

NETWORK INSTALLATION GUIDE V5.1



DORSET SOFTWARE

Recorder 6

JOINT NATURE CONSERVATION COMMITTEE

The logo features a crown above the text 'JOINT NATURE CONSERVATION COMMITTEE'. The text is in a bold, serif font, with 'JOINT' on the first line, 'NATURE' on the second, 'CONSERVATION' on the third, and 'COMMITTEE' on the fourth. The text is underlined.

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GLOSSARY

Term	Description
Application Role	A definition of a security role in SQL Server which details the tables, stored procedures and functions that are accessible to the user. Unlike normal SQL Server roles, application roles are not linked to any users or user groups. Application roles are activated when the application submits a password to SQL Server, therefore granting that application the required access to the database.
Backup	The creation of the files required to restore the database to its recorded state at a given point in time should a non-recoverable problem occur.
CAL	Client Access License. The license required for a client machine to access SQL Server (not MSDE).
Database Administrator (DBA)	Person responsible for maintenance and administration tasks on a database server.
Server Login	A definition of the authentication required to gain access to the database server.
Database User	A definition of the authentication required to gain access to one specific database on the server. A database user is normally linked to a server login, so a single login operation authenticates the user onto both the server and the database.
Log Shipping	A method for creating a copy of a database that is dynamically updated by applying the changes recorded in the master database's transaction log to the database copy at regular intervals. This approach is useful for ensuring a redundant copy of the data is maintained at all times which might only be a few minutes out of date. It is also useful if the redundant copy is set up as a read only database for reporting and data browsing operations.
MSDE	Microsoft SQL Server Desktop Engine. This is the limited version of SQL Server that is included with a <i>Recorder 6</i> installation for users who do not have a dedicated SQL Server. It is limited to a maximum of 2GB of data per database and will only process a maximum of 5 requests simultaneously.



Replication	A method for creating a copy of either the entire database or a subset of the data. Replication operations tend to be less frequent than log shipping operations, but there is more flexibility as to what data is replicated. This is useful if the redundant copy is set up as a read only database for reporting and data browsing operations.
Restore	The act of using a backup to recover the state of a database to its recorded state at a given point in time.
SQL	Structured Query Language. This is a language used to issue various commands to the database server, including requests for data (queries), data updates or administration commands.
Transaction Log	A file maintained by SQL Server for each database which sequentially records changes (transactions) made to the database.



INTRODUCTION

This document is designed to assist you in making the best of the *Recorder 6* programme by comparing the various options that are available to you. It also gives important information that is needed for effective installation and running of the programme on a network including information on backups, standard installations, tips on optimisation, some useful SQL Server Functions and un-installation guidelines. A separate set of installation guidelines are available to users who wish to install on a standalone machine.

This document is designed for use by people familiar with computers and their personal system. It may also be used as a guide for users to assess the level of assistance they may require in setting up their system. Whilst installing on a standalone machine is likely to be straightforward, it is strongly suggested that you consider whether you need the assistance of a *Recorder* approved expert before attempting a networked installation. Anyone attempting a networked installation should read the relevant parts of this documentation prior to proceeding.

Migrating from *Recorder 2002* to *Recorder 6*

Some people installing *Recorder 6* will be “upgrading” from *Recorder 2002*. Although *Recorder 6* and *Recorder 2002* are very similar - they have a different database behind the scenes and different registry settings. It is therefore not a process of upgrading from one programme to the other as was the case with *Recorder 2000* to *Recorder 2002*. The migration process is as follows;

1. Install *Recorder 6*
2. Transfer data from *Recorder 2002*
3. Uninstall *Recorder 2002*

Migration of data will only be possible if *Recorder 2002* is at version 2.3.1 or later. Please upgrade *Recorder 2002* as appropriate before installing *Recorder 6* or attempting a transfer. The upgrades required are available on the NBN website (<http://nbn.org.uk>).

The database to be transferred must be physically on the SQL Server that the *Recorder 6* database is installed on in order for the process to work effectively.

The data transfer and *Recorder 2002* un-installation functionalities are available on the *Recorder 6* installation CD. For further information please refer to page 49.

The *Recorder 6* database

Many users of *Recorder 6* will already be familiar with *Recorder 2002* and need to be aware of differences between the two programmes for installation purposes. The main difference between the two systems is the database used to store data.

Recorder 6 utilises Microsoft SQL Server 2000 to store data as opposed to Access 97. SQL Server 2000 is a significantly more powerful and configurable product than Access 97 and therefore requires additional expertise to get the best from it. Details of the differences between Access and SQL Server 2000 are provided later in this document.

To buy a license for Microsoft SQL Server can be expensive but there is a free run-time version of Microsoft SQL Server 2000 called MSDE. By using MSDE, which is supplied on the *Recorder 6* install CD, you can use *Recorder 6* regardless of whether you have bought a copy of Microsoft SQL Server or not. Alternatively, *Recorder 6* will also install against an existing full instance of SQL Server 2005 or SQL Express (a free run-time version), although this is not fully supported yet. For further information please contact your reseller. There are some limitations with using MSDE and certain users will require a full copy of SQL Server. Details of these circumstances are supplied later in this document.

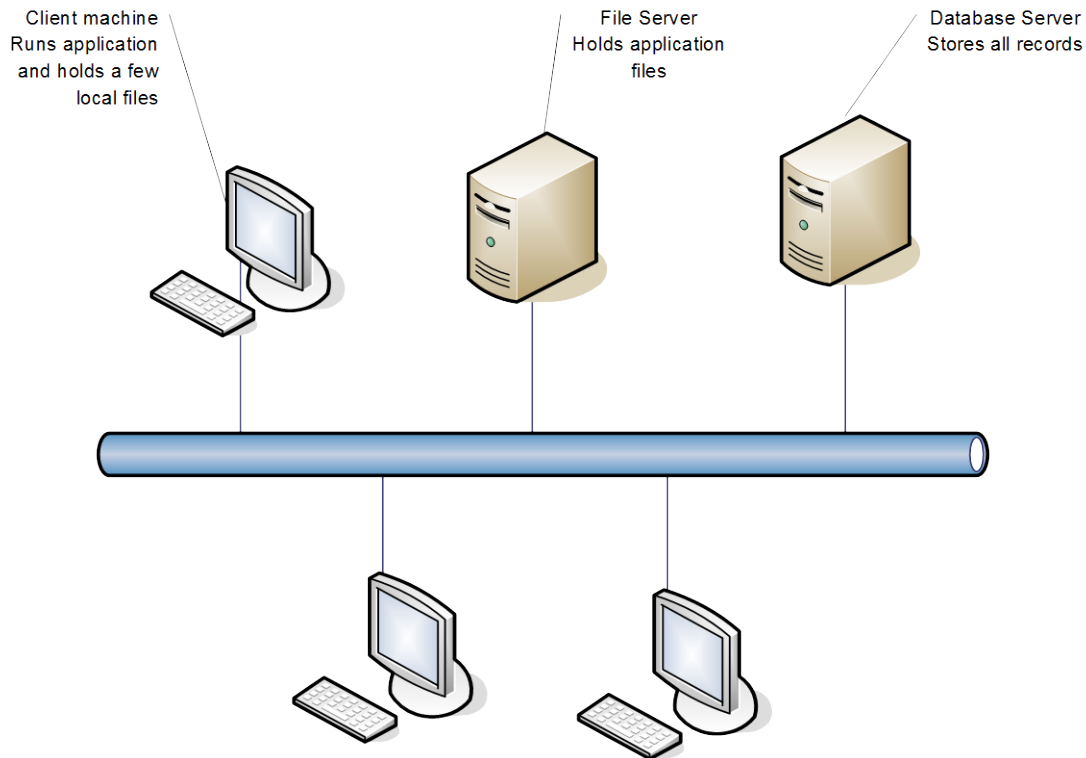


Many users are very comfortable with reporting from the *Recorder 2002* database using MS Access tools and do not want to lose this functionality. We have therefore supplied a “linked” Access 97 database in the database folder enabling users to access the database with the software and skills they already possess.

NETWORKED & STANDALONE INSTALLATIONS

Recorder 6 can be installed either on a standalone machine or on a network. A networked installation consists of three elements linked in the way described below.

The following illustrates a typical network setup of *Recorder 6* using a full SQL Server database:



It is most common for SQL Server to be installed on a dedicated server and the installation of *Recorder 6* allows and supports this. It is possible to store the file server files on the same machine as the database server (SQL Server), although for best performance this is not recommended.

It is necessary for the workstations to have an appropriate drive mapping to the file server prior to installation. However, there is no such requirement for the database server to be mapped as the database server only contains the database and no other pieces of the software.

As well as the full SQL Server installation illustrated above, it is also possible to install *Recorder 6* with MSDE rather than SQL Server. In such cases it is likely that the MSDE installation will be on the file server. Please see later information comparing MSDE and full SQL Server installations.

Standalone installations

For a standalone installation of *Recorder 6*, the user's Program Files folder is used to store both the files that would have been on the file server, as well as the local files that are held on the client machine. The database records are stored in an MSDE installation on the same machine. Other than the segregation of responsibilities across several machines, the standalone and networked versions of *Recorder 6* are identical.

Details are available later in this document of "standard" networked and standalone installations of *Recorder 6*, including information on file placement and registry settings.



DATABASE PLATFORM COMPARISONS

There are four options for the database used by *Recorder 6* (listed below):

1. Use the provided Microsoft SQL Server 2000 Desktop Engine (MSDE) which is available on the installation CD.

Note: MSDE is based on the core SQL Server technology and is fully compatible with SQL Server 2000. This means that it is possible to enter data into *Recorder 6* using MSDE then at a later date migrate to SQL Server 2000 if required. This compatibility means that there is no need to migrate data, simply detach the database file from MSDE and attach it to the SQL Server.

2. Download and install Microsoft's SQL Express which is available for free from Microsoft's website.

Note: Recorder 6 does not yet fully support SQL Server 2005 and SQL Express, although a small number of users already use this set up without any major problems. This option is not currently included on the installation CD and requires a separate download.

3. Purchase and install Microsoft SQL Server 2000. There are a number of different licenses for SQL Server 2000, though Recorder itself does not need any of the functionality provided by the more expensive licenses.
4. Purchase and install Microsoft SQL Server 2005.

MSDE is identical to SQL Server 2000 but with some limits on connections, database size and functionality. SQL Express is identical to SQL Server 2005 and again has some (different) limits on functionality. SQL Server 2005 is able to run a SQL Server 2000 database in "compatibility mode" which means that all the old features are supported and new features are disabled. Compatibility mode 80 is used when using Recorder against SQL Server 2005 or SQL Express and means that it is possible to use any of the 4 options described with, at least in theory, no differences in functionality.

There are a number of differences in functionality between the 4 different database options and for further information it is recommended you visit Microsoft's website. However, the following list describes the salient differences with respect to running Recorder:

- Total database size is limited to 2 GB in MSDE and 4 GB in SQL Express. In practice this corresponds to a maximum database size of approximately 1.2 million and 2.4 million species observations respectively, depending on the richness of the data stored.
- MSDE is not supported on any version of Vista, so SQL Express is required if a Vista machine is used as the database server.
- MSDE is limited to 5 concurrent active connections. In practice it will support more than 5 concurrent users, though if more than 5 operation requests are submitted to MSDE at once it will queue them up resulting in performance degradation. This limit does not apply to any other option including SQL Server Express.
- MSDE has a limit of 2 GB RAM usage and SQL Express is limited to 1 GB. In large, high throughput database systems SQL Server is heavily dependent on RAM usage in order to cache data and query execution plans, and improve performance. These limits are unlikely to affect most Recorder users though a limit of 1 GB RAM will limit SQL Express' performance when used on large databases with several concurrent users.
- MSDE is not supplied with any tools for maintaining the database server or performing backups etc. SQL Server 2000 & 2005 both come with a rich set of tools, and a free management tool is available for SQL Express called SQL Server Management Studio Express Edition. Note that there are several free third party tools available for managing MSDE databases.
- SQL Express will only use a single processor on each machine on which it is installed.



MIGRATING FROM MSDE - SQL SERVER

The steps for moving a database from MSDE 2000 to SQL Server 2000 are as follows:

1. Ensure all users are out of the database
2. With Enterprise Manager, register the MSDE instance as a new server
3. Select the database and right-click to bring up the popup menu
4. Select **“All Tasks ► Detach Database...”** from the popup menu
5. Click <OK> to detach the database
6. Copy the following 2 files to the Data folder of the SQL Server install:

<database name>_Data.MDF

<database name>_Log.LDF

These are both located in the *Data* folder of the MSDE instance. If the default settings are kept during the MSDE install, these files are found under the “C:\Program Files\Microsoft SQL Server\MSSQL” or, if the MSDE instance was named, “C:\Program Files\Microsoft SQL Server\MSSQL\$<instance name>”

7. Select the Databases folder of the target SQL Server and right-click to bring up the popup menu
8. Select **“All Tasks ► Attach Database...”** from the popup menu
9. Browse to the copy of the files and click <OK>. The database is automatically attached
10. Ensure that there is an NBUser login on the SQL server. Using Enterprise Manager, browse to the server, select Security, then Logins. If necessary, create the NBUser login with "SQL Server Authentication", a password of "NBPassword", and default database NBData (see page 21). On the Database Access tab, click Permit for the NBData database with public access. If you wish to use the backup and restore facility built into Recorder to change the location of the backup file it is necessary to also tick the Disk Administrators checkbox on the Server Roles tab.
11. Enable the NBUser login by running the following SQL in Query Analyser or using an ODBC connection from another database such as Access:

```
EXEC sp_change_users_login 'Update_One', 'NBUser', 'NBUser'
```

12. Notify *Recorder 6* that the database is now on a new server by:
 - a. Opening the registry editor (regedit.exe)
 - b. Browse to My Computer\HKEY_LOCAL_MACHINE\Software\Dorset Software\Recorder 6.
 - c. Double click on the right hand side on the 'Server Name' property
 - d. Change the property value to the name of the SQL Server instance (unless you are using a named instance of SQL Server, the name of the server machine on the network is enough)
13. The database is now ready for use



SYSTEM REQUIREMENTS

The following guidelines illustrate the specification of machines that will give reasonable performance in *Recorder 6*. It is possible to use lower specification machines although the performance is reduced. Using less than 256MB RAM on a machine running MSDE or SQL Server provides very poor performance in most cases.

Specifications for a single user using MSDE on the same machine

Processor: Intel Pentium 3 processor or later, 800MHz minimum
Memory: 512MB RAM
Hard disk: 3GB disk space minimum (10GB recommended)
Software: Windows 98 (SP1) or later; Internet Explorer 5 or later

Specifications for the client machine when using a separate server machine

Processor: Intel Pentium 3 processor or later, 200MHz minimum
Memory: 128MB RAM minimum (256MB for Windows 2000 or XP).
Network: 100 Mbit Ethernet
Hard disk: 1GB total disk space minimum
Software: Windows 98 (SP1) or later; Internet Explorer 5 or later

Specifications for the Server machine for a small network, up to 10 users or so, and about 5GB of data

Processor: Intel Pentium 3 processor or later, 800MHz minimum
Memory: 512MB RAM
Network: 100 Mbit Ethernet
Hard disk: 20GB total disk space minimum
Additional: Redundant power supplies and fans advisable
Software: Suitable backup hardware and software
Windows 2000 or later
SQL Server 2000 and CALs, or MSDE

Specifications for the Server machine for a medium size network, up to 30 users or so, and about 20GB of data

Processor: Intel Pentium 3 processor or later, 800MHz minimum
Memory: 1GB RAM minimum
Network: 100 Mbit Ethernet
Hard disk: 60GB total disk space minimum, ideally a separate drive for the SQL logs.
Consider using RAID.
Additional: Redundant power supplies and fans advisable
Software: Suitable backup hardware and software
Windows 2000 or later
SQL Server 2000 and CALs



Note: A path to 'My Documents' is required in order to successfully install Recorder 6.



PERMISSIONS & INSTRUCTIONS

This section indicates the various permissions, rights and privileges required to install and run *Recorder 6*, as well as the process that must be gone through. Please discuss these permissions with your network manager in advance before attempting installation. Unless stated otherwise, a step is performed by inserting the Installation CD and selecting the appropriate option. If the CD does not begin automatically use windows explorer to locate (it is in the root folder) and run the setup.exe file.

Networked installations

Installation

Networked installations are performed as a number of steps:

Installing MSDE (if required)

To install MSDE users need administrator rights over the server that you wish to be the database server. New installations of MSDE require a reboot. This reboot must also be performed as an administrator and the installation CD must remain in the machine throughout the entire installation process.

This stage must be performed directly on the database server – not via a workstation.

Attaching the Recorder 6 database to the instance of SQL Server or MSDE

This requires system administrator privileges on SQL Server/MSDE. In the case of standard MSDE installations this is achieved through the login of 'sa' with no password and will be done automatically. However, it is highly likely (and desirable) that a SQL Server installation will have a different systems administrator and password or that your particular SQL Server uses the trusted connection method. If you have SQL Server, the administrator will be able to supply the appropriate information.

This stage must be performed directly on the database server – not via a workstation.

Installing files on the file server

To install *Recorder 6* and any Addins, users need full control rights over the folder on the file server where Recorder is to be installed.

This stage may be performed via a workstation.

Performing a workstation installation

To install *Recorder 6* and any Addins, users need administrator rights over the workstation.

Prior to installation ensure that the workstation has a drive mapping to the file server. The mappings from each of the workstations should be identical. If there is no suitable mapping to the file server in existence, the following instructions are available.

To share a network folder from Windows 2000 or Windows 2003 server

1. Open Windows Explorer.
2. Right-click on the folder to be shared and select "Sharing and Security" ("Sharing" for Windows 2000).
3. Select the "Share this folder" option.
4. Ensure that the "Share Name" is suitably descriptive. Note: To create a "hidden" share that cannot be found in Network Neighbourhood, add a \$ sign at the end of the share name.
5. Click the Permissions button then select the "Everyone" group and ensure the "Change" and "Read" permissions are checked and the "Full Control" permission is unchecked.



Note: Best practise advises granular permissions are set on the underlying folder and not on the share.

6. Select the "Security" tab and ensure that the permissions for the folder are set appropriately. Note: Best practise advises that permissions are assigned to groups instead of individuals.
7. To add a new group, click the "Add" button, type in the name of the Windows group and click OK. Select the new group and check the appropriate permissions. Note: standard permissions are "Read & Execute", "List Folder Contents" and "Read" for read-only access and the above plus "Modify" and "Write" for read-write access.
8. Click "OK" to confirm the sharing and security changes.

To connect a network folder from Windows XP or Windows Vista

1. Open Windows Explorer. Then select "Map Network Drive" from the "Tools" menu (press Alt to show menu bar in Vista).
2. Select an appropriate drive letter from the "Drive" drop down ("Folder" drop down in Vista).
3. Enter the share name in the form [\\servername\sharename](#) into the "Folder" dropdown.
4. Ensure that "Reconnect at logon" is checked.
5. Click "Finish" to map the drive.

Do not install using the CD: Browse to the File Server:\\Recorder 6 Server\WorkstationSetup.exe via the drive mapping to install *Recorder 6* on a workstation.

Data transfer from Recorder 2002

The data transfer from *Recorder 2002* involves detaching and reattaching a new mdf file to the instance of SQL Server or MSDE. Therefore the rights required are the same for the initial attaching of the mdf file. Again, the process must be run directly on the SQL Server.

The *Recorder 2002* database to be transferred needs to be on the local disk of the same server as the *Recorder 6* database to work effectively. It can be copied across to the server if required (copy all *.mdb files from the Recorder 2002 Database folder).

Standalone Installations

Installation

To install *Recorder 6* and any add-ins, users need administrator rights. New installations require a reboot of the machine. This reboot must also be performed as an administrator. **The installation CD must remain within the machine for this reboot.**

Data transfer from Recorder 2002

The data transfer requires administrator rights over the server.

Running Recorder 6

Running Recorder 6

To use *Recorder 6*, users need standard workstation access rights (e.g. the Standard User rights required to log in as an XP user), read access to all Recorder files on the Server and **read** and **write** access to both the *Object Sheet* folder and the *User Files* sub-folders on the file server. For the network version, the user also needs **read** and **write** access to the workstation's *Map Files* folder.

Upgrading

Whenever an upgrade is to be installed, it should be done through an administrator user account to avoid any potential problems due to limited user account access rights. The 'sa' login or a trusted connection with database owner privileges over the Recorder database is required during the upgrade.

To download Recorder 6 upgrades or for further information please visit Recorder Software's website at www.recordersoftware.com, or alternatively contact a reseller.



EXAMPLE NETWORK INSTALLATION

A Recorder Network installation can be configured to operate with the database server and database files on one machine (the database server), the application & other files on another machine (the file server) and user specific files and code libraries on another machine (the client or workstation). In actual fact, Recorder doesn't care where these machines are on the network, or even if just one machine is fulfilling all 3 roles, and the choice of configuration is one of the major decisions involved in a Recorder Network installation. Here is a list of some of the more common configurations of Recorder when installed with the Network Installation kit:

- The client, file server and database server are all installed on a single machine. In this configuration, Recorder behaves exactly like a standalone installation except that the installation process is more flexible.
- The file server and database server are installed on a single dedicated machine and one or more clients are installed on users' workstations. In this configuration, SQL Server is sharing the disk and network with the File Server part of the system.
- The file server is installed on one machine, the database server on another and one or more clients are installed on users' workstations. This configuration has the highest potential performance because it is possible to optimise each server for the required task and the servers do not share a network connection.

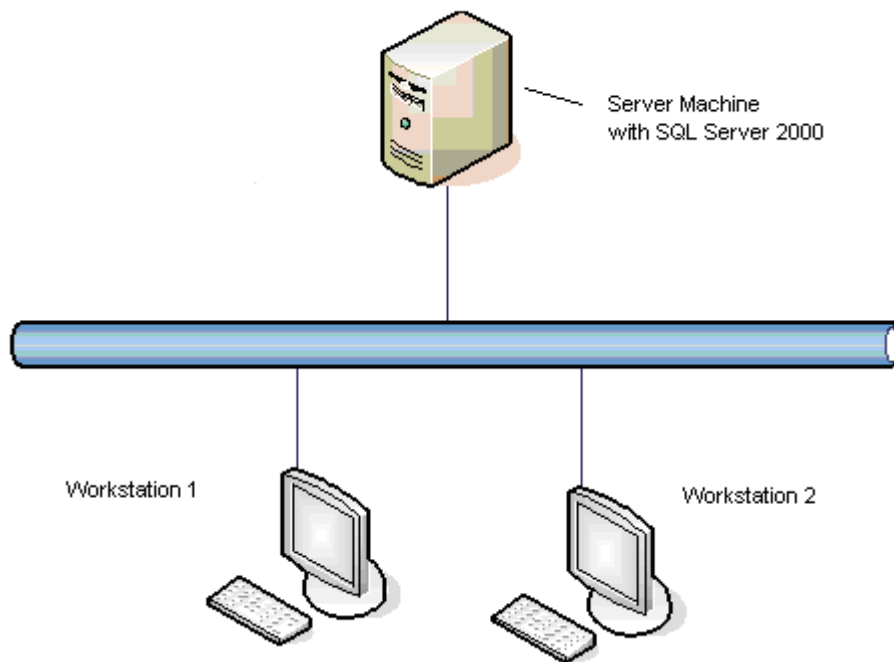
With many different configurations possible, the following is just one example of how Recorder 6 can be installed on a network. This step by step approach is intended to provide general help to those setting up Recorder 6 in a networked environment, and aims to highlight some areas that require careful consideration before proceeding with installation.

This example uses Trusted Connections as a means of controlling access to the Recorder application database. In the majority of cases, using the SQL Authentication method is satisfactory and requires less effort (particularly if the site you are installing at does not have appropriate network and database administrators). For more information on this decision see Security & Login options (page 30).



Hardware Specification and Set Up

In the example outlined, the network comprised of one (database and file) server machine, and two workstation machines (see diagram below).



The three machines used had the following specification/s:

Processor:	Intel Pentium 4 Processor, 1.70GHz
Memory:	512MB RAM
Hard Disk:	10GB total disk space
Operating System:	Windows Server 2003 Standard Edition (server), Windows XP Professional (workstations)
Software:	SQL Server 2000

Note: This disk space was sufficient in this instance as the above set up was for testing purposes only and had just 2 users that were never logged in to Recorder concurrently. However, under normal circumstances it is recommended to have at least 20GB of total disk space available for a small network (with up to 10 users).

Please refer to 'System Requirements' (page 11) for more details on the specifications required for reasonable performance of Recorder 6, or to the 'Optimisation' section (page 47) for advice on improving performance.

Database Used

An instance of SQL Server 2000 (Standard edition) had previously been installed on the server machine. The authentication method used for this instance of SQL Server was 'mixed mode'. This was enabled by right clicking on the database server in Enterprise Manager, selecting properties, then changing the setting on the Security tab, or by selecting an option during installation to enable *mixed mode* authentication. The instance of MSDE installed by Recorder 6 has this option automatically set.

Network Configuration



A specific network drive (R:\) was created on the server machine for Recorder and this was mapped to the two workstation machines.

Two users of the network were created as follows:

- User 1: 'Recorder Admin'
Group: Administrators
Permissions: Full Control
- User 2: 'Recorder User'
Group: Power User
Permissions: Modify, Read and execute, List Folder Content, Read, Write

In this example the network domain was called Recorder and 2 network groups were created, one called Administrators and one called Users.

The user Recorder Admin was created as a member of the network group 'Administrators' (Recorder\Administrators), and Recorder User was a member of the 'Users' group (Recorder\Users).

Part 1 – Installation of major components on server machine

To install Recorder 6 in a networked environment you need to install the major components of the package on the server machine. Before proceeding, please ensure that you have the following permissions:

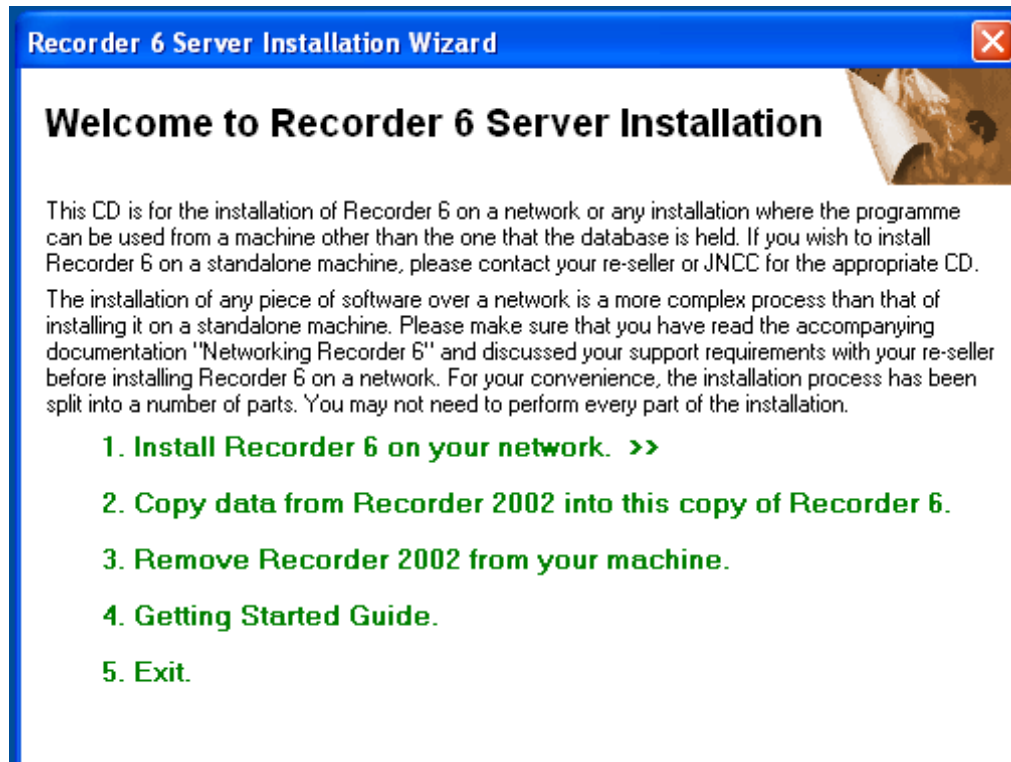
- Administrator rights over the server machine
- Administrator rights over the workstation machines
- Administrator rights over SQL Server 2000 (on the server machine)

Please note that this includes having the appropriate rights over the registry.

Then perform the following steps:

1. Insert the Recorder 6 CD (ensure you have a network copy) into the server machine. Note that whichever configuration you are using with respect to clients and servers, this step **MUST** be performed on the machine on which SQL Server is installed. This is because the installation places files on the hard disk locally accessible by SQL Server – for security reasons a default installation of SQL Server cannot access any files across the network.





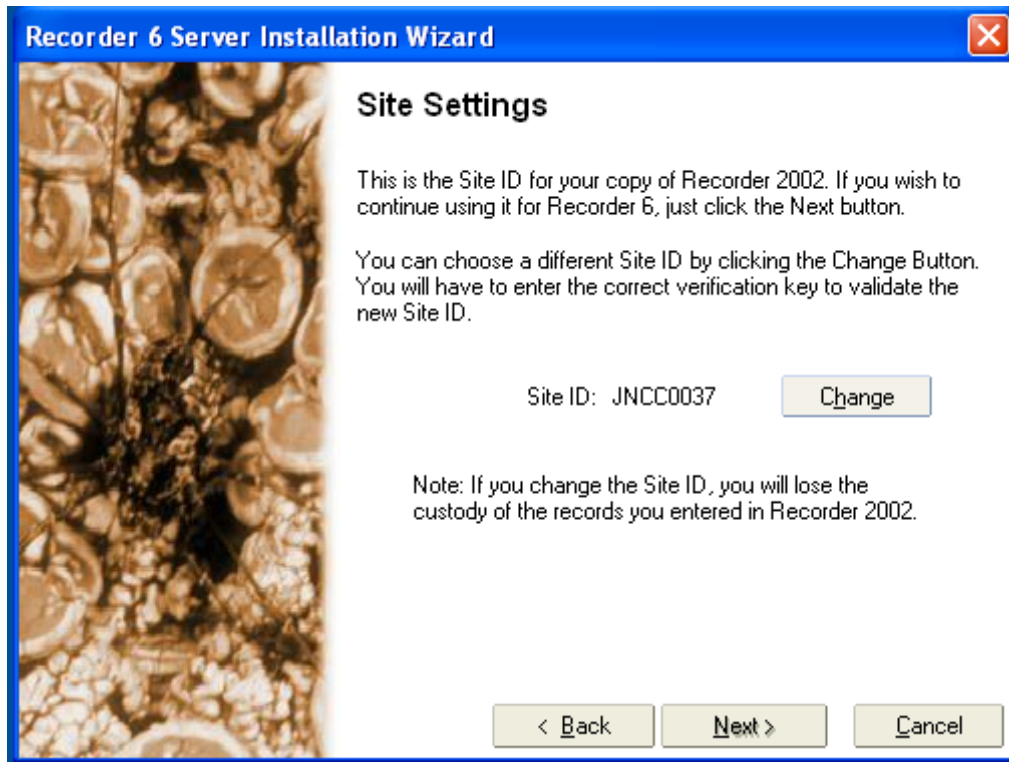
2. The above Welcome Screen should appear. However, if it does not, browse to the CD drive using Windows Explorer and double click on 'Setup.exe'. Note that you can also access the 'Release Notes' here.

Select option 1 - 'Install Recorder 6 on your network'

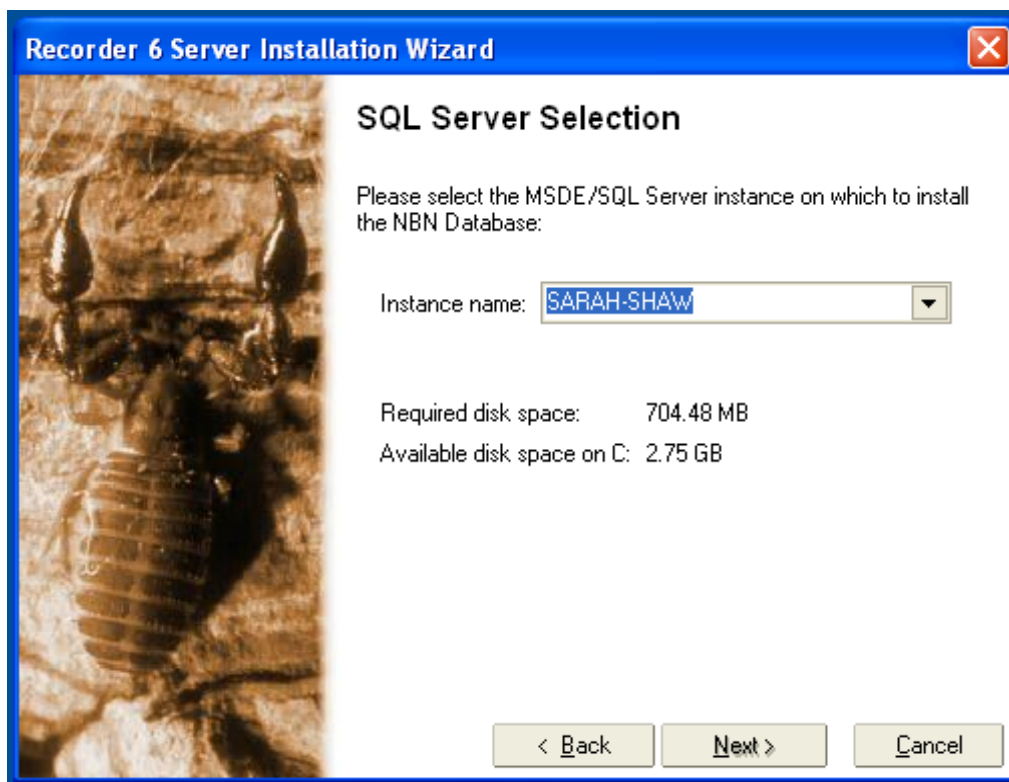
3. In the next screen option 2 was selected – 'Create the Recorder 6 database and attach it to your instance of SQL Server/MSDE'.
4. The Site Settings Screen.

In this screen you can specify if you wish to use your previous Recorder 2002 Site ID, or if you wish to use a new site ID. To do this, click on the <change> button and enter the new Site ID and Verification Key into the appropriate fields and click <ok>. Then click <next>





5. The SQL Server Selection Screen.



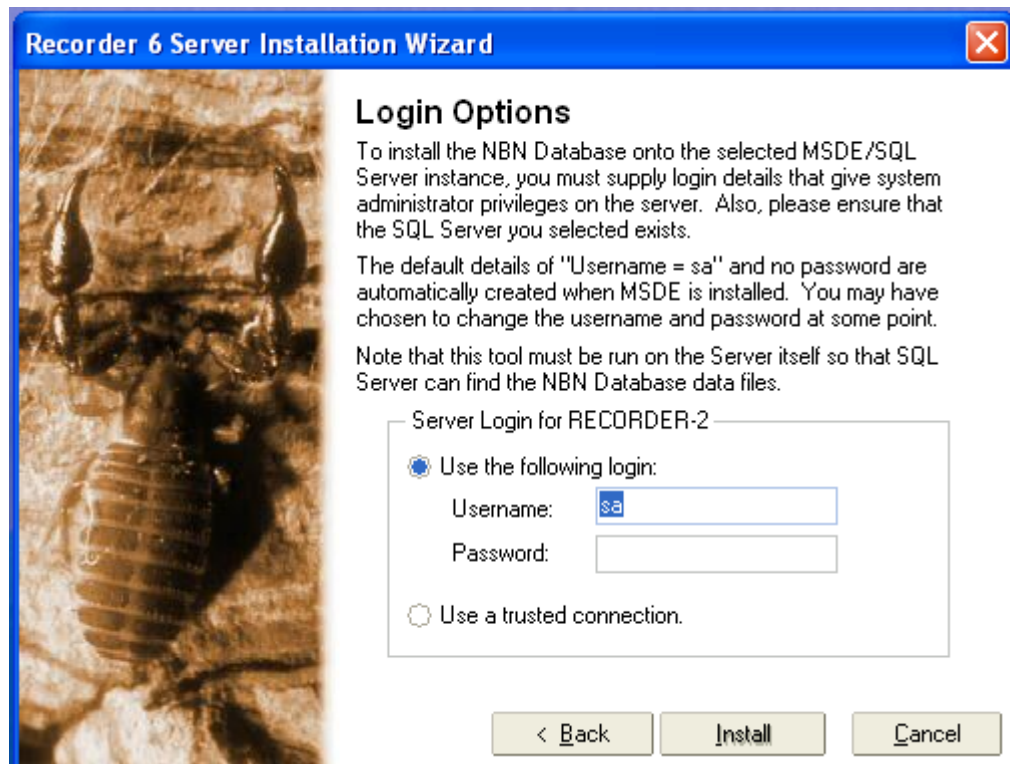
Select the name of the instance of SQL Server on the server machine that you plan to use with Recorder from the drop-down list.



Note: In some circumstances, not all available instances will be listed here. If the instance you wish to use is not listed, click in the instance name field and type in the name of the instance you wish to use. Take care not to inadvertently select the local instance name, which is listed by default if available.

Please take note at this stage and ensure that the required disk space does not exceed (or preferably does not come close to) the available disk space.

6. The Login Options Screen.



To install the NBN database onto the instance of SQL Server selected you must either supply a SQL Server login that has system administrator privileges, or you can use a trusted connection. In this example set-up the 'trusted connection' option was selected and used.

Note: If you are using the default instance of MSDE supplied with Recorder 6, the username 'sa' with the password left blank (already entered on screen) has the appropriate system administrator privileges required.

The trusted connection method of login can only be used by those using Windows NT/2000, Windows XP or Vista. It cannot be used with Windows 98 or with any network that is not domain-based.

Please refer to Security & Login options (page 30) for more information regarding the different login options available on this screen.

7. Click <install>

Creating the appropriate users in SQL Server

If planning to use a trusted connection to authenticate Recorder users when running the application you need to create the appropriate logins and users of the NBN database in SQL Server, associated with each domain account.

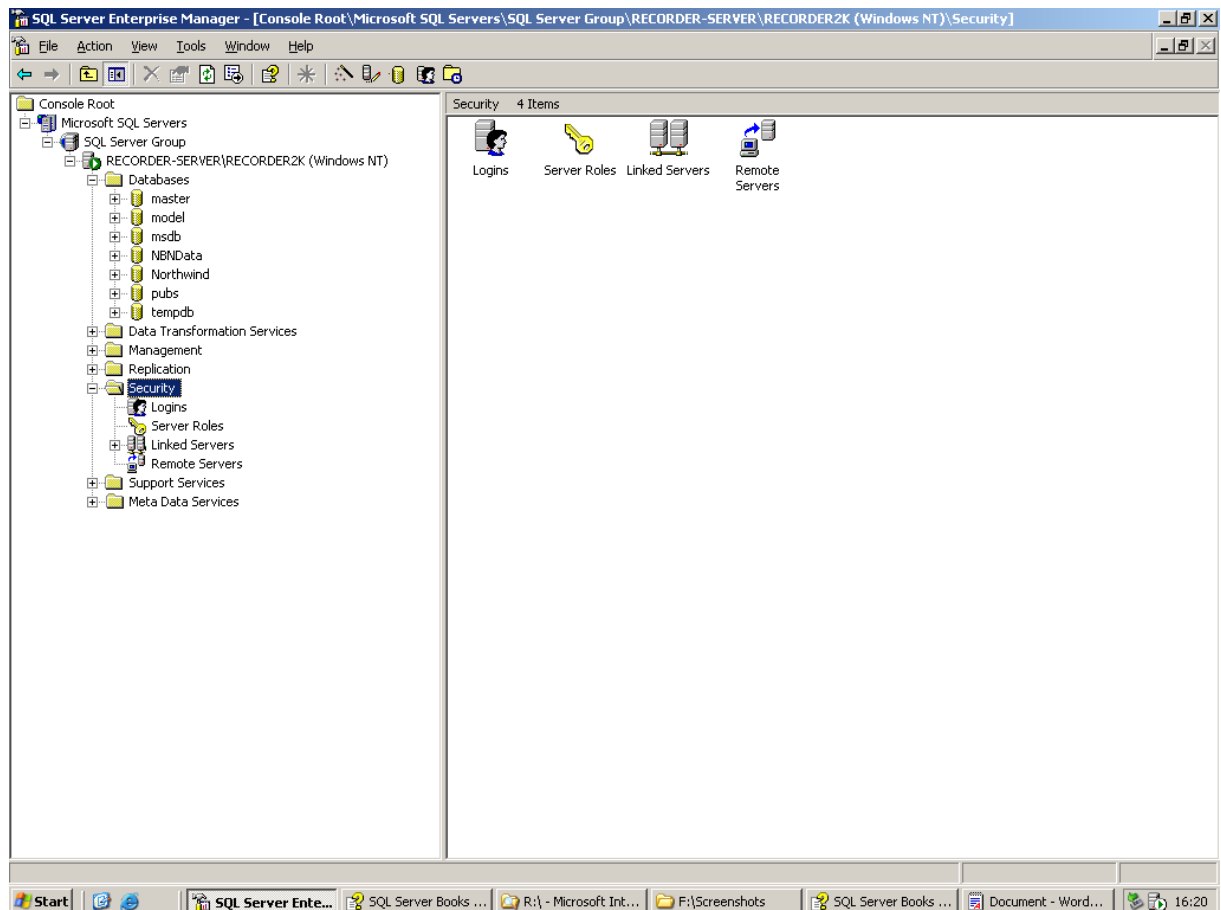
Creating Logins in SQL Server



First of all, ensure the Windows account you are using has the permissions required to create new logins in SQL Server. For example, when using trusted connection, those who are part of Windows NT/2000 group 'Administrators' typically have 'public' and 'db_owner' access to all databases within that instance of SQL Server.

To create a login:

1. On the server machine open SQL Server 2000 - Enterprise Manager. Navigate to 'Security' and expand the node.

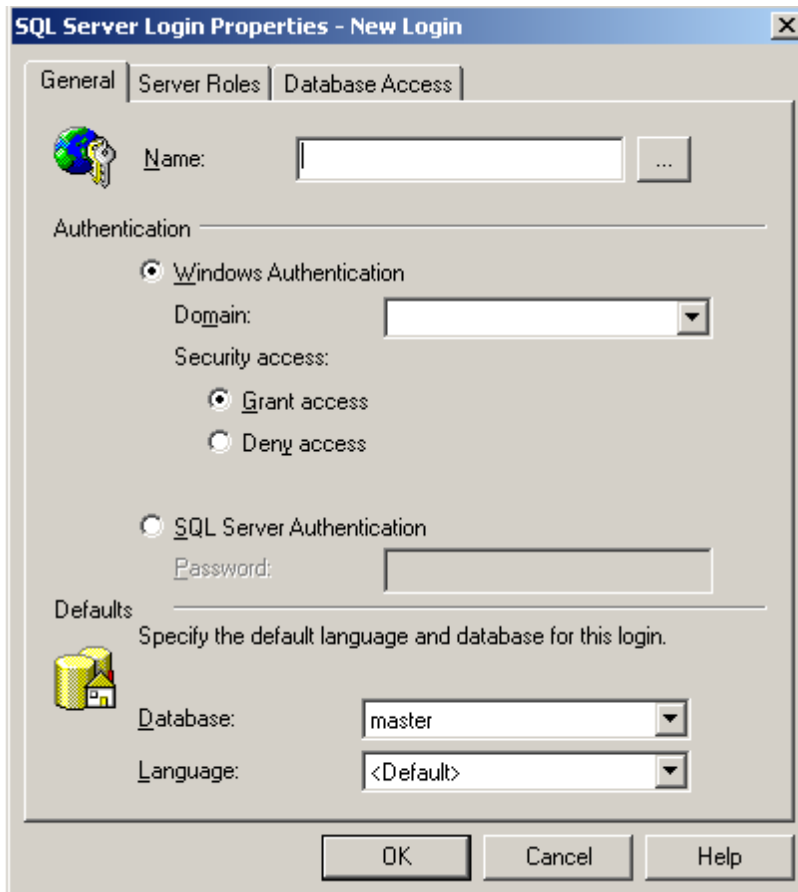


2. Right click on 'Logins' and click on 'New login...'

3. In the following screen you need to specify:

- The name of the login you wish to create. Using the browse button it is possible to navigate to the Windows domain account name that you wish to use.
- Select Windows authentication and the domain you wish to use. Note that you can specify either a domain user (as "domain name\user name") or a network group ("domain name\group name"). For example you might use the network group called Recorder\Users. In future, to allow a new network user to access Recorder the network administrator needs to simply add them to the Recorder\Users network group.
- It is ok to leave everything else here as default at this stage.



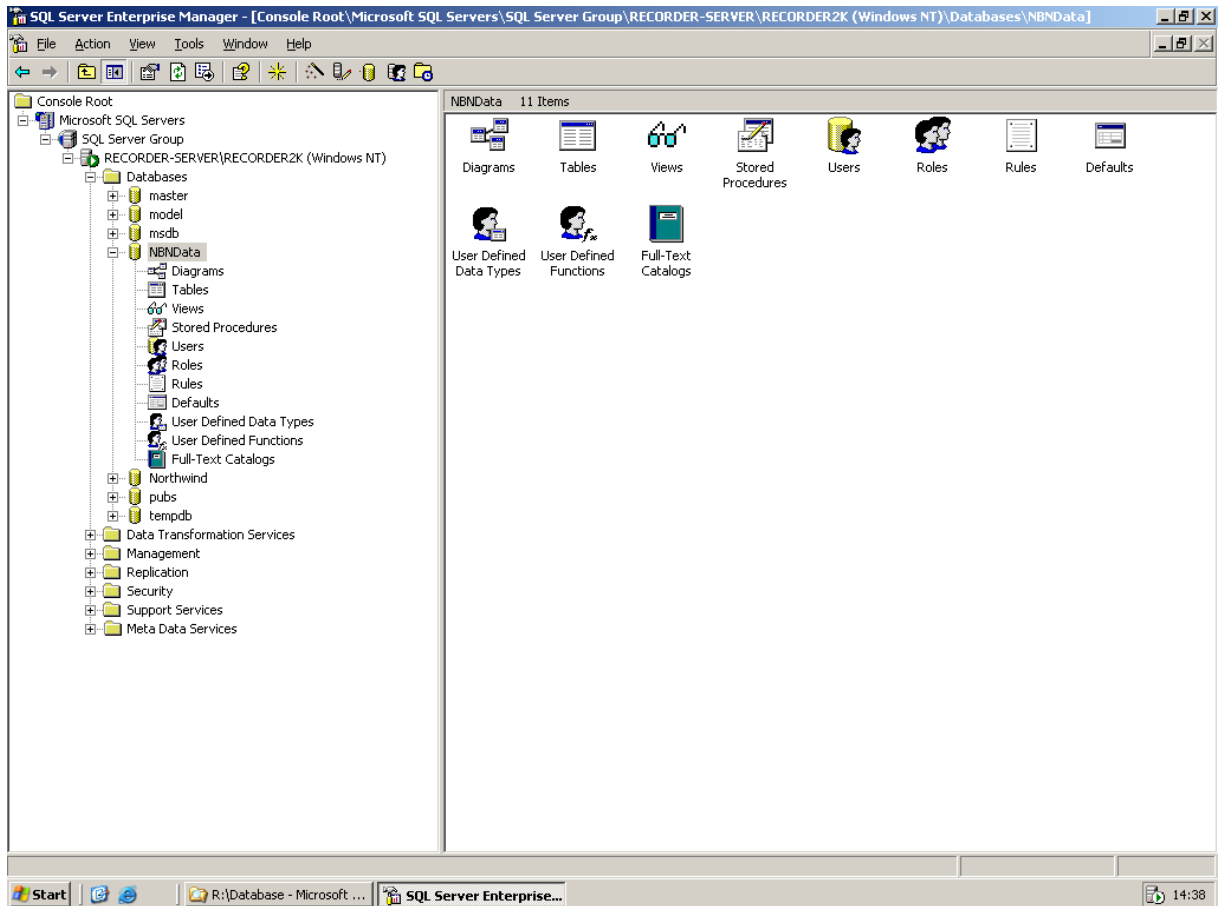


Creating NBN Users

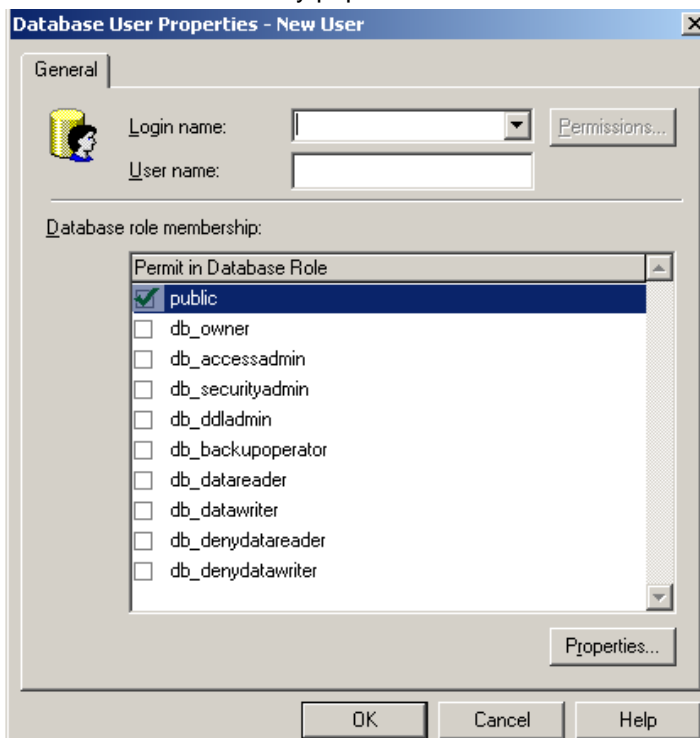
To make the login/s that you have just created into users of the NBN database you need to perform the following steps:

1. On the server machine open SQL Server 2000 - Enterprise Manager. Navigate to the 'NBNdata' database and expand the node (see screenshot below).





2. Select 'Users' and right click. Select 'New database User'.
3. Select the Login name you have just created from the drop-down list (see screenshot below). This will automatically populate the User name field.



4. You then need to specify the permissions each user/group will have. Permissions can either be set by assigning users/groups to a role, or can be applied directly by clicking on <permissions>. It is often preferable to assign users to an existing role in SQL Server or to one which you have created yourself, as it can be time consuming and problematic to set permissions directly for every individual user. For more information on roles and permissions in SQL Server please refer to SQL Server's 'Books Online' or Microsoft's SQL Server web resources found at <http://www.microsoft.com/sql/default.mspx>.

In this example two logins were created and were both assigned as users of the NBN database. The details of these logins are provided below:

USER 1:

User Name: Recorder\Administrators

Login Name: Recorder\Administrators

Database Role Membership: Public, db_ Owner

Server Role Membership: Disk Administrators (Optional, this enables setting of the backup file location from within Recorder)

USER 2:

User Name: Recorder\Users

Login Name: Recorder\Users

Database Role Membership: Public, db_datareader, db_backupoperator (optional, enables use of Recorder's built in backup and restore function)

Server Role Membership: Disk Administrators (Optional, this enables setting of the backup file location from within Recorder)

The two users created were assigned the above database roles by ticking the appropriate boxes seen in the 'Database User Properties' screen shown above. The roles selected specify the permissions each network group has in the NBN database when accessing it directly in SQL Server. By creating the Recorder\Administrators login as a database owner user of the NBNDData database, members of this network group now have full control over Recorder's database and therefore are able to perform upgrades and any maintenance operations required.

However, when accessing the NBN database via Recorder 6 these permissions will *always* be overridden, please refer to the Security and Login Options (page 30) for more information.

USER 1 'Recorder Admin' is a member of the Recorder\Administrators group so now has all the system administrator rights required to perform Parts 2 and 3 of the installation of Recorder 6 on each workstation machine.

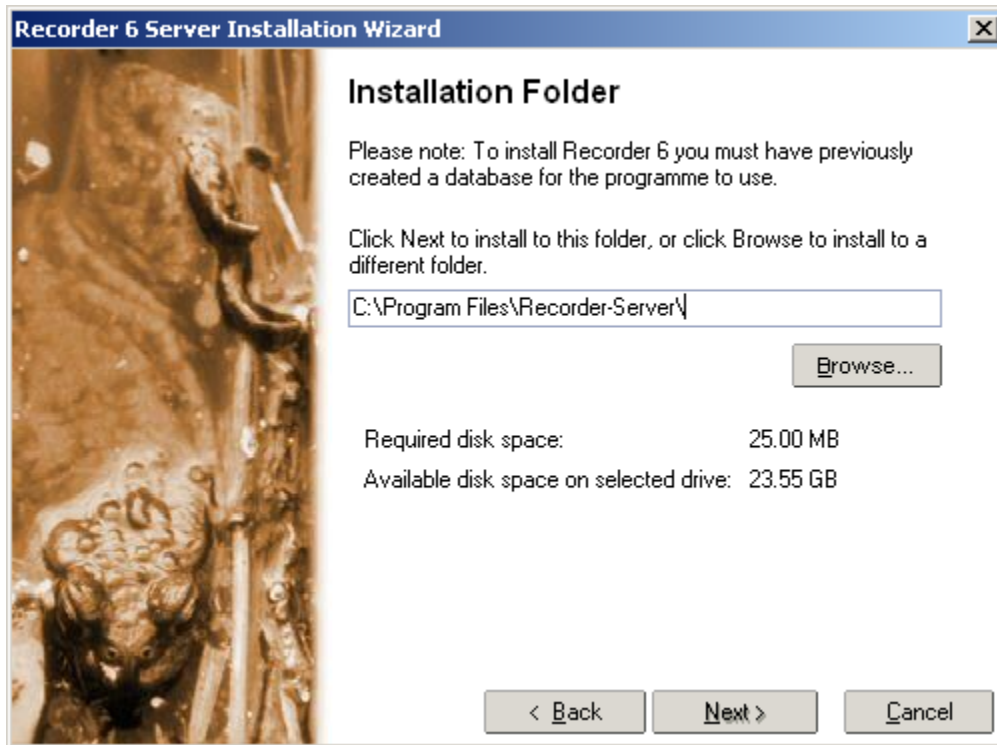
Part 2 – Installation of application files on file server

In this example installation, the same server is being used as both the database server and the application file server, so this step follows on immediately from the previous step. This step does not need to be performed on the server itself, it is normally performed from a workstation but with rights to create the required files in the Recorder installation folder.



From the installation CD, select option 1 "Install Recorder 6 on your network", and then option 3 "Recorder 6 Server installation".

1. Installation Folder selection



Browse to an existing folder, or type in the name of a new folder. If the folder does not exist, the installation process will prompt whether this should be created.

2. Database Server Selection screen – same as when creating the database in part 1.
3. Login Options screen – same as when creating the database in part 1. Note that in this case, the option you choose defines whether subsequent workstation installations of Recorder are set up to use the SQL Authentication method of connection to the database (using the NBUser login) or to use a Trusted Connection. For more information, see Security & Login Options (page 30).
4. Exit from the installation CD.
5. Special file permissions should be set up for all users on certain folders – see 'Running Recorder 6' on page 14.
6. The root folder in which the application files were installed should be shared over the network. This is done on Windows Server 2003 by modifying the folder's properties. On the Sharing tab select "Share this folder". It is recommended that a network drive mapping (e.g. R:) be set up via a group policy, so that all workstations in the group on the network will automatically have a link to this folder. Further information on sharing and connecting to network folders is given in the section entitled Permissions and Instructions.

Part 3 – Installation of minor components on each workstation

After creating the appropriate logins/users in SQL Server in the example provided, the Recorder Admin login can be used to run the second part of the Recorder 6 installation process. This part of the installation process must be carried out on each workstation machine. Perform the following steps:



1. Using 'Recorder Admin' to login on to Workstation 1, and using Windows Explorer navigate to the network drive where the major components of Recorder 6 have already been installed, in this example '(R:) Recorder on 'recorder-server''. Double click on 'WorkstationSetup.exe'.
2. The Welcome screen.

Select option 1 – 'Install Recorder 6 Workstation on this machine'.



3. The Installation Folder Screen.

By default the WorkstationSetup.exe places the Recorder 6 folder under the following:

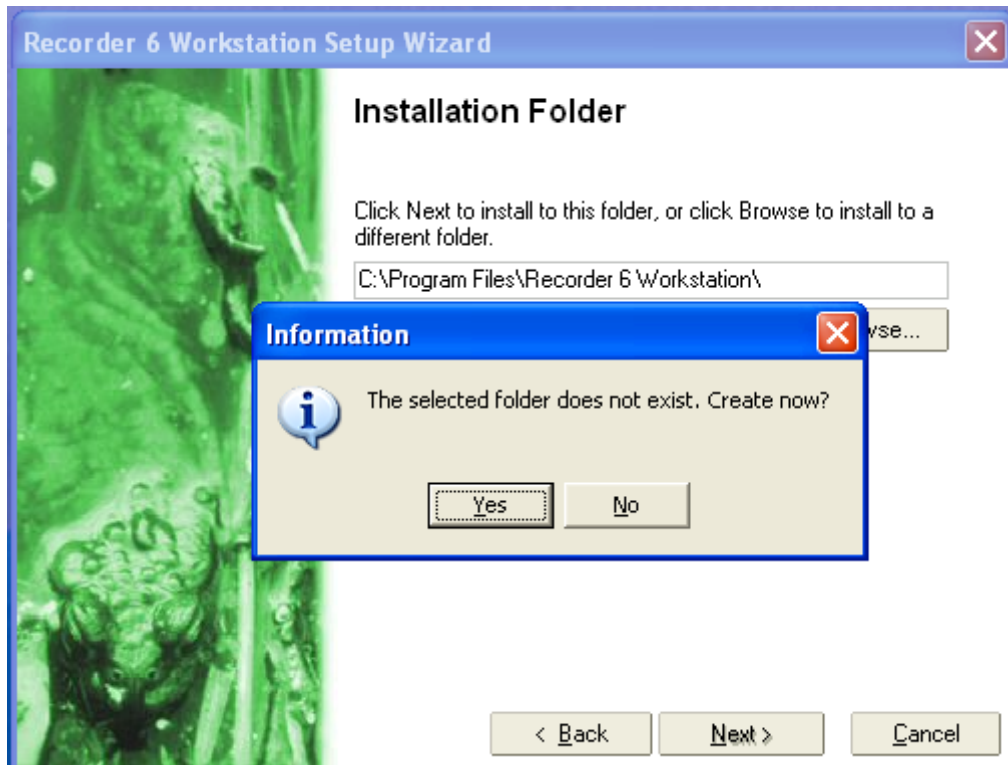
C:\Program Files\Recorder 6 Workstation

However, you can browse and place this folder elsewhere. Again, please take note at this stage and ensure that the required disk space does not exceed (or preferably does not come close to) the available disk space.

In this example the file path was left as default. Click <next>

The following information message will be displayed to inform you that this folder does not exist and will be created.



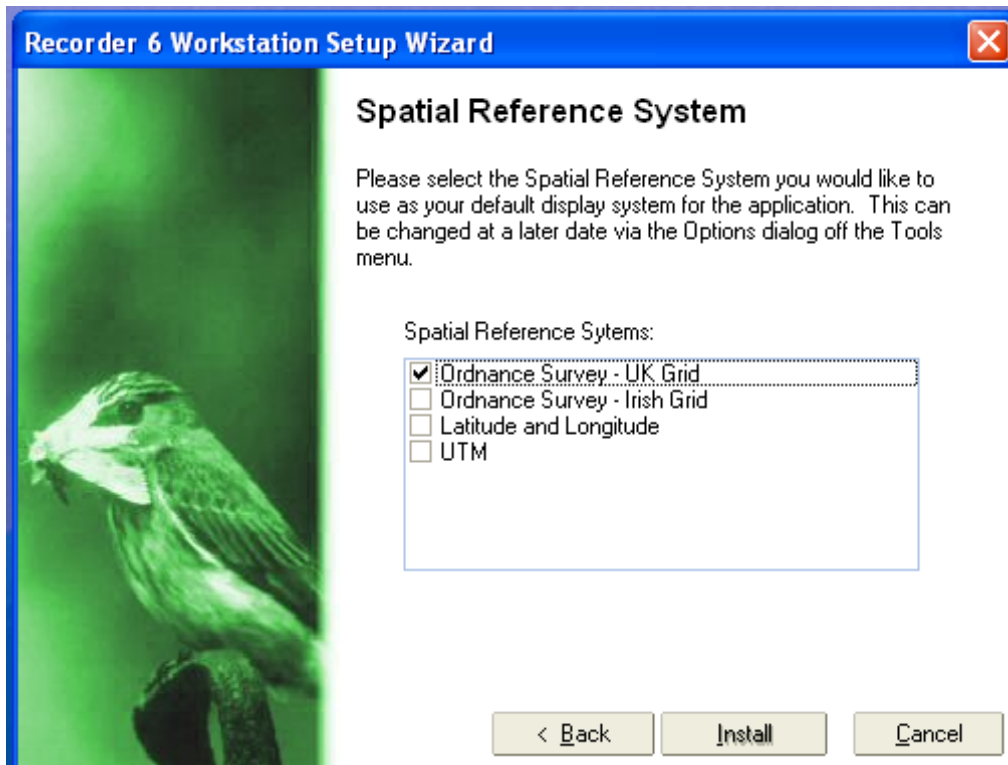


Click <Yes>

4. The Spatial Reference System Screen.

Select the appropriate Spatial Reference System (see screenshot below). In this example 'Ordnance Survey –UK Grid' was selected. Note, if you are installing lots of workstations with a different default option then you can edit the file in Recorder 6 Server\Workstation Setup\Spatial Systems.txt and change the order of the listed systems. The first one listed is the default option.





5. Click <install>
6. If installing a version of Recorder that is older than 6.10.3, a modification needs to be made to a registry setting (Start ... Run ... regedit) to allow users without workstation administration rights to run Recorder and use the map files. The setting:

HKEY_CURRENT_USER\Software\Dorset Software\Recorder 6\Settings\Map File Path

should be set to the local workstation map file path, for example:

C:\Program Files\Recorder 6 Workstation\Map Files

7. The local map file path above should be made writable by all users – see Running Recorder 6 on page 14.

You should now have a working copy of Recorder 6 installed on this workstation. To install on the second workstation repeat steps 1-7 on workstation 2, and on every workstation on the network that you wish to have Recorder 6 installed on.

For further information on the contents of each Recorder 6 folder, and where it is placed as default please refer to 'Installation Folders' (page 34).

Other installation environments

The environment in which Recorder is to be installed may differ from this example. Here are some of the implications of these differences.

Workgroup environment



Instead of a Windows controlled domain, your network might consist of a workgroup. In this case, the Trusted Security option cannot be used to install and run Recorder 6 and you must select to use the SQL Server authentication method (the 'sa' login and password).

MSDE instead of SQL Server

The Trusted Security option cannot be used to install and run Recorder 6 unless you have SQL Server client tools (e.g. Enterprise Manager), which are not supplied with a default instance of MSDE. The SQL Server Management Studio Express application, released by Microsoft as a free download to accompany SQL Server Express, is also suitable for use when using the Trusted Security setting. It is available from <http://www.microsoft.com/downloads/details.aspx?FamilyId=C243A5AE-4BD1-4E3D-94B8-5A0F62BF7796&DisplayLang=en>.



SECURITY & LOGIN OPTIONS

The following provides some additional background information on how Recorder 6 uses the different login options to install and run Recorder 6.

Background

SQL Server has 2 concepts with respect to authentication and controlling access to databases:

- A **server login** is a server wide definition of how a user can authenticate themselves onto the server. The process of ensuring that a user is who they say they are is called **authentication**.
- A **database user** is a definition of the access rights someone using a given login has on a specific database. The process of allowing access to a given unit of functionality based on the authenticated user is called **authorisation**.

Methods of defining a login

The first method is to specify a username and password on the database server; this method is called SQL Server authentication and the login details are not related in any way to the user group or account in Windows. Please note that a default installation of SQL Server does not allow SQL Server authentication. This must be enabled by right clicking on the database server in Enterprise Manager, selecting properties, then changing the setting on the Security tab, or by selecting an option during installation to enable *mixed mode* authentication. The instance of MSDE installed by *Recorder 6* has this option automatically set.

The second is to specify either a Windows user or Windows network group for a login – anyone who has already logged into Windows as the correct user or a user who is a member of the correct group is then trusted by SQL Server with the privileges associated with that login. This is called Trusted Security, or Windows Authentication. Note that you can grant a login to either a specific network user or an entire network group using this method. This is only appropriate for network users on Windows 2000, XP or Vista as other previous versions of Windows do not support network logins using a Domain account in the same fashion.

Logins Required for Recorder

Once the user has been identified with a login, SQL Server maps that login to the matching database users in order to identify what can and can't be done. There are a number of methods for determining authorisation in SQL Server. Each database object (e.g. a table or stored procedure) is able to grant or deny access to either a specific database user, or to a role. A database role defines a group of operations that a user is able to perform and also operations they are restricted from performing. A role is used for one or many users. By updating the security settings for the role, all users linked to that role are updated in one go.

For Recorder to run there are 2 types of login required to the SQL Server database:

- The first is the 'administrator' login which is used during installation of Recorder and during subsequent upgrades. This login must link to a user with full access to the database server in order to create the database file, plus create and update the objects within it.

In SQL Server or MSDE, there is always a login called 'sa' (system administrator) that gives the user full rights to all operations on the server. When SQL Server is installed, the user is forced to specify a password for this account - it is a good idea to make this password secure and kept safe and we recommend that it is not password! For MSDE, the 'sa' account is installed with no password. Sometimes Recorder needs to know how to login as 'sa' so that it can perform certain tasks, such as



upgrades so it is important that the person responsible for the *Recorder 6* installation (e.g. the database administrator) knows the current 'sa' password. If the data in the database is confidential or critical then it is essential that the 'sa' password is changed to a secure password rather than being left blank. To do this, use the following SQL:

```
EXEC sp_password null, '<insert password here>', 'sa'.
```

- The second is the 'user' login which is used whilst running Recorder 6. Whilst it would be possible to use the same login as when installing Recorder, this is inadvisable since to make the database as secure as possible, as few people as possible should be aware of the 'administrator' login. The login used by Recorder should link to a user with the minimum rights possible in order to run the application; this approach ensures that the possibility of inadvertent or deliberate damage to the database or server are minimised.

The recommended level of access rights for the user login is to have Public and db_datareader privileges to the NBNDData database. In addition, giving the user db_backupoperator and making them a member of the Disk Administrators Server Role enables the use of the built in backup and restore functionality.

Finally, when connecting to Recorder the database user does not need to have permissions other than read rights on the USER table. This allows Recorder to identify the required level of permissions appropriate to the user's access level defined in Recorder (e.g. Full Edit or Add Only). Recorder then uses a facility in SQL Server called Application Roles to enable the required permissions on the various tables and objects for the user. An Application Role is a set of permissions that can be used to replace a database user's own permissions by an application as long as the application knows the password for the role. So, once Recorder has identified a user from the Login screen it calls a procedure on SQL Server to activate the correct Application Role. Each Application Role used by Recorder is named with a prefix R2K_.

Selecting an appropriate login during installation and upgrade

During the installation process or a subsequent upgrade you are presented with the 'Login Options' screen. Here you can choose whether Recorder will use the 'sa' (system administrator) or another SQL Server login specified, or whether it will use a trusted connection (authentication through your windows domain account and associated permissions to SQL Server).

If using the default installation of MSDE provided with Recorder selecting 'sa' with no password will work, otherwise you will need to find out the appropriate method of connection from the person who installed SQL Server. If they have granted you "system administrator" rights using your network login then you can select the Trusted Connection option to login, otherwise you will need to obtain the password to the 'sa' account.

Whichever method of login you select during the installation process, Recorder then uses this login to access the instance of SQL Server specified and creates the database, the application roles described below and sets up other security information. The SQL Server login used during installation therefore needs to have system administrator privileges.

Selection of login method for Recorder

By default, when you install the Recorder files to the File Server (**Install Recorder 6 on your Network >> Recorder 6 Server Installation** stage in the Installation) the option you choose for the login during this stage is used to define the method of authentication used by Recorder. The key factors in deciding which approach to use are:

- 1) Using SQL Authentication to access the database means that administration of user accounts in Recorder is simplified and requires nothing more than the facilities provided in the Tools menu User Configuration screen.
- 2) Using SQL Authentication to access the database requires the creation of a server wide login on the SQL Server. Some SQL Server database administrators like to control access to databases entirely through network groups and trusted connections and do not like specific logins created at the server level, so may prefer a trusted connection approach.



- 3) Using Trusted Connections users cannot login to Recorder even if they install the Workstation on their machine and know the username and password of another Recorder user, unless the network administrator explicitly grants them access. Therefore this approach gives the greatest level of security.

If you specify an SQL login such as the 'sa' account then the installation process creates a login and database user called 'NBNUser' which has read only access to the database. Recorder will then login using the NBNUser SQL Authentication method. The password to this login is set to 'NBNPassword' (case-sensitive) as it does only grants read only access to the data so does not need to be secure.

If you specify a trusted connection at this stage then Recorder will subsequently login using a trusted connection, so it is important that the user is given at least read only access to the Recorder database, either directly or via membership of a network group. If the option to use trusted connections is selected, then the network administrator is responsible for ensuring that all users who need access to Recorder 6 are given access to the SQL Server. The recommended approach to this is to:

1. Create a network group, for example Recorder Users.
2. Add the required users to this group and give this group read/write access to the Recorder 6 installation folder on the network or at least the User Files sub folder.
3. Create a login on the database server using Enterprise Manager and link the login to the Recorder Users group. To do this:
 - a. Browse to the database server
 - b. Expand the node and expand the Security node beneath it.
 - c. Right click in the right hand panel and select New Login.
 - d. Select the Recorder Users user group in the Name text box by using the '...' button.
 - e. Grant Recorder Users public access to the NBNDData database by going to the Database Access tab and checking the box in the Permit column for the NBNDData database.

Once installed and running, Recorder 6 uses the login to get read access to SQL Server to verify the username and password details supplied in the 'Recorder – login' screen against the USER table. The access levels set for each username defined in the USER table switch on the appropriate application role and the permissions set for the database.

It is possible to override the option selected during installation of the File Server in terms of which login method Recorder uses. To change the login method used by all subsequent installations of Recorder workstations open the InstallSettings.ini file in the Recorder server installation folder. Change the Trusted Security setting to 1 to force subsequent installations to use trusted connections or 0 to force subsequent installations to use SQL Authentication using the NBNUser login. For installations of the workstation that have already been performed, this setting can still be changed in the registry by altering the value for HKEY_LOCAL_MACHINE\Software\Dorset Software\Recorder 6\Trusted Security.

Application Roles

As stated before, Application Roles provide a placeholder for a set of permissions that are not specifically associated with any given user. Recorder 6 only needs authorisation to read the data in the USER table in order to perform its own user authentication and then select the required application role to grant database privileges to the user whilst running Recorder. The Application Role, once activated, completely replaces the user's own permissions or the permissions of the NBNUser account with the permission set defined for the Application Role. This means that people accessing data externally, e.g. for reporting purposes, need not have write access to the data unless the database administrator chooses to allow them to write directly to the data.

The following table outlines the different access levels available in Recorder 6 via the application roles:

Access levels in Recorder	Application Role in SQL	Permissions
---------------------------	-------------------------	-------------



Server		
Read Only	'R2k_ReadOnly'	This role permits select rights on all tables, plus update rights on LAST_KEY, USER, SETTING.
Record Cards Only	'R2k_RecordCardsOnly'	In addition to the rights available to 'R2k_ReadOnly', this role grants permissions required for operation of recording cards.
Add Only	'R2k_AddOnly'	In addition to the rights available to 'R2k_RecordCardsOnly', this role grants permissions required to add data to the system through any screen.
Full Edit (own data only) Full Edit	'R2k_FullEdit'	In addition to the rights available to 'R2k_AddOnly', this role grants permissions required for full edit operation of the system, except system operations.
System Manager	'R2k_Administrator'	In addition to the rights available to 'R2k_FullEdit', this role grants permissions required for full operation of the system.



INSTALLATION FOLDERS

This section describes the folders and contents of a “standard” standalone and network installation of *Recorder 6*. Please note that users may choose non-standard file paths for many of the items described below. In general a *Recorder 6* networked installation is identical to the standalone version except that the folders used are stored either on the server or locally.

Standalone Installation

C:\Program Files\Microsoft SQL Server

If the default installation option to install an MSDE instance is selected, then the installation is placed into this folder.

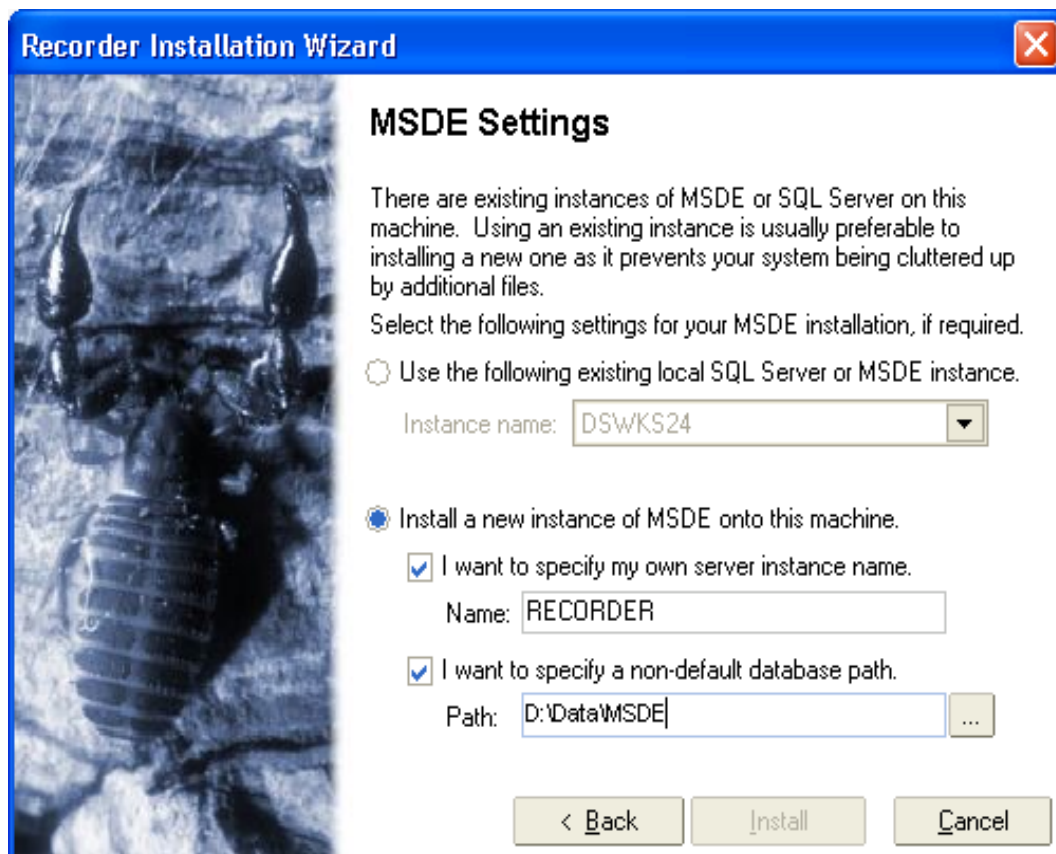
C:\Program Files\Microsoft SQL Server\MSSQL\Data

By default, the SQL Server database files are placed in here. This includes a *.mdf (data) and *.ldf (log) file for each database created. As well as the nbndata database, there are other system databases in this folder required by SQL Server (master, model, msdb, tempdb).

Note that the location of this folder can be altered using the install kit by checking the box 'I want to specify a non-default database path' on the MSDE Settings page during installation.

In addition, if the user chooses to name the instance of MSDE that is installed during the installation process (by checking the box labelled 'I want to specify my own server instance name'), then the path would be C:\Program Files\Microsoft SQL Server\MSSQL\$<instance name>\Data.

These options are shown in the following screenshot:



C:\Program Files\Recorder 6\

This is the root folder for the application installation. It contains the following files:

Files	Description
Recorder.exe Recorder.ex_ Uninstall.exe	Application splash screen, main executable and un-installation application. Note that the un-installation application should be accessed from Control Panel.
C4dll.dll CnvBmp5.gll CnvBNA5.gll CnvDlg5.gll CnvDXF5.gll CnvMIF5.gll CnvNTF5.gll CnvSHP5.gll CnvTIF5.gll CnvVpf5.gll CnvWMF5.gll mfc42.dll MS5.dll MS5Cnv.dll MS5User.dll msvcrt.dll	Library files required by the MapServer5 Turbo mapping system used within Recorder.

C:\Program Files\Recorder 6\Addins

Folder in which Addin files are installed.

C:\Program Files\Recorder 6\Addins\Images

Folder in which images for Addins are installed.

C:\Program Files\Recorder 6\Base Maps

This folder contains files required for each base map available within Recorder.

A base map file for use by Recorder consists of a *.gsf file (the mapping engine MapServer's proprietary format) plus a *.ini file that defines the associated system. There are other files with the same name but different extensions that MapServer creates which contain database and indexing information, normally *.gdb, *.gix, *.mdx. All of these files are necessary for the map to work, not just the gsf file itself. The ini file contains 2 lines:

Description=xxxx - description of the base map displayed in the Map Options dialog.

System=xxxx - spatial reference format that this map is based on (OSGB, OSNI, LTLN or an Addin system).

Recorder is also able to use an ESRI Shape file (*.shp) as a base map, in which case the file is converted to a .gsf file when the base map is initialised.



C:\Program Files\Recorder 6\Database

In *Recorder 6* installations, this contains a Microsoft Access 97 database file called nbndata.mdb. This contains ODBC links to each table in the MSDE database. This is not used by the application at all, but is provided for 2 reasons:

- Some legacy Addins written for *Recorder 2002* are able to continue functioning without modification by accessing data via this file.
- Users who own a copy of Access and are used to being able to writing custom reports and queries within the Access environment are able to continue doing so.

Note that when security of the *Recorder 6* database is paramount then this file should be deleted, as it offers un-secure access to the data. Even if password protected the level of security is significantly reduced as tools to extract passwords from Access databases are freely available on the internet.

C:\Program Files\Recorder 6\Dtd

This folder contains the document type definition (nbndata.dtd) that defines the structure of the XML document used for exchanging data. In addition, it contains the exportstart.xml file which provides a template for the header of the XML file.

C:\Program Files\Recorder 6\Help

This contains the REC20HLP.CHM file which provides HTML help for the application. It also contains other support files required by this help file.

The following HTML files are used to provide descriptive text for each page in the Import Wizard: AbundanceQualifiersMatch.htm, AssociatedSpeciesMatch.htm, AssociationTypesMatch.htm, BiotopesMatch.htm, ColumnTypes.htm, FileSelect.htm, FixedWidths.htm, Import.htm, ImportAnalysis.htm, LocationsMatch.htm, MissingData.htm, NamesMatch.htm, RecordTypesMatch.htm, ReferencesMatch.htm, SpeciesMatch.htm, SpecimenTypesMatch.htm, SubstratesMatch.htm.

C:\Program Files\Recorder 6\Images

This folder contains images used by the application: AboutR2K_2.bmp, BlankIcon.bmp, cdicon.cmp, Default.bmp, Logo.bmp (used by the splash screen), NBNIcon.bmp.

The following files are used to provide images on each page of the Import Wizard: Columns.jpg, Data.jpg, Import.jpg, Match.jpg, Settings.jpg.

C:\Program Files\Recorder 6\Map Files

The Map Files folder holds the details of initialised maps for a particular client machine, including all the information needed to display maps as they were defined. The base map and any background layers are identified by a file placed in this folder (*.gds). This also includes links to the polygon layers, but not the polygon layers themselves.

Note that the *.gds file name is the primary key of the record in the Base_Map table that this file is associated with.

Refreshing an existing map through the Map Options screen recreates the contents of the map file folder for a selected map. This includes re-linking in the existing object sheets where required.

C:\Program Files\Recorder 6\Object Sheet

This folder contains MapServer 5 Turbo files required for each polygon layer created on any map.

C:\Program Files\Recorder 6\User Files\Import Templates

This folder contains any saved files that provide a template for the Import Wizard.

C:\Program Files\Recorder 6\User Files\Polygon Filter

This folder contains any saved files for the Polygon Filter facility in the Report Wizard.

C:\Program Files\Recorder 6\User Files\Recording Cards

This folder contains saved Recording Cards.



C:\Program Files\Recorder 6\User Files\Reports

This folder contains saved reports generated by the Report Wizard. It includes links to the template or snapshot file associated with a report but not the actual template or snapshot.

In addition, XML files placed in this folder provide custom reports available to Recorder. The XML definition is described elsewhere.

C:\Program Files\Recorder 6\User Files\Rucksacks

This folder contains saved Rucksacks.

C:\Program Files\Recorder 6\User Files\Snapshots

This folder contains saved snapshot files for the Snapshot Wizard.

C:\Program Files\Recorder 6\User Files\Templates

This folder contains saved report layout templates.

C:\Program Files\Recorder 6\User Files\User Dictionary Images

This folder is initially empty, but provides a location in which to store user images or other files that are to be linked in to the Taxon or Biotope dictionaries as custom facts.

Networked Installation

For a network installation of *Recorder 6*, most files are located on the file server so that they can be shared between multiple *Recorder 6* users across the network. However, the connection between a workstation and the file server on a network is likely to be significantly slower than the speed with which data can be written to and read from a local hard disk. Therefore on a networked installation certain folders are maintained on the local disk for performance reasons.

Please note:

1. All *User Files* sub-folders on the server must have **read** and **write** access granted to all *Recorder 6* users by the network administrator so that the data can be shared effectively. This also applies to the Object Sheets folder.
2. The Options screen of *Recorder 6* allows users to change the location where the files mentioned above are saved. If they change these paths, other users are not able to share their files.

Workstation

<local folder>

Contains Uninstall.exe (the application used by Control Panel when the *Recorder 6* workstation is uninstalled). The InstallLog.txt file details all files that were installed and therefore needs to be removed by the un-installation process.

Also contains InstallSettings.ini, which describes connection settings to the server. These are only used by Recorder the first time it is run, or if the registry settings are lost.

<local folder>\Base Maps

See description of folder under 'Standalone Installation' (page 34).

For performance reasons, base maps stored on the network are cached locally in this folder as described under <server folder>\Base Maps.

<local folder>\Map Files

See description of folder under 'Standalone Installation'.

For performance reasons, the Map Files folder is always maintained locally.

Server

<server folder>



Contains application and MapServer library files as for a standalone installation. See description of folder under 'Standalone Installation'.

In addition

Contains WorkstationSetup.exe, the installation file required to install a workstation to use this server folder.

Uninstall.exe file, which is provided for Server un-installations. It does not remove installations from workstations, workstations should be uninstalled prior to uninstalling the server.

<server folder>\Addins

See description of folder under 'Standalone Installation'.

<server folder>\Addins\Images

See description of folder under 'Standalone Installation'.

<server folder>\Base Maps

See description of folder under 'Standalone Installation'.

The Base Maps files are initially installed onto the server machine but due to performance considerations are run from the various workstations. Recorder automatically copies the files to the local disk when it starts in order to minimise network traffic during map use as base maps are fairly large files. Additional base maps therefore need only to be copied onto the file server machine where *Recorder 6* was originally installed.

<server folder>\Database

See description of folder under 'Standalone Installation'.

<server folder>\Dtd

See description of folder under 'Standalone Installation'.

<server folder>\Help

See description of folder under 'Standalone Installation'.

<server folder>\Images

See description of folder under 'Standalone Installation'.

<server folder>\Object Sheet

See description of folder under 'Standalone Installation'.

This folder must be stored on the network so that the polygon layers on an initialised map can be shared.

The Object Sheets are located on the *Recorder 6* server and are shared between all clients. Any changes made to an object sheet, such as an additional polygon layer added by one user or an additional polygon drawn on a layer by one user are visible shortly afterwards to all other users.

<server folder>\User Files\Import Templates

See description of folder under 'Standalone Installation'.

<server folder>\User Files\Polygon Filter

See description of folder under 'Standalone Installation'.

<server folder>\User Files\Recording Cards

See description of folder under 'Standalone Installation'.

<server folder>\User Files\Reports

See description of folder under 'Standalone Installation'.

<server folder>\User Files\Rucksacks

See description of folder under 'Standalone Installation'.



<server folder>\User Files\Snapshots

See description of folder under 'Standalone Installation'.

<server folder>\User Files\Templates

See description of folder under 'Standalone Installation'.

<server folder>\User Files\User Dictionary Images

See description of folder under 'Standalone Installation'.

<server folder>\Workstation Setup

This folder contains support files required whilst running the installation for a workstation.



INSTALLATION REGISTRY SETTINGS

This section describes the locations within the system registry where *Recorder 6* records settings. Note that not all registry settings are present until *Recorder 6* has been fully installed and run for the first time.

There are no registry settings created by *Recorder 6* on the file server.

Registry Key	Description
HKEY_LOCAL_MACHINE\Software\Dorset Software\Recorder 6	Root path to settings that apply to the machine. Contains database connection information.
HKEY_LOCAL_MACHINE\Software\Dorset Software\Recorder 6\Installed Addins	Contains 1 key per Addin installed, where the name is the OLE automation name of the COM object. Describes the Class ID of the COM object enabling Recorder to load it.
HKEY_CURRENT_USER\Software\Dorset Software\Recorder 6\Settings	Main folder for user specific settings. Note that if this key does not exist when Recorder is started, it will be recreated with default values.
HKEY_CURRENT_USER\Software\Dorset Software\Recorder 6\Forms	Used to remember the last used position of each form in Recorder, with a sub-key created for each form previously used. Note that if this folder does not exist when Recorder is started then forms will initially load in their default position.



SQL SERVER VS ACCESS

Comparing SQL Server with Access

Recorder 6 uses SQL Server 2000 to store data, in comparison to *Recorder 2002* which used Microsoft Access 97. There are some fundamental differences between these two products that led to the decision to use SQL Server:

Access	SQL Server
<p>Desktop database</p> <p>This means that the when a query is run against the database (e.g. find me all species beginning with 'myr') the application must connect directly to the file on the disk, bring all the required data back over the network, then process the query on the client machine. Often it may be necessary to bring back the entire contents of a table so network usage is heavy and the client machine needs to be powerful.</p>	<p>Client/Server database</p> <p>This means that the application connects to a process running on the server and submits the query to it. The process then connects to the data locally, obtains only the required data and returns this over the network to the client. The client does not need to process the query and the network bandwidth used is much less.</p>
<p>Generally lower performance</p> <p>Access generally performs well with small datasets and low numbers of users. When the amount of data and users grows the performance deteriorates significantly as all users are fighting to access the same file on disk at the same time.</p>	<p>Generally higher performance</p> <p>There are more opportunities for performance enhancements on SQL Server. The process that all users connect through is able to cache the results of commonly used queries in RAM, or it may keep a copy of an entire table in RAM if it is being used frequently. There are a high number of other performance optimisations built into SQL Server. SQL Server databases are regularly used to hold datasets with many millions of records; there are even SQL Server installations containing terabytes of data!</p> <p>However, it is worth noting that for a standalone system with a relatively small dataset, the performance of MSDE is likely to be slightly worse than the performance of Access 97 if the system is low on RAM.</p>
<p>Low Security</p> <p>Access is generally considered suitable for small datasets with non mission critical data in it. It is not designed for the same level of security as SQL Server.</p>	<p>High Security if required</p> <p>SQL Server is designed to be a highly secure solution suitable for commercial web servers.</p>
<p>Low Scaleability</p> <p>Access 97 is limited to 1GB of data.</p> <p>In addition, as more and more users connect to Access the performance decreases on a <i>pro rata</i> basis as they are all accessing the same disk file.</p>	<p>High Scaleability</p> <p>The MSDE installation supplied with <i>Recorder 6</i> is limited to 2GB of data and optimised for up to 5 concurrent operations (in practice it works well for at least 10 Recorder users).</p>



	<p>Users requiring more users or data storage have a simple upgrade path to a licensed installation of SQL Server. Using SQL Server means there are no limits on data size or numbers of users other than the power of the server. See the section on 'System Requirements' (page 12) for some guidelines as to a suitable specification of server required in various situations.</p> <p>It is even possible to distribute a single database across up to 128 SQL Server machines and share the work load across all the machines for extreme performance. This setup (called server federation) places SQL Server at the top of many performance charts for RDBMS.</p>
<p>Low reliability</p> <p>Due to all users accessing the same data file there is potential for file corruption.</p> <p>Access does not support on-line backups so 24 hr availability is not possible.</p>	<p>High reliability and availability</p> <p>The SQL Server process works in such a way that if an operation is not completed correctly, then it has no effect. The chances of database corruption are dramatically reduced.</p> <p>SQL Server databases are backed up whilst they are still in use so 24hr availability is possible.</p>
<p>Limited querying language</p> <p>Access supports a limited subset of the SQL standard, although there are some useful additional functions available. However, there is no ability to write branching code in SQL.</p>	<p>Powerful querying language</p> <p>SQL Server supports Transact SQL - an extension to the SQL standard that allows developers to write complex logic in the code that runs on the server. This allows advanced data operations to be coded on the server, improving performance by reducing the need to bring data back across the network to the client machine. Queries and code can be stored in stored procedures and user functions on the server for code re-use.</p>
<p>No support for Views</p> <p>Access does not support Views, which are queries that define a view of one or more tables that can then be treated as a table in its own right. For example, a View could be used to create a flat list of taxon occurrences including the date (from the Sample table), the location (from Location_Name) and the taxon name (from Index_Taxon_Name). This would then make reporting queries simpler.</p> <p>Access does allow the user to store queries in the database which act like Views. However, when using these queries Access is not able to use the underlying indices and the performance is often very poor.</p>	<p>Supports Views</p> <p>SQL Server has full support for Views.</p> <p>When using a View in another query, SQL Server is able to determine the indices that could be used from the underlying tables. The query optimiser is often able to use the View in a query with little or no loss of performance.</p>



BACKUP & RESTORE

There are two main reasons why regular backing up of SQL Server/MSDE databases is essential:

- 1) In the event of a critical failure (for example a hard disk failure) it allows the database to be restored so that only data entered since the backup is lost.
- 2) The transaction log created by SQL Server is emptied when the database is backed up. Without a backup operation it will continue to grow in size.

There are several things to be aware of concerning the backup and restoration of a database.

- A database must be backed up and restored by users with the appropriate permissions to the database server. For SQL Server users and network installations, these permissions are granted by the database administrator. Standalone users are automatically administrators of their own databases.
- An initial backup device is created during the installation process. The location of the backup device is in the temp folder of the user installing *Recorder 6* and is identified as NBNDData_Backup in the list of backup devices known to the server. The actual file name is NBNBackup.bak. *Recorder 6* allows users with system administrator access to view and change the location where this backup is placed.

Note that if the backup device cannot be found at the expected physical location, the menu options to perform either a backup or restore are unavailable. In this case, the database administrator should make sure an appropriate backup strategy is in place.

The default instance of MSDE the backup has a 'simple' recovery model – for more details on this please refer to Microsoft SQL Server's 'Books Online' or visit <http://www.microsoft.com/sql/default.mspx>

- There are no differences between standalone or network installation for backup and restore, it relates to the database engine itself.
- There must be enough disk/tape space to accommodate the backup.
- In addition to backing up the NBNDData database, it is recommended that regular backups are also made of the msdb and master databases. For more information please refer to Microsoft SQL Server's 'Books Online' or visit <http://www.microsoft.com/sql/default.mspx>.



CREATING A REPORTING DATABASE

There are two reasons to create a separate database for reporting in *Recorder 6*:

- To improve performance. If large and complex reports are being generated regularly this may have an adverse effect on the performance for other users performing data entry. By cloning the database onto a separate SQL Server the reports are run against another server without affecting the data entry system.
- To improve control over the data that is reported on. For example, it may be desirable for the staff generating reports to have access to only certain parts of the data or for the latest data not to be included in the reports.

There are several options for creating a reporting database.

1. Regularly backup the main database and restore it as the report database.

This is achieved by using either the built in *Recorder 6* menu options, or using Enterprise Manager for users with an SQL Server license. If you use Enterprise Manager, it is possible to create a schedule for the backup and restore operations. For example, you are able to set it so that they occur automatically each night.

One issue with this approach is that the login (which provides access to the database server) and the user (which provides access to the NBNDData database on the server) are usually linked by a unique ID. When you backup a database and restore it onto another server only the database user is backed up and restored, not the actual login. This means that the login and user information maintained on the reporting SQL Server get out of synch. Fortunately this can be fixed with the following SQL:

```
exec sp_change_users_login 'update_one', 'nbnuser', 'nbnuser'
```

2. Set up a replication process to keep the reporting database updated with the latest data added to the main database (available for a full SQL Server license).

Using replication in SQL Server is fully described in the SQL Server Book's online help files. We recommend that a database administrator with SQL Server experience is consulted prior to setting up replication.

3. Use log shipping to feed transaction logs from one database to another on a constant basis.

Continually backing up the transaction logs from a source database and then copying and restoring the logs to a destination database keeps the destination database synchronized with the source database. Using log shipping in SQL Server Enterprise Edition is fully described in the SQL Server Book's online help files. We recommend that a database administrator with SQL Server experience is consulted prior to setting up log shipping.

4. Export filters are used to copy data from one machine to another

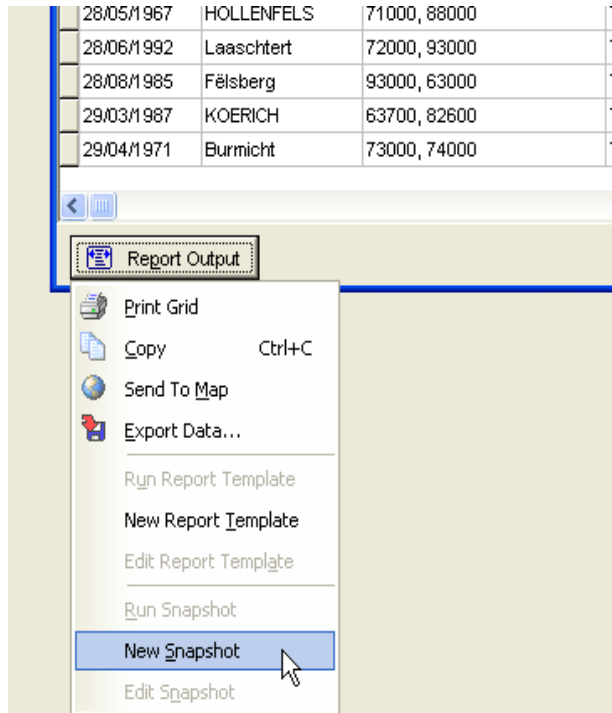
This creates an export filter, available through the “**Tools ► Export Management ► Manage Export Filters**”. This filter is run through the “**Tools ► Export Management ► Export Using Filter ► <filter name>**” menu option, where <filter name> is the name given to the export filter. At this point, the amount of data to export is reduced by specifying a cut off date. This is useful for subsequent exports, to ensure that only the newest data is exported, therefore avoiding redundancy. On the system to receive the data, simply import the data as usual, through “**Tools ► Import Data...**”

5. Snapshot Wizard

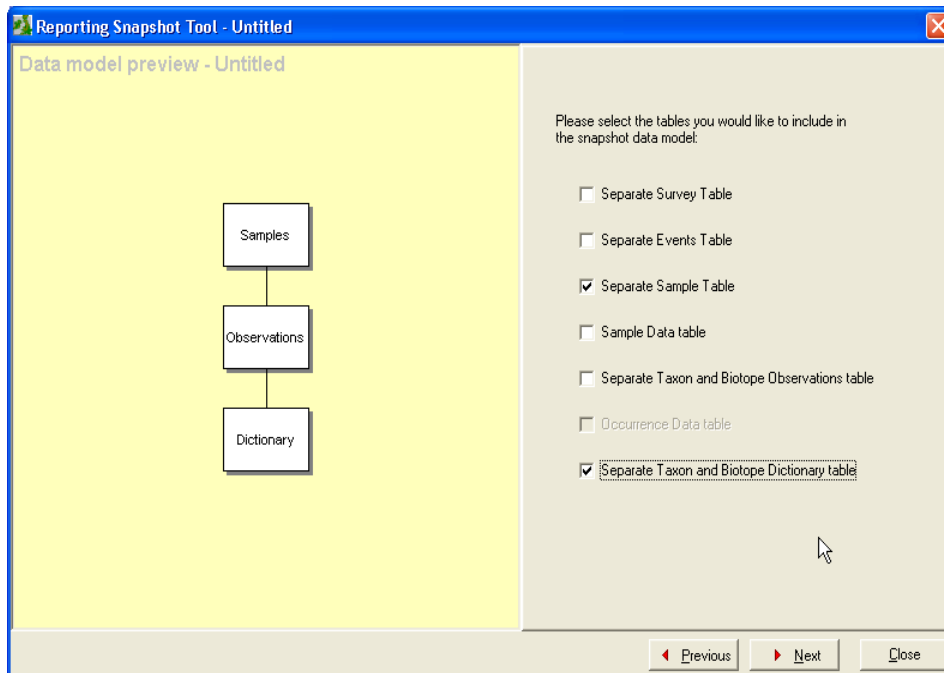
The difference between this approach and the previous approaches is that the Snapshot Wizard in *Recorder 6* is designed to provide a simpler version of the data model containing a subset of records that can be used for reporting using another package, such as Microsoft



Access or Crystal Reports. The Snapshot Wizard allows the user to configure whether the data is output into a new table in the existing database, or onto a different database, or even onto a different server. The output data is populated into either a single table in the database or into a very simple version of the data model with just a handful of tables in it. First, the Report Wizard is used to identify the records that are to be included in the snapshot. The Snapshot Wizard is available from the Report Output button on the bottom left of the Report Wizard results screen:



The following screenshot illustrates how the snapshot wizard can be adjusted by selecting from the list the tables you wish to include in the data model output:



For more information on the Snapshot wizard please refer to the “Standalone Installation Guide” or the in-system help provided with *Recorder 6*.



OPTIMISATION

Performance Optimisation

Performance optimisations of a SQL Server installation or MSDE instance are beyond the scope of this document and are to be considered only by experienced database administrators. However, there are simple measures that may help improve performance:

- Database shrinking reclaims free disk space held by the database being shrunk, releasing that much to the system to use for other purposes. It is also possible to reorganise the contents of the database file, providing better performance.
- Memory consumption for database server improves system responsiveness. Adding more memory in the machine also improves performance and allows the database server to use more memory for its own use.
- Too many active applications reduce the capacity of the whole system by forcing it to share processing time and resources between them. This reduces the amount of time spent actively processing requests. These applications include all those running as background processes, often shown as an icon in the system tray by the clock on the bottom-right corner of the screen.
- Regular disk defragmentation is recommended. A bigger hard disk, if space becomes a premium, is also advisable even if there is enough space for the data being stored. System defragmentation is quicker if there is more free disk space available.
- If the server has multiple hard disks, an optimisation option is to place the transaction log on the faster disk and on a separate disk to the main database. For updates, the log is accessed first and more often than the main database and could therefore create a bottleneck.

Shrinking the database

For SQL Server users with access to Enterprise Manager, shrinking the database is manually performed through the “**All Tasks ► Shrink Database...**” menu, available through the right-click popup menu of the relevant database.

For best results, the “*Move pages to beginning of file before shrinking*” option should be selected.

A scheduled automatic shrink is available as an option on this screen.

For MSDE users, the database auto shrinking option is on by default. This means that the database is set for automatic, periodic shrinking. You can manually trigger this operation, if users have access to an application allowing them to run SQL commands on the relevant server.

The Transact SQL command to run for this is:

```
DBCC SHRINKDATABASE (<DatabaseName>)
```

where <DatabaseName> is the name of the database to shrink.

Please note that this is not usually necessary for MSDE users. Access to the database is suspended while a shrinking operation is in progress and it may take a while to complete.

Memory usage on the server

SQL Server and MSDE are designed to take up as much available memory as possible when needed, leaving a minimum for the operating system to work with. It is not released as soon as it is no longer required. This is why it is ideal to have SQL Server/MSDE installed on their own server machine.



Realistically, this is not always possible, especially with MSDE. It is possible to force the database engine to only use a fixed maximum amount of memory, leaving the rest of the system unaffected, but you need SQL Server client tools to do this.

MSDE Users

MSDE users need an application that can connect to the appropriate database server, such as Query Analyser or MS Access. Using MS Access to run “pass-through” SQL statements allow direct action on the relevant database server. Please refer to MS Access help for more information.

The commands to manually reconfigure the memory usage of a SQL Server/MSDE database server are:

1. EXEC sp_configure @configname = 'max server memory', @configvalue = 256

This command tells the database engine to use only a maximum of 256 Mb of memory and no more.

2. EXEC sp_configure @configname = 'min server memory', @configvalue = 64

This command tells the database engine to keep 64 Mb of memory for itself.

3. RECONFIGURE

This command forces the new settings to take effect.

Please note that the minimum amount specified may not be reached. The database server keeps hold of this minimum amount only if it has been reached once. It is therefore possible that it never reaches this level in the first place.

Ensure there is sufficient disk space for additional virtual memory for the system. Adding extra memory on the machine allows higher limits to be set and contributes to better overall performance.

SQL Server Users

SQL Server users are able to use Enterprise Manager to undertake the same tasks by:

1. Selecting the properties of the relevant server and going to the Memory tab.
2. Then adjusting the memory requirements on this screen. However, if SQL Server is installed on a dedicated machine then this should not be necessary.



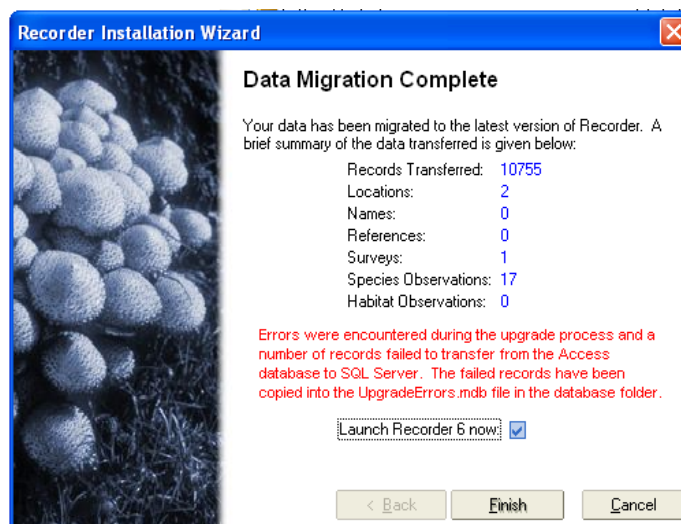
TRANSFERRING YOUR DATA FROM RECORDER 2002

To transfer your data from your copy of *Recorder 2002* to *Recorder 6* please;

1. Ensure that you have all of the necessary permissions etc. (see page 13)
2. Close all other programmes on your machine
3. You can either insert the installation CD or double click on the 'WorkstationSetup.exe' file within the Recorder 6 server folder to access the transfer wizard
4. Choose option 2 "Copy data from *Recorder 2002* to this copy of *Recorder 6*"
5. Read the important information on the screen and click <Next>
6. The next two screens displayed allow you to choose which elements you wish to transfer from your copy of *Recorder 2002*. The minimum for transfer is the database of records itself. In addition to this you can choose to transfer some or all of your supporting information such as rucksacks, recording cards, mapping files etc. by putting a tick in the appropriate boxes to the left of the screen.
7. Once you have selected all of the information you wish to transfer click on <transfer>

Note: The transfer process may take some time to run, depending on how much data you have to transfer.

8. Once the transfer is complete the following screen will appear (see below). This screen provides information about the records that have been transferred. If any errors have been found it is advisable to investigate them and correct the data before re-attempting the transfer. Your re-seller should be able to assist you with this if you are unsure about how to proceed.



9. Once you are happy with your installation of *Recorder 6*, uninstall *Recorder 2002* using option 3 on the *Recorder 6* installation CD.

The *Recorder 2002* Access database may be backed up as a zip file to another location, so that the original data is saved before everything is removed. Ensure all files and other data that need to be kept are moved to a different location, as the whole *Recorder 2002* folder is deleted.



Note: The transfer process copies an empty database from the CD before transferring data from *Recorder 2002*. This means you need to perform the transfer *before* entering data into *Recorder 6* and (if necessary) upgrade your copy of *Recorder 6* to the latest version *after* transferring data from *Recorder 2002*.



UNINSTALLATION

Recent Recorder 6 installations

The *Recorder 6* installer in version 6.7.2 and later comes with an uninstaller that will clear all the installed and user added files automatically, and will remove the registry settings. If you wish to retain any files that have been added or created within the *Recorder 6* installation folder, such as rucksacks, templates or recording cards, or any other user file, please take a copy of them before you proceed with uninstalling. Only the Database folder and the Objects folder are left behind, and these can be removed manually if required. Similarly, if you wish to remove the NBN database files, detach the database using SQL Server Enterprise Manager (or equivalent) and delete the NBNDData.mdf and NBNDData.ldf files from the appropriate folder.

The *Recorder 6* Uninstall is available through “**Control Panel ► Add/Remove Programs**”. It is listed as “*Recorder (remove only)*”.

After uninstalling all the workstations, the file server installation is removed by running the Uninstall.exe program in the Recorder 6 Server folder. Note that this does not remove the database or the MSDE instance if this was installed; the MSDE instance can be removed using “**Control Panel ► Add/Remove Programs**” and selecting the appropriate Microsoft SQL Server instance to remove.

Recorder 6 installations prior to 6.7.2

To uninstall *Recorder 6* installations for versions installed at 6.6.8 or earlier:

1. Locate the install folder for *Recorder 6*, usually Program Files*Recorder 6*.
2. Unregister all installed addins by running the following from “**Start menu ► Run...**” (⌘ + R) for each OCX and DLL file present in the Addins folder, located under the main *Recorder 6* install folder:

```
regsvr32 /u <folder name>\<addin name>
```

where <folder name> is the full path to the location of the Addins folder below the main *Recorder 6* installation folder, and <addin name> is the name of an OCX or DLL file. Dismiss all messages as and when they appear.

Please note that there is no adverse effect in not performing this step. This is intended to clean up the registry properly to remove redundant information that would only clog up the system.

3. Before deleting the *Recorder 6* main folder, ensure any data that needs to be kept is moved to another location.
4. Delete the main *Recorder 6* folder.

From “**Start menu ► Run...**” run **RegEdit**.

Locate and delete the key `HKEY_CURRENT_USER\Software\Dorset Software\Recorder 6`

Locate and delete the key `HKEY_LOCAL_MACHINE\Software\Dorset Software\Recorder 6`

Recorder 2002 installations - use Recorder 6 CD.

Recorder 6 now comes with everything required to remove an existing *Recorder 2002* installation. To uninstall *Recorder 2002*:

1. Insert the *Recorder 6* installation CD and run the Setup program.
2. Select the “**Remove Recorder 2002 from your machine**” option from the menu.



3. Follow the on-screen instructions.

The *Recorder 2002* Access database may be backed up as a zip file to another location, so that the original data is saved before everything is removed. Ensure all files and other data that needs to be kept are moved to a different location, as the whole *Recorder 2002* folder is deleted.



IMPORT WIZARD INFORMATION

This section provides background information on the process involved during use of the Import Wizard.

All imports handled through the Import Wizard involve the following stages:

- 1) Utilising the import file to create a temporary Access database on the local disk which contains the records ready for import. The structure of the access database is a clone of the main database, but with many of the constraints missing and only the required tables are present.
- 2) Parsing the temporary Access database using the validation addin (StdValLib.dll). This applies standard validation rules to the imported data and returns a list of invalid records to Recorder.
- 3) Comparing the temporary Access database with the main database to identify which records are duplicated and which are new.
- 4) Asking the user to identify which of the duplicated records to import and which to ignore.
- 5) Copying the records from the temporary Access database into the main database, overwriting existing records where the user has identified that the imported record takes priority during step 4.

For NBN XML import files, the XML file is parsed and converted into records to produce the temporary Access database. The record conversion process is automated by code that compares the structure of the XML document with the structure of the database schema and dynamically maps the two together. Cases where the XML element or attribute do not match with the database scheme attribute names are described in the Special_XML_Element table.

For Zipped Access import files, the file contained in the zip file is already in the same format as the temporary Access database so the process unzips the file and proceeds straight to step 2 above.

For other file formats the process described in step 1 is somewhat more involved. Firstly there are a wide variety of file formats supported and secondly the format of the files is not pre-determined by Recorder. The Import Wizard was designed to allow enhancement of its facilities through updates to the tables which drive it (the IW_... tables). The principle steps in the Import Wizard process are described below:

- 1) First, allow the user to define any special rules to do with limiting the records imported, or defining the format of dates etc in the import file.
- 2) Secondly, Recorder uses a third party tool called SMIImport to convert the import file, in whatever format, into a unified format dataset that can be understood by the remainder of the Import Wizard code.
- 3) The Import Wizard asks the user to match columns in the import dataset to the list of supported columns for the Import Wizard. The list of supported columns in the Import Wizard are detailed in the IW_Column_Type table. There are some predefined 'match patterns' for each column type in IW_Column_Type_Pattern, for example columns that start 'loc' or 'site' match to the Location column type by default. The table IW_Column_Type_Relationship describes column types that interact with one another, for example if you specify a Location column you must also specify a Grid Reference column. These validation rules are used to determine when the user is able to proceed from the column matching page. In addition, when a column is matched to the column type, the IW_Column_Type table identifies an internal class that is used to parse the import data for errors. There are a number of generic classes available that are re-used for several column types, as well as a number of specialist classes written specifically. For example, the TRequiredTextParser class simply ensures that every cell contains a value, TSpatialRefParser ensures that each import cell can be validated as a spatial reference.



- 4) The Import Wizard then transfers the content of the import dataset into some temporary SQL Server tables and parses out any multiple fields (e.g. lists of observers in a single field).
- 5) The Import Wizard identifies essential data fields that are not present in the import file and asks the user to specify them, such as the Survey name, default record type to use. These values are applied to every single record created by the import process.
- 6) The Import Wizard identifies 'Match Rules' for the columns included in the import file using IW_Column_Type_Match_Rule and IW_Match_Rule. For each match rule, a page is displayed asking the user to link each of the distinct pieces of information in the column with a linked database record. The user is able to click the Create New Record button in which case the Import Wizard creates the data record required in the main database immediately (this is the only part of the main database affected by the Import Wizard before the actual import is performed).

The IW_Match_Rule table defines several stored procedures which are used during matching, including the stored procedure used when Create New Record is clicked and the stored procedure used when scanning for matches. When the user specifies a match manually, this match is stored in a table called IW_Matched_nnn where nnn indicates the type of data being matched. In future, the stored procedure used to scan for potential matches will also scan the IW_Matched_nnn table to find user specified matches (which are highlighted in light green).

- 7) Finally, the Import Wizard uses the information obtained so far to generate a set of tables in an Access database in the same format as the main database, ready for import using the same methods as the previously discussed import formats. The rules used to determine how records are created are stored in the IW_Table_Rule, IW_Output_Field and IW_Table_Rule_Output_Field tables. The temporary tables are placed in an Access database file called tmpnn.mdb in the NBN Import folder within the Windows Temp folder. The file extension is changed to .tmp, but if renamed to *.mdb then it can be opened in Microsoft Access after the Import Wizard is closed.



MAP INFORMATION

This section provides background information regarding the mapping system used in Recorder which may be useful in providing support.

The mapping tool used within Recorder 6 is a third party component library called MapServer 5 Turbo, available from Graticule (<http://www.graticule.com>). This component is used as the majority of alternative components require a license fee for each client installation, whereas MapServer 5 Turbo incurs a single fee for the developers only.

The setup of maps in Recorder is dependent on the following folders and database tables:

- Base Maps folder (identified by registry value HKEY_CURRENT_USER\Software\Dorset Software\Recorder 6\Settings\Base Map Path). This contains files to describe each base map.
- Map Files folder (identified by registry value HKEY_CURRENT_USER\Software\Dorset Software\Recorder 6\Settings\Map File Path). This contains GIS system files specific to the user and should be stored locally on the machine's hard disk.
- Object Sheet folder (identified by registry value HKEY_CURRENT_USER\Software\Dorset Software\Recorder 6\Settings\Object Sheet File Path). This contains GIS system files shared by all users and should be stored on the file server in a network installation.
- Base_Map table. This lists each base map that has been setup by a user for use in Recorder. Note there may be any number of base maps set up for each set of base map files, for example 2 versions of a Great Britain outline base map.
- Computer_Map table. This lists each computer that has been used to initialise each base map.
- Map_Sheet table. This lists all base map, background and polygon layers than are drawn onto each map.

Base Maps

Base maps are represented in the system by a single vector layer stored in MapServer's internal file format, plus an .ini file which describes to Recorder how this layer is used. The vector layer consists of 4 files, suffixed *.gsf, *.gdb, *.mdx & *.gix. The ini file plus all these layer files must be placed in the Base Maps folder in the Recorder installation to work, and the file name (up to the prefix) must be the same. For examples see the installed Base Maps folder.

The ini file format is simple and provides a description for the base map layer and a link to the appropriate spatial reference system so that Recorder is able to translate map coordinates to latitude and longitude.

Initialised Maps

When a new base map is set up by the first user, several things happen:

- 1) Information about the base map is added to a new record in the Base_Map table. This record is sufficient to identify the existence of the base map to other users who may wish to 'join' and use the same base map.
- 2) The first user's MapServer instance initialises the base map by creating a file called <Base_Map_Key>.gds in the user's Map Files folder. This file is known as a dataset file and contains links to each map layer file, including the selected base map layer file which is accessed within the Base Maps folder.
- 3) A default polygon layer is added to the map. Addition of a polygon layer is described below.



- 4) A record is added to Computer_Map. This links a given workstation to the base map instance because on a multi-workstation network a base map may be in use by only some of the workstations.
- 5) A record is created in the Map_Sheet for each of the base map layer and the polygon layer. This describes to Recorder a complete list of the layers that are drawn on the map.

If a subsequent user selects an existing base map and resets it, then Recorder creates the dataset file <Base_Map_Key>.gds in their Map Files folder and creates a record in Computer_Map linking that workstation to the base map.

Adding Polygon Layers

When a new polygon layer is added by a user, the following actions occur:

- 1) A record is added to Map_Sheet to track the polygon layer.
- 2) A new polygon layer is created in MapServer by copying the SheetSource.* files from the Base Maps folder into the Object Sheet folder, renaming them then attaching them to the MapServer dataset. This method is used rather than asking MapServer to create the layer files itself because of a bug in MapServer resulting in occasional invalid layer files being created.

Note because the Map_Sheet table is shared between users, as is the Object Sheet folder, polygon layers are shared between users. In fact, when 2 users have the same base map open and one draws a new polygon, Recorder periodically checks for new polygons on the other client machine and they will automatically appear soon after they are drawn.

Adding Background Tiles

When adding a new background tile, the following actions occur:

- 1) A record is added to Map_Sheet to track the background tile. This record has the Computer_ID field set to the name of the workstation because background tiles are set up on a per machine basis. They are stored locally rather than on the network because of the performance issues caused by accessing large amounts of digitised tiles over a network. When retrieving the list of layers in a map from the Map_Sheet table, Recorder filters to include only records where the Computer_ID is null or matches the current machine, so other user's background tiles are ignored.
- 2) The graphic file is imported into the MapServer dataset file (the .gds file - MapServer's main file that contains information about the sheets and objects that are currently linked to each user's map) and attached to the map. This results in a new file being created in the Map Files folder, with the same filename as the source file but a *.gsf extension. This file contains the digital data.

Resetting Maps

When a user resets a map, there are two types of reset possible. The first type simply recreates the user's <Base_Map_Key>.gds file in their Map Files folder and re-links it to any existing polygon and background layers. The second "All" option also deletes all the background and polygon layers. As this approach affects all users of the base map, Reset_Index fields are maintained in the Base_Map and Computer_Map tables.

When a user resets using the "All" option, the Base_Map.Reset_Index field is incremented. In addition, their own Computer_Map record is incremented.

When another user reloads this base map, Recorder checks and finds that their Computer_Map.Reset_Index is now 1 less than the Base_Map.Reset_Index. This causes Recorder to prompt the user to reset their map and rebuild their <Base_Map_Key>.gds table.



SQL SERVER FUNCTIONS

The database supplied with *Recorder 6* has a number of functions embedded in it that perform various common tasks, for example to assist the internal reporting systems. They are available for use within any SQL query submitted to the database and are described below:

Function: FormatDatePart	
Description:	Function to return either a year or month number given a vague date start, end and type. Note that this function does not work for Unknown vague dates.
Parameters:	@VagueDateStart - Vague date start @VagueDateEnd - Vague date end @VagueDateType - Vague date type @ISMonth - Return month (value=1) or year (value=0)
Example:	<pre>SELECT TOP 100 Vague_Date_Start, Vague_Date_End, Vague_Date_Type, dbo.FormatDatePart(Vague_Date_Start, Vague_Date_End, Vague_Date_Type, 0) AS Year, dbo.FormatDatePart(Vague_Date_Start, Vague_Date_End, Vague_Date_Type, 1) AS Month FROM Sample WHERE Vague_Date_Type <> 'U'</pre>

Function: FormatEventRecorders	
Description:	Returns a list of the sample recorders for a given sample, separated by semi-colons.
Parameters:	@SampleKey - identifies the sample to obtain the recorders for.
Example:	SELECT TOP 10 dbo.FormatEventRecorders(Sample_Key) FROM Sample



Function: FormatGridRef

Description:	Returns an OSGB or OSNI spatial reference formatted to 10k or 1k precision.
Parameters:	@GridRef - grid reference @GridSys - either 'OSNI' or 'OSGB' @IS1km - specify 1 for a 1km accuracy, 0 for 10km accuracy.
Example:	SELECT TOP 100 dbo.FormatGridRef(Spatial_Ref, Spatial_Ref_System, 0) FROM Sample WHERE Spatial_Ref_System LIKE 'OS%'

Function: FormatIndividual

Description:	Takes the title, initials, forename and surname of an individual and formats them to an appropriate display string. Any parameters that are not known must be passed as null.
Parameters:	@Title @Initials @Forename @Surname
Example:	SELECT dbo.FormatIndividual('Mrs', null, null, 'Smith')

Function: FormatTaxonStatusKind

Description:	Returns a semi-colon separated list of the checklists that a taxon is found on.
Parameters:	@TaxonListItemKey - identifies the taxon to obtain checklists for.
Example:	SELECT TOP 10 dbo.FormatTaxonStatusKind(Taxon_List_Item_Key) FROM taxon_list_item

Function: IncrementKey

Description:	Increments an 8 character NBN Key to the next appropriate value.
Parameters:	@OldKey
Example:	SELECT dbo.IncrementKey('AAABCDEZ') returns 'AAABCF0'.



Function: ufn_FormatEventOwners

Description:	Returns a list of survey event owners as a semi-colon separated string.
Parameters:	@Key - the key of the survey event to list owners for.
Example:	SELECT TOP 10 dbo.ufn_FormatEventOwners(Survey_Event_Key) FROM Survey_Event WHERE dbo.ufn_FormatEventOwners(Survey_Event_Key)<>"

Function: ufn_GetFormattedBiotopeName

Description:	Retrieves a biotope name as a string suitable for display, including the code and term.
Parameters:	@ListItemKey - Biotope_List_Item_Key identifying the biotope.
Example:	SELECT dbo.ufn_GetFormattedBiotopeName('NBNSYS0000008570')

Function: ufn_GetFormattedName

Description:	Formats an organisation or individual to a string that is suitable for display.
Parameters:	@NameKey - can be either an individual or organisation's NAME_KEY.
Example:	SELECT dbo.ufn_GetFormattedName('NBNSYS0000000003')

Function: ufn_GetFormattedReferenceName

Description:	Returns a reference as a display string.
Parameters:	@SourceKey
Example:	SELECT TOP 100 dbo.ufn_GetFormattedReferenceName(Source_Key) FROM Reference

Function: ufn_GetFormattedSpeciesName

Description:	Returns a species name as a display string. Note that the display string contains HTML <i> and </i> tags to denote italic text. For example ' <i>Boletus badius</i> Fr.' is returned as '<i>Boletus badius</i> Fr.'
Parameters:	@ListItemKey - specify a valid Taxon_List_Item_Key.
Example:	SELECT TOP 100 dbo.ufn_GetFormattedSpeciesName(Taxon_List_Item_Key) FROM Taxon_List_Item



Function: ufn_RtfToPlaintext	
Description:	Converts text in rich text format (RTF) to plaintext, removing the formatting characters.
Parameters:	@rtf
Example:	<pre>SELECT TOP 100 dbo.ufn_RtfToPlaintext(title), title FROM Reference WHERE Title LIKE '{\%'</pre>

