

Microsoft SQL Technical Guide

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Chapter 1: Introducing MS SQL

This chapter contains:

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Providing Feedback on Documentation

We always welcome comments and feedback on the quality of our documentation including on-line help files and handbooks.

If you have any comments, feedback or suggestions regarding any aspect of our documentation, please email:

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Please ensure that you include the aspect of documentation on which you are commenting.

Introduction

The full range of Schools Information Management Software (SIMS) produced by Capita is being updated so that all data is stored in an SQL database. The move to SQL will ensure that the data is secure at all times and is resilient to damage caused by a system crash.

This guide endeavours to answer some of the questions which you may find yourself asking as you migrate to the new MS SQL system found on CD 3.20. A Glossary of Terms is provided at the end of this handbook with explanations of terms that may be unfamiliar.

What is SQL?

SQL is a Structured Query Language for requesting information from a database. It has been in use since 1974 and there are several variants. An *ANSI standard* was defined and then most companies producing SQL have added extra functionality to make their product better than the rest. SQL code can be used to add records, query a database, build a new table, build an index, create a backup and even create a new database.

This means that code written using the Standard SQL can be used with any SQL Data Source. However, in practice most code is written to exploit the advantages of a specific SQL Data Source, which means some re-coding is needed before an alternative Data Source can be used.

The code can be held within a conventional executable file (EXE), a shared block of code (DLL), or can be embedded within the database itself as a stored procedure.

A programming language is needed to build an application that uses underlying SQL code to control a database. For example, Attendance 6.00 is written in Delphi 5.

Microsoft SQL Server 2000 (MS SQL 2000) has several utilities available to directly interrogate a SQL Database, but these **must** be handled with the utmost care and an appropriate System Administrator User ID and Password, must be entered.

Why Have Capita ES Chosen MS SQL Licensed Editions or Desktop Engine?

Microsoft SQL Server 2000 Licensed Edition (MS SQL 2000)

Microsoft have made great improvements in terms of database performance and self-tuning capabilities. Combined with Microsoft's market position and provision of underlying operating systems and network solutions, this makes MS SQL 2000 best placed to hold the SIMS database.

Microsoft Data Engine 8 (SQL Server 2000 Desktop Engine)

The Microsoft Data Engine (SQL Server 2000 Desktop Engine) is a royalty free, but limited version of Microsoft SQL Server. It can be installed with no additional software licence as long as one machine on a network is running Windows NT4 or Windows 2000. The database size is limited to 2Gb and only one CPU in the host machine. SQL Server 2000 Desktop Engine should perform well for most sites and it's restricted nature has been minimised by the way the SIMS system has been designed.

Schools that make extensive use of SIMS on many machines should consider upgrading to the licensed edition of MS SQL Server 2000 if they find that the performance of SQL Server 2000 Desktop Engine is insufficient for their needs.

If MS SQL 2000 is already installed, the SIMS installation routines will configure it to handle the SIMS database. If a site wishes to move to MS SQL 2000, it can be installed over the top of SQL Server 2000 Desktop Engine and should need no reconfiguration of the system.

Versions of SQL

Name	Max File Size	Connections **	Suitable OS	CPUs	Tools
Desktop Engine	2Gb	5	Windows 2000 / NT4 Server or NT4 Workstation or 2000 / XP Pro.	1-2	No
Licensed Edition	No limit	Only limited by Licence	Windows 2000 or NT4 Server	1-4	Yes

** Concurrent connections to the database.

Licensing

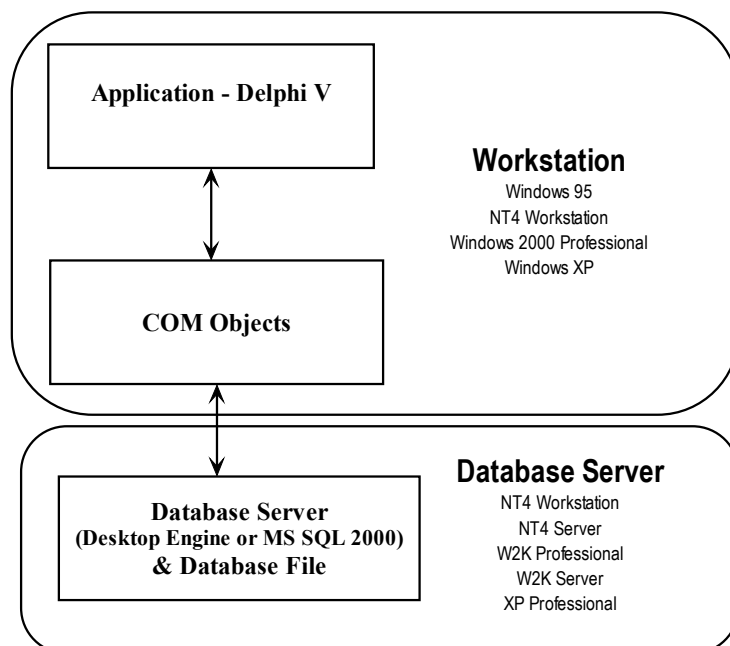
SQL Server 2000 Desktop Engine does not require a license and the workstations do not require *Client Access Licences (CALs)*.

All other versions of MS SQL 2000 require appropriate licences. MS SQL can be purchased with a bundled number of CALs. Please contact your software vendor for details – Capita Education Services do not sell MS SQL.

Three Tier Architecture

SQL Server 2000 Desktop Engine should be suitable for the vast majority of SIMS users due to the Three Tier approach. The Three Tier approach is where the client, the front end application, handles interaction with the user, while the business processing of the application is handled by a special application server in what is called the middle tier. The application server then communicates with the database.

As applied to SIMS, the Client will be the Attendance 6.nn/Profiles 6.nn executable file that will run on a SIMS workstation, the Middle Tier runs on the same workstation. The Database will reside on a machine that can be the same as the file server or a machine dedicated to the task.



Chapter 2: Installations

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Introduction

The following installation information applies to both Network and Standalone installations. For standalone installations, the single machine will also act as the database server.

PLEASE NOTE: This section provides an overview of the installation process. Additional information can be found in the Guide to Installing Infrastructure CD 2.00 (ISTRUCTG.PDF) and the Guide to SIMS CD 3.20 (CDROMG.PDF). It is STRONGLY recommended that these guides are read before proceeding with either installation.

Pre-Requisites

On All Machines

- Regional Settings must be set to **English (United Kingdom)** in Control Panel.
- From the same page, the **Set as system default locale** check box must be selected (for Windows NT4) or the **Set default** button clicked and **English (United Kingdom)** selected (for Windows 2000).
- The **Short date format** must be set to **dd/MM/yyyy**.
- The CP 2.45 version of Workstation setup (N:\SIMS\WSSETUP\WSSETUP.EXE) must have been run on all machines that will be using CP 3.20.

On the Database Server Only

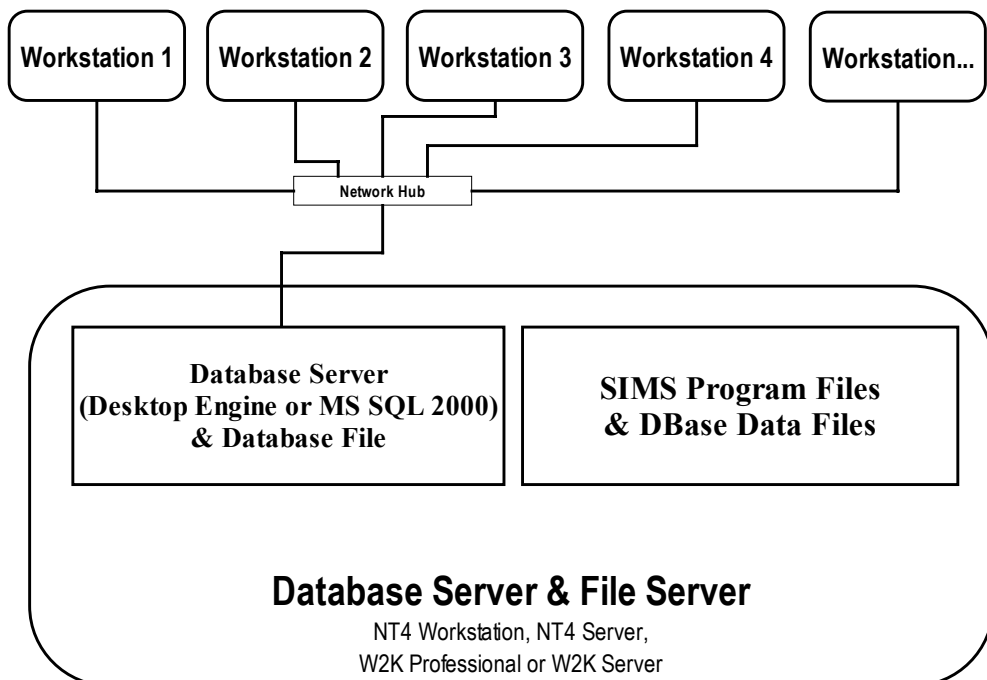
- Microsoft Internet Explorer 5.xx must be installed.
- A printer must be set up in Windows although it is not necessary to have an actual printer attached or accessible over the network.

- The screen resolution must be set to a minimum of **800 x 600**.
- You should have a minimum of 1Gb free disk space.
- If you are using the “subst” method for referring to your SIMS folder on the database server, you will need to change this to the Windows mapping method.
- If any Windows NT4 machine is being added to a Novell network, it will require a Novell client so that files can be copied to the SIMS folder during CD 3.20 installation.
- The Database Server machine must have CP 2.45. This is because a file called SIMS.INI must exist in the Windows folder and contain a section called **Setup**. This section in turn contains a keyword of **SIMSDirectory** which holds a value such as **N:\SIMS** (where N: denotes the network drive where SIMS is installed). The same file may contain, in the same section, a keyword of **Folder**. The CD 3.20 installation uses the value of SIMSDirectory to check the value of **CP-
_VERSION** in **N:\SIMS\SYSTEM\PLATFORM.MEM** to ensure the currently installed CP 2.4n is a compatible version.

Considerations

One Server - Combined File & Database Server

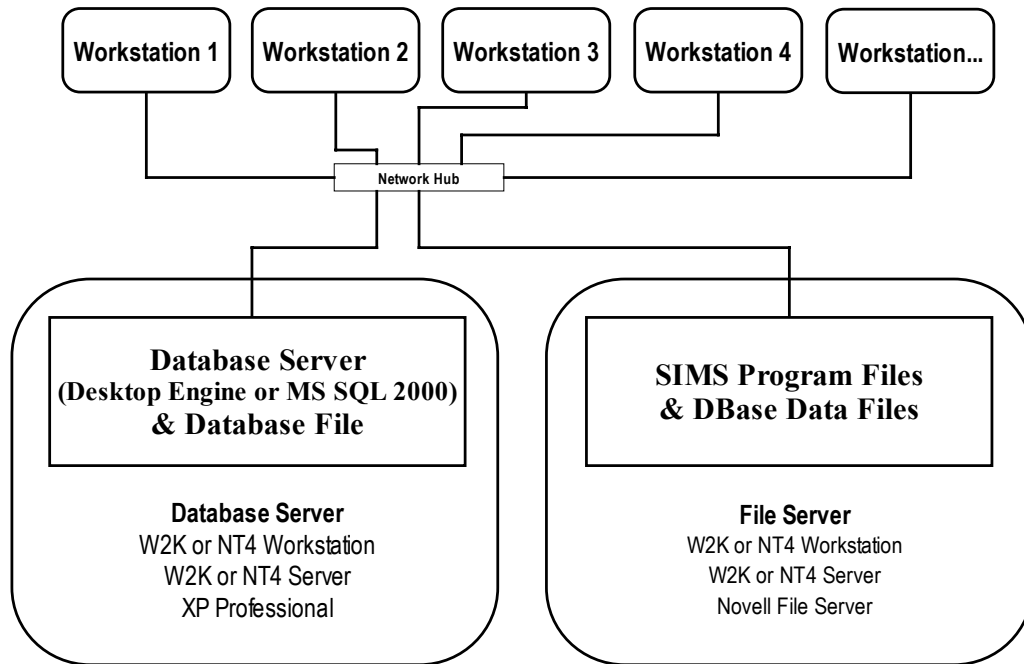
The database resides on the same machine acting as a file server. It is only possible to have a combined file database server where Windows NT4 or Windows 2000 is being used as the file server.



Either the MS SQL 2000 database server or SQL Server 2000 Desktop Engine can be installed on the current file server if it is of a good specification and is not currently running slowly. The absolute minimum specification is a P266 with 256 MB of RAM.

Two Servers - File Server & Database Server

For the database server, Windows NT4, Windows 2000 or Windows XP must be used, but the file server can be Novell or Windows based.



TCP/IP **must** be an available protocol between the Client machines and the database server.

Installation

Installing and setting up SIMS Common Platform 3.20 consists of the following steps:

*NOTE: Additional information can be found in the Guide to Installing Infrastructure CD 2.00 and the Guide to SIMS CD 3.20. It is **STRONGLY** recommended that these guides are read before proceeding with either installation. Both guides are available by clicking the **Read me...** button on the respective installation CD-ROM menus.*

On the Database Server

1. Install the Infrastructure CD 2.00.
2. Give yourself the necessary access rights to the new modules in System Manager (DOS).

3. Run the Data Checking Utility and correct any faulty data.
4. Install SIMS Common Platform 3.20 from the SIMS CD Spring 2002.
5. Run SIMS Core Integrator to copy data from dBase to SQL
6. Run System Manager 6.10 to add users, etc.
7. Run the Attendance Data Conversion Utility (if you will be using Attendance 6.00).

At Each SIMS Workstation

Microsoft Internet Explorer 5.xx must be installed.

Run SIMS Launcher and, when prompted, run the CP 3.20 Workstation Setup.

NOTE: You will need to be logged on with Local Administrator rights to the machine on which you wish to install Workstation Setup for it to proceed correctly.

Follow the on-screen instructions. You may be prompted to re-boot your machine.

NOTE: It is not necessary to run the Workstation setup on a standalone machine because installing the Database components carries out an equivalent task automatically.

Chapter 3: Backing Up and Restoring

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Backing Up Data

There are various methods of backup available, but it is important to note, that once any type of backup file has been created, it **MUST** then be backed up in the conventional way, to tape for example.

Important Notes:

- Once a SIMS module has accessed the SIMS database, it remains open and cannot be backed up or restored. Therefore, no one should be logged into the system while any backup or restore operation is taking place.
- Backup files generated using any of the following methods can consume large amounts of disk space. It is **STRONGLY** recommended that unwanted backup files are regularly deleted from the \PROGRAM FILES\MICROSOFT SQL SERVER\MSSQL\$SIMS\BACKUP folder. Please note that the MSSQL\$SIMS folder may be named differently dependent on the named instance chosen when MS SQL 2000 was installed. If for example, you entered a name of ABBEY during installation, the folder would be called MSSQL\$ABBEY. You may have elected to accept the default instance during installation – in which case, the folder will be named MSSQL.

Backup File Naming Convention

All backup methods generate a single backup file with a .BAK file extension. The files are named to provide information about the content of the backup. The file name consists of the following sections which are all separated with an underscore:

Database name

Currently, this will either be SIMS or SYSTEM representing which database has been copied.

Platform Number

cpNNN, e.g. CP320

Originating module

This section of the file name represents the module used to create a backup file or the type of backup created. The following are currently available:

INC	Core Integrator
MNW	System Manager
PRE	Created before a Common Platform installation
POST	Created after a Common Platform installation

Date

YYYYMMDD

Time

HHMMSS

Examples:

A backup of the SIMS database created by Core Integrator would be called:

SIMS_CP320_INC_20010503_120502.BAK.

A backup of the MS SQL System databases taken before the installation of CD3.20 would be called:

SYSTEM_CP320_PRE_20010506_110533.BAK.

Automatic SIMS Database Backup Using Core Integrator

An automatic backup of the SIMS database is carried out each time Core Integrator is run. The backup file is created BEFORE any data is copied into SQL.

If Core Integrator is run at a similar frequency to required backups (once a day for example), then these automatic backups should be sufficient.

A backup file created by Core Integrator would appear similar to the following:

SIMS_CP320_INC_20010503_120502.BAK.

Ad-hoc SIMS Database Backups Using System Manager

System Manager contains a backup routine which will backup the SIMS database. This method generates exactly the same file format as that automatically generated when Core Integrator is run and can therefore be used to supplement the Core Integrator backups if required.

A backup file created by System Manager would appear similar to the following:

SIMS_CP320_MNW_20010503_120502.BAK.

Ad-hoc SIMS Database Backups Using Command Line Tools

A set of two batch files have been provided on CD 3.20 to enable you to perform ad-hoc backups/restores using command line tools. The following two files need to be copied into your \PROGRAM FILES\MICROSOFT SQL SERVER\MSSQL\$SIMS\BINN folder:

NOTE: The MSSQL\$SIMS folder may be named differently. Please see the Important Notes on page 9.

- BackupSQLDb.bat
- RestoreSQLDb.bat

NOTE: The batch files are provided as a foundation for anything LEAs/schools want to do with them. They are provided "as is". This means that support will not be provided for custom modifications made without SIMS direction.

To perform a backup using a command line tool:

From a Dos prompt, type:

```
BackupSQLDb {DatabaseName} [{MediaName}]
```

NOTE: MediaName is optional and is simply used to add a description to the backup if required.

Example:

```
BackupSQLDb sims "Any name/description you want"
```

```
BackupSQLDb sims
```

Automatic SIMS Database Backups Before and After CD3.20 Installation

There are potentially two SIMS database backups that can be generated during the CD3.20 installation. These files are generated to allow you to return to the SIMS database that existed before and/or after the CD3.20 installation. It is unlikely that these files will be required unless there was a serious problem with the installation.

Pre-installation SIMS Database Backup File

This backup file is ONLY generated if the SIMS database exists prior to the installation of CD3.20.

A pre-installation SIMS database backup would appear similar to the following:

```
SIMS_CP320_PRE_20010301_123032.BAK
```

Post-installation SIMS Database Backup File

This backup file is automatically created after the CD3.20 installation is complete and would appear similar to the following:

```
SIMS_CP320_POST_20010301_123032.BAK
```

Restoring Data

Important Notes:

- Once a SIMS module has accessed the SIMS database, it remains open and cannot be backed up or restored. Therefore, no one should be logged into the system while any backup or restore operation is taking place.

- Backup files generated using any of the following methods can consume large amounts of disk space. It is **STRONGLY** recommended that unwanted backup files are regularly deleted from the \PROGRAM FILES\MICROSOFT SQL SERVER\MSSQL\$SIMS\BACKUP folder. Please note that the MSSQL\$SIMS folder may be named differently dependent on the named instance chosen when MS SQL 2000 was installed. If for example, you entered a name of ABBEY during installation, the folder would be called MSSQL\$ABBEY. You may have elected to accept the default instance during installation – in which case, the folder will be named MSSQL.

There are various ways of restoring data which depend on the reason a restoration is required. Before using any of these methods, you need to ensure the required backup files have been restored from tape (or other backup media) to the \PROGRAM FILES\MICROSOFT SQL SERVER\MSSQL\$SIMS\BACKUP folder.

Restoring the SIMS Database Using System Manager

System Manager contains a routine to restore from backup files (.BAK) and this method can obviously only be used if System Manager is working.

The file will firstly need to be restored from tape (or other backup media), in the conventional way to the \PROGRAM FILES\MICROSOFT SQL SERVER\MSSQL\$SIMS\BACKUP folder.

NOTE: The MSSQL\$SIMS folder may be named differently. Please see the Important Notes on the previous page.

Please see the System Manager documentation for information on how to restore.



More information:

Choosing Which Backup File to Restore on page 13

Restoring the SIMS Database Using Command Line Tools

A set of two batch files have been provided on CD 3.20 to enable you to perform ad-hoc backups/restores using command line tools. The following two files need to be copied into your \PROGRAM FILES\MICROSOFT SQL SERVER\MSSQL\$SIMS\BINN folder:

- BackupSQLDb.bat
- RestoreSQLDb.bat

NOTE: The batch files are provided as a foundation for anything LEAs/schools want to do with them. They are provided "as is". This means that support will not be provided for custom modifications made without SIMS direction.

This method should be used if you are unable to restore the SIMS database using System Manager.

To perform a restore using a command line tool:

From a Dos prompt, type:

```
RestoreSQLDb {DatabaseName} {BackupFileName}
```

Example:

```
RestoreSQLDb sims sims_cp320_inc_20011231_123456.bak
```

Restoring the MS SQL System Using the Command Line SQL Utility (OSQL)

This is likely to be after a major hard disk failure or hard disk corruption.

1. Uninstall SQL Server 2000 Desktop Engine/MS SQL 2000 and delete SIMS.MDF & SIMS.LDF.
2. Re-install SQL Server 2000 Desktop Engine/MS SQL 2000 and Service Pack 1 from the Infrastructure CD 2.00.
3. Restore the latest System databases backup file using a command line tool as follows:

- From a Dos prompt, type:

```
RestoreSQLDb {DatabaseName} {BackupFileName}
```

There are two databases within 'System' that need to be restored. They are Master and MSDB and must be restored separately from the same backup file.

Example:

```
RestoreSQLDb master system_cp320_post_20011130_231256.bak
```

```
RestoreSQLDb msdb system_cp320_post_20011130_231256.bak
```

- If you are unable to determine whether the current SIMS database is usable, restore the latest SIMS database using a command line utility as follows:

From a Dos prompt, type:

```
RestoreSQLDb {DatabaseName} {BackupFileName}
```

Example:

```
RestoreSQLDb sims sims_cp320_inc_20011231_123456.bak
```

Choosing Which Backup File to Restore

In virtually all cases, the required backup file can be determined by viewing the list of backup files stored in the \PROGRAM FILES\MICROSOFT SQL SERVER\MSSQL\$SIMS\ BACKUP folder in Windows Explorer. The list should be sorted by the **Modified** column and the latest dated/timed selected.

NOTE: The MSSQL\$SIMS folder may be named differently. Please see the Important Notes on page 9.

If you are restoring your SIMS database, this should be the latest file beginning SIMS_. If you are restoring your System database (MSSQL), this will be the latest file beginning SYSTEM_.

Chapter 4: Additional Information

This chapter contains:

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References

Definitions of Terms - Webopedia

<http://webopedia.internet.com/>

Microsoft Licensing

<http://www.microsoft.com/finland/products/sql/licensing/per.htm>

MS SQL7 – Microsoft Documentation

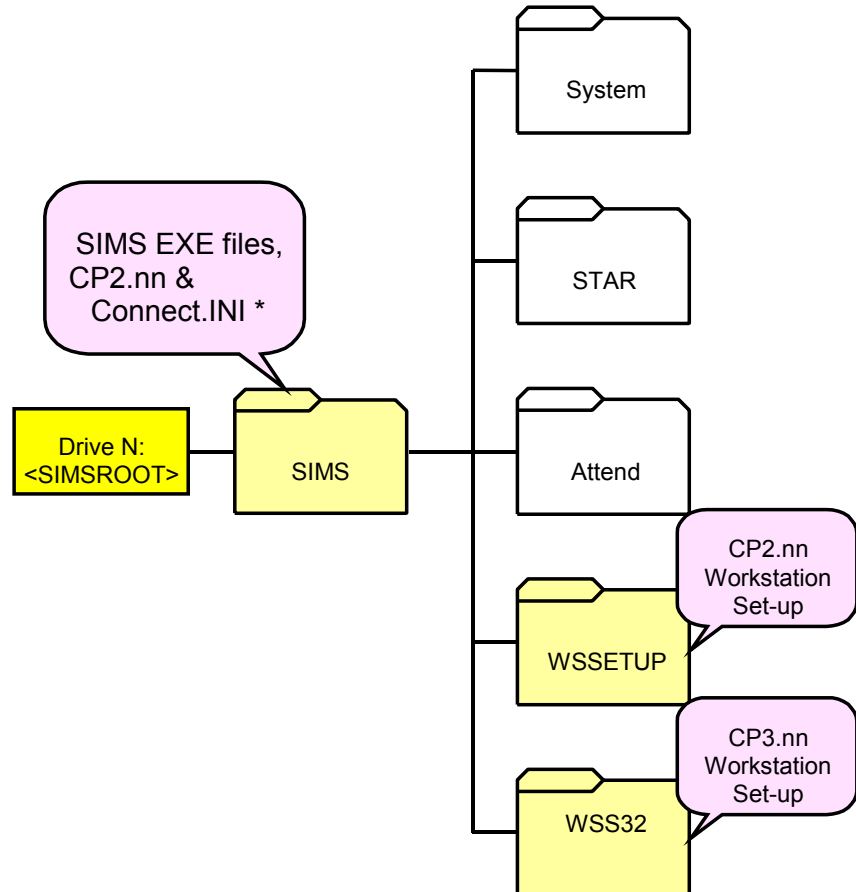
<http://www.microsoft.com/sql/productinfo/70books.htm>

Folder Structures

The SIMS Folder

The SIMS folder holds the executable files for the DOS, Windows dBase modules and Windows MS SQL modules. Sub directories hold all dBase Data and the System folder which holds the data dictionary and all the dBase security information.

NOTE: The Microsoft SQL Server folder can be on any local hard drive.



The connect.ini file is used when running the CP3.20 applications to designate the location and name of the SQL Server containing the SIMS data. If the server is renamed, the settings in this file will need to be altered to reflect the changes.

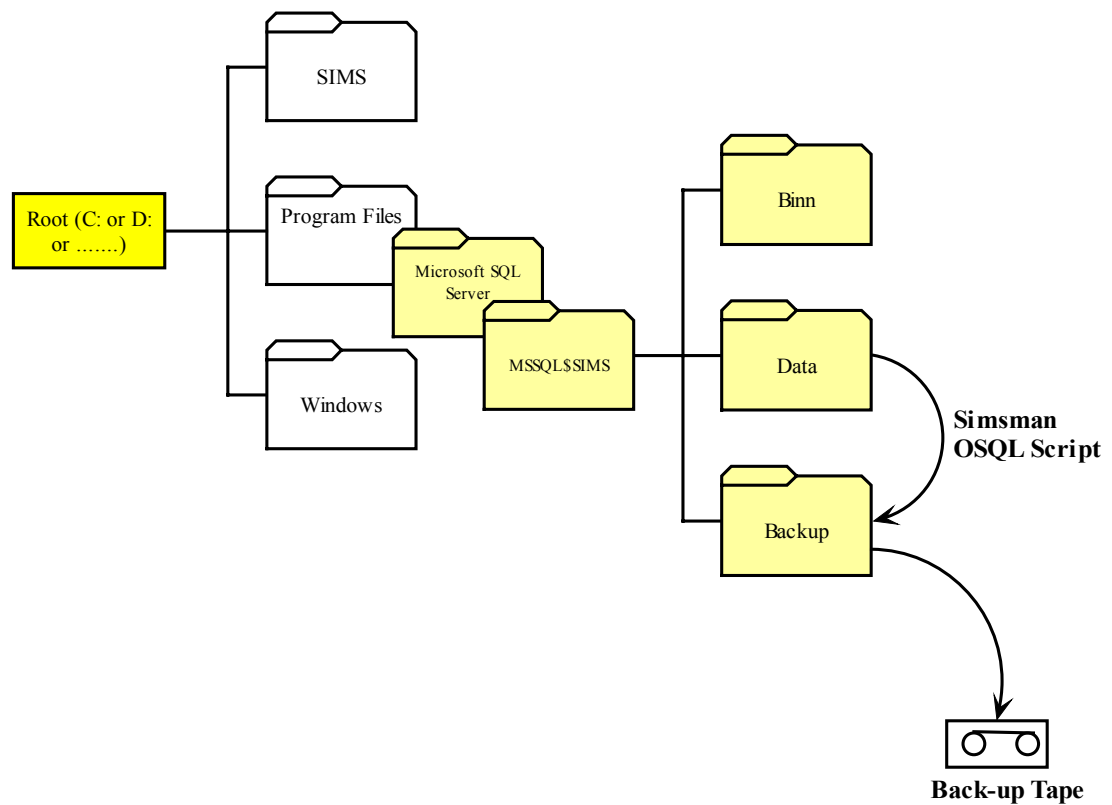
Connect.ini file format:

```
[SIMSConnection]
Database Name=SIMS
Server Name=MyServerName
```

The Microsoft SQL Server Folder

The Microsoft SQL Server folder holds the executable files and data files for MS SQL 2000 or SQL Server 2000 Desktop Engine. The Data Folder holds several master files plus the SIMS database and log files, SIMS.MDF and SIMS.LDF respectively. When Core Integrator runs it makes a backup file in Microsoft SQL Server backup folder.

NOTE: The Microsoft SQL Server folder can be on any local hard drive. The SIMS folder can be on any local hard drive or network drive. The MSSQL\$SIMS folder may be named differently. Please see the Important Notes on page 9.



More information:

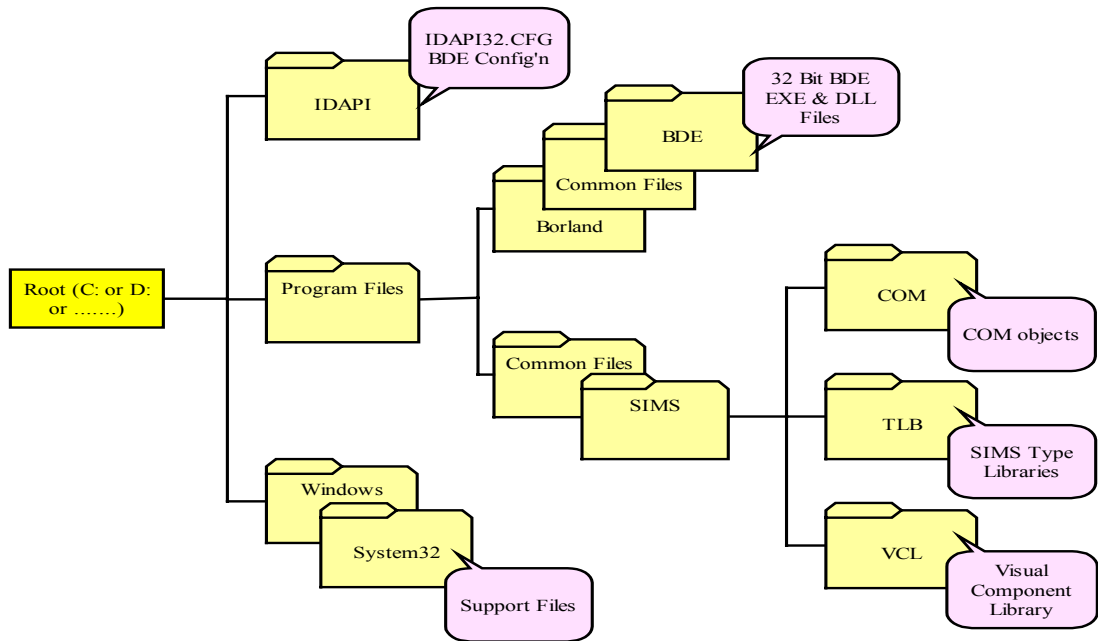
For further information about running Core Integrator, please see the **Core Integrator** handbook.

The Program Files Folder

Within the \PROGRAM FILES\COMMON FILES folder is a second folder called SIMS. This folder holds COM objects and support files needed by SIMS and MS SQL based modules. The COM folder is needed by a SIMS Workstation.

The **Common Files** sub-folder is used to store components used frequently by different Microsoft applications.

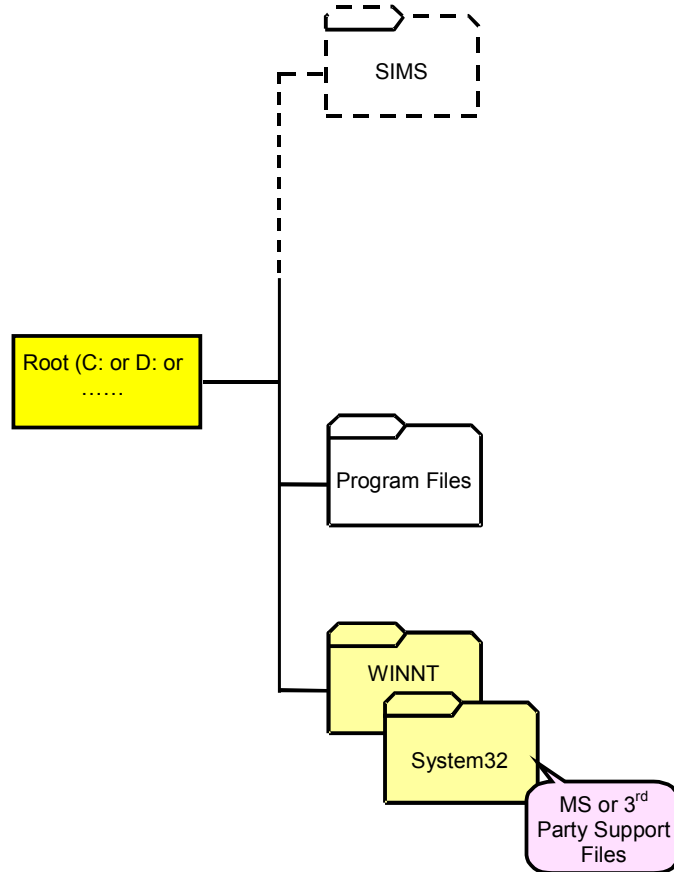
NOTE: The Microsoft SQL Server folder can be on any local hard drive. The SIMS folder can be on any local hard drive or network drive.



The Windows Folder

Any support files provided by Microsoft or a third party supplier are often stored in the \WINDOWS\SYSTEM32 folder.

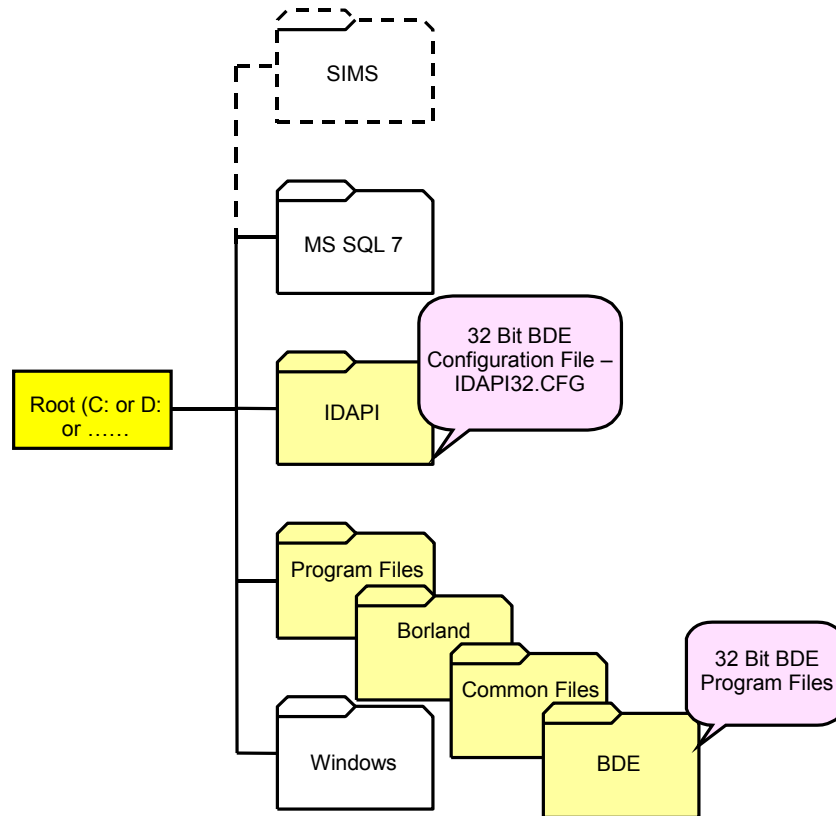
NOTE: The Microsoft SQL Server folder can be on any local hard drive. The SIMS folder can be on any local hard drive or network drive.



The BDE Folder

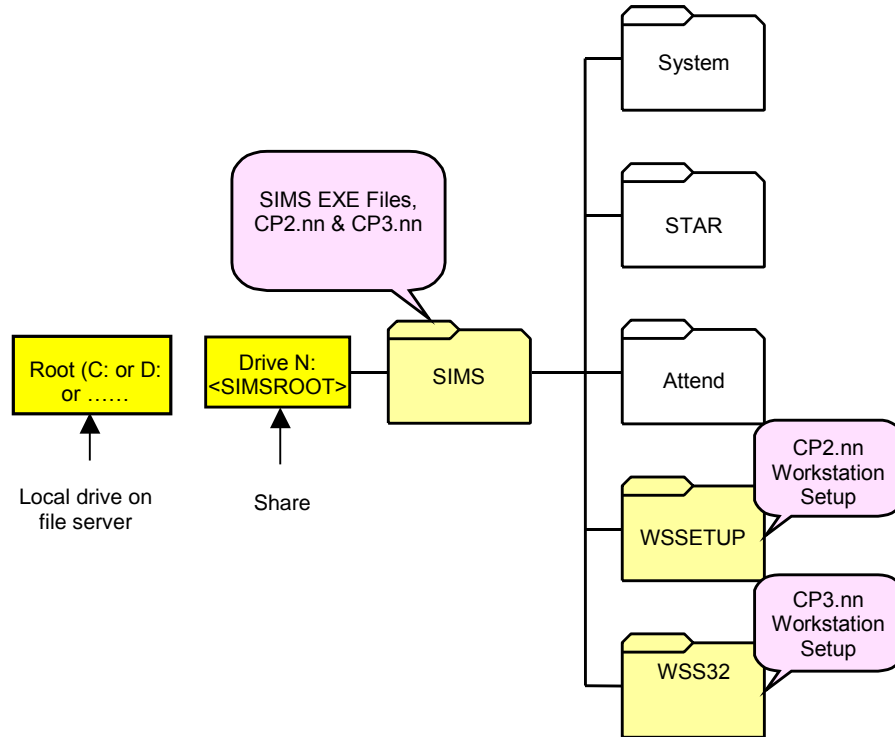
Only Core Integrator uses the BDE and ODBC to communicate with the MS SQL Database. A 32-bit Data Source called SIMS_Schools is defined in ODBC32, which is located in the Control Panel.

NOTE: The Microsoft SQL Server can be on any local hard drive. The SIMS folder can be on any local hard drive or network drive.



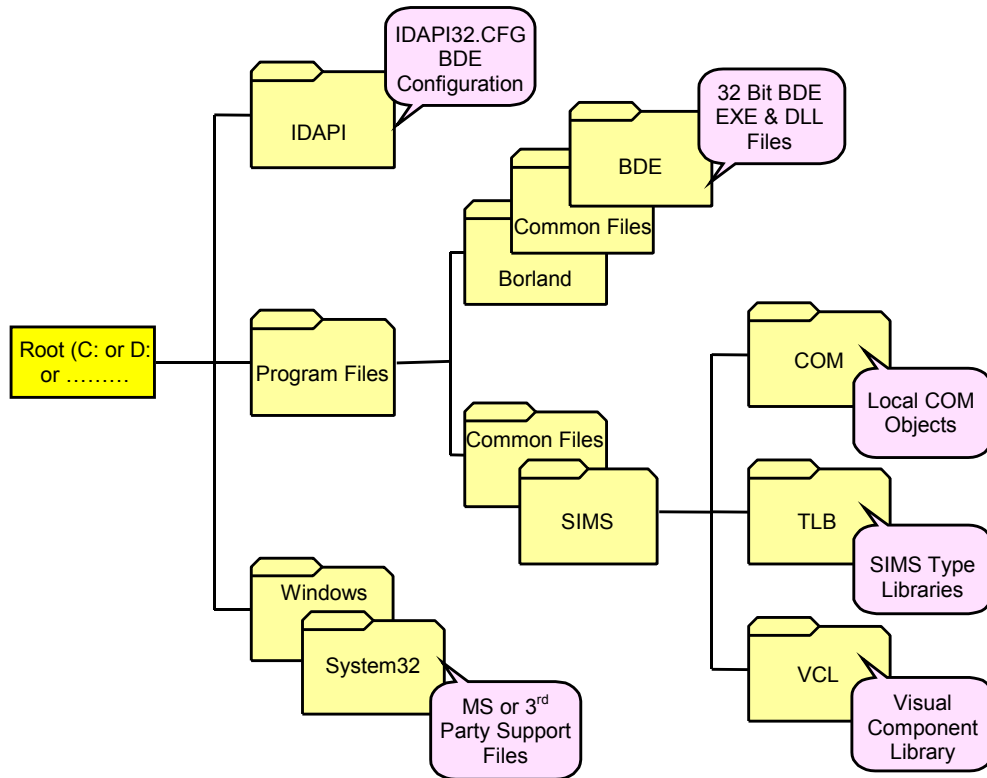
File Server Folder Structure

Files under the \SIMS folder must be visible to all workstations.



SIMS Workstation Folder Structure

The following diagram shows the folder structure for a SIMS Workstation which contains a subset of the folders detailed earlier in this Chapter.



Glossary

ANSI Standard

The American National Standards Institute. This is the institute that creates standards for the computer industry.

BDE (Borland Database Engine)

Acts as an interface between Delphi applications and the ODBC, taking data access commands from the application.

Client

The client is the interface which interacts between you and the application server (middle tier). The application server then communicates with the database.

(CAL) Client Access License

An SQL Server Client Access License (CAL) is required in order for a device (e.g. a PC, workstation, terminal, etc.) to access the services or functionality of Microsoft SQL Server.

COM (Component Object Model) Objects

COM objects are blocks of code, usually DLLs, that can be called by an Application on the local machine or a client machine on a network.

Core Integrator

Core Integrator is a module used to copy dBase data into MS SQL.

DLL (Dynamic Link Library)

A piece of compiled code containing one or more functions which can be accessed dynamically at run time by one or more running programs.

Infrastructure CD

The Infrastructure CD will install the necessary components to allow you to run CD 3.nn and also includes the MicroSoft Database Engine, the restricted version of MS SQL7.

ODBC (Open Database Connectivity)

Standard interface for accessing databases.

SIMS Workstation

A computer configured to run SIMS modules using shared data across a network.

TCP/IP

TCPIP is the recommended protocol for MS SQL Applications across the Network. In practice this has proved faster and more resilient than other protocols.

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