Version 3.4.0

Ed Vassie

Document Control

* 1. Change History

FineBuild Change History is documented online. For details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Change%20History>

* 1. Changes Forecast

January 2018 – Regular review and implementation of enhancements.

* 1. Related Documents

| Title | **Author** | **Description** |
| --- | --- | --- |
| SQL Server FineBuild Wiki | Ed Vassie | Main reference for SQL Server FineBuild  <http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation> |
| SQL Server FineBuild Quick Start | Ed Vassie | Guide for the first-time user of the SQL Server FineBuild process |

* 1. License

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# Overview

## Introduction

The main objective of FineBuild is to make it easy for anyone to produce a best-practice installation and configuration of SQL Server.

For experienced staff, FineBuild will simplify the automated deployment of a site standard ‘Gold Build’. For inexperienced staff, it packages the expertise needed to install SQL Server complete with Service Packs, Cumulative Updates, and useful tools, all configured for optimum use.

FineBuild also abstracts most of the differences in the operating system and the SQL Server version and edition, and will perform all operating system configuration tasks needed for SQL Server. This results in a similar experience when installing SQL Server 2005 Express on Windows XP through to installing SQL Server 2017 on a Windows 2016 Core cluster. All this is designed to fulfil the FineBuild strapline of .

FineBuild consists of a Wiki, this Reference manual, an introductory *FineBuild Quick Start* guide, and associated scripts. The scripts are pre-configured to provide a best practice configuration, and require minimal configuration for drive letters and account names before deployment. However, a flexible configuration file and script parameters allow significant changes to the build if required. Site-specific scripts can also be included in the build process without the need to change any of the supplied code.

FineBuild is free for internal use by the organisation downloading FineBuild, including use in Production and for personal use, under the terms of the MS-PL License. However, anything that can be described as commercial exploitation of FineBuild (e.g. selling FineBuild or FineBuild support services) requires separate licensing which can be obtained from the FineBuild authors.

Even though there is no charge for using FineBuild, please donate whatever FineBuild is worth to you as all money goes direct to charity. Tearfund is one of the UK’s largest community development and disaster relief charities, and donations can be made direct to [tearfund.org](http://www.tearfund.org) or via the link on the FineBuild site. Authors of some of the community tools also have donation links, so if you use their tool then please pay what it is worth to you.

The main body of this manual documents each step of the install process. Details of how to configure the install media and scripts are in the Appendix, in the section on page 49.

## SQL FineBuild Build Files

This section describes the Builds provided by FineBuild.

| **Item** | **Description** |
| --- | --- |
|  | **SQL FineBuild standard Builds** |
| [SQLFineServer](http://sqlserverfinebuild.codeplex.com/wikipage?title=Main%20Instance%20Server%20Build) | Install a main instance of SQL Server on to a multi-disk server |
| [SQLFineInstance](http://sqlserverfinebuild.codeplex.com/wikipage?title=Additional%20Named%20Instance%20Server%20Build) | Add an additional SQL Server instance to a server that already hosts a main instance of SQL Server. |
| [SQLFineWorkstation](http://sqlserverfinebuild.codeplex.com/wikipage?title=Workstation%20Build) | Install SQL Server on to a single-disk server. |
| [SQLFineClient](http://sqlserverfinebuild.codeplex.com/wikipage?title=Client%20Tools%20Only%20Build) | Install the SQL Server client tools to a DBA Administration server that requires only the client tools. |
|  | **Miscellaneous Build Files** |
| *SQLFineCluster* | See [SQL Server Cluster Install](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Server%20Cluster%20Install) |
| *SQLFineFix* | See on page |
| *SQLFineExpress* | See the *SQL Server FineBuild Quickstart* document |

# Preparatory Tasks

All tasks in this section that relate to an installation of the server components of SQL Server must be completed before the installation is handed over for use.

* Where a Workstation build is being performed, refer to on page 46.
* Where the Client components only are being installed, refer to on page 47.
* If an upgrade of SQL Server to a new version is being performed, refer to on page 50 for details of this process.
* Ensure that the *GroupDBA* and *GroupDBANonSA* parameters contain the group names used at your location before running FineBuild.

The drive letters and folder names used as examples in this document are described online at <http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Naming%20Standards>. You should use the drive letters and folder names that are relevant to your site.

## Install Preparation

### DBA Team Preparation

The following preparatory tasks should be completed before attempting to install SQL Server. Many of the tasks are pre-requisites to a SQL Server installation, but where indicated some of the tasks can be performed after the SQL install but before the server is handed over for application use.

| **Item** | **Description** |
| --- | --- |
| [FineBuild Media Preparation](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Media%20Preparation) | Prepare FineBuild media for installation of SQL Server |
| [Development, Test and Production Environments](http://sqlserverfinebuild.codeplex.com/wikipage?title=Development,%20Test%20and%20Production%20Environments) | Dedicated environments for Development, Test and Production |
| [SQL Administration Server](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Administration%20Server) | Dedicated server for administering SQL Server |
| [DBA Role Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=DBA%20Role%20Accounts) | Individual accounts for each DBA Role |
| [SQL Service Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Service%20Accounts) | Individual accounts for each SQL Server service |
| [Software Install Account](http://sqlserverfinebuild.codeplex.com/wikipage?title=Software%20Install%20Account) | Dedicated account for installing software |

A new user of SQL FineBuild should also review the items below that are used by FineBuild while it runs.

| **Item** | **Description** |
| --- | --- |
| [FineBuild Configuration File](http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Configuration%20File) | Repository of parameters for SQL FineBuild |
| [FineBuild Log File](http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Log%20File) | Detailed record of progress for the FineBuild install |
| [Configuration Report File](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configuration%20Report%20File) | Summary of options used for the FineBuild install |

### Hardware Requirements

The hardware requirements should be based on site Infrastructure Hardware Build Standards, and meet or exceed Microsoft minimum requirements for Windows and SQL Server. For a virtual guest server, only the drive letter configuration must be complied with.

A suggested disk drive configuration for a Production server is given below, and the drive letters shown will be used in the rest of this document. However, the install scripts can cope with site standards for drive letters.

The most important aspects of the drive configuration are:

* Only program files should be placed on the System drive. This minimises the possibility of critical Windows components being inadvertently changed.
* Place database data files and log files on separate drives, to minimise I-O contention between these types of files.
* Place tempdb data files on a separate drive to other database files, to minimise I-O contention.
* Place the system /Temp folder away from the system drive, to minimise the possibility of using all system drive space.
* Place backup files on a separate drive, to both allow a different quality of service to be applied to this drive, and to minimise I-O contention when the local backup files are dumped to the network or to tape.

All drives should be in some form of hardware RAID configuration, to provide fault tolerance. The RAID configuration for each drive is determined by local site standards.

| **Drive Letter** | **Type** | **Drive Label** | **Minimum Size** | **Notes** |
| --- | --- | --- | --- | --- |
| C: | Basic | System | 30 GB (W2003)  40 GB (W2008) | At least 15 GB free space should exist prior to the initial SQL Server installation to allow for expected maintenance over 5 years. |
| E: | Dynamic | Tools | 5 GB | DBA tools and miscellaneous files  At least 2.5 GB free space should exist prior to the SQL Server installation. |
| I: | Dynamic | Backup | 10 GB | Database backup files |
| J: | Dynamic | SQL Logs | 5 GB | Database log files (including tempdb) |
| K: | Dynamic | SQL Data | 5 GB | Database data files |
| T: | Dynamic | Temp | 10 GB | tempdb and system \Temp folder |

Notes:

1. All drives can be Basic, but C: must be basic. The operating system can only be installed on a Basic drive.
2. Drives E: and I: should be included in the daily tape backup process, and all files on these drives must be included in each tape backup. The C: drive should be backed up to tape as determined by the Windows Support team. None of the other drives on the database server need be backed up to tape.
3. If any drives are taken off line as part of a failover process, these must also be basic. Many sites have experienced issues where dynamic drives refuse to come on line until the server is rebooted, but this problem does not affect basic drives.
4. The disk space requirements for the SQL Server program files can be found at on page 49.
5. Details of how to configure the drives for best performance using RAID or on a SAN are outside the scope of FineBuild. There is a lot of good advice on the internet about this subject, and this can be used for research if required.

However, when preparing specifications for RAID or SAN, it is important to specify not only the amount of disk space required per drive letter, but also the expected average and peak read and write operations per second for each drive letter for both sequential and random access. Although these figures can be difficult to calculate, they become very important in any discussions with hardware vendors about how to achieve the desired performance.

### Software Requirements

The Windows requirements should be based on local site standards. The following items are required for SQL Server:

* *Windows Indexing* service NOT active
* *Remote Desktop* connectivity active

In many environments, the *Distributed Transaction Coordinator* (MSDTC) service must also berunning.

Any anti-virus software must be configured to ignore all files containing data for SQL Server, AS, SSIS, RS, FTS, and backups. Due to the variety of file types involved, the most common practice is to exclude all files within the SQL Server data folders.

The Windows startup options that may be useful are documented online. For further details please see <http://sqlserverfinebuild.codeplex.com/wikipage?title=Windows%20Memory%20Switches>.

Contact your organisation’s Support Centre if any Windows Startup options need changing.

### Prepare Install Media

Prepare the FineBuild media for the SQL Server install as described at   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Media%20Preparation>.

It is suggested that all servers in Development domains use Developer Edition, as this has the lowest license cost.

It is recommended that both Production and pre-production domains use the same edition of SQL Server installed on the same type of hardware running the same edition of Windows, to ensure the pre-production experience is as close as possible to Production.

The install media will be referred to as SQL…\ in the remainder of this document.

### Final Preparation

1. Check Connectivity

* The database server must be accessible via Windows Explorer from the DBA Admin Servers.
* The database server must be accessible via Remote Desktop from any other Support machines

1. Perform any required additional preparation processing via the *User1Preparation* script.

The *User1Preparation* script can be edited as required to perform any required processing for items that must be completed before SQL Server is installed. All other additional processing is placed in the *User2Configuration* script.

In practice, the most likely use for the *User1Preparation* script would be to automate the setup of Windows Clustering.

## Run FineBuild

The FineBuild process should be started by using one of the standard build files given in on page 7.

Some of the tasks cannot be automated, and must be performed interactively. The residual interactive tasks are listed below and should be completed before the server is handed over for use:

1. Complete the Preparatory Tasks by performing on page 13. There is no manual setup shown for these tasks, as these permissions are normally either controlled by GPO or not controlled at all.

### Preparation Processing

SQL FineBuild must perform some initialisation before it can start the SQL Server install process. These items are described below:

| **Item** | **Description** |
| --- | --- |
| **FineBuild Initialisation** |  |
| Check Install Requirements | Validate that the server can support the requested SQL Server install |
| [Setup Utilities](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Utilities) | Ensure Utility programs available on Server |
| [Setup Cluster Storage Group](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Cluster%20Storage%20Group) | Setup Cluster Group to host Storage |
| **Server Preparation** |  |
| [Setup Server Name](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Server%20Name) | Server name set to upper case if in mixed case |
| **Windows Preparation** |  |
| [Setup Service Timeout](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Service%20Timeout) | Service startup timeout adjusted if server is slow |
| [Setup SSRS Service Timeout](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20SSRS%20Service%20Timeout) | Adjust service timeout for SSRS |
| [Setup Power Configuration](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Power%20Configuration) | Power Configuration adjusted to Maximum |
| Setup No Defrag |  |
| Setup Windows Audit |  |
| **Account Preparation** |  |
| [Setup Group Membership](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Group%20Membership) | Set membership of Windows Groups |
| [Setup Group Rights](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Group%20Rights) | Set Windows Rights and Priviliges for Groups |
| [Setup User Rights](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20User%20Rights) | Set Windows Rights and Priviliges for Users |
| Setup SPNs | Setup Service Principal Names for SQL Server services |
| [Setup No Windows Global Access](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20No%20Windows%20Global%20Access) | Disable Windows Global Access to Server |
| **Network Preparation** |  |
| [Setup Firewall Port Exceptions](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Firewall%20Port%20Exceptions) | Set Firewall Exceptions for SQL Server components |
| Setup Network Adaptors | Rename Network Adaptors to match Cluster Network names |
| Setup Network Bindings | Set correct Network Bindings for Cluster install |
| Setup No TCP NetBIOS | Disable NetBIOS over TCP |
| Setup No TCP Offload | Disable TCP Offload |
| **Drive Preparation** |  |
| [Setup Drive Labels](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Drive%20Labels) | Drive Labels set for all drives used by SQL FineBuild |
| [Setup Drive Shares](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Drive%20Shares) | Network shares created for all drives used by SQL FineBuild |
| [Setup No Drive Indexing](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20No%20Drive%20Indexing) | Disable Contents Indexing for all drives used by SQL FineBuild |
| **Folder Preparation** |  |
| [Setup Folder Structure](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20SQL%20Folder%20Structure) | Create folders needed for SQL Server installation |
| [Setup System Temp Folder](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20System%20Temp%20Folder) | Change location of System *\Temp* folder |
| [Setup All Users Temp Folder](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20All%20Users%20Temp%20Folder) | Change location of all user *\Temp* folders |
| [Setup Folder Permissions](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Folder%20Permissions) | Set permissions for DBA and SQL service accounts |

#### Setup WMI Permissions

The following WMI Provider Key permissions must be granted. These permissions should augment but not replace the generic inherited properties for the WMI provider key, and permissions must propagate to all sub-keys.

WMI Provider Key Permissions processing is performed by FineBuild as Process Id 2CAJ in on page 15.

| **WMI Provider Key** | **Permission** | **User / Group** |
| --- | --- | --- |
| \\.\root\CIMV2 | Full Control | DBA Sysadmin Group  DBA Non-Admin Group  SQL Service Accounts  (local) Administrators |
|  | Enable Account | (local) Users |

#### Setup Windows Audit

Setup Windows Audit is documented online. For details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Windows%20Audit>

#### Setup Service Permissions

Service Permisions are documented online. For details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Service%20Permissions>

#### Setup Kerberos Authentication

The most secure network authentication protocol built in to Windows is Kerberos. It provides encryption of all network traffic and is considered as the best practice approach by security professionals.

Basic Kerberos authentication requires that Service Principle Names (SPNs) are created in order for services to automatically use Kerberos security. Because this provides significant extra protection compared to the legacy NTLM protocol and is easy to set up, it should be used for all SQL Server instances.

Kerberos can also be used to provide secure authentication between applications using delegated trusts, such as between SQL Linked Servers, or between IIS and SQL Server. In this situation (sometimes called ‘double hop’ authentication), additional configuration is required.

##### Service Principal Names

A Service Principle Name (SPN) is an endpoint for security purposes. Creation of an SPN requires Domain Administrator authority.

Configuration of Service Principal Names is performed by FineBuild in Process Id 1ED.

1. The process to create SPNs is documented online. For more details see  
    <http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20SPNs>.
2. The following account attributes should be configured by the domain account administrator. This allows the service to discover that an SPN exists for it, and that it can use Kerberos security.

| User Right | Assignment |
| --- | --- |
| Read servicePrincipalName | SQL Service Accounts |
| Write servicePrincipalName | SQL Service Accounts |

1. Confirm that the SPNs have been created correctly with the following command. Any user can use SETSPN to list existing names, and a copy of SETSPN is included in the FineBuild\Build Scripts folder.

SETSPN –L ServiceAccount

##### Delegated Trust

If it is required to support delegated trust, the following tasks are required in addition to the basic Kerberos setup.

Configuration of Delegated Trust is **not** performed by FineBuild and must be completed manually.

The following account attributes must be configured:

| User Right | Assignment |
| --- | --- |
| Account is trusted for delegation | SQL Service Accounts |

In addition, all server names that host endpoint services (e.g. IIS and SQL Server) require the Computer is trusted for Delegation attribute. The constrained delegation model should be used.

# SQL Server Installation

## Introduction

The SQL Server install process is split internally into 3 sections:

* Install Pre-requisites

Install all pre-requisite components. If any component is installed that requires a reboot, this will be performed after all pre-requisite components have been installed.

* Install SQL

Install the SQL Server components

* Install Post-requisites

Perform post-install configuration

All tasks in this section are performed by the *FineBuild2InstallSQL* script, and must be completed before the SQL Server installation is handed over for use. There are no residual interactive tasks for this section.

All installation activity must be performed while logged on using an account that is a member of the local Administrators group on the server on which SQL Server is being installed. When installing on Windows 2008 or above, FineBuild must be run using the Administrator context (i.e. Use *Run as Administrator* or turn User Access Control off).

To install Express Edition, see the *SQL Server FineBuild Quickstart* document.

To install a named instance, see on page 15.

To upgrade an existing instance of SQL Server 2000 or SQL Server 2005 to SQL Server 2008, follow the process given in on page 50.

Regardless of the type of install, FineBuild allows the selection of which SQL Server components are installed. Details of the parameters that control this are given online at   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Setup%20Parameters>.

## Install Prerequisites

The SQL Server Base Install relates to Process Id 2A in the *FineBuild2InstallSQL* script. The FineBuild2Install script is run automatically by the *SQLFineBuild* script.

The following items are required as pre-requisites to the SQL Server install.

| **Item** | **Description** |
| --- | --- |
| Setup Windows Pre-Requisites | Install Windows OS Pre-Requisites |
| [Setup Slipstream Install Media](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Slipstream%20Install%20Media) | Merge SP and CU into install media for SQL 2008 and SQL 2008 R2 |
| [Setup MSDTC CID](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20MSDTC%25CID) | Create new CID Guid for MSDTC |
| [Setup MSDTC Network Access](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20MSDTC%25Network%20Access) | Enable Network Access for MSDTC |
| [Setup MSDTC Cluster](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20MSDTC%25Cluster) | Create MSDTC Cluster for SQL Server Cluster install |
| [Install .Net 2.0](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20.Net%202.0) | Install .Net 2.0 for SQL Server 2005 |
| [Install .Net 3.5](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20.Net%203.5) | Install .Net 3.5 SP1 for all SQL Server versions |
| [Install IIS](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20IIS) | Install IIS on Windows 2008 and above if needed by other components |
| [Install Windows Installer 4.5](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Windows%20Installer%204.5) | Install Windows Installer 4.5 for SQL 2008 onwards |
| [Install Powershell V1](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Powershell%20V1) | Powershell V1 for SQL Server 2008 and 2008 R2 |
| [Install Powershell V2](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Powershell%20V2) | Powershell V2 for all SQL Server versions |
| [Install Windows 2003 KB925336](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Windows%202003%20KB925336) | Windows Installer fix for Windows 2003 |
| [Install Windows 2003 KB933789](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Windows%202003%20KB933789) | Registry permissions fix for Windows 2003 |
| [Install Windows 2003 KB937444](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Windows%202003%20KB937444) | Filestream compatibility fix for Windows 2003 |
| [Install Windows 2008 KB956250](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Windows%202008%20KB956250) | Preparation fix for .Net 4 for Windows 2008 |
| [Install .Net 4.0](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20.Net%204.0) | Required for SQL 2012 and above, but recommended for all versions of SQL Server |
| [Setup Distributed Replay](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Distributed%20Replay) | Setup Distributed Replay Utility (DRU) |
| [Install .Net 4.5](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20.Net%204.5) | Required for SQL Server Data Tools, but recommended for all versions of SQL Server |
| Setup PS Remote | Setup Powershell for remote access |
| [Pre-Requisites Reboot](http://sqlserverfinebuild.codeplex.com/wikipage?title=Pre-Requisites%20Reboot) | Reboot Server if required |

## Install SQL Server Components

The main SQL Server installation is started following completion of the prerequisites installation. If a reboot was performed, the install will resume automatically during the first logon after the reboot.

### Install SQL Server

The Install SQL Server process relates to Process Id 2BB in the *FineBuild2InstallSQL* script which is documented online. For further details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Server%20Build>

### Installing a Named SQL Server Instance

When installing an additional named instance of SQL Server with FineBuild, only the SQL Server Database Services are installed. All other components are only installed with the Main Instance.

The Installing a named SQL Server instance process relates to Process Id 2BB which is documented online. For further details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Additional%20Named%20Instance%20Server%20Build>

## Post-Install Tasks

A number of tasks related to the SQL Server install need to be completed. The Post-Install tasks relate to Process Id 2C. Many of these tasks are documented online, but some have not yet been documented. For more details please check *SetupPostSQLTasks* in the *FineBuild2InstallSQL* script or see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Post%20Install%20Tasks>.

The Post-Install tasks consist of the following items:

| **Item** | **Description** |
| --- | --- |
|  | **Check SQL Server Edition Data** |
| Save Edition Data | Save data relating to the SQL Server Edition |
| Save Client Tools Paths | Save Paths to Client Tools |
| Save SQL Menu Names | Save SQL Server Menu Names |
| Check SQL Services | Check required SQL services were installed |
| [Setup File Permissions](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20File%20Permissions) | Setup File Permissions for DBAs |
| [Setup Registry Permissions](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Registry%20Permissions) | Setup Registry Permissions for DBAs |
| Setup WMI Permissions | Setup WMI Permissions for DBAs |
| [Setup Cluster Bindings](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20Cluster%20Bindings) | Cluster manageability tasks |
| Setup SSRS Cluster | Setup Reporting Services Cluster |
| [Setup SSIS Cluster](http://sqlserverfinebuild.codeplex.com/wikipage?title=Setup%20SSIS%20Cluster) | Setup SSIS Cluster |
|  | **Reboot Processing** |
| [Post-Install Reboot](http://sqlserverfinebuild.codeplex.com/wikipage?title=Post-Install%20Reboot) | Reboot Server if required |

## SQL Server Fixes Install

This process installs the latest Service Pack, the current Cumulative Update hotfix pack, and the current Books online (BOL) update.

The SQL Server Fixes processing is performed by the *FineBuild3InstallFixes* script and is documented online. For further details please see   
[http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation##InstallSQLPostInstallTasks](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#Extra%20Components%20Install)

| **Item** | **Description** |
| --- | --- |
| [Install SQL Service Pack](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Service%20Pack) | Install requested Service Pack if not already included in Slipstream processing |
| [Install SQL Cumulative Update](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Cumulative%20Update) | Install requested Cumulative Update if not already included in Slipstream processing |
| [Install SNAC Update](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SNAC%20update) | Install SQL Server Native Client (SNAC) update |
| [Install SQL Books Online Update](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Books%20Online%20update) | Install latest SQL Server Books Online (BOL) update |
| [Post-Fix Tasks](http://sqlserverfinebuild.codeplex.com/wikipage?title=Post-Fix%20Tasks) | Processes that must be run after updates have completed |

Continue with on page 17.

# SQL Server Extra Components Install

FineBuild can install a number of additional components that improve the useability of SQL Server, as listed below. All of the Extra Components are optional. Each site should review which, if any, are needed. **If you do not want a given component then do not download it.** The installation of the Extra Components is controlled by the Configuration file or script parameters.

Authors of some of the community components have donation links, so if you use their product then please pay what it is worth to you.

The Extra Components installs are documented online. For further details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#Extra%20Components%20Install>

| **Component** | **Description** |
| --- | --- |
| **Pre-Requisite Extras** |  |
| [Baseline Configuration Analyser](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Baseline%20Analyzer) | Framework for use by the Microsoft Best Practice analysers |
| [Report Viewer](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Report%20Viewer) | .Net Control to display SSRS Reports |
| [Install Visual Studio 2005 SP1](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Visual%20Studio%202005%20SP1) | Install SP1 for Visual Studio 2005 |
| [Install Windows 2008 KB932232](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Windows%202008%20KB932232) | Install Windows 2008 KB932232 VS2005 SP1 Compatibility Fix |
| [Install VS 2005 SP1 KB954961](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20VS%202005%20SP1%20KB954961) | Install SQL 2008 KB954961 VS2005 SP1 Compatibility Fix |
| [Install Visual Studio 2010 SP1](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Visual%20Studio%202010%20SP1) | Install SP1 for Visual Studio 2010 |
| [Install VS 2010 SP1 KB2781514](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20VS%202010%20SP1%20KB2781514) | Install VS 2010 SP1 KB2781514 fix |
| SQL Compact Edition 4.0 | Lightweight SQL processor |
| **Business Intelligence Extras** |  |
| [SSDT-BI](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SSDT-BI) | Install SQL Server Data Tools for BI |
| [MDX Studio](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20MDX%20Studio) | Significant extra functionality for developers of MDX queries |
| [BIDS Helper](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20BIDS%20Helper) | Adds extensive functionality to the Business Intelligence Development Studio (BIDS) |
| **Integration Services Extras** |  |
| [DTS Designer Components](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20DTS%20Designer) | Support for designing legacy SQL 2000 DTS packages |
| [DTS Backup 2000](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20DTS%20Backup%202000) | Export and import DTS packages while retaining the DTS Designer layout and annotations |
| [SSIS Dimension Merge SCD](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SSIS%20Dimension%20Merge%20SCD) | Building block within SSIS for implementing the Kimball methodology (The SSIS Dimension Merge SCD component is produced independantly of Kimball Associates) |
| [SSIS Raw File Reader](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SSIS%20Raw%20File%20Reader) | Read SSIS Raw Files |
| [SQL Server 2005 Backward Compatibility](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%202005%20Backward%20Compatibility) | Support running DTS packages and SMO |
| **Report Services Extras** |  |
| [SQL 2000 Taskpad View Custom Report](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%202000%20Taskpad%20View) | Functionality similar to the Taskpad View in SQL Server 2000 |
| [Report Services Scripter](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Report%20Services%20Scripter) | Scripting of Microsoft SQL Server Reporting Services catalog items |
| [Linked Report Generator](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Linked%20Report%20Generator) | Generation of linked reports to any number of Reporting Services folders, based on a single base report |
| **SQL Server Extras** |  |
| [SQL Best Practice Analyser](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Best%20Practice%20Analyzer) | Allows various aspects of the SQL Server configuration and database configuration to be checked against Microsoft best practice |
| [Java DBC Driver](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Java%20DBC%20Driver) | Allows Java application to access SQL Server |
| [Microsoft OLE Provider for DB2](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20OLE%20Provider%20for%20DB2) | Allows SQL Server to access DB2 databases |
| [SQL Cache Manager](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Cache%20Manager) | Allows the DBA to view and manage the SQL Server Plan Cache |
| [SQL Internals Viewer](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Internals%20Viewer) | Displays the contents of database data and log pages, and other internal details of SQL Server |
| [Master Data Services](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Master%20Data%20Services) | Framework and repository for managing the key reference data of an organisation |
| [SQL Performance Dashboard](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Performance%20Dashboard) | Custom Reports that assist the management of SQL Server |
| [System Views Map](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20System%20Views%20Map) | Diagram of the SQL Server system tables and views |
| [SQL Notification Services](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Notification%20Services) | Platform for applications that generate and send messages (Obsolete since SQL Server 2005) |
| [StreamInsight](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20StreamInsight) | Framework for complex event processing |
| [Semantic Search](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Semantic%20Search) | Discover statistically relevant insight through prominent words and similar content in documents stored in Full-Text indexes |
| [Data Quality Services (DQS)](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Data%20Quality%20Services) | Knowledge-driven data cleansing solution |
| [Replication Distributor](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Replication%20Distributor) | Database used to distribute SQL Publications to Subscribers |
| [SSDT](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SSDT) | Install SQL Server Data Tools |
| **Tool Extras** |  |
| [Windows Access-Based Enumeration](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Access%20Based%20Enumeration) | Prevents user who do not have access to the server from discovering information about shares and other details for the server |
| [Extended Events Manager](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Extended%20Events%20Manager) | Powerful way of troubleshooting problems with SQL Server |
| [PDF Reader](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20PDF%20Reader) | Sumatra PDF reader, a light-weight stable PDF Reader |
| [Process Explorer](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Process%20Explorer) | Advanced version of Windows Task Manager, often vital in troubleshooting problems within executable code |
| [Process Monitor](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Process%20Monitor) | Advanced tool that shows real-time file system, registry and thread activity |
| [RML Utilities](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20RML%20Utilities) | Provides analysis of SQL Server dump information |
| [SQL Nexus](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20SQL%20Nexus) | Provides analysis of SQL Server trace information |
| [Troubleshooting Guide](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Troubleshooting%20Guide) | Microsoft best practice information on troubleshooting problems with SQL Server |
| [XML Notepad](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20XML%20Notepad) | An XML file editor |
| [Plan Explorer](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Plan%20Explorer) | Simplifies the process of understanding SQL Execution Plans |
| [Plan Explorer SSMS Addin](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20Plan%20Explorer%20SSMS%20Addin) | Adds Plan Explorer functionality into SSMS |
| [ZoomIt](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20ZoomIt) | Zoom into a portion of your Windows display |

Continue with on page 20.

# SQL Server Configuration

## Introduction

Following the installation of SQL Server, a number of configuration tasks are needed so that SQL Server performs optimally. The items in this section must be performed at this time as they involve changes that can only be made using an account with Local Administrator rights. All tasks in this section must be completed before the SQL Server installation is handed over for use.

The SQL Server Configuration process is process is performed automatically by the *FineBuild5ConfigureSQL* script. These scripts cover the items from page 20 to page 31 inclusive.

Some of the tasks within this page range cannot be automated, and must be performed interactively, as described below:

1. Review if any of the [SQL Server Certificates](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Server%20Certificates) configuration is required.
2. Review if any [SQL Server Proxy Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Server%20Proxy%20Accounts) configuration is required.
3. If SQL Mail is being used, the processing on page 42 is required.

## SQL Server Service Configuration

The SQL Server Service Configuration process is required to be performed once for every SQL Server instance that is installed. It relates to Process Id 5A in the *FineBuild5ConfigureSQL* script

| **Item** | **Description** |
| --- | --- |
| [Configure COM Security](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20COM%20Security) | Allow access to Integration Services from remote machines |
| [Configure SQL Network Protocols](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Network%20Protocols) | Configure port usage for SQL Server Database Engine |
| [Configure Service Account Names](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Service%Account%20Names) | Set Service Accounts where not set by SQL Installer |
| [Configure SQL Startup Parameters](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%25Startup%20Parameters) | Add standard Trace Flags to SQL Server parameters |
| [Configure SQL Service Recovery](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Service%20Recovery) | Recovery actions to take if a service fails |

## SQL Server Instance Configuration

All of the items in this section are included in the automated install *FineBuild5ConfigureSQL* script. The Instance Configuration process relates to Process Id 5B.

| **Item** | **Description** |
| --- | --- |
| [Configure SQL Server Surface Area](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Serface%20Area) | Optimise SQL Server Surface Area manageability |
| [Configure Errorlog Retention](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Errorlog%20Retention) | Configure number of Errorlog files |
| [Backup Service Master Key](http://sqlserverfinebuild.codeplex.com/wikipage?title=Backup%20Service%20Master%20Key) | Backup Service Master Key |
| [Configure Database Mail](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Database%20Mail) | Configure Database Mail functionality |
| [Configure SQL Mail](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Mail) | Configure legacy SQL Mail functionality |
| [Configure SQL Instance Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Properties) | Configure Properties for a SQL Server Instance |
| [Configure SQL Instance General Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20General%20Properties) | Configure the General Properties for a SQL Server Instance |
| [Configure SQL Instance Memory Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Memory%20Properties) | Configure the Memory Properties for a SQL Server Instance |
| [Configure SQL Instance Processor Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Processors%20Properties) | Configure the Processor Properties for a SQL Server Instance |
| [Configure SQL Instance Security Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Security%20Properties) | Configure the Security Properties for a SQL Server Instance |
| [Configure SQL Instance Connections Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Connections%20Properties) | Configure the Connections Properties for a SQL Server Instance |
| [Configure SQL Instance Database Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Database%20Properties) | Configure the Database Properties for a SQL Server Instance |
| [Configure SQL Instance Advanced Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Advanced%20Properties) | Configure the Advanced Properties for a SQL Server Instance |
| [Configure SQL Instance Permissions Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Permissions%20Properties) | Configure the Permissions Properties for a SQL Server Instance |
| [Configure SQL Agent Instance Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Agent%20Properties) | Configure Properties for a SQL Agent Instance |
| [Configure SQL Agent General Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Agent%20General%20Properties) | Configure the General Properties for a SQL Agent Instance |
| [Configure SQL Agent Advanced Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Agent%20Advanced%20Properties) | Configure the Advanced Properties for a SQL Agent Instance |
| [Configure SQL Agent Alert System Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Agent%20Alert%20System%20Properties) | Configure the Alert System Properties for a SQL Agent Instance |
| [Configure SQL Agent Job System Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Agent%20Job%20System%20Properties) | Configure the Job System Properties for a SQL Agent Instance |
| [Configure SQL Agent Connection Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Agent%20Connection%20Properties) | Configure the Connection Properties for a SQL Agent Instance |
| [Configure SQL Agent History Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Agent%20History%20Properties) | Configure the History Properties for a SQL Agent Instance |
| [Configure Analysis Services Instance](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Analysis%20Services%20Instance) | Configure Analysis Services Instance |
| [Configure AS Instance General Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20AS%20Instance%20General%20Properties) | Configure Analysis Services Instance General Properties |
| [Configure AS Instance Collation Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20AS%20Instance%20Collation%20Properties) | Configure Analysis Services Instance Collation Properties |
| [Configure AS Instance Security Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20AS%20Instance%20Security%20Properties) | Configure Analysis Services Instance Security Properties |
| [Configure AS Instance Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20AS%20Instance%20Properties) | Configure AS Instance Properties |
| [Configure AS Management API](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20AS%20Management%20API) | Configure AS Management API |
| [Configure Integration Services Instance](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Integration%20Services%20Instance) | Configure Integration Services Instance |
| Configure SSIS Connectivity | Configure SSIS connectivity options |
| [Configure SSIS Catalog DB](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SSIS%20Catalog%20DB) | Configure SSIS Catalog Database |
| [Configure Notification Services Instance](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Notification%20Services%20Instance) | Configure Notification Services Instance |
| [Configure Report Services Instance](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Report%20Services%20Instance) | Configure Report Services Instance |

## SQL Server Account Configuration

All of the items in this section are included in the automated install *FineBuild5ConfigureSQL* script. The SQL Server Account Configuration process relates to Process Id 5C.

| **Item** | **Description** |
| --- | --- |
| **SQL Server Accounts** |  |
| [Configure Standard Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Standard%20Accounts) | Setup accounts needed within SQL Server |
| [Configure Sysadmin Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Sysadmin%20Accounts) | Setup authorities for sysadmin accounts |
| [Configure DBA Non-Sysadmin Group](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20DBA%20Non-Sysadmin%20Group) | Setup authorities for DBA non-Sysadmin Group |
| [Configure *sa* Account](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SA%20Account) | Disable and optionally rename the SA account |
| [Configure](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20xp_cmdshell%20Proxy%20Account) *[xp\_cmdshell](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20xp_cmdshell%20Proxy%20Account)* [Proxy Account](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20xp_cmdshell%20Proxy%20Account) | Setup the *xp\_cmdshell* Proxy Account |
| [Configure Database Owner Account](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Database%20Owner%20Account) | Setup low-privilege account to own user databases |
| [Configure User Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20User%20Accounts) | Add end-user accounts to SQL Server |
| **Report Services Accounts** |  |
| [Configure Reporting Services Administration Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Reporting%20Services%20Administration%20Accounts) | Configure Administration Accounts for Reporting Services |
| [Configure Reporting Services Unattended Execution Account](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Reporting%20Services%20Unattended%20Execution%20Account) | Setup account for SSRS Unattended report execution |
| [Backup Reporting Services Encryption Keys](http://sqlserverfinebuild.codeplex.com/wikipage?title=Backup%20Reporting%20Services%20Encryption%20Keys) | Backup encryption keys used by Reporting Services |
| [Configure Reporting Services IIS Alias](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Reporting%20Services%20IIS%20Alias) | Configure IIS Alias for Reporting Services |

## Database Configuration

The Database configuration relates to Process Id 5D in the *FineBuild5ConfigureSQL* script.

### System Database Configuration

#### Introduction

SQL Server will allow a damaged database file to be recovered to the point of failure by applying transaction logs to a backup. It is important to move the data files (.mdf) and transaction logs (.ldf files) to separate disks, so that a single point of failure would not result in loss of data. This also helps to spread the I-O load, allowing performance to be less affected by high workloads. On a standard database server normally the log file disks are J:\ and the data file disks are K:\. For a particularly busy server, consider putting each database on its own drive or mount point. Each database will have its own directory to contain the files, with User databases treated in the same manner.

The system databases msdb and tempdb are moved to new locations, with the data and log files on separate disks. However, due to the way that maintenance is applied, the files for *master* and *mssqlsystemresource* must all remain in the original install locations. There is no integrity or performance advantage in moving *model*, so that database is also left in its original location. The process described in this document for moving the remaining files is based on Moving System Databases in Books Online (BOL).

WARNING: The process of moving system database files is complex and must be performed in the correct sequence. Failure to perform this process correctly may result in the need to re-install SQL Server.

#### Modify System Databases

This section moves the system databases msdb and tempdb, and also moves the databases for Report Services if they are installed. It is recommended that the commands used below are created in a script file, so they can be cross-checked for accuracy before they are applied. Also, ensure that the correct instance name is used in the name portion *MSSQLSERVER*.

**Do not restart SQL Server, and do not examine the contents of any database, until process is completed.**

The System Database configuration relates to Process Id 5DA in the *FineBuild5ConfigureSQL* script. Automated configuration of System Database requires all of the following to be true:

* *ConfigSysDB* keyword in the configuration file set to YES.

##### Modify msdb database files

Using SQL Server Management Studio, run the following SQL statements:

ALTER DATABASE msdb MODIFY FILE (NAME=MSDBdata,   
FILENAME= 'K:\SQLFiles\MSSQL.MSSQLSERVER.DATA\MSDB\MSDBDATA.MDF',   
FILEGROWTH = 200 MB, MAXSIZE = UNLIMITED)

ALTER DATABASE msdb MODIFY FILE (NAME=MSDBdata, SIZE = 200 MB)

ALTER DATABASE msdb MODIFY FILE (NAME=MSDBlog,   
FILENAME= 'J:\SQLFiles\MSSQL.MSSQLSERVER.LOG\MSDB\MSDBLOG.LDF',   
FILEGROWTH = 50 MB, MAXSIZE = UNLIMITED)

ALTER DATABASE msdb MODIFY FILE (NAME=MSDBlog, SIZE = 50 MB)

##### Modify tempdb database files

The tempdb database should be configured to maximise parallel processing of work files. It will consist of a number of fixed size files and a spill file of 1 MB, all of which are placed on the T: drive. The *templog* file remains on the J: drive. The number of fixed size file is determined by the same formula used to calculate MAXDOP (i.e. Divide the number of processors available to SQL Server by 1.5 and round the value up to the next highest integer, but with a maximum of 8)

Automated configuration of tempdb requires all of the following to be true:

* *SetupTempDb* keyword in the configuration file set to YES.

1. Using SQL Server Management Studio, run the following SQL statements. The size for the tempdb data files is given by the /tempdbFile: value, and defaults to 200 MB.

ALTER DATABASE tempdb MODIFY FILE (NAME=tempdev,   
FILENAME='T:\SQLFiles\MSSQL.MSSQLSERVER.DATA\TEMPDB\TEMPDB.MDF',   
FILEGROWTH = 0)

ALTER DATABASE tempdb MODIFY FILE (NAME=tempdev, SIZE = 200 MB)

ALTER DATABASE tempdb ADD FILE (NAME=tempdev\_2,   
FILENAME='T:\SQLFiles\MSSQL.MSSQLSERVER.DATA\TEMPDB\TEMPDB\_2.NDF',   
FILEGROWTH = 0, SIZE = 200 MB)

ALTER DATABASE tempdb ADD FILE (NAME=tempdev\_spill,   
FILENAME='T:\SQLFiles\MSSQL.MSSQLSERVER.DATA\TEMPDB\TEMPDB\_Spill.NDF',   
FILEGROWTH = 200 MB, SIZE = 1 MB, MAXSIZE = UNLIMITED)

ALTER DATABASE tempdb MODIFY FILE (NAME=templog,   
FILENAME='J:\SQLFiles\MSSQL.MSSQLSERVER.LOG\TEMPDB\TEMPLOG.LDF',   
FILEGROWTH = 50 MB, MAXSIZE = UNLIMITED)

ALTER DATABASE tempdb MODIFY FILE (NAME=templog, SIZE = 50 MB)

##### Modify Report Server database files

The Modify Report Server database files configuration relates to Process Id 5DA in the *FineBuild5ConfigureSQL* script. Automated configuration of Modify Report Server database files requires all of the following to be true:

* *ConfigSysDB* keyword in the configuration file set to YES.
* *InstSQLRS* keyword in the configuration file set to YES.
* *RSInstallMode* keyword in the configuration file is *not* FilesOnlyMode.

Using SQL Server Management Studio, run the following SQL statements. The report server catalogue database is put into its own folders, while the report server temporary database has its data file moved to the T: drive.

ALTER DATABASE ReportServer MODIFY FILE (NAME=ReportServer,   
FILEGROWTH = 200 MB, MAXSIZE = UNLIMITED)

ALTER DATABASE ReportServer MODIFY FILE (NAME=ReportServer\_log,   
FILEGROWTH = 50 MB, MAXSIZE = UNLIMITED)

ALTER DATABASE ReportServerTempDB MODIFY FILE (NAME=ReportServerTempDB,   
FILEGROWTH = 200 MB, MAXSIZE = UNLIMITED)

ALTER DATABASE ReportServerTempDB MODIFY FILE (NAME=ReportServerTempDB\_log,   
FILEGROWTH = 50 MB, MAXSIZE = UNLIMITED)

##### Copy System Database Files

The files for the databases that are being moved must be copied to their new locations. Also, a backup copy is made of certain critical system database files.

The Copy System Database Files configuration relates to Process Id 5DB in the *FineBuild5ConfigureSQL* script. Automated configuration of Copy System Database Files requires all of the following to be true:

* *ConfigSysDB* keyword in the configuration file set to YES.

The mssqlsystemresource database is hidden from normal database backup tools, and therefore a backup of this database can only be made by copying the actual database files. Additionally, if a restore of the master database is performed, it must be at the same fix level as the mssqlsystemresourcedatabase. In order to safeguard the integrity of these databases, their files should be copied to a backup location after the application of a Service Pack or Hotfix, or after any significant changes that may be made by a DBA.

1. Stop SQL Server.
2. Copy the msdb database files to their new locations.
3. Copy the mssqlsystemresource and master database files to the following backup location, overwriting any copy of these files that may already exist.

I:\SQLFiles\MSSQL.*instance*.Backup\SystemDataBackup

Note: Ensure the correct value *instance* is used.

#### Restart SQL Server

During this stage, SQL Server will be restarted, and continue to run in normal mode.

The Restart SQL Server configuration relates to Process Id 5DC in the *FineBuild5ConfigureSQL* script. Automated configuration of Restart SQL Server requires all of the following to be true:

* *ConfigSysDB* keyword in the configuration file set to YES.

1. Start SQL Server as normal.
2. Start SQL Server Agent.
3. If Reporting Services is installed and is *not* configured as FilesOnlyMode, then start Reporting Services.
4. Check that all databases are accessible using SQL Server Management Studio.
5. When SQL Server appears to be running correctly, delete the obsolete files from step 2) of above.

### Configure Full Text Search

The Configure Full Text Search process relates to Process Id 5DD in the *FineBuild5ConfigureSQL* script. Automated configuration of Full Text Search requires all of the following to be true:

* *ConfigSQLFT* keyword in the configuration file set to YES.

#### Move Full Text Data

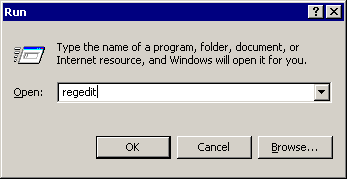
The Microsoft SQL Server 2005 install process places the Full-Text data on the same drive as the SQL Server program files. If it is intended to make extensive use of the Full-Text feature, then performance can be maximised by placing the Full-Text files on a separate drive.

The FineBuild install process moves the Full-Text data to a folder on the drive specified by the *DrvFT* keyword. This section performs the work needed to move the Full-Text files.

This portion of Full Text Search configuration is only performed if the following is true:

* The version of SQL being installed is SQ2005.

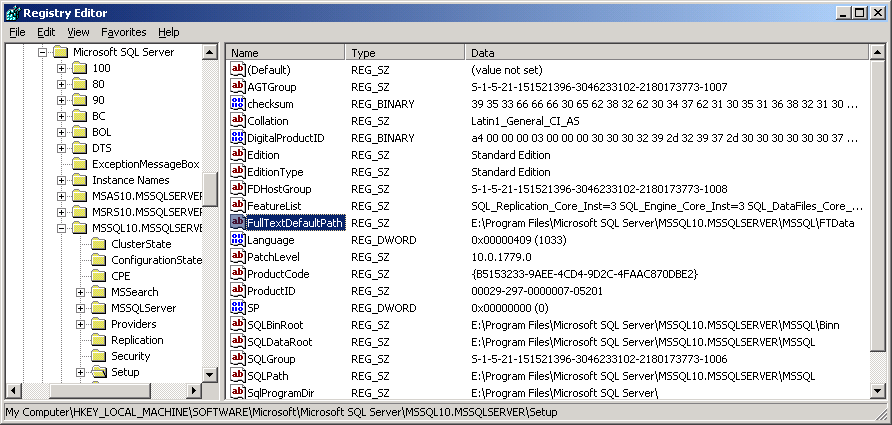
1. Open the Registry Editor by Start -> Run and type *regedit*



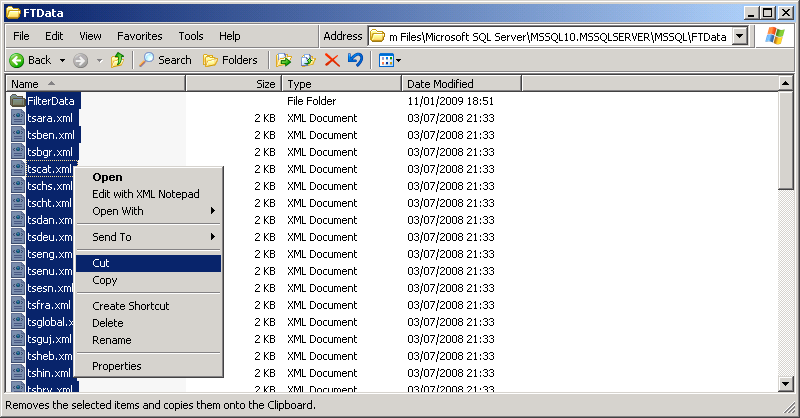
1. For the default instance navigate to:

HKLM\SOFTWARE\Microsoft\Microsoft SQL Server\MSSQL10.MSSQLSERVER\Setup

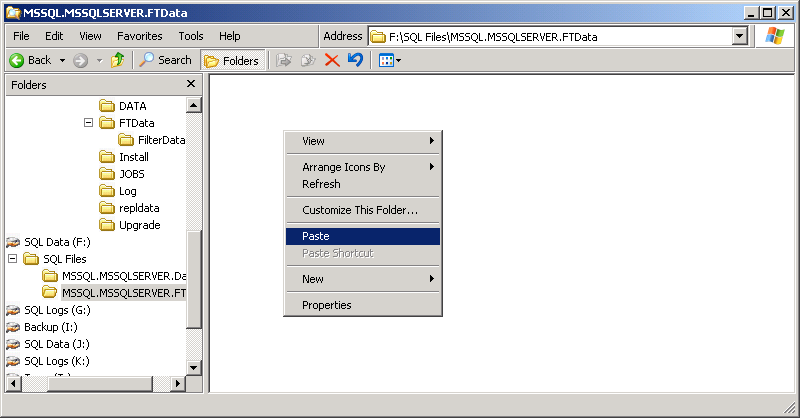
For a named instance substitute the instance name in place of .MSSQLSERVER\.



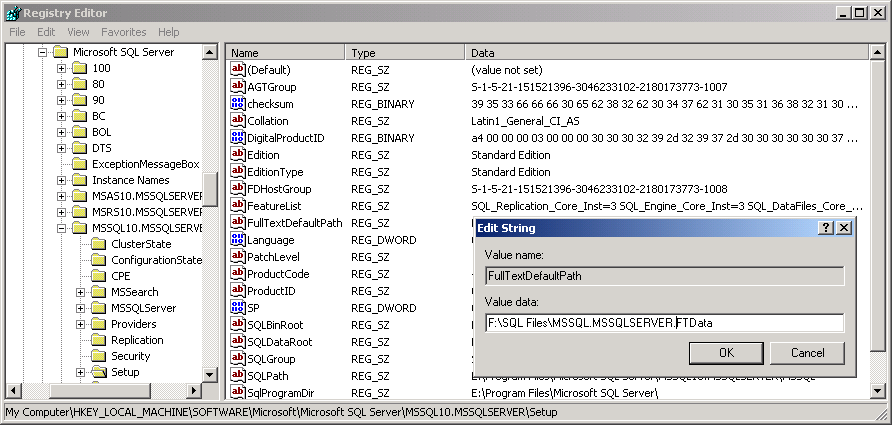
1. Using Windows Explorer, navigate to the location given in the *FullTextDefultPath* key. Highlight all files and select *Cut*.



1. Navigate to the SQLFiles\MSSQL.MSSQLSERVER.FTData folder on the drive specified by the DrvFT keyword and select Paste. If no value was given for *DrvFT* then the Full-Text files remain on the program files drive.



1. Update the value for the *FullTextDefultPath* registry key to match the new Full-Text search file location. Close the Registry Editor when you have finished.



#### Optimise Full Text Performance

This portion of Full Text Search configuration is performed for all SQL Server versions.

1. In Management Studio open a new Query Window and set the maximum number of processors to use when building a full text index. Use the *maxdop* value calculated in [Configure SQL Instance Advanced Properties](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Instance%20Advanced%20Properties).

EXEC sp\_configure 'max full-text crawl range', '*maxdop*'

## Management Processes

A number of routines are installed to assist in managing SQL Server. All of the items in this section are included in the *FineBuild5ConfigureSQL* script.

| **Item** | **Description** |
| --- | --- |
| [Configure System DB Management](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20System%20DB%20Management) | Configure routines to help manage SQL Server |
| [Configure DBA\_DB Database](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20DBA%20Database) | Configure database for DBA routines |
| [Configure Management Data Warehouse](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Management%20Data%20Warehouse) | Collect performance-related data about SQL Server |
| [Configure Policy Based Management](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Policy%20Based%20Management) | Manage SQL Server according to declared Policies |
| [Configure Generic Maintenance Processes](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Generic%20Maintenance%20Processes) | Configure backup and other maintenance for all databases |

### Database Standardisation

Standard parameters need to be set on all databases. These cover standard database options, ownership, and growth settings.

The Database Standardisation configuration relates to Process Id 5EG in the *FineBuild5ConfigureSQL* script. Automated configuration of Database Standardisation requires all of the following to be true:

* *ConfigDBOpts* keyword in the configuration file set to YES.

#### Database Properties

1. Using SQL Server Management Studio, highlight each database in turn and select Properties. Select Options and set the following values. If any value cannot be set for a system database, then ignore that value.

Compatibility level Highest possible for your version of SQL Server

Auto Close False

Auto Create Statistics True

Auto Shrink False

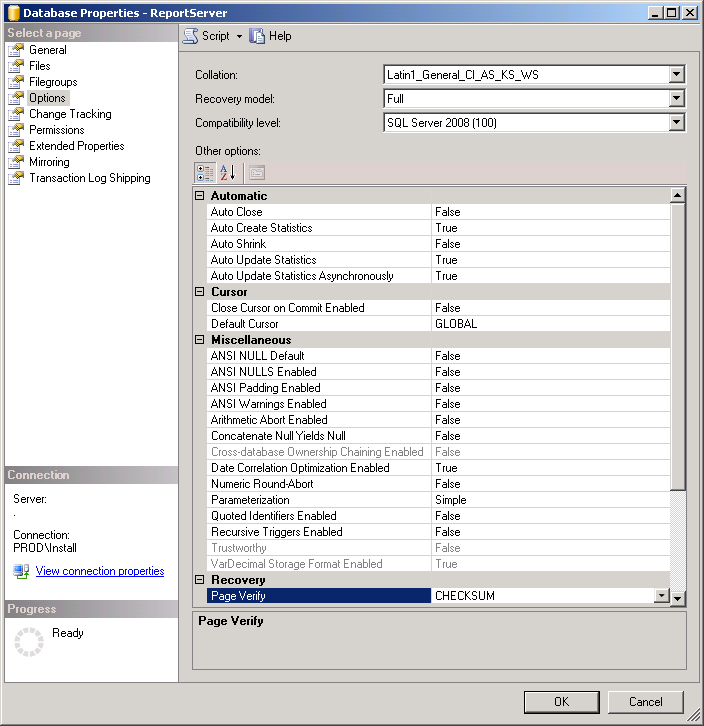
Auto Update Statistics True

Auto Update Statistics Asynchronously True

Date Correlation Optimization Enabled True

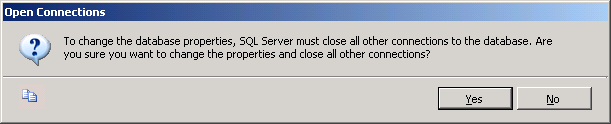
Page Verify Checksum

The settings for Collation and Recovery model will depend on application requirements.



Note: These parameters, apart from database compatibility level, can be set at any time by running the *DBA\_Data..spSetDBOptions* routine.

1. The following message may be given. Ensure that no users of the database will be inconvenienced before responding Yes.



#### Database Ownership

All user databases should be owned by an account with low privileges, as discussed in <http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20Database%20Owner%20Account>.

All user databases that are owned by an account with sysadmin authority will have their ownership changed to the standard database owner account.

The following command should be used to perform any required change of ownership.

SP\_ChangeDbOwner 'DB\_Owner'

#### Database Growth Settings

In order to minimise Windows file fragmentation and disk space usage, the database file size and growth values should be set as shown in the table below unless requested otherwise. Databases over 100 GB and tempdb should be set to fixed sizes, but space increases required for these should be made according to the table.

The initial size of a database should be set to allow enough data for 1 year without growing, and then rounded up as shown below. The growth values should be reviewed every few months, and new values set if appropriate.

Log file sizes should also be set in the same way, except that the minimum log file size is 5 MB.

|  |  |  |  |
| --- | --- | --- | --- |
| **Growth Band** | **Database Size** | Minimum Size | Growth |
| 1 | Under 50 MB | 10 MB | 10 MB |
| 2 | 50 MB to 200 MB | 50 MB | 50 MB |
| 3 | 200 MB to 1 GB | 200 MB | 200 MB |
| 4 | 1 GB to 10 GB | 1 GB | 500 MB |
| 5 | 10 GB to 100 GB | 10 GB | 5 GB |
| 6 | Over 100 GB | 100 GB | 10 GB |

For example, to find the initial size for a new database data file:

Space required to hold initial data when first installed 40 MB

Expected data growth in first year 30 MB

Space required at end of first year 70 MB

Look up Growth Band and round up space according to Minimum Size and Growth increment…

Round up space according to Growth Band 2 100 MB

Therefore, the data file for this database should be created with an initial size of 100 MB and a growth increment of 50 MB.

#### Use of Multiple Database Files

Performance can be improved for high-use databases by using multiple files of fixed size, and where relevant using separate filegroups. Because of the complexity in setting up such a configuration, it is not recommended that this is done for low-use databases.

Where multiple files are configured, one file should be specified for each CPU socket in use, up to a maximum of 8 files. These files should be of a fixed size, to allow SQL Server to balance I-O loads across the files. In addition, a spill file with an initial size of 1 MB, but with a space increment appropriate for the fixed file sizes should be specified. Because SQL Server will use the file that has the most free space, no data will be allocated to the spill file until all space is used in the other files. Therefore, the use of a spill file will avoid the risk of all database space being exhausted before a DBA can respond to a space alert. (This arrangement is used to by FineBuild to configure tempdb.)

Where a database consists of Dimension, Fact and Aggregation tables, consideration should be given to locating the Fact tables in a separate filegroup to the Dimension tables, and placing these filegroups on different drives, as this can improve performance still further. A typical Data Warehouse of between 100 GB and 500 GB may be configured with separate filegroups for the Fact and Aggregation tables, with the Dimension tables remaining in the default filegroup. Larger databases are likely to need a more complex arrangement of filegroups to obtain maximum performance.

### Windows Management Items

The items in this section are performed at this time because they involve changes to the windows ‘All Users’ profile, which can only be performed using an account with Local Administrator rights. Each of the files listed below should be copied to the following locations:

* 1. For Windows 2003

C:\Documents and Settings\All Users\Desktop

C:\Documents and Settings\All Users\Start Menu

* 1. For Windows 2008

C:\Users\Public\Desktop

C:\Program Data\Microsoft\Windows\Start Menu

#### SQL Server Menu Items

Desktop and Start menu shortcuts are created for a number of SQL Server components used by the DBA team.

The SQL Server Menu Items configuration relates to Process Id 5FA in the *FineBuild5ConfigureSQL* script. Automated configuration of SQL Server Menu Items requires all of the following to be true:

* *InstSQLTools* keyword in the configuration file set to YES.
* *ConfigMenus* keyword in the configuration file set to YES.
* */MainInstance:* parameter set to YES.

1. Create the following menu shortcuts. The table below shows the required shortcut name and source location. Each of the files listed should be copied to the locations described above:

| Shortcut Name | Source File Location |
| --- | --- |
| SQL Server 2008 Management Studio | C:\Documents and Settings\All Users\Start Menu\ Programs\Microsoft SQL Server 2008 |
| SQL Server 2008 Books Online | C:\Documents and Settings\All Users\Start Menu\ Programs\Microsoft SQL Server 2008\Documentation and Tutorials |
| SQLDiag tool | C:\Documents and Settings\All Users\Start Menu\ Programs\Microsoft SQL Server 2008\Performance Tools |

#### Reporting Services Menu Items

Start menu shortcuts are created for a number of Reporting Services components used by the DBA team.

The Reporting Services Menu Items configuration relates to Process Id 5FB in the *FineBuild5ConfigureSQL* script. Automated configuration of Reporting Services Menu Items requires all of the following to be true:

* *InstSQLTools* keyword in the configuration file set to YES.
* *ConfigMenus* keyword in the configuration file set to YES.
* *InstSQLRS* keyword in the configuration file set to YES.
* *RSInstallMode* keyword in the configuration file is *not* FilesOnlyMode.
* */MainInstance:* parameter set to YES.

1. Create a menu to contain Reporting Services items if it does not already exist.

Create a folder called *Reporting Services* as a subfolder of the ‘All Users’ *Microsoft SQL Server 2008* menu folder

1. Create the following Internet Explorer shortcuts in the Reporting Services folder.

*ReportServerURL* will have the value *ReportServer* for a default instance of Reporting Services, and have the value *ReportServer\_instance* (e.g. ReportServer\_HR) for a named instance of SSRS.

| Shortcut Name | Source URL |
| --- | --- |
| Report Builder | http://*servername*/*ReportServerURL*/ReportBuilder/ReportBuilder.application |
| Report Manager | http://*servername*/Reports |

#### Windows Menu Items

Desktop and Start menu shortcuts are created for a number of Windows components used by the DBA team.

The Windows Menu Items configuration relates to Process Id 5FA in the *FineBuild5ConfigureSQL* script. Automated configuration of Windows Menu Items requires all of the following to be true:

* *ConfigMenus* keyword in the configuration file set to YES.

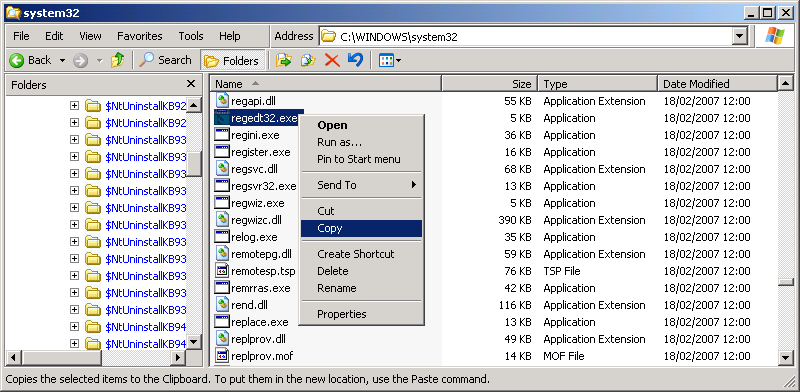
1. Create the following menu shortcuts. The table below shows the required shortcut name and source location. Each of the files listed should be copied to the locations described above:

| Shortcut Name | Source File Location |
| --- | --- |
| Command Prompt | C:\Documents and Settings\Default User\Start Menu\ Programs\Accessories |
| Notepad | C:\Documents and Settings\Default User\Start Menu\ Programs\Accessories |
| Windows Explorer | C:\Documents and Settings\Default User\Start Menu\ Programs\Accessories |

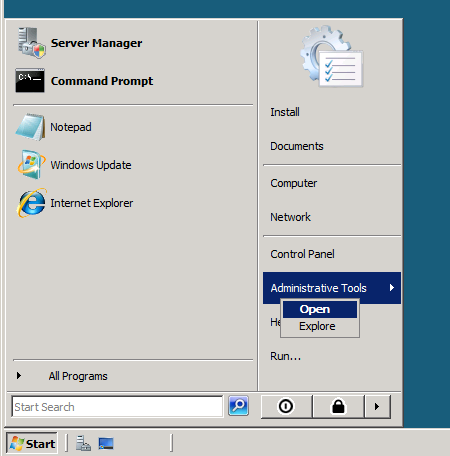
1. Create menu shortcuts for the programs listed below. The menu item should be created in the designated folder

| Shortcut Name | Menu Folder | Program Location |
| --- | --- | --- |
| Registry Editor | Administrative Tools | C:\Windows\System32\regedt32.exe |
| Remote Shutdown | Administrative Tools | C:\Windows\System32\shutdown.exe  (A parameter of –i must be given) |
| Windows Management Instrumentation Tester | Administrative Tools | C:\Windows\System32\wbem\wbemtest.exe |

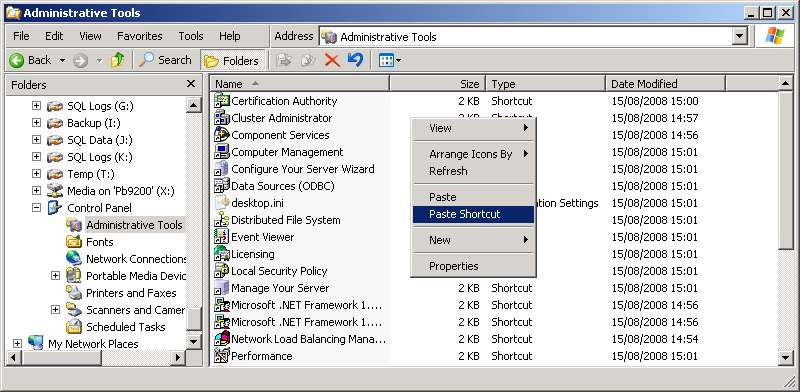
Using Windows Explorer, navigate to the Windows \System32 folder. Highlight *regedit32.exe* and select *Copy*.



Navigate to the All Users Administrative Tools folder.



Select *Paste Shortcut*. Rename the shortcut *Registry Edit*.



1. Delete the *Desktop.ini* file from the All Users \Desktop folder.

#### Bring Cluster Resources Online

This section is only relevant if SQL Server has been installed as a cluster. If you have not installed SQL Server as a cluster then continue from on page 31.

The FineBuild process stops and starts SQL Server services outside the control of the Cluster Management service. This results in some cluster resources being put into an Offline status. This section puts the cluster resources online so that the cluster can be used.

The bring cluster resources online processing relates to Process Id 5FD in the *FineBuild5ConfigureSQL* script. Bring cluster resources online will always be performed if SQL Server has been installed as a cluster.

The following example assumes:

* The Windows cluster is called *PDGB01SQLC01*
* The SQL DB cluster is called *SQLC01DB*
* The Analysis Services cluster is called *SQLC01AS*

CLUSTER "PDGB01SQLC01" GROUP "SQLC01DB" /ON

CLUSTER "PDGB01SQLC01" RESOURCE "SQL Server" /ON

CLUSTER "PDGB01SQLC01" RESOURCE "SQL Server Agent" /ON

1. If SQL Server DB Engine has been installed, run the following commands:

CLUSTER "PDGB01SQLC01" GROUP "SQLC01AS" /ON

CLUSTER "PDGB01SQLC01" RESOURCE "Analysis Services" /ON

1. If SQL Server Analysis Services has been installed, run the following commands:

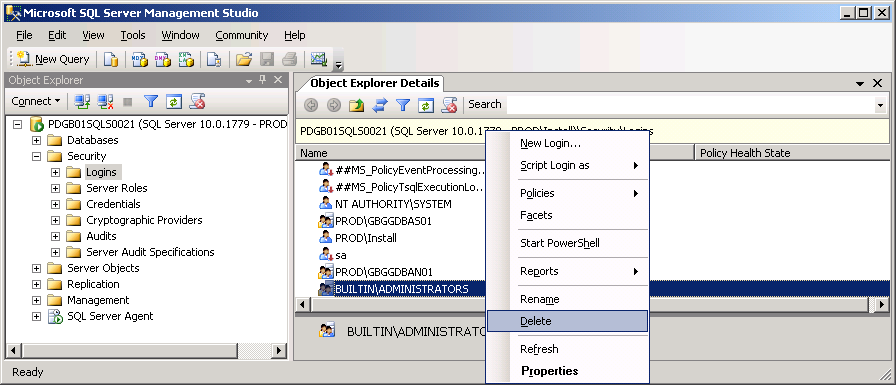
## Remove Redundant Accounts

The SQL Server install process creates some logins that should be deleted or disabled as part of the normal server hardening process.

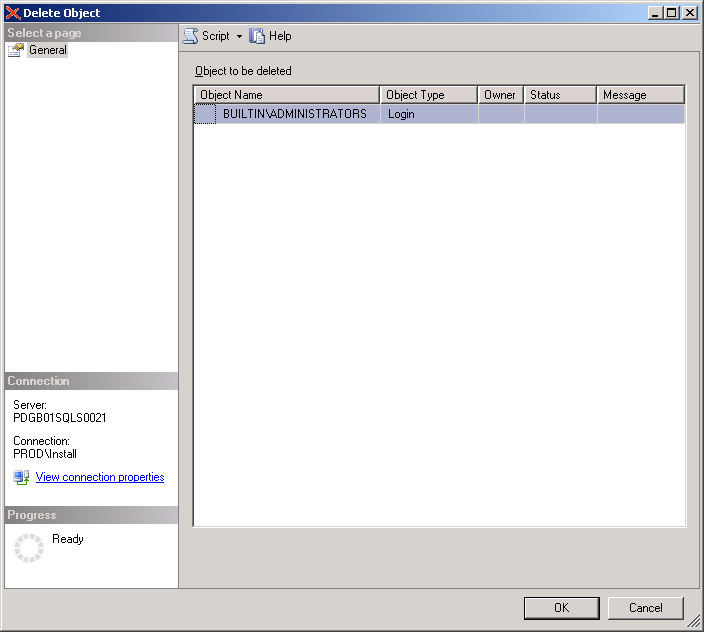
The Remove Redundant Accounts configuration relates to Process Id 5G in the *FineBuild5ConfigureSQL* script. Automated configuration of Remove Redundant Accounts requires all of the following to be true:

* *ConfigOldAccounts* keyword in the configuration file set to YES.

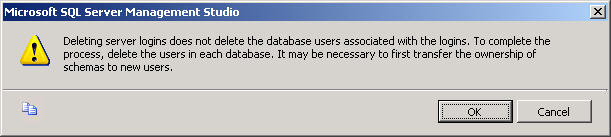
1. Use SQL Server Management Studio and navigate to Logins. Right-click on one of the accounts to be removed (in this example BUILTIN\Administrators) and select Delete.



1. Click ‘OK’ to continue with the delete.



Click ‘OK’ to the warning message.



1. The following accounts should be removed for a standard build, but not for a Workstation build.

BUILTIN\Administrators

NT AUTHORITY\NETWORK SERVICE

Removal of the BUILTIN\Administrators account is a critical part of securing SQL Server. There are no circumstances where it is good practice for every account who has Windows local Administrator authority to also have Sysadmin authority within SQL Server.

## Final Configuration Tasks

The tasks in this section are not included in the Automated Install described on page 20.

### Site-Specific Configuration

Any site-specific configuration can be completed at this stage. The *User2Configuration* script can be changed as required to automate the site-specific configuration. Alternatively, the configuration can be completed manually, outside the FineBuild process.

#### Install Database Backup Tool

If a third-party database backup tool (e.g. *SQL Litespeed*, *SQL Backup*, etc) is to be used, the installation process can be added to the *User2Configuration* script. Each site should maintain its own installation document for the tool used.

Continue with User Preference Setup on page 33.

# User Preferences Setup

## Overview

This section performs configuration of the SQL Server client tools and other user customisation. Whenever anyone logs on for the first time to a machine where SQL Server has been installed, they will need to configure the Client Tools.

The User Preferences setup is performed automatically by the *FineBuild6ConfigureUsers* script. This works by updating the registry settings in user profiles. The profiles are updated or all users, including the .DEFAULT user profile, but excluding the profiles for the local system accounts. The interactive process documented below shows the steps that would need to be performed to set the registry values updated by this script.

Some of the tasks cannot be automated, and must be performed interactively. The residual interactive tasks are listed below and should be completed before the server is handed over for use:

1. **If it is required to use SQL Server Mail, then this step must also be repeated when logged on using the SQL Server service account.** The creation of the Outlook mail profile that is needed for SQL Server Mail can only be done when logged on interactively using the service account.

If only DB Mail or no mail facility is to be used then this work is not required.

The User Preferences setup process is performed automatically by the *FineBuild6ConfigureUsers* script. If SQL Server Mail is used, then this step must be repeated manually when logged on using the SQL Server service account.

## Books Online Configuration

The SQL Server Books Online (BOL) is configured so it will use local files instead of trying to access the Internet. This can improve the performance of Books Online

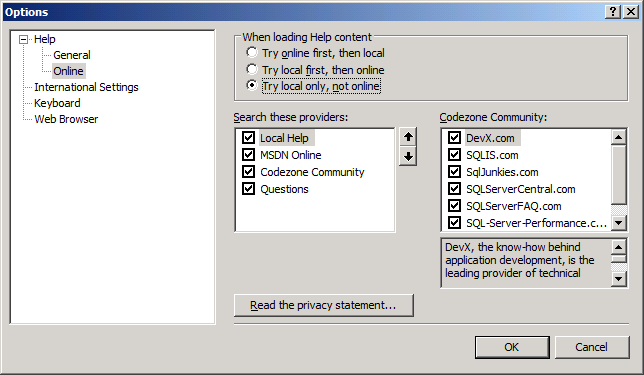
The Books Online configuration relates to Process Id 6A in the *FineBuild6ConfigureUsers* script. Automated configuration of Books Online requires all of the following to be true:

* *SetupBOL* keyword in the configuration file set to YES.

1. Start Books Online (Start -> Programs -> Microsoft SQL Server 2008 -> Documents and Tutorials -> SQL Server Books Online). Wait while Books Online looks for the Internet to respond…



1. Select *Tools -> Options*, select *Online* then specify *Try local only, not online*. Click *OK* to continue*.*



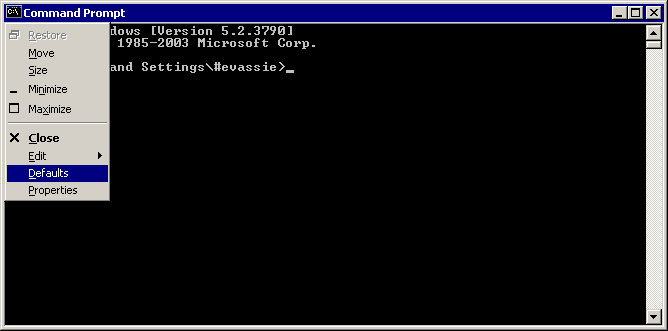
## Command Window Settings

The Windows Command Window (CMD) is configured to have greater support for the type of work performed by DBA staff.

The Command Window configuration relates to Process Id 6B in the *FineBuild6ConfigureUsers* script. Automated configuration of Command Window requires all of the following to be true:

* *SetupCMD* keyword in the configuration file set to YES.

1. Open a Command Window, click on the window icon and select *Defaults*.



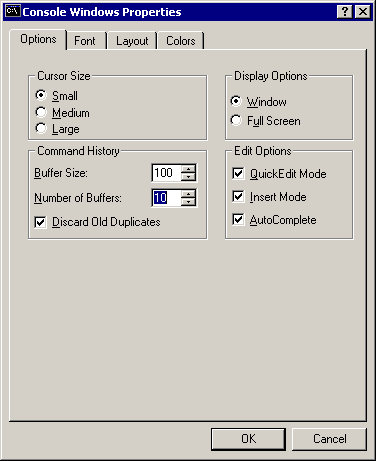
1. Select *Options* and set the following values:

Buffer Size 100

Number of Buffers 10

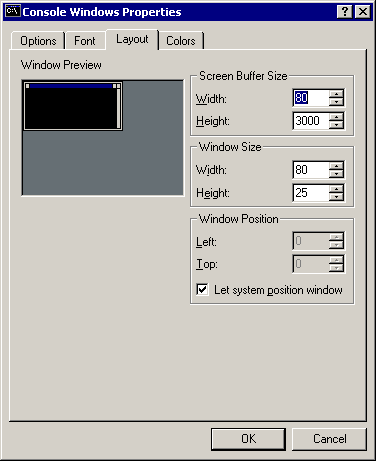
Discard Old Duplicates Checked

QuickEdit Mode Checked



1. Select *Layout* and set the following values:

Window Buffer Size Height 3000



## SQL Server Management Studio Configuration

SQL Server Management Studio as installed makes various attempts to contact the Internet. If the Internet is not available, the user will experience a series of delays while attempts at connecting to the Internet time out. Management Studio is therefore configured so that it will never attempt to contact the Internet, resulting in improved performance.

The Management Studio configuration relates to Process Id 6C in the *FineBuild6ConfigureUsers* script. Automated configuration of Management Studio requires all of the following to be true:

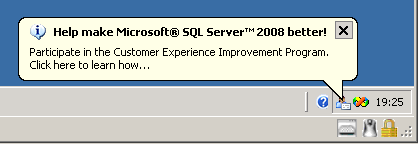
* *SetupSSMS* keyword in the configuration file set to YES.

1. Start the SQL Server Management Studio (Start -> Programs -> Microsoft SQL Server 2008 -> SQL Server Management Studio).

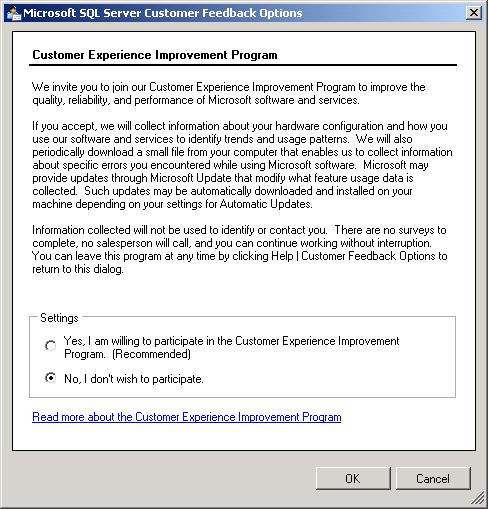


1. Stop Customer Feedback Options message notice

When SQL Server Management Studio is started, the following message is seen for a short time:



1. Click within the balloon, and set the feedback option to ‘*No’*. Click *‘OK’* to continue.

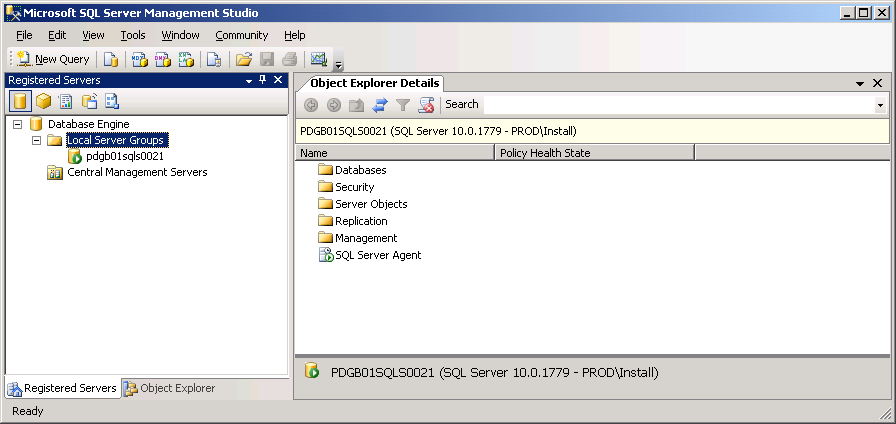


1. The Management Studio Connection window is displayed. Enter the server name and click ‘*Connect’.*

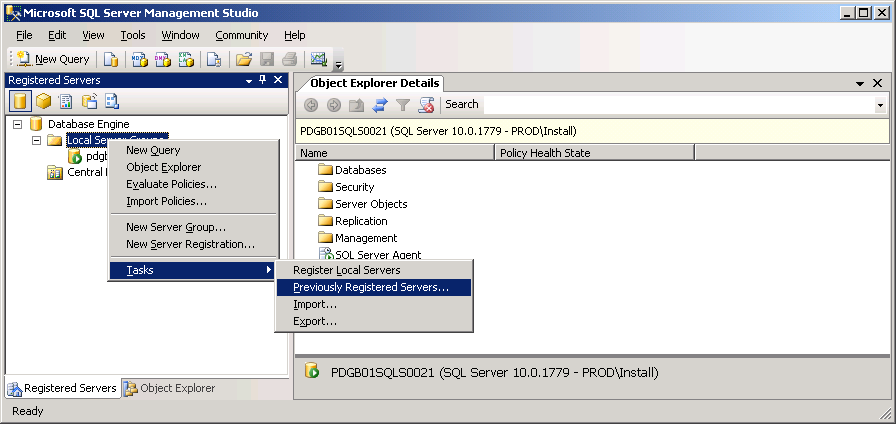


1. Select View -> Registered Servers

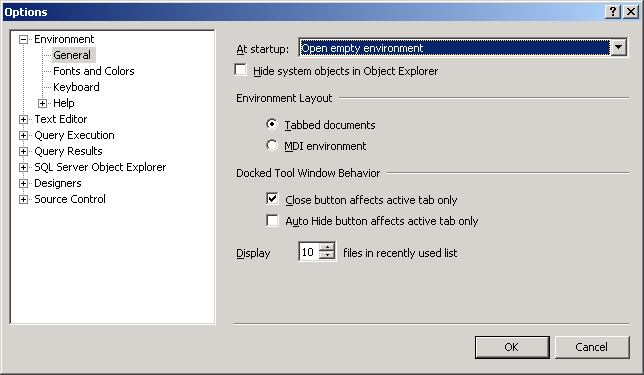
This will display a list of known servers, similar to what was seen in SQL Server 2000 Enterprise Manager.



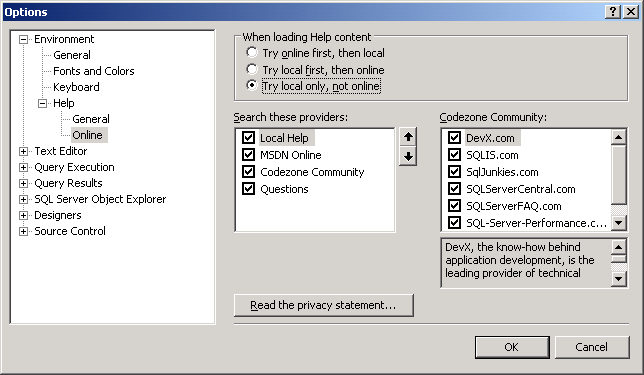
1. If SQL Server instances have previously been installed on this server and registered to SSMS or Enterprise Manager, right-click on Local Server Groups and select Previously Registered Servers to import the SQL Server details.



1. Select Tools -> Options, and specify Open Empty Environment. This will avoid the need to connect to SQL Server whenever Management Studio is started.



1. Configure the Help options to search local files only. Select Tools -> Options, and specify Help then Online. Click on Try local only, not online, and then click on OK.



1. SQL Server Management Studio can now be closed.

### Custom Reports

The SQL Server Management Studio installation includes a number of standard reports that show information about the state of various SQL Server components. It is possible to add additional reports, known as Custom Reports, by copying them to the user profile. Additional Custom Reports can be found on the internet by searching for SSMS Custom Report.

The FineBuild install will have put a number of custom reports into the *DrvProg*:\DBAFiles\SQL Server Management Studio\Custom reports folder, and they can be accessed from there.

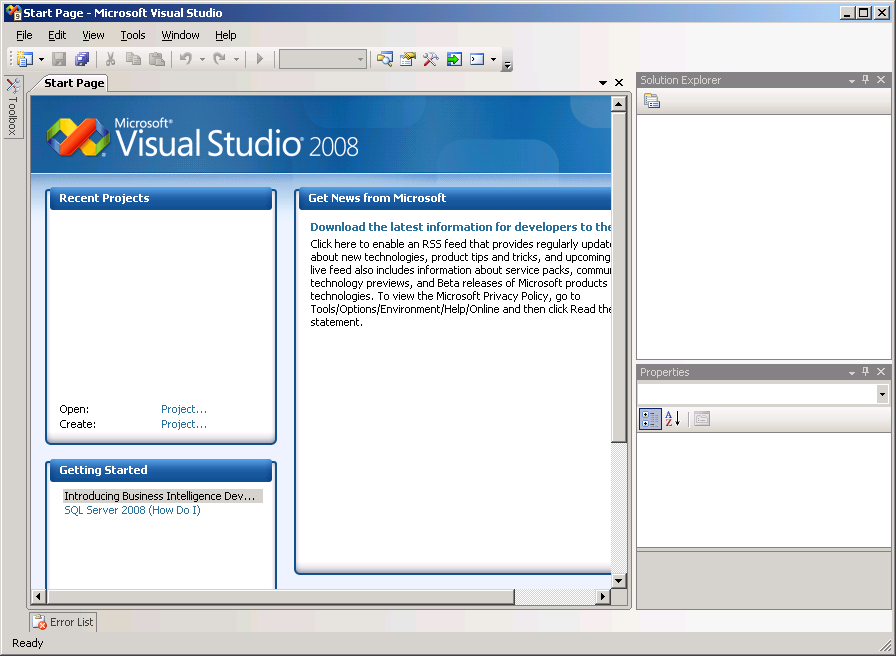
## Visual Studio Configuration

Visual Studio as installed makes various attempts to contact the Internet. If the Internet is not available, the user will experience a series of delays while attempts at connecting to the Internet time out. Visual Studio is therefore configured so that it will never attempt to contact the Internet, resulting in improved performance.

The Visual Studio configuration relates to Process Id 6D in the *FineBuild6ConfigureUsers* script. Automated configuration of Visual Studio requires all of the following to be true:

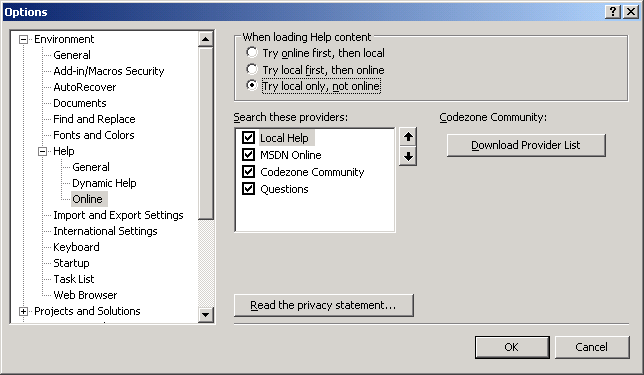
* *SetupVS* keyword in the configuration file set to YES.

1. Start Visual Studio (Start -> Programs -> Microsoft Visual Studio 2008 -> Microsoft Visual Studio 2008).



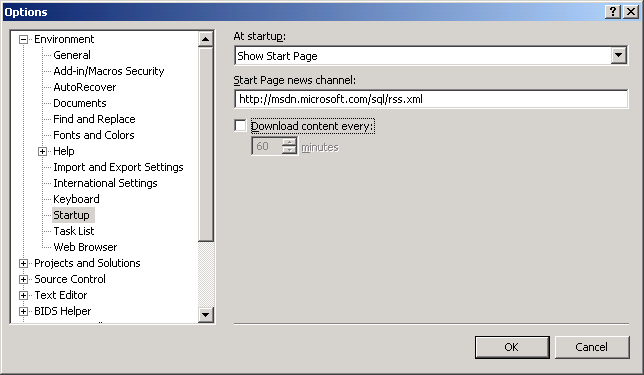
1. Select Tools -> Options, then locate *Help* and click on *Online*. Set the following value

When loading help content Try local only, not online

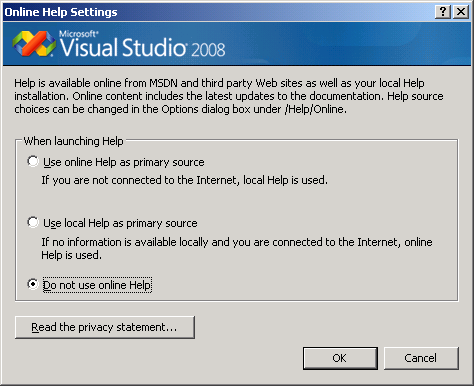


1. Locate *Startup* and set the following value. Click *OK* to continue.

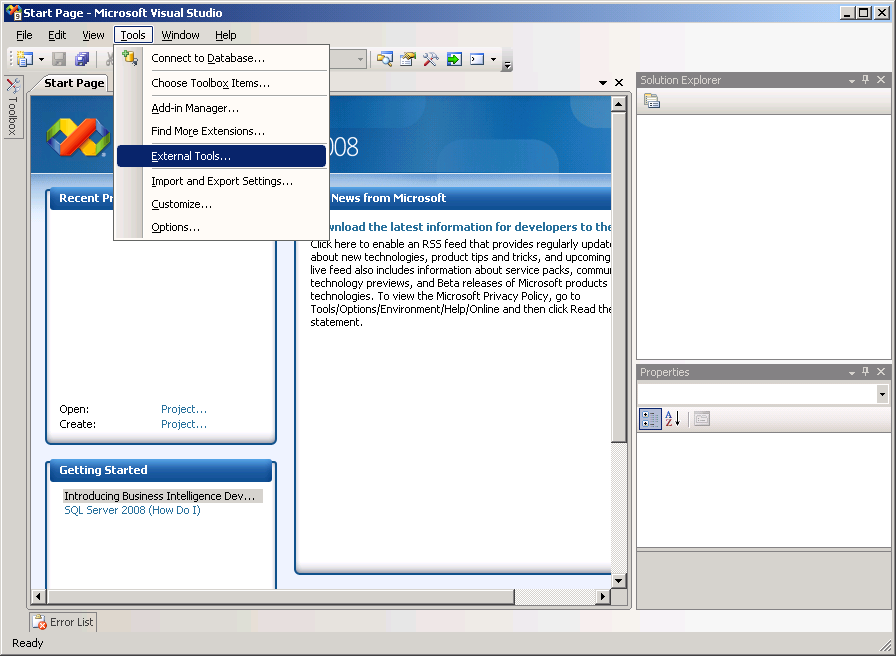
Download content every: Clear



1. Configure the Help options to search local files only. Select *Help -> How Do I*. In the *Online Help settings* window, select *‘Do not use online Help’*. Click ‘*OK*’ to continue.



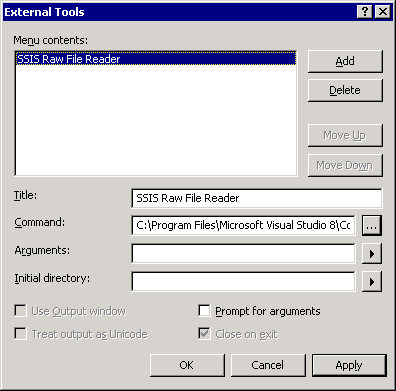
1. Add the Raw File Reader to the list of external tools. Select *Tools* and then select *External Tools*.



1. Set the following External Tools values, then click *OK* to continue.

Title SSIS Raw File Reader

Command Click the ellipses, then type RawFileReader.exe



## Configure Internet Settings

There are many places in the SQL Server tools where certificates are checked. These checks will default to accessing an external certificate authority web site. If the SQL Server is installed in an environment that does not have external internet access, the user will experience a number of 15-second delays while these checks time-out.

Certain Internet Options can be set in order to prevent certificate lookup. As these items cannot be included in a GPO, they must be performed manually at this stage.

The Internet configuration relates to Process Id 6E in the *FineBuild6ConfigureUsers* script. Automated configuration of Internet requires all of the following to be true:

* *SetupNet* keyword in the configuration file set to YES.

Note: If a site PKI infrastructure has been set up, this section will require changes and may become obsolete.

1. Select Settings -> Control Panel -> Internet Options -> Advanced, then scroll down to the *Security* section and set the following values. Click *OK* to continue.

Check for Publisher’s certificate revocation Clear

Check for server certificate revocation (requires restart) Clear

Warn about invalid site certificates Clear



## Setup Windows

### Optional Windows Settings

The Optional Windows Settings configuration relates to Process Id 6F in the *FineBuild6ConfigureUsers* script. Automated configuration of Optional Windows Settings requires all of the following to be true:

* *SetupWindows* keyword in the configuration file set to YES.

The windows settings described below are completely optional. However, they provide useful functionality and have therefore been included in the FineBuild configuration.

| Description | GUI Path | Registry Key |
| --- | --- | --- |
| Automatically move mouse pointer to default dialogue button | Open Control Panel and click on *Mouse*. Select *Pointer Options* and check *Snap to Default Button*. | HKCU\Control Panel\Mouse\ SnapToDefaultButton = 1 |
| Lock the Start bar | Right-click on Start bar and select *Properties*. Check *Lock the taskbar*. | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced\ TaskBarSizeMove = 0 |
| Do not use Personalised Menus | Right-click on Start bar and select *Properties*. Select *Start Menu* and click *Customize*. Locate and clear *Use Personalized Menus*. | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced\ IntelliMenus = 0 |
| Show Control Panel as a Menu | Right-click on Start bar and select *Properties*. Select *Start Menu* and click *Customize*. Locate and check *Expand Control Panel*. | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced\CascadeControlPanel = ‘YES’ |
| Set default mode for Windows Explorer to Explore | Select Windows Explorer *Tools* Menu. Then select *Folder Options* and click on *File Types.* Locate and click on *Folders*. Click *Advanced*, highlight *Explore* and click on *Set Default*. | HKCR\Folder\shell\ (default) = ‘explore’ |
| Do not display full path in Title Bar | Select Windows Explorer *Tools* Menu. Then select *View*, then locate and clear *Display the full path in the title bar.* | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\ CabinetState\Fullpath = 0 |
| Do not search for network folders | Select Windows Explorer *Tools* Menu. Then select *View*, then locate and clear *Automatically search for network folders and printers.* | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced\NoNetCrawling = 1 |
| Show file extensions for known file types | Select Windows Explorer *Tools* Menu. Then select *View*, then locate and clear *Hide extensions for known file types.* | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced\HideFileExt = 0 |
| Show hidden files | Select Windows Explorer *Tools* Menu. Then select *View*, then locate and check *Show hidden files and folders.* | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced\Hidden = 1 |
| Show Operating system files | Select Windows Explorer *Tools* Menu. Then select *View*, then locate and clear *Hide protected operating system files.* | HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced\ShowSuperHidden = 1 |

### Setup Menu Items

The Setup Menu Items configuration relates to Process Id 6G in the *FineBuild6ConfigureUsers* script. Automated configuration of Setup Menu Items requires all of the following to be true:

* *SetupWindows* keyword in the configuration file set to YES.
* Operating system is not Windows 2008 R2 or above

| Description | Folder Path |
| --- | --- |
| SQL Server Management Studio Quick Launch | Copy the existing shortcut found in C:\Documents and Settings\All Users\Start Menu\Programs\Microsoft SQL Server 2008 to the user profile Quick Launch bar |
| Windows Explorer Quick Launch | Copy the existing shortcut found in C:\Documents and Settings\Default User\ Start Menu\Programs\Accessories to the user profile Quick Launch bar |

## Configure ‘My Documents’ Location

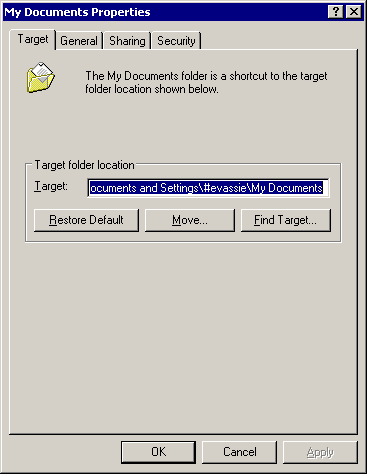
The location for the ‘My Documents’ folder for all users is moved to a common location the E: drive for the following reasons:

* Avoid adding unnecessary items to the C: drive.
* Ensure that work performed by the DBA team is easily available to all team members.
* Ensure that DBA Team files can easily be included in a backup, as many sites do not regularly take backups of the C: drive.

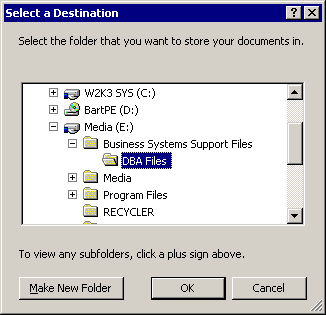
The ‘My Documents’ configuration relates to Process Id 6H in the *FineBuild6ConfigureUsers* script. Automated configuration of ‘My Documents’ requires all of the following to be true:

* *SetupMyDocs* keyword in the configuration file set to YES.

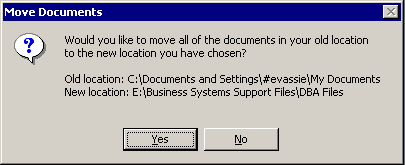
1. Right-click on the *My Documents* icon on the Desktop and select *Properties*.



1. Click Move and navigate to E:\DBAFiles. Click OK to continue.



1. Click Yes to the confirmation message



## Configure Outlook Mail Profile

This process should only performed during the install of a default instance of SQL Server.

It is required only for the SQL Server service account, and only if the applications running on SQL Server require to use SQL Server Mail. If applications are only using DB Mail, this step is not required.

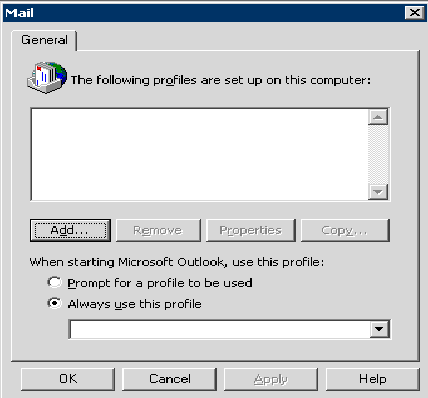
An Outlook mail profile must be created for the SQL Server service account to allow SQL Server to send alerts via e-mail. Only one Outlook mail profile can be used by SQL Server, and this can be used by all instances that share the same service account. If a named instance is set up that uses a different service account to the other instances, then that instance cannot use the Outlook mail profile or SQL Mail facilities but it can use DB Mail facilities.

The Outlook mail profile can be configured using either the automated install or the interactive install process.

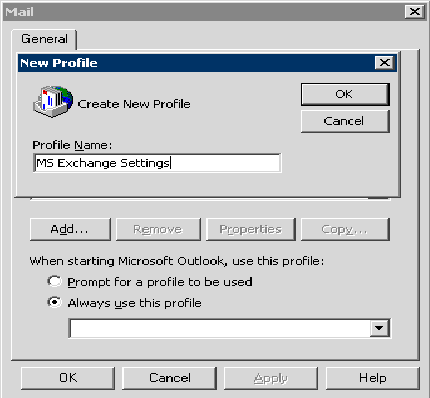
The Outlook configuration relates to Process Id 6H in the *FineBuild6ConfigureUsers* script. Automated configuration of Outlook requires all of the following to be true.

* *SetupOutlook* keyword in the configuration file set to YES.
* SQL Server is running using a Domain service account.
* The logged-on user is the SQL Server service account.
* An Exchange server name is either supplied by a /Mailserver: parameter, or an Exchange server can be found on the Domain.

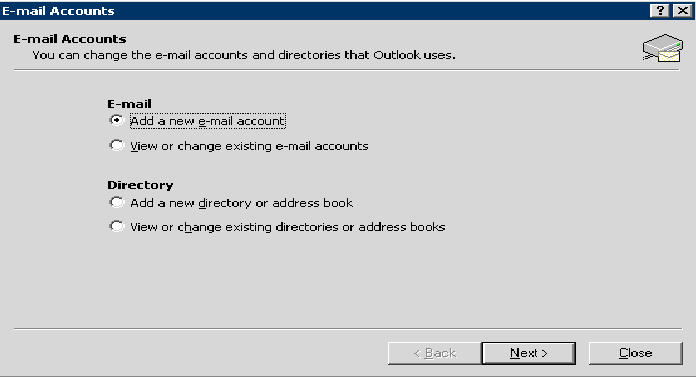
1. Log on to the server using the SQL Server service account and ensure that Outlook has been installed. If Outlook has been installed, there will be an Outlook icon on the desktop. If this does not exist, raise a Work Request to ask your *Support Centre* to install Outlook.
2. Right click on the Microsoft Outlook icon and choose Properties. The following window should appear: Click ‘Add’ to add a new Profile.



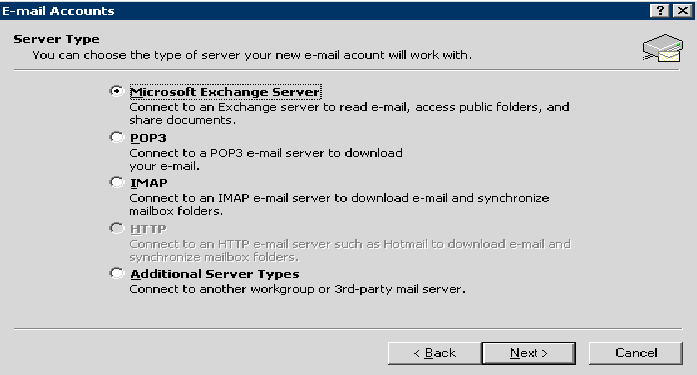
1. Type ‘MS Exchange Settings’ as shown. Click on ‘OK’ to continue.



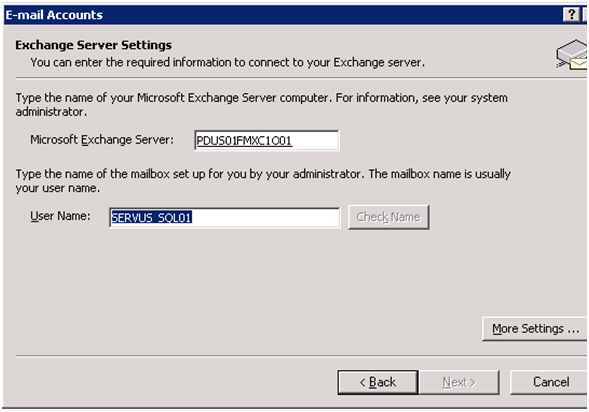
1. Choose ‘Add a new e-mail account’ and click ‘Next’ to continue.



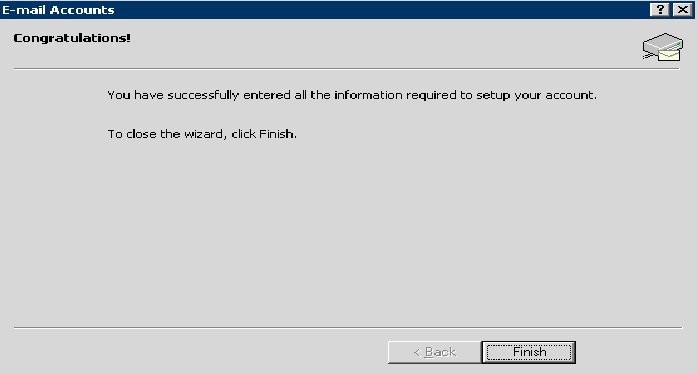
1. Choose the ‘Microsoft Exchange Server’ option and click ‘Next’ to continue.



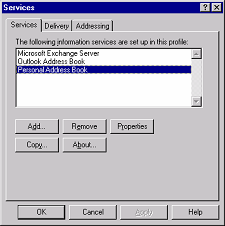
1. Enter the correct details for the Microsoft Exchange server and mailbox. The mailbox should be the same as the SQL Service account used to create the mail profile. Click ‘Next’ to continue.



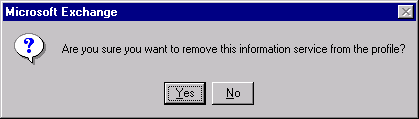
1. Click ‘Finish’ to complete the mail profile setup.



1. This step is only required if the Personal Address Book was included in the mail profile. In Outlook, select the ‘Tools’ menu item then select ‘Services’.



Highlight ‘Personal Address Book’ and then click ‘Remove’. The following confirmation window is displayed. Click ‘Yes’ to continue, then click ‘OK’



## Disable Install Login

The login used to run this SQL Server install process should be disabled, except when doing a Workstation build.

If the login used to run FineBuild is a member of the DBA System Adminitrators group, this login should be dropped as the login will inherit all required rights from the DBA System Administators group.

If the login used to run FineBuild is not a member of the DBA System Adminitrators group, this login should be disabled. This will prevent the login from being used for SQL System.Administration, but will allow the login to be quickly re-enabled when Service Packs or other updates need to be applied to the SQL Server programs. If this account is dropped, all further configuration must be performed using a DBA account.

## Server Reboot

Reboot the server to ensure a completely clean configuration is used.

## Server Handover

All tasks required to produce a SQL Server FineBuild for a given instance are now complete. The server can now be handed over to the Application Support teams.

# Workstation Build Install

The Workstation Build is intended mainly for Development Workstations, where developers require the use of a local SQL Server instance during application development. The build is very similar to the Main Server Build, except that all components are installed on to a single drive and all services run using local NETWORK SERVICE authority.

Installation of a Workstation Build is normally performed using the 1-click process *Workstation Build* via the *SQLFineWorkstation* script described in on page 7. All install activity should be done when logged on using an account with local Administrator authority.

## Preparatory Tasks

All tasks in this section must be completed before the SQL Server workstation build installation is handed over for use.

1. The on page 8 should be performed as part of the Workstation Build install process.
2. The on page 8 should be reviewed. For a Workstation Build, normally only the System drive is required, the requirements for the other drives can be ignored.
3. The on page 10 should be reviewed.
4. The process on page 10 should be followed to make the install media available for running FineBuild.

## Run FineBuild

Some of the tasks cannot be automated, and must be performed interactively. The residual interactive tasks are listed below and should be completed before the server is handed over for use:

1. Complete the Preparatory Tasks starting with on page 12 and then all remaining tasks up to on page 13.

### Preparation Processing

The on page 11 processing should be done. Normally all files and folders should be placed on the System drive is required for a Workstation Build.

### SQL Server Workstation Install

| **Item** | **Description** |
| --- | --- |
|  | **Workstation Build Installation** |
| [Install SQL Pre Install Tasks](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation# Install%20SQL%20Pre%20Install%20Tasks) | Install software required prior to installing SQL Server |
| [Workstation Build Install](http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Workstation%20Build) | Install SQL Server for a Workstation Build |
| [SQL Server Fixes Install](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#SQL%20Fixes%20Install) | Install SQL Server Fixes |
| [Extra Components Install](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#Extra%20Components%20Install) | Install Client Tools Community Components |
|  | **Workstation Build Configuration** |
| Workstation Configuration | See on page 20, but do not remove the BUILTIN\Administrators account in on page 31. |
| [User Preferences](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#User%20Configuration) | See on page |

The SQL Server Workstation FineBuild is now complete. Reboot the server to ensure a completely clean configuration is used.

# Client Tools Install

The Client Tools install is should be performed when it is required to install only the client tools, such as on the DBA Admin Servers.

It is not required to perform a client tools install for a Workstation build, as the client tools are installed along with the rest of the SQL Server components.

Installation of a Client Build is normally performed using the 1-click process *Client Build* via the *SQLFineClient* script. There are no residual interactive tasks for this section.

All install activity should be done when logged on using an account with local Administrator authority.

## Preparatory Tasks

All tasks in this section must be completed before the SQL Server client tools installation is handed over for use.

1. The on page 8 should be performed as part of the Client Tools install process.
2. The on page 8 should be reviewed. For a Client Tools install, normally only the System drive is required, the requirements for the other drives can be ignored.
3. The on page 10 should be reviewed. For a Client Tools install MSDTC is not required.
4. The process on page 10 should be followed to make the install media available for running FineBuild.

## Run FineBuild

The SQL Server installation is performed by running the *Client Build* described inin on page 7.

Some of the tasks cannot be automated, and must be performed interactively. The residual interactive tasks are listed below and should be completed before the server is handed over for use:

1. Complete the on page 12.

### Preparation Processing

The on page 11 processing should be done. Normally all files and folders should be placed on the System drive for a Client Tools install.

#### GPO Preparation

Group Policy Objects (GPOs) can be set up[[1]](#footnote-1) to enforce authorities and permissions. GPO setup is documented online, for full details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Group%20Policy%20Management>

### SQL Server Client Components Install

| **Item** | **Description** |
| --- | --- |
|  | **Client Tools Installation** |
| [Install SQL Pre Install Tasks](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation# Install%20SQL%20Pre%20Install%20Tasks) | Install software required prior to installing SQL Server |
| [Client Build Install](http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Client%20Build) | Install SQL Server for a Client Build |
| [SQL Server Fixes Install](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#SQL%20Fixes%20Install) | Install SQL Server Fixes |
| [Extra Components Install](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#Extra%20Components%20Install) | Install Client Tools Community Components |
|  | **Client Tools Configuration** |
| SQL Server Menu Items | See on page |
| Windows Menu Items | See on page |
| [User Preferences](http://sqlserverfinebuild.codeplex.com/wikipage?title=Documentation#User%20Configuration) | See on page |

The SQL Server Client Tools FineBuild is now complete. Reboot the server to ensure a completely clean configuration is used.

1. Appendix

The Appendix contains items that do not form part of the SQL Server install process, but which are related to it (e.g. for planning or troubleshooting purposes).

* 1. FineBuild Media Setup
     1. SQL Server Instance Naming Standards

The folder and path naming standards used by SQL FineBuild are documented online, for full details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Naming%20Standards>

* + 1. Install Media Preparation

Before FineBuild can be used, the install media must be prepared. This preparation is documented online, for full details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Media%20Preparation>

* + 1. Site-Specific Components

Installation of site-specific components can be performed within the FineBuild process. There are two places where site-specific code can be added to FineBuild:

1. User1Preparation

This should be used for any additional processing required before SQL Server is installed. The main use for this routine is to automate a Cluster setup by clustering MSDTC, etc.

The *User1Preparation* script is automatically run by the SQLFineBuild script, as the default value for the *UserPreparation* keyword in the configuration is *Yes*. If you want to run a different file, supply the path to your User Preparation script in the *UserPreparationvbs* keyword.

The *User1Preparation* script contains standard code for initialisation, restart, error-handling, and utility functions. User code should be entered in the *ProcessUserConfig()* subroutine.

Examples of how to code SQL statements or reading and writing to the Windows Registry can be found in the main FineBuild scripts. Feel free to copy what you need and change it to meet your requirements.

1. User2Configuration

This should be used for any additional configuration required before the server is handed over for operational use.

The *User2Configuration* script is automatically run by the SQLFineBuild script, as the default value for the *UserConfiguration* keyword in the configuration is *Yes*. If you want to run a different file, supply the path to your User Configuration script in the the *UserConfigurationvbs* keyword.

The *User2Configuration* script contains standard code for initialisation, restart, error-handling, and utility functions. User code should be entered in the *ProcessUserConfig()* subroutine.

Site-specific options can also be specified for the SQL Server base install by using the */UserOptions:* parameter.

* + 1. Disk Space Requirements

The following permanent disk space requirements are needed to install SQL Server. In addition to these requirements, space will be required on the System drive for updates to Windows, anti-virus and other software required at your site.

The space requirements have been taken from the SQL Server install documentation, (normally the Readme file), and adjusted where actual values are known from installations. Most of the space on C:\ is required for objects in the Global Authorisation Cache (GAC).

If the program files are placed on the System drive, then the space required on the System drive is the sum of the C:\ and E:\ drive figures given below.

| **Main Instance Install Task** | C:\ Space  System | E:\ Space  Programs | J:\ Space  SQL Data | K:\ Space  SQL Log | Install Media |
| --- | --- | --- | --- | --- | --- |
| Initial Microsoft Installation | 3,000 MB | 800 MB | 5 MB | 7 MB | 3,000 MB |
| FineBuild Additional Components | 200 MB | 80 MB | 600 MB | 130 MB | 200 MB |
| CU (typical) | 900 MB | 0 MB | 0 MB | 0 MB | 350 MB |
| Service Pack (typical) | 900 MB | 300 MB | 0 MB | 0 MB | 900 MB |
| Total space after 5 years assuming 3 SPs and 10 CUs | 15,000 MB | 1,800 MB | 600 MB | 140 MB | 9,400 MB |

If a named instance is installed, each named instance will require the following additional space. A small amount of additional space may be added to the E: drive for each service pack or CU.

| **Named Instance Install Task** | C:\ Space  System | E:\ Space  Programs | J:\ Space  SQL Data | K:\ Space  SQL Log | Install Media |
| --- | --- | --- | --- | --- | --- |
| Initial Installation | 300 MB | 550 MB | 600 MB | 130 MB | 0 MB |

While any install process is running, the additional temporary space will be required:

C:\ 2,000 MB

System \Temp folder 600 MB

Additional permanent disk space will be needed for user databases, database backups, etc, which should be specified in the handover documentation for each SQL Server machine.

* 1. FineBuild Advanced Features
     1. SQL Media Alternative Folder Names

The folder names and locations given for are the default values used by FineBuild. However, run-time parameters can be used to supply different folder names or locations.

The options available and how to use them is documented online. For further details please see <http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Media%20Alternative%20Folder%20Names>.

* + 1. Upgrade from Old Version of SQL Server

This section covers the tasks needed to upgrade a standard implementation of SQL Server 2000 or above to a more recent version of SQL Server.

There are two methods of performing an upgrade of SQL Server:

1. Clean Install upgrade to the new version of SQL Server

This method involves using a new server to host the new version of SQL Server.

This is the recommended method of performing the upgrade because it results in a completely standard installation of SQL Server that should minimise future support issues.

1. In-Place upgrade to a new version of SQL Server

This method involved running the install process with special options to upgrade the old version of SQL Server directly to the new version. Although there may be situations where this appears to be the most appropriate method to upgrade SQL Server, the use of this method is not recommended. This is because there is a real risk that the upgrade will fail leaving SQL Server unusable. If the upgrade does succeed then the resulting file locations and registry entries give a non-standard installation of SQL Server which could cause long-term support issues.

If you do use the in-place upgrade method, your planning must allow for the re-installation of Windows if SQL Server becomes unusable. Experience has shown that upgraded that require the installation of .Net 3.5 SP1 are particularly vunerable to failure – for more details please see:  
<http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Server%20Installation%20Problems>.

The first step in doing any upgrade is to review the advice given by Microsoft concerning the upgrade. This will highlight any pre-requisite software levels and common problems. The Microsoft advice strongly recommends using the SQL Server *Upgrade Advisor* tool to assist in identifying potential problems with your own system. The information given here assumes that you have completed all necessary preparation and are ready to perform the upgrade.

* + - 1. Clean Install Upgrade to New Version of SQL Server

This process can be used to upgrade from either SQL Server 2000 or SQL Server 2005. Any version-specific work will be highlighted.

* + - * 1. Preparatory Tasks

1. Install the desired version of Windows on to a new server. A physical or virtual server can be used.
2. If the routines contained in the *SqlDBAManagement.Cab* file have not been installed on your old SQL Server instance, then install them as they will be used in the next step.
3. Extract all files from the *VersionUpgrade.Cab* file into a temporary folder.

See <http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Components%20Inventory> for an overview of these Cab files.

1. Run the *SQL2000\_Export* script to script the following items:
   1. SQL Server logins
   2. User database roles in master, model or msdb.
   3. SQL Batch Jobs.
   4. SQL Agent Alerts.
   5. SQL Agent Operators.
   6. DTS packages. These will be saved as structured storage files.
2. **For SQL Server 2005 and above only**, export the following objects. FineBuild does not provide any support for exporting these objects.
   1. Encryption Keys
   2. Certificates
   3. Endpoint definitions
   4. Server permissions
   5. Service Broker configuration
3. Take backups of all user databases. Save these backups until the upgrade is complete and the server has been accepted by Application Support.
   * + - 1. SQL Server Installation
4. SQL Installation

If the main instance is being upgraded then use the *Main Instance Server Build* described in on page 7.

If an additional named instance is being upgraded then use the *Additional Named Instance Server Build* described in on page 7.

Complete all the residual interactive tasks described online for the selected build.

* + - * 1. Post-Upgrade Tasks

1. Reboot the server.
2. Restore all user databases that were backed-up in of 6) on page 51.

Do not attempt to restore any system databases or any databases used for SQL Server components such as Reporting Services. The databases supplied with the new version of SQL Server have significant structure changes and if you use the old versions then SQL Server will not work correctly.

1. Update and run the *SQL2008\_Edit\_Jobs.bat* script as indicated within the script. Ensure that details are added for all user databases.
2. Register any DTS Custom Tasks that are required by applications running on this server. Any DTS OCX components that are placed in the Windows *\system32* folder on a 32-bit system must instead be placed in the Windows *\SysWOW64* folder on a 64-bit system.
3. Run the *SQL2008\_Import* script. This will import all items exported in of on page 51.
4. Review all SQL Server jobs. Check that any file names referenced are valid for the new version of SQL Server. If upgrading from SQL Server 2000, update the syntax of any job tokens to comply with the syntax given in KB 915845.
5. **For SQL Server 2005 only.** Import all objects exported in 5) of on page 51. FineBuild does not provide any support for importing these objects.
6. Open the Properties page for each user database, and set the compatibility option to *10.0* (SQL Server 2008). Apply the database options given in on page 27.

Note: If you have multiple servers that are grouped together for failover purposes (as a cluster or otherwise), then database compatibility should remain at the original compatibility level until all servers in a failover group are upgraded to the new version of SQL Server. If changing database compatibility is deferred, it may be necessary to repeat the steps below after the database compatibility level is increased.

1. Perform a Statistics update for all databases, using 100% sampling. This is required because each new version of SQL Server introduces new statistics components that are used to select optimal access paths, but these are not available until statistics have been rebuilt. This process can take a number of hours.
2. Take backups of all databases after the Statistics update has finished.
3. Raise a GPO change to remove the SQL service accounts from the local Administrators group.
4. If your site has a standard set of scripts that verify the correct operation of SQL Server (e.g. after a Patch Installation), then run these scripts now. This should verify the continued correct operation of all services following the upgrade.
5. If your site has a standard set of scripts that verify the correct functioning of all SQL Server applications (e.g. after a Failover), then run these scripts now. This should verify the continued correct functioning of all applications following the upgrade.
6. Hand over the server for live use.
   * + 1. In-Place Upgrade to new version of SQL Server

This method of upgrading SQL Server is not recommended. This is because the resulting file locations and registry entries give a non-standard installation of the new version of SQL Server which could cause long-term support issues.

* + - * 1. Preparatory Tasks

1. Complete all the non-automated processes in on page 8, with one exception. (The automated portions of will be performed by the SQLFineServer script.)

The exception is that the SQL Server service account must remain a member of the local Administrators group until the upgrade to SQL Server is complete.

1. Raise a ticket for your *Support Centre* to take an image of the System (C:) and SQL Program Folder (E:) drives of the server. These may be needed to restore from if the upgrade process is not successful.
2. Take backups of all databases (apart from tempdb). Save these backups until the upgrade is complete and the server has been accepted by Application Support.
3. Manually run the .Net 3.5 SP1 install. If this install succeeds then it is possible to continue with the SQL upgrade.

If the .Net 3.5 SP1 install fails, it is not possible to complete the upgrade of SQL Server. In this situation the system backups taken in 2) should be restored and a plan made to re-install Windows on this server.

1. Review list of additional components installed with the old version of SQL Server. Some components (e.g. SQL Internals Viewer) do not support an upgrade in place to a new version of the component. These components must be uninstalled before running the FineBuild SQL Server upgrade.
2. Detach all user databases. This is done to safeguard the format of the user databases while the upgrade is being run. If the upgrade process does not complete successfully, it will be easier to resolve any issues if the user databases are not involved.
3. If the master database or **for SQL 2005 only** the resource database has been moved from their original locations, then they must be returned to their original locations. The model, msdb and tempdb databases can remain in their current location. Use the process for moving system database files given in BOL. Although the upgrade processing should be able to cope with customised locations for the system databases, testing has shown this is not always the case.
4. If the ownership of any of master, model, msdb or tempdb has been changed away from *sa*, then ownership must be changed back to *sa*.
5. The account running the install process must be both a member of the Windows local Administrators group and be a member of the DBA system administrators group for the SQL Server instance being upgraded.
6. **For SQL Server 2000 only**, if the stored procedure *msdb.dbo.sp\_send\_dbmail* exists, then drop it. This will be replaced by a Microsoft-supplied procedure in the new version of SQL Server.
7. **For SQL Server 2005 only**, if the *sa* account has been renamed, it must be changed back to *sa* before starting the upgrade process, due to a bug in the Microsoft code.
   * + - 1. SQL Server Installation
8. SQL Installation
   1. If the main instance is being upgraded then use the *Main Instance Server Build* described in on page 7, using the following parameters:

**CALL "SQLFineServer.bat" /Type:Upgrade ^**

*/RsUpgradeDatabaseAccount:ROOT\ServGB\_SQLRS\_0001" /RSUpgradePassword:"Orfd450!#DTWjn63hw45JDD873hk84*

* 1. If an additional named instance is being upgraded then use the *Additional Named Instance Server Build* described in on page 7, and add the following parameters:

**CALL "SQLFineInstance.bat" /Type:Upgrade ^**

**/Instance:HR ^**

*/RsUpgradeDatabaseAccount:ROOT\ServGB\_SQLRS\_0001" /RSUpgradePassword:"Orfd450!#DTWjn63hw45JDD873hk84*

If the SQL Server installation fails, it can be difficult to track down the root cause of the problem. The final failure that is reported is often not the root cause, and you must be prepared to study the SQL Server install log files and Errorlog files carefully until the root cause is identified.

It is also important to confirm that the preparatory tasks 5), 7), 8), 9), and 11) were all completed. If one of these steps was not performed, it may be possible to perform it now and rerun the upgrade process. However, if the upgrade fails at the same point it is advisable to restore from the Windows and SQL Server backups before re-trying the upgrade process another time.

**Warning: If the install of SQL Server in the upgrade process fails, SQL Server could become unusable. In this situation the following process is required for recovery:**

a) Un-install SQL Server.

b) Install the old SQL Server version.

c) Restore all system databases from the backups taken above.

d) Re-start the SQL Server upgrade process using the Clean Install option.

* + - * 1. Post-Upgrade Tasks

1. Reboot the server.
2. Move all user database files to folder names that comply with the on page 49.
3. Re-attach all user databases that were detached in step 5) of on page 53.
4. Review all SQL Server jobs. Check that any file names referenced are valid for the new version of SQL Server. Also update the syntax of any job tokens to comply with the syntax given in KB 915845.
5. Open the Properties page for each user database, and set the compatibility option to *10.0* (SQL Server 2008). Apply the database options given in on page 27.

Note: If you have multiple servers that are grouped together for failover purposes (as a cluster or otherwise), then database compatibility should remain at the original compatibility level until all servers in a failover group are upgraded to the new version of SQL Server. If changing database compatibility is deferred, it may be necessary to repeat the steps below after the database compatibility level is increased.

1. Perform a Statistics update for all databases, using 100% sampling. This is required because each new version of SQL Server introduces new statistics components that are used to select optimal access paths, but these are not available until statistics have been rebuilt. This process can take a number of hours.
2. Take backups of all databases after the Statistics update has finished.
3. Raise a GPO change to remove the SQL service accounts from the local Administrators group.
4. If your site has a standard set of scripts that verify the correct operation of SQL Server (e.g. after a Patch Installation), then run these scripts now. This should verify the continued correct operation of all services following the upgrade.
5. If your site has a standard set of scripts that verify the correct functioning of all SQL Server applications (e.g. after a Failover), then run these scripts now. This should verify the continued correct functioning of all applications following the upgrade.
6. Hand over the server for live use.
   * 1. Apply SQL Server SP or CU

The FineBuild scripts can be used to apply a Service Pack or Cumulative Update maintenance.

This process will normally place a new copy of the mssqlsystemresource database, and update the master database with details of the update. Experience with SQL Server 2005 has shown that the update process can fail if these databases are not in their default locations, due to a mis-match between the expected values in mssqlsystemresource and the actual values, causing SQL Server to fail to start. In order to minimise risk with SQL Server updates, a design decision was made for FineBuild to leave these databases in their default locations

Applying a SP or CU to SQL Server using FineBuild can be done either with the SQLFineFix script or by manually running the underlying processes as described in on page 16.

The syntax and options for the SQLFineFix script is described below:

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REM

**CALL "SqlFineBuild.bat" %\* /Type:Fix /IAcceptLicenseTerms ^**

**/InstSP:Yes /InstSPCU:Yes /InstSPCUSNAC:Yes /InstBOL:Yes ^**

**/SPLevel:SP1 /SPCULevel:CU4**

* The */Inst...* keywords specify which components are to be updated.
* The */SPLevel*: and */SPCULevel*: keywords specify the updates that are to be applied.
* The file names of the updates are given in the *Files* node of the configuration file. If necessary, add additional entries to the Files node based on the examples already there.
  + 1. Install SQL Server as a Cluster

FineBuild supports installing SQL Server 2005 and above on a Windows cluster, including many common pre-installation and post-installation tasks.

| **Item** | **Description** |
| --- | --- |
|  | **Cluster Planning** |
| [SQL FineBuild Cluster Overview](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20FineBuild%20Cluster%20Overview) | Overview of the SQL FineBuild Cluster Install process |
| [Cluster Naming Convention](http://sqlserverfinebuild.codeplex.com/wikipage?title=Cluster%20Naming%20Convention) | Naming convention for SQL FineBuild Clusters |
| [Cluster IP Address Allocation](http://sqlserverfinebuild.codeplex.com/wikipage?title=Cluster%20IP%20Address%20Allocation) | Assighment of IP Addresses to SQL Clusters |
| [Cluster Disk Configuration](http://sqlserverfinebuild.codeplex.com/wikipage?title=Cluster%20Disk%20Configuration) | Configuration of disks for Cluster installation |
| [SSIS Cluster Guidelines](http://sqlserverfinebuild.codeplex.com/wikipage?title=SSIS%20Cluster%20Guidelines) | Guidelines for when it is safe to use a SSIS Cluster |
|  | **Cluster Installation** |
| [Cluster Install Preparation](http://sqlserverfinebuild.codeplex.com/wikipage?title=Cluster%20Install%20Preparation) | Preparation required prior to installing a SQL Server Cluster |
| [Install First SQL Server Cluster Node](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20first%20SQL%20Server%20Cluster%20node) | Install the first node of the first SQL Cluster |
| [Install Remaining SQL Server Cluster Nodes](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20remaining%20SQL%20Server%20Cluster%20nodes) | Install remaining nodes of the first SQL Cluster |
| [Install Additional SQL Server Clusters](http://sqlserverfinebuild.codeplex.com/wikipage?title=Install%20additional%20SQL%20Server%20Clusters) | Install additional SQL Clusters on the same Windows Cluster |

* + 1. Large Scale Deployment Using SQL FineBuild

This subject is documented online. For details see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Large%20Scale%20Deployment%20Using%20SQL%20FineBuild>.

* + 1. Non-English Versions of SQL Server

FineBuild can be used to install non-English versions of SQL Server on non-English versions of Windows. This subject is documented online. For details see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Non-English%20Versions%20Of%20SQL%20Server>.

* + 1. Security Compliance

FineBuildf can help you comply with common Security Standards. This subject is documented online. For details see <http://sqlserverfinebuild.codeplex.com/wikipage?title=Security%20Compliance>.

* + 1. FineBuild Components Inventory

The FineBuild Components Inventory contains an overview of all the components that make up FineBuild (including the Configuration File, Log file and Report file), and the and is documented online. For further details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Components%20Inventory>

* + 1. FineBuild Parameter Inventory

The FineBuild Parameter Inventory is described online. For more details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Parameter%20Inventory>

* + 1. Troubleshooting

This section gives some troubleshooting hints for problems that may occur during SQL Server installation. It is not intended as a guide to SQL Server problems that may occur following completion of the SQL Server installation.

The FineBuild scripts are designed to simplify troubleshooting, and can be restarted in the event of a failure. Troubleshooting FineBuild is documented online. For further details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=FineBuild%20Troubleshooting>.

* 1. Best Practise Advice

This section contains advice on best practise for operating SQL Server.

| **Item** | **Description** |
| --- | --- |
| [Best Practice Guidelines](http://sqlserverfinebuild.codeplex.com/wikipage?title=Best%20Practice%20Guidelines) | Guidelines for what forms *Best Practice* |
| [SQL Server Administration](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Server%20Administration) | Best Practice for administering SQL Server |
| [SQL Server Proxy Accounts](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Server%20Proxy%20Accounts) | Creation and management of the xp\_cmdshell proxy and the SQL Agent job proxy accounts. |
| [DBA Password Store](http://sqlserverfinebuild.codeplex.com/wikipage?title=DBA%20Password%20Store) | A secure place used by the DBA team to store passwords |
| [SQL Server Memory Management](http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Server%20Memory%20Management) | How to optimise SQL Server use of memory |
| [Group Policy Management](http://sqlserverfinebuild.codeplex.com/wikipage?title=Group%20Policy%20Management) | Management of Group Policy Objects |
| [Configure SQL Server Certificates](http://sqlserverfinebuild.codeplex.com/wikipage?title=Configure%20SQL%20Server%20Certificates) | Installing Certificates to manage SQL Server Encryption |

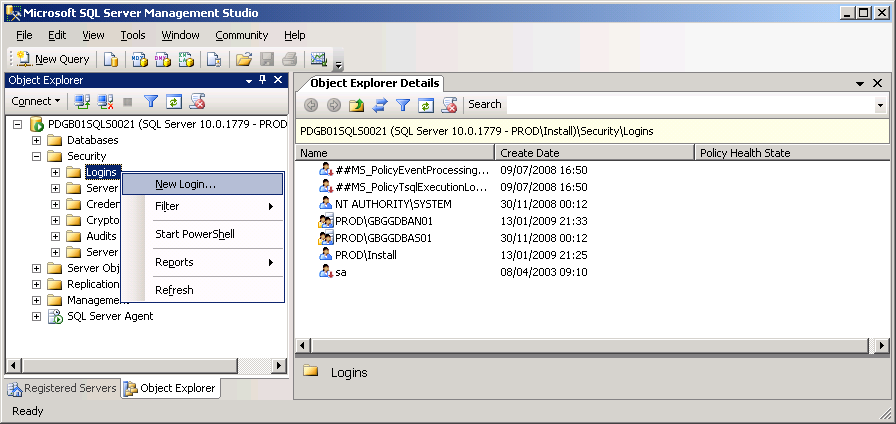
* 1. User Account Maintenance

The naming standard used within SQL FineBuild for Windows Group and Account names is described online. For details see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=SQL%20Naming%20Standards>

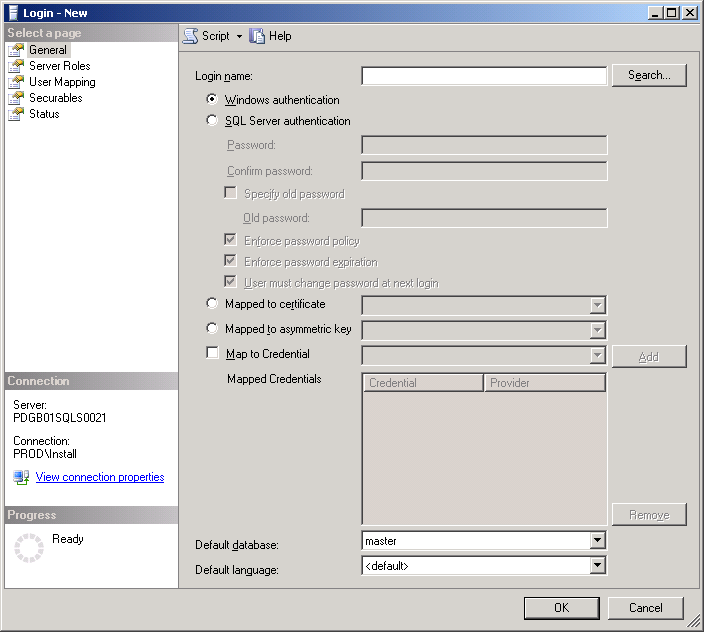
The process of adding a user account to SQL Server is described in *How to: Create a SQL Server Login* and *How to: Create a Database User* in SQL Server Books Online.

The following process will create a login for the Windows group on SQL Server.

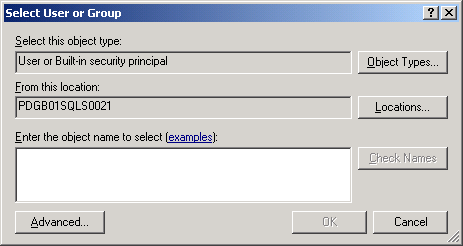
1. Use SQL Server Management Studio to connect to the SQL instance. Navigate to *Logins*, right-click and select *New Login*.



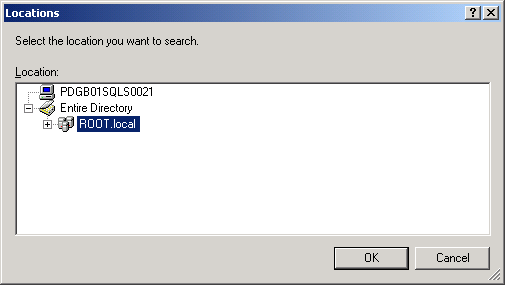
1. Click on the *Search* button to find the required login.



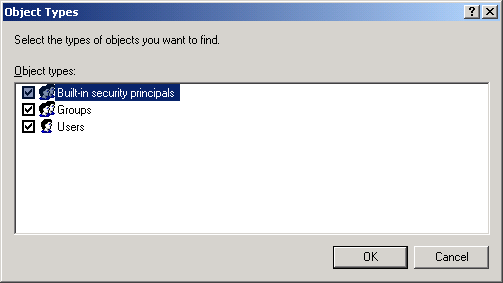
1. The standard Select user or Group window is displayed.



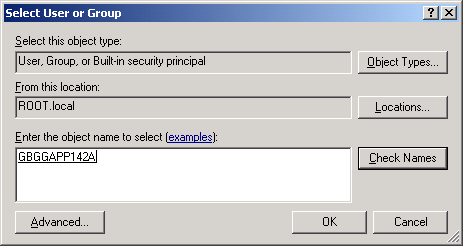
1. If the location does not show the current domain, click ‘*Locations’* and set the focus to the current domain.



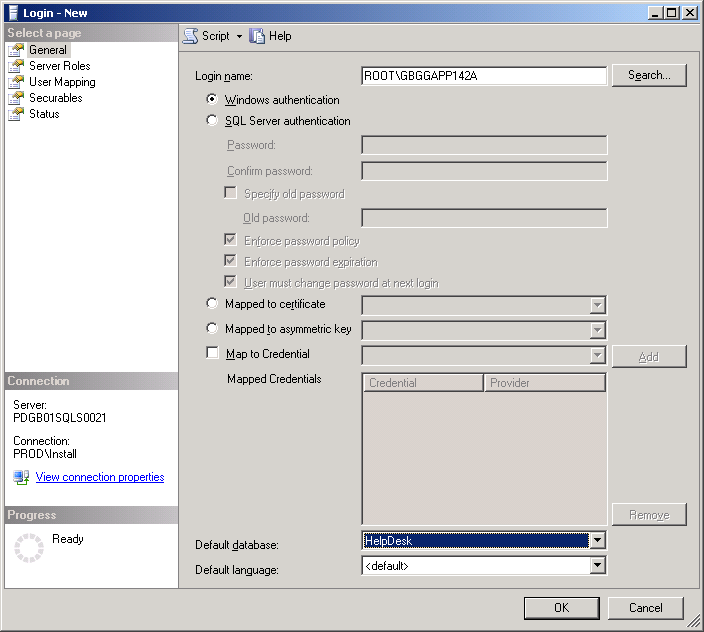
1. If the Object Types do not include Groups, click on ‘*Object Types’* and ensure Groups are included.



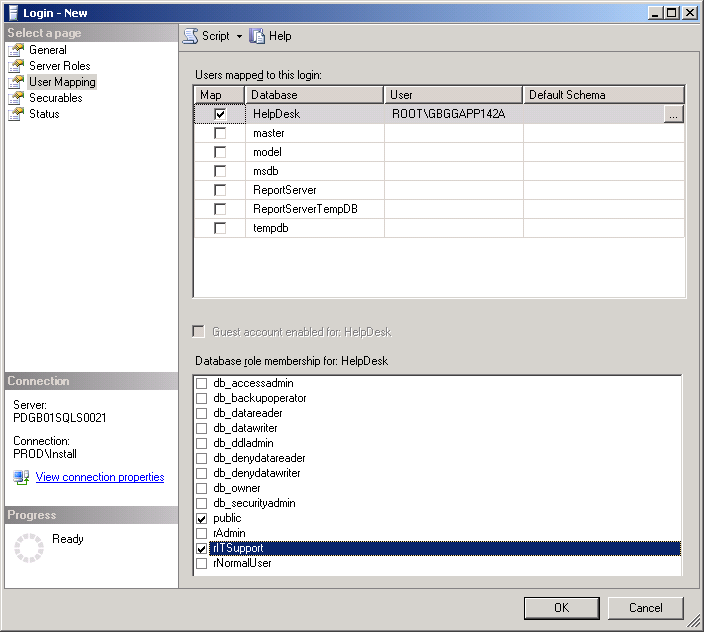
1. Specify the required Windows group (in this example GBGGAPP142A) and click *‘Check Names’*.



1. Specify the default database for this group login (in this example HelpDesk)



1. Do not specify any Server Roles for the group login. Click on *User Mapping* and specify the Database(s) to be accessed by this login. Select the required roles for the group login.



* 1. Windows Security Reference

Microsoft have published the rights required by each service and it is appropriate to provide a reference to these in this document.

* + 1. Service Account Attributes

The following Account rights are required by the specified SQL Server services.

| **Service** | Account Attribute | **Reference** |
| --- | --- | --- |
| SQL Server& Analysis Services | Account is trusted for Delegation | BOL: Kerberos Authentication and SQL Server |
| SQL Server & Analysis Services | Read servicePrincipalName | KB 811889 |
| SQL Server & Analysis Services | Write servicePrincipalName | KB 811889 |

In addition, the server which hosts the services requires the Computer is trusted for Delegation attribute. The constrained delegation model should be used.

* + 1. Service Account User Rights

The following user rights are required by the specified SQL Server services. All references are from BOL: *Setting Up Windows Service Accounts* unless otherwise specified.

| **Service** | User Right | **Reference** |
| --- | --- | --- |
| SQL Server | Act as part of the operating system |  |
|  | Adjust memory quotas for a process |  |
|  | Bypass traverse checking |  |
|  | Lock pages in memory | BOL: Enabling memory support for over 4 GB of Physical Memory[[2]](#footnote-2). |
|  | Log on as a batch job |  |
|  | Log on as a service |  |
|  | Perform volume maintenance tasks | BOL: Database File Initialization |
|  | Replace a process level token |  |
| SQL Server Active Directory Helper | None | Runs using Network Service authority |
| SQL Server Agent | Act as part of the operating system |  |
|  | Adjust memory quotas for a process |  |
|  | Bypass traverse checking |  |
|  | Log on as a batch job |  |
|  | Log on as a service |  |
|  | Replace a process level token |  |
|  | Member of Local Administrators group | Required if automatic restart of services is enabled in SQL Agent. This option is not used in FineBuild**[[3]](#footnote-3)** |
| SQL Server Analysis Services | Log on as a service |  |
| SQL Server Browser | Log on as a service |  |
| SQL Server FullText Search | Log on as a service |  |
| SQL Server Integration Services | Bypass traverse checking |  |
|  | Create global objects |  |
|  | Impersonate a client after authentication |  |
|  | Log on as a service |  |
| SQL Server Reporting Services | Log on as a service |  |
| SQL Server Writer | None | Runs using Local System authority |

* + 1. Service Principal Names (SPN)

The following Service Principal Names are required by the specified SQL Server services.

| **Service** | SPN | **Reference** |
| --- | --- | --- |
| SQL Server | MSSQLSvc | KB 319723. Include the port number. |
| SQL Server Analysis Services | MSOLAPSvc.3 | KB 917409. |
| SQL Browser for Analysis Services | MSOLAPDisco.3 | KB 950599 |

* + 1. Service Authorities

The following service access rights are required for the specified services.

| **Service** | Access | **Reference** |
| --- | --- | --- |
| All SQL Server services | Read access for Network Service | KB 941823 |

* + 1. SQL Server Port Use

SQL Server uses the following ports. This information is not needed unless the database server is isolated from clients by a firewall, in which case the ports must be opened.

| **Description** | Port | **Reference** |
| --- | --- | --- |
| SQL Server TCP connectivity | 1433 (TCP) | KB 287932 |
| SQL Server instance discovery | 1434 (UDP) | KB 287932  Not used in FineBuild. |
| SQL Server Named Pipe connectivity | 445 (TCP) | KB 839269 |
| SQL Server database mirroring | 5022 (TCP) |  |
| Analysis Server | 2383 (TCP) | BOL: Server Architecture (Analysis Services) |
| Integration Services | 135 (TCP) |  |
| Report Services | 80 (TCP) |  |
| Service Broker | 4022 (TCP) |  |

If a named instance of SQL Server is installed, an additional TCP port will be required to allow connectivity to the named instance.

SQL will also use standard Exchange ports for mail connectivity, and standard Windows ports for authentication. KB article 832017 has more details of these port numbers.

* + 1. Authorities used by SQL Server Proxies

The following table gives the account used in each of the scenarios below. All scenarios assume the caller does not have Sysadmin authority.

| **Scenario** | **Authority** |
| --- | --- |
| xp\_cmdshell called in a query window | xp\_cmdshell proxy |
| xp\_cmdshell called in a stored procedure | xp\_cmdshell proxy |
| xp\_cmdshell called in a SQL Agent job | xp\_cmdshell proxy |
| Authority needed to start a job | Job owner |
| Write to Job Output file | SQL Agent service account |
| T-SQL run in a job using a step type of *T-SQL* | Job owner |
| Windows command run in a job using a step type of *Operating System (CmdExec)* (e.g. DTS Package) | CmdExec proxy |
| T-SQL run using SQLCMD run in a job using a step type of *Operating System (CmdExec)* | CmdExec proxy |
| SSIS Package run in a job step using a step type of *SQL Server Integration Services Package* | SSIS proxy |
| SSAS Cube build run in a job step using a step type of *SQL Server Analysis Service* | SSAS Proxy |

As can be seen, the authority used by a given process in a job will depend on what that process is doing. Any and all use of xp\_cmdshell will run using the xp\_cmdshell proxy. The authority used by the various SQL Agent subsystems will depend on the authority given to the proxy for that subsystem. A job containing multiple steps, running T-SQL in step 1, a Windows command in step 2, and a SSIS package in step 3 with each subsystem having its own proxy would have each step run using a different set of Windows authorities.

In order to minimise the complexity of managing what authority will be used by a given SQL Agent job, the recommendation is repeated that the job owner account should be defined as the credential for all SQL Agent proxies used by that job, and that all job steps should be configured to use the job owner proxy. This will result in just 2 potential authorities being used – the job owner proxy for all activities apart from running xp\_cmdshell, where the xp\_cmdshell proxy authority will be used.

The following table gives the Windows authorities required by the Proxy accounts:

| **Account** | Right | **Reference** |
| --- | --- | --- |
| xp\_cmdshell proxy | *Read & Execute* right on Windows \System32\CMD.EXE | http://forums.microsoft.com/ MSDN/ShowPost.aspx? PostID=321062&SiteID=1 |
| xp\_cmdshell proxy | Log on as a batch job | BOL |
| SQL Agent proxy | Log on as a batch job | BOL |

* 1. Miscellaneous Items
     1. Converting Database Collation

If a database has been created that does not use the standard SQL Server instance collation, it may be necessary to convert the database collation to the standard instance collation. This section describes the process that must be used to perform this conversion. This work can be performed before the server is handed over for live use, or scheduled for a later date.

The conversion requires that any database constructs that rely on any given character matching or ordering process must be removed before the conversion can be performed. After the conversion has been done, these constructs can be re-installed and will use the new collation.

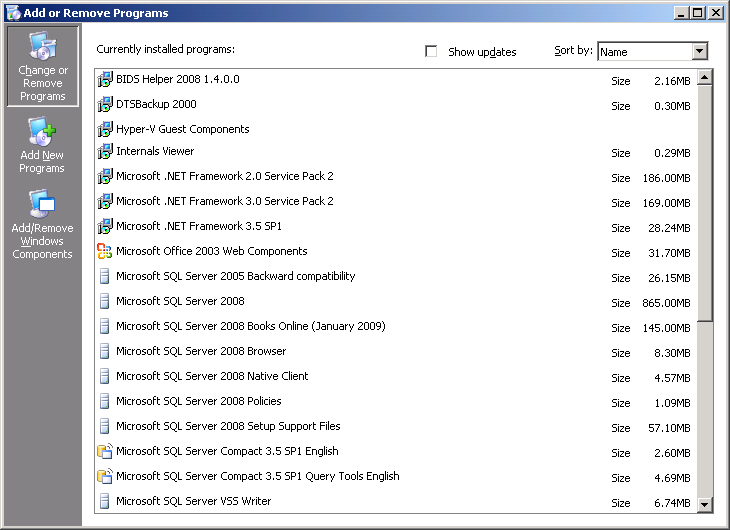
Note: The process given below has not yet been tested and may need to be changed.

1. Script all database constraints. Generate separate scripts to drop and create the constraints.
2. Script all foreign key relationships. Generate separate scripts to drop and create the relationships.
3. Script all indexes. Generate separate scripts to drop and create the indexes.
4. Drop all constraints, foreign keys and indexes using the *drop* scripts generated above.
5. Alter the database collation to the server default.
6. Rebuild all constraints, foreign keys and indexes using the *create* scripts generated above.
7. Update statistics for the entire database, using 100% sampling.
   * 1. Uninstall SQL Server

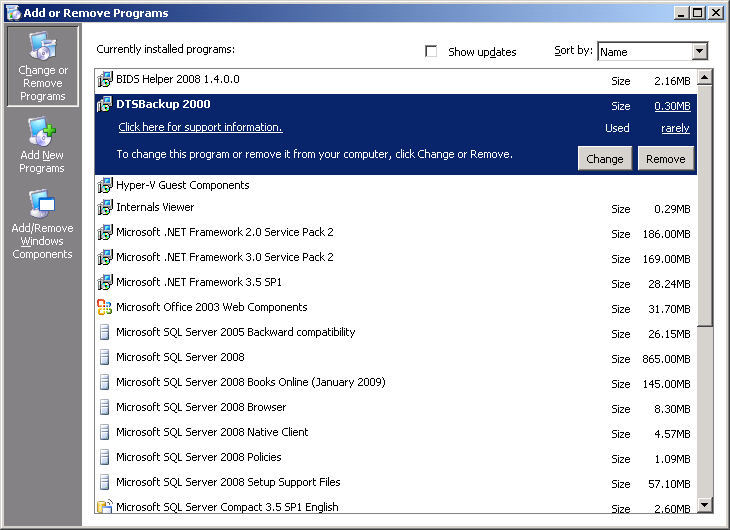
If it is required to uninstall SQL Server the following process should be followed. The Windows 2008 *Programs and Features* window does not always show every program that has been installed. If a given program is not shown for Windows 2008, then ignore that step of the uninstall process.

1. Navigate to the control panel applet for uninstalling programs.

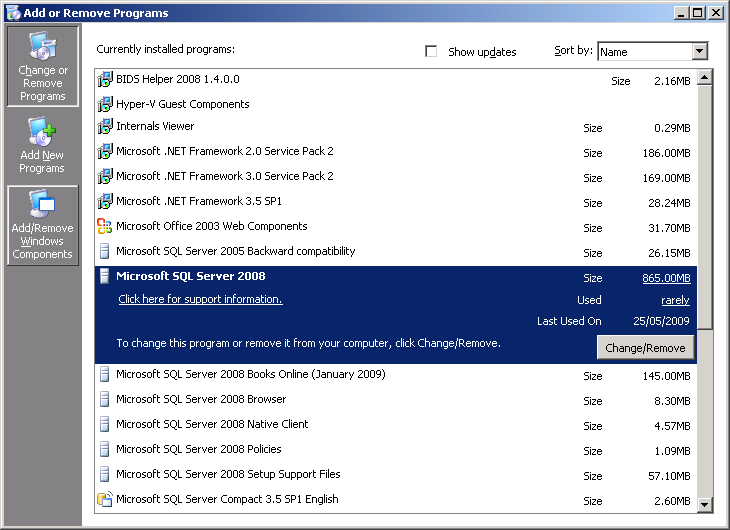
* For Windows 2003: Start -> Control Panel -> Add or Remove Programs
* For Windows 2008: Start -> Control Panel -> Programs and Features.



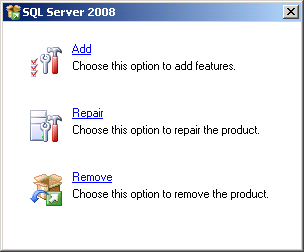
1. Select *DTSBackup2000* and click *Remove*. This component is uninstalled first as it is dependent on other DTS components being on the server. If the other components are uninstalled first, then DTSBackup2000 will not uninstall.



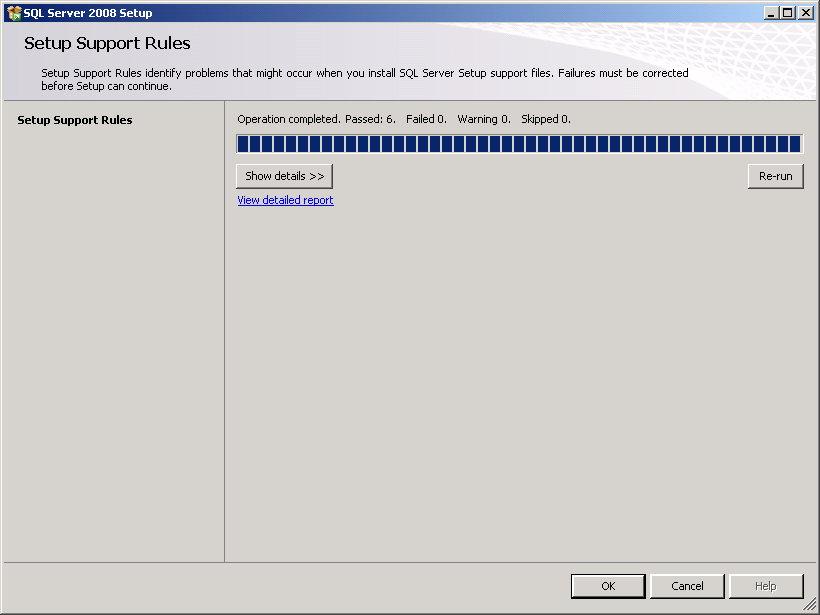
1. Select *Microsoft SQL Server 2008* and click *Change/Remove*.



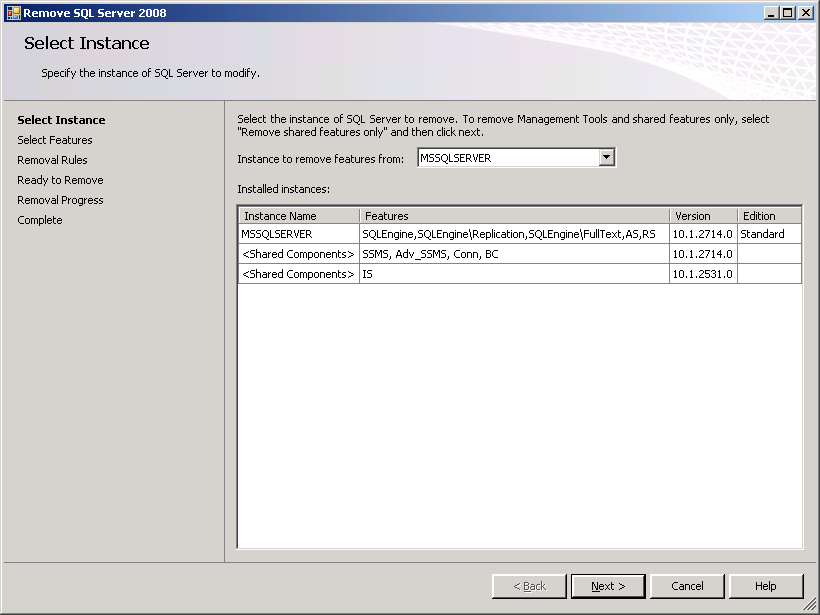
1. Select *Remove*.



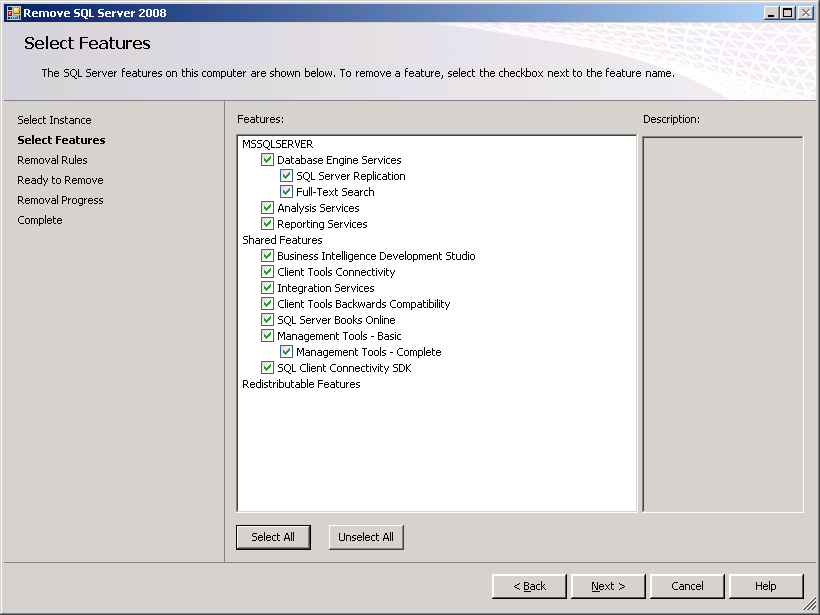
1. The Setup support Rules window is displayed. Click OK to continue.



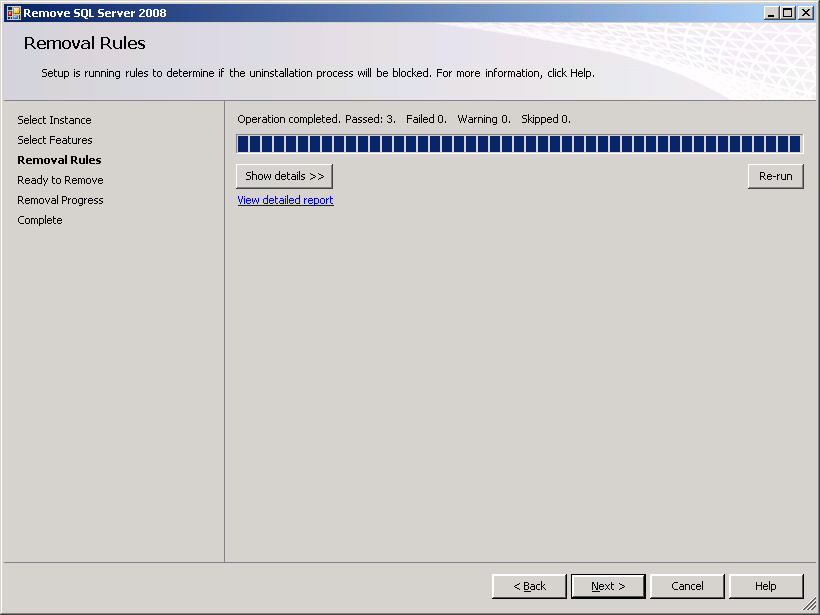
1. The Select instance window is displayed. Select the instance you want to remove. Click *Next* to continue.



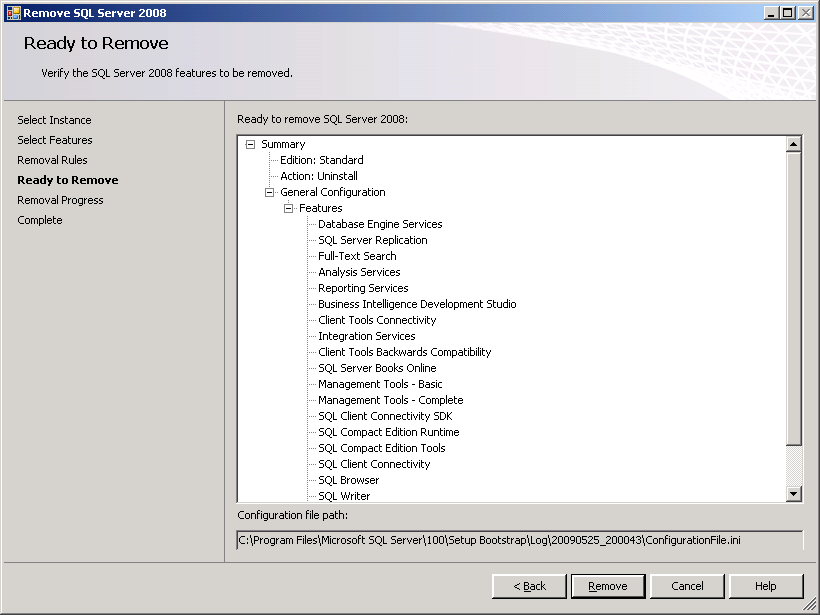
1. The Select Features window is displayed. Click *Select All* to select all items for removal. Click *Next* to continue.



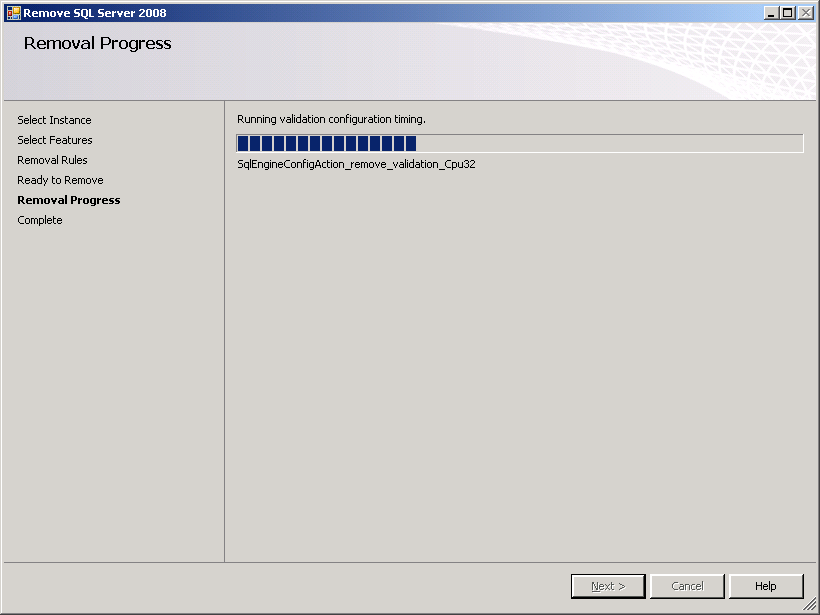
1. The Removal Rules window is displayed. Click *Next* to continue.



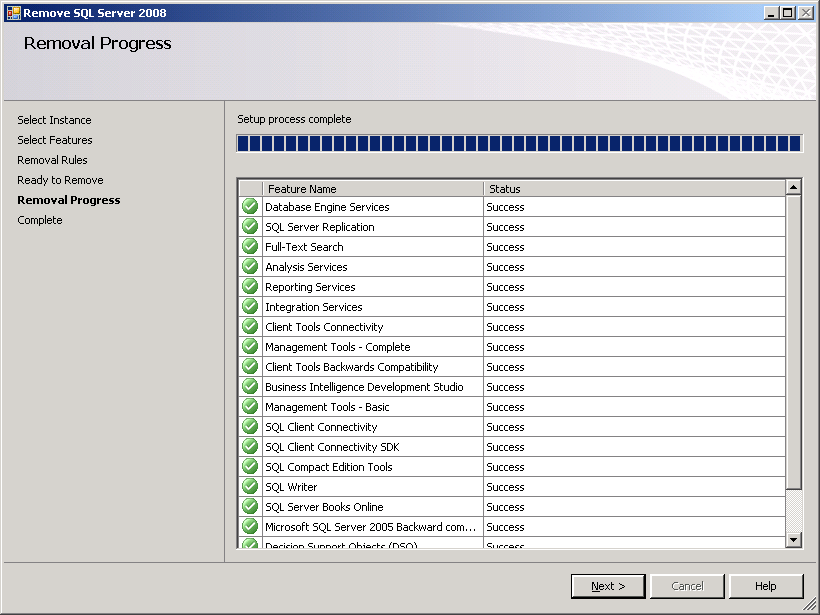
1. The Ready to Remove window is displayed. Click *Remove* to continue.



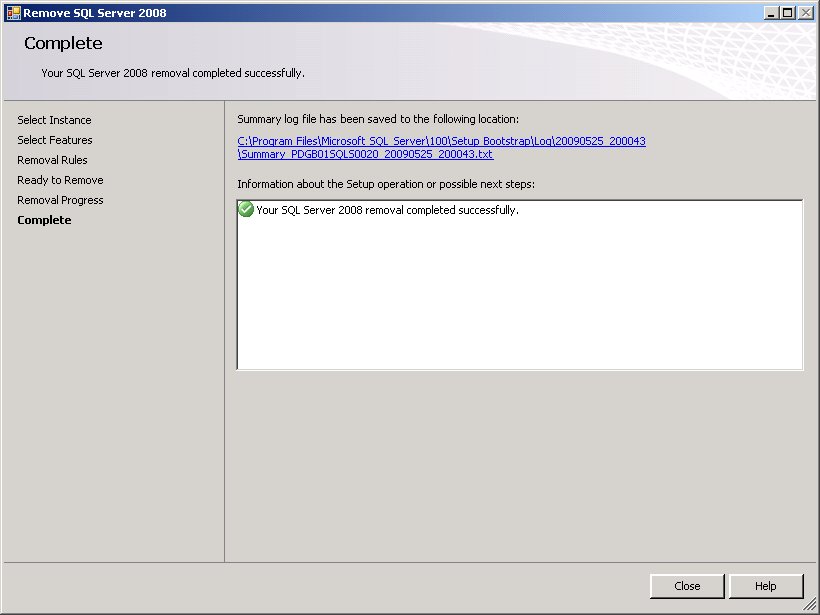
1. The Removal Progress window is displayed. Wait while SQL Server is removed.



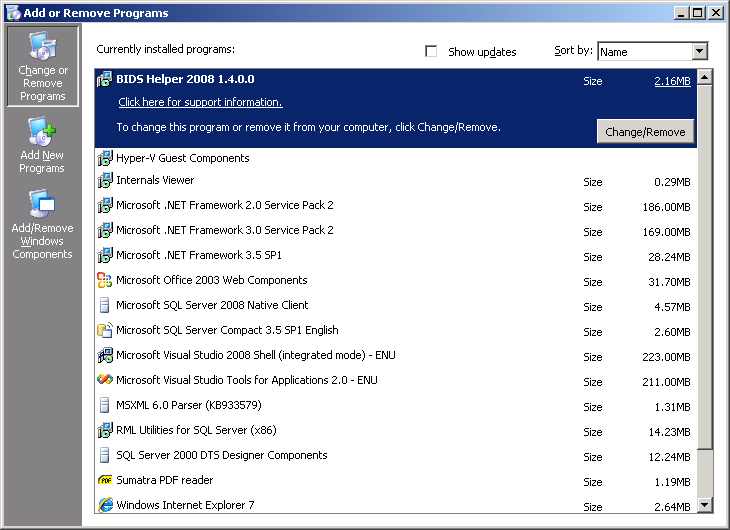
A summary window is displayed when all components have been removed. Click *Next* to continue.



1. The Complete window is displayed. Click *Close* to end the SQL Server uninstall process.

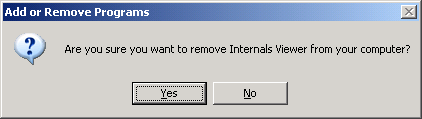


1. Press PF5 when the uninstall is complete to refresh the display (it should refresh automatically but does not).



1. Uninstall the other components that were installed as part of on page 17. Never uninstall any *Microsoft .NET Framework* components, as this can cause some Windows components to stop functioning correctly.

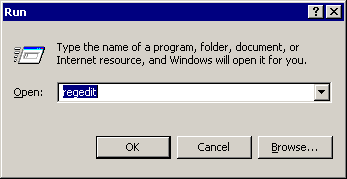




1. If all instances of SQL Server have been removed, delete the following SQL Server folders that are not removed automatically. If any user databases are required to be kept, move them to a different folder structure before the files below are deleted.

| **File Name** | **Notes** |
| --- | --- |
| C:\Program Files\Microsoft SQL Server |  |
| E:\Program Files\Microsoft SQL Server |  |
| I:\SQLFiles |  |
| J:\SQLFiles |  |
| K:\SQLFiles |  |
| T:\SQLFiles |  |

1. If all instances of SQL Server have been removed, optionally delete the following Registry keys that are not removed automatically. Navigate to Start -> Run. Type *regedit* and press *OK*.



| **Registry Key** | **Notes** |
| --- | --- |
| HKCU\Software\Microsoft\Microsoft SQL Server |  |
| HKLM\SOFTWARE\Microsoft\Microsoft SQL Server |  |
| HKLM\SOFTWARE\Microsoft\Microsoft SQL Server Compact Edition |  |

1. Remove the following menu and desktop items

| **Menu / Desktop Item** | **Notes** |
| --- | --- |
| All Users\Desktop\SQL Server Books Online |  |
| All Users\Desktop\SQL Server Management Studio |  |
| All Users\Start Menu\SQL Server Books Online |  |
| All Users\Start Menu\SQL Server Management Studio |  |
| All Users\Start Menu\Programs\Microsoft SQL Server 2008 |  |

1. Reboot the server before starting a new installation of any version of SQL Server.
   * 1. Future Enhancements to FineBuild

It is unlikely that FineBuild can ever be considered as complete. The contents of a ‘best practice’ configuration will change over time, based on the experiences of people who use SQL Server. Additionally, because FineBuild is raising the standard of what should be expected for any SQL Server install, best practice will move on to focus on the next level of detail. This means that more can always be added to FineBuild.

A list of potential future changes to FineBuild is documented online. For further details please see   
<http://sqlserverfinebuild.codeplex.com/wikipage?title=Future%20Changes%20to%20FineBuild>.

END OF DOCUMENT

1. See on page 31 for a discussion on the use of GPOs with SQL Server. [↑](#footnote-ref-1)
2. An article from the Windows Server Performance Team warns that care must be taken when using *Lock Pages in Memory* to avoid over-allocating memory and therefore harming overall performance. See <http://blogs.technet.com/askperf/archive/2008/03/25/lock-pages-in-memory-do-you-really-need-it.aspx>. [↑](#footnote-ref-2)
3. FineBuild uses the *Recovery* tab of the Service Control applet to manage automatic restart of SQL Server. [↑](#footnote-ref-3)