# Proficy* CSense 6.0

# Getting Started

Version 6.0
March 2015

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# Starting with Proficy CSense 6.0

Welcome to Proficy CSense! Proficy CSense 6.0 is used to monitor both assets and industrial processes, to pinpoint causes of process variation, and to optimize performance. It is used by process engineers, HMI users, production staff and solution engineers.

Proficy CSense make use of a suite of components to determine and understand the causes of process deviation in industrial environments. This component combination provides the capability for complete and integrated process performance enhancement for a given asset or collection of key performance indicators (KPIs) within an industrial process.

With the release of Proficy CSense 6.0, we are bundling these components into three editions of the software, each with a unique focus. Each edition is licensed separately. The following is a brief description of each edition, along with the components included in each edition:

- Troubleshooter Edition, for offline, ad hoc, or on demand process modelling and troubleshooting, which includes the Continuous Troubleshooter and Discrete & Batch Troubleshooter, along with all external connectors, Virtual Campus, and Action Object Toolkit.
- Run-time Edition, for the online deployment and monitoring environment, which includes Action Object Services, Virtual Campus, Action Object Toolkit, and Proficy CSense Report Server (1 User CAL).

- Developer Edition, for the expert user, trained in analytics and/or with software development experience. This is used for process modelling and troubleshooting, and designing and implementing online monitoring and control solutions. The Developer Edition includes both the Troubleshooter Edition and Run-time Edition components, and adds the Architect.

The Proficy CSense 6.0 suite includes the following third party software extensions:

- Extension for Excel
- Extension for MPC

The Proficy CSense 6.0 suite also includes the following packaged solution, sold as a separately licensed product:

- Process+

Process+ is used to enable remote monitoring of process control loops, using analytical information presented in online or emailed reports.

Refer to your purchase documents for the specific edition you are licensed to use. If any of the required execution files are missing or appear to have been damaged in the distribution process, please contact your Proficy CSense agent or distributor. Alternatively contact support.

Before you begin installing our product, please read this Getting Started Guide. It includes information about the following:

- Product information
- Installation requirements and instructions
- Key concepts and Quick start guides
- Supported regional settings
- Contact information

# Proficy CSense Component Suite

## Continuous, and Discrete & Batch Troubleshooters

**(included in the Troubleshooter and Developer Editions)**

The Continuous Troubleshooter and Discrete & Batch Troubleshooter enable you to rapidly troubleshoot time continuous, discrete or batch processes by examining production data from a variety of historical data sources. Data is prepared and visualized, and rules-based and data driven process models can be constructed. The knowledge extracted from these models allows you to estimate the benefit of the proposed process changes, all with a few button clicks. Using this modeled system, root causes of process deviations are identified, so processes can be corrected to produce a consistent product at optimal yield levels.

## Architect

**(included in the Developer Edition)**

This comprehensive development platform provides drag-and drop building blocks to quickly develop scalable, robust solutions. These solutions can then be deployed online, either in real-time or as scheduled events, through the Action Object Manager. A solution is generally developed from a combination of recipes for data preparation, a blueprint of data actions, and a way of sinking data for reuse, either in the Action Object Manager, or a number of third party applications.

## Action Object Services

**(included in the Developer and Run-time Editions)**

Action Object Services comprises both the web services used to deploy and execute Action Objects, as well as the actual application used for deployment - the Action Object Manager.

The Action Object Manager provides a simple and easy way to deploy and monitor Action Objects. An Action Object (AO) is the name given to an executing configuration, which could have been created and deployed from a number of sources, including Architect and Process+ to name a few. An executing Action Object is an OPC Server, and can be connected to from OPC clients.

There are different types of Action Objects that can be deployed:

- Advanced Analytics Action Objects
- Event-based Action Objects
- Process+ Action Objects
- Real-time Action Objects
- Scheduled Action Objects

## Virtual Campus

**(included in all editions)**

The Virtual Campus (VC) is an easy-to-use software application that offers interactive training for the Proficy CSense product suite.

As standalone, self-paced training, the VC includes the following training aids:

- easy-to-follow demonstrations
- guided simulations, and
- practical exercises using the installed Proficy CSense software.

The VC is typically installed with all editions of Proficy CSense, enabling you to simply toggle between the training activites and the software products.

## Action Object Toolkit

**(included in all editions)**

The Action Object Toolkit is provided with all editions and is geared for advanced users to programmatically create blueprints and Action Objects. This set of software tools also enables the development of deployable Action Objects, created in any number of third party applications, that can be integrated into the Proficy CSense software. The Action Object Toolkit includes the following sub-components:

- Web Services (on the Report Server allowing third parties to obtain reporting data)
- Blueprint SDK
- COM Wrapper blueprint block
- .NET Wrapper blueprint blocks
- .NET Wrapper Data Recipe operations
- ISV Object

## Proficy CSense Report Server

The Report Server is a reporting platform to view analytical information and data in a web based environment. This information from Proficy CSense reporting services, such as Process+ or Cause+, is used for monitoring and managing the performance of assets and processes on industrial plants.

A System Administrator will initially configure the Report Server, and in doing so, assign reports and users to different levels of a developed hierarchy. This hierarchy represents the dependency structure of the processes and assets of the plant.

Licensed users are able to access the Report Server to view reports to which they have been assigned. The analytical information in these reports is generated from statistical calculations of data in Action Objects created in independent applications. These deployed Action Objects provide the calculated information that is displayed in the Report Server. One User CAL is included with both the Run-time and Developer Editions. Additional CALs can be purchased and licensed as needed.

## Proficy CSense Extensions

### Extension for Excel

Through the addition of a "Proficy CSense" ribbon bar in Microsoft Excel, the Proficy CSense Extension for Excel provides you with the ability to launch a Proficy CSense Troubleshooter directly from Microsoft Excel and import data from the workbook. It further enables you to launch an ISV Action Object from Excel and import the results directly into your workbook.

**Extension for MPC**

The Proficy CSense Extension for MPC provides Proficy CSense blueprint developers with a powerful model predictive control component for the development of advanced process control solutions.

The Proficy CSense Extension for MPC consists of two components:

1. An MPC plugin to the existing .NET Wrapper block in Architect. This is the Execution System component.
2. A web-based configuration front end for the configuration of the MPC component. This is the Design component.

**Proficy Process+**

Proficy Process+ is a packaged solution and is licensed independently of any edition. Process+ offers an effective online solution to identify and monitor poorly performing control loops. It is used to assist plant engineers and operators to analyze the performance of control loops and control elements, and distribute this information in online reports or by email to specified users.

The intention of Process+ is to be able to monitor the functioning of control loops remotely, using analytical information presented in online or emailed reports. Reports of these control loops are viewed using the Proficy CSense Report Server.

To generate this analytical information describing the control loops, an Action Object is created in the Action Object Manager, and then deployed online for automated control loop monitoring. Process+ Action Objects are configured by adding the loop definition information of existing control loops to the monitoring system, and specifying the appropriate data source for the loop data.

# Installing Proficy CSense Components

This chapter provides general information you need in order to install Proficy CSense, including:

- Hardware and software requirements for each component
- Installing the hardware key and replacing defective keys

Each licensed edition of the Proficy CSense suite, or component of the suite, also has individual hardware and software requirements. Read below for the specific requirements for your component.

## Before installation

1. Exit any existing copies of Proficy CSense software you have running.
2. Ensure that you have a Proficy CSense license for this version installed. (See the Licensing section of this document.)
3. Log in to Windows with an account that has administrator privileges.
4. Consider disabling virus-checking software and Internet security applications on your system for the duration of the installation process. These applications may impact on the installation process or cause it to appear unresponsive.

## Upgrades

Upgrades are supported from Proficy CSense version 5.5 and later.

## Uninstalling previous versions

1. From the Start menu, select **All Programs** to see the list of all the programs installed on the computer.
2. Select **Proficy > Licensing**, expand the menu, and select **Uninstall** to remove the program.
3. Follow the InstallShield Wizard to uninstall the product.

## Installing Proficy CSense

**IMPORTANT:**

**Proficy CSense requires Administrative rights on the target system in order to be installed.**

**Regarding hardware and software requirements listed below, if you intend to use Process+ then you will need to bear additional requirements in mind when installing Proficy CSense. These are listed in the 'Installation Requirements for Using Proficy Process+' section.**

### Installing from a DVD ROM

1. Insert the Proficy CSense 6.0 DVD into your target system's DVD ROM Drive.
2. If Autoplay is enabled, the Setup autorun will startup automatically. From the Proficy CSense 6.0 Autorun setup menu, click the link to start the installation application.
3. If Autoplay is disabled and the Autorun setup application does not startup automatically, simply open My Computer and browse to your DVD ROM Drive. Run `<Setup.exe>` from the root of the installation DVD to start the installation application.

4. To install the Proficy CSense Extensions, click the required extension to install, and follow the on-screen instructions to complete the process.
5. Start the required application from the Windows start menu.
6. Refer to the section on licensing in this manual to correctly license your product.

## Installing from an electronic distribution

1. Extract the contents of the distributed file to a temporary location on your hard drive.
2. Open My Computer and browse to your folder containing the extracted contents and run the `<Setup.exe>` application file located in the root folder of the extracted contents.
3. From the Autorun setup menu, start the installation.
4. Follow the on-screen instructions to complete your installation.

   **NOTE: Should you install a product not supported by your license key, the software will notify you that your product is not licensed when attempting to run an application.**

## Minimum hardware requirements

- 5 GB available hard drive space
- 1GB RAM (recommended: 4GB or more and should be increased as solution size increases, to ensure optimal performance)
- Procesor speed (CPU):
  - x86 Processor: 1.0 GHz

    - x64 Processor: 1.4 GHz
    - Recommended: 2.0 GHz or faster
- 1024x768 display resolution

## Software requirements

- Microsoft .NET Framework 4.5
- SQL Server 2008 R2, or 2012 (Express editions are also supported, although not recommended for production environments.)
- This version of Proficy CSense does not support SQL Server configured to run in the NETWORK SERVICES account. Refer to the section on configuring SQL Server for installing Proficy CSense 6.0.
- Proficy CSense requires SQL Server FILE STREAMING to be enabled. This is be enabled automatically, if possible. If the software is unable to automatically enable FILESTREAM, you will be notified. Then, refer to the section on configuring SQL Server for installing Proficy CSense 6.0.
- All Windows users of Proficy CSense must be configured as SQL Server System Administrators for the SQL Server instance in use.
- Adobe Flash Player 16 (required for CSense Virtual Campus)
- Adobe Acrobat Reader XI (required for CSense Virtual Campus)
- Supported operating systems:
    - Microsoft Windows 7 (x86 and x64 Platforms)
    - Microsoft Windows Server 2008 (x86 and x64 Platforms)

- Microsoft Windows Server 2008 R2 (x64 Platforms)

  Microsoft Windows Server 2012 R2 (x64 Platforms)
- Microsoft Windows 8.1 (x86 and x64 Platforms)

## Optional requirements

- Proficy Historian 3.5 or later (up to Proficy Historian 6.0) OLE DB Provider (required for the Proficy Historian data source)
- OSISoft PI OLE DB Provider (required for the OSIsoft PI Historian data source)

## Installing 3rd party software components

**NOTE:**

**Some electronic distributions of Proficy CSense may not contain the distribution files for all of the required 3rd party software components.**

1. Refer to the system requirements before attempting to install Proficy CSense 6.0 and ensure that all required 3rd party software components are present on the target system.
2. If required 3rd party software components are not present on the target system prior to installation, some 3rd party components are provided as part of this distribution of Proficy CSense.
3. To install the 3rd party software components part of your distribution of Proficy CSense, from the Autorun setup menu click the <`Install Requirements`> link.
4. From the Requirements menu, select the software component you wish to install to launch the setup routine for the software component.

5. Follow the on-screen instructions to complete the installation for the component.
6. Restart your system if required by the setup.

## Installing Proficy Process+

To use Proficy Process+ you will need to install

- Proficy CSense (Runtime Edition)
- Proficy CSense Report Server

These components (Proficy CSense and Proficy CSense Report Server) can be installed on the same machine or on separate machines.

**IMPORTANT:**

Proficy Process+ requires Administrative rights on the target system in order to be installed.

### Proficy CSense (Action Object Server) for Process+

- Before installation, ensure that Port 80 in your firewall is open.
- Your installation of CSense (Runtime Edition) must meet the installation requirements detailed in the section of this document on Installing Proficy CSense and you should follow the instructions detailed there.
- You will also need to bear the following additional hardware requirements in mind when installing Proficy CSense Runtime Edition:
    - Additional 2 GB hard drive space
    - Dual Core 2GHz or faster (Recommended: Quad Core)

- Additional 8 GB RAM (Recommended: 16 GB)
- 1024x768 Display resolution
- At least one properly installed and configured network adapter

The requirements listed above are for a system of Process+ Action Objects configured with:

- 100 control loops or less
- Interim data retention period of 7 days or less
- Sampling frequency no faster than 15 seconds

### Proficy CSense Report Server for Process+

- Your installation of Report Server must meet the installation requirements detailed in the section of this document on Installing the Proficy CSense Report Server and you should follow the instructions detailed there.

## Installing the Extension for Excel

### System requirements

- Microsoft Office 2007 or 2010 (32 bit versions only)
- Microsoft Excel
- Primary Interop Assemblies for Office 2007 or later
- Visual Studio Tools for Office 3.0
- Proficy CSense 6.0

### Installation and licensing instructions

**To install:**

1. Uninstall previous installations of the Excel Extension before installing this version.
2. Run the `<Setup.exe>` and follow the on-screen instructions.
   - The installer may prompt you to download required files from the Microsoft website. This may require Administrative rights if all the required components are not yet present on the target system.

Note that each Windows user wishing to use the Excel Extension will have to install his/her own instance of the extension.

**Licensing:**

A properly installed and valid Proficy CSense 6.0 license is required to make use of the Proficy CSense Extension for Excel.

**NOTE:**

**The features installed as the Extension to Microsoft Excel are determined by which edition of Proficy CSense is installed.**

## Installing the Extension for MPC

Follow the instructions in the guide entitled *Getting Started with the Proficy MPC Extension*. This can be found on your installation DVD or in your installation archive under **Extensions > MPC**.

# Installing the Proficy CSense Report Server

**IMPORTANT:**

**Proficy CSense Report Server requires Administrative rights on the target system in order to be installed.**

## System requirements

### Minimum hardware requirements

- 100 MB available hard drive space
- 4GB RAM
- Procesor speed (CPU):
  - x86 Processor: 1.0 GHz
  - x64 Processor: 1.4 GHz
  - Recommended: 2.0 GHz or faster
- 1024x768 display resolution
- At least one properly installed and configured network adapter, connected to the same network as the Web Clients and the Action Object Servers

### Software requirements

- Supported operating systems:
  - Microsoft Windows Server 2008 R2 (x64 Platforms) with the IIS role installed.
  - Microsoft Windows Server 2012 R2 with the IIS role installed.
- Microsoft .NET Framework 4.5

- Internet Information Services (IIS) 7.0
  - Ensure that the following IIS Role Services are enabled on your system **before** installing the Proficy CSense Report Server:
    - Common HTTP Features
      - Static Content
      - Default Document
      - Directory Browsing
      - HTTP Errors
    - Application Development
      - ASP.NET
      - .NET Extensibility
      - ISAPI Extensions
      - ISAPI Filters
    - Health and Diagnostics
      - HTTP Logging
      - Request Monitor
    - Security
      - Basic Authentication
      - Windows Authentication
      - Request Filtering
    - Performance
      - Static Content Compression
    - Management Tools

        - IIS Management Console
- Microsoft SQL Server 2008 R2 or 2012, with SQL Server Reporting Services (SSRS)
    - **Note: This SQL Server should be dedicated to hosting the Proficy CSense Report Server only.**
    - **Note: Use of Reporting Services for Proficy CSense Report Server is only explicitly supported on the same machine as the Report Server install. Running Reporting Services remotely is not supported.**
    - SQL Server Express is not supported. A full version of SQL Server is required.
    - SSRS should be configured **before** installing the Proficy CSense Report Server.
    - If you are doing a fresh SQL Server install, select SSRS as an option when you do the SQL Server install. You can also configure SSRS on an existing SQL Server install, but it will require more effort to configure.
    - The minimum SQL Server features to select for the Proficy CSense Report Server are:
        - SQL Server
        - SQL Server Reporting Services
        - SQL Server Management Studio
        - SQL Server Management Tools selected for installation.
            - The Management Tools are needed for the Report Viewer tool which displays reports.

- To configure SSRS on an instance of SQL Server, do the following in the SQL Server Setup wizard:
    - If you have an existing SQL Server install then, on the Installation Type page, select to update an existing SQL Server instance.
    - On the Feature Selection page, make sure that you select Reporting Services.
    - On the Server Configuration page, confirm that you can see an entry for SQL Server Reporting Services.
    - If you are installing SQL Server and the Reporting Services together then you will not need to do any further configuration. However, if you are adding Reporting Services to an existing SQL Server install (that is, *after* installing SQL Server) you need to do the following:
        - Open up the Reporting Services Configuration Manager from the Start menu.
        - First, enter the Server Name and the Report Server Instance where you have the Report Server installed.
        - On the Service Account page, select the account in which your Reporting Services will run.

- On the Web Service URL page, configure the options for a web service URL (this will be a local IIS website) and click Apply. After clicking Apply, the results are shown in the results pane at the bottom of the screen. Usually, it is sufficient to accept the defaults provided:

| Field | Default value |
|---|---|
| **Virtual Directory** | Report Server |
| **IP Address** | All Assigned (Recommended) |
| **TCP Port** | 80 |
| **URLs** | http://<MACHINENAME_or MACHINE_IP>:80/ReportServer |

- On the Database page, create a new database by clicking Change Database and entering details for a new Report Server database on the same machine where you created the Reporting Services instance and where you intend to install Proficy CSense Report Server. Click Apply.
- On the Report Manager URL page, configure a Report Manager URL and click Apply. Usually, it is sufficient to accept the defaults provided. After clicking Apply, the results are shown in the results pane at the bottom of the screen.

- You can now click on the Exit button. The URLs that were configured in the Web Service URL and the Report Manager URL should now be accessible to you from within a web browser.

## Installing from a DVD ROM

1. Insert the Proficy CSense Report Server 6.0 DVD into your target system's DVD ROM Drive.
2. If Autoplay is enabled, the Setup autorun will startup automatically. From the Proficy CSense Report Server Autorun setup menu, click the link to Report Server to start the installation application.
3. If Autoplay is disabled and the Autorun setup application does not startup automatically, simply open My Computer and browse to your DVD ROM Drive. Run `<Setup.exe>` from the root of the installation DVD to start the installation application.
4. Click Proficy Report Server, and follow the on-screen instructions to complete the process.
5. Follow the on-screen instruction to complete the installation process.
6. Start Proficy Report Server from the Windows start menu.

## Installing from an electronic distribution

1. Extract the contents of the distributed archive file to a temporary location on your hard drive.

2. Open My Computer and browse to your folder containing the extracted archive contents and run the `<Setup.exe>` file located in the root folder of the extracted contents.
3. From the Autorun setup menu, start the installation by clicking the Report Server link.
4. Follow the on-screen instructions to complete your installation.

## Uninstalling the Report Server

1. From the Start menu, select All Programs to see the list of all the programs installed on the computer.
2. Select Proficy CSense Report Server, expand the menu, and select Uninstall to remove the program.
3. Follow the InstallShield Wizard to uninstall the product.

# Licensing

The Proficy License Manager provides a single, easy-to-use tool to both view and manage online software licensing.

To access the online help for the Proficy License Manager, perform the following steps.

1. From the desktop, select **Start > Programs > Proficy Common > License Documentation**.
2. The Proficy License Manager online help opens.

For more information see http://support.ge-ip.com/licensing.

# Supported Regional Settings

Proficy CSense 6.0 supports the same regional settings as Windows.

## Localized Operating Systems

Proficy CSense 6.0 is supported by most localized operating systems.

We are aware of the following issues:

1. Special language characters are not supported in path names. An example of these characters includes those used to denote the desktop in Chinese.
2. You are not able to connect to a running blueprint from Architect.
3. For certain regions, certain text displayed on user interfaces may display incorrectly.

# Key Concepts

## Data preparation

Preparing your data for troubleshooting the problems experienced on your plant is the first step in correcting your process deviation.

Data is imported from historical sources, a number of mathematical and statistical operations can be applied, and data can be manipulated. This enables you to create a dataset that is relevant and appropriate for troubleshooting your process. The data can be visualized, and loaded into the project to continue with modeling the system to analyze how to reduce process variation.

## Data recipes

During data preparation in the Continuous Troubleshooter and Discrete & Batch Troubleshooter, different operations can be applied to your data. The total sequence of operations is referred to as a data recipe. This data recipe can be shared with colleagues, repeated on different datasets, and scheduled for regular deployment on datasets through the Action Object Manager.

## Cause+ KPI Scenarios

Some tags are critical indicators of the performance of a process and are therefore known as the Key Performance Indicators, or KPIs. (Tags are data fields, also known as fields or points in some applications.)

Within the Continuous Troubleshooter, scenarios for monitoring and optimizing the performance of these KPI's are created, in order to reduce the amount of variation that occurs within a process when these KPIs deviate from normal behaviour.

The KPI Scenarios are developed to contain the following information:

- Target input field: the monitored input field which indicates process deviation
- Cause input fields: input fields having an effect on the performance of the target field
- Lower and/or upper limit exceeded: specified process limits have been exceeded, indicating unacceptable process conditions, and a corrective change to the system is required.
- Active condition: the scenario is said to be active when the limits have been exceeded.
- Message fields: these messages are preprogrammed, and instruct process operators on the corrective action required.
- Top cause name: the input field contributing the most to deviation in the target field when the scenario becomes active.
- Top cause value: the data value of the input field exceeding the limits
- Programmed rules: additional rules of corrective action incorporated into the KPI Scenario. These rules are created using practical, expert knowledge.

Cause+ Scenarios can be furthered configured within an Architect blueprint, and then this blueprint can be deployed in the Action Object Manager, as an Advanced Analytic Action Object. View reports of the Cause+ Scenarios as Advanced Analytics items using the Proficy CSense Report Server.

## Action Objects

An Action Object (AO) is the name given to an executing solution blueprint or a scheduled data recipe. The executing blueprints could have been created and deployed from any number of services, including Architect, Cause+, and Process+ to name a few of Proficy's components. Data recipes that are to be executed on a scheduled basis are created in the Continuous Troubleshooter, or Discrete and Batch Troubleshooter, and then deployed using the Action Object Manager. Action Objects can also be created programmatically using the Proficy Software Development Kit.

These Action Objects can then be deployed for online process monitoring and control though the Action Object Manager. An executing Action Object is an OPC Server, and can be connected to from OPC clients.

## Process+ Action Object

A Process+ Action Object is a configuration of instructions, deployed online, and used to monitor control loops in a process. During configuration of the Action Object, data is collected from a defined data source, and information about the specified feedback loops defined. Using the feedback loop information, reports are generated from calculated statistics, for easy understanding of the status of the control loops.

An executing Action Object is an OPC Server, and can be connected to from OPC clients.

## Action Object Manager

The Action Object Manager provides a simple and easy way to deploy and monitor Action Objects. Making use of the Microsoft Management Console (MMC), and provided as a snapin to MMC, the Action Object Manager allows you to easily maintain all your Action Objects from one central point of access.

The Action Object Manager is the service for deploying real-time or scheduled Action Objects for online process monitoring and control.

## Loop configuration information

This data used in Process+ details the configuration of the specific control loop. Variables within the loop are measured, providing measurements such as the set point value, process variable value, and control variable value. There is also configuration information for the actual control loop, including: upper and lower limits, the control mode, and if the loop is enabled or disabled, etc.

## Interim data

Data is collected from the data source, and stored as interim data on the Action Object server until the time period for collection is over. This collection period can be anything from a few seconds for historical sources, to 24 hours for a full day shift using a real-time source. The reports are generated from calculations made using this interim data.

## Report data

Report data is calculated from collected interim data. Determined by the type of report selected, different calculated values are reported, or different aspects of the control loop specified in the loop configuration information is reported. The report data is stored in the Action Object server.

## Data model

This model in the Proficy CSense Report Server is created by the Administrator. It is built up from a hierarchical sorting of reports of different assets and processes within a plant, showing dependencies of the reports, and thus the plant assets and processes.

Administrators will sort reports that are added to the system, and in doing so assign licensed users to the reports. Users can only see reports to which they have been assigned. This is to enable the Administrator to limit the viewing of users, maintaining confidentiality where necessary.

## Items

An item in the Proficy CSense Report Server is a logical grouping of related measurements and statistics that typically represent a real world entity, such as a control loop or a key performance indicator (KPI).

## Users

Authenticated domain users who are entitled to view plant information and who are added to the list of licensed users by the Administrator. A user is able to view item information on reports to which they have been assigned.

## Roles

Users of the Proficy CSense Report Server are assigned roles: either an Administrative role or simply as a Viewer.

## Proficy CSense Report Server reports

There are a range of reports associated with each item, which the users view in their web browser. Users are only able to see reports of items to which they have been assigned.

## Virtual Campus terminology

**Virtual Campus:** The application that houses the subject matter, and the product that you install.

**Virtual Campus Training:** The various subjects or modules that are presented in the training.

**My Virtual Campus Training folder:** The folder in which you can save a variety of activities. You will also find the relevant data sources and files needed to complete the various activities in this folder.

**Subjects:** These will explain a component within the Proficy CSense suite. Subjects are divided into modules encompassing a number of lessons. Lessons cover a specific learning focus within the module, using video demonstrations and simulations.

**Toolbar:** This is the playback bar located at the bottom of each video. The toolbar contains the fast forward, rewind, replay, pause and play buttons. The toolbar also contains a progress bar.

## Help

### Accessing help

Proficy CSense:

- From the Start menu, point to All Programs > Proficy > Proficy CSense > Start Centre > click Help.

Proficy CSense Report Server help:

- From the Administrator's login page, click Help before logging in.
- From the Report Server, click Help from the menu.

## Table of contents

The table of contents is organized into books and pages. Click a book or page to display its contents. Double-click a book to expand it and display the books and pages nested below it.

# Virtual Campus Training

## Learning objectives

Once you have completed the training material in the Virtual Campus, you will be able to do the following:

- Troubleshoot processed that are time continuous, batch driven, or discrete unit driven.
- Prepare your data for effective data analysis
- Model the process based on the target performance indicator of the process
- Construct models from your data, including Principal Component Analysis (PCA), Partial Least Squares (PLS), a Classification Model or a Decision Tree
- Develop Cause+ scenarios to determine the root cause of process deviation
- Assimilate subject matter expert knowledge into the developed model
- Visualize the process by simulating the model
- Deploy Cause+ scenarios to two of the Proficy CSense Extensions

Expert application engineers can then:

- Export the developed model into Architect for further customization
- Develop a solution blueprint for online deployment as an Action Object, using drag and drop blocks
- Understand fuzzy logic

- Understand how to incorporate scripts in Architect
- Use the Action Object Manager to deploy Action Objects
- Customize Cause+ scenarios in the Architect

## Starting Virtual Campus training

When you open the Virtual Campus for the first time, you will notice the following courses listed in the Table of Contents:

- Proficy CSense course
- Proficy CSense Solutions course

**Proficy CSense course**

This is the fundamental course in understanding Proficy CSense. Modules covered in this course include:

- **Continuous Troubleshooter**, for troubleshooting continuous processes
- **Discrete & Batch Troubleshooter**, for troubleshooting discrete or batch processes
- **Architect**, for creating and customizing solution blueprints
- **Action Object Manager**, for deploying different types of Action Objects. This includes developing and deploying Process+ Action Objects.

**Proficy CSense Solutions course**

This course focuses on creating a Cause+ solution, leading users through the process of creating a Cause+ Scenario in the Troubleshooters, customizing the Cause+ solution blueprint in Architect, and deploying the scenario as a blueprint.

## Required prior knowledge

Some courses require prior knowledge from completing other courses. The following table lists the course prerequisites:

| Course | Prerequisites |
|---|---|
| Proficy CSense Course | None - This is a fundamental, introductory course |
| Proficy CSense Solutions Course | Proficy CSense Course |

## Best practise tips

Here's how to get the most out of your training:

**Complete all modules:**

- All the modules in each course are important and designed to help you gain a better understanding of the equipment.
- Avoid skipping the introductory presentations of the VCT package - these presentations cover *Getting Started* and the *Course Overview*. These presentations were design to help you orientate themselves with the course, and provides valuable information on how the Virtual Campus works.

**General procedure:**

- Viewing the demonstrations, then complete the simulation.
- Do the exercises, they show you how to use the actual software.

**Click on the slides to proceed, not on the fast track buttons on the Virtual Campus toolbar:**

- The **next** and **previous** buttons on the toolbar of each demonstration, simulation and presentation are only there to fast track through the slides once a delegate has viewed the whole presentation. These buttons should not be used to proceed to the next slide as this will cause the presentation to appear faulty. Always click on the slide to proceed to the next slide.

**Use correct versions of Proficy CSense:**

- Always install products from the Proficy CSense product suite that are supported by the Virtual Campus.
- Although some exercises may still work, unsupported software might cause some exercises to not work correctly.
- Unsupported versions will also cause some results not to match those of the solutions.

## Troubleshooting the course

| Error message | Possible solution |
|---|---|
| File corrupt | The Course module that you are trying to run was meant for an earlier version of Proficy CSense.<br><br>The file can actually be corrupt.<br><br>A valid module will also display a corrupt message if you uninstalled Proficy CSense. |
| After getting the "file corrupt" error and installing a different module, the following course module loading warning was shown: "*Warning! Incorrect Proficy CSense version found. Current Proficy CSense version: ****** " | The course module you want to install was built on a version of Proficy CSense that is not the same as the one installed on your computer.<br>The course module will still work, but there may be references to software features that either no longer exist, or have subsequently been added to the software. |
| On opening the Virtual Campus, message says "application is not licensed" or "The license is invalid or corrupt…" | Ensure that the licensing was correctly applied. (See the Licensing section of this document.)<br><br>Redo the licensing procedure. |
| Videos in the Virtual Campus aren't playing | Ensure that Adobe Flash Player 16 is installed. Earlier versions will not play the videos.<br><br>Check that the permissions and policies settings of your web browser are not set to prohibit the Adobe |

| | |
|---|---|
| | Flash Player from playing. If so, contact your Systems Administrator.<br><br>Refer to the software requirements in the Installing the Virtual Campus section of this document. |
| The pdf presentations in the course modules aren't opening | Check that Adobe Acrobat Reader XI is installed.<br><br>Refer to the software requirements in the Installing the Virtual Campus section of this document. |
| Some of the information is not displayed or cut off when completing an activity or viewing a solution | The resolution of your screen does not match those set out in the requirements. You need a screen 1024x768 display resolution. |
| No connection to the OPC Loopback server | Ensure that the Loopback OPC Server service is running. |
| When starting up an activity or solution, a message shows that there are not enough licenses available | Ask your Systems Administrator if you have exceeded the number of computers that your license is permitted to host. |
| The presentations appear faulty when clicking on the fast forward/rewind buttons on the toolbar | Do not use the buttons on the toolbar to move between slides, click on the slide to move to the next slide.<br>The toolbar prohibits the animation on a presentation slide to show.<br><br>Only use these buttons after you have already viewed the presentation and want to fast track to a specific slide. |
| The demonstration/simulation freezes whenever a presentation is reached | This is not n freeze, click on the screen to proceed to the next one, once all presentation slides are |

| | |
|---|---|
| | completed the demonstration/simulation will continue as normal without you having to forward the slide. |
| Can't save the activities and solutions that I've been working on | The activities and solutions are set as “read only” to preserve the structure of the course.<br><br>If you want to save copies of your activities, use the "Save as" option, just remember to reconfigure the data source path (where you save the data source) in the source blocks. |
| Links on the Course Evaluation presentation don’t work | Make sure that you have an internet connection and that it is connected. |

# Proficy CSense Report Server Quick Start Guide

## For Administrators

After installating the Report Server, the Administrator first needs to set up the system to configure reports, and assign both items and users to the reports. Log into the Report Server, define your username and password, then configure the system as folllows:

1. Configure the system settings of the Report Server.
2. Configure licensed users and create user groups. In doing this, you will be adding users to the system, and can manage user details and their roles.
3. Install the example reports on the system, from the Tools menu. Customize the report if required.
4. Define the servers from which you will be accessing reporting data from deployed Action Objects.
5. Configuring the items and the reports to be used. As you do, structure them in a hierarchical manner either in, or below, the root entry, to represent your plant in a data model.
6. While configuring reports, you will
   a) Assign items to the report, which will enable you to see the data from these items in the report
   b) Assign user groups to the report, which will define the users that are permitted to see the reports.
7. Optional: Configure email details on reports which will be emailed to defined recipients on a scheduled basis.

## For Clients

After installating the Report Server, navigate through the data model to view the reports of assets or processes within the plant.

1. View the reports in your web browser.
2. Add or view comments on reports.

# Process+ Quick Start Guide

After installation of Process+, it will be automatically listed in the Action Object Manager, under Action Object Services > Action Objects > Process+. Click on Process+ to continue with configuration of a Process+ Action Object. This is made easier using the configuration wizard.

When adding a Process+ Action Object, decide whether to add an Action Object for scheduled deployment for continuous reporting, or for a once-off ad hoc report.

Adding a Process+ Action Object requires the following configuration:

1. Name the Action Object.
2. Define the Loop Definitions file, which needs to have been created prior to configuring the Action Object.
3. Define the type of data source.
4. Select after which shifts the reports must be generated.
5. Specify rules to determine the system control mode.
6. Configure the properties of the data source and data window.
7. Verify runnability of the Action Object, and complete the configuration.

# Configuring SQL Server 2008 R2

In order to successfully install Proficy CSense 6.0, certain SQL Server configuration requirements need to be met. The instructions below are for SQL Server 2008 R2.

## Configuration requirements

These include:

- SQL Server must be configured to run in an account that is not the NETWORK SERVICES account.
- Each user of Proficy CSense 6.0 must be given System Administration rights for the SQL Server instance that is going to be used for Proficy CSense 6.0.
- SQL Server FILESTREAM must be enabled. This will be done automatically where possible.

This configuration can be set when installing a new instance of SQL Server, or on your existing installation of SQL Server.

**Note: Make sure that you select the correct SQL Server platform when installing SQL from the Proficy CSense 6.0 installation DVD. Should you select the incorrect platform, you will not be able to enable the FILESTREAM option.**

For installing new instances of SQL Server from the installation DVD, choose between the:

- 32-bit version of SQL Server for a 32-bit operating system or
- 64-bit version of SQL Server for a 64-bit operating system.

Users with operating systems prior to Windows 7, or existing installations of SQL Server pre-dating SQL Server 2008 R2 will be required to download and install the following system updates before installing SQL Server:

- Windows Powershell 1.0, and
- Windows Installer 4.5

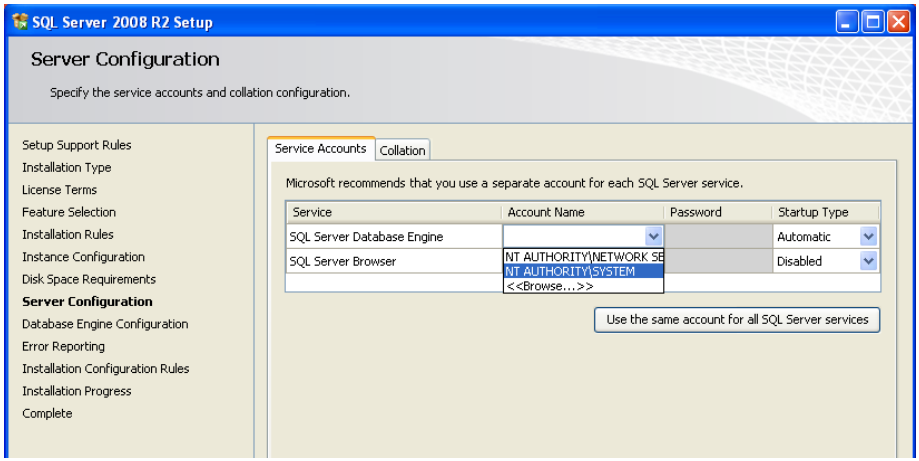
These applications are offered as free downloads from the Microsoft website.

## New instance configuration

### Running SQL Server in the correct account

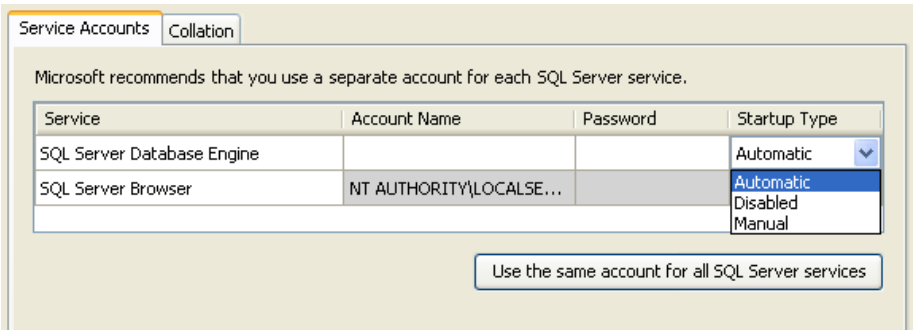
It is necessary for SQL Server Services to run in an account that is NOT the Network Services Account.

1. During the SQL Server 2008 R2 setup, follow the installation Troubleshooter until the step [`Server Configuration`].
2. On the [`Service Accounts`] tab, click in the box under [`Account Name`] for the SQL Server Database Engine.
3. From the drop down list, select [`NT AUTHORITY\SYSTEM`], or [`<<Browse…>>`] for a specific user account.




4. If you browse for a specific user account, ensure that the selected user is a local machine Administrator.

5. Ensure that the [`Service Startup Type`] is set to [`Automatic`].

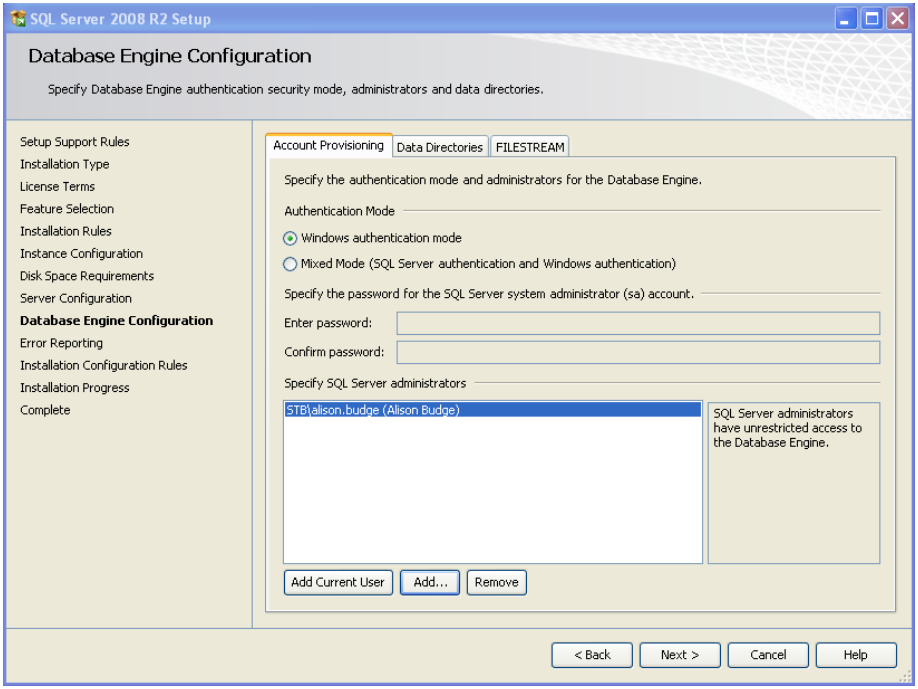



6. Click [`Next`] to continue with the Server Configuration.

## Configuring users as System Administrators

To configure users of Proficy CSense as SQL Server administrators:

1. During the SQL Server 2008 R2 setup, follow the installation Troubleshooter until the step [`Database Engine Configuration`].
2. Select the tab [`Account Provisioning`].

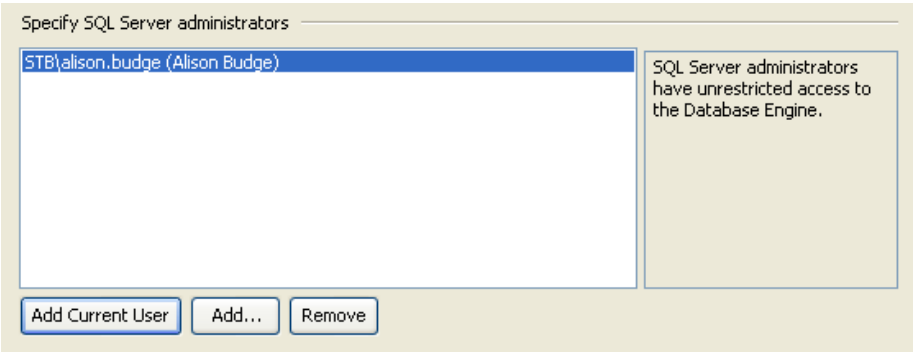



3. Where it is necessary to [`Specificy SQL Server administrators`], there are two strategies to consider:
   a) Adding the current user as a SQL Server administrator, or
   b) Adding a specific user or a group of users as SQL Server administrators, such as the local Administrators group for example.
4. Choose between:

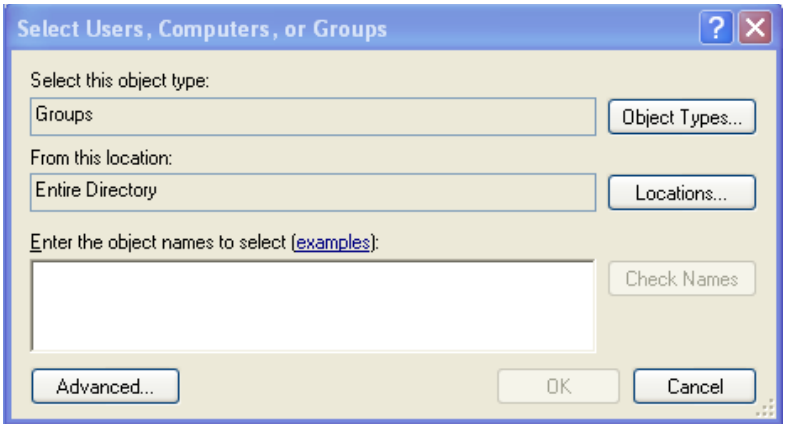
a) [Add Current User] to add the currently logged on user as an administrator, or

b) [Add] to add a specific user or group of users as SQL Server administrators.

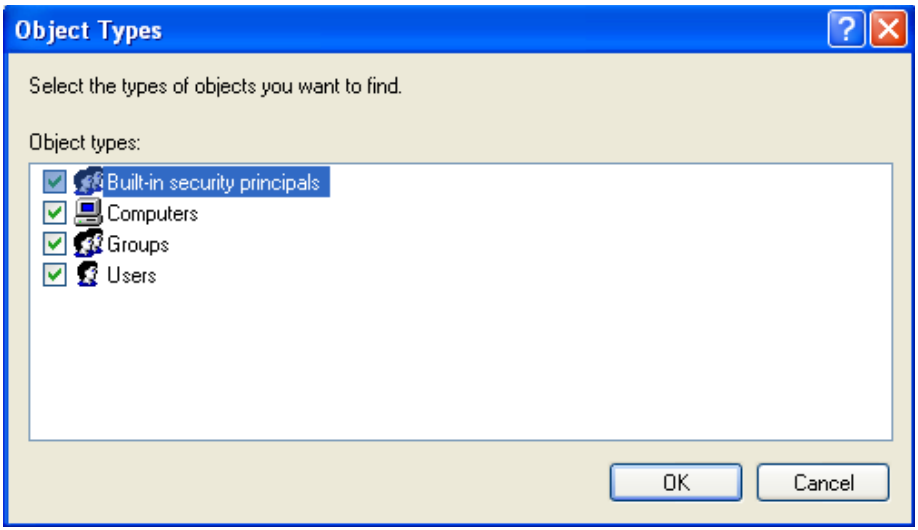
5. Add Current User: If you select to add the currently logged on user, simply click the [Add Current User] button. The details of the current user will be listed under the SQL Server administrators listed.



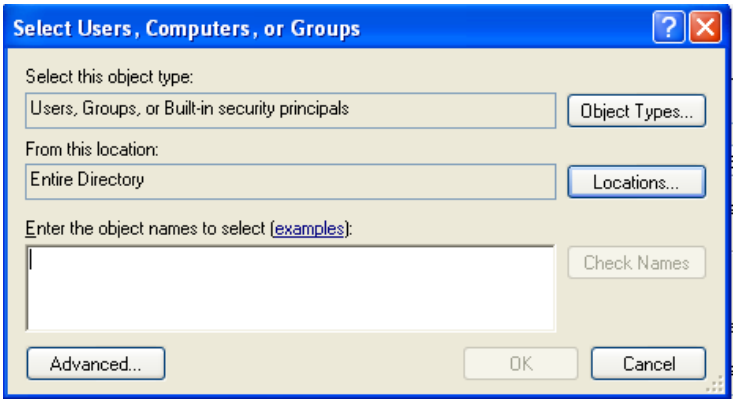

6. Add specified user: If you select to add a new user or group of users, clicking [Add] will show the following screen:



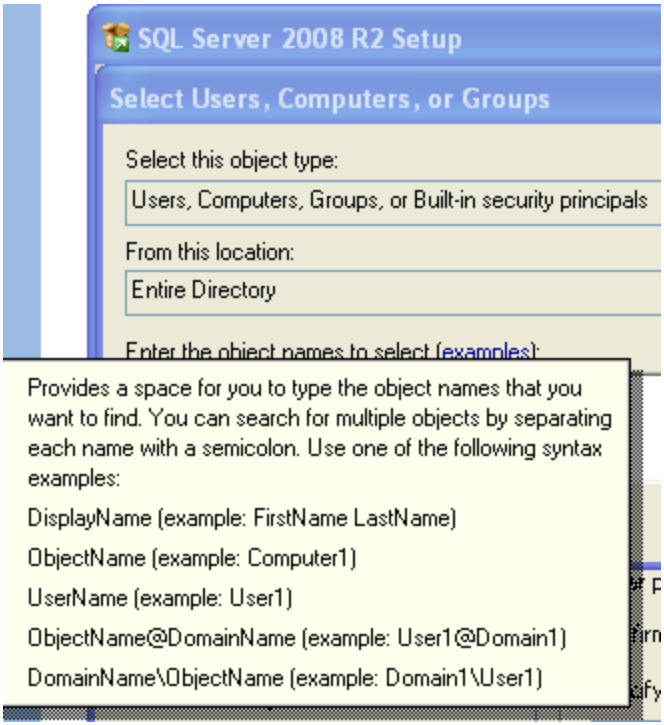

7. Select the type of object you want to find and add, by checking the boxes next to the required object types.




8. Select the location of the object type by clicking on the [`Locations`] button.




9. Enter the object names to be added in the text box. These could be groups of users, a specific user, or specified computers. See the examples given in the Troubleshooter for the correct formatting required for each new object name to be added.



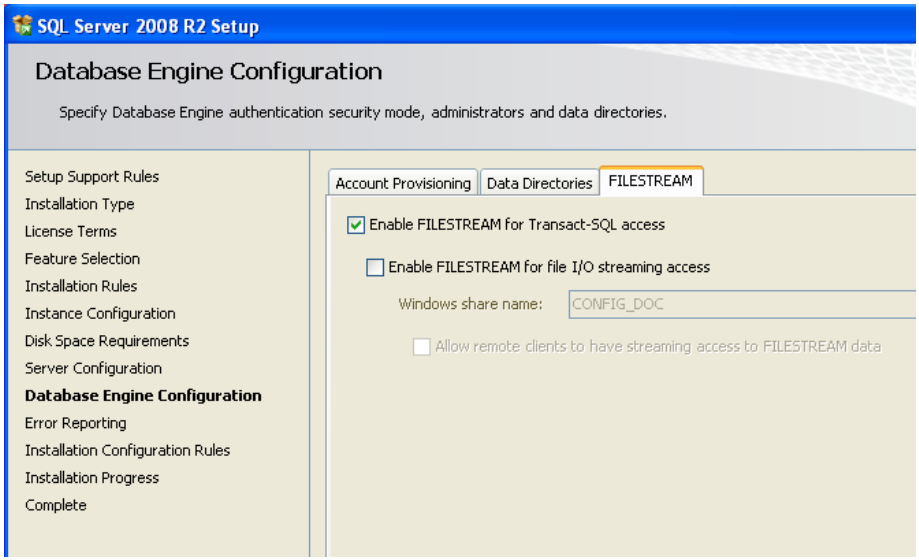

10. If you don't know the object name required and wish to select from populated lists, click [`Advanced`], and then [`Find Now`]. Select your choice and click [`OK`].
11. Click [`OK`] to save the configuration.

## Enabling FILESTREAM

The FILESTREAM option must be enabled for the intended SQL Server instance. This will be done automatically where possible.

1. During the SQL Server 2008 R2 setup, follow the installation Troubleshooter until the step [`Database Engine Configuration`].
2. On the [`FILESTREAM`] tab, check the box next to [`Enable FILESTREAM for Transact-SQL access`].

**Note that FILESTREAM is only required for Transact-SQL access. The other boxes can remain unchecked.**




3. Continue installing SQL Server 2008 R2. The software requirements for installing Proficy CSense 6.0 have now all been met.

# Existing instance configuration

For users with an existing installation of SQL Server 2008 or SQL Server 2008 R2 on your system, this section provides instructions on configuring your instance of SQL Server for Proficy CSense 6.0.

## Running SQL Server in the correct account

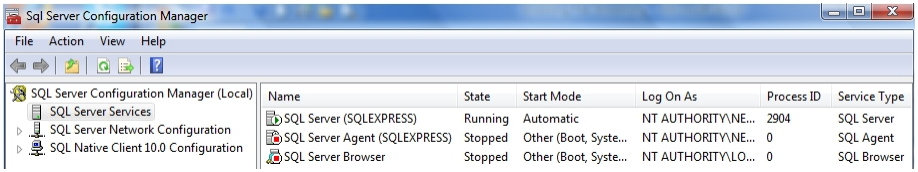
It is important that the SQL Server Services are run in an account that is NOT the Network Services Account.

To change the SQL Server account:

1. Click the [`Start`] button in the bottom left corner of the monitor, and select [`All Programs`]. Find [`Microsoft SQL Server 2008 R2`] in this list of programs.
2. Click on [`Microsoft SQL Server 2008 R2`], and select [`Configuration Tools`].

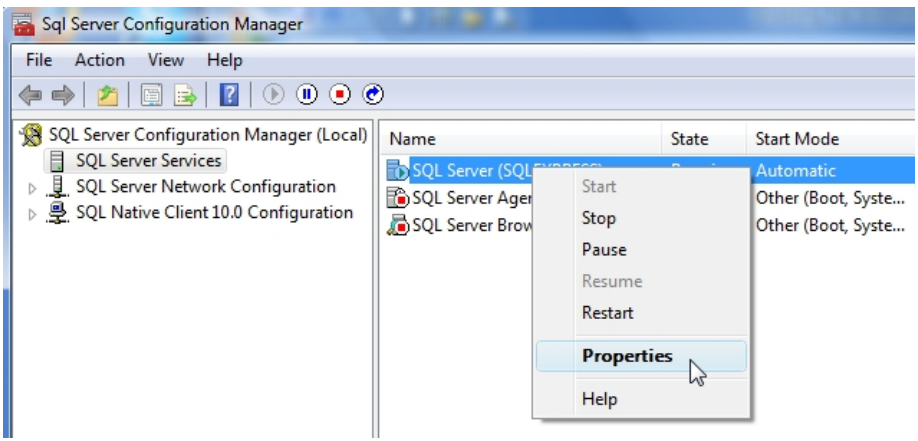
3. Select [`SQL Server Configuration Manager`]. This will list the different SQL Server components on the left, and the configurations of each on the right.

4. In the left pane, highlight [`SQL Server Services`]. The available services will be listed in the right pane, together with further information about each service.

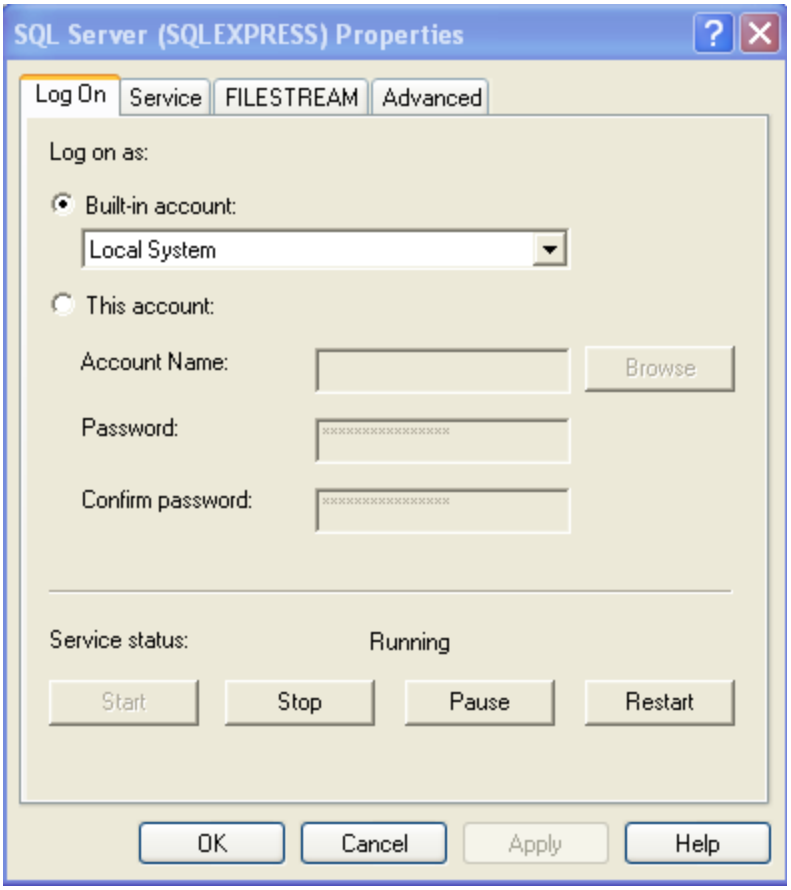



5. Highlight the instance name of SQL Server in the format [`SQL Server (<instance_name>)`]. This could be the default names of [`SQL Server (MSSQLSERVER)`] or to your customised SQL Server name. Right click on it.

6. Select [`Properties`] from the list of possible actions.




7. The properties of the SQL Server will be shown in the dialog box. Information is available over four different tabs; select the [`Log On`] tab.




8. Select to log on as either a [`Built-in account`] or specify another account.

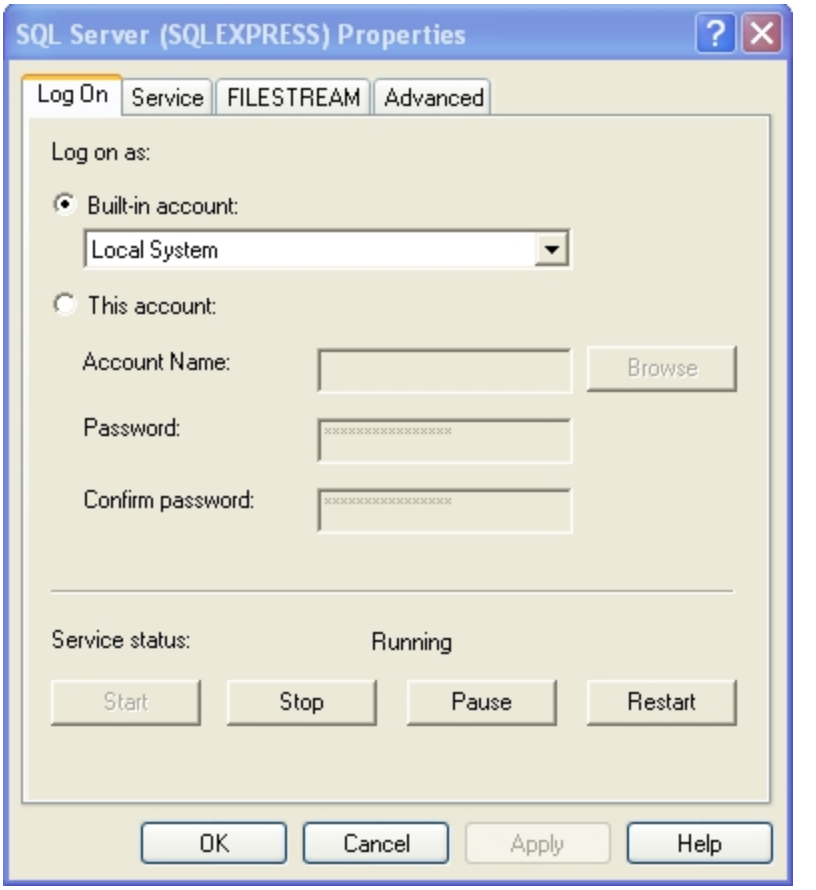
a) Built in account: From the drop down list, select either the [`Local System`] account or the [`Local Service`] account. Do not select the [`Network System`] account.

**Note: The Local System account may prevent the service from interacting with other servers, depending on the privileges granted to the account.**

**The Local Service will have no network connectivity.**

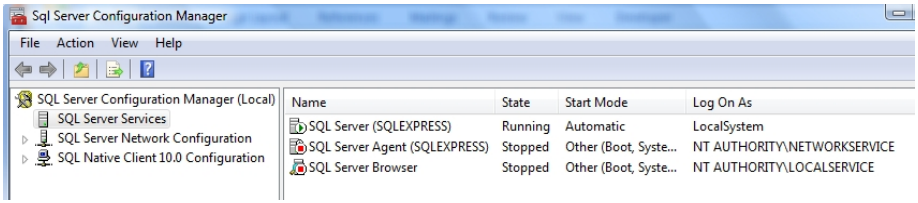
b) This account: Specify a user's account, and provide a password for the account.

**Note: The specified user must be a local machine Administrator.**




9. Click [`Apply`] to save the changes.
10. You will be prompted to allow the service to be restarted. The page will refresh, and the service state shown as [`running`].
11. This will close the services properties dialog box.

12. The SQL Server Services will now list the configured account under the [`Log On As`] column.




## Enabling FILESTREAM

1. Click the [`Start`] button in the bottom left corner of the monitor, and select [`All Programs`]. Find [`Microsoft SQL Server 2008 R2`] in this list of programs.
2. Click on [`Microsoft SQL Server 2008 R2`], and select [`Configuration Tools`].

3. Select [`SQL Server Configuration Manager`]. This will list the different SQL Server components on the left, and the configurations of each on the right.

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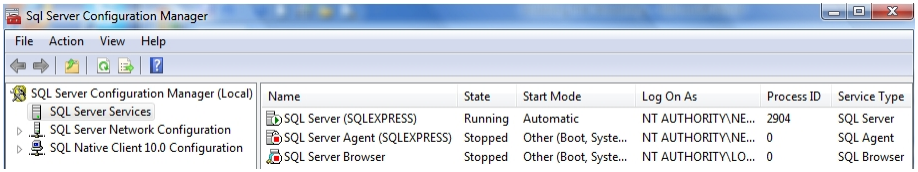


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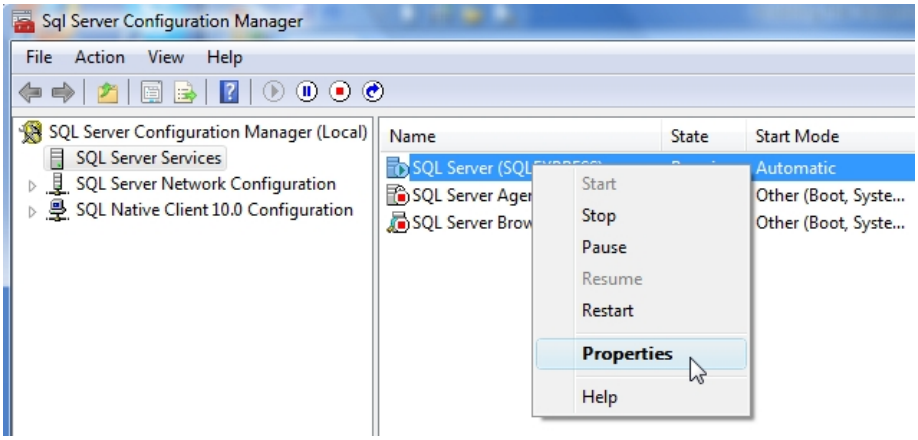
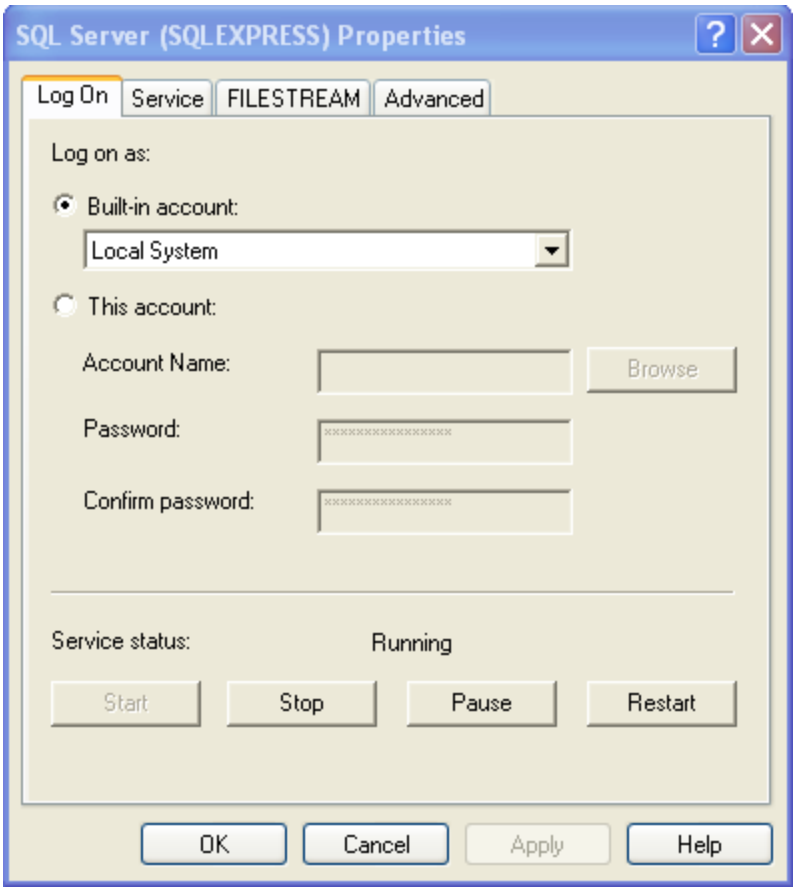
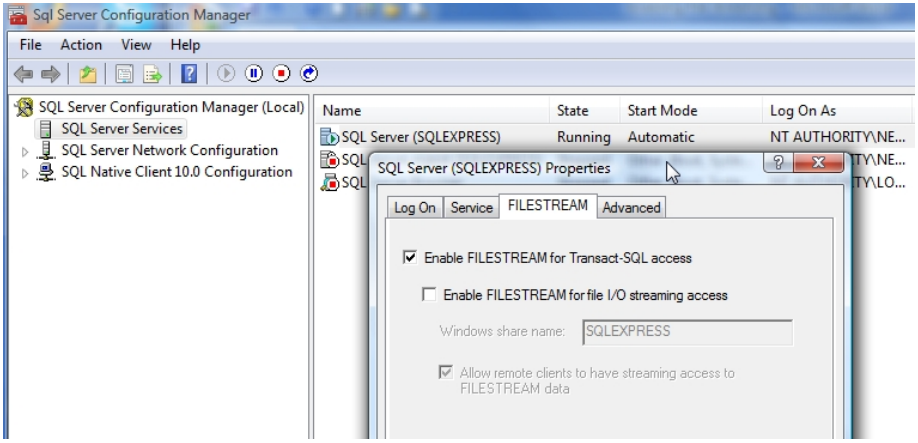


7. The properties of the SQL Server will be shown in the dialog box. Information is available over four different tabs, and opens on the [`Log On`] tab.




8. Select the [`FILESTREAM`] tab.
9. Check the box next to [`Enable FILESTREAM for Transact-SQL access`].

**Note: FILESTREAM is only required for Transact-SQL access. The other boxes can remain unchecked.**




10. Click [`Apply`] to save the changes. The service will not need to be restarted.
11. FILESTREAM is now enabled, one of the software requirements for installing Proficy CSense 6.0.

## Configuring users as System Administrators

Users that install SQL will be a machine or domain administrator, and only a machine or a domain administrator can install Proficy CSense 6.0. Therefore, in most cases, the machine or domain administrator who installs SQL and then Proficy CSense 6.0 afterwards will already have all the rights that they need to use the software, and the installation will succeed.

However, if an administrator installs the software but they are not users that will eventually log in and use the Proficy CSense 6.0 applications, users must be added in SQL with the role of System Administrator, or "sysadmin", in SQL Server Management Studio.

Users can be added as System Administrators in one of two ways:

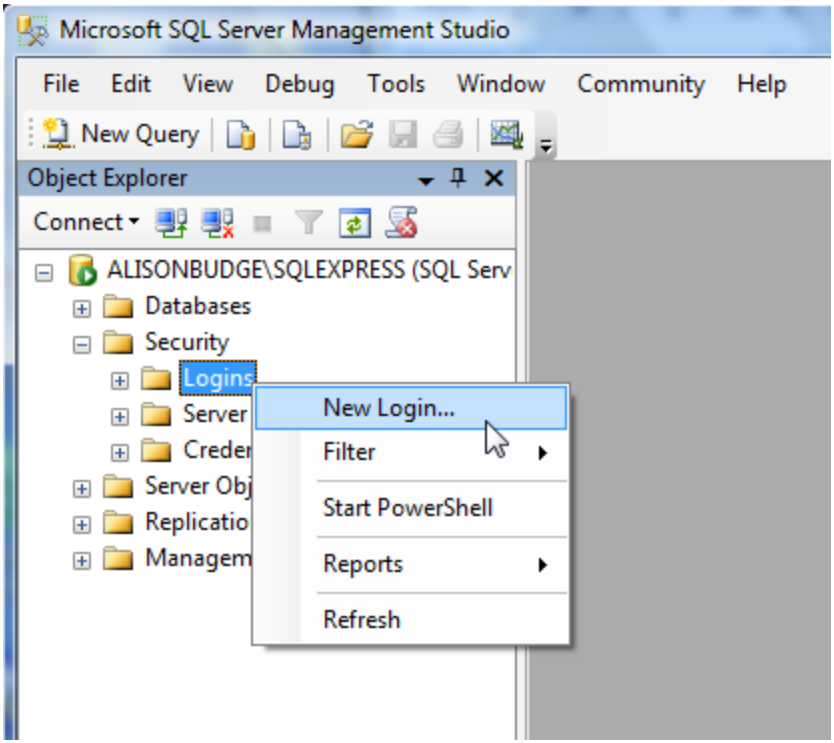
a) individually, or

b) an entire group of users may be added (such as the "Administrators" group).

**A) Configure an individual user with the "sysadmin" role:**

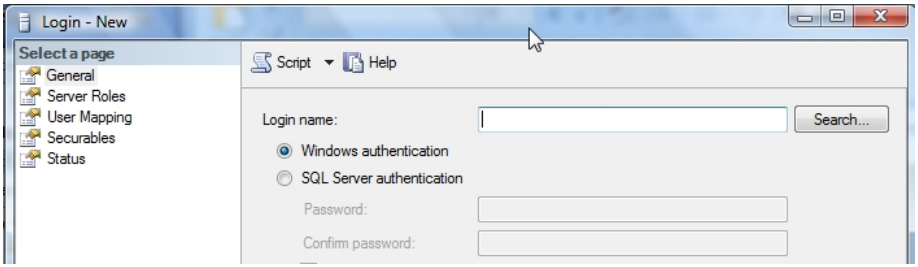
1. Click the [`Start`] button in the bottom left corner of the monitor, and select [`All Programs`]. Find [`Microsoft SQL Server 2008 R2`] in this list of programs.
2. Click on [`Microsoft SQL Server 2008 R2`], and select [`SQL Server Management Studio`].
3. Select the correct server from the drop down list, and click [`Connect`].

4. In the left pane, expand the [`Security`] folder, right click on the [`Logins`] folder, and select [`New Login`].

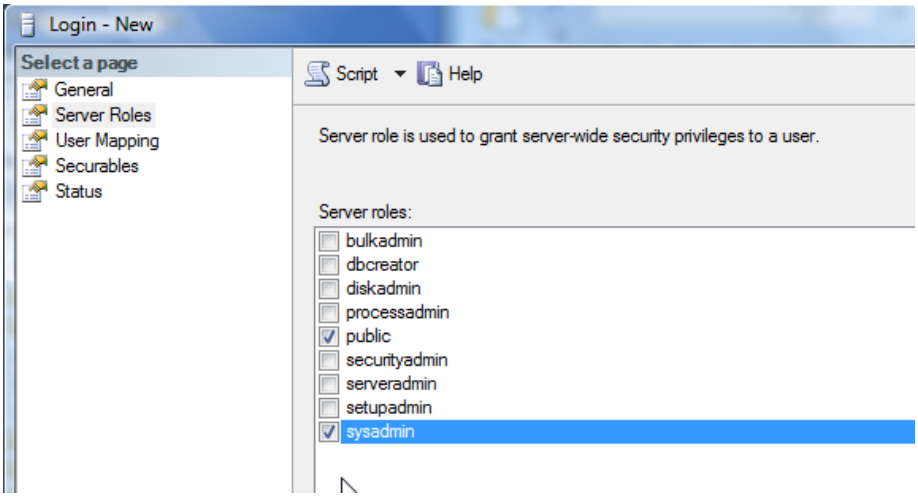



5. On the default opening [General] page, provide the Login name. Either type in the name of the domain or machine user directly, or select one from the drop down list by clicking the [Search] button.

**Note: Be sure to use the full domain\username format in the Login Name field.**




6. In the left hand pane, select the [`Server Roles`] page. A list of server roles will populate the right hand pane. Check the box next to [sysadmin].

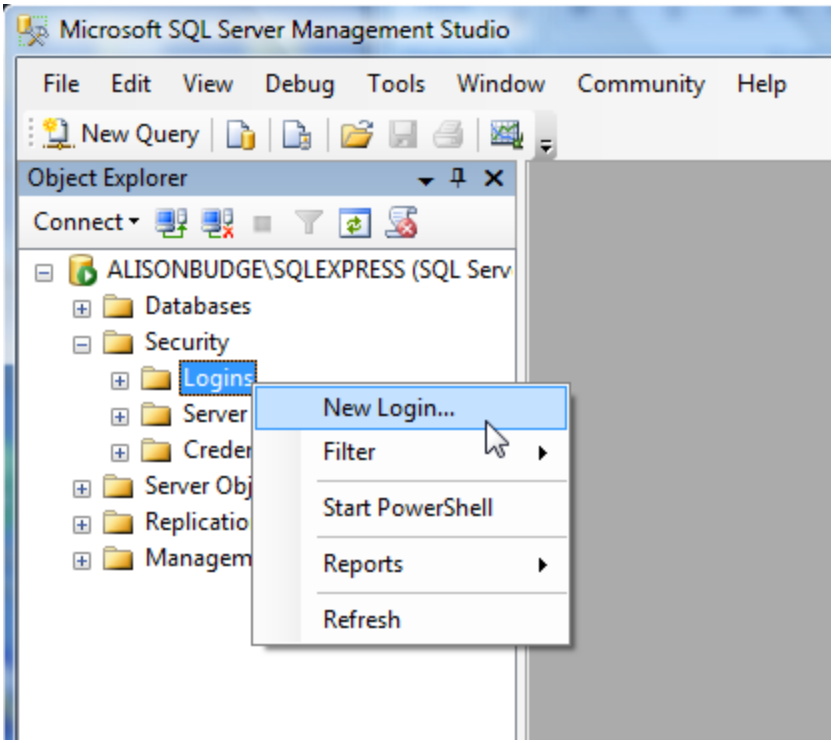



7. Click [`OK`] to save the new configuration.

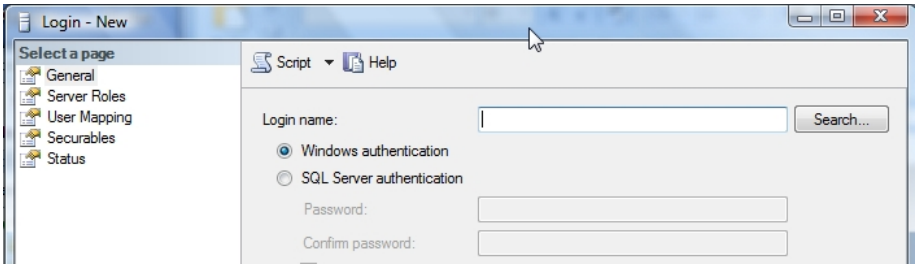
**B) Configure a group of users with the "sysadmin" role:**

1. Click the [`Start`] button in the bottom left corner of the monitor, and select [`All Programs`]. Find [`Microsoft SQL Server 2008 R2`] in this list of programs.
2. Click on [`Microsoft SQL Server 2008 R2`], and select [`SQL Server Management Studio`].
3. Select the correct server from the drop down list, and click [`Connect`].

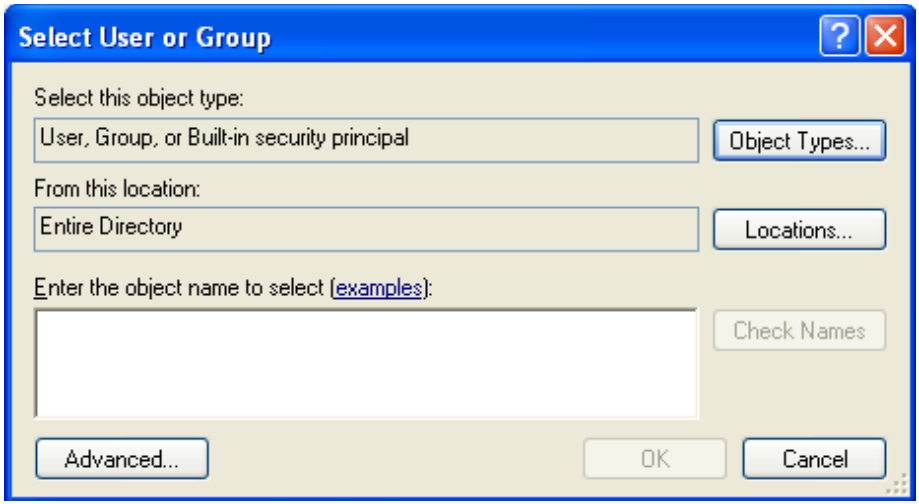
4. In the left pane, expand the [`Security`] folder, right click on the [`Logins`] folder, and select [`New Login`].



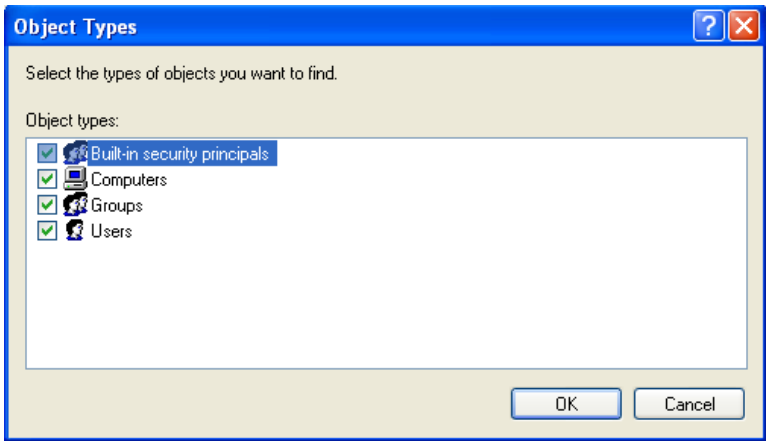

5. On the default opening [`General`] page, next to the Login name, click the [`Search`] button.



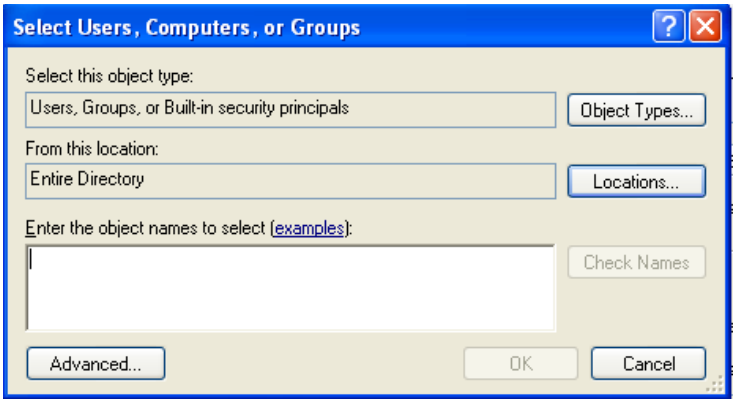

6. The following screen will show:



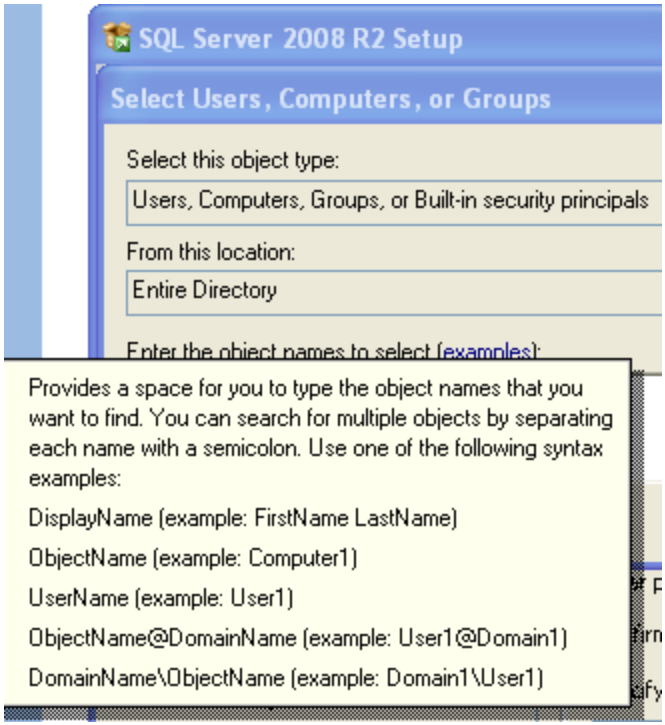

7. Select the type of object you want to find and add, by checking the boxes next to the required object types.



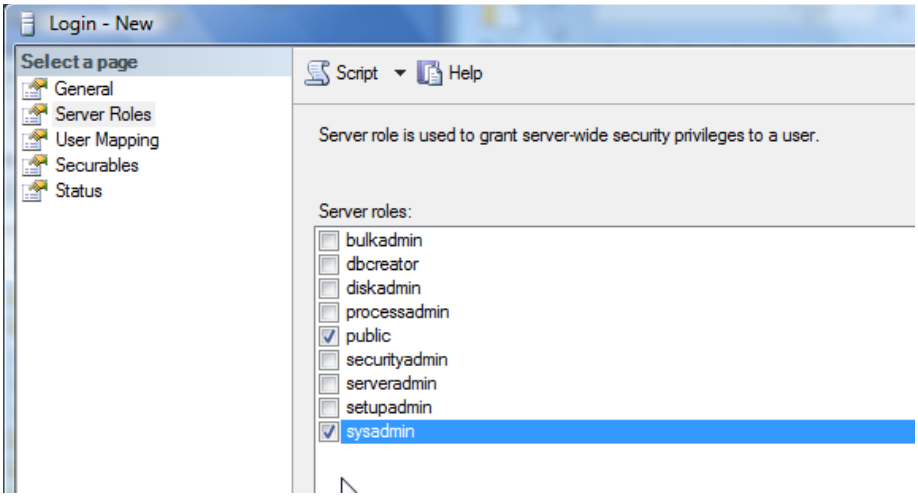
8. Select the location of the object type by clicking on the [Locations] button.




9. Enter the object names to be added in the text box. These could be groups of users, a specific user, or specified computers. See the examples given in the Troubleshooter for the correct formatting required for each new object name to be added.




10. If you don't know the object name required and wish to select from populated lists, click [`Advanced`], and then [`Find Now`]. Select your choice and click [`OK`].
11. Click [`OK`] to save the configuration.
12. In the left hand pane, select the [`Server Roles`] page. A list of server roles will populate the right hand pane. Check the box next to [sysadmin].




13. Click [OK] to save the new configuration.

The software requirements for SQL Server 2008 R2 configuration in order to successfully install Proficy CSense 6.0 have now all been met.

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