation wizard has been initiated. After the ***Welcome*** window, the ***Customer Information*** window appears:



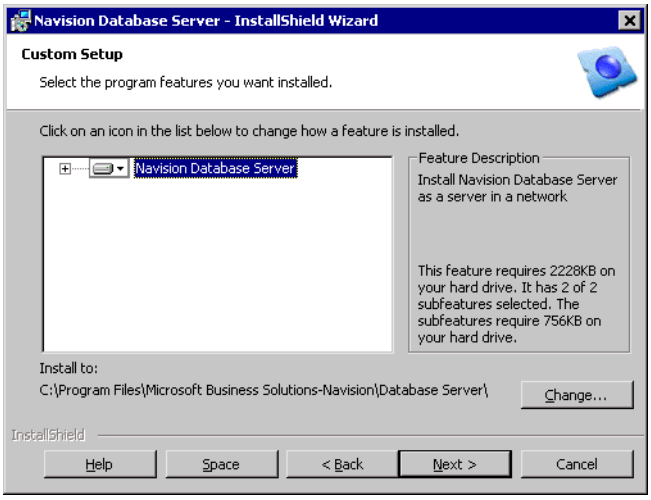
You can enter your name and the name of your organization in this window. You can also specify to whom this installation belongs. You can choose between the person who installed it and any user who logs onto this computer. This determines who is allowed to see the installation and therefore able to uninstall it. It does not determine who is able to log on to the server via the network.

Click Next and the ***Setup Type*** window appears:



In the ***Setup Type*** window, you can choose between a typical installation and a custom installation. A custom installation allows you to specify which features will be installed and how they will be installed.

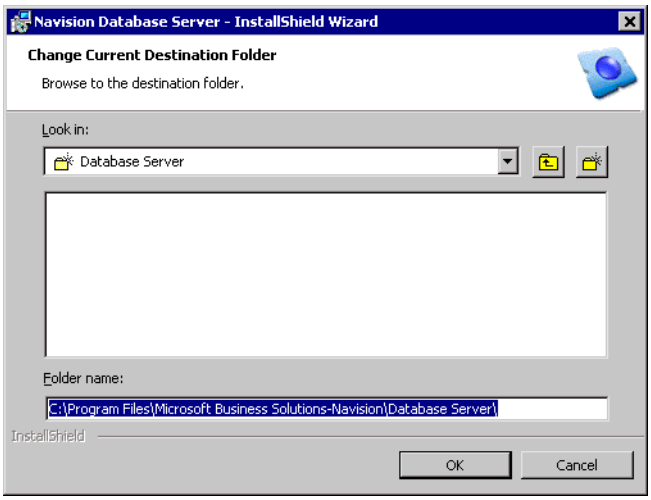
If you select *Custom*, the following window appears:



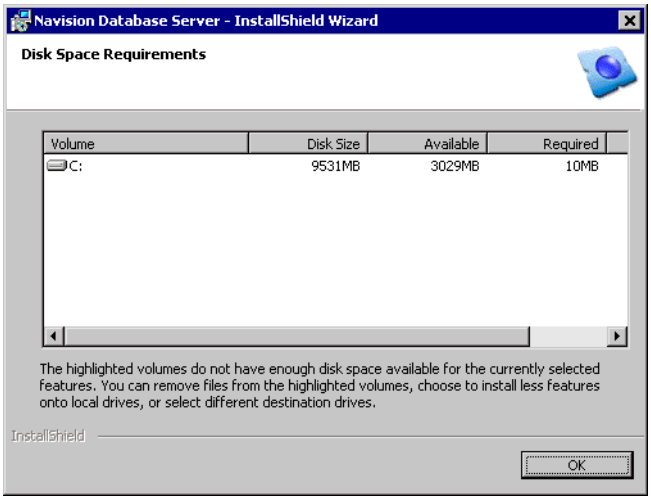
In the ***Custom Setup*** window, you can select the features that you want to install. This is a standard Windows Installer dialog box where you can select to install or not to install the Navision Database Server Snap-In for Microsoft Management Console. The snap-in allows you to supervise Navision Database Servers across the domain.

For more information about the Snap-In for Microsoft Management Console, see the section "Navision Database Server Manager" on page 44.

If you want to install Navision Database Server in a different folder, click Browse. The following dialog box will appear:

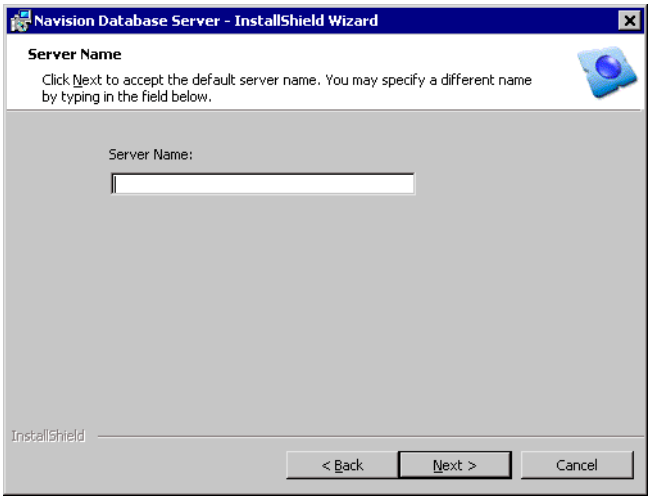


If you click Disk Space in the ***Custom Setup*** window, the following window will appear informing you of how much space is available on the various drives to which you have access:



Naming the Server

Click Next in the ***Custom Setup*** window, and the ***Server Name*** window appears:

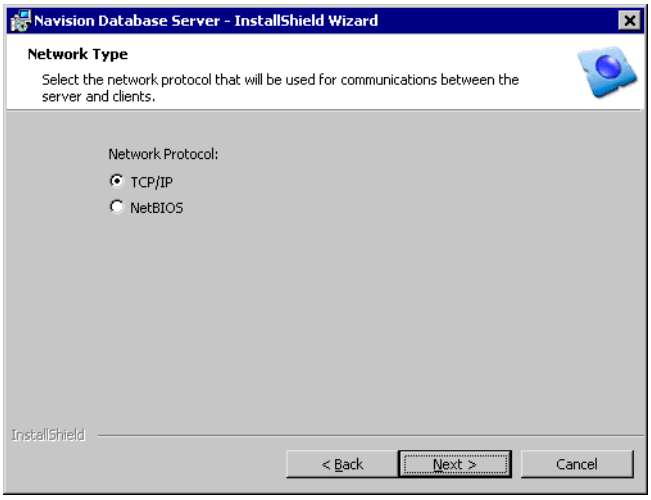


In the ***Server Name*** window, you can type in a name for the server. By default it will select the name that the computer has in the network. This name must not contain any spaces.

If you select *Typical* in the ***Setup Type*** window, the installation will use the computer name as the server name. If this name already exists, it will insert *#1* at the end of the computer name. If this name also exists, it will try with *#2*, and so on. That means if the computer name is *PC0515* and this server name already exists, the installation will try *PC0515#1*.

Selecting the Network Protocol

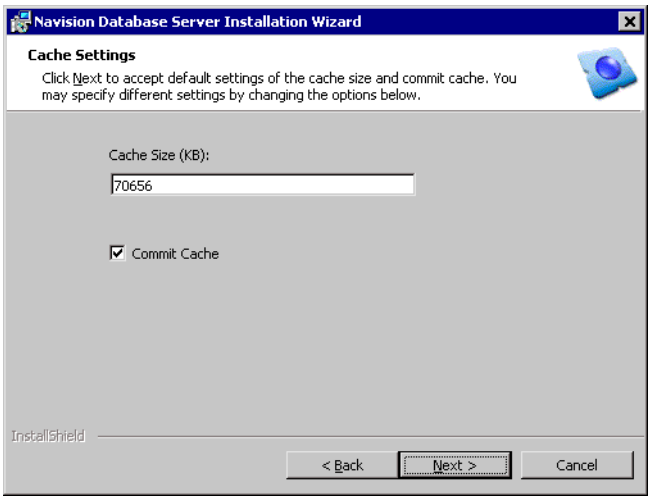
Click Next after you have named the server and the ***Network Type*** window appears:



In the ***Network Type*** window, you can select which network protocol will be used for communication between the clients and the server (TCP/IP or NetBIOS). If you have chosen *Typical* in the ***Setup Type*** window, TCP/IP will be selected as the network protocol. TCP/IP is the default setting.

Cache Settings

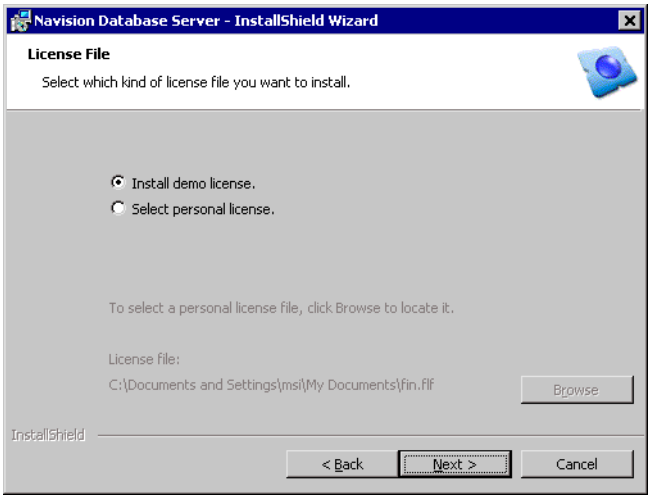
Click Next after you have selected the network protocol and the ***Cache Settings*** window appears:



This window allows you to determine the amount of space that will be reserved on the server used for both the Cache and the Commit Cache. You can accept the default settings or adjust them to suit your needs.

License File

Click Next after you have specified the cache settings and the ***License File*** window appears:



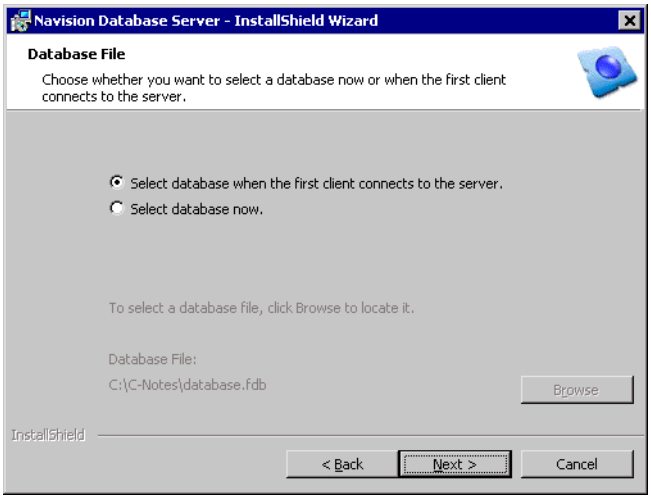
In the ***License File*** window, you specify which kind of license file you want to install. You can choose between installing the demo license file or your personal license file. *Install demo license* is the default value.

When you choose the *Select personal license* option the Browse button and the **License file** field will be enabled. You are now able to use the Browse button to locate your license file. If you have chosen to install a *Typical* installation in the ***Setup Type*** window, the *Install demo license* option is automatically selected.

For more information about license files, see the section called "License Files" on page 19.

Selecting the Database

Click Next after you have selected the license file you want to install, and the ***Database File*** window appears:



This window allows you to specify whether you want to select a database now or wait until the first client connects to the server. If you choose to select the database now,

the Browse button and the **Database File** field become enabled and you can use them to locate the database that you want to be opened when Navision is started.

Click Next and the installation process will continue. It will display a progress bar that allows you to monitor the installation. The installation program will also inform you when the installation is complete and whether it has been successful or not.

Publishing Navision Database Server in a Windows 2000 Network

In order for other server and client computers to be able to identify and connect with your Navision Database Server, you must publish it in the network. Before you can publish a Navision Database Server in the network, you must add a definition of a Navision service connection point to the Active Directory. Navision Database Server uses this service connection point to publish itself in the network and the clients use this information to locate the server and to find out how to connect to it. Only servers that have been installed as a service can be published in the network.

To add a definition of a Navision Database Server to the Active Directory, you must add a Schema Extension to Active Directory. This must only be done once for each forest of domains and domain trees, regardless of how many Navision Database Server are in that forest.

When you install Navision Database Server, a file called `schemaXt.exe` is copied into the folder that contains Navision Database Server. Run this file to add a definition of a Navision service connection point to the Active Directory. Starting up a Navision Database Server (running as a service) will publish a service connection point using the definition that has been added to Active Directory.

Maintaining Navision Database Server

The ***Maintenance Setup Type*** window for Navision Database Server differs from that of Navision in that you are not able to modify the server installation. If you need to change the server name, for example, you must uninstall the program first and then install it again and give it the new server name.

If you install the server again in the same folder (for example, if you install an update), any existing database files, database backup files and license files will not be overwritten by the new installation. This means that if you want a new database or a new license file to be installed when you reinstall the program, you must delete these two existing files from the Navision folder before you start.

Note

We recommend that you make a backup of any license files, databases and database backups that are stored on the server before modifying, repairing or removing the server installation.

1.4 License Files

A single-user installation comes with a demonstration license file, `cronus.flf`, that allows you to see all the application areas in the demonstration company that is part of the accompanying standard database, `database.fdb`. To start working with Navision, you will need a license file that contains permissions for the desired application areas and functions. You obtain the license file from your Microsoft Certified Business Solutions Partner.

You can use your license file to work in the demonstration company as well as your own companies, but your permissions will be limited (even in the demonstration company) to those provided by the license file. On the other hand, your license file does not contain the restrictions of the demonstration license file, which are listed on page 52.

Your license file is always named `fin.flf`, and you receive it on a diskette by itself. In a single-user installation, copy the license from the diskette to your computer. In a multiuser installation, the license will be copied to the server during the installation process and does not need to be copied to the individual clients. The clients automatically work with the same license file as the server to which they are connected.

After you have copied your license file to your computer or the server, store the diskette in a safe place until you need to use it again.

The Final Adjustments

For both single users and clients, you may need to adjust the Navision setup to match your computer and the rest of the system. There are a number of system setup tools to help you. They are described in the chapters called "System Setup" and "Advanced Performance Issues."

1.5 Importing a Database into Navision Database Server

In a multiuser installation, in addition to installing one or more clients, you must install the server program and set up a database on the server. It is easier to start by setting up the database.

The server program does not come with a database. If you already have a Navision database, copy it to the same computer that your server will be installed on. If you do not already have a database, you can use the standard database, `database.fdb`, or a copy of it. For more information, see the section called "Using the Standard Database" on page 52.

You can also create a new database. To do this, you need some of the information in the standard database. A single-user version must therefore be installed somewhere in the network so that you can transfer the database that comes with it to the server.

To create a new database before you install the server:

1. Install a Navision single-user.

   Remember to select the *Complete Installation* option. (See "Installing, Maintaining and Removing Single-Users and Clients" on page 4.)

   The standard database will be installed as part of the complete installation and comes with a demonstration company. It is not a good idea to leave the demonstration company in your working database (see page 52 for details). If, however, you want to leave it in, skip to step 6.

2. Click File, Company, Open to open the demonstration company.
3. Click File, Company, Delete.
4. Click Yes when you are asked (twice) whether you want to delete CRONUS International Ltd.
5. Close the single-user program.
6. Start the Navision Database Server Setup program.

Starting the Server

When installed as a service on Windows NT, the Navision Database Server starts automatically every time you start Windows NT.

Note

Remember to make a full backup of the database before deleting it from the hard disk. For more information, see the chapter called "Making Backups" on page 113.

1.6 Running More than One Server

The following sections describe the possibilities for running more than one server with the same database or with different databases. Appendix B gives more detailed information about network communications.

Two or More Servers, Same Database

It is possible to run two or more Navision Database Servers with the same database provided that:

- each server has a different server name.
- all the servers are run from the same folder.

With this configuration you could, for example, have one server running TCP/IP and another one running NetBIOS on the same database. See "NetType – Selecting a Net Type" on page 34 for a description of TCP/IP and NetBIOS.

Two or More Servers, Different Databases

It is possible to run two or more Navision Database Servers with different databases provided that:

- each server has a different server name.
- the server programs are located in different folders.

This means that to use two databases on the same computer, you must install the server program twice, in two different folders.

The following examples describe how to configure your installation for running two servers with different databases, using TCP/IP and using NetBIOS.

Two Servers on the Same Computer, Both Using TCP/IP

To run two servers, both running TCP/IP, on the same computer, follow the procedure outlined below to configure the computer correctly.

Install the Navision Database Server in two different folders as follows:

The Servers

1. Install the first server as described previously (page 13).
2. Make a copy of the folder where Navision Database Server was just installed and rename it. You must do this because you cannot install two versions of Navision Database Server on the same computer.
3. Select a unique server name for the second server.

Once the two servers have been installed, proceed as follows:

1. Locate the `SERVICES` file.

Windows 98: `C:\WINDOWS\`

Windows NT: `C:WinNT\Sys32\drivers\etc\`

2 Edit the `SERVICES` file to include statements such as:

```
...
...
servername1          2407/tcp
servername2          2408/tcp
...
...
```

The server names shown should be replaced with your actual server names.

3 Start the first server in the first folder, using the following parameters:

```
server servername=servername1, nettype=tcp, cache=xxx,
commitcache=yes, database=AAAA
```

4 Start the second server in the second folder, using the following parameters:

```
server servername=servername2, nettype=tcp, cache=xxx,
commitcache=yes, database=BBBB
```

In these examples, xxx represents the cache size, and AAAA and BBBB are the names of the databases. Remember to write out the full path for each database file.

5 Edit the `SERVICES` file on the client as follows:

```
...
...
servername1          2407/tcp
servername2          2408/tcp
...
...
```

6 Start the first client, using the following parameters:

```
fin servername=servername1, nettype=tcp
```

7 Start the second client by using the following parameters:

```
fin servername=servername2,

nettype=tcp
```

You must also edit the `HOST` file on the clients. It is located in the same folder as the `SERVICES` file. Follow the same procedure when editing the `HOST` file.

The system should now be up and running.

Two Servers on the Same Computer, Both Using NetBIOS

When you use NetBIOS, you do not have to configure the HOSTS and SERVICES files.

The Servers

1 Install the two servers in two different folders.

2 Start the first server in the first folder using the following parameters:

```
server servername=servername1, nettype=netb, cache=xxx,
commitcache=yes, database=AAAA
```

3 Start the second server in the second folder using the following parameters:

```
server servername=servername2, nettype=netb, cache=xxx,
commitcache=yes, database=BBBB
```

In these examples, xxx represents the cache size, and AAAA and BBBB are the names of the databases. Again, remember to write out the full path for each database file.

The Clients

4 Now that the servers are up and running, start the first client, using the following parameters:

```
fin servername=servername1, nettype=netb
```

5 Start the second client, using the following parameters:

```
fin servername=servername2, nettype=netb
```

The system should now be up and running.

Chapter 2
System Setup

Navision comes with a standard setup that enables it to be used immediately. However, different installations may require small variations in the setup. You can easily implement these changes yourself. Once you have changed the settings, the program uses them until they are changed again.

There is no simple formula that specifies the setup selections that different users need or the order in which they must be defined.

The chapter contains the following sections:

- Navision Installations
- Single-User and Client Setup Properties
- Navision Database Server Setup Properties
- Setting the Program Properties

2.1 NAVISION INSTALLATIONS

Navision can be installed in several different configurations. The various program properties can then be used to determine the way the different types of installations perform. However, the program properties do not all apply to the different configurations and their effect can vary.

Navision can be configured to run as multiuser installations or as single-user installations.

Multiuser

In a multiuser installation, many users use common information that is stored in one or more databases on a *server*. The computers that work with the data are called *clients*, and the way the server and the computers work together is called *client/server*.

There are, however, two different types of multiuser installation:

- A classic client/server installation, where the server is installed on one computer and the clients are installed on other computers in the network.
- A multiuser installation, where both the server and the client programs are installed on a file server and the clients are run remotely from other computers in the network.

Single-User

In single-user installations, all the work is done on one computer and all the information (the database) is stored on this computer. Even if you purchase several single-user installations and run each on its own computer, the entire installation is still called *single-user* because the information is stored on each individual computer and not in one centrally located database.

Single-user installations are the easiest to set up and maintain.

The Setup File

Navision is able to remember the various settings that are used by different clients and single-users. This includes the server the client was connected to and the database and company the client was working with. It does this by saving these settings in a setup file. This setup file is called a zup file in Navision. The different clients can all share the same zup file and thereby use the same settings, or they can all have individual zup files and thereby use their own customized settings.

Windows 2000

If you using a Windows 2000 network and the network administrator has decided to implement roaming users, you will not have to utilize setup IDs. With roaming users, Windows 2000 will save the personal settings of each individual user on the server, including their zup file. This file will be called `fin.zup` and will contain Navision information that is specific to that user.

If you are using Windows 2000 and the network administrator has decided to implement local users, the zup file of each user will be saved on their local hard disk. Several users can also use the same computer and have their own zup files stored on the hard disk as long as they have individual windows accounts. The zup file of each individual user is stored in `C:\Documents and Settings\User Name\Application`

`Data`. All of these zup files will be called `fin.zup` unless you create individual setup IDs.

You only have to implement setup IDs if the users are using the same Windows account.

Windows 98

If the clients are using Windows 98, Navision will only create one zup file on each computer. If the different users want to save their individual settings, setup IDs will have to be created for them.

If you do not enter a setup ID, the program will use the setup file called `fin.zup` when you start the program. You will be prompted to save any modifications that you have made during the session when you close the program. These changes will be saved as `fin.zup` and will be recreated the next time the program is started.

When several users are using the same zup file they will each be prompted to save the changes they have made in the `fin.zup` file when they close the program. The `fin.zup` file that was saved by the previous user who quit the program will be replaced.

If you delete the zup file on a client or single-user installation Navision will recreate the default zup file the next time the program is started.

You can also make a standard setup created for a particular type of user available to other users with similar needs. To do this, copy the appropriate setup file to the folder from which the user starts the program, and enter the setup ID (file name) in the **Target** field (see page 48).

Alternatively, you can store the setup file on a common drive in the network (but here it can be overwritten by other users). If you choose to place the setup file in a folder other than the one containing the program files, you must remember to specify the entire path name after `id=`.

The setup ID is not the same as the user IDs in Navision, but you can use the same names. In fact, it can be an advantage to do so because although you cannot see the name of the setup file in the program, you can always see the user ID on the status bar at the bottom of the program window.

The following table lists the different program properties and the type of installation to which they apply:

Property	Client	Server	Described on
ID	X		page 29
Server Name	X	X	page 30
Database	X	X	page 30
Company	X		page 31
NT Authentication	X		page 32
Commit Cache	X	X	page 33
Object Cache	X		page 33
Net Type	X	X	page 34
TempPath	X		page 34
DB Test	X		page 35
TestTarget	X		page 36
Status Bar	X		page 36
Close Forms On Esc	X		page 37
Marquee Full Selection	X		page 37
Quick Find	X		page 38
User Portal Pipe Name	X		page 38
DB Read-Only	X		page 39
DBMS Cache	X	X	page 40
Stoptime		X	page 41
Sessions		X	page 42
Install As Service		X	page 43
Uninstall As Service		X	page 43

2.2 Single-User and Client Setup Properties

This section describes all of the program properties that you can set for both clients and single-users:

ID – Saving the User Setup

Program Property	Purpose	Where Specified	Default Value	Value
ID (clients only)	Saves the program setup	By entering `ID=alice` in the Command line or the **Target** field.	Fin	Name of ID (including path if ID file is not located in Navision folder)

Each user in a Navision multiuser installation can choose the setup of windows and program properties that they want to use. Each user must have a unique ID, in order for the program to be able to save and use the setup selections of the individual users. You can create a user setup by starting the program with an ID. The information about the users' setup will be stored under this ID. Here is an example in which the program starts with an ID called *SUPER*:

```
c:\Program Files\Microsoft Business
Solutions-Navision\Client\fin.exe id=SUPER
```

In a list of Navision program files, you can see that each time you have started with a new setup ID, a file has been created that has the ID as the first part of the file name and `.zup` as the file name extension (for example, `super.zup`). This is called a setup file.

Returning to the Original Setup

You can always return to the standard setup file, `fin.zup`, by starting the program without specifying a setup ID.

If you have previously worked without a setup ID and made changes in the setup, the `fin.zup` file will contain these changes. If you do not want to use this modified `fin.zup` file but would prefer to return to the original starting point of the program, delete the `fin.zup` file and start the program again without an ID. The program will create a new, clean setup file, named `fin.zup`.

For more information about zup files, see the section called "The Setup File" on page 26.

Server Name – Choosing the Server

Program Property	Purpose	Where Specified	Default Value	Value
Server Name	Specifies which server to connect to	Can be selected by clicking File, Database, Open or by entering `servername=My Server` , in the Command line or the **Target** field:	None	Name of server

This program property is used to specify the server that a particular client will connect to and does not apply in a single-user environment.

You can set up the connection to the server in the **Target** field by entering the name of the server after `servername=`.

You can connect to a server from within Navision by clicking File, Database, Open on the menu bar. For more information about connecting with a server and opening a database, see the section called "Opening the Database" on page 59.

Click File, Database, Information and click the ***Database*** tab to see which server you are currently connected to.

Database – Selecting a Database

Program Property	Purpose	Where Specified	Default Value	Value
Database	Specifies which database to open. A Navision Database Server can only have one database open at a time.	File, Database, Open and Command line or by entering `database=My Database` in the Command line or the **Target** field. In a client/server installation this only works in combination with `servername=`	None	Name of database (including path if database is not located in Navision folder)

The Database program property is used to make the program start with a particular database open. (The database must already exist.) In the **Target** field or on the

command line that starts the program, type the name of the database immediately after `database=`.

To open a database from within Navision:

1 Click File, Database, Open.

2 In the window that appears, select the server and the database that you want to open.

Click File, Database, Information to see which database is being used. For more information about databases, see the chapter called "Working with Databases" on page 51.

Navision Database Server can only have one database open at a time. If a client wants to open a database other than the one that is currently open, they will have to wait until the first database is closed before they can open the desired database.

When you select a database for a client, you can also select the company you want to open automatically by using the Company program property.

Company – Selecting a Company

Program Property	Purpose	Where Specified	Default Value	Value
Company	Specifies which company to open	File, Company, Open or by entering `company=CRONUS International Ltd.` in the Command line or the **Target** field. In a client/server installation this only works in combination with `servername=` and `database=`	None	Company name

With this program property, you can select the company that will open automatically when a client starts Navision. You must also specify the server and the database that contain the company before you specify the company in the **Target** field.

Because Navision can only have one database open at a time, you must connect to a server that already has the appropriate database open. If no other clients are using the system, you can select the server, database and company that you want.

From within the program, you can select a company by clicking File, Company, Open. You can also select a company from the list displayed at the bottom of the File menu. You can see the current company on the title bar of the program window.

Windows Authentication – Selecting the Authentication Mode

Program Property	Purpose	Where Specified	Default Value	Value
NTAuthentication	Specifies which type of authentication is to be used	File, Database, Open or by entering `ntauthentication =yes` in the Command line or the **Target** field.	Yes	Yes/No

This program property is used to determine which type of authentication is to be used when logging on to a server and opening a database.

After selecting the server and the database in the ***Open Database*** window you must:

1 Select the type of authentication that is to be used.

2 Enter your user ID and your password, if database server authentication is being used. If Windows authentication is being used, you do not have to enter a password or user ID.

3 Click OK.

Alternatively, you can enter `yes` or `no` after `ntauthentication=` in the **Target** field or on the command line that starts the program.

If you are using Windows authentication, Navision will start, automatically connect to the server and open the database that you have specified.

If Database authentication is being used, Navision will start and prompt you to supply your user ID and password before connecting to the server and opening the database.

For more information about the types of authentication used in Navision, see chapter 4 "Security".

Commit Cache – Writing the Cache

Program Property	Purpose	Where Specified	Default Value	Value
Commit Cache	Makes the program run faster	Tools, Options or by entering `commitcache=` in the Command line or the **Target** field.	No	Yes/No

The Commit Cache program property allows Navision to postpone writing the information stored in cache on the server to the database until later. Storing this information in cache allows Navision to work faster.

You must restart the program before any changes that you make to this parameter take effect.

Object Cache – Improving Response Times

Program Property	Purpose	Where Specified	Default Value	Value
Object Cache (KB) (clients only)	Makes the program run faster	Tools, Options or by entering `objectcache=8000` in the Command line or the **Target** field.	8,000 KB	More than 0 KB and less than 1,000,000 KB

The Object Cache property increases the speed of the program. Objects such as code, descriptions and windows that will be used on the client computer are stored in the object cache. This means that the client computer only needs to retrieve these objects once from the server, and then they will be stored in the object cache. The client computer must have enough memory to store the objects while they are being used in order to benefit from the object cache.

Running out of object cache (that is, setting too small a value) does not cause any problems. The total size of all the objects used in the standard application is approximately 20 MB. If you have enough memory, set the object cache to 20 MB. The size of the most important objects, such as the table descriptions, is 1 MB. You should therefore, as a minimum, set the object cache to 1 MB. The upper limit is 1 GB.

Click File, Database, Information to open the ***Database Information*** window and see how much space has been allocated in the **Object Cache (KB)** field. To change the amount of space allocated to the object cache, on the menu bar, click Tools, Options, and enter the setting in the **Object Cache (KB)** field.

NetType – Selecting a Net Type

Program Property	Purpose	Where Specified	Default Value	Value
NetType	Permits choice of network protocol	Tools, Options or by entering `NetType=` in the Command line or the **Target** field.	TCP	Netb, TCP

To use Navision in a network, you must select the network protocol that is used for communication between the server and the clients. There are two possible values:

- `nettype=tcp` (for TCP/IP)
- `nettype=netb` (for NetBIOS)

The same selection must be entered on all the client computers in the network as well as on the server. On the server, enter the net type you have selected in the **Target** field (see page 47) or on the command line after the start command. On the client computers, enter the selection in the **Target** field or click Tools, Options on the menu bar within Navision.

To check the setting when you are using the program, click File, Database, Information, and look at the ***Connection*** tab. For more information about the ***Database Information*** window, see page 68.

TempPath – Location of Temporary Working Files

Program Property	Purpose	Where Specified	Default Value	Value
TempPath	Specifies location of temporary working files created automatically	Tools, Options or by entering `Temppath=` in the Command line or the **Target** field.	Windows 2000: `C:\Documents and Settings\User Name\Application Data\Local Settings\Temp` Windows NT: `C:\Temp` Windows 98: `C:\Windows\Temp`	Path to temporary files

When Navision is running it creates a number of temporary files, which are automatically deleted when you close the program. As a default, the temporary files of each individual user are stored in `C:\Documents and Settings\User`

`Name\Application Data\Local Settings\Temp`, unless you specify a different working folder. If you do so, this working folder will be the default location. You can specify the working folder in the **Target** field or by clicking Tools, Options. You must specify the full path, including the drive and all the folders.

DB Test – Testing the Database

Program Property	Purpose	Where Specified	Default Value	Value
DB Test	Tests the database	File, Database, Test or by entering `dbtest=min` in the Command line or the **Target** field.	None	Min., Normal or Max.

You can use this program property to test the consistency and integrity of the database. You can also run the test from within the program by clicking File, Database, Test. You can specify exactly what you want to test in the dialog box that appears.

When you enter the DB Test program property in the **Target** field, the database will be tested before the program opens. You can specify one of the following options:

- `dbtest=min`
- `dbtest=normal`
- `dbtest=max`

You can read about the extent of these tests, as well as how to create a customized version of the database test, in the section called "Testing the Database" on page 63.

TestTarget

Program Property	Purpose	Where Specified	Default Value	Value
TestTarget	To specify how error messages generated by the database test are managed.	File, Database, Test or by entering `testtarget=@screen` in the Command line or the **Target** field.	@screen	@screen, @eventlog, filepath

You use this program property to specify how any error messages that are generated during a database test are managed. They can be displayed on the screen or stored in the Event Log or in a text file. You can enter one of the following options:

- `testtarget=@screen`
- `testtarget=@eventlog`
- `testtarget=filepath`

You must enter the full path and the name of the text file. If you select event log, you can read the error messages that were generated during the database test in the Windows ***Event Viewer***. If you select screen, the error messages will be displayed on the screen and the database test will require interaction from the user if any errors are found. Selecting screen can make the database test quite time consuming.

For more information about testing the database, see Testing the Database on page 63.

Status Bar

Program Property	Purpose	Where Specified	Default Value	Value
Status Bar	Activates or deactivates the status bar	Tools, Options	Yes	Yes/No

On the menu bar, click Tools, Options, and in the ***Options*** window you can specify whether or not the status bar will be displayed at the bottom of the program window.

The status bar contains the following information:

- The complete name of the active field and its contents.
- The work date.

- The current user ID.
- Whether or not any filters have been placed on the data (FILTER appears).
- Whether or not you are about to create something NEW (an account, for example).
- Whether you are working in Insert (INS) or Overtype (OVR) mode.

When you make a visible change in the setup (such as making the status bar invisible), it is practical to use the ID program property and a setup file on your own computer. This makes the setup selections valid only for yourself. For more information, see the section called "ID – Saving the User Setup" on page 29.

This property can only be adjusted from within Navision.

Close Forms On Esc

Program Property	Purpose	Where Specified	Default Value	Value
Close Forms On Esc	Determines whether windows close when you press Esc	Tools, Options	Yes	Yes/No

Click Tools, Options on the menu bar and you can choose whether or not the window you are working in will close when you press Esc.

It is practical to use the ID program property and have a setup file on your own computer if you change the setup. This makes the setup selections valid only for yourself. For more information, see the section called "ID – Saving the User Setup" on page 29.

This property can only be adjusted from within Navision.

Marquee Full Selection

Program Property	Purpose	Where Specified	Default Value	Value
Marquee Full Selection	Determines how graphical objects are selected on the screen	Tools, Options	No	Yes/No

With this setting, you can choose whether graphical objects must be completely within the frame in order to be selected, or whether it is sufficient for them just to touch the edges. This property is relevant for developers using the C/SIDE® development

environment. To make this selection, on the menu bar click Tools, Options and make your selection in the ***Options*** window.

This property can only be adjusted from within Navision.

Quick Find

Program Property	Purpose	Where Specified	Default Value	Value
Quick Find	Quick search by letter in all windows	Tools, Options	Yes	Yes/No

This setting allows you to activate a quick search facility. When the Quick Find setting is enabled, you can search for an entry in any non-editable field, by typing a letter or number. You can also enter the entire name of the element you are looking for. When you enter a letter or number, the ***Find*** window opens automatically, and the first row that matches what you entered becomes the active row.

When the Quick Find property is disabled, you can open the ***Find*** window by clicking Edit, Find on the menu bar or by clicking Find on the toolbar.

This property can only be adjusted from within Navision.

User Portal Pipe Name

Program Property	Purpose	Where Specified	Default Value	Value
User Portal Pipe Name	The name of the Named Pipe used by User Port Application Server	Tools, Options	<\\.\Pipe\UserPortalPipe>	\\server name\Pipe\the name of your choice

This program property only takes effect if you have converted your client to a User Portal Application Server and allows you to customize the name of the Named Pipe used by User Portal Application Server. The maximum length of the string you enter that contains the name you are giving the Named Pipe is 260 characters.

To convert the client to a User Portal Application Server run the command line parameter `runasupas`.

For more information about User Portal Application Server, see the manual *User Portal Installation Guide*.

DB Read-Only

Program Property	Purpose	Where Specified	Default Value	Value
DB Read-Only	Determines that it is impossible to enter any data into the database	By entering `dbreadonly=` in the Command line or the **Target** field.	No	Yes/No

This program property allows you to specify that the database has read access only. This prevents other users from entering data into the database.

2.3 NAVISION DATABASE SERVER SETUP PROPERTIES

Almost all the program properties for the server can be specified in the **Target** field or on the command line that is used to start the server.

The following four properties apply to both the server and the client and have been described in the previous section:

Program Property	Purpose	Where Specified	Default Value	Value
Commit Cache	Makes the program run faster	Command line, **Target** field	No	Yes/No
Server Name	Sets the name of the server	During installation	The name of the server computer	Server name
Database	Selects an existing database	Command line, **Target** field	None	Name of database (including path if not located in Navision folder)
Net Type	Selects network protocol	During installation, Command line, **Target** field	TCP (TCP on UNIX)	TCP or Netb

The server name is specified during the installation and the only way it can be changed is to uninstall the server and then install it again giving it a different name.

The remaining setup properties only apply to the server and are described in this section.

DBMS Cache

Program Property	Purpose	Where Specified	Default Value	Value
DBMS Cache (KB)	Makes the program run faster	Tools, Options or by entering `cache=` in the Command line or the **Target** field.	8000 KB	More than 100 KB and less than 1,000,000 KB

This property only applies to server and single-user installations.

DBMS Cache (Database Management System Cache or just *Cache*) is the name for a reserved space in the computer's memory – where data is stored temporarily, until it has been processed completely. After this, the *commit cache* transfers it to the hard disk. This system quickly frees Navision for new work.

When the cache becomes full, old information in it is replaced with new. When you turn off the computer, everything in the cache is cleared from the memory. At that point, it has already been transferred from the cache to the database.

The cache requires a minimum of 100 KB memory. The upper limit is 1 GB. To see how much cache has been allocated, click File, Database, Information and check the **DBMS Cache (KB)** field in the ***Database Information*** window.

It is usually advantageous to specify as large a cache as possible. If the computer does not have enough memory, however, doing so can cause the operating system to "swap." Swapping means moving part of the cache to the hard disk to make more memory available. When this happens, the performance will be considerably slower because reading and writing take much longer when the hard disk is involved than when these operations are carried out in memory. To avoid swapping, you can add more memory to your computer, reduce the number of programs running simultaneously, or you can make the cache smaller. See page 139 to learn how to adjust the cache size.

You must restart the program before any changes that you make to this parameter take effect.

Stoptime – Closing the Program Automatically

Program Property	Purpose	Where Specified	Default Value	Value
Stoptime	Stops the server automatically at a particular time	By entering `stoptime=` in the Command line or the **Target** field.	None	hhmmss

You can set the server Stoptime program property in the **Target** field (see page 47) or on the command line. Enter the property as follows: `stoptime=hhmmss`, with `hhmmss` replaced by a time in hours, minutes and seconds.

The server will stop automatically when the computer's built-in clock reaches the specified time. You can use this function to make the database unavailable after a particular time. It is not necessary to stop Navision in order to make backups. For more information see the chapter called "Making Backups" on page 113.

Sessions – Number of Client Sessions Allowed

Program Property	Purpose	Where Specified	Default Value	Value
Sessions	Specifies the number of client sessions that can be connected to the server at the same time	By entering `sessions=` in the Command line or the **Target** field.	Maximum determined by license file	Number of sessions allowed by the license file

A *session* is an active (running) copy of Navision. The term must not be confused with *client*, which refers to one connected computer. One client computer (Windows 2000, Windows 98 or Windows NT) can run several sessions at a time if the client program is started more than once. Here are two different ways in which 10 sessions can be running:

- 2 computers, each with 5 sessions (each computer starts the program 5 times)
- 10 client computers, each started once

The Sessions program property is set on servers and specifies the number of sessions that are allowed to be connected to the server at one time. When you obtain your license file, you obtain permissions for a specific number of sessions. These are automatically assigned to the server when you start it.

To see how many sessions a license allows, click File, Database, Information. The ***Database Information*** window appears. Look on the ***Sessions*** tab, in the **Licensed Sessions** field.

You use this program property to distribute the sessions efficiently – either because you want to start several servers with the same license file or because you want to limit access to the current server.

If a client tries to start a session that will exceed the number specified, a message will appear.

Install As Service

Program Property	Purpose	Where Specified	Default Value	Value
Install As Service	Installs the server as a service on Windows NT	**Target** field or Command line	Has no value	Has no value

Navision Database Server is automatically installed as a service. When the Navision Database Server is installed as a service, it starts every time you start Windows NT – without the user having to log on to the system. To manually install the Navision Database Server as a service, enter the following after the command prompt:

```
server installasservice
```

Do not use the equal sign with this property.

Note

If you install Navision Database Server as a service and want to use Hotcopy to store the database backups on a remote computer, you must change the Log On options of the Navision Database Server service. The Navision Database Server service must use the credentials of a domain user that has the appropriate rights on the remote computer and not use the default value (local system account). For more information about HotCopy, see page 125.

Uninstall As Service

Program Property	Purpose	Where Specified	Default Value	Value
Uninstall As Service	Uninstalls the server as a service on Windows NT	**Target** field or Command line	Has no value	Has no value

If you want to uninstall Navision Database Server as a service on Windows NT, enter the following after the command prompt:

```
server uninstallasservice
```

Do not use the equal sign with this property.

Navision Database Server Manager

If the Navision Database Server Manager Snap-in for the Microsoft Management Console is installed and Navision Database Server is installed as a service, you can use the Microsoft Management Console to change the properties of Navision Database Server using the Navision Database Server Manager.

The Navision Database Server Manager is a Microsoft Management Console snap-in that makes it possible for you to manage Navision Database Servers across a domain. With the Navision Database Server Manager, you can see and reconfigure a number of Navision Database Server properties. The Navision Database Server can be started immediately after the installation of Navision Database Server is complete. For more information about the installation, see the section Installing Navision Database Server on page 13.

The Navision Database Server Manager interacts with Navision Database Server the same way that the SQL Server Enterprise Manager does with SQL Server and requires that Navision Database Server is installed. The Navision Database Server Manager accesses the Navision Database Server properties through the registry. If any changes are made to the properties, the Navision Database Server Manager notifies Navision Database Server about the changes, in order for it to respond accordingly.

You can change the properties at run-time, and they will be effective immediately. If Navision Database Server is not running, the properties will take effect the next time you start Navision Database Server.

Adding snap-in

To open the Navision Database Server Manager for the first time:

1 Open Microsoft Management Console.

   The Microsoft Management Console consists of two panes.

   The left-hand pane displays the actual contents of the Manager, that is, an overview of the nodes that have been added to the view. The right-hand pane contains HTML pages that represent the server managers.

2 Click Console, Add/Remove Snap-in.

3 In the ***Add/Remove Snap-in*** window, click Add.

4 In the ***Add Standalone Snap-in*** window, select *Navision Database Server Manager* and click Add.

5 Click Close and OK to return to the console.

You can now add Navision Database Server to the server manager. In the following diagram, one Navision Database Server node has been added to the Navision Database Server Manager node.

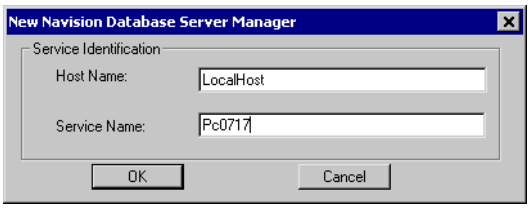
Adding Navision Database Servers

You can add as many Navision Database Servers to the Navision Database Server Manager as you want. They will be listed under the Navision Database Server Manager node in the left-hand pane of the console.

To add a Navision Database Server to the server manager:

1 Right-click the Navision Database Server Manager node.

2 Click New, Database Server Manager, and the following window appears:

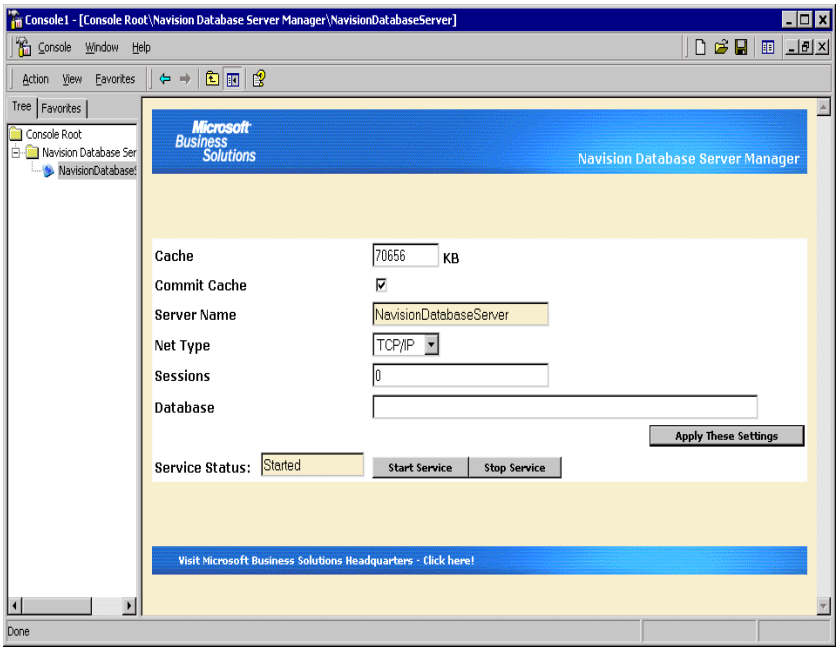


3 The default value that you should enter in the **Host Machine** field is *LocalHost*, but you have access to all computers in the domain.

4 Enter the name of the Navision Database Server that you want to add, for example *NavisionDatabaseServer*. This is the name that you gave the server when you installed it and must not contain any spaces.

5 Click OK to return to the console.

Navision Database Server Manager now contains one node, that is, one Navision Database Server:



Properties

In the right-hand pane of the ***Navision Database Server Manager*** window, you can define or change the properties of Navision Database Server nodes. To see the configuration settings for a specific Navision Database Server, click the Navision Database Server node that you want to see the properties for. In the right-hand pane of the window, the properties are then displayed.

You can enter new values for each of the shown properties for each Navision Database Server node.

You also have the option to start or stop Navision Database Server as a service. In the **Service Status** field, you can see the current status of the server, that is, whether it is running or not.

The field has the following three options:

- *Stopped*
- *Starting*
- *Started*

When you have made your changes to the configuration (by editing the values) and confirmed the changes by clicking *Apply These Settings*, the Navision Database Server Manager does the following:

1. Changes the properties for Navision Database Server and places them in the registry.
2. If Navision Database Server is running, the Navision Database Server Manager notifies Navision Database Server of the changes that have been made to the registry. The changes take effect immediately. If Navision Database Server is not running, the changes will take effect when you restart Navision Database Server.

If the configuration change fails, Navision Database Server shuts down, and the program reacts in the following way:

1. The value in the **Service Status** field changes to *Stopped*.
2. An error message is then logged in the Windows NT event log.

2.4 Setting the Program Properties

As explained in the previous sections, you can customize the system setup by changing the settings of the various program properties.

Some settings must be entered in the **Target** field of the Navision ***Properties*** window (see the section called "Connecting Automatically" on page 48). You can also start a server from a command prompt. If the server has been installed on Windows 2000 or Windows NT as a service and the Startup Type option is set to automatic, the server will start automatically every time you start the operating system.

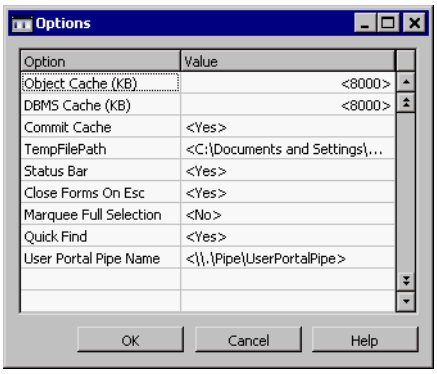
You can specify the program properties in any order. Enter them after the program's start command, separated by commas. The name of each program property is followed by an equal sign (=) and the value to which the property is to be set, for example:

```
d:\fin\fin.exe servername=My server, company=CRONUS International
Ltd., id=alice
```

This does not apply, however, to the two server properties: `installasservice` and `uninstallasservice`. For these properties, enter the parameter on the command line as follows:

```
d:\fin\server.exe installasservice
```

You can also set most of the program properties from the menu bar in the program – for example, by clicking File, Company, Open (to set Company) and File, Database, Open (to set Database). To see the properties that do not exist as menu items click, Tools, Options and the ***Options*** window appears:



Note

Any changes made in this window are saved in the setup file and will be valid the next time the program is opened. If you do not want users to be able to make "permanent" changes in these options, you can set default values in the command line of a batch file (called `fin.bat`, for example) with which the user starts the program.

The program properties that you can set depend on whether you are setting up a client computer, or a server.

Connecting Automatically

Many of the properties that are described in the this chapter can be entered as command lines after the command prompt or included as program properties that are automatically set when you start Navision.

To carry out this procedure on a Windows XP or a Windows 2000 computer you must have administrative rights on the computer.

To set them as automatic program properties:

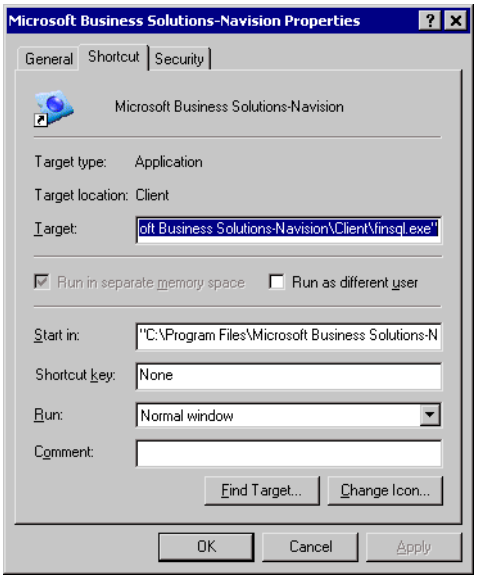
1 Open Windows Explorer.

2 Open the folder Documents and Settings, All Users, Start Menu, Programs, Navision.

3 Notice that there are two identical Navision icons on the right. You must select the icon for the version of Navision that you are using.

On Windows XP and Windows 2000 you must delete the existing shortcuts and create new ones in order to gain access to the **Target** field. Also note that by copying the shortcut to the user specific folders, you can tailor the program properties to the individual user.

4 Click File, Properties or right-click the Navision icon and select Properties. The ***Microsoft Business Solutions–Navision Properties*** window appears:



5 Click the ***Shortcut*** tab. The **Target** field shows where Navision is located. It contains the path for the start command `fin.exe`. After the start command, you can add other commands and settings for program properties.

Here is an example:

```
servername=My Server, nettype=tcp, company=CRONUS International
Ltd.
```

When you set the program properties in this way, the program performs certain tasks the next time it is opened. It will use TCP/IP to connect to the server called `My Server` and open the company called CRONUS International Ltd., if it exists in the database. If you don’t enter the company parameter, you will have to open the company manually after the program starts.

You can change any of these selections while you are working. You can do this from within the program. For example, you can select a different database (provided it has already been created) or a different company, or you can create a new company. If you do not want a client to be able to do these things, you can set limits when you assign user permissions (by setting limits on the "system" object type). You can read about assigning user permissions on page 98.

Chapter 3
Working with Databases

The Navision database is the heart of the application. All the information, companies, modifications, reports, and so on are stored here. It is therefore important that you know how to manage the database and are familiar with the tools that Navision provides for doing this.

This chapter describes the basic operations involved in working with a database, as well as some more advanced features.

The chapter contains the following sections:

- The Standard Database
- Creating and Maintaining Databases
- Testing the Database
- Deleting the Database
- Database Information
- Database Efficiency
- License Files
- Expanding a Working Database
- Advanced Database Information
- Standby and Hibernation

3.1 The Standard Database

You must have a database to be able to work with Navision. When you install a single-user installation, a standard database called `database.fdb` is automatically provided.

Using the Standard Database

You can use the standard database (`database.fdb`) in two ways: with a demonstration license (`cronus.flf`) or with your own license (`fin.flf`). The standard database contains a demonstration company called CRONUS International Ltd.

Using the Demonstration License File Cronus.flf

If you choose to work with the demonstration license file, `cronus.flf`, you have access to all the Navision application areas and can test all the functions – including ones you have not purchased permissions for. The demonstration license file does, however, contain certain restrictions:

Restrictions of Cronus.flf

- Posting is only possible in the period November to February.
- You are only allowed to make 4000 write transactions in a database.
- The maximum number of companies is two.
- You can only have stand-alone installations or run Navision Database Server on Windows NT.
- You can have a maximum of two sessions running at any one time.
- Any company name must start with CRONUS (written in capital letters). This ensures that it will be clearly identifiable as a demonstration company – and you will not accidentally create a "real" company with the wrong license file.

Using Your Own License File

If you work with your own license file (`fin.flf`), you can use only the functions for which you have purchased permissions. This means that you can see only the data for those functions – even in the demonstration company.

On the other hand, your own license file does not limit posting dates. You can also create as many companies in `database.fdb` as you have purchased permissions for. If you create more than one additional company in the database, however, you will no longer be able to use the license file `cronus.flf` because it allows only two companies in the database. Thus, you will lose the benefits of using `cronus.flf`, for example, you will not be able to see all the functions in the entire demonstration company.

3.2 Creating and Maintaining Databases

The demonstration database contains many limitations, which can be difficult to keep track of. Therefore, we recommend that you create a separate database for your own companies. Your license file specifies the maximum size for your database, and you can create as many new companies as you like within the allowed space.

To create a new database for your companies, you must:

1 Create the new database.

2 Restore the backup of the original standard database (`database.fbk`) into the new database. The backup must include at least *Data Common to All Companies* and *Application Objects*. *Data Common to All Companies* includes the program's report list and permissions groups. Restoring *Application Objects* transfers the accounting application to the database. For more information about making backups, see "Making Backups" on page 113.

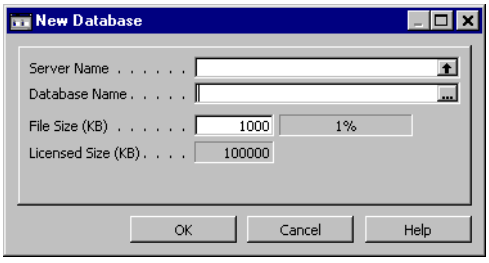
Note

Regardless of whether you choose to continue to work in the standard database or create a new one, make sure that you always have at least one copy of the database you are working with stored in a safe location. If you accidentally delete the folder containing Navision, the database file will disappear, which means that all your data will be lost.

Creating a Database

To create a new database from a client or from a single-user installation:

1 Click File, Database, New. The ***New Database*** window appears:



2 In the **Server Name** field, enter the name of the server. If you are using Windows XP or Windows 2000, you can use the AssistButton® ⬆ and select the server from a list of the Navision Database Servers that are available within the current domain. If the client computer is using Windows NT or Windows 98 and you have installed support for Active Directory and the domain controller is running on Windows 2000, you will also be able to use this function. If the client computer is using Windows NT or Windows 98 and you have not installed support for Active Directory, you will have to enter the name of the server manually.

3 When you enter something in the **Server Name** field the AssistButton … in the **Database Name** field will disappear, indicating that you must enter the name of the database manually. If you want to create a database that will not be stored on the server you must enter the entire path and the name of the database manually.

   If you want to create a database that is stored locally, you do not need to enter anything in the **Server Name** field and can use the AssistButton … to open a standard Windows dialog box where you can create the database in the desired location.

4 Enter the desired size (KB) of the database in the **File Size (KB)** field. The minimum size (1000 KB) is already entered in the field. To the right of this field, you can see what percentage of the maximum size is being taken up by this database.

5 The **Licensed Size** field tells you the maximum size of your database. This information is contained in your license file.

Warning

Never create the database on compressed drives (this also includes the Compress property under the NTFS file system of Windows NT). A database located on a compressed drive can be corrupted by a power failure.

Database Size

The size depends on how many bookkeeping transactions will take place each day, week, and so on. Your Microsoft Certified Business Solutions Partner can help you choose a suitable database size. Do not make the database too large to begin with; you can always expand it, but you can never make it smaller (and the allocated space cannot be used for anything else on your computer). The maximum size of a database is 128 GB.

The number of KB you have permissions for is displayed in the **Licensed Size (KB)** field.

Database in Several Files

When you create a database, it consists of only one file. After the database has been created, you can divide it into several files and place them on different hard drives. This process is described in the next section called "Expanding the Database" on page 55.

Dividing your database into several files on several (physical) disks, lets you utilize disk space optimally. It also reduces the access time to the database, which improves the program's performance. You can read more about performance issues in the chapter called "Advanced Performance Issues" on page 131.

Using Commit Cache

If you have divided your database into several files on several disks, it will be utilized most efficiently if you start the program with the program property Commit Cache set to *Yes*. You can set this up under Tools, Options on the menu bar or in the **Target** field as described on page 48.

Multiuser Installations

In multiuser installations, where there is a network server available, it is possible to start the Navision Database Server program from a computer in the network and at the same time have the database files located on the network server instead of on Navision Database Server. This is *not recommended*, however, because it places a heavy load on the network, which will decrease performance. Normally, Navision sessions communicate directly with Navision Database Server, but if the database files are on a network server, all the database transactions must be sent from the server program via the network to the database files on the network server.

Another reason for not having database files on the network server is that this increases the risk of introducing transmission errors into the data that is being sent back and forth. Data sent between the server program and the database in this way is not protected by the Navision checksum system. Transmission errors in a network are much more common than disk errors or other computer errors, so the risk of introducing errors is sharply increased by putting the database files on the network server.

Do not store database files on drives that are "shared" through the network program. If database files are located on shared drives, the program's performance declines drastically.

Expanding the Database

You use the expand database function to divide the database into several database files and spread them over separate disks. You can also use it to increase the size of these files if the database is beginning to run out of space and to increase the size of a single file database.

You do not need to expand your database until you are about to run out of available space. You can check this by clicking File, Database, Information and looking in the **Database Used (KB)** field in the ***Database Information*** window. The value in this field should not exceed 80% (rule of thumb). As soon as it reaches this level, it is a good idea to expand the database.

The amount of free space in the database must reflect the amount of space required for the maximum number of updates that can be carried out by the other concurrent users, when one user is performing the lengthiest task that your installation contains. This is approximately 16 MB per user (rule of thumb).

Warning

Navision does not give you any warning that you are about to run out of space in the database. You must keep track of the status of the database, including how much space is left and how much database space you have purchased permission for.

However, Navision displays an error message if there is not sufficient free space to perform the current task. It also displays an error message if you are performing a time-consuming task and all the available space in the database that contains your snapshot has been used by other concurrent activities.

Performance

The performance of the program depends only slightly on the size of the database. Unsatisfactory performance may be caused by problems with your equipment, by storing the database in an impractical location, or by setting the Cache and Commit Cache program properties without giving due consideration to your needs. You can read more about how to set the caches starting on page 139.

Requirements

To expand your database, you must have adequate space available on your hard disk(s), and you must have purchased permission for (at least) a database of the size you want to expand to. The **Licensed Size (KB)** field in the ***Database Information*** window shows the size database you have purchased permission for. If you don't have permission to expand the database further, an error message will appear when you try to do so.

Remember that it is not always a good idea to simply expand your database to the maximum size possible; once space has been allocated to the database it cannot be used for anything else on your computer.

Note

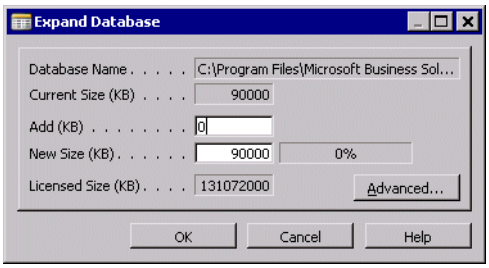
Before you expand your database, you should back up your database as described in the chapter called "Making Backups" on page 113.

Ways to Expand the Database

There are two ways to expand the database:

- Expand the existing database file.
- Create one or more new database files, possibly in different locations. This can be advantageous if there is more space on another disk.

No matter which method you choose, start by clicking File, Database, Expand. The ***Expand Database*** window appears:

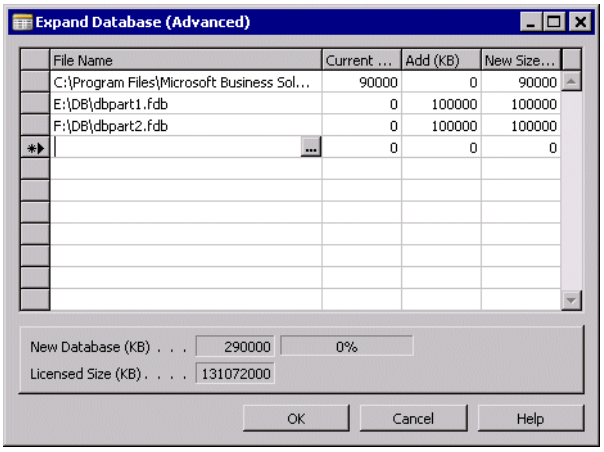


Expanding an Existing Database File

To expand the database, enter the number of kilobytes you want to add in the **Add (KB)** field, or enter the new *total* number of kilobytes in the **New Size (KB)** field. Click OK to expand the database.

Creating an Extra Database File

To create an extra database file in order to expand the existing database, click Advanced in the ***Expand Database*** window. The ***Expand Database (Advanced)*** window appears:



Here you enter information about the new database file or files you want to create.

Each new database file must be set up on its own line. Enter the name (including the full path) in the **File Name** field and the size of the database file in the **Add (KB)** field. If the actual database name is `db.fdb`, for example, you could call one database file "`dbpart1.fdb`" and another "`dbpart2.fdb`" and place them in different folders on different drives.

When you are expanding the database it is important to remember that:

- All of the database files must be approximately the same size. This improves performance.
- The database can consist of up to 16 physical files.
- Each database file can be between 1 KB and 128 GB.
- All of the files together cannot exceed 128 GB.

Name of a Database with Multiple Files

The proper database name, that is, the one that will be referred to elsewhere in the program, appears on the first data entry line. This is the primary file and it points to the other files. As far as the user is concerned the database is one logical file. If you need to use the database name (to open the database or make a Navision backup, for example), use this name and ignore the fact that the database consists of several files.

At the bottom of the window, you can see the size of the complete database increase as you create each file.

When you click OK, the information is saved, and you can continue to work in the database.

Moving a Company from one Database to Another

If you happen to create a company in the wrong database, you can move it to the correct database by making a backup copy of just the company. (Select the

appropriate company before you begin the backup.) When the backup is complete, you open the correct database and restore the company backup into it.

Before you can use this database, you must restore a backup of the standard database.

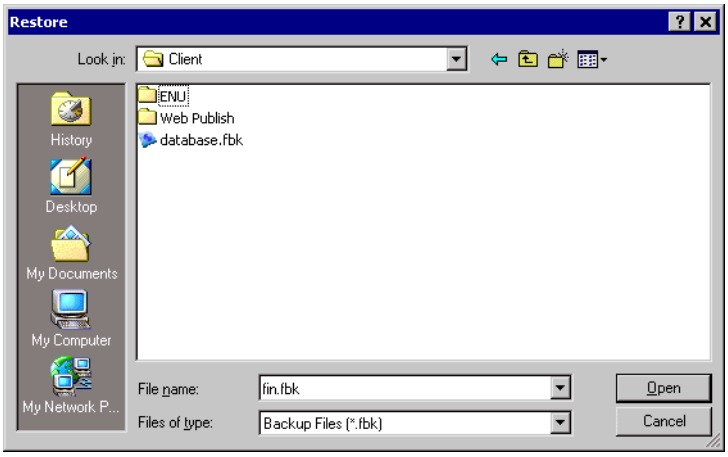
Restoring the Standard Database

The database that you have just created contains only a few basic tables and is not yet ready for use in Navision. Before it can be used, you must restore the backup of the original standard database (`database.fbk`) into the new database.

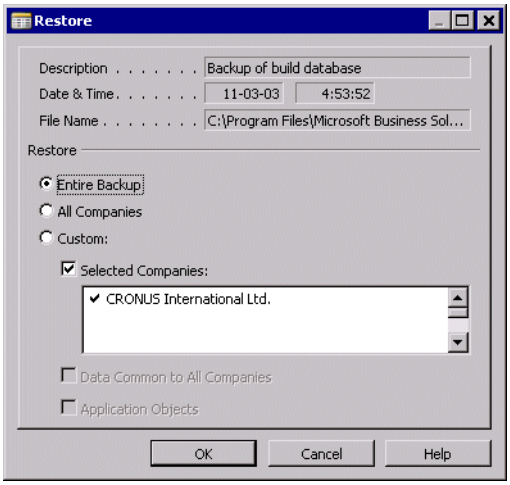
This backup comes with Navision and is stored in the Navision folder on the client computer if you have carried out a complete installation. The backup contains all the information necessary for using the database, including *Data Common to All Companies* and *Application Objects*. *Data Common to All Companies* includes the program's report list and permissions groups. When you restore the *Application Objects*, the accounting application is transferred to the database.

To restore the standard database:

1 Open the new database, and on the menu bar click Tools, Restore. The following window appears:

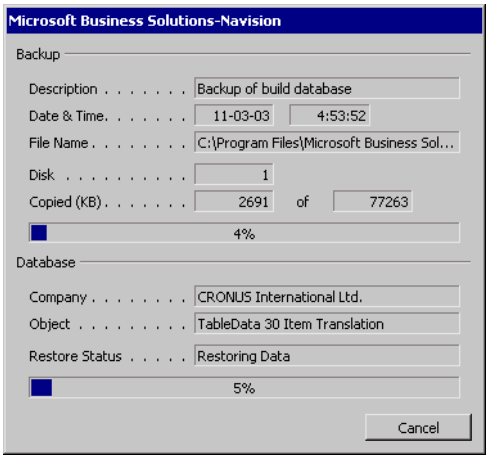


2 Select *database.fbk* and click Open. The ***Restore*** window appears:



3 Make sure that **Custom** is selected and that the **Data Common to All Companies** and **Application Objects** check boxes are selected.

4 Click OK to start restoring the database. The following window appears:



The restore procedure will take a few minutes, and this window allows you to monitor its progress.

For more information about making backups and restoring databases, see the chapter called "Making Backups" on page 113.

When the restore process has been completed, your database will be ready for use in Navision.

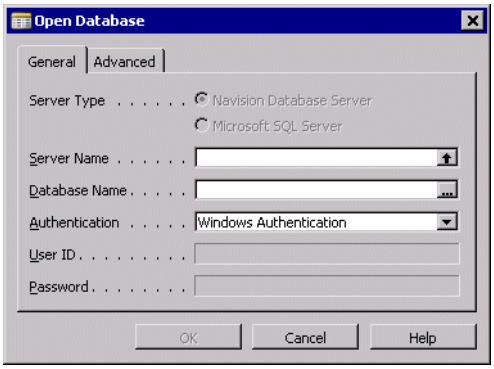
You can now create your own companies in the database.

Opening the Database

On clients and single-user installations, you can open the database from within the program.

To open a database:

1 Click File, Database, Open. The ***Open Database*** window appears:



2 In the **Server Name** field, enter the name of the server. If you are using Windows XP or Windows 2000, you can use the AssistButton ⬆ and select the server from a list of the Navision Database Servers that are available within the current domain Windows 2000. You can only use this function if you are running in a Windows 2000 network.

   You can also use this function if the client computer is using Windows NT or Windows 98 and you have installed support for Active Directory. If the client computer is using Windows NT or Windows 98 and you have not installed support for Active Directory, you will have to enter the name of the server manually.

3 If you have selected a server, you will not have to enter any information in the **Database Name** field.

   If you want to open a database that is not stored on the server, you must enter the entire path and the name of the database manually.

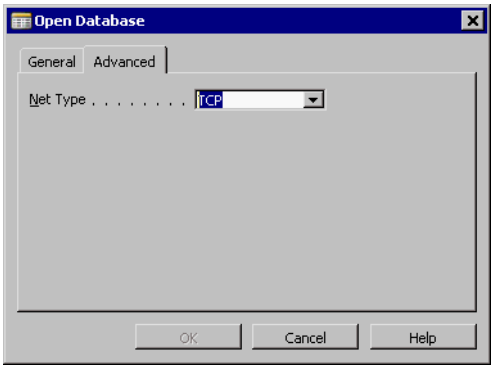
   If the database is stored locally on your hard drive, you must enter the name of the database in the **Database Name** field. If you do not know the name of the database, you can use the AssistButton …. A standard Windows dialog box will appear and you can use it to locate the desired database with the file extension `.fdb`.

4 In the **Authentication** field, specify the type of authentication you require. You can choose between and *Windows Authentication* and *Database Server Authentication*. You can use the AssistButton ▼ to select the authentication type from a list. You can read more about authentication in the chapter called "Security" on page 91.

5 You must enter a user ID and password if you are using database server authentication. If you are using Windows authentication, you do not have to enter a user ID and password.

6 Click OK to open the database.

You can specify the network type that will be used when you connect to the server. In the ***Open Database*** window, click the **Advanced** tab. However, it is not usually necessary to change the network type from the default setting.



You can use the AssistButton ▾ to select the net type from a list and then click OK to accept your selection. You can choose between *TCP/IP* and *NetBIOS*.TCP/IP is the default network protocol.

If there is already a database open, it will be closed when you open the new one. However, if you are working in a multiuser setup you will not be able to close a database as long as one of the other clients is working with it. Navision Database Server can only have one database open at a time.

When you have opened the database, you can open a company by clicking File, Company, Open, or you can add a new company by clicking File, Company, New. You can only have one company open at a time. However, you can open and close companies regardless of whether other users are working with them.

Information about the database and the company that are open when you close Navision is saved in the `.zup` file, and that database and company will be used as a default database and company when you start the program again.

You can also use the Database program property to specify the database you want when starting a server or changing to another (existing) database. You can set the Database property in the **Target** field (see page 48) or on the command line that starts the program, like this:

```
d:\finserv\server.exe database=db.fdb
```

Note

Navision will automatically open the database and company that you were last working on when you reopen the program.

Automatic Reconnection

Navision can automatically detect if the connection to the server has been broken. It will do this the next time the client tries to access the server after having been inactive for at least 10 minutes. If the connection has been broken, for example, because the server has been stopped and then restarted, Navision will attempt to reestablish the connection to the server and open the database with the same settings that were used

when the database was last opened. The user can then continue to work with the database and will not notice that the server has been unavailable.

This allows you to shut down the server temporarily, for example, for hardware upgrades or modifications to server properties and then restart it, without causing any serious inconvenience.

Closing a Database

If you want to close a database (for example, before opening another), you can click File, Database, Close. However, you don't have to follow this procedure; Navision will save all data and close everything down correctly when you select another database or quit the program. There can never be more than one database open at a time, but you can choose to close the database as an extra safety precaution if you want to delete a database or do something similar.

On servers, you can use the Stoptime program property to stop the server at a specific time of day. After this, the clients will no longer be able to access the database.

3.3 Testing the Database

To safeguard against errors, you should frequently check the integrity and consistency of your database. You do this from clients or single users.

Without Opening the Program

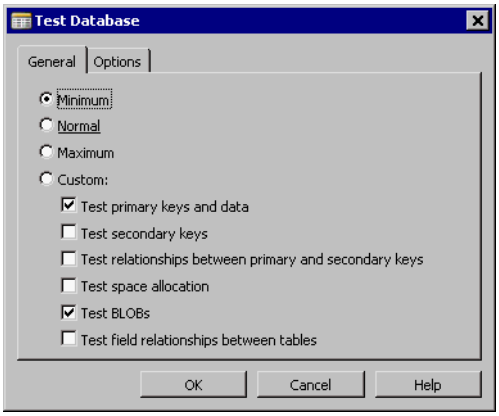
You can also test the database without opening the program. You start the test by setting the program property DB Test in the **Target** field (see page 48). Here is an example:

```
d:\Microsoft Business Solutions-Navision\Client\fin.exe
servername=My Server, ntauthentication=yes, database=database.fdb,
dbtest=normal
```

The possible settings for DB Test in the **Target** field are `min.`, `max.` and `normal.` You can customize the database test if you start the test from within Navision.

From within the Program

To start the test from within the program, click File, Database, Test. The ***Test Database*** window appears:



You determine the extent of the test by selecting one of the four option buttons at the top of the window (such as **Minimum**). When you select an option, the individual tests included in that option are run.

The following table lists what the different tests involve:

Level	Test Fields	Features Checked
Minimum	Test primary keys and data	All records in all tables can be read. Records are sorted in ascending order according to the primary key. All fields are correct in relation to the field type.
	Test BLOBs	All BLOBs (fields for pictures – for example, on the item card) can be read. You can read about BLOBs in the *Introduction* manual and the *Application Designer's Guide*.

Level	Test Fields	Features Checked
Normal	All the fields included in the Minimum test, plus:	
	Test secondary keys	All secondary keys in all tables can be read. Sorting is done correctly according to the secondary key. All fields in the sorting have the correct field type.
	Test space allocation	All space in the database is either used by a sorting key or is available.
Maximum	All the fields included in the Normal test, plus:	
	Test relationships between primary and secondary keys	The connection between the primary and secondary keys is correct.
	Test field relationships between tables	All fields that have relationships to other fields can be accessed from the field to which they are related.
Custom	The same fields as in the Maximum test, but you can cancel the ones you don't want to run.	Whatever you select.

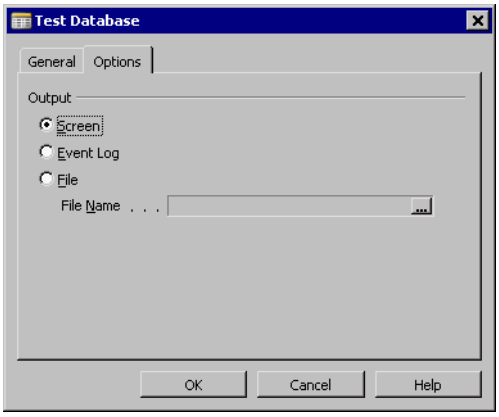
Primary and secondary keys, mentioned in the previous table, are sometimes described as indexes and are used, for example, when you sort information. The keys determine how information in a table is ordered. You switch keys to sort information in a table in a different way. For example, you might want to sort your customers by name or by number. See the *Application Designer's Guide* manual for more information about sorting. For a more detailed description of keys, see page 84.

How often you need to test the database depends on how secure the rest of the system (including the network) is and what level of security you need. It is a good idea, however, to test before you make a backup – especially if you don't use the Navision backup function.

Note

Test space allocation cannot be executed when there is more than one user on the system. If you select a test that includes it, *Test space allocation* will not be executed if there are other users on the system, but the rest of the test will be executed normally.

Click the **Options** tab to specify how the output from the database test is managed:

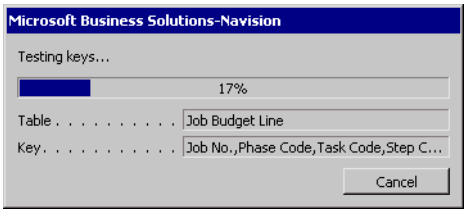


The output from the database test consist of the errors messages that are generated during the test. These can be handled as follows:

Option	Means
Screen	The error messages are displayed on the screen. Each time an error message is displayed you must click OK before the test continues. This can be quite troublesome if the test generates a large number of messages.
Event Log	The error messages are written in the operating system's event log. For more information about the event log, see the operating system's documentation.
File	The error messages are written to a text file. Use the AssistButton … to specify the name and location of the text file.

If you select **Event Log** or **File** the database test is not interrupted and will not take so long. You can then review any error messages that were generated and repair the things that caused them.

While the test is being performed, the following status window is displayed:



If an error occurs, the program stops and displays an error message indicating what the error is and where it occurs.

The following steps must then be taken:

1 Export a Navision backup copy of the database.

2 Create a new database, and restore the backup into it.

3 Run a *Maximum* test on the new database to check it.

4 If it is error-free, check to make sure that the company data is correct. Afterwards, you can continue to work in the new database.

5 If this does not work, contact your Microsoft Certified Business Solutions Partner for help.

Warning

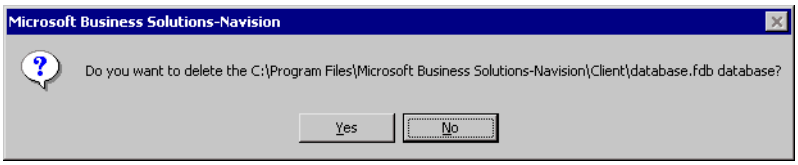
Never delete a corrupted database (one that contains an error) before a new, tested database has functioned without errors for a period of time.

It is important that you remember to make backups – and make sure that they can be restored. You can read more about backups in the chapter called "Making Backups" on page 113.

3.4 Deleting the Database

Never delete a database without making a backup. Save one or more copies of the backup in a secure place. (See the chapter called "Making Backups," which discusses how to make backups as well as some of the legal requirements about saving old financial data.)

After you have made the backup, you can click File, Database, Delete to remove the copy of the database that will no longer be used. Before the database is deleted, you will have to answer two messages like this one:



When you delete a database, *everything* in the database is deleted, including any customizations you have made.

You are not able to delete a database that you cannot open from within Navision. You cannot delete a database if other clients are connected to the database.

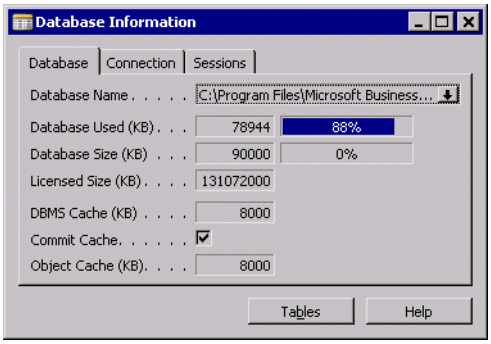
Deleting Part of a Database

If you don't want to do anything quite so drastic as deleting the entire database, there are various other ways to delete information:

- To remove *old information*, use the Date Compress batch jobs. On the main menu, click Periodic Activities, Date Compression for the relevant application area.
- To remove *individual records*, click Edit, Delete. There must be no open entries or nonzero balances for the records you want to delete.
- To remove a *company*, click File, Company, Delete.
- If you have access to the development environment for Navision, you can delete *individual objects*. You can read about the development environment in the *Application Designer's Guide*.
- If you need to delete *almost everything* except a couple of objects, such as some reports, you can save the objects by exporting them before you delete the database. You can then click File, Database, Delete to delete the database. Finally, you can restore the old objects to a new database.

3.5 Database Information

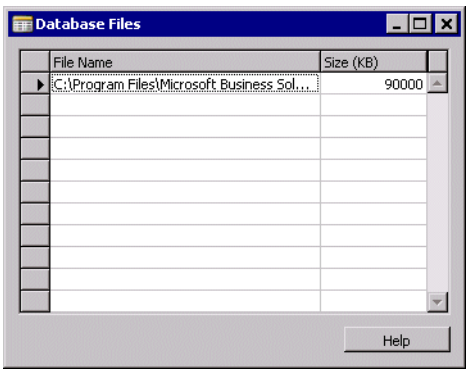
To see information about the current status of the database in Navision, click File, Database, Information. The ***Database Information*** window appears:



This is where you can check to see whether everything is set up correctly, whether there is enough space available in the database, how much cache has been allocated to the program, and so on. (You can't change anything in this window – you can only view information.)

Database

The ***Database*** tab contains information about the database that is currently open. The name of the database appears in the ***Database Name*** field. A database can be set up to consist of several individual files. You can see the names and sizes of the files if you click the AssistButton ⬇ to the right of the field. The ***Database Files*** window appears:



If you click Tools, Zoom (CTRL+F8) from the menu bar while this window is displayed, you will get more detailed information about the database – information that can be used for statistical purposes and to check the performance level. You can read more about performance issues in the chapter called "Advanced Performance Issues" on page 131.

The ***Database*** tab also displays the following information about the database:

- How much of the total database is currently in use and what percentage of the total space in the database is being used. This should not exceed 90%. If it does, you

can expand the database by clicking File, Database, Expand. See page 55 for details.

- How large the total database is, and what percentage this is of the total database size you have permissions for.
- How much database space you have purchased permissions for.
- Whether DBMS cache has been allocated in the system – and how much. The value affects the program speed. To specify cache size, use the program property Cache or click Tools, Options and enter the size as the value for DBMS Cache (KB).
- Whether Commit Cache is turned on (a check mark means that it is). The commit cache affects the program speed. To specify the size of the commit cache, use the program property Commit Cache or click Tools, Options and enter the size as the value for Commit Cache.
- Whether object cache has been allocated in the system. The Object Cache program property is used only on clients where it affects the speed of the program.

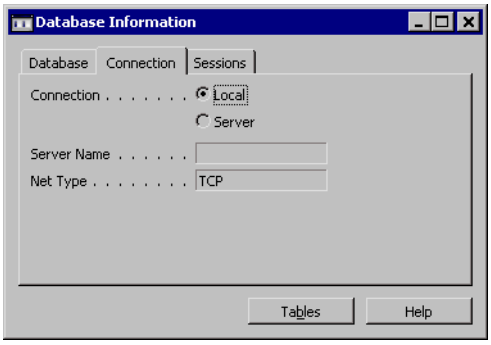
Note

Due to the size of the memory allocation blocks (8KB), the DBMS Cache field can display a slightly different figure than expected. The DBMS Cache rounds down to the nearest block, for example, if you have allocated 500 it will be rounded down to 496.

You can read about the various program properties in the chapter called "System Setup"on page 25.

Connection

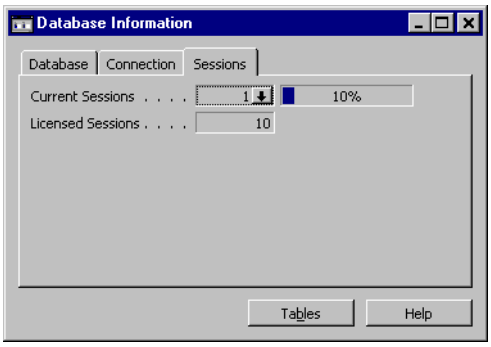
On the ***Connection*** tab, you can see the following information:



- Whether the database you are working in is located on your computer or on a server.
- If you are working in a database that is located on a server, the name of the server and the network protocol that is being used.

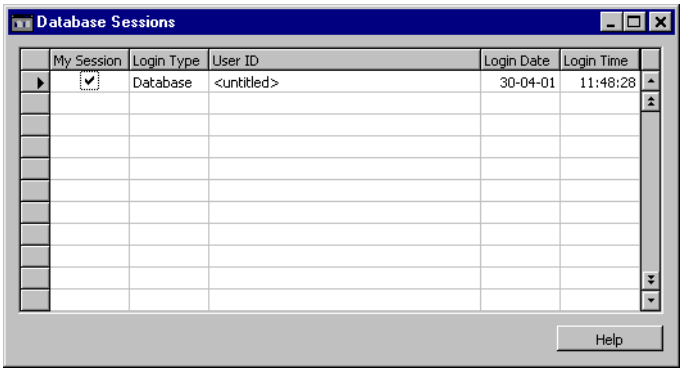
Sessions

The ***Sessions*** tab contains the following information:



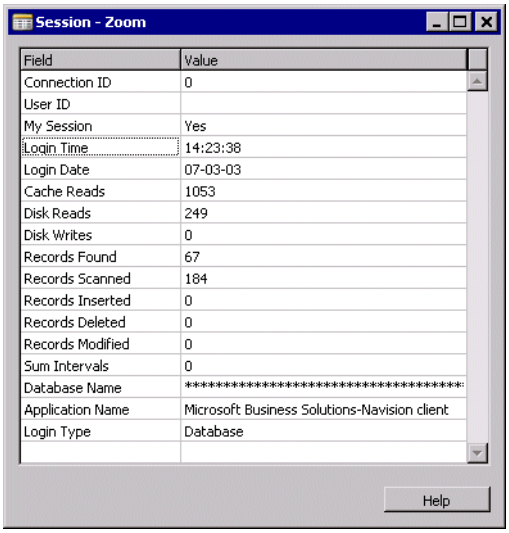
- The **Current Sessions** field tells you how many sessions (active Navision programs) are presently connected to the database. The number is shown both as the number of sessions and as a percentage of the maximum number of sessions for which you have permissions. Each computer (Windows 2000, Windows 98 or Windows NT) can have several sessions running at once.
- The **Licensed Sessions** field tells you the maximum number of sessions (active Navision programs) that can connect to the database. If you need more, you must obtain them from your Microsoft Certified Business Solutions Partner.

If you click the AssistButton ⬇ to the right of the **Current Sessions** field, the ***Database Sessions*** window appears listing details of all the sessions connected to the server:



The window lists all the current connections to the database and the time when each user logged on. Each line represents one login. A user can appear more than once if they have started more than one session. The session that you are currently using has a check mark in the **My Session** field.

If you put the cursor on a line in the ***Database Sessions*** window and click Tools, Zoom on the menu bar, you will get more detailed information about a particular session. The following window appears:



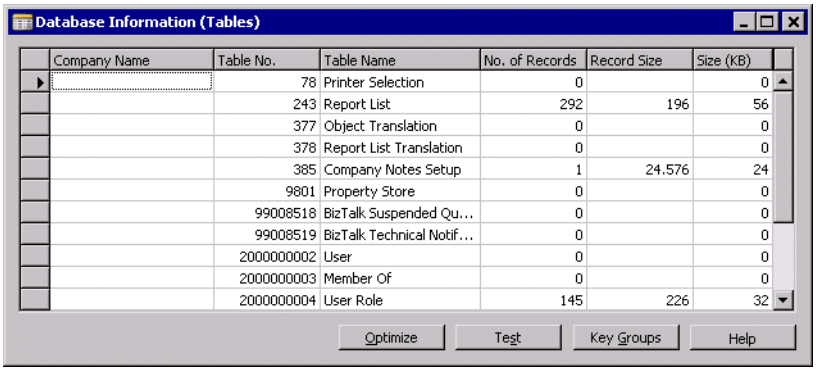
The information here can be used for various statistical purposes.

The Tables button at the bottom of the ***Database Information*** window opens a window displaying information that is used for analyzing where and how data is distributed in the database. You can read about this in the following section.

3.6 Database Efficiency

After you have been using Navision for a while, it is a good idea to check how effectively the database is being utilized. There are a number of special tools for doing this.

Click File, Database, Information, and then click Tables at the bottom of the ***Database Information*** window. A list of all the tables in the database appears:



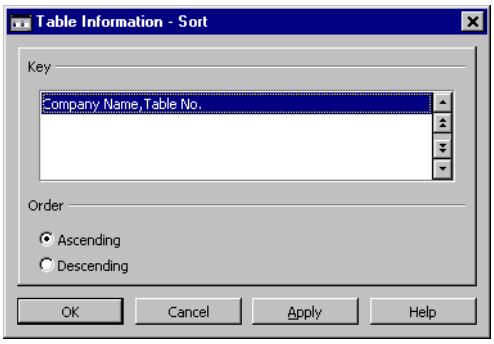
All the information in Navision is organized in tables. Each line in the window represents one table. You find the following information on each line:

Field	Contents
Company Name	The name of the company to which the table on the line belongs.
Table No.	The number of the table. (Each table in Navision has a unique number.)
Table Name	The name of the table. This is the name that is used in C/SIDE rather than the name of the window that displays the table on the screen (they are often the same).
No. of Records	The number of records (entries) in the table. By keeping track of how many new records have been added in a certain period, you can estimate the number of records you can expect in the next period.
Record Size	The average number of bytes per record in a table. Combining this with the number of records in the **No. of Records** field enables you to estimate whether you will have enough space in your database.
Size (KB)	The total size of the table, in kilobytes.
Optimization	This is a percentage that tells how effectively Navision uses this table in the database. The higher the percentage, the more effectively the table is utilized. To optimize the location of data in the table, click Optimize at the bottom of the window. (This column is not shown in the picture.)

The values displayed in the ***Database Information (Tables)*** window cover all the information linked to the individual tables in Navision, both financial information and keys. The next section explains how to use this information to improve the utilization of the database.

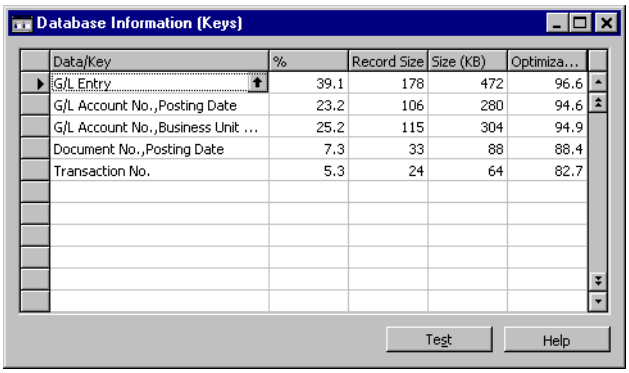
Using Keys and Key Groups to Improve Performance

To make the information in the tables as useful as possible, many of the tables have several predefined sorting keys. To view these predefined sorting keys, select a table in the ***Database Information (Tables)*** window and click View, Sort and the ***Table Information - Sort*** window appears:



You can change the sorting order for the table from ascending to descending.

For more technical information about the keys, click File, Database, Information, and then click Tables in the ***Database Information*** window. In the ***Database Information (Tables)*** window, place the cursor on the table whose keys you want to see and click Keys. The ***Database Information (Keys)*** window appears:

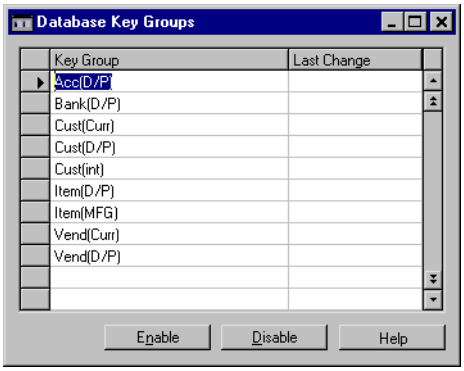


Keys have several uses, but maintaining them (if, for example, one is renamed) places a large demand on the system's resources. You can therefore improve database utilization and performance by deactivating or completely removing keys that are not used in your installation. However, you should not remove or deactivate keys without giving it some thought because there are certain functions the program cannot run when certain keys are missing.

Because of this, the program does not allow you to change the status of keys unless you have access to the C/SIDE development environment.

If you do not have access to C/SIDE, you can have your Microsoft Certified Business Solutions Partner create a set of keys that makes a particular type of task easier. The Solutions Partner can set them up as *key groups*, which you can enable and disable without risk. The program will perform better when you have disabled the key group (because the system does not have to maintain the keys included in the key group).

To enable or disable the key groups, click File, Database, Information, Tables, Key Groups. The ***Database Key Groups*** window appears:



Enter the key group names, and click Enable or Disable. You must remember the names of the key groups.

Setting Up a Key Group

To set up key groups (you must have access to C/SIDE), you must specify which key group each key belongs to. The keys are found in the definitions of the tables.

To set up a key group:

1 Click Tools, Object Designer.

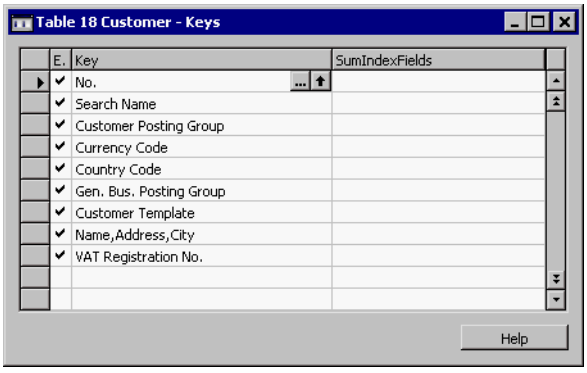
2 Click Table.

3 Select the table that contains the key, which you want to include in the key group.

4 Click Design.

5 Click View, Keys. You can now see the keys for the selected table.

This window shows the keys for the ***Customer*** table:



Disabling a Key Group

If you do not often need to sort the ***Customer*** table by the Currency Code key, you could put the Currency Code key in a key group called, for example, *RarelyUsed* and disable it. The name of the key group must not be longer than 10 characters.

To rename a key group and disable it:

1 In the ***Keys*** window (as shown in the previous example), select the line containing Currency Code.

2 Click View, Properties.

3 In the ***Properties*** window, enter *RarelyUsed* for the KeyGroups property.

4 Save the table definitions by closing the Table Designer.

5 Click File, Database, Information, Tables.

6 Select the ***Customer*** table, and click Key Groups.

7 To disable the key group RarelyUsed, type *RarelyUsed* in the **Key Group** field.

8 Click Disable.

Now, if you click Customers on the Sales & Receivables main menu and then on the menu bar, click View, Sort, you are no longer able to sort the ***Customer*** table by currency code.

Note

When you re-enable keys that have been disabled, the program performs a sorting procedure that requires a certain amount of free space in the database.

Decreasing the Table Seek Time

The Navision database is organized in a *tree structure*. As this tree expands with new records, these records are distributed at the bottom level of the tree. The tree is designed so that data is placed only at the bottom level. For details of the tree structure, see page 84.

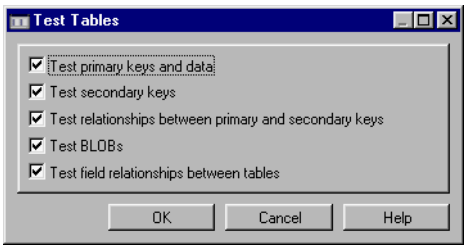
It is possible to decrease the seek time in the tree by optimizing the table in question. Optimizing the table will make finding the specific record quicker by removing any empty space in the table and possibly minimizing the number of levels in the tree.

To minimize the number of levels in the tree for a particular table, select the table in the ***Database Information (Tables)*** window and click File, Database, Information, Tables, Optimize.

On the other hand, if you often insert new records in the table, the program inserts the record in its proper place, between all the other records, by moving all the other records to make room for the new record. So inserting records in a table that is often used can take longer if its tree structure has been optimized and the empty space removed. You can read more about the database structure on page 84.

Finding Errors in the Tables

If you suspect that there are errors in some tables, you can perform error tests. To perform a test on selected tables, click File, Database, Information, Tables, Test. Then highlight the tables to be tested and click Test. The ***Test Tables*** window appears:



If you do not select any tables, the test will be carried out on all the tables.

From this window, you can activate the same tests, (except the space allocation test), that you can by using the DB Test program property or by clicking File, Database, Test. If you choose to test only one table and select *Test field relationships between tables*, the relationships between the selected table and the related tables will be tested. If Commit Cache is turned on, the test will be speeded up significantly.

Creating Space in the Database

The number of entries in the system will grow as you continue to use Navision. At some point you must, therefore, choose between expanding the database or combining some of the old entries, so they take up less space.

Date Compression

Combining entries is called *compression*. Although you can only compress entries from closed fiscal years, you can compress them more than once.

Note

Date compression removes information from the entries, so you must always make a backup of the database before you run the function.

What Is Combined?

During the compression process, several old entries are combined into one new entry. For example, G/L entries from previous fiscal years can be compressed so that there is only one positive and one negative entry per account per month (one each for debit and credit).

After the compression process has been carried out, certain fields will always remain in the combined new entry. The contents of each of these fields will be set to a common or total value. In G/L accounts, for example, these are **Posting Date**, **G/L Account No.**, **Gen. Bus. Posting Group**, **Gen. Prod. Posting Group**, **Gen. Posting Type**, **Amount** and **VAT Amount**. The contents of the other fields will be cleared by the date compression.

You can also select other fields to be retained. If you select more fields to be retained, this will result in more new, compressed entries per time period. The fields that you can select are listed in the window that appears when you choose the Date Compression batch job.

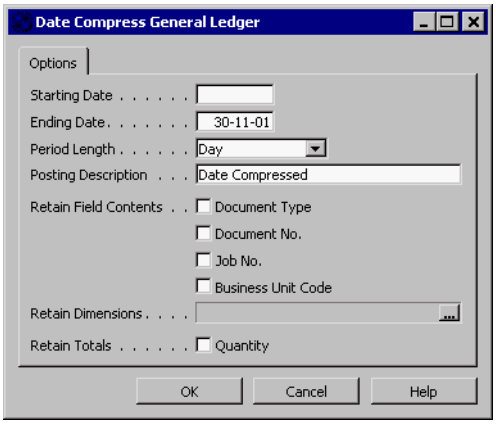
What Is the Result?

The number of entries that remain after the date compression process has been completed depends on how many filters you set before you start the batch job, which fields you want to have combined, and the compression period you select. There will always be at least one combined entry. When the batch job is finished, the result is displayed in the date compression register in the area of the program where you ran the batch job.

The amount of a date-compressed entry is the sum of all the entries that have been compressed into it. The date is set at the starting date of the compression period, for example, the first day of the month if you are compressing by month. After compression has taken place, you can still see the net change in each account for each compression period.

Starting Date Compression

There are date compression batch jobs for each type of entry that can be created in Navision. The batch jobs are found in the appropriate application areas on the main menu. For example, to find the batch job for date compression of G/L entries, click General Ledger, Periodic Activities, Date Compression, General Ledger. If you click the batch job, the following window appears:



Note

When you choose other date compression batch jobs (other than G/L Entries), a tab appears containing filters that you can set on the entries before they are removed for compression. You can use this facility if you only want entries with particular values in a field to be included in the compression.

The ***Options*** tab contains the following fields, in which you can set up the conditions for the compression:

Field	Comments
Starting Date	Enter the first date you want to include in the compression. The compression will include all (for example, G/L) entries from that date until the date in the **Ending Date** field. If you do not enter a date, the compression will begin with the first posting date in the program.
Ending Date	Enter the last date you want to include in the compression. All (for example, G/L) entries from the starting date through this date will be compressed.
Period Length	Enter the time period over which you want to combine entries. To see the options, click the AssistButton ▾ to the right of the field:
Options:	**Entries Combined:**
Day	From the same posting date
Week	From the same week (only entries with a common month and accounting period)
Month	From the same month (only entries with a common accounting period)
Year	From the same year (only entries with a common accounting period)
Quarter	From the same quarter (only entries with a common accounting period)
Year	From the same fiscal year and calendar year
Period	From the same accounting period (grouped within the same calendar year)
Posting Description	Enter the description that will accompany the entry or entries created by the compression. *Date Compressed* is suggested as a default.
Retain Field Contents	Enter a check mark by the fields whose contents you want to save. Selecting a field here, means that when a group of entries for a period is compressed, a common or total value for the field will be retained in the combined entry. Thus, you will still have all the information about this field for each compression period. The more fields you select here, the more detailed the information is in each compressed entry.
Retain Dimensions	Click the AssistButton … and the ***Dimension Selection*** window appears. In this window select the dimensions that you want to retain in the compressed entries.
Retain Totals	Enter a check mark if you want each combined entry to include the total contents of the **Quantity** field. This option is available for G/L entries to allow you to retain the totals if you want to. In many cases, this total will be meaningless because the **Quantity** field is used in various contexts. However, you may want to retain the totals if you have used the field when registering purchases, for example, so you can choose to have it included in the combined entry.

Note

If you select *Day, Week, Month, Quarter or Period* as the time period, you will later be able to compile various statistics about the compressed entries by period.

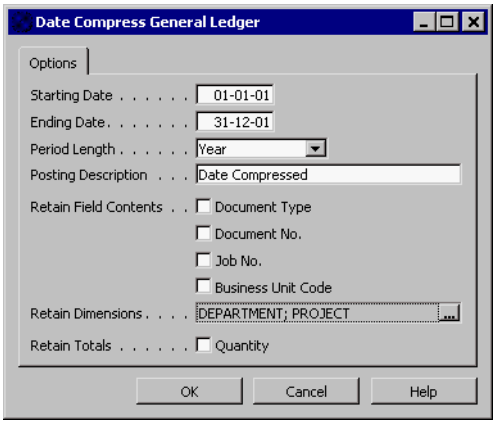
Example of Date Compression

In the following scenario, a company has used Navision since January 1, 1995 for five complete fiscal years that follow the calendar year. The company is now in the middle of the sixth fiscal year (2000). Until now, no entries have been deleted or compressed, but the company believes it no longer needs to have a complete historical record of everything that has happened.

Here is a suggested compression strategy for G/L entries:

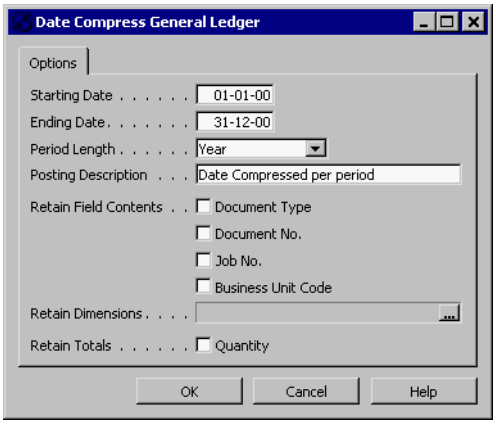
1. In the present fiscal year (Fiscal Year 6), save all entries (no date compression at all).

2. In the preceding fiscal year (Fiscal Year 5), create one combined transaction per account per day per department per project. It will still be possible to create statistics for each day based on department and project. Fill in the fields in the window as shown here:

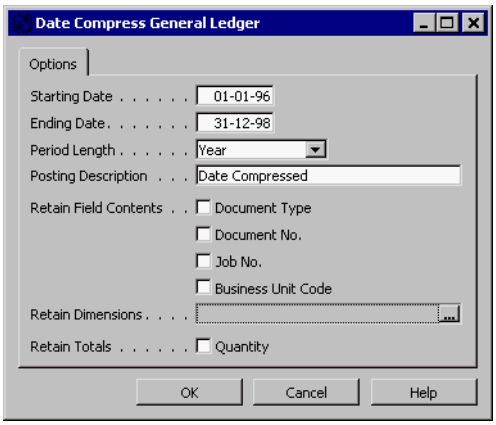


3. For the fiscal year before that one (Fiscal Year 4), create one combined transaction per account per accounting period. It is not necessary to preserve information about departments and projects. From now on, the statistics for this fiscal year can be printed only on the basis of period, without reference to departments and projects.

Fill in the window as shown here:



4 For fiscal years that are more than three years old, only one combined entry per account per fiscal year needs to be saved. For the three oldest fiscal years, you will be able to generate statistical information based only on totals for entire years. Fill in the window as shown here:



3.7 License Files

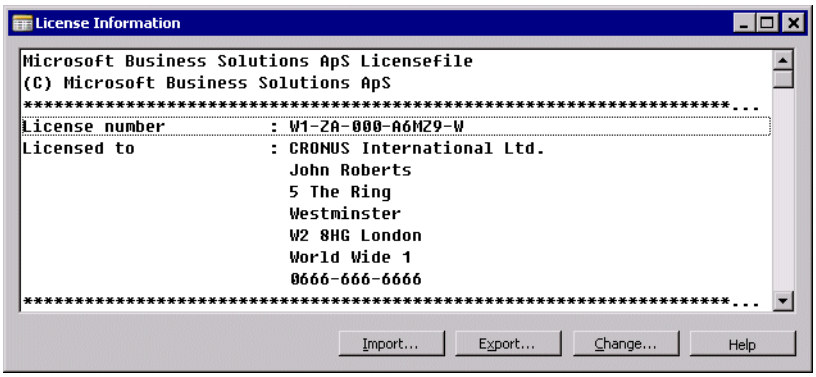
The Navision installation comes with a demonstration license file, `cronus.flf`. The demonstration license file allows you to use the standard Navision program as a stand-alone application and gives you access to the demonstration company that is part of the accompanying standard database, `database.fdb`. To start working with Navision, you will need a license file that contains permissions for the desired application areas and functions. This license file will be supplied by your Microsoft Certified Business Solutions Partner.

You can use your license file to work in the demonstration company and in your own companies, but your permissions will be limited (even in the demonstration company) to those provided by the license file. Your license file is not subject to the same restrictions as the demonstration license file. These restrictions are listed on page 52.

Your license file is always named `fin.flf` and is uploaded to the server during the server installation. The clients automatically work with the same license file as the server they are connected to.

Importing, Exporting and Changing License Files

On the menu bar, click Tools, License Information. The ***License Information*** window appears:



The information displayed includes the license number of the current license file, the name of the owner and the functionality that the owner has purchased (along with any expiration dates). If at any time you want information about the current license file, you can open this window. The buttons at the bottom of the window allow you to import and export license files and to temporarily change the license that you are using.

The license information that is displayed in this window will always be taken from the license information that is stored on the server, unless you have changed your license temporarily with the Change facility.

Importing a License File

In the ***License Information*** window, click Import, to use a different license file. The ***Import License File*** dialog box appears. Locate and select the license file that you want and then click Open. The program will then import the license file into the

Navision folder on your computer and it will be called `fin.flf`. The license file will automatically replace any other file called `fin.flf` without asking you to confirm that you want it to do so.

This new license file will be the active license file the next time you open Navision. When you connect to a server, the license stored there will become the active license.

Exporting a License File

Click Export to export a copy of your license file, for example, to a disk. The ***Export License File*** appears. This is a standard windows dialog box.

Temporarily Changing the License File

If, for example, you are a Microsoft Certified Business Solutions Partner representative visiting a customer, you may want to change the license file temporarily. To do so, insert the disk containing the license file and click Change. The ***Change License File*** dialog box appears. Select the license file to be read into the system. The information contained in it will be transferred to the client when you click Open. When you access any servers, this temporary license information will continue to be used instead of the license information stored on the servers. The server license will be reinstated when Navision is closed and opened again.

Navision will warn you before your license expires. If you fail to notice the warning and the license on the server expires, you will not be able to access the server. However, you can use the Change facility to gain access to the server by using an alternative license file.

When you receive your new license file, you should copy it to the server.

Ensuring that You are Using a Valid Navision License

You may want to verify that you are using a valid Navision license that has been issued to your company.

To check the validity of your license file:

1. Click Help, About Navision and the ***About*** Navision window appears.
2. Click *Check your license information* and your web browser opens a web page that will help you check the validity of your Navision license.

3.8 Expanding a Working Database

You will need to expand your database from time to time. This might be because your database has grown too big and it no longer has the recommended 20% free space. You might also want to expand your because you want to add an extra hard disk.

To expand a working database we recommend that you follow this procedure:

1 Use the backup function in Navision to make a complete backup of your database.

2 Make sure that you are the only client connected to the database.

3 Create the new database that you want to restore the backup into. Remember that you cannot restore a backup into a database that contains data.

4 Create all the other database files on the other hard disks. Remember that all the database files must be the same size.

5 Close and reopen the database. This will ensure that the server rebuilds the list of free blocks in the database.

6 Restore the database backup that you created earlier. The database is now spread evenly across all the database files and you will get the best performance from your database.

3.9 Advanced Database Information

In order to understand how a table is optimized in Navision, you need to understand how the database is constructed. The next section explains this.

In a multiuser installation, Navision handles the problem of several users accessing the database concurrently (at the same time) with a technique called *optimistic concurrency*, which uses the *database version principle*. Optimistic concurrency and the database version principle are explained on page 86.

Optimizing a Table

A database table contains a *primary key* and several *secondary keys*. There must be a primary key, and there can be a maximum of 40 keys (both primary and secondary keys) in all. The keys determine how data is sorted.

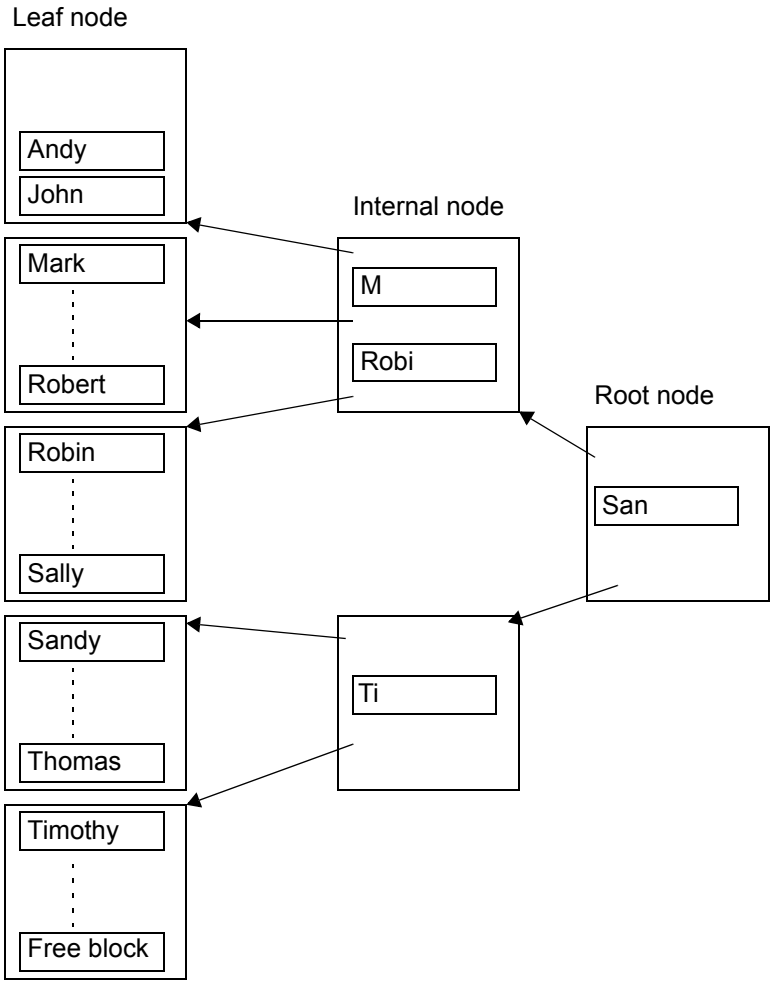
Keys

The keys are arranged in so-called *B+ trees (balanced trees)*. A balanced tree is one in which the program always passes through the same number of levels to access data at the bottom of the tree, regardless of which branch of the tree the data is located on.

A tree data structure is made up of *nodes* (see the figure on the next page) where each node in the tree, except for a special node called the *root*, has one parent node and may have one or more child nodes. The root node has no parent. A node that has no child node is called a *leaf*; a nonleaf node is called an *internal node*.

The level of a node is defined as the level of its parent plus one. The level of the root node is defined as zero. Searching for a record in a B+ tree is very fast because it is not necessary to search the entire tree to find the record.

The following figure illustrates a B+ tree:



Data is only found in the leaf nodes, not in the internal nodes.The internal nodes and the root node only contain dividers (San, M, Robi and Ti in the diagram) and pointers (arrows in the diagram) to the next nodes in the tree.

A divider contains information that separates the data in the levels below it. Depending on whether the value of the data you are searching for in the level below is smaller than or greater than the value in the divider, the search path goes either to the left or to the right (up or down in the figure).

For example, consider the search for the name *Sandy*. Sandy comes after *San* in alphabetical order, so the search path would go from the root node to the internal node containing the divider labeled *Ti*. Sandy comes before Ti, so the search would go to the left (*up* in the diagram) of the divider to the leaf node containing Sandy.

One internal node can contain several dividers. This minimizes the number of levels in the tree and ensures that the path to the record is as short as possible and the tree can be said to be balanced.

As you insert more data in the tree, the leaf nodes may be only partly filled. When you optimize a table in Navision, the leaf nodes are packed together in order to save space

in the tree. When more information is inserted, data will be moved to new nodes to make room for the insertion.

How the Database Works

What if two or more users are reading the same record at the same time? And what if two or more users working on the same record try to save the record at different points in time? Navision uses several strategies to deal with these problems. They are explained in the following sections.

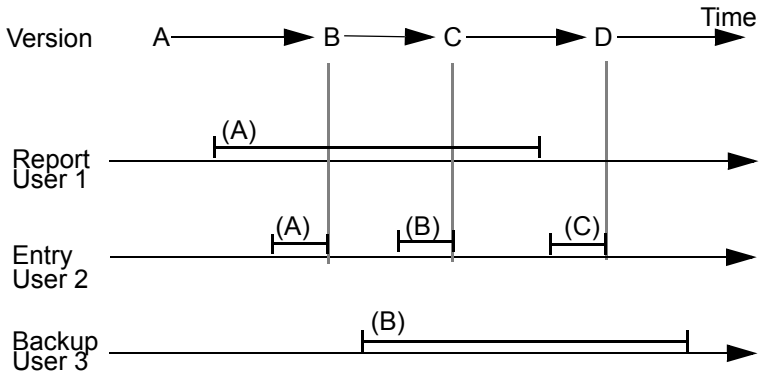
Optimistic Concurrency

Navision uses a technique called *optimistic concurrency*. With optimistic concurrency, you always have access to the record you want to work with. Thus, if two or more users try to access the database at the same time, they will all be allowed to do so. This is possible because the Navision database is based on the *database-version principle*. Every time a user *commits* something to the database, a new *version* of the database is created. (A transaction is said to be committed when it is physically written to the database or to commit cache – if it is turned on. See the section called "Commit Cache – Writing the Cache" on page 33.)

When you enter new data, your changes are private. It is not until you commit the changes that the new data becomes public, and the newest version of the database is established. The DBMS (database management system) enables several Navision clients to access and modify the database concurrently by letting them work on individual versions, which are merely snapshots of the database at the time when they first accessed it.

Read Consistency and Concurrency

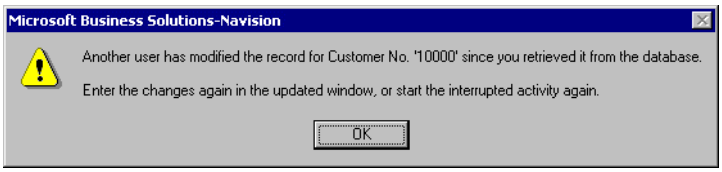
The following figure shows three Navision clients accessing the same database. Imagine that the first access is made by a report. The second access is made by a user who inserts new entries in the database, and the third access is made by a backup procedure.



The generation of the report is based on version A of the database. It is a time consuming process, and while the report is being generated, User 2 enters or modifies records in the database. After each entry is committed, a new version of the database

is created. These are versions B, C and D. However, a snapshot of the database (version A) was made when the report started, and the report continues to work on version A of the database. User 3 starts a backup procedure. When this process starts, the most recent version of the database is B, created by the completion of the first entry by User 2. A snapshot of this version is made, and this version (B) is backed up. The backup process is unaffected by User 2, who continues to enter new data during the backup process. This example shows that working with data versions makes it possible for many users to access the database without interfering with each other.

If, however, two or more users access the same record at the same time the user who first tries to write the changes to the record will be allowed to do so. The other user(s) will receive the following message from the system when they try to commit their changes to the database (if they are trying to modify customer number 10000):



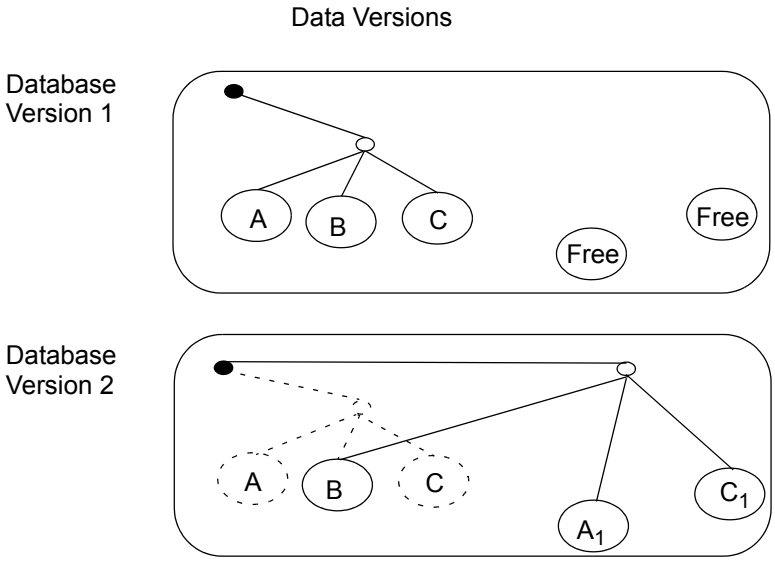
In this case, the user has to repeat his or her work using a new snapshot of the latest (modified) version of the database.

The implications of the database-version principle approach are many; most important is that different Navision clients may read different versions of the same database. These versions are snapshots of the database at the point in time when the clients start to access the database. In this way, the DBMS allows for concurrency (that is, for more than one user to have access to the database at the same time) while still maintaining read consistency. If the accesses to the database involve only data retrieval and no changes, then the newest version will persist – for all clients – until a write transaction is performed.

Database Versions

The following figure illustrates the concept of database versions. The data in the Navision database is stored in the data structure mentioned previously, the B+ tree. Imagine that the tree structure in our database contains a branch with customers A, B and C. Furthermore, there are two free database blocks available. Assume that you need to modify customers A and C. When you modify the records, the DBMS makes a copy of the original customers A and C from database version 1. These copies use

two free database blocks. You then perform your modification on the copies (they are now named A1 and C1), and the system creates a new internal node.



If an error occurs during the transaction, or the user decides to abort the changes, the database blocks occupied by the copied branch will be released and be available for new database updates.

If the transaction is committed, this new internal node will replace the old node, and the database blocks used by the old versions of customer A and C will now be available as free database blocks which can be used by database updates. Now, the newest database version is version 2 in the figure.

3.10 Standby and Hibernation

Navision supports the standby and hibernation facilities provided by Windows 2000.

Putting your computer on standby means that the entire computer switches to a low power state. When on standby, all devices, such as the monitor and hard disks, turn off and your computer uses less power. When you want to use the computer again, it comes out of standby quickly, and your desktop is restored exactly as you left it. Standby is particularly useful for conserving battery power on portable computers. Because standby does not save your desktop state to disk, a power failure while on standby can cause unsaved information to be lost.

Putting your computer in hibernation means that before shutting down your computer saves everything that is currently in memory to disk, turns off your monitor and hard disk, and then turns off your computer. When you reactivate your computer, your desktop is restored exactly as you left it. It takes longer to bring your computer out of hibernation than out of standby.

Shutting Down

Individual workstations can go to standby or hibernate after being idle for a certain length of time. It is also possible to force the computer to go to standby from the Windows' Shut Down dialog box.

However, Navision will not allow Windows to go into hibernation or standby in the following situations:

- Carrying out a transaction, for example, posting an order
- Printing a report
- Making a backup

If you attempt to make the computer go to standby or hibernation from the windows Shut Down dialog box during any of these situations, a window will appear informing you that Navision is busy and that shutting down is not yet possible.

When you click Cancel in this window, the hibernation or standby procedure will be postponed.

If you ignore this window, the computer will go into hibernation or standby when Navision has completed its task.

Restarting

When you restart your computer after it has gone to standby or is in hibernation, it will restart with the desktop exactly as it was when you left it, and you will see the same Navision windows that were open. However the information displayed in these windows will also be the same as before and is therefore not necessarily up to date.

The window will not be updated until you use the program and actively update the window in question.

Using a Laptop

If you are using a laptop computer and close the lid, Windows will shut down. However, an active Navision client will force Windows to wait until the operation it is carrying out is finished before shutting down. When the user reactivates Windows, the Navision client will be exactly as it was when you left it.

Chapter 4
Security

This chapter explains how the security system used by Navision works. It also explains how to set up an effective security system that controls the access that each user has to the program as well as the rights that they have within the program.

The chapter contains the following sections:

- Authentication in Navision
- Active Directory and Navision
- Security within Navision
- Setting Up Logins, Passwords and Permissions
- Changing Passwords
- User Time Limits and the Time Register
- Selecting a Printer

4.1 Authentication in Navision

An enterprise business solution must have a built-in security system to ensure that only people with the appropriate authorization can gain access to the information contained in the system. A minimum level of security requires that users be assigned user IDs and passwords, thereby limiting access to the program. Navision satisfies this requirement by integrating its own security system with the active directory security system and with the single sign-on system.

But before explaining how the Navision security system works it is necessary to clarify some of the concepts that are involved:

- Authentication: the process by which the system validates the users identity. This can be done having the user enter an ID and password when they log on.

  Navision supports two kinds of authentication: Windows authentication and database server authentication.

- Login: when a user has identified themselves and been recognized by the system, they are granted access to the parts of the system for which they have permissions.

  If the user has used Windows authentication to log on to the system, they have been assigned a Windows login.

  If the user has used Navision or database server authentication to log on to the system, they have been assigned a database login.

Windows Security

One of the main features of Windows security is the single sign-on system. Navision supports this feature and can also use more of the features contained in the Active Directory security system.

The Windows single sign-on and the unified login supported by Windows NT are the same. In this manual, we will refer to both of these systems as Windows authentication.

With the Windows authentication system, Navision checks whether the user in question, who has already logged on to the network, is a member of an Active Directory security group or has a valid Windows NT account.

When a user opens Navision and tries to connect with a server and open a database using Windows authentication, they will not have to supply a user ID or password. Navision will automatically ask Windows to confirm whether or not this user, who has already logged on to the network, has a valid Windows account and whether this account gives them the right to access this particular server.

If the user is allowed to access the server, then Navision will check to see if the user has been assigned a Windows login within Navision. If the user has a Windows login, they will be granted access to the database.

The user will be granted access to Navision and be given the permissions specified for that Windows user and those specified for any Windows groups of which they are a member. The user will also be granted any other specific permissions that they have been granted within Navision. If the user does not have a valid Windows account, or if their account does not include permission to log on to server on which Navision Database Server is running, authentication fails and the user receives an error message.

Database Server Authentication

If the server does not support Windows authentication, then database server authentication must be used. It is also used when the network administrator has chosen not to use Windows authentication. The Navision administrator decides which kind of authentication each individual user should use by assigning each user or group a Windows login or a database login.

If the Navision administrator has decided to use database server authentication, they must assign each user a database login. This entails creating a user ID and password for the user within Navision. The user will have to enter this user ID and password when they try to access a database.

The user ID and password must be created by a system administrator, superuser or somebody else with permission to create Navision users. If the user has a valid user ID and supplies the correct password, access will be granted to the relevant areas of the system. If the user ID does not exist or if the password supplied by the user is not valid then authentication fails and the user receives an error message.

Active Directory Service Security

The Active Directory Service gives Navision several new security features.

These include allowing administrators to:

- grant or deny users access to Navision by simply adding them to or deleting them from a Windows security group.
- grant other people in the organization, for example heads of departments, the power to create and administer users and groups.

Active Directory Security also supports Windows authentication and provides you with:

- secure validation and encryption of passwords.
- a time limit on passwords.
- minimum password length.
- account lockout after an invalid password is entered.

4.2 Active Directory and Navision

Active Directory makes Navision even more flexible and easier to administer.

To take full advantage of features provided by Active Directory, the domain controller must be running on Windows 2000 and the clients must be running on Windows XP or Windows 2000 or have been Active Directory enabled. The features that will not be available are the Windows Users and Groups window (see page 98) and the Available Navision Database Server window (see the chapter called "Working with Databases").

Active Directory allows the administrator to give administrative permissions to other users, thereby delegating large areas of responsibility to other members of the organization. Others users, for example department managers, can administer all the groups that they need within their department from the Microsoft Management Console. This allows them to make Windows users members of specific security groups that have been given roles within Navision. They can control access to and permissions within Navision without having to open Navision, provided that the Windows security groups have been given the appropriate roles within Navision.

Navision administrators can also manage database security for Windows logins from within Navision without having to use the Microsoft Management Console.

Navision also allows you to create Navision users, give them roles and modify the rights of these users and roles from within Navision. All the Active Directory security groups will be visible within Navision. It is possible to give these Active Directory groups roles within Navision.

If the domain controller is running on Windows 2000 and the clients are running on Windows 98, the system administrator will not be able to benefit from Active Directory security. In this case, the system can only make use of the Windows authentication provided by Windows 2000. Windows 2000 will manage server security in much the same way as Windows NT and database security will be completely administered from within Navision.

4.3 Security within Navision

Navision allows you to control the access that individual users have to the information contained in the database. You do this by giving the users roles within the database and granting sets of permissions to these roles and to the individual users. In this way, users have access to only those areas of the program for which they have been granted permissions. The database that comes with the program includes a number of predefined roles. (See the list later in this chapter.) You can use the roles as they are, change them or create new ones.

Navision allows you to create two different kinds of login – database logins and Windows logins.

Database Logins

If you are using database server authentication to control access to the system, you can choose the level of security that you want to use: user permissions, user IDs and passwords, or no user IDs. The ways in which Navision user IDs can improve security are described in the following section.

Time-Limited Permissions

Passwords in Navision do not have time limits, but you can put time limits on user IDs. If you yourself have the required permissions, you can always delete a user ID from the system or cancel all its permissions. If this is too drastic, you can specify a limited time period in which a particular user ID is allowed to post in the system. You set up this limitation under General Ledger, Setup, Users as explained on page 111 in this chapter.

Registering Time Use

Under General Ledger, Setup, Users, User Setup, you can specify that you want the program to register the amount of time each user works with a company. This can be used, for example, by accountants who post for others, to document the amount of time spent working on the accounts of the various companies. To see the time use that has been registered, click General Ledger, Setup, Users, User Time Registers. The ***User Setup*** table is described on page 109 and the ***User Time Register*** table on page 111.

Default and Fixed Printer Selections

User IDs can be used to determine which printer an individual user will be connected to. You can set this up under General Ledger, Setup, Printer Selections. You can read more about this on page 112.

User IDs on all Entries

All G/L entries and most other entries in Navision contain a field displaying the user ID of the user who made the entry.

Identifying Individual System Setups

The current user ID always appears on the status bar at the bottom of the program window. If you save individual setup files for different users, it can be helpful to use the user ID as the setup ID. This is the only way that you will be able to see in the window which setup file has been used to start the program.

If you are using Windows 2000 or Windows XP, you will only have to set up user IDs if users are using the same Windows account, because Windows 2000 and Windows XP store each user's individual setup file in their Windows account directory.

You can read more about setup files on page 29.

4.4 Setting Up Logins, Passwords and Permissions

The Navision security system is company specific and contains information about the permissions that have been granted to each individual user with access to each particular company. This includes information about what roles the users have been given as well as any particular rights that they have been granted as individual users.

In order to create Navision users, you must give them an identity within the database that allows them to log on to the system. When the user has logged on to the database, they are able to perform tasks in accordance with the permissions that they have been allocated.

Initiating the Security System

The Navision security system is initiated when you create a database login for a *superuser*. The superuser then owns and administers all access to this database from within Navision. Until you create a superuser, any user with access to the system can carry out any transactions that they want to in a Navision database.

One of the first things that the superuser should do is create user IDs for the other people who will have access to the database and assign roles to these users. Permissions are allocated at company level in Navision.

Who Can Grant Permissions in Navision?

Navision only allows specific users to administer security and grant permissions. Only users who have been given the Super and Security roles are allowed to administer security. These Navision users can only grant permissions to other users that they themselves possess.

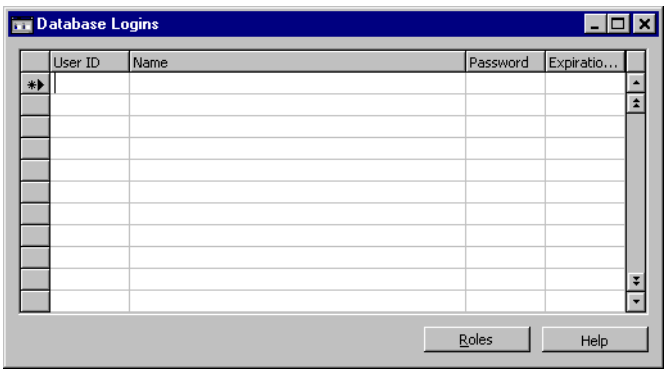
Creating Logins

In order to add new users to the system, you must create a database login or a Windows login for them.

Creating a Database Login

Creating a database login involves giving the new user a user ID and one or more roles that contain the permissions that are appropriate to their position within your organization.

To create a database login, click Tools, Security, Database Logins on the menu bar. The ***Database Logins*** window appears:



To initiate the security system, you must start by creating a database login for a superuser. To do this you must set up the user ID of a superuser who has permission to perform everything that is possible in the entire program.

The following example illustrates how to set up such a superuser. You can use the same procedure to create the database logins for the other users.

To create a database login for a superuser:

1 Open the ***Database Logins*** window.

2 In the **User ID** field, enter the user ID of one of the people who will administer this database, in this case *SUPERUSER*. You can type uppercase and lowercase letters as you like – the program will convert all letters to uppercase. You can change the user ID in this field at a later time.

3 In the **Name** field, enter the name of the user to whom this ID belongs.

4 If you want to be able to use database server authentication you must enter a password. It is encrypted as you type, so neither you nor anyone else can see it. A Navision password can contain a maximum of 10 characters. It is important to remember where you have used uppercase and lowercase letters because passwords are case-sensitive. The password can be used for as long as you want. In a multiuser installation, however, where a system manager has set up all the user IDs, each user should change their own password immediately after logging on for the first time so that no one else knows their password. It cannot be seen anywhere in the system.

   If you set up passwords for others, remember to tell them that passwords are case-sensitive. Users do not need passwords if they are going to use the unified login supported by Windows NT and Windows 2000.

5 In the **Expiration Date** field, you can enter a final date on which a user will be able to log on to the program. As a security precaution, superusers should *not* be given a date limitation.

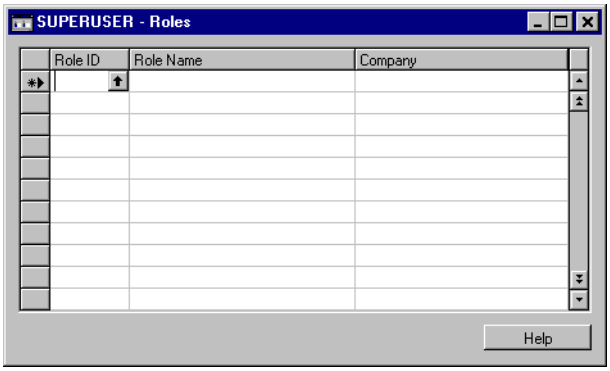
Giving the Superuser a Role

You must grant the "*SUPER*" permissions to your superuser before you grant permissions to any other users. Navision requires that at least one user is assigned this role in each database. You grant permissions to users by giving them roles or by granting them specific permissions.

Assigning Roles

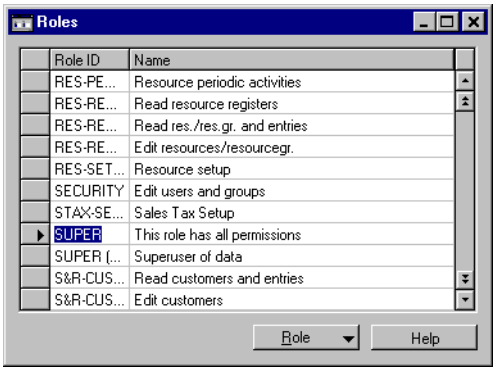
In the ***Database Logins*** window, make sure that the current record symbol ▸ on the left side of the window is next to the login of the superuser that you have just created

and click Roles at the bottom of the window. The ***SUPERUSER - Roles*** window appears:



This window lists the roles that this user has been given, but it is empty now because you have not yet given this superuser a role.

To see a list of the roles that have been set up, click the AssistButton ⬆ at the right of the **Role ID** field. The ***Roles*** window appears:



If you have not changed them, these will be the standard roles that come with the program. You must give the superuser the role named *SUPER*:

SUPER	Read, use, change and delete all data and all application objects (if you have purchased a license to do so).

To add the role to the ***SUPERUSER Roles*** window, scroll down to the line containing the desired role and double-click it or select it and click OK.

As a default, permissions apply to all the companies in the database, but they can be restricted to a particular company. To do this, enter the name of the company (or use the AssistButton ⬆) in the **Company** field on the right side of the window. For permissions to apply to several companies, you must set up one line per company (each line starting with the same role ID). If you specify that the permissions a user has only apply to a particular company in the database, the user in question will only be able to see that company.

Note

The standard roles come with the standard database. When you create a new database, the roles will be copied into it when you make a backup of *Data Common to All Companies* and *Application Objects* in the old database and restore them into the new database.

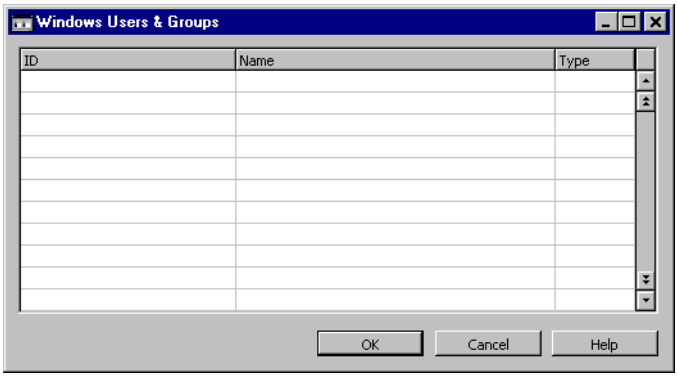
Creating a Windows Login

It is also possible to create a Windows logins for a Windows user or group that allows them to access the system.

To create a Windows login:

1 Click Tools, Security, Windows Logins and the ***Windows Login*** window appears.

2 In the **ID** field, click the AssistButton ⬆ and the ***Windows Users & Groups*** window appears:



This window lists all of the Windows users and groups that are available in the current forest of domains and domain trees. This window is only available if both the domain controller is running on Windows 2000 and the clients are running on Windows 2000 or have been Active Directory enabled. However, if you are running a Windows NT network, you can type in the names of the Windows users and groups in the ***Windows Login*** window. Remember to use the Domainname\Username format.

3 Select the Windows user or group for which you want to create a windows login.

4 Click OK and the Windows user or group will be added to the ***Windows Login*** window.

You have created a Windows login and can now give it a role within Navision.

Roles and Permissions

Before granting permissions to the users, you should look at the standard roles that come with Navision. You can use the roles as they are, you can modify them, or you can set up completely different ones.

Each role describes a set of access permissions to tables, reports, functions, and so on. Various permission types allow the user to:

- Read (information in a table, for example)
- Insert (information in a table, for example)
- Modify (information in a table, for example)
- Delete (information in a table, for example)
- Execute (functions or reports, for example)

You can give each user one or more roles as needed by following the procedure described above.

There is no point in granting permissions to areas that your license file does not permit you to use. However, granting such permissions does not cause any problems. If you have the program customized or purchase additional application areas, however, remember to change or add to the permissions.

Creating a Navision Role

If the existing roles do not meet the needs of your organization, you can always create new ones.

To create a new role:

1 Click Tools, Security, Roles. The ***Roles*** window appears.

2 Click Edit, Insert New (or use F3) to get an empty line on which to create the new role.

3 Enter an ID for the role in the **Role ID** field and a description of it in the **Name** field.

4 Press Enter or click the next line to accept the new role. Then click the new role again.

5 Click Role, Permissions. The ***Permissions*** window for this new role appears. See the picture on page 104. Because this is a new role, the window will be empty.

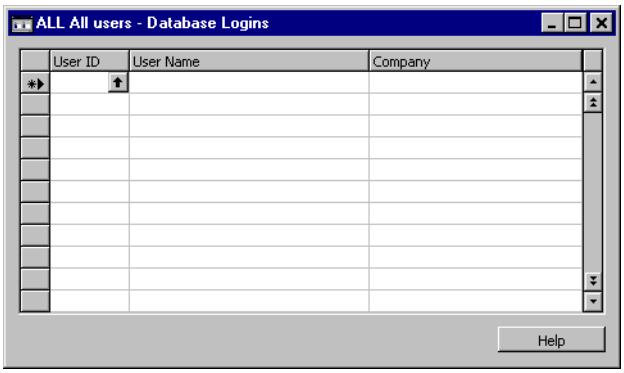
6 In the ***Permissions*** window, you can use the AssistButtons to select the type of object that you want to grant permission for and then the specific instance of that object. Enter *Yes* under the permissions you want to assign to the role, or select *Yes* with the help of the AssistButton ▾ to the right of the field. These permissions will then be granted to the new role.

7 Alternatively, if you want to grant the role extensive permissions, you can click All Objects at the bottom of the window. A list of all the objects in the application appears.

Enter *Yes* under the permissions you want to give the role, or select *Yes* with the help of the AssistButton ▾ to the right of the field. When you click OK in the ***Permissions (All Objects)*** window (see page 105), the lines marked *Yes* will be copied to the ***Permissions*** window for this role, where you will subsequently be able to see them.

Giving a Database Login a Role

To see which users or logins have been given a particular role, click Tools, Security, Roles to open the ***Roles*** window. Select the role you are interested in and click Role, Database Logins. The following window appears listing the database logins that have been given this role in the database:

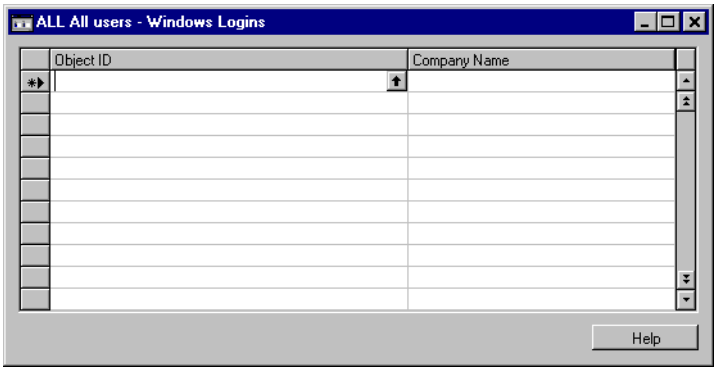


If you have already set up the database logins and user IDs, you can easily give a number of new users this role. To do this, you must be a superuser or at least have the permissions you want to give to others, as well as access to security.

Click the AssistButton ⬆ in the **User ID** field and select the user in the ***Database Logins*** window that appears and click OK. You have to add each user individually. This window is the same as the one that appears when you click Tools, Security, Database logins. It is described on page 97.

Giving a Windows Login a Role

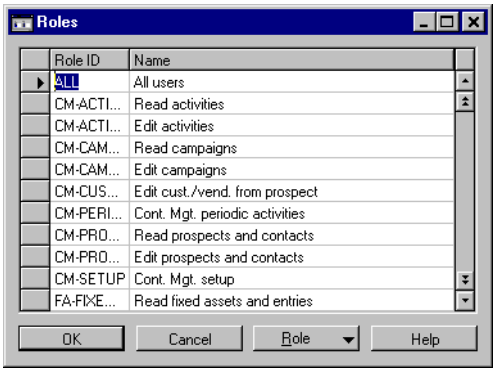
To see the Windows logins that have been given a particular role in Navision, open the ***Roles*** window and select the role you are interested in and click Role, Windows Logins. The following window appears listing the Windows logins that have been given this role in the database:



To give a new Windows login this role, click the AssistButton ⬆ in the **Object ID** field and the ***Windows Login*** window that appears. Select the Windows login that you want to give this role to and click OK.

Modifying the Permissions Granted to Navision Roles

To view, modify, create or delete permissions for existing Navision roles, click Tools, Security, Roles on the menu bar. The ***Roles*** window appears. It lists the IDs and names of all the Navision roles:



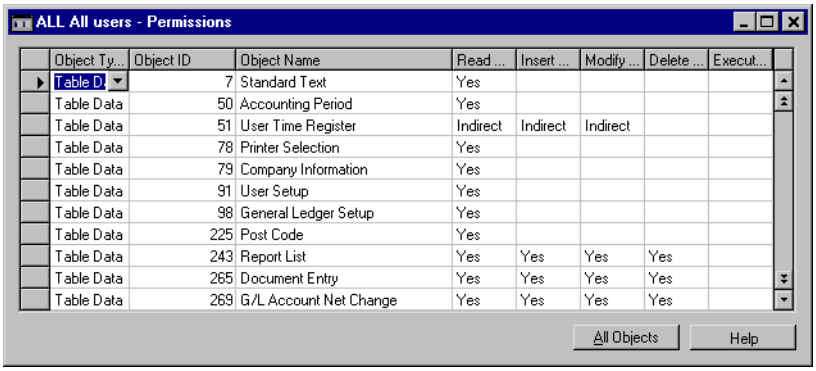
For detailed information about the permissions that have been granted to each role, select the role (ALL is selected in the picture) and click Role, Permissions. Some of the special roles are described in the following table:

Group	Permissions
SUPER	This role can read, use, change and delete all data and all application objects (that your license permits). Navision *requires that at least one user is assigned this role in each database.* You cannot alter the permissions that have been granted to this role.
SUPER (DATA)	This role can read, use, change and delete all data. This is a role that you will normally assign to an accounting manager or another person who can work with all the data but does not need to make changes in the program.
SECURITY	This role has access to the tables and functions related to security information (users, permissions and passwords). Users who have been given this role can grant permissions to others, but they can only grant those permissions they themselves have. Therefore if you want to create an "area superuser," you should give the person the SECURITY role plus permissions for the areas (such as Purchases & Payables) in which they can grant and revoke permissions for other users. This allows them to create new Microsoft Business Solutions L0gins and to grant and revoke permissions for other users within the area of Purchases & Payables.
ALL	This role can use fundamental (but not “high-security”) tables and functions. The permissions the user gains with this role can only be used in the tables that users must normally have access to, such as the Main Menu. Assign this role to all users (except SUPERUSER), because this is a prerequisite for all other roles you will assign to them.

Modifying Permissions for Individual Objects

To modify a role, open the ***Roles*** window and select the role (there should be a ▸ to the left of the line). Click Role, and then click Permissions. The ***Permissions*** window

appears. This window allows you to see which permissions are granted to each role. The following window is for the role ALL (All users):



Each line represents an *object* (table, report, form, dataport, codeunit, system and so on) in Navision. You can modify, delete or insert lines. In the **Object Type** field, you can click the AssistButton ▾ to view or select the types of objects to which you can grant permissions.

In the **Object ID** field, use the AssistButton ⬆ to select the object that you want to grant permission to. The **Object Name** field is filled in automatically when you select an object ID.

There are five permissions fields where you can see whether the role has permission to read, insert, modify, delete or execute for the table, report, and so on.

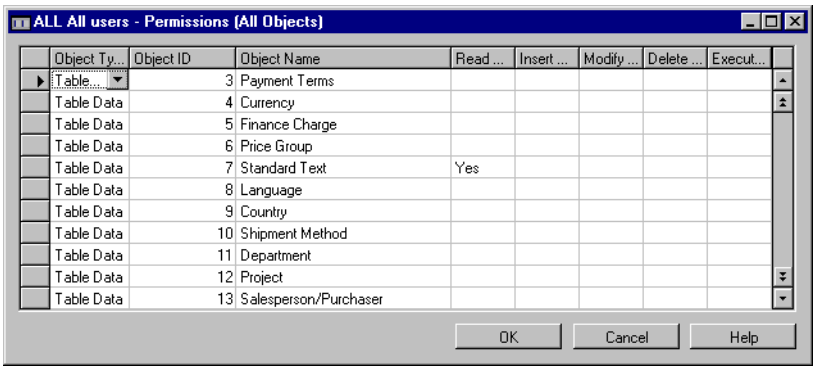
The following options appear in the permissions fields:

Permission	Meaning
Yes	This permission is granted and you have full access to this object. You can always, for example, read this object.
Indirect	This permission is granted indirectly. An indirect permission allows you to, for example, read the object via another object that you have permission to use, such as, a codeunit or a form. Example: You have permission to run Codeunit 80, ***Sales-Post.*** The ***Sales-Post*** codeunit performs many tasks. One of these is to modify Table 39, ***Purchase Line***. When you run the ***Sales-Post*** codeunit, Navision checks whether or not you have permission to modify the ***Purchase Line*** table. If you do not have permission to modify the ***Purchase Line*** table, the codeunit will not be able to complete its tasks and you will receive an error message. If you have permission to modify the ***Purchase Line*** table, the codeunit will run successfully. However, you do not need to have full access to the ***Purchase Line*** table in order to run the codeunit. If you have indirect permission to modify the entries in the ***Purchase Line*** table, the ***Sales-Post*** codeunit will run successfully. When you have indirect permission, you can only modify the ***Purchase Line*** table when you run the ***Sales-Post*** codeunit or another object that has permission to modify the ***Purchase Line*** table.
	Not selected (the field is empty) and you do not have this permission.

Modifying Permissions for Multiple Objects

You can also grant permissions for multiple objects to a role. This is a useful time saving feature if you want to radically modify the permissions that apply to a role.

To see all the objects for which you can grant permissions, click All Objects. The ***Permissions (All Objects)*** window appears:



Enter *Yes* in the fields for the permissions that you want to add. (When you return to the window containing the list of permissions, it will include all of the items for which you entered *Yes*.) Click OK to save your selection.

Additional Security Features Provided by Active Directory

If both your network and clients are running on Windows 2000 or Windows XP or are Active Directory enabled you will have access to some extra security features. You will be able to give Windows users and groups roles within Navision. You will also be able to make Navision roles members of Windows security groups. This can only be done from within Navision and the individual permissions that are granted to the roles can only be administered from within Navision.

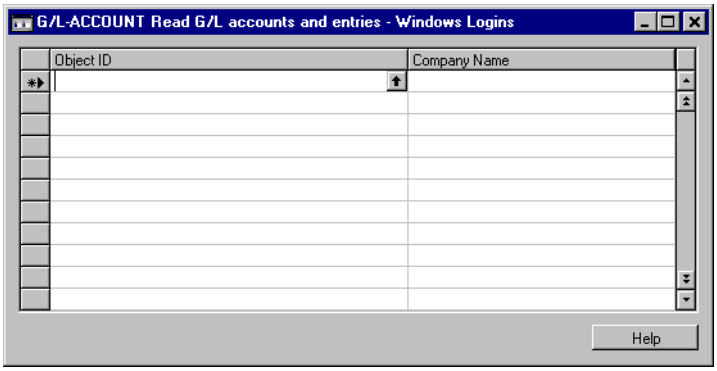
Giving Windows Users and Groups a Navision Role

Active Directory allows you to give Windows users and groups a Navision role.

To give a role to Windows user or group:

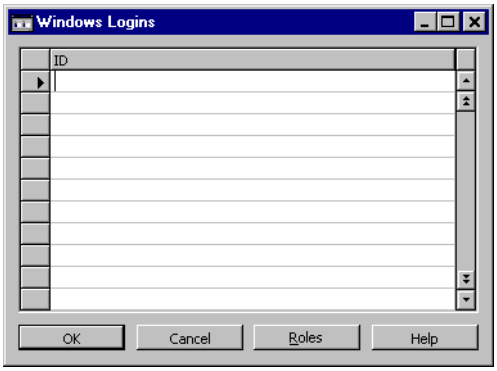
1 Click Tools, Security, Roles on the menu bar to open the ***Roles*** window.

2 Select the Navision role you want to modify and click Role, Windows Logins and the ***Windows Login*** window for this role appears:



This window lists all the Windows users and groups that have already been given this role in Navision. To add a Windows user or group to the list, select an empty row or create one by clicking Edit, Insert New (or use F3).

3 Click the AssistButton ⬆ in the **Login ID** field. The ***Windows Login*** window appears:



This window contains a list of all the Windows users and groups that can log on to Navision.

4 Select the Windows user or group that you want to give this Navision role to and click OK. This user or group will now be added to the list shown in the ***Windows Login*** window for this role.

Adding Navision Roles to a Windows Security Group

Active Directory also allows you to make Navision logins and roles members of Windows security groups. Click Tools, Security, Windows Logins to open the ***Windows Login*** window.

This window lists all the of the Windows users and groups that can currently access the system. Select the Windows login to which you want to add a Navision role. Click Roles and select the relevant role from the ***Roles*** window that appears. This role and all the individual users that have been given this role will now be added to the Windows login that you selected earlier.

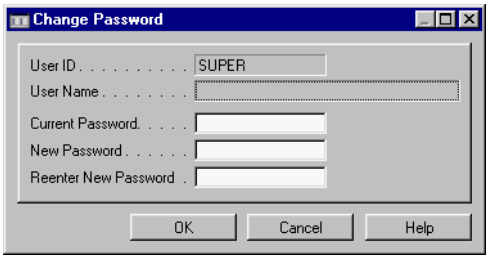
4.5 Changing Passwords

If you work in a multiuser installation and have been given your user ID and password by the system manager, it is a good idea to change your password the first time you use the program. That will ensure that you are the only one who knows your password. This is not necessary if you work in a single-user installation and have set up your own user ID.

Note

Passwords in Navision do not have time limits. If you want to set time limits for access, you can place an expiration date on the user ID or you can specify an allowed posting period for each user (click General Ledger, Setup, Users, User Setup).

To change your program password, click Tools, Security, Password and the ***Change Password*** window appears:



The user ID and user name, which appear in the two uppermost fields, cannot be changed here. To change them, click Tools, Security, Users.

Enter your current password in the **Current Password** field (remember to distinguish between uppercase and lowercase letters). Enter your new password in the **New Password** field. You must then confirm the new password by entering it again in the **Reenter New Password** field. This verifies that you entered it correctly the first time and that you can remember it. The password will not appear when you enter it, and you cannot see it anywhere else in the program.

If a message appears informing that the password is incorrect, there are two possible causes:

- You typed it wrong the second time – try again.
- The password that you created is not what you think it is. Perhaps you made a typing error the first time, or maybe you used uppercase and lowercase letters differently in the two fields. Enter the password in the **New Password** field again, and then reenter it again.

Click OK if you want to change the password; click Cancel to stop the password from being changed.

If you forget your password or user ID

If you forget your password or user ID, you will be allowed an unlimited number of attempts to enter it. You can also request a new password from a user who has permission to change other people's passwords.

If all users have forgotten their user IDs or passwords (passwords are encrypted, so they cannot be seen anywhere in the program), so no one can set up new ones, you can get a special password from your Microsoft Certified Business Solutions Partner.

To get a new password from your Microsoft Certified Business Solutions Partner:

1. Open Navision.
2. When the ***Login*** window appears, enter *??????????...* (20 question marks) as the user ID. The program now displays a window containing a code.
3. Give the code to your Microsoft Certified Business Solutions Partner, and they can supply you with a new password.

Warning

Do not use the keyboard or mouse before you enter the new password.

4. Enter the password from the Microsoft Certified Business Solutions Partner. It can only be used once.
5. Click OK to close the window.
6. As soon as you have entered it, click Tools, Security, Users, and set up your own password.

4.6 User Time Limits and the Time Register

Navision allows you to put time limits on user IDs. If you are using Windows authentication, you can also put a time limit on passwords within the Windows 2000 and Windows NT networks. If you have the required permissions, you can always delete a user's ID from the system or cancel all their permissions. Alternatively, you can specify a limited time period during which a particular user ID is allowed to post in the program.

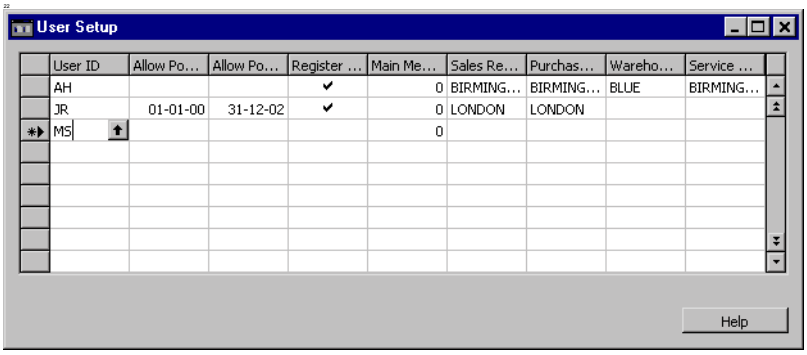
After you have created a user ID, you can specify that the user with that ID can post only during certain time periods (for example, June 1 – June 15) and that the program must keep track of the amount of time the user has been working in each company. This can be used, for example, by accountants who post for others, to document the amount of time spent working on the accounts of the various companies. The ***User Setup*** and ***User Time Register*** windows are used for putting time limits on user IDs. They are both found under General Ledger, Setup, Users.

User Setup

In the ***User Setup*** window, you define when each user will be allowed to post and whether the program will record the amount of time that they were logged on. You can also assign responsibility centers and warehouse locations to the user.

This window lets you specify the main menu that will appear when the user with a particular ID opens Navision. This is relevant because the program can be customized in many ways – many different main menus may be available. If they are, you can choose to display to display one main menu to users who work with the Inventory application area, for example, and another to those who work with the General Ledger application area.

Click General Ledger, Setup, Users, User Setup and the ***User Setup*** window appears:



Fill in the fields in the ***User Setup*** window according to these guidelines:

Field	Comments
User ID	Enter the user ID for which you want to set up conditions. The user must have been set up already. If you cannot remember the user ID, click the AssistButton ⬆ to the right of the field to see a list of the user IDs that have been set up in the current database.
Allow Posting From	Enter the date on which the user will be allowed to start posting.
Allow Posting To	Enter the last date on which the user will be allowed to post.
Register Time	If you want to register the amount of time a user works on the company, enter a check mark by clicking the field or pressing the spacebar.
Main Menu ID	If you want the user to see a particular main menu when they start the program, you must specify it here. If you cannot remember whether any special menus have been created, click the AssistButton ⬆ to the right of the field and a list will appear. If you do not select any special main menu, the user will see the standard main menu.
Sales Responsibility Center Filter	Enter the code for the responsibility center to which you want to assign the user. Click the AssistButton ⬆ to the right of the field to see the responsibility centers that have been created. This responsibility center will be the default responsibility center when the user creates new sales documents. The user will only see sales orders that are created from their responsibility center. If you leave this field blank, the default responsibility center in Customer or Company Information (in order of priority) will be used.
Purchase Responsibility Center Filter	Enter the code for the responsibility center to which you want to assign the user. Click the AssistButton ⬆ to the right of the field to see the responsibility centers that have been created. This responsibility center will be the default responsibility center when the user creates new purchase documents. The user will only see purchase orders that are created from their responsibility center. If you leave this field blank, the default responsibility center in Customer or Company Information (in order of priority) will be used.
Warehouse Location Filter	Enter the code for the location to which you want to assign the user. Click the AssistButton ⬆ to the right of the field to see the locations that have been created. This location will be the default location when the user creates new warehouse documents. The user will only see warehouse documents that are created from their location. If you leave this field blank, the default location in Company Information will be used.
Service Responsibility Center Filter	Enter the code for the responsibility center to which you want to assign the user. Click the AssistButton ⬆ to the right of the field to see the responsibility centers that have been created. This responsibility center will be the default responsibility center when the user creates new service documents. The user will only see service orders that are created from their responsibility center. If you leave this field blank, the default responsibility center in Customer or Company Information (in order of priority) will be used.

For more information about responsibility centers, see the online Help.

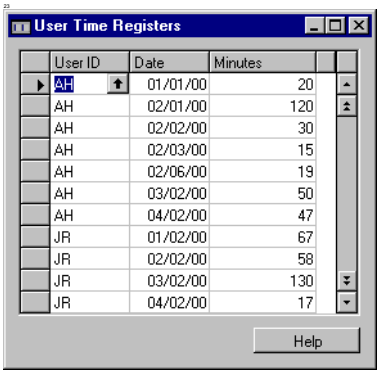
Note

Other fields for posting periods are found under General Ledger, Setup, General Ledger Setup, but those periods refer to the entire company and thus apply to all users. Anything that you enter for a particular user under ***User Setup*** will take precedence over the general choices you made under General Ledger, Setup, General Ledger Setup, for that user.

User Time Register

If the **Register Time** field in the ***User Setup*** window contains a check mark, the ***User Time Registers*** window will contain information about when and how long individual users have been logged on to the company.

Click General Ledger, Setup, Users, User Time Registers. The ***User Time Registers*** window appears:



This window displays the time use registered for a number of users. The lines are generated automatically, but you can also enter information in them.

Time use is registered in whole minutes, rounded to the nearest minute. The program creates one line per user, per day. If the same user uses the company more than once on a day, the line displays the total time used on that day.

If a user finishes using the company after midnight, the time use will be registered to the date when work began – not the date it was completed.

User IDs on all Entries

All entries in Navision contain a field displaying the user ID of the user who made the entry.

Identifying Individual System Setups

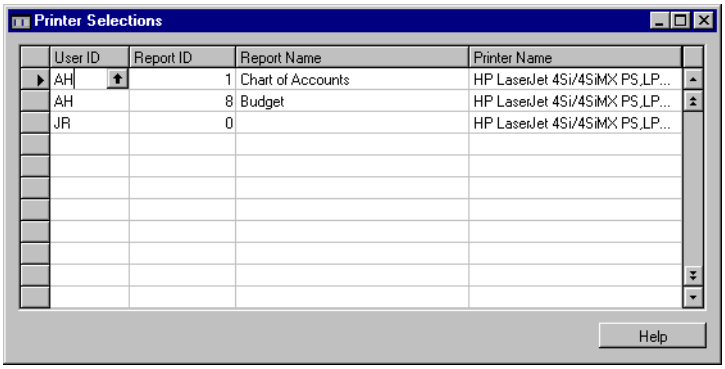
The current user ID always appears on the status bar at the bottom of the program window. If you save individual setup files for different users, it can be helpful to use the user ID as the setup ID. This is the only way that you will be able to see in the window which setup file has been used to start the program. For more information about setup IDs, see page 29.

4.7 Selecting a Printer

When you want to print from Navision, you can use the printers you have installed on your computer. The printer that has been designated as the default printer in Windows will be used as the default printer in Navision.

Individual Printer Selection

If you want a particular user to always use a specific printer, or if you want a particular report always printed on the same printer, you can set these options as *fixed printer selections.* A fixed printer selection will apply no matter what printer selections or other changes have been made in the program. The fixed printer selection does not determine options such as paper format. To select fixed printers, click General Ledger, Setup, Printer Selections. The ***Printer Selections*** window appears:



Fill in the fields in the ***Printer Selections*** window according to these guidelines:

Field	Comments
User ID	Enter the ID of the user for whom the printer selection applies. The user ID must have been created in the ***User*** table already. To see a list of all the users, click the AssistButton ⬆ to the right of the field. If you would like the selection to apply to all users, leave the field blank.
Report ID	Enter the ID of the report to which the printer selection applies. To see a list of all the reports, click the AssistButton ⬆ to the right of the field. If you would like the selection to apply to all users, leave the field blank.
Report Name	This field is filled in automatically when you enter the report ID.
Printer Name	Enter the name of the printer that will be used for both the user ID and the report specified on this line. To see a list of all the available printers, click the AssistButton ⬆ to the right of the field. The ***Printers*** window appears and you can select the printer you want from there.

Chapter 5
Making Backups

This chapter contains guidelines for why, when and how to back up your Navision data. It describes various methods of making backups and the advantages and disadvantages of the various storage media.

The chapter contains the following sections:

- Why, When and How to Make Backups
- Using the Navision Backup Function
- Testing before Using Other Backup Methods
- Restoring Backups
- Advanced Backup and Restore Information
- Server Based Backup

5.1 Why, When and How to Make Backups

You make backups so that there is always an extra copy of your company data to restore into the application if a problem should arise with the working copy.

You should make backups for your own sake, but in most countries it is also a legal requirement.

This means that if you upgrade to a new version of Navision or change the installation in another way, you must still keep at least one copy of your company data in a readable format (and in a safe place).

If you upgrade to a new version of the accounting system (for example, from the old text-based version of Navision to Microsoft Business Solutions–Navision), it may be necessary to save the old system in order to be able to access the old information. You do not need to have the old system installed – you can just save it and install it if you need to.

Determining When to Make Backups

Determining a procedure for creating backups is a vital part of maintaining your database. If you make frequent entries in your database, you will need a backup procedure that guarantees the reliability of your data and will allow you to fully recover your data after any failures that may occur.

We also recommend that you always make a backup before:

- expanding the database.
- deleting a database. (You cannot retrieve it after it has been deleted unless you have saved a backup.)
- installing or removing equipment from the computer or computers on which the Navision database is stored.
- performing date compression (see the section called "Creating Space in the Database" on page 76) and optimizing tables (see the section called "Optimizing a Table" on page 84).
- copying the database or parts of it with an operating system command.
- using programs to optimize your hard disk.

It is always a good idea to have an up-to-date copy of your company data in a secure place (a bank box, for example) in case of fire, theft, computer viruses, and so on.

Procedures for Making Backups

There is no formula for how often you should make backups, but remember that if you restore a backup that is a week old, you will have to reenter all the information for the past week. A backup is no more secure than the original data, so you must also protect yourself against errors in the backups. One way to do this is to create a system of backups at several levels:

- Every day, back up the company. If you have made design changes, make backups of the application objects or database.
- Every week, back up the database. Store the results so that the five most recent backups are in different locations. (About every month or so, put a backup copy in the company's safe or other secure place.) If a problem occurs in one place, the previous backup can probably be used.
- Every six months, restore the latest backup onto a different computer than the one you normally work on. Then test the contents of the hard disk. If there are no errors, put the copy in the company's safe or another secure location outside the company.

Using this backup procedure, you will at most lose only a limited amount of data, because you should be able to restore data from a previous backup without any problem.

Backups in a Network

If you work with Navision in a network, a good procedure is to make a backup to the local hard disk, copy it to the network server, and compare the copy on the server to the backup on the local hard disk.

5.2 Using the Navision Backup Function

You can make backups by copying the database with an operating system command, but there are several important advantages to using the Navision backup function:

Advantages of Using Navision -Backup Function

- The system tests the database for errors, so incorrect information is not copied to a backup.
- The data is compressed, so it takes up as little space as possible.
- The system calculates how much space the backup will use.
- You can keep working in Navision while you are making a backup.

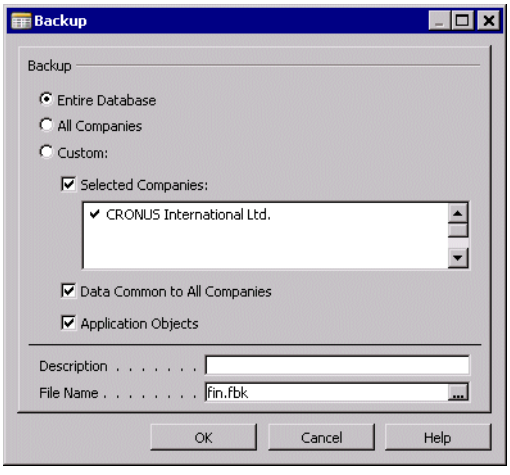
Whenever you create a new database, you must always use a Navision backup to restore the *Data Common to All Companies* and the*Application Objects* into the new, empty database. Data common to all companies includes the report list, permissions groups, user IDs and printer selections, but no real company data. For more information, refer to page 123.

Tip

You can make a backup while other users are using the database because when you do, the program backs up the latest version of the database. If a user writes something into the database, a new version of the database will be generated, but the backup program will continue to back up the version that existed just before this new version of the database was created.

Preparing for a Backup

To make a backup, click Tools, Backup and the ***Backup*** window appears:



You can now specify how extensive you want the backup to be. Click the option button next to the type of backup that you want to make:

- *Entire Database* (including all companies in the database, data common to all companies, and application objects)

- *All Companies* (that is, only the companies)
- *Custom* (whatever you select)

If you select *Custom*, you must place a check mark next to the companies that you want copied. You do this in the list of companies under *Selected Companies*. You can make a backup of any item or combination of objects that you like. For example, the application objects and one company. You cannot make a backup of part of a company.

It is best to make an complete backup. If you need to restore a backup later on, you don't have to restore the entire backup – you can choose how much of the backup to restore.

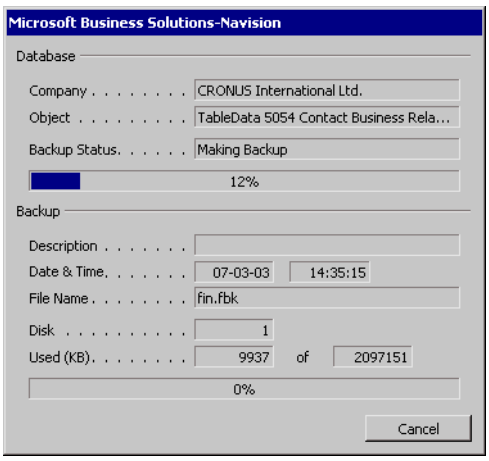
Description, Name and Location of the Backup

You must give the backup a unique description in the **Description** field at the bottom of the window. In the **File Name** field, enter a name for the backup. Navision will suggest file names containing consecutive numbers and the file name extension `.fbk`. It is a good idea to use the default because Navision will use the same default when you restore backups. It will also help you get a quick overview of the backups you have.

The file name of the backup includes the path (location on the disk or network). If you enter only a file name, the backup will be saved in the current folder on the current drive. This will normally be in the same place as Navision. If you want to save the backup in a different location (because it takes up too much space, or because you want to save it on disks, for example), enter the path and the name in the **File Name** field. To save the backup with the correct name and location, click the AssistButton… to the right of the field. A standard Windows dialog box appears and you can use this to select a target drive and directory where you want to store the backup. Type the file name of the backup. Click Save when you have finished.

The **File Name** field now contains the name of the backup.

Click OK to start making the backup, and the following window appears:



While the backup is being made, you can see how much of the database has been copied so far on the top status indicator. You can see the status of the disk or disk

location it is being copied to on the bottom status indicator. To stop the backup, click Cancel. If you do not cancel it, the backup will proceed, and you will receive a message when it has finished.

Verifying a Navision Backup

To verify that a backup is consistent, simply restore it to a new, empty database. If you are able to read the data in the database, the backup is consistent. If you have only backed up a company, restore the backup to a database that contains only the *Application Objects* and *Data Common to All Companies*, and see if you can read any data in the company.

Automatic Backup on Windows NT

If you want to make an automatic backup of the database at a specific time on Windows NT, and you run a client/server installation with the server running as a Windows NT service, you could use the built-in AT and net start/stop command. The AT command runs a given batch file at a given time. Type "AT" after a command prompt to get further help for this command. The batch file could look like this:

```
net stop <myserver>

backup <path and databasename>

net start <myserver>
```

where *myserver* is the name of the Navision Database Server running as a service on Windows NT. `Backup` is the name of the backup program that backs up your database named "databasename." Store these three lines in a batch file, and supply this batch file as a parameter to the AT command. Remember to supply the full path to the batch file. The AT command requires the Windows NT Schedule service to be running.

5.3 Testing before Using Other Backup Methods

The Navision backup function makes a backup by creating a file containing the most basic information from the database. When the backup file is restored back into the system, Navision recreates the rest of the information from this file. The larger the database, the longer it takes to back it up and to restore the backup. Because of this, users of installations with large databases often choose to back up onto tape, using the tape station's backup program.

You can also use the Navision backup function to make frequent backups to the hard disk, and then back up the entire hard disk onto tape. Doing this backs up both the working database and the Navision backup of the database.

Testing the Database before Copying It to a Tape Station

If you choose to make backups without using the Navision backup function, you must first test the database for errors. To do this, use the DB Test program property or click File, Database, Test on the menu bar. Testing the database is described starting on page 63. If you choose to use the built-in backup function, you do not have to run the test. While the backup is in progress, the backup program checks the database for errors. (It tests primary keys and data.)

5.4 Restoring Backups

Before you can restore a Navision backup you must create an empty database into which you can restore the backup. This is because you cannot restore data over existing data.

Creating a new database is described in detail starting on page 53. Remember that all the database files should be the same size.

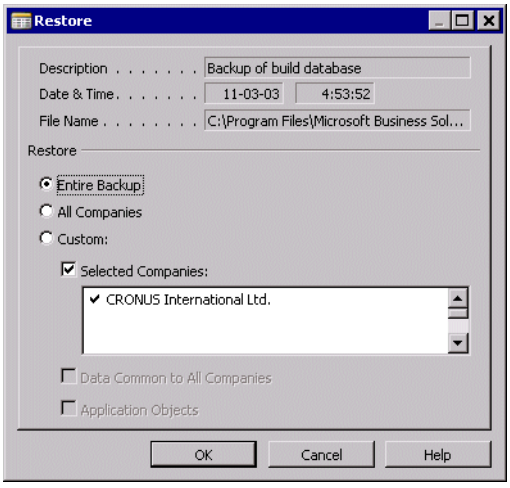
Although you do not want the new database to be too large, it must be large enough to contain the backup. If the backup was made using the Navision backup facility, it will be packed, and you may not know its size when it is unpacked. In this case, start with the size that you think you need. If that is not large enough, you will get an error message when you try to restore, and you can expand the database a little at a time. (Expanding the database is described starting on page 55.) Then you can try to restore the backup again.

When you have created the database and restored *Data Common to All Companies* and *Application Objects*, proceed in one of the following ways:

- If the backup was made with the Navision backup function, click Tools, Restore to restore the backup.
- If the backup was exported to a tape station using the tape station's backup program, use the tape station's corresponding restore program. Remember that using the tape station's own restore program will probably overwrite the entire existing database.

When you click Tools, Restore, a standard Windows dialog box appears and you can use this to locate the backup on the disk, hard disk or network. Find the folder containing the backup, and select the backup file.

Click Open and the ***Restore*** window appears:

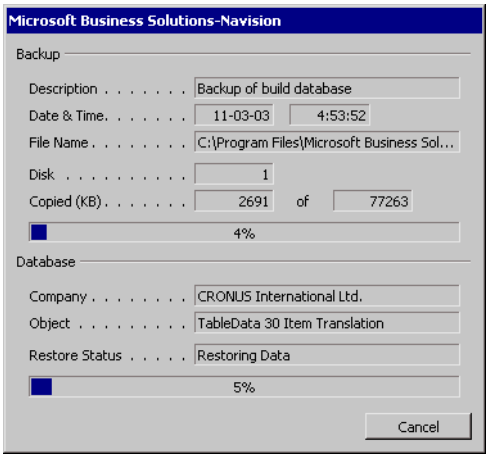


The name of the backup appears in the **File Name** field with its description and the time and date of its creation in the two fields above it. In the lower part of the window, you can select how much of the backup will be restored:

- *Entire Backup* (including all the companies in the database, *Data Common to All Companies* and *Application Objects*)
- *All Companies* (that is, only the companies)
- *Custom* (the *Selected Companies*, and can also include *Data Common to All Companies* and *Application Objects*). Remember that whenever you have a completely empty database, you must start by restoring a backup that contains at least these two options. You cannot restore the data common to all companies into a database that already has other tables in it.

You can limit the amount of the backup that you want to restore. To do this, remove some of the check marks in the window.

After you have made your selection, click OK to start the restore. A status window appears allowing you to monitor the progress of the restore procedure:



If you restore from disks, you will be prompted to insert new disks.

The amount of time it takes to restore a database depends on the size of the database.

5.5 Advanced Backup and Restore Information

Description of a Backup File

The backup file is a slightly compressed copy of the database. The backup program copies small blocks from the database, compresses them and gives them a header. Among other things, the header has a *header checksum*, which ensures data integrity. When the backup program has written all the small blocks, it calculates and writes a *master checksum*. These two checksums have two purposes:

- To verify that data in the backup is consistent and not corrupted.
- To protect the backup from modifications.

The Header in the Backup File

At the beginning of the backup file you will find a header in ASCII format containing a list of all the objects in the file. To see a list of the objects included in the backup (named, for example, backup.fbk and located in the folder d:\backup\), go to a command prompt and type the following:

```
type backup.fbk |more
```

The backup file contains an end of file marker after the list, so you do not see the binary content of the file. For each object, the list will show you its type, number, name, date and time of creation, size in bytes and a version number. If the object is table data, the version number is replaced with the name of the company to which the data belongs. This list is useful for seeing which objects are included in the backup, without restoring the entire backup.

Constraints on Restoring a Backup

There are certain constraints when you restore a backup into a database that is not empty. When you create an empty database, it is actually not completely empty. An empty database is defined as a database that contains only an empty security system and the company table definition. You can define and limit user access permissions to the database in the security system. An empty security system is identical to the security system that is automatically generated when you generate an empty database in Navision. An empty security system consists of the tables listed below:

Table	Defines...
User Group	the user groups that you want in your system.
Permissions	which rights the different user groups have.
User	the individual user and his or her password.
Member Of	which groups the individual users belong to.

Of the tables here, only the ***User Group*** and ***Permission*** tables, where a superuser has been set up, hold data. If you change the contents of the four security tables, the security system is no longer empty.

The contents of the backup can be divided into the following data types:

- *Application Objects*, which comprise the application, such as the ***Customer*** table, the ***Item*** table and the ***G/L Account*** table.
- *Data Common to All Companies*, which includes the report list, permissions groups, user IDs and printer selections and the security system tables.
- *Company Data*, which is all the data in the tables.

The following table contains answers to questions or problems that may arise during the restore process:

Question or Problem	Answer
Can I restore everything into an empty database?	All data types can be restored into an empty database.
Can I restore objects of the type *Application Objects* into a non-empty database?	No. Objects of type *Application Objects* can only be restored into an empty database.
I cannot restore my company into the database.	You cannot restore a company if there is another company with the same name in the database. If, however, you want to restore the company that is in the backup, rename the existing company in the database, and then restore the company in the backup.
I cannot restore objects of the type *Data Common to All Companies*.	If the database contains objects of type *Data Common to All Companies* other than the security system tables, it is not possible to restore objects of type *Data Common to All Companies*.
I am prompted to confirm overwriting of the existing security system while restoring. What does that mean?	If all objects of type *Data Common to All Companies* in the database are security system tables, then all objects of type *Data Common to All Companies* can be restored. If neither the security system in the database nor the security system in the backup is empty, you will be prompted to confirm whether the existing security system in the database should be overwritten by the security system from the backup.

To restore data from three different backups into an empty database:

1 Restore the objects of type *Application Objects* from one backup.

2 Restore the objects of type *Data Common to All Companies* from another backup.

3 Restore *Selected Companies* from yet a third backup.

To calculate the amount of free space that is required in the database to restore a backup, use the following formula:

The Minimum Size Needed to Restore

Free space needed in database = twice the size of the selected items to be restored + the size of the generated secondary keys + twice the amount of the data in the largest table.

The last term represents a worst-case scenario, and you can usually manage with less space than this formula calculates. The generated secondary keys are those keys that were active when the backup was made.

Changed Table Definition Compared to Backup

If a field in a table definition has changed its type or number compared to the backup, it is not possible to restore data into the corresponding table. If you have changed some of a field's properties in a table definition, the restore program will try to fit the data into the table anyway. If, for example, you have shortened a text field's length from 80 to 40 characters, and there is no data in that specific table in the backup that is longer than 40 characters, the backup will be successfully restored. Otherwise the restore will stop, and you will have to increase the length of that particular field. After that, you can continue the restore from where it stopped.

5.6 Server Based Backup

Navision also has a server based backup program, called HotCopy. This program is installed with Navision Database Server and is stored in the same directory as Navision Database Server.

HotCopy can only be run from the server location and can only create backups on hard disks. You cannot make incremental or differential backups. You can make a backup of a database while clients are using it. The backups are file copies of the database and are not compressed.

Using HotCopy

You can only create a backup from the command prompt. You must specify a number of parameters:

```
hotcopy

source=databasefile1 (databasefile2…databasefile16)

destination="backup directory1" ("backup directory2"…"backup
directory16")

[description="This is the backup for Monday"]

[email=username@navision.com]

[servername=myserver]

[user=myname password=mypassword | osauthentication=yes]

[dbtest=normal]

[cc=yes]

[nettype=tcp|netb]
```

The parameters are case sensitive and those that are enclosed in [ ] are optional.

Every entry that contains a space must be placed inside quotation marks.

The following example only uses the mandatory parameters. The database is stored in the same directory as the server based backup program and the backup is stored on another computer:

```
hotcopy source=database.fdb
destination=\\backupcomputer\backup\Monday
```

The following example uses all the parameters and the database is divided into two files:

```
hotcopy
```

```
source=C:\database\database1.fdb C:\database\database2.fdb

destination=\\backupcomputer\backup\Monday

description="This is the backup for Monday"

email=username@navision.com

servername=myserver

user=myname

password=mypassword

dbtest=normal

cc=yes

nettype=tcp
```

Note that you must enter the path to each database file.

On a UNIX computer the source parameter should be written as follows:

```
Source=/database/database1.fdb/database/database2.fdb
```

Backup Description File

Alternatively, you can refer to a backup description file that contains all the relevant parameters. We recommend that you use the backup description file.

```
hotcopy source=backupdescription.txt
```

You can give the backup description file any name that you like.

The parameters are:

Parameter	Explanation
source	The database file to be used for the backup. You must use this parameter. This can be either the name of the database or the name of a database file. If you want to make a backup of several database files, you must specify all of the file names. If you are using a backup description file, you must enter the name of the backup description file. You must enter either the absolute path or the relative path to the database file(s). When no path is specified the database file(s) must be stored in the same directory as `HotCopy.exe`. You can also enter the full path of the backup description file. If a backup description file is specified as the source file, all the other command line arguments are ignored. The format of the backup description file is described below.

Parameter	Explanation
destination	The path of the directory to which the database file is to be copied. You must use this parameter if you are creating the backup with the command line arguments. If only one path is specified for the destination but several files are specified as the source, all the files will be backed up in the same destination. If all the database files have the same name, the backups must be created in different directories. The database file(s) that you backup will be saved in the destination directory with the same name as the original(s). If you have previously made a backup in this directory, HotCopy will overwrite it. HotCopy will not inform you that it is overwriting the earlier backup. If the destination path is the same as the source path, the database file will be saved with a new suffix ".bak". For example, database.fdb will be saved in the source directory as database.fdb.bak. If you have previously made a backup in this directory, HotCopy will overwrite it. HotCopy will not inform you that it is overwriting the earlier backup.
dbtest	A database test is performed before the backup is made. You can choose between three different tests that correspond to the standard Navision database tests. The possible values are: minimum, normal and maximum. If you are using the UNIX system, the maximum database test cannot test the relationship between tables. For more information about database tests, see Testing the Database on page 63.
cc	A consistency check should be performed after the backup files are saved. The consistency check is a bit for bit comparison of the original database with the backed up one. The possible values are: yes and no
description	This is a free text that describes the backup. This text is displayed as the subject in the E-mail that the administrator can receive and as the "source" entry in the Event Viewer.
email	The E-mail address of the person who is to be informed about the final status of the backup procedure. The E-mail message contains the following information: Subject: This is the backup for Monday (The description of the backup). Backup started at 2001/03/15 10:02:50. Backup ended successfully at 2001/03/15 10:06:06. If the backup failed the E-mail will only contain the description of the backup and a message informing you of the error that caused the backup to fail. If you are using the UNIX system, E-mails can only be sent if the Sendmail program has been installed.

Parameter	Explanation
servername	The name of the Navision Database Server that HotCopy should connect to when you initiate the backup procedure. If you omit this argument, HotCopy will try to create a connection using the "local host" name. If this also fails because Navision Database Server is not running HotCopy will create a "local" connection. In other words you can create a backup when the database server is not running. We recommend that you only use HotCopy when Navision Database Server is running.
osauthentication	Whether or not the person creating the backup can use single sign-on (NT authentication). The only value you can enter is yes. You can either enter this parameter or the 'user' and 'password' parameters.
user	If NT authentication is not used this is the user ID of the person performing the backup.
password	If NT authentication is not used this is the password of the person performing the backup.
nettype	The network protocol that is used for communication between the server and the clients. The possible values are: `netb` (NetBIOS) and `tcp` (TCP/IP).

The Backup Description File

The backup description file contains information that HotCopy will use to perform the backup. The file has two section containing one or more entries. The backup description file can include comments – any text string that begins with a semicolon and does not take up more that one line.

The backup description file must have the following format:

```
[Backup Files]

\\backupcomputer\backup\Monday\database.fdb=\\computer\shareName\Bac
kupDirectory

\\backupcomputer\backup\Monday\database1.fdb=\\computer\shareName\Ba
ckupDirectory

\\backupcomputer\backup\Monday\database2.fdb=\\computer\shareName\Ba
ckupDirectory

[Options]

;This is the description of the Monday backup

description=This is the backup for Monday

dbtest=normal

cc=yes
```

```
email=operator@navision.com

servername=myserver

user=myname

password=mypassword

osauthentication=no

nettype=netb
```

You must fill in the section called [Backup Files]. In this section you specify the database name on the left hand side and the backup directory on the right hand side. You can only specify a directory as the destination for the backup.

Output

The outcome of the backup procedure is always specified in the Event Log of the computer that was used to start the backup procedure. On UNIX computers this information is stored in a file called `hotcopy.log`.

The backup administrator can also be notified of the result of the backup procedure by E-mail.

Note

If you have set up Navision Database Server as a service and want Hotcopy to store the database backup on a remote computer, you must change the Log On options of the Navision Database Server service. You must give the Navision Database Server service the credentials of a domain user that has the appropriate rights on the remote computer and not use the default value (local system account).

Restoring a Copy of the Database

To restore the database:

1. Stop the server.
2. Replace the database files with the backed up versions.
3. Start the server.

The backup must be restored to the same directory that the original database was stored in. If the original database has been deleted or the disks on which it was stored have been destroyed, you must recreate the original configuration with the same directory and exactly the same path as the original database before restoring the backup.

Alternatively, can start the server and specify the location of the new database and all of the database files in the command line.

Important

The backup that HotCopy makes is a snapshot of the database. It does not contain information about any transactions that were carried out after the backup procedure was started. Navision cannot create a transaction log. If you want to have a transaction log, you should migrate to the Microsoft SQL Server Option for Navision.

Chapter 6
Advanced Performance Issues

Performance issues are important for the system administrator. The system must be optimized to make it as effective as possible.

This chapter describes how to tune your system and what equipment to buy to obtain an optimized system. It also describes how to detect bottlenecks at both a software and a hardware level, and how the Windows NT Performance Monitor can help you.

The chapter contains the following sections:

- Checklist for Optimizing Hardware
- Selecting Hardware, Operating System and Protocols
- Detecting Bottlenecks

6.1 Checklist for Optimizing Hardware

There are many factors that must be considered if you want to get the best performance out of your enterprise business solution. It is not possible to define a single optimal solution, because there are many individual requirements that have to be considered. The information in this chapter will help you assess your requirements, and select the appropriate hardware and software. Once you have established the network, you can optimize the system by tuning the various parameters described in the following sections.

The following table can be used as a checklist when you optimize your installation:

Item	Recommendation	You can read more about this on:
Hard Disk	As fast as possible	page 133
Controller	Fast, secure and battery backed, able to control several hard disks simultaneously	page 133
RAID	RAID 1 is preferable	page 135
Memory	As much as possible, of ECC type or with parity	page 135
Network Adapter	As fast as possible	page 136
CPU	As fast as possible	page 136
File System	FAT (PC), NTFS(NT), raw device (UNIX)	page 137
Network Protocol	TCP/IP	page 138

6.2 Selecting Hardware, Operating System and Protocols

When deciding what kind of network configuration to use, there are several points that are worth considering:

- Security level
- Quality
- Price
- Required performance level
- Number of users
- The network's ability to be expanded

The optimal network configuration is very dependent on individual requirements because it represents a balance of these criteria. Therefore, identify you network requirements before configuring it.

Choosing the Computers

In a multiuser solution, you can, in principle, use the same type of computer for both the clients and the server. There is a difference, however, in how much CPU power, memory (and memory type) and disk space each will need.

Computers for Clients and Single-User Installations

An important factor to consider is that, in a network, it is the client computers that process the data they retrieve from the database. Consequently, a slow client computer working on a transaction can delay all the other clients until it finishes because it locks certain parts of the database. Thus, it is important to buy powerful client computers with enough computing power not to slow down the network. The faster the computer, the faster the transactions will be processed.

Computers for Servers

The database is stored on the server, making it a critical area of the application since several users can access it at the same time. It is therefore important to select a powerful computer for the server. In addition, there are certain aspects of the server that require further consideration:

- The hard disk and controller
- The RAID system
- The memory
- The network adapter
- The CPU

The Hard Disk and Controller

The hard disk is the slowest component in a computer because it consists of mechanical parts. Access times to the hard disk are long compared to those to memory (normal access time to memory is less than 60 nanoseconds and access

time to a hard disk is faster than 10 milliseconds). All of the programs and information are stored on the hard disk, so data is continuously read from and written to the disk. Since there is only one read/write head in a hard disk, only one read or write operation can be carried out at a time.

By using more than one disk in your system, you can increase performance dramatically. You must, however, use a hard disk controller that supports control of more than one hard disk at a time without increasing access time to the disks. Furthermore, it is important for the controller to have a high transfer rate so data can travel quickly between the memory and the hard disk. The use of CPU per disk transfer must also be minimized. An example of a controller with these features is the Fast Wide SCSI 2 (Small Computer System Interface) controller.

Warning

Do not use the write-back or lazy-write caching systems that are built into your hard disk controller unless the disk controller has a battery backup. Using a battery-supported hard disk controller will prevent loss of data that might otherwise result if the system suffered a power failure.

You should also be aware of the write-cache facility that most of today's hard disks use. When you buy a hard disk, be sure that you can disable its write-cache (using software or a jumper on the disk). If a power failure occurs when data is still in this cache, you could lose the data.

It is also necessary to have some sort of error detection unit implemented to allow the controller to determine when a byte of data in the cache is corrupted – for example, from a single-bit error or a defective memory chip.

Furthermore, any errors that occur must be corrected, so some sort of correction scheme must be implemented in the controller. An ECC (Error Correction Code) RAM is an example of this kind of correction scheme.

Speed and Hard Disk Capacity

You can increase performance by several hundred percent by expanding your system from one to six hard disks. To avoid poor performance in your daily work, you should add more than one hard disk to your system and divide the database among these hard disks. Four relatively slow hard disks (for example of 5 GB each) perform much better together than one super hard disk (of 13 GB). Tests have shown that the four-hard-disk configuration allows more than twice the number of transactions per second than the one-hard-disk configuration. Each hard disk that you add will improve performance.

As a rule of thumb you could say that each time you double the number of hard disks you increase performance by 100%.

Several "intelligent" controllers exist, which can control several hard disks simultaneously, for example, RAID (Redundant Array of Independent Disks) systems.

RAID Systems

If you have a very large Navision installation, you should consider using a RAID system. This system consists of several disks. The key feature of a RAID system is that the failure of one disk does not bring the entire system down. You can recreate the lost data from parity information or from a direct copy stored on the other disks.

Several RAID configurations exist and are described in the following table:

Item	Description
Raid 0	Called striping. The data is broken up into chunks as it is written across all the drives. This provides the highest performance, but no redundancy is provided.
RAID 1	Called *mirroring*. The data is written redundantly to pairs of drives and can be read independently from each drive. This is fast and provides full redundancy, but the disk capacity required is doubled. The read performance can be up to twice as fast as a single drive because both drives can process the read request simultaneously. Write performance is nearly unchanged. RAID 1 is best for transaction processing, where many small I/Os are required.
RAID 2	Called *redundancy through Hamming code*. The data is bit-interleaved across groups of drives with some of the drives storing error correction codes. This provides full redundancy and more error correction capability, but is often slow due to the hardware overhead.
RAID 3	Called *parallel transfer disks with parity*. The data is bit-interleaved across groups of drives with only one drive dedicated to storing parity. This provides full redundancy and high transfer rates when large blocks of data are transmitted.
RAID 4	Called *independent access array*. The data is broken up into chunks and written across the drives with one drive dedicated to parity. This provides full redundancy, but the single parity drive causes a bottleneck when the parity has to be updated.
RAID 5	Called *independent access array with rotating parity*. The data is broken up into chunks and written across the drives. The parity for the stripes of data is also spread across all the drives, so no one drive is dedicated to parity.

Navision Database Server is a program that requires high security and good disk performance. RAID 1, *mirroring*, best satisfies these criteria with its combination of high performance in read processing and very high reliability resulting from a constant, online backup of the database. RAID 1 is, however, the most expensive configuration because every megabyte of disk storage requires two megabytes of actual disk space. The Navision Database Server program can handle up to 16 disks (32 disks in a mirrored configuration).

Memory and the Server

It is important for the server to have enough memory for all its tasks. There cannot be too much memory in your server. Because a Navision Database Server has to serve several users and must put some memory aside for each user, the amount of memory should be proportional to the number of users. Normally a user "takes up" 2 to 8 MB of Navision cache, depending on the task, so you can estimate the requirements for your configuration. Remember to include the memory requirements of the operating system (at least 128MB for Windows 2000 or Windows NT), the Navision Database Server

program (1 MB), 50 kilobytes per user connected to the server and add to this the memory requirements of other programs that are running. It is also important that the memory has a parity bit or is of the ECC (Error Correction Code) type.

The Network Adapter

Communication to and from the client passes through the network. If messages are to be delivered quickly, you must have a fast network adapter. This also ensures that the CPU use per network send/receive activity is minimal, which reduces the load on the CPU. The physical connection (the cabling) between the server and the clients must also be able to support the high speed.

The CPU

The speed of the CPU is also an important performance factor. It is the CPU that performs all the calculations involved in Navision – the faster the CPU, the more calculations per second. It is also important to have as much level 2 cache in the system as possible. This increases the speed with which the CPU gets data from and saves data to RAM.

However, it should be noted that adding more hard disks gives a greater improvement in performance than increasing the speed of the CPU.

The Operating System

The Navision Database Server can run on the following operating systems:

- Windows XP
- Windows 2000
- Windows NT 4.0 or later
- IBM AIX version 4.1 or later
- HP-UX version 10.20 or later (This will require some patches – the latest information is contained in a readme file for installing this version of the server.)

The Navision client (or a single-user) installation can run on the following operating systems:

- Windows XP
- Windows 2000
- Windows 98
- Windows NT 4.0 or later

The Navision Database Server program and Navision clients can only run on 32-bit platforms.

File Systems

The following file systems can be used. The choice depends on the operating system.

- FAT

- FAT 32
- NTFS
- Native UNIX file system
- Raw device in UNIX environment

FAT

This file system is used by MS-DOS, Windows 98 and Windows NT. FAT is a data structure that MS-DOS creates on the disk when the disk is formatted. When MS-DOS stores a file on a formatted disk, the operating system places information about the stored file in the FAT so that MS-DOS can retrieve the file when it is requested later. This system is the only system MS-DOS can use.

Limitations

One of the limitations of this system is that you can only store file names in the format `nnnnnnnn.xxx`. The file name can have up to eight characters, and the file name extension can have three.

NTFS

This is an advanced file system specifically designed for use with the Windows NT operating system. It supports long file names, full security access control, file system recovery and extremely large storage media.

Native UNIX File System

Different UNIX systems support different file systems, each of which has advantages and disadvantages. Their performance levels as regards the Navision database are more or less the same.

Raw Device in UNIX Environment

Using a raw device in the UNIX environment enables you to bypass the native UNIX file system and obtain direct access to the hard disk, which improves performance. Consequently, using a raw device is recommended if you want to use a Navision database on a UNIX computer.

Comparison of the File Systems

Since Navision uses hard disks extensively, it is important to have a fast and reliable file system. The file systems mentioned have approximately the same performance level with regard to read and write operations, and Navision does not utilize all the facilities of the other operating systems.

If you run on a UNIX platform, you should use a raw device for the database. Doing so can improve performance by 100% compared to using the native UNIX file system.

Network Protocols

Navision can use two protocols:

- TCP/IP

- NetBIOS

The most important advantages and disadvantages of each protocol are:

TCP/IP

Advantages	**Disadvantages**
Faster than NetBIOS	Difficult to configure
Can be routed	
Is used on the Internet	

NetBIOS

Advantages	**Disadvantages**
Easy to configure	More difficult to route
	Not as fast as TCP/IP

The advantages of TCP/IP make it the preferred protocol, even though configuring it is more complicated.

Tip

If you experience problems connecting the Navision client to the Navision Database Server in a network that runs TCP/IP and you have a DNS (Domain Name System) server or DHCP (Dynamic Host Configuration Protocol) server, try starting the Navision Database Server with the property `servername=<the machine name>`. Then connect the Navision client to the Navision Database Server with that server name.

The machine name can be found in the network configuration program. The name you use for the Navision Database Server must be registered in the HOSTS file on the DNS or DHCP server. The machine name is registered in this HOSTS file. If your network does not have a DNS or DHCP server, you can use the TCP/IP command PING to verify that the server name exists. PING simply tries to make contact with the specified machine.

Type `ping <servername>` after the command prompt. If you get a reply, the server can be reached. If not, you must reconfigure your TCP/IP network to include the server in the host file.

6.3 Detecting Bottlenecks

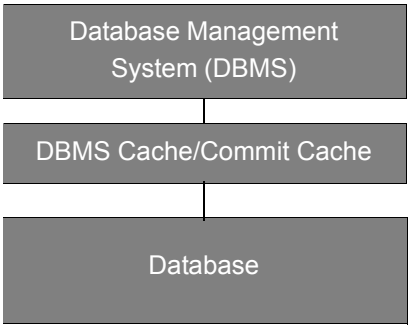
A bottleneck causes the system to run slowly and perform poorly. Bottlenecks can occur in the software or in the hardware.

Software Bottlenecks

A bottleneck in the software may result from the system being poorly adjusted. There are three relevant properties to adjust in Navision:

- DBMS (Database Management System) Cache
- Commit Cache
- Object Cache

You can find a detailed explanation of these caches starting on page 33. If the DBMS Cache is set too high and if there is not enough of the faster physical memory for the system's requirements, the system will begin to swap (using the slower hard disk as memory). If the DBMS cache is set too low, there may not be enough DBMS cache for Navision to operate. Both situations cause the system to run slowly. Turning off the Commit Cache can also slow down the system.



DBMS Cache and Commit Cache

As the previous diagram shows, the DBMS cache and commit cache are database related. Therefore, in a client/server environment these two caches are on the server along with the database, and the object cache is on the client machine. (In a stand-alone installation, all three caches are together.)

The system may perform badly if these caches are not optimally sized for your system. The following formula is a way of calculating the amount of DBMS cache you need:

Size of DBMS Cache =

+ Amount of physical memory

– Memory requirements of the operating system

– 50 kilobytes x number of workstations

– 1 MB for the Navision Database Server

– memory requirements of other programs running

The maximum size of the DBMS cache is 1000 MB. The commit cache takes up space in the DBMS cache (but it does not take up additional space in memory). It can use up to 2/3 of the allocated size of the DBMS cache.

Object Cache

Object cache is used on the client computer to store the objects (code, descriptions and windows) retrieved from the server. The client needs to retrieve these objects only once from the server and can then store them in the object cache. The total size of all the objects used in the standard application is around 20 MB. If you have enough memory, set the object cache to 20 MB. The size of the most important objects (the table descriptions) is 1 MB. You should set the object cache to 1 MB as a minimum. This is the default value.

When you install the server program in a network, you can choose to install it on the file server or on a dedicated server. Installing the program on a dedicated server gives better performance because a dedicated server doesn't have to do other things. Remember to place the database on the same server as the server program so the server program doesn't have to use the network to get information from the database.

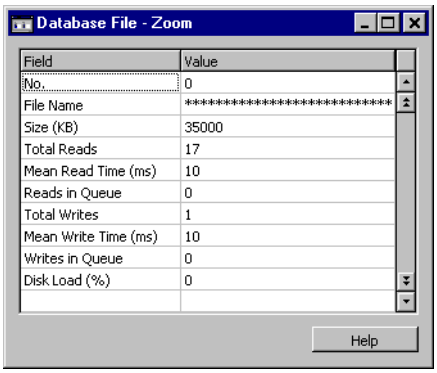
Hardware Bottlenecks

To test whether a bottleneck occurs at the hardware level, you can use a tool that monitors the different sections of the computer's memory. This tool comes with your operating system. In Windows NT it is called the Performance Monitor. (See page 141.)

Alternatively, you can use two virtual tables in Navision that contain various types of information about the performance of the computer's hardware. These are the ***Database File*** table and the ***Performance*** table. You can also use the ***Session*** table to find out how many database connections are currently open.

To access the ***Database File*** table, click File, Database, Information. On the ***Database*** tab, click the AssistButton ↓ next to the database name.

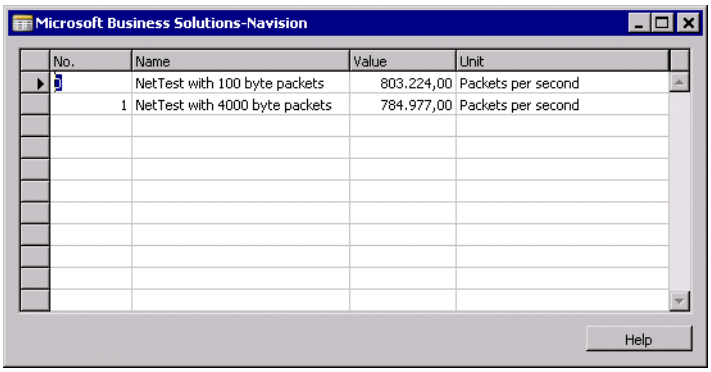
Select the database, and click Tools, Zoom. The following window appears:



The most important pieces of information here are the mean read and write times. In an optimized system, these should be no more than 10-13 milliseconds (ms). If these figures are significantly higher, try to optimize the disk system according to the recommendations given earlier in this chapter. The **Reads in Queue** and **Writes in**

Queue fields show whether there are any blocks (of size 8 kilobytes) of information waiting in the commit cache. Finally, the disk load is shown as a percentage of maximum load.

To see how the network is performing, create a form containing the (virtual) ***Performance*** table. Doing this requires a developer license because you can only see the ***Performance*** table from the Object Designer.



This table performs a net test with packets of 100 and 4000 bytes. The net test measures how many of these packets it is possible to send and receive per second. For the system to be fast, the number of packets per second should be greater than 400 for the 100-byte packets and greater than 70-80 for the 4000-byte packets. If the test results are less than this, the network should be optimized (by changing from NetBIOS to TCP/IP, for example). This table also shows how much of the CPU power on the client and on the server is currently used (0.00 percent means that the CPU is currently idle).

The Performance Monitor in Windows NT

Another way to get similar information about CPU, disks, net and memory is to use the Performance Monitor that comes with Windows NT.

Tip

To see the disk performance with the Windows NT Performance Monitor, make sure that the device named *diskperf* has been started.

The following table illustrates the ways in which the Performance Monitor can help you deal with bottlenecks that can occur when running Navision Windows NT:

Problem	Solution
Pages/sec shows that the memory has been swapping to the disk when the Navision Database Server is running. (You add Pages/sec to the Performance Monitor by clicking Edit, Add To Chart and in the Add to Chart window, selecting the Object *Memory* and the Counter *Pages/sec*).	Buy some more RAM for the computer, or try to decrease the Navision cache size according to the formula given earlier in this chapter.
% Disk Time is more than 80% over a long period (not peak value), and you are sure that the system is not swapping. Remember to select the correct instance (that is, the correct disk), and make sure that the diskperf device is started. (You add % Disk Time to the Performance Monitor by clicking Edit, Add To Chart and in the Add to Chart window, selecting the Object *PhysicalDisk* and the Counter *% Disk Time*.)	Buy faster hard disks, or divide the database among several disks. Try to increase the cache size according to the formula given earlier, and follow the other recommendations given in this chapter.
% Processor Time for the server process is 80% or more over a long period (not peak value), indicating that the CPU is used all the time for the Server process. (You add % Processor Time to the Performance Monitor by clicking File, Add To Chart and in the Add to Chart window, selecting the Object *Process* – not Processor and the Counter *% Processor Time* and then selecting the Server process in the Instance field.)	Buy a faster CPU for the machine.

Appendix A
Glossary

This appendix contains an alphabetical list of useful technical computer terms used in this book.

A.1 GLOSSARY

Active Directory Active Directory is the directory service used in Windows 2000 Server. It allows any object on a network to be tracked and located. Active Directory provides the ability to build applications that give a single point of access to multiple directories in a network environment.

backup To keep your data safe, you should frequently make a copy of it. This copy is called a backup.

BLOB Binary Large Object – an object that can store anything but is normally used to store bitmaps and memos.

cache Cache means a store or hiding place. As a computer term, it refers to part of the computer's memory. The cache serves as a way station for data that is on its way to or from the hard disk and needs to be processed by the CPU. The advantage of using cache is that it is a quickly accessible memory that can keep the hard disk from having to work too hard. The larger the cache, the better the performance. The Navision program property called Cache represents the program's database cache and must not be confused with the Commit Cache program property. (See the separate entries for commit cache and object cache.)

client A client is one of the computers in a network from which an individual user works with the common data that is found on the server. See single user.

client/server This is the term for a particular way in which several computers (a server and some clients) work together in a network. Each computer does some of the work itself (in contrast to old-fashioned systems, in which the server did all the work and was therefore heavily loaded and slow). A client/server system is faster than one in which all the work is done by the server.

command line You can type command lines (such as `copy`, `del`, and `rename`) in response to a prompt from an operating system (MS-DOS or UNIX) and specify parameters for running programs. A Navision Database Server can be started from a command line.

commit cache When the Navision database is updated by write transactions or deletions (for example, when you are posting), the screen is locked for a certain period. When you use commit cache, Navision can register write transactions as soon as they are logically present in the database, before they are physically written to the disk. In this way, the screen is not locked as long as it would otherwise be, and your work is speeded up. The function is especially useful in larger networks. Commit cache is described in the chapter called "System Setup" on page 33.

Configuration See setup.

CPU The CPU (Central Processing Unit) is the "brain" of a computer. It is the element that contains all the computing power and makes it possible to run programs.

C/SIDE (Client/Server Integrated Development Environment) C/SIDE is the name of the development system in which Navision is programmed. It is partly a

programming language and partly a collection of tools that standardize routines, functions and codes, and in other ways take care of trivial tasks.

database login An entry in the User table that Navision uses to verify the user ID and password that the user enters in order to gain access to the Navision database. A database login can give the user access to a Navision database that is stored in either SQL Server or Navision Database Server.

database server The computer in a network that contains and manages a shared database is called a database server.

database server authentication The process by which the information (user ID and password) entered by the user is verified. This can be done having the user enter an ID and password when they log on or by using a smart card to identify themselves to the system.

DBMS (Database Management System) A layer of software between the physical database and the user. The DBMS manages all requests for database action (for example queries or updates) from the user. In addition, a DBMS permits centralized control of security and data integrity requirements.

dedicated server A dedicated database server performs only tasks involving the database and no other network tasks.

disk cache This is a portion of the computer's memory that is set aside to temporarily hold information read from or written to the disk.

domain A domain is a single security boundary of a Windows NT computer network. Active Directory is made up of one or more domains. On a stand-alone workstation, the domain is the computer itself. A domain can span more than one physical location. Every domain has its own security policies and security relationships with other domains. When multiple domains are connected by trust relationships and share a common schema, configuration and global catalog, you have a domain tree. Multiple domain trees can be connected together into a forest.

domain controller With Windows 2000, a server in a domain can be a domain controller. This is one of two roles that a server in a domain can have. The other server role is as a member server.

A domain controller contains matching copies of the user accounts and other Active Directory data in a given domain. It is possible to change the role of a server back and forth from domain controller to member server (or stand-alone server), even after setup is complete.

domain tree A domain tree consists of multiple domains which are connected by trust relationships and which share a common schema, configuration and global catalog. Multiple domain trees can be connected together into a forest. See domain.

ECC RAM Error Correction Code RAM. RAM that implements a method of detecting and correcting errors that may occur.

external cache See level 2 cache.

forest A forest is a collection of Active Directory domain trees. Forests serve two main purposes: to simplify user interaction with the directory, and to simplify the management of multiple domains. See domain.

hard disk controller Controls access to one or more disk drives, CD-ROMs and diskette drives.

hosts file This file contains the mappings of IP addresses to host names.

host name The name of the computer in the network running TCP/IP. Connected to this name is an address that is the IP address of the computer.

IP address Internet Protocol address. Every computer running in a TCP/IP network has a host name and a corresponding IP address. Other computers in the network use this IP address to communicate with your computer. There is a host name for each IP address; the host name and the IP address are listed in the `hosts` file.

key Fast and efficient searches in a database require a sorting system. The information you are looking for is located in fields; by assigning an order to some of these fields, you can determine the order in which the fields will be searched. This field combination is called a key (or sorting key). A key can consist of a single field. Navision comes with a number of keys, but you can set up more. Updating the keys consumes a lot of the computing power, so you can improve the performance by disabling some keys. The chapter about working with databases (starting on page 51) contains a more detailed description.

lazy-write cache This is a type of cache that holds information in the cache between the disk and the disk controller. When the computer writes something to the hard disk, the disk controller actually writes the information to the lazy-write cache and not to the disk. The data is then written to the disk when demand on the system is low.

level 2 cache Also called external cache. Level 2 cache is a cache that exists between the CPU and the memory. This is a very fast type of cache that improves the system’s performance.

log on/off To log on or off means to open or close a Navision database.

memory Computer memory refers to Random Access Memory (RAM). When a new program is started, the operating system places the program in the memory so that the CPU can work with it.

multiuser installation A multiuser Navision installation is one in which Navision is used on several computers connected in a network and using common data on a server.

NetBIOS NetBIOS is an abbreviation for Network Basic Input Output System. This is one of the protocols (sets of rules) that are necessary for different programs, including Navision, to be able to communicate in a network. Another network protocol is TCP/IP.

network server The computer in a network that provides shared services to the other computers is called a network server. If it contains the Navision database, it is also called a database server. We do not recommend that you use one computer as

the server for both the network and Navision because each role requires a large amount of computing power.

non-dedicated database server A non-dedicated database server is a computer that not only manages the database program but also runs other programs.

object The Navision application consists of a number of objects, for example: tables, forms, reports, codeunits and dataports.

object cache Object cache, like cache, allows the program to work faster. Object cache is used only on clients because its task is to store the code, descriptions and windows that will be used on the client, so they only need to be retrieved once. Using object cache requires the computer that is used as client to have enough memory to store the objects while they are being used.

program property A program property is something you can use to set various system values or other information that affects how the program works. For example, in Navision you can use the Database program property to specify the database that will be used. Many program properties can be set by clicking Tools, Options on the menu bar. In addition, most of them can be entered in the **Target** field or the command line used to start the program, as described on page 48.

protocol A protocol is a set of rules, such as the set of rules that determines how data can be exchanged. NetBIOS is an example of such a protocol; TCP/IP is another protocol.

RAID (Redundant Array of Inexpensive (or Independent) Disks) A storage system based on a disk array that holds a certain amount of redundant information. The redundant information can be used to detect and (in some configurations) correct errors that may occur.

RAM See memory.

raw device This is used in UNIX systems. You can define a disk in the UNIX system as a raw device. This lets you bypass the UNIX file system and obtain direct access to the disk (hence the name raw device). This cuts down on overheads and improves performance.

role A role is a collection of permissions that are given to a user. An example is a role that gives rights to read, post and print orders, invoices and credit memos. There is also an item called Roles on the Security submenu of the Tools menu. Note that the old concept of groups has been replaced by roles.

rollback This is a feature of the Windows Installer service. The system restores itself to its initial state if an installation failure occurs. This feature is not available once an application has been installed successfully. At that point, an uninstallation would be required to remove the program. Even if the program is uninstalled, there is no guarantee that the system will be returned to its preinstallation state.

schema The Active Directory schema is the set of definitions that defines the kinds of objects and the types of information about those objects, which can be stored in Active Directory. The definitions are themselves stored as objects so that Active

Directory can manage the schema objects with the same object management operations that are used for managing the rest of the objects in the directory.

server A server is the computer that serves the other computers in a network. A server carries out several functions. It can be a database server, network server and/or printer server. Thus, it enables the computers in the network to use the shared equipment or data. See also these terms: dedicated, nondedicated, database server, network server.

service A process in Windows 2000 and Windows NT that performs a specific system function or executes a specific program. This execution is started as soon as the operating system is loaded, before any user is logged onto the system.

services file This file contains port numbers for services.

service connection point(SCP) The service connection point is an object that contains information about the server, such as binding information, the Domain Name System (DNS) name and type, product, version, globally unique identifier of the object (GUID), and so on. The Navision Database Server must have an SCP object that contains the necessary server information.

session A session is an active (running) copy of Navision.

setup The setup of a computer is the way in which the system is adjusted to work with other hardware or software elements, such as a printer or a particular program. The setup is also called a configuration. The setup of a program is the way in which its functions are modified to fit the needs of a particular user.

single sign-on A key feature of Windows 2000 authentication is its support of single sign-on. This is a process that allows a user with a domain account to log on to a network once with his or her password, and to gain access to any computer in the domain.

single-user installation A single-user Navision installation is one in which Navision is used on an independent computer. The difference between a client and a single-user installation is that a single user uses its own database, whereas a client is connected to a network of computers that use a common database.

SMS (System Management Server) If you have installed SMS software on every computer in the network, you can manage the whole network from the computer at the top of the network hierarchy.

sorting key See key.

swapping This is a process used by a computer to enable it to use more memory than is physically present. If the active programs together use more memory than the computer has, the least-used data is "swapped" (moved) to the hard disk in a "swap file." When this data is needed again, it is retrieved back into the memory, and other data is placed in the swap file on the hard disk. You can read more about swapping in the description of the DBMS Cache program property on page 40.

target field The field in which you specify the location of the program that you want to run, along with any parameters you want to set. You can read about this on page 48.

TCP/IP Like NetBIOS, this is a network protocol.

Windows authentication The process by which the user is verified by the single sign-on system supported by Windows 2000 or the unified login supported by Windows NT. In Navision, we refer to both of these systems as Windows authentication.

Windows login An entry in the Windows Login table that Navision uses to verify that the user has a valid Windows account and has access to this Navision database. A Windows login can give the user access to a Navision database that is stored in either SQL Server or Navision Database Server.

Appendix B
Network Communications

This appendix contains information about setting up and testing network communications for running Navision. It assumes that you have a good understanding of personal computer hardware, LAN, NetBIOS or TCP/IP, Windows 2000 and Windows NT. The instructions for installing the server and client programs can be found in chapter 1.

The appendix contains information about the following topics:

- Setting Up Network Communications
- Testing Network Communications

B.1 Setting Up Network Communications

When the server program runs on Windows 2000 or Windows NT, you can choose to use the TCP/IP or NetBIOS protocol.

TCP/IP on the Server

TCP/IP is the default protocol in the Windows 2000 and Windows NT operating systems.

The server program will use TCP/IP port 2407 as a default. If this port is occupied by another process, you can specify another port by making a new entry in the `services` file.

The `services` file is normally located in the directory:
`<X:>\<winnt>\systems32\drivers\etc`

`<X:>` is the drive where the server is installed and `<winnt>` is the directory where the operating system is installed.

Open the `services` file in Notepad or any other ASCII editor and make a new entry in the `services` file using the following format:

```
<servername> 3001/tcp
```

Replace `<servername>` with the name of the server from which you start the server program, and 3001 is a free port number.

Note

If you make changes in the `services` file, you must make corresponding changes in the `services` file on all client units. Otherwise, the client will not be able to find the server program on the network.

TCP/IP on the Client

The client program uses the WinSocket API. This means that the client program can run on any TCP/IP protocol that uses the WinSocket API.

- When the client program runs on Windows 2000, Windows 98 or Windows NT, the TCP/IP protocol included with Windows can be used.

If you have changed the TCP/IP port for the server program, you must make the same changes in the `services` file for each client. This can be done in the same way as described in the section called "TCP/IP on the Server."

If you are not running Domain Name Service then you will also have to edit the `hosts` file on all the clients.

The `hosts` file, is normally placed in the same directory as the `services` file:

```
C:\windows
```

Open the `hosts` file in Notepad and make a new entry as follows:

```
x.x.x.x   <servername>
```

Replace `x.x.x.x` with the server's TCP/IP address, and replace `<servername>` with the name of the server from which you start the client program.

NetBIOS

The server program looks at the license file to determine how many NetBIOS sessions it should allocate. The server program allocates one NetBIOS session for each client session purchased, plus one extra. The client program will request one NetBIOS session for each client session started.

B.2 Testing Network Communications

To test whether the communication works, you can use various test utilities, or you can try to establish communication between the server program and the client.

One utility you can use with TCP/IP is *ping*. You use ping to check whether the server computer is reachable over the network. From the client computer, use the `ping <host>` command to check whether the TCP/IP connection is OK.

Establishing Communication between the Server and Client

To test the communication between the server program and the client program, you must start the server program.

Starting the Server

Switch to the disk on which the server program is installed and then to the directory in which the server program is installed.

Start the server program with the following three property settings:

```
servername=<servername>

nettype=<nettype>

database=<database path>
```

Server Name

If you don't specify a server name, the server program will default to Server1. You can enter any name, but make sure that all clients are started with the same server name. Also make sure that when TCP/IP is chosen as network protocol, the `hosts` and `services` files use the same server name. When using TCP/IP, the server name in the `hosts` file on the client is used instead of the server name provided on the command line.

Net Type

Net Type should either be *netb*, when NetBIOS is used, or *tcp,* when TCP/IP is used.

Database

<database path> should contain the full path to the database.

Example

An example of starting the server program under Windows NT is:

```
server servername = FinServer, nettype = tcp,
database=d:\fdb\database.fdb
```
(written as one command)

If the server program has problems communicating with the network protocol, it will not start properly. In this case, it is recommended that you check the setup and make sure that everything has been specified correctly.

Starting the Client

After the server program has been started without problems, start the client program. The important program properties for the client program are Server Name and Net Type. It is a good idea to specify these properties in the **Target** field of the Navision ***Properties*** window. (Read more about this on page 48.)

When you start the client program with the proper server name and net type, you should be able to communicate with the server program. If you have any problems, check the communication setup.

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