Proficy Plant Applications 2022

Getting Started Guide

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Chapter 1. Plant Applications Installation Overview

Introduction

Plant Applications is a unique software solution that digitizes the collective information being generated throughout your production facilities into a "virtual plant" for access where, when, and how you need it. Plant Applications provides clear insight into your production to greatly improve operational effectiveness.

Plant Applications continues to offer an SDK to customize and implement platform (MESCore) features.

United Manufacturing Database Support

Plant Applications continues support for the Unified Manufacturing Database (UMDB) that combines a Plant Applications data model with the S95 data model employed by the SOA platform.

The model offers a single platform to implement holistic, operational performance-management solutions for batch, discrete, and mixed environments using equipment, product, and people centric models. It provides the following benefits:

- Extension by the new MESCore Service provider of the SOA data model to enable creation of a Unified Manufacturing Database.
- Data entry through the convenient Workflow Client interface. A separate license for Workflow is required to use workflows.
- Data methods to design custom displays and forms to gather, monitor, and analyze plant operations data. Using methods with Workflow requires a license.

Licensing

Plant Applications licensing has been simplified to help manage concurrent users. The Plant Applications Server is licensed based on the number of concurrent users that connect to the server.

A concurrent user has access to all modules and functions in Plant Applications. You can license individual modules, supporting module-level licensing for customers having previous licensing for the Efficiency, Quality, and Production modules.

A Workflow license is not required for Plant Applications. A separate Workflow license is required to create workflows or to use methods.

After installing Plant Applications, you can use the License Viewer to help determine what licenses exist on a machine. From the Windows **Start** menu, select **Programs > Proficy Common > License Viewer**.

📒 **Note:** As a part of Plant Applications 2022 installation, GE provides a third-party software CodeMeter along with the Plant Applications Server installer.

For more information about the latest GE Digital product offerings, see https://www.ge.com/digital/products. For general information about the new GE Digital licensing model, search for Licensing information on https://digitalsupport.ge.com/. A help system is installed with licensing and is available from the `Proficy Common` directory.

Chapter 2. Preparing to Install Plant Applications

Plant Applications Server and Client Requirements

Before you install Plant Applications, verify that all required software versions have been installed on the target machine.

Workflow is required for Plant Applications and can be installed from the **Installation Menu**.

See to compare machine requirements in a test, standard production, and high-transaction environment.

📄 **Note:** Plant Applications does not support Web Client Displays for Vision, which were delivered in previous versions.

The Plant Applications Server and Web Client servers can be hosted in the AWS/Azure Cloud. Ensure that when they are hosted in Cloud they meet the Plant Application and Web Client Server system requirements.

Operating System

Plant Applications requires one of the following operating systems, with latest service packs or revisions:

- Microsoft® Windows® Server 2019 (64-bit) for server installations
- Microsoft® Windows® Server 2016 (64-bit) for server installations
- Microsoft® Windows® Server 2022 R2 (64-bit)
- Microsoft® Windows® 10 (64-bit) for Client installations
- Microsoft® Windows® 11 (64-bit) for Client installations

Network Interface Software

- Internet Protocol Version 4 (IPv4)

Microsoft®.NET Framework

- Microsoft .NET Framework 4.7 for Workflow 2.6 SP1

  📄 **Note:** You can download the Microsoft .NET Framework 4.7 from the following URL: https://go.microsoft.com/fwlink/?LinkId=825299

- Microsoft .NET Framework 4.7.2 for Plant Applications Server

• Microsoft .NET Framework 3.5 for Plant Applications Client

Microsoft® SQL Server®

• Microsoft® SQL Server® 2019 (with the latest Cumulative Update installed), 2017 (64-bit), and 2016 (64-bit)

> 📝 **Note:** You must have SQL Server 2016 (64-bit) and later for the Plant Applications Server and Web Client installation. If you are running a previous version of SQL Server, a message stating that the prerequisite criteria not met appears. You must upgrade to SQL Server 2016 (64-bit) and later to continue with the installation.

• Microsoft System CLR Types SQL Server 2016 (32-bit only)

> 📝 **Note:** Do not install if you already have the Microsoft System CLR Types SQL Server 2016 (32-bit only) installed.

• SQL Server 2012 Native Client version 11.4.7001.0 and later

> 📝 **Note:** The SQL Server 2012 Native Client is required for Plant Applications Server and Plant Applications Client machines. If the version of the SQL Server 2012 Native Client you installed is not 11.4.7001.0 or later, you must upgrade it. You can download the SQL Server 2012 Native Client version 11.4.7001.0 or later from the following URL: https://www.microsoft.com/en-us/download/details.aspx?id=50402

• For information on SQL Server requirements, refer to SQL Server Requirements *(page 19)*.

Software Requirements

Software	Requirement
Web Server	IIS 8.0 or later based on the operating system
Microsoft Office	Microsoft Excel 2019 or 2016 (required for SQL Server and Web Engines) 32-bit. 📝 **Note:** If you import data using a Microsoft Excel file that was created in an older version, it will not contain the columns necessary to support the new Event Progress feature. Refer to topics in Plant Applications Help for steps describing how to use the Excel add-in.
Document Viewer	PDF reader (required to view some Web Server reports)
Workflow	Workflow 2.6 SP1 📝 **Note:** You must install Workflow 2.6 SP1 if you are installing a clean environment of Plant Applications.

Software	Requirement
Browsers	• Microsoft Internet Explorer 11 (Web Reports) 📄 **Note:** Currently, Plant Applications Web Client components do not support Internet Explorer. • Chrome v92 (Plant Applications Web Client components) • Safari v13.1+ (Plant Applications Web Client components) 📄 **Note:** Process Analyzer only supports Chrome.
Communication	MAPI-compliant Mail client software

Server Hardware Requirements

Minimum Requirement	GE Recommended
The minimum server requirements when running a Plant Applications environment without SOA entities and not using the Client or Workflow: • 4 CPUs with 3.0 GHz processor each • 16 GB RAM (Optimization of memory allocation needs to be to SQL Server) • 1 TB hard drive (minimum 7.2KRPM) • Network speed of 1 GBPS • Monitor with minimum 1366 x 768 resolution	For a standard implementation, GE recommends the following: • 10 Cores with 2.6GHz processor each • 32 GB RAM (For better memory allocation, we recommend to have 32 GB RAM) • 4 TB hard drive (minimum 7.2KRPM) 📄 **Note:** Hard drive size is dependent upon anticipated database growth, backups, and practices employed to purge data. • Network speed of 1 GBPS • Monitor with minimum 1366 x 768 resolution

Client Hardware Requirements

Client hardware requirements may vary depending upon the installed base of computers at your facility. However, based on GE's experience with multiple customer sites, the following configuration is recommend:

- Pentium 4-based computer with 2 GB of RAM (minimum)
- 20-GB hard drive space (minimum)
- DVD drive
- Network interface software for network communications supporting TCP/IP
- Monitor for the lab and floor operations, 100 percent IBM compatible, supporting a 24-bit graphics card for 1024 x 768 or higher resolution and at least 65535 colors
- Two-button mouse with scroll wheel or compatible pointing device such as a touch screen

Supported Small Screen Devices

Supported devices:

- **iPad 6th Gen**: Safari v13.1+, Chrome 92 and later

  📝 **Note:** To view the application content, you must select the desktop site option from the Chrome browser settings menu.

- **HP tablet**: Chrome 92 and later
- **Android 10-inch Tablet**: Chrome 92 and later.

  📝 **Note:** To view the application content, you must select the desktop site option from the Chrome browser settings menu.

Compatible or supported applications with above devices:

- Activities
- Downtime
- OEE Dashboard
- Reports
- My Machines
- Alarms
- Process Orders
- Waste
- Unit Operations
- Work Queue
- NCM

Port Requirements

Use internal interfaces to open the ports required for Plant Applications operations.

Port	Description
80	Used by Web server for serving traditional web reports.
1433	Used by SQL Server for communication to SQL.

Use the `CXS_Service` table in the Plant Applications database to modify the following ports.

Port	Description
12293	Used by Proficy Server Manager for the Service Control feature of the Administrator.

Port	Description
12294	Used by Proficy Server Gateway for clients (including SDK) to send/receive Plant Applications messages.
12295	Used by Proficy Server Gateway for clients (including SDK) to send/receive Plant Applications messages.
12295	Used by older (4.0 and older) versions of Client Manager.
12299	Used by Proficy Server Remote Data Service, allowing Proficy services perform remote read and write operations to a historian.
12401	Used by Proficy License Manager for licensing requests from Proficy services to clients.

Use INI files such as `cmRTR.ini`, `cmConfigMgr.ini`, `PlantAppsMessging.ini`, or `Message.ini` (found in the Plant Applications program installation directories), to modify the following ports:

Port	Description
10000	Used by the Proficy message router to process Plant Applications messages between services clients communicating with the router.
12280	Used by the Proficy message router to process Plant Applications messages between services clients communicating with the router.

Language Support

Plant Applications supports the following languages for translation:

Languages	Plant Applications Client	Plant Applications Web Client	
		Process Available in versions above	Discrete Available in versions above
US English	YES	8.0	8.0
Arabic	YES	8.0	8.1
Bosnian	YES	8.2	
Chinese (Simplified)	YES	8.0	8.1
Czech	YES	8.1	8.1
Danish	YES	8.0	
Dutch	YES	8.0	2022
Finnish	YES	8.0	

Languages	Plant Applications Client	Plant Applications Web Client	
		Process Available in versions above	**Discrete** Available in versions above
French (European)	YES	8.0	2022
German	YES	8.0	8.2
Hebrew	YES	8.0	
Italian	YES	8.0	2022
Japanese	YES	8.0	8.1
Korean	YES	8.0	
Russian	YES	8.0	8.2
Polish	YES	8.0	
Portuguese (Brazilian)	YES	8.0	2022
Slovenian	YES	8.0	
Spanish (Latin American)	YES	8.0	8.2
Swedish	YES	8.0	
Turkish	YES	8.0	8.2
Vietnamese	YES	8.1	8.1

Compatibility with Other GE Products

GE Software	Supported Version
Operations Hub	• Operations Hub 2.1 with SIM3 and later • Operations Hub 2022
Workflow	2.6 SP1
Historian	7.0 SP6, 8.1, 9.1, and 10.0
iFix	6.1, 6.5, and 6.8
CIMPLICITY	11.0 SIM2 and 2022

For silent installers, see

Workflow Requirements

The **Proficy Application Server** selection under **Prerequisites** in the Plant Applications **Installation Menu** installs Workflow 2.6 SP1 components. When upgrading, refer to Upgrade from Plant Applications Version 7.0 SP5 and Later *(page 119)*.

SOA Platform

The SOA platform is installed along with Workflow and is required by Plant Applications to install the UMDB. A Workflow license is not required to use Plant Applications with the UMDB, but a Workflow license is required to build workflows. Plant Applications supports the 32-bit version of Workflow.

📝 **Note:** Install or upgrade Workflow components before Plant Applications components. When upgrading, follow the steps in Upgrade from Plant Applications Version 7.0 SP5 and Later *(page 119)* to remove components before starting the installation.

Standard Deployment Architecture

The following diagram shows the recommended deployment architecture for Standard Edition Web Client Installation. In this diagram, the various servers suggests the order of installation of the various software packages on their respective servers. We recommend that you follow the same order.
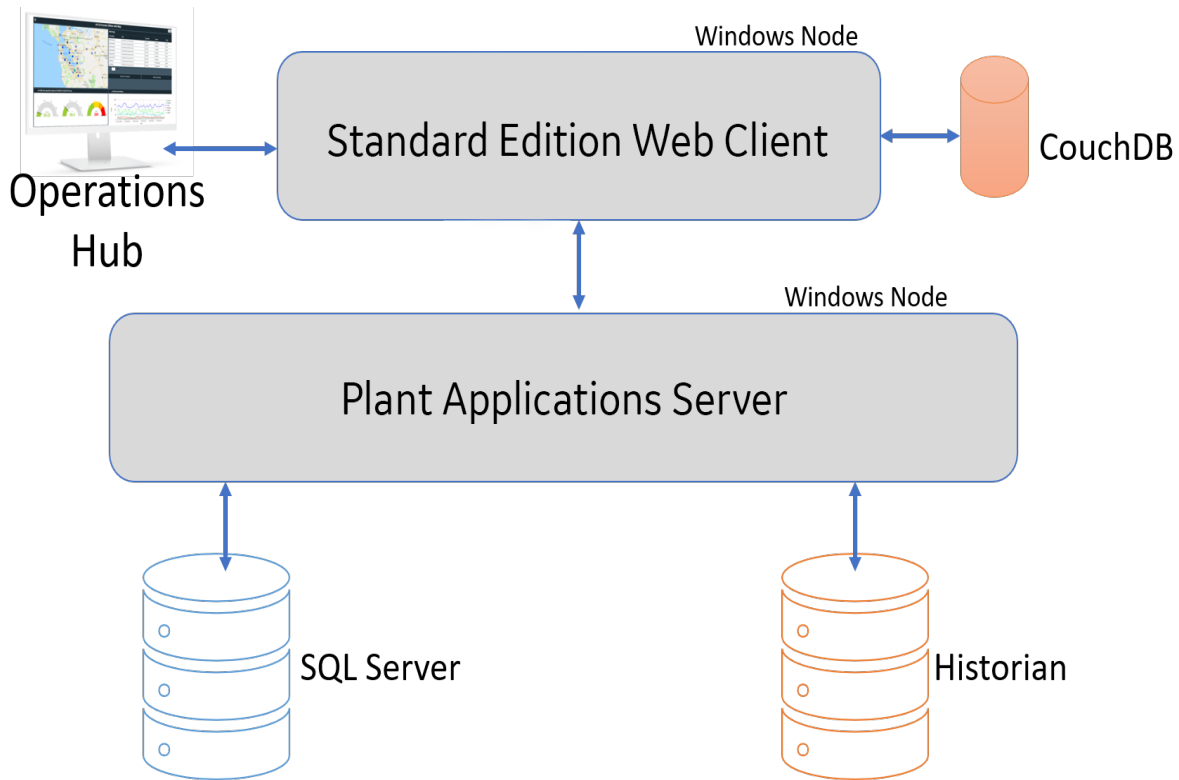
If, however, you choose the minimum-number-of-servers configuration for the deployment, resolve the following possible port conflicts:

- **Operations Hub and Plant Applications Web Reports:** Operations Hub uses 443 as the port number for https binding. Therefore, use a different port for the Web Reports server.
- **Operations Hub IQP and Apache CouchDB:** Both these applications use 5986 as the port number. Therefore, modify the `default.ini` file of Apache CouchDB to set the port number under httpd to 5987.

Enterprise Deployment Architecture

The following diagram shows the recommended deployment architecture for Enterprise Edition Web Client Installation. In this diagram, the various servers suggests the order of installation of the various software packages on their respective servers. We recommend that you follow the same order.
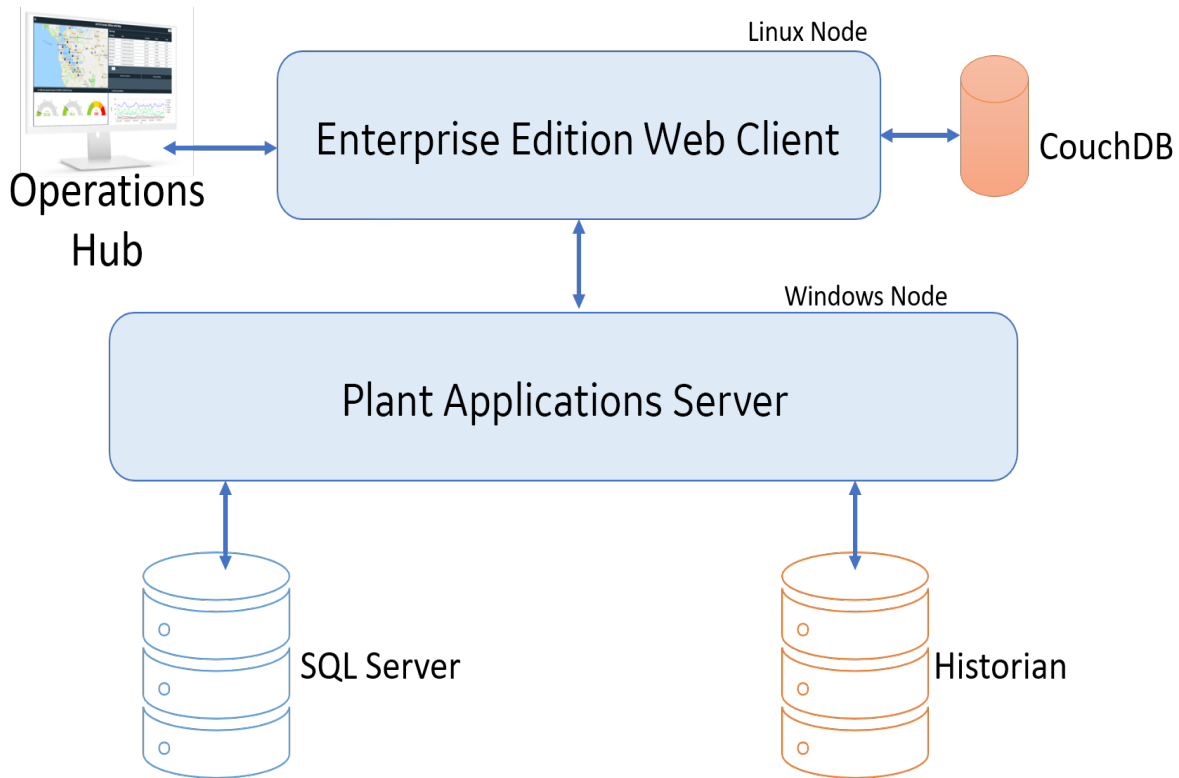
If, however, you choose the minimum-number-of-servers configuration for the deployment, resolve the following possible port conflicts:

- **Operations Hub and Plant Applications Web Reports:** Operations Hub uses 443 as the port number for https binding. Therefore, use a different port for the Web Reports server.

📝 **Note:** If port 5986 is used by any other application, then modify the `default.ini` file of Apache CouchDB to set the port number under httpd to 5987.

Silent Installers

The Silent Installers are available in the Silent folder and the SQL Server 2012 Native Client prerequisites are available in the **Tools** folder on Proficy Plant Applications ISO. For more information on executing the silent installers, refer to the [How to Silently Install the Plant Applications Client and SIM](#) KBA article.

SQL Server Configuration

Databases, transaction logs, tempdb, non-clustered indexes, and back-ups should be installed on separate hard drives. The following RAID specifications are recommended when running in a Plant Applications environment without SOA entities and not using the Client or Workflow. Additional requirements may be necessary for a Unified Manufacturing Database.

- SQL database: RAID 0+1, RAID 1, or RAID 5 or higher
- SQL transaction logs: RAID 0+1 or RAID 1 and should be a separate physical device
- SQL tempdb: RAID 0+1 or RAID 1
- SQL indexes: RAID 0+1 or RAID 1
- Back-ups: RAID 0 (no fault tolerance, but faster writes), or RAID 5 or higher

⚠ **Important:** For a current listing of the supported service packs and hot fixes released by Microsoft, refer to the article KB9920 at the GE support site (https://ge-ip.force.com/communities/CC_Home).

For up-to-date instructions and the latest information on installing SQL Server, visit the MSDN web site: https://msdn.microsoft.com/en-us/library/bb545450.aspx

Additionally, the following configuration is recommended:

- Use Mixed Mode security.
- Exclude the database files from anti-virus scanning.
- Use multiple processors for every installation.
- Enable the default backup job, which is disabled during the Plant Applications Server installation, or create a maintenance plan.

Multiple Databases on a Single SQL Server

Multiple Plant Applications databases cannot be installed in the same instance of SQL Server because the 'proficydbo' account uses a default database and there can only be one default database. To use multiple Plant Applications databases on a single SQL Server, you must install multiple instances of SQL Server.

Table Statistics

When an individual table query experiences significantly reduced performance or selects the wrong index, the first thing that can be done is to update the table statistics. The query optimizer in SQL Server bases its choice of indexes and execution plans on the current table statistics. If the table statistics are not representative of the actual data in the table, the query optimizer may make bad decisions.

By default, SQL Server automatically updates table statistics periodically, but the automatic update is not always accurate. Furthermore, the default statistics are calculated based on a small subset of the rows in a table, which may not always give the best results. SQL Server chooses a small subset for performance reasons because calculating statistics can be a time-consuming and resource-intensive

task, depending on the size of the table. Manually updating the statistics based on the full set of rows in the table or even based on a larger percentage of rows (for example, 50%) might improve query performance.

📋 **Note:** Care should be taken to ensure that the statistics update is done during low server utilization periods.

For Plant Applications, the `User_Defined_Events` table should have the statistics regularly updated, which can be accomplished using the UPDATE STATISTICS command. For example: UPDATE STATISTICS User_Defined_Events WITH FULLSCAN.

Database Sizing

The database should be initialized to the full database size. This reduces fragmentation within the database caused by incremental database growth. It also prevents the periodic performance slowdowns that occur when the database size is incrementally increased by SQL Server. SQL Express is not supported because it limits database size to 2 GB, which is below the minimum required for Plant Applications.

Setting Nested Triggers

In SQL Server, nested triggers must be allowed. For more information on nested triggers, search for "nested triggers" in the SQL Server Books Online.

1. In the **SQL Server Management Studio**, right-click the server and click **Properties**. The **Server Properties** dialog box appears.
2. Under **Select a page**, click **Advanced**. The **Advanced** page appears.
3. Under **Miscellaneous**, ensure **Allow Triggers to Fire Others** is set to `True`.

SQL Server Requirements

📋 **Note:** Passwords for recent versions of SQL Server are case sensitive. Ensure passwords are updated if upgrading from a version older than 2008.

SQL Server Installed Components

The following components must be installed:

   • Database Engine Services

SQL Server Naming Conventions

Do not use special characters for server names.

SQL Server User Access

As an SQL Server user, you must have following permissions to install or upgrade the Plant Applications Server successfully.

1. SYSADMIN Server role.
2. MINIMUM SQL Server User Accesses required to install or upgrade Plant Applications when SYSADMIN Server role is not available for the Database User.

   To install Plant Applications, the following configurations are required for the database user:

   a. Server Role:
      - processadmin
      - public
      - setupadmin
   b. Mapping for Database User with Server Roles

      For example:

For This Database	Use This Database User Role
msdb	• public • SQLAgentUserRole
Plant Applications Database (SOADB)	• db_owner • public
tempdb	public

   c. Securables

      You can set the following permissions (WITH GRANT) for the database users:

      - Connect Any Database
      - Alter any login
      - Connect SQL
      - Create any database
      - View any definition
      - View any database
      - View server state

      Note: For msdb users, you must give access to the following with permissions as shown in the table:

Access To	This Permission
Table	Select 'WITH GRANT'
View	Select 'WITH GRANT'

Access To	This Permission
Stored procedure	Execute 'WITH GRANT'

Supported Network Protocols

Before installing SQL Server, the stand-alone named and default instances must support the following network protocols:

- Shared memory (Shared memory is not supported on failover clusters)
- Named pipes
- TCP/IP

The same network protocol must be set up on the server and client computers to be able to communicate with each other.

SQL Server Browser Service and Plant Applications Server

Microsoft System CLR Types SQL Server 2016 (32-bit only) must be installed.

If you are installing Plant Applications Server on a computer and SQL Server on a different computer, the SQL Server Browser service (sqlbrowser) must be running before installing Plant Applications Server.

For information on the SQL Server Browser service, see: http://msdn2.microsoft.com/en-us/library/ms165724.aspx

Enabling TCP/IP and XP_cmdshell

The xp_cmdshell option and the TCP/IP protocol, which are disabled by default, must be enabled. The installation process verifies whether the TCP/IP protocol is enabled and if it is not enabled, a message box appears asking permission to enable the TCP/IP protocol. If permission is denied, the installation process will quit. The **xp_cmdshell** option is automatically enabled during the installation process.

📋 **Note:** If you are installing Plant Applications Server on a computer and SQL Server on a different computer, you must manually enable the TCP/IP protocol. It cannot be enabled remotely.

Conflict with ReportServer Virtual Directory

SQL Server installs a virtual directory called ReportServer when the SQL Server Reporting Services (SSRS) component is installed. This virtual directory conflicts with the Plant Applications ReportServer virtual directory. If you are planning to run SQL reports, you need SSRS. But if you

are planning to use Plant Applications reports delivered through the Plant Applications Report Server (web reports), do not install the SSRS component.

📒 **Note:** The virtual directory conflict affects only 2008 server that has been installed to the default instance. A named instance (not the default name) will not conflict with Plant Applications.

To Rename, Move, or Create the Reporting Services Virtual Directory:

1. Click **Start > Programs > Microsoft SQL Server 2008 > Configuration Tools**.
2. Click **Report Services Configuration**. The **Report Server Installation Instance Selection** dialog box appears so that you can select the report server instance.
3. For **Machine Name**, enter the name of the computer on which the report server instance is installed.
4. For **Instance Name**, select the **SQL Server Report Services** instance. Only SQL Server report server instances appear in the list.
5. Click **Connect**. The **Reporting Services Configuration Manager** screen appears.
6. Click **Report Server Virtual Directory**. The **Report Server Virtual Directory Settings** page appears.
7. Click **New**. The **Create a New Virtual Directory** dialog box appears.
8. In **Virtual Directory**, type in a new virtual directory name and click **OK**.

Supported Portals

The Plant Applications continues support for Web Parts and Microsoft SharePoint Portal Services. The release does not support Proficy Real-time Information Portal or Link Manager.

Web Parts is validated for Windows SharePoint Services 3.0. To use Web Parts with a later version of SharePoint, contact GE Support.

📒 **Note:** SharePoint Portal Services 3.0 installs on port 80, which conflicts with the Plant Applications Web Server that also uses port 80. You must change SharePoint to use a different port, such as port 81 or another port that is not used.

Anti-Virus Scanning

To prevent performance issues, the following directories and files should be excluded from being scanned by your anti-virus software:

- MSScript.ocx
- Historian program files
- Historian archive data files
- SQL Server database files
- SQL Server transaction logs

- SQL Server backups
- Plant Applications program files
- Plant Applications log files
- Plant Applications buffer files

VMware Support and Configuration

VMware is an officially supported and tested environment for running the Plant Applications Server and Clients. Support for VMware ESXi Server version 5.0 and above is provided. Advanced features of VMware (such as VMotion, VMware VMFS, clustering support, high availability, and so on) are not supported.

Validated configurations:

- A maximum of five VMware images running on sufficient hardware is supported
- One computer running Proficy Historian
- One or more computers running the Plant Applications clients (these may be the same computers as the Proficy Historian computers or a single computer)

General VMware Information

For information regarding VMware specifications and requirements, see http://www.vmware.com/pdf/vi3_30_20_installation_guide.pdf.

Due to the wide range of parameters associated with the hardware, configuration, memory settings, third-party software installations, and the number of virtual machines running, GE recommends that you visit the VMware web site to help you determine the hardware requirements for configuring your virtual environment. Start by looking at the VMware Compatibility Guide, provided by this link on the VMware web site: http://www.vmware.com/resources/compatibility/search.php

Time Zone Support

The following table represents Plant Applications constraints and indicates whether other applications must be running in the same time zone as the Plant Applications server.

Application	UTC Mode	Non-UTC Mode
Plant Applications Web Server	Not supported – must use Proficy DataMart	Same time zone
Proficy DataMart	Same time zone	
SQL Server	Same time zone	Same time zone
Plant Applications Clients (including Web Clients)	Any time zone	Same time zone

Application	UTC Mode	Non-UTC Mode
Proficy Historian	Any time zone	Any time zone
Other Historians	Any time zone	Same time zone

VMware Licensing

When installed on a VMware image, you must use a keyless license (not a HASP key) for Plant Applications.

Local Language Support for VMware

All the computers interacting with a Plant Applications server must be set to the same code page (also known as the "Language for Non-Unicode Programs") as the Plant Applications Server.

Performance for VMware

It is critical that sufficient hardware is allocated to support multiple Plant Applications installations on a computer.

WAN Performance for VMware

Plant Applications is designed to run on-node or in a high-speed, low latency LAN environment. Performance issues can be expected when running it across a low-speed or high latency WAN. If Plant Applications is being used for production control, then network downtime will cause production downtime. Therefore, it is critical that reliability, throughput, and latency of the network connections are carefully managed.

Computer

- Model: Dell PowerEdge 2950
- System type: ACPI Multiprocessor PC
- Operating System: Microsoft Windows Server 2003, Enterprise Edition, Service Pack 2
- Internet Explorer 6.0.3790.3959
- VMware Workstation 6
- Allocated Memory per Virtual Machine: 4 GB

Mother board

- CPU Type: 4x DualCore Intel® Xeon 5050, 3000 MHz
- Mother Board Name: Dell PowerEdge 1950
- Chipset: Intel Greencreek 5000X
- Memory: 8192 MB (DDR2-533 Fully Buffered ECC DDR2 SDRAM)
- BIOS Type: Phoenix (05/17/06)
- Communication Port: Communications Port (COM1)

• Communication Port: Communications Port (COM2)

Data Stocking

- IDE Controller: Intel 631xESB/6321ESB Ultra ATA Storage Controller - 269E
- Storage Controller: Dell SAS 5/i Integrated Controller
- Hard Disk Drive: 2X MAXTOR ATLAS10K5_300SAS SCSI Disk Device (300 GB, 10000 RPM, Serial Attached SCSI)
- Hard Disk Drive: 2X MAXTOR ATLAS10K5_300SAS SCSI Disk Device (300 GB, 10000 RPM, Serial Attached SCSI)
- CD-ROM: HL-DT-ST CDRW/DVD GCC4244 (DVD:8x, CD:24x/24x/24x DVD-ROM/CD-RW)

Additional VMware Notes

GE cannot guarantee the performance of the Plant Applications software in a virtualized environment due to the wide range of parameters associated with the hardware, configuration, memory settings, third-party software installations, and the number of virtual machines running - all of which can affect performance. Therefore, GE cannot provide support related to the performance of the Proficy software running on a virtual machine if it's determined that the issue is related to the virtual environment. Also, GE does NOT provide support or troubleshoot a customer's virtual machine infrastructure. It is the responsibility of you, the customer, to ensure that the performance of the Plant Applications software and any third-party applications (especially those not recommended by GE) are adequate to meet the needs of your run mode environment. GE does not support issues related to functionality that is not available as a result of running in a virtual machine infrastructure. Examples include the functionality of card level drivers such as those for the Genius® family of drivers, the Allen-Bradley® DH/DH+ drivers, the Cyberlogic's MBX® Driver for the SA85 card, as well as functions requiring direct video access. Check with the vendor of your third-party application for support statements regarding that third-party product's ability to run in a virtualized environment.

Setting up IIS Web Services

📝 **Note:** Before you make any changes to Internet Information Services (IIS), you might want to export your existing configuration to review it. For more information on an existing Microsoft utility, refer to https://www.iis.net/learn/get-started/getting-started-with-iis/getting-started-with-appcmdexe

Verify that all role services for Web Server and IIS have been installed.

1. Open **Server Manager**.

2. Expand **Roles**, then select **Web Server (IIS)**.

3. Scroll down in the information listed for the Web Server (IIS) to view installed Role Services, and verify that the correct services have been installed.

4. If needed, click **Add Roles** in the Roles Services section to start the **Add Role Services** wizard to add a role.

5. Click the **Web Server (Installed)** box to enable service selection. Restart the machine if role services have been added.

6. Expand **Features**, and run the **Add Features** wizard.
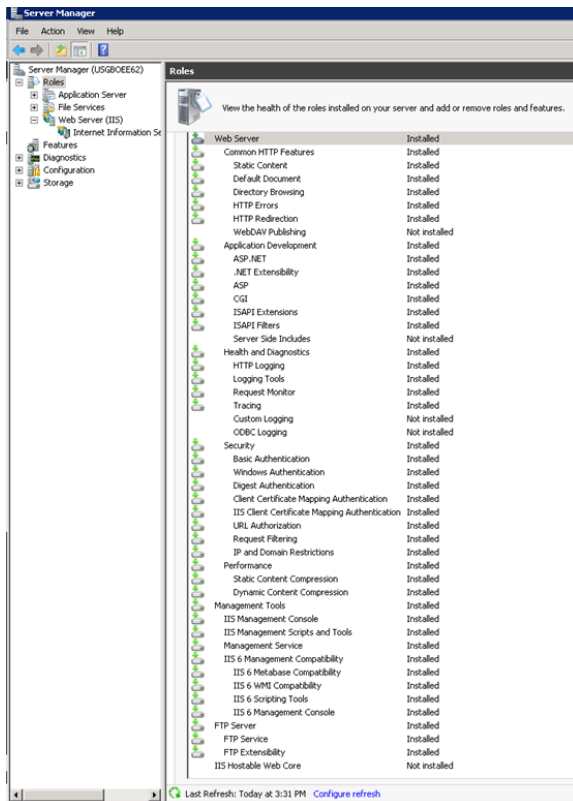
7. Select **HTTP Activation** under .NET Framework 3.5.1 Features, then run the wizard to install the feature.

Removing WebDAV Publishing from IIS

WebDAV Publishing causes an error when deleting or updating comments or events. When installing IIS, do not include WebDAV.

If IIS is already installed with WebDAV, uninstall it from the **Role Services** screen of the **Server Manager**.
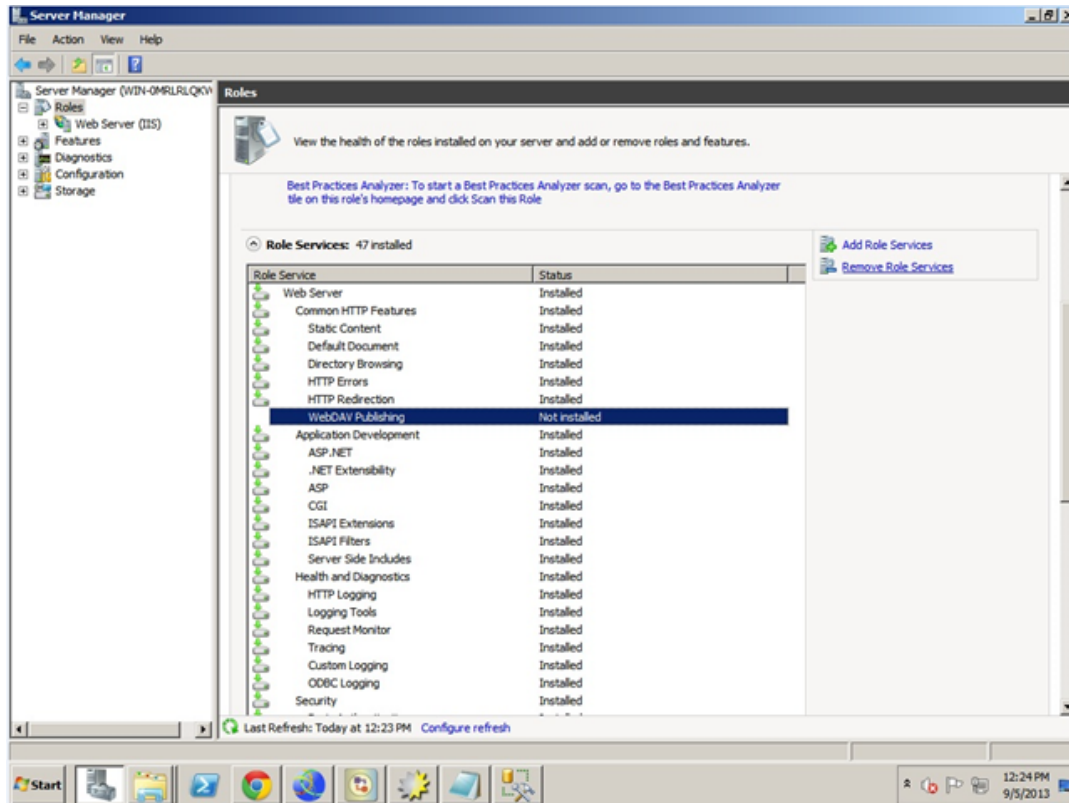
Editing the ISAPI File Path

An error can occur when loading ISAPI filters.

1. Open **Internet Information Services (IIS) Manager** from the **Server Manager**, then right-click the icon to open the **ISAPI Filters** pane from the ISS section of the ISS Manager.
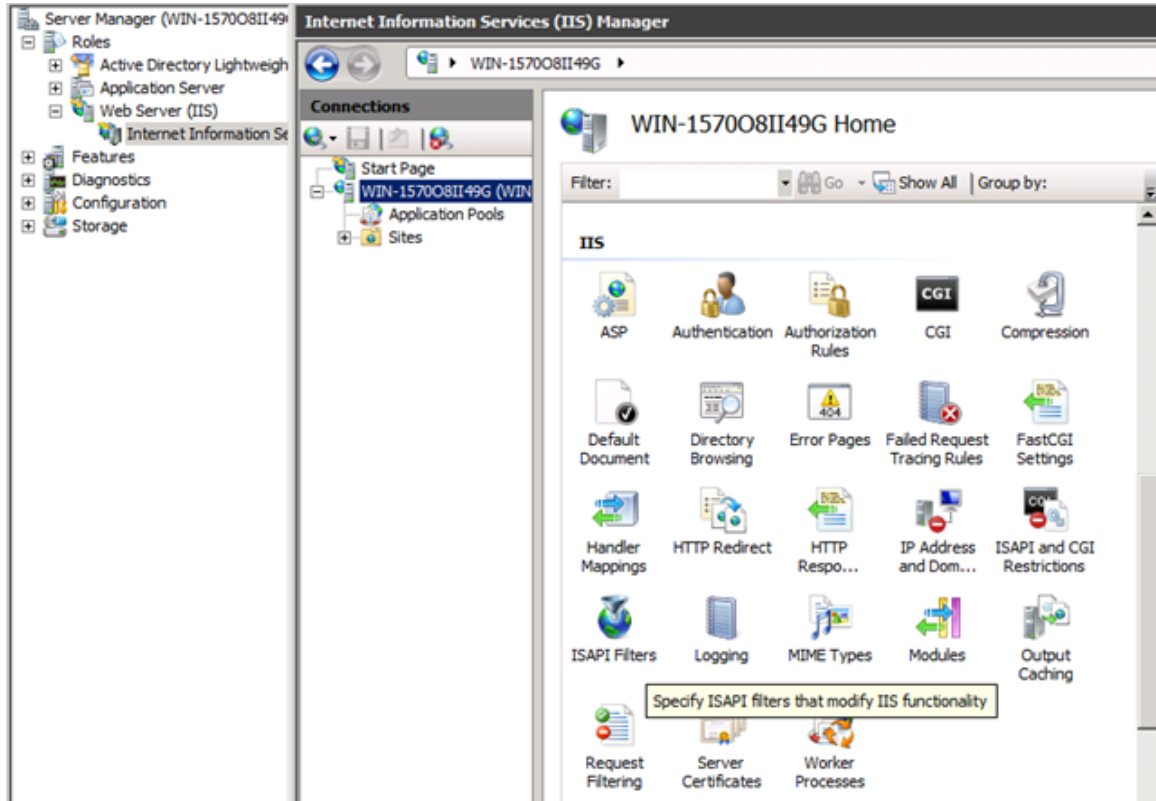
2. Expand the Executable column and look for any executable path containing two backslashes instead of one. Right-click the executable and select **Edit**.
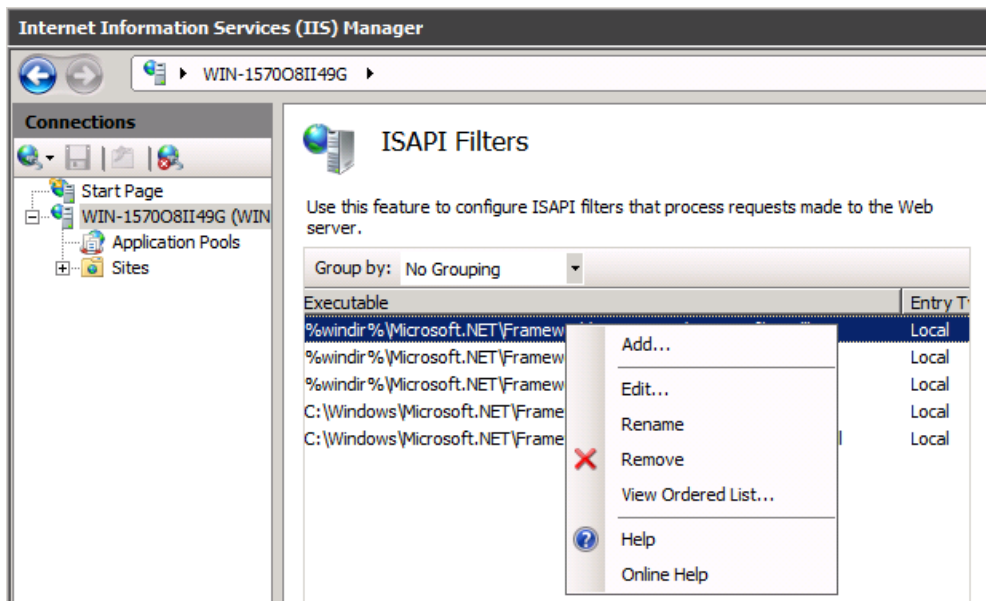
3. Change the ISAPI Filter path to use a single slash, such as `\aspnet_filter.dll` as shown in the following example.
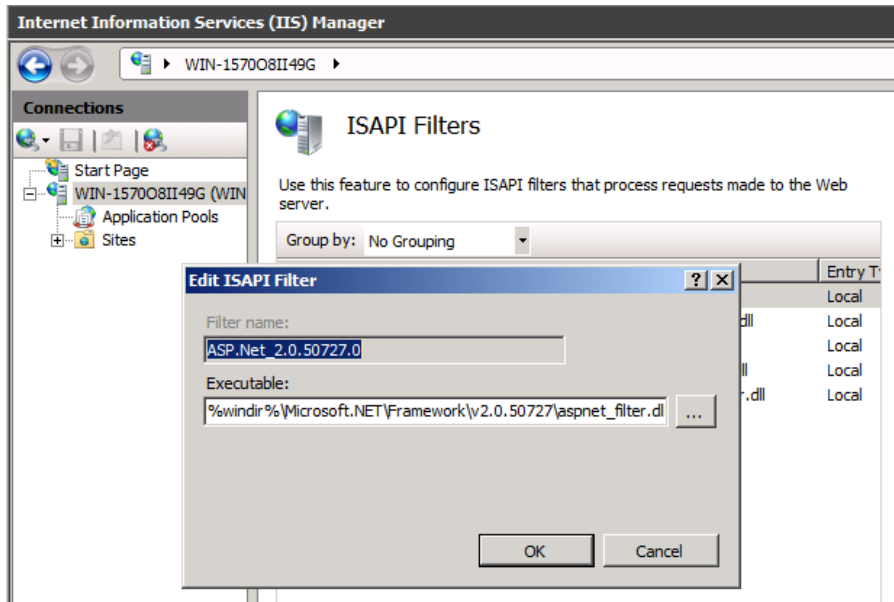
4. Navigate to **ISAPI** and **CGI Restrictions** under IIS for the Report Server, then right-click to open the pane.
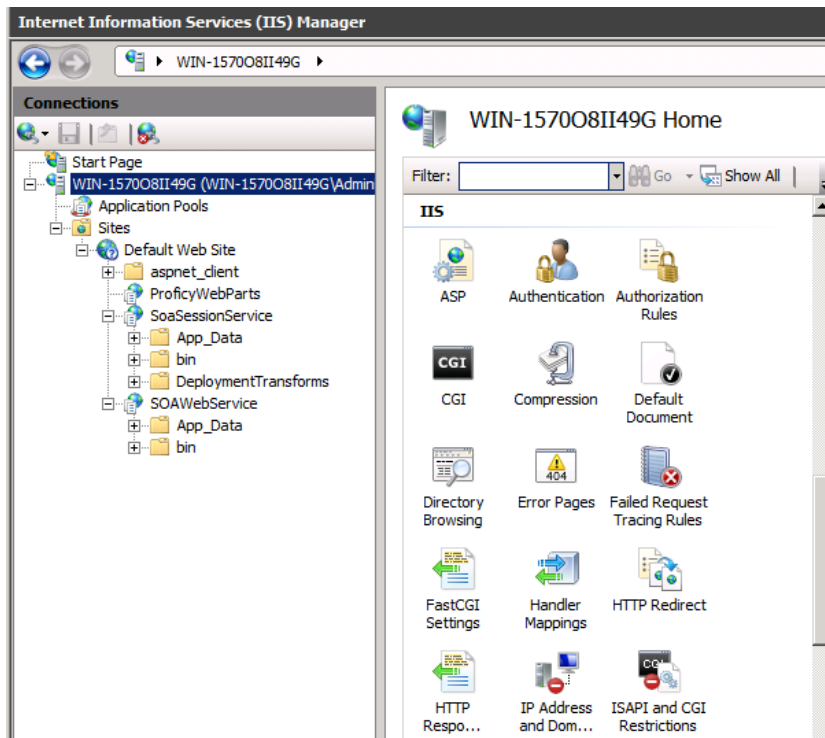
5. Verify that the *Framework* and *Framework64* extensions for ASP.NET, version 4.0.30919, are set to **Allowed**. Right-click an entry to make a change if necessary.
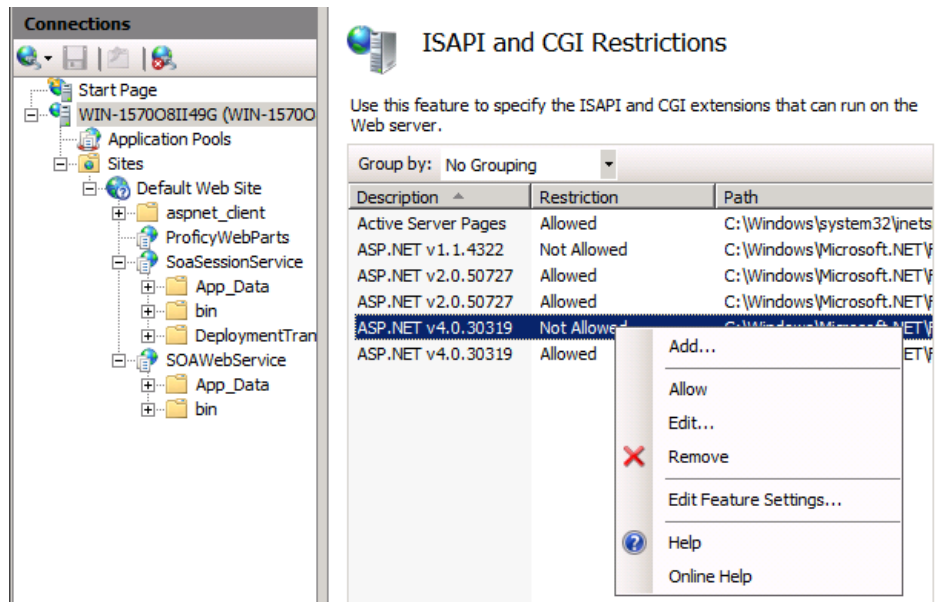
SSL Security Certificates

The Proficy Application Server requires SSL security certificates.

You can use self-signed certificates in intranet environments only. The certificates need to be trusted on each client machine that accesses the websites. Self-signed certificates are best used in demonstration environments, but not in enterprise or Internet deployments. You can use existing certificates deployed by your existing security policy or purchase new certificates.

When installing the Proficy Application Server, you are prompted to generate new certificates, import certificates, or use legacy certificates. If you do not have a certificate, you will typically generate a new one. You can follow the instructions at technet.microsoft.com to create a self-signed certificate for testing in an intranet environment.

📋 **Note:** You need the fully-qualified domain or machine names when registering SSL security certificates.. They should be the same names that you provide when you define IIS and the HTTPS binding, and must match the name on the certificates (for example: `MyComputer.MyDomain.com.`

Before You Begin

Before you install Plant Applications, complete the tasks described in this section.

Review Time Zone Settings

Ensure that the system time and time zone of the server and client that you want to use for Plant Applications are correct and in sync.

📝 **Note:** Ensure that you must set the Plant Applications Server and the Database Server to the same time zone as that of the Default time zone site parameter.

Review Architecture Requirements

You must install a historian such as GE Digital Historian as well as prerequisite software such as SQL Server. Plant Applications supports Historian (standard or enterprise) 8.1.

Due to the competition for ports, "all-in-one" deployments are no longer supported. We recommend that Historian and Web Client be installed on separate server nodes.

Refer to Test and Production Environments *(page 113)* to learn about architecture strategies to meet the needs of particular environments.

Review Upgrade References

If you are upgrading from version 7.0 SP5 and later, refer to Upgrade from Plant Applications Version 7.0 SP5 and Later *(page 119)* for additional steps. Contact GE Support at General Contact Information *(page 136)* for assistance with upgrading from earlier versions.

If you are installing the Plant Applications Server, Clients or Web Server report components in a clustered environment, review the information in *Appendix B* at Cluster Overview *(page 125)*.

If upgrading the Unified Manufacturing Database (UMDB), refer to these sections:

- Upgrade Strategies *(page 33)* gives strategies to upgrade the UMDB from previous versions.
- Database Setup Strategies *(page 34)* describes how to upgrade a SOA or Plant Applications database to a UMDB.
- Set Up Languages for Plant Applications Displays *(page 88)* explains how to implement additional languages after installing Plant Applications. Plant Applications displays use English as the default language.

System Requirements Location

Plant Applications Server and Client Requirements *(page 9)* outlines system requirements.

Preparing for a UMDB Implementation

The UMDB essentially combines the SOADB database (S95 data model) and GBDB database (Plant Applications data model). You can choose to use only the Plant Applications data model by disabling UseProficyClient configuration parameter (ID 87). The following items are important to consider as a part of installation planning:

- Strategy
  - Using the new, combined data model offered by the UMDB enables you to define a plant environment in an S95 structure while providing a strict and formal definition that was

not possible with Plant Applications. Thus, it is advantageous to define all configuration information through the Client interface and to use Plant Applications for features that are unique to Plant Applications such as specifications, alarms, and downtime.

- ◦ Although it may be helpful to configure some units in an S95 model, it may be practical to maintain the configuration of some units in Plant Applications. In this situation, it is important to carefully manage the configurations. Once data is extracted from Plant Applications to the S95 model, it retains characteristics of the S95 model. If units are defined in both models, problems with orphans can arise.
- ◦ See Working with a Merged System and UMDB in Plant Applications Help for a description of the new Client interfaces and changes to the Plant Applications Administrator.
- Database purges: Plant Applications supports a Unified Manufacturing Database (UMDB) to combine a SOA database employing an S95 data model with a Plant Applications database. Purging data from the UMDB is a two-step process involving both the Plant Applications and SOA purge utilities. The following notes apply to a purge of the Plant Applications database:
  - ◦ Perform online purges to Plant Applications databases before upgrading to the latest version.
  - ◦ For sites using only the Plant Applications data model, there are cursor purges that can be executed to trim the database as an interim solution.
  - ◦ For sites incorporating both the Plant Applications and S95 data models, do not purge the PA database as this will orphan data on the WF side and could introduce issues.
- Conversion of custom containers and displays remains a GE IP Services function.
- Moving or renaming a server after migrating to a UMDB.
  - ◦ Standard Plant Applications 5.0 scripts work with Plant Applications 8.1 to move or rename the server.
  - ◦ Refer to Workflow documentation for information about scripts and related procedures.
- Recommended installation paths
- New naming convention for specific Plant Applications tables starting in version 6.1.
  - ◦ UMDB tables have a _Base naming convention and are associated with SQL Views for improved performance and to enable modifications without impacting existing structures. Data is linked in a view to maintain compatibility between the S95 and Plant Applications models.

Table	SQL View
Product_Base	dbo.Products
Prod_Lines_Base	dbo.Prod_Lines
Prod_Units_Base	dbo.Prod_Units
Departments_Base	dbo.Departments
Users_Base	dbo.Users
Variables_Base	dbo.Variables

  - ◦ Modification of existing spLocals when upgrading to Plant Applications is not needed.
  - ◦ Table limitations on the Plant Applications side are not enforced in for the S95 structures to SOA to enable incorporation of proactive error checking for conditions inside workflows.

It is recommended to incorporate field size limitations in documents where appropriate. For example, limit event_num.Events to 25 characters.
- Reporting
  ◦ Plant Applications has two reporting structures.
  ◦ Plant Applications continues to have Web Reports for information that is specific to Plant Applications.
  ◦ The SOA database (S95 data structure) has its own reporting.

Setting up the Remote Data Service

The Remote Data Service (RDS) allows Plant Applications Client components, including the Administrator, to access historians without installing the API components on the local server.

By consolidating the historian connections, the RDS provides a single point of configuration and software installation, making it easier to deploy the Plant Applications software. If you do not use the RDS, you must install the Historian API Client Tools on the Plant Applications Server and the individual Client workstations.

1. Use the Plant Applications client installation to install the RDS service on the remote historian server.
2. Edit the historian in the Plant Applications Administrator, then select the Remote Data Source option to facilitate communications.
3. Install Historian Client API tools.

   a. Install the Historian on the computer where you will install the Plant Applications server.

   b. Select the following components on the **Select Components** page:
      - Historian Excel Add-in
      - Historian Administrator
      - Historian Client Tools
      - Historian Documentation & Help
      - OLE DB

   c. Click **Next**, then click **Finish** to restart the computer with your changes.

Upgrade Strategies

When upgrading Plant Applications, you must take UMDB management into account.

For more information, on handling your UMDB, see Database Setup Strategies *(page 34)*. You should always back up an existing database. See Upgrade from Plant Applications Version 7.0 SP5 and Later *(page 119)* if you are upgrading from Plant Applications, or contact Support *(page*

136) if you are running a version of Plant Applications that does not support the UMDB or for any other upgrade paths.

Database Setup Strategies

The SOA platform and Plant Applications employ SQL databases running on SQL Server software to store information.

Merging an existing SOA database with an existing Plant Applications database to form a Unified Manufacturing Database (UMDB) requires detailed planning, The strategy you employ to set up database depends on your existing situation and your goals. For example, you can opt for a new installation with a new database, or you can upgrade an existing database to install a UMDB. It is probably a rare case that you would need to install a UMDB that combines existing SOA and Plant Applications databases. The UMDB can reside on the same machine as the Plant Applications server or on a separate server with SQL Server installed.

You can use one of the following basic strategies for establishing a database:

Create a New Database for New Data

Enter a new database name during the Workflow installation with the intention of starting fresh with new data for a new UMDB to hold and Plant Applications data. The necessary SQL database tables, compatible with the software versions, are set up.

When using Workflow Client to create equipment, material, and personnel, the entities are aspected to the Plant Applications data model for access in Plant Applications. In the same way, entities created in Plant Applications are aspected for use in the Workflow Client. To create a new database, enter a new database name. Refer to *Plant Applications Client Help* for information about Fully Qualified Domain Names.

You should back up an existing database before installing a new release of Workflow or Plant Applications. SQL Server changes to the SOA database, such as the addition of data models and tables included with software, cannot be reversed.

Point to an Existing Database

If you have an existing SOA or Plant Applications database, you can point to the database during the Workflow installation and a subsequent Plant Applications installation. To point to an existing database, enter its name when prompted for a database name. During the Workflow installation, SOA data tables are updated for compatibility with new software.

When Plant Applications is installed, the MESCore Service Provider adds the necessary Plant Applications tables and aspects to the SOA database to install a UMDB. If you are using only an existing Plant Applications database, it will not have any SOA data structures.

If upgrading an existing SOA database to a UMDB, refer to Preparing a SOA Database for UMDB Integration *(page 74)*. After Plant Applications is installed, you must run the CreateAspect command from the command line with options to prepare the database for migration.

Create a New Database as a Placeholder

Enter a new database name as a placeholder during the Workflow installation with the intention of later pointing to an existing database. Database upgrade can be a slow process or you may want to follow a more complex strategy to merge data. Creating a new database during installation helps to not interrupt the installation process while providing options for handling database setup.

- Use the utilities available with SQL Server to move a database from one server to another.
- Historian data is stored in separate tables and may be in a separate database. It is useful for reporting to have the Historian database point to a Plant Applications database, because alarms are then kept in a common "alarms" table. When generating a custom report, you can report on alarms from both Historian and Plant Applications.

Aspecting

Aspecting cross-references objects residing in the Plant Applications database with objects that follow the S95 data structures used by Workflow.

Set the **UseProficyClient** site parameter to `True`, to enable aspecting. You cannot rename aspected items. Aspecting of user names uses the fully-qualified domain name (FQDN) specified for a Windows account. For more information, see the *Plant Applications Help*.

- When using the Workflow client to create equipment, material, and personnel, the entities are aspected to the Plant Applications data model for access in Plant Applications. In a similar fashion, entities created in Plant Applications are aspected for use in the client.
- Set the **UseProficyClient** site parameter to *True* to merge the Plant Applications and the SOA equipment models using the Workflow client. For more information, see *Enabling the Proficy Client UI and Aspecting* in the *Plant Applications Help*.

About TLS Support

You must install the following software packages to support transport layer security (TLS) 1.2:

- Microsoft .NET Framework 4.7
- Microsoft SQL Server Native Client for the SQL Server (the minimum required version is 11.4.7001.0)

Consider the following points to enable TLS 1.2 in operating systems:

- TLS 1.2 is already enabled in Windows 8 (and later versions) and Windows Server 2012 (and later versions) operating systems. To use TLS 1.2 in these operating systems, you must add registry keys to disable TLS 1.0 and 1.1.
- To enable TLS 1.2 in operating systems prior to Windows 8 or Windows Server 2012, you must add keys, and modify existing keys to disable TLS 1.0 and 1.1.

📄 **Note:** Use the following URL to access the keys: https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2012-R2-and-2012/dn786418(v=ws.11)#BKMK_SchannelTR_TLS10.

About FIPS Support

Plant Applications supports Federal Information Process Standards (FIPS). If you want to use FIPS-compliant algorithms for encryption, hashing, and signing, you must enable FIPS on the machine on which you want to install Plant Applications.

About the SQL Server AlwaysOn Requirements

The Plant Applications modules support the Microsoft SQL Server **AlwaysOn** feature that provides a high-availability and disaster-recovery solution for SQL servers. The feature acts as an enterprise-level alternative to database mirroring and maximizes the availability of a set of user databases for an enterprise. For more information, refer to the URL https://docs.microsoft.com/en-us/previous-versions/sql/sql-server-2012/ms190202(v%3dsql.110).

About Replicating Logins and Jobs for the SQL Server Nodes

For the high-availability solutions to work, you must replicate all the user logins (including the default logins ComXClient, ProficyConnect, and ProficyDBO) and all SQL Server Agent Jobs of the primary replica of the Plant Applications database (SOADB) to all the secondary replicas of the SQL Server instance (nodes used in a cluster environment). In addition, you must create replicated user logins with security identifiers (SID) that match those of the primary replica of the Plant Applications database. For more information, refer to the URL https://docs.microsoft.com/en-us/sql/database-engine/availability-groups/windows/logins-and-jobs-for-availability-group-databases?view=sql-server-2017.

About the Tested High-Availability Solutions

The following table describes the high-availability solutions tested for Plant Applications modules.

High-Availability Solution	Cluster Type	SQL Server Node 1	SQL Server Node 2	SQL Server Node 3
Failover Cluster Instances	Single Subnet	Network A	Network A	Not applicable
Failover Cluster Instances	Multi-Subnet	Network A	Network B	Not applicable
Availability Groups	Single Subnet	Network A	Network A	Not applicable
Failover Cluster Instances + Availability Groups	Single Subnet	Network A	Network A	Network A
Failover Cluster Instances + Availability Groups	Multi-Subnet	Network A	Network B	Network B
Failover Cluster Instances + Availability Groups	Multi-Subnet	Network A	Network B	Network A

📝 **Note:** The performance of a high-availability solution in a multi-subnet cluster environment depends on the complexity of the network.

Chapter 3. Installing Plant Applications

About Installing Plant Applications

This section of the document describes how to get started with the installation of Plant Applications. Ensure that you perform the following tasks for installing Plant Applications:

- • Installation Overview *(page 39)*
- • Install the Proficy Plant Applications Workflow *(page 40)*
- • Binding HTTPS *(page 52)*
- • Install the Plant Applications Server *(page 53)*
- • Install the Plant Applications Client and Administrator *(page 62)*
- • Data Authorization for Events Configured for Each Event Type *(page 64)*
- • Install the Plant Applications SDK *(page 64)*
- • Install the Plant Applications Web Client *(page 65)*
- • Unicode Utility *(page 72)*
- • Task Lists for ActiveX and SOA Web Client *(page 74)*
- • Preparing a SOA Database for UMDB Integration *(page 74)*
- • Access the Plant Applications REST APIs *(page 65)*

The following table outlines the steps that you must complete to install Plant Applications for the first time. These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed. All steps are required unless otherwise noted.

Step	Task	Notes
Workflow Installation		
1	Install SQL (2016/2017/2019)	-
2	Install .NET 4.7	-
3	Enable WCF HTTP Activation	-
4	Install Proficy Application Server (WF 2.6 SP1) *(page 40)*	-
Plant Applications Server Installation		
5	Install .NET 4.7.2	-
6	SQL Native Client Server 2012	-
7	Install Plant Applications Server *(page 53)*	-
Plant Applications Client and Administrator Installation		

Step	Task	Notes
8	Install .NET 2.0	-
9	Install the Plant Applications Client and Administrator *(page 62)*	-
Web Reports Server Installation		
10	IIS 6 Management Compatibility	-
11	Microsoft Internet Information Server (WWW & FTP Services) version 6.0 or greater is required to continue.	-
12	Install Web Reports Server *(page 77)*	-
13	Unicode Utility *(page 72)*	-
14	Install SDK *(page 64)*	Optional
Plant Applications Web Client Installation		
15	Install Operations Hub 2.1 and 2.1 SIM3	-
16	Install Plant Applications Web Client *(page 65)*	-

Installation Overview

Plant Applications software includes components for Plant Applications and Workflow.

The Unified Manufacturing Database (UMDB) requires Workflow, but you only need licensing if you are using workflows. The Proficy Application Server installs Workflow 2.6 SP1. If you are upgrading from a previous version of Plant Applications, see Upgrade from Plant Applications Version 7.0 SP5 and Later *(page 119)*.

📄 **Note:** By default, all non GE functionality is installed on the C: drive. If you do not want to use the default location, you can manually install the non GE functionality to the required location.

Run the `installfrontend.exe` program as an administrator to display the **Installation Menu**, which includes the following options:

Menu Selection	Description
View Documentation	Accesses documentation.
Browse the DVD	Displays a dialog for browsing files and folders.
Exit	Closes the menu.
Proficy Application Server	Installs the Proficy Application Server which includes Workflow. Workflow includes SOA components (without a Workflow license), which are necessary to support UMDB data structures.

Menu Selection	Description
Plant Applications Server	Installs Proficy Plant Applications, MESCore Service Provider with Proficy Server (Plant Applications) services, and enables real time updates on the Web Client displays.
Plant Applications Report Server	Installs the server used to view Plant Applications Web Server reports with a browser.
Plant Applications Client	Installs the Plant Applications Administrator option for administration and the Plant Applications Client option to access Client displays. Also installs Plant Applications Help and other documentation.
Plant Applications .NET SDK	Installs the .NET SDK for use with VB.NET applications. It uses a COM wrapper with C# or VB.NET applications. Access additional Utilities for Plant Applications.
Plant Applications Web Client	Installs the Plant Applications Web Client.
SQL Native Client download	Installs the Microsoft SQL Server Native Client.

By default, Proficy Server services are automatically installed on the computer where the Plant Applications Server installation runs. To install Proficy Server services on one computer and install the UMDB on another, run the Plant Applications Server installation on the computer where you want the Proficy Server services installed. During the installation, you can identify the SQL Server where you want to install the UMDB.

📝 **Note:** The *Preparing to Install Plant Applications* chapter includes steps for setting up the SQL Server.

Install the Proficy Plant Applications Workflow

The Proficy Application Server installs Workflow components as prerequisites for Plant Applications.

Verify that you have:

- Installed the license files.
- Turned the WCF HTTP Activation component On.

Workflow is required even if you are planning to use legacy Plant Applications features and Plant Applications data models without any merged SOA data models. You need a Workflow license to use workflows.

During the Proficy Application Server installation, you must specify the location for the SQL Server that hosts the database, as well as the name of the database. Stored in an XML file the Plant Applications installation uses this information in one of these scenarios:

- When Workflow adds Plant Applications tables to the SOA database to install a UMDB. After installing Plant Applications, you must run scripts to prepare data when a UMDB is installed with existing SOA data.
- When Workflow adds SOA tables and keys to a Plant Applications database (if specified as the database during installation) to install a UMDB. Before installing Workflow, you must run a script to prepare the Plant Applications database for the UMDB installation.

1. Copy the software and extract files to the computer where you want to install the Proficy Application Server components, then run `InstallFrontEnd.exe` as an administrator.

   The **Proficy Plant Applications 2022** page appears.
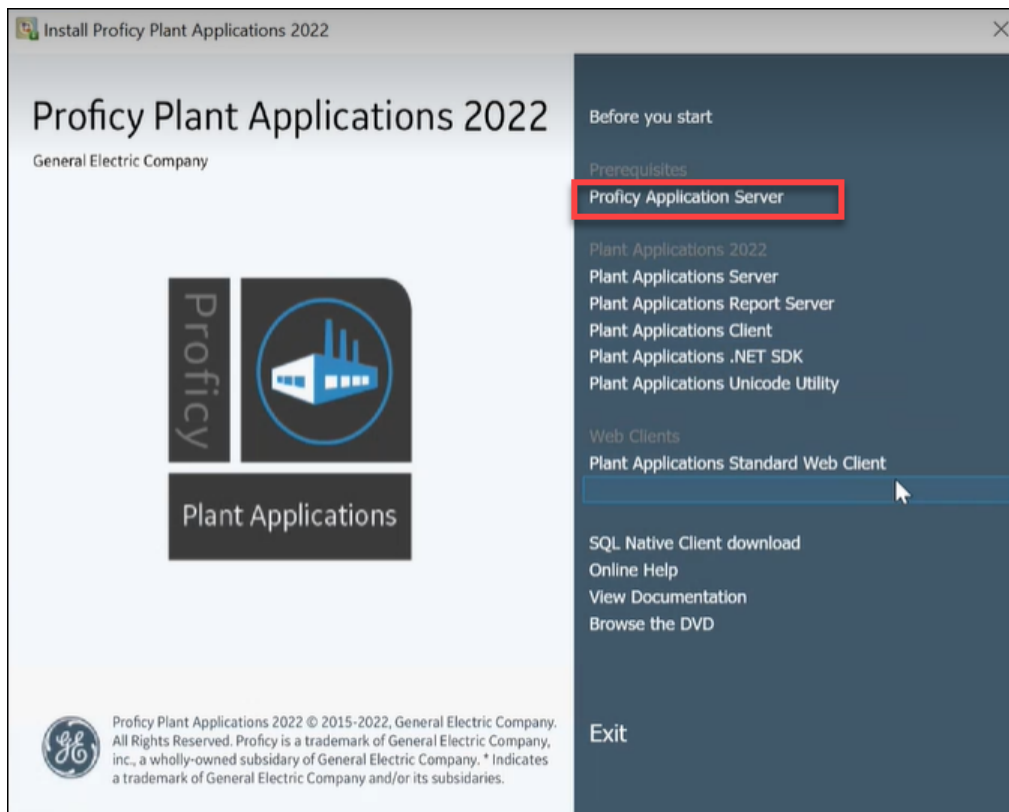
2. From the **Installation Menu**, under **Prerequisites**, select **Proficy Application Server**.

   The **Workflow 2.6 SP1** page appears.
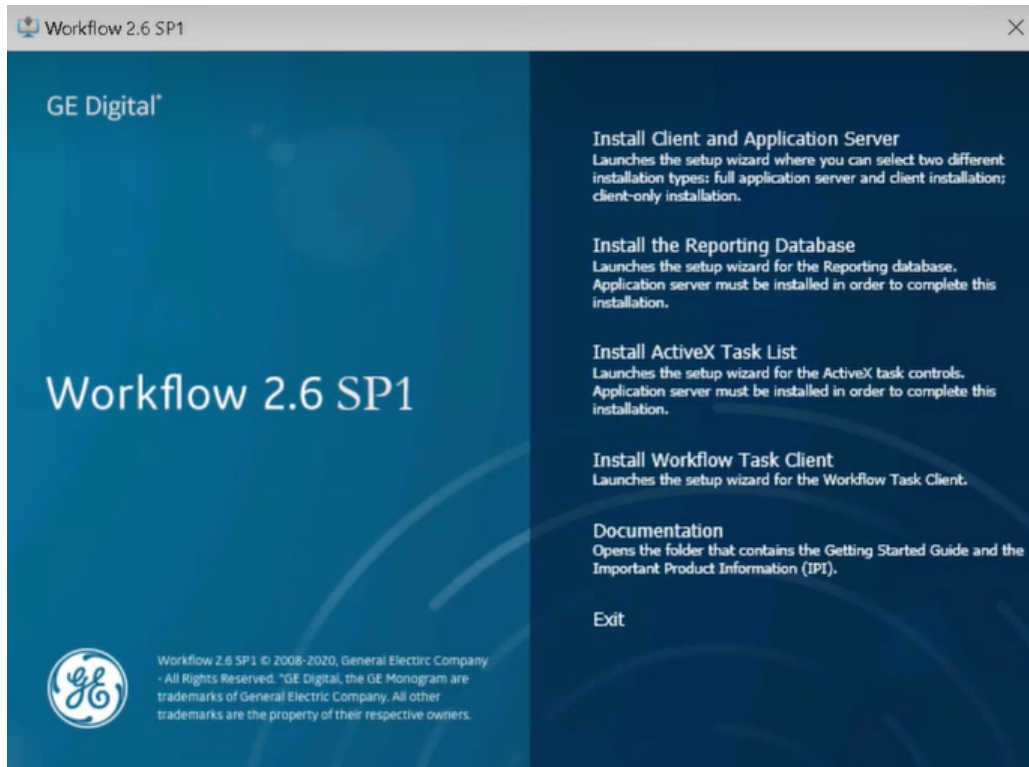
3. Select **Install Client and Application Server**.

The **Client and Application Server Setup Wizard** appears.
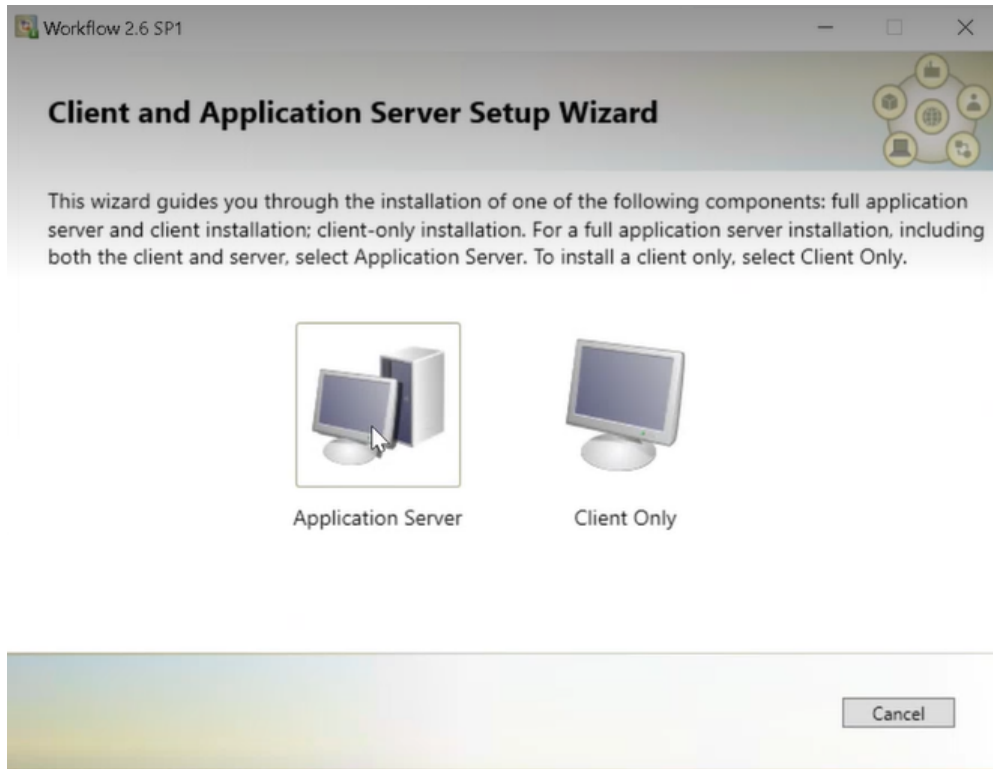
4. Select **Application Server**.

   The **Application Server Type** page appears.
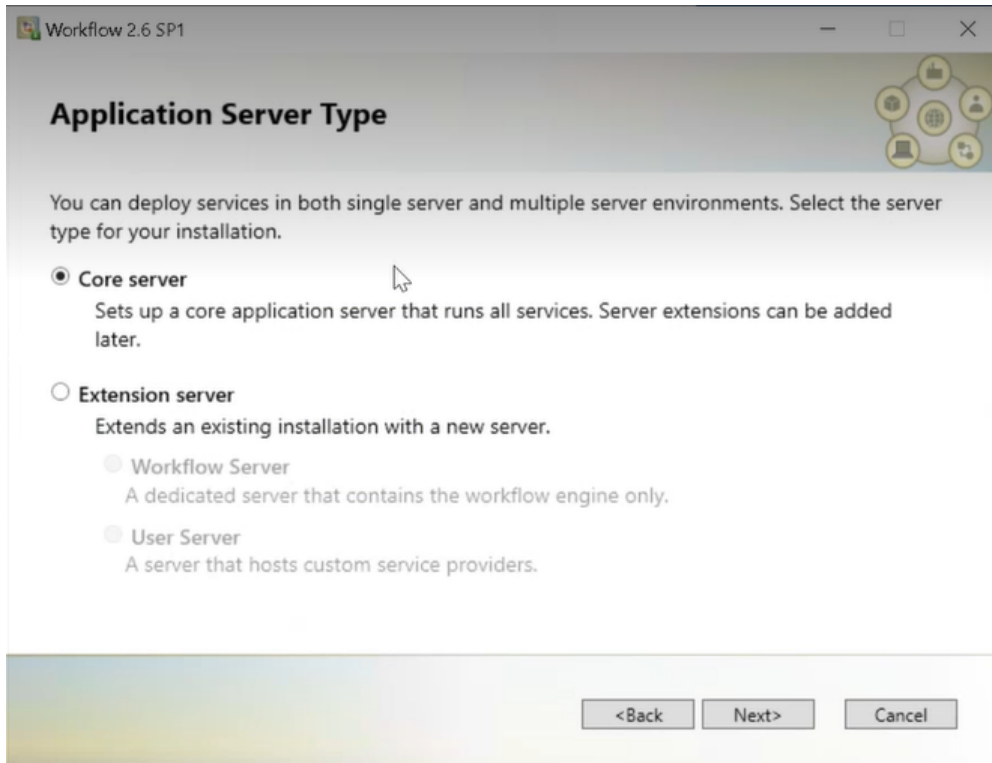
5. Select **Core server** as the type of **Proficy Application Server**, then select **Next**.

   The **License Agreement** page appears.
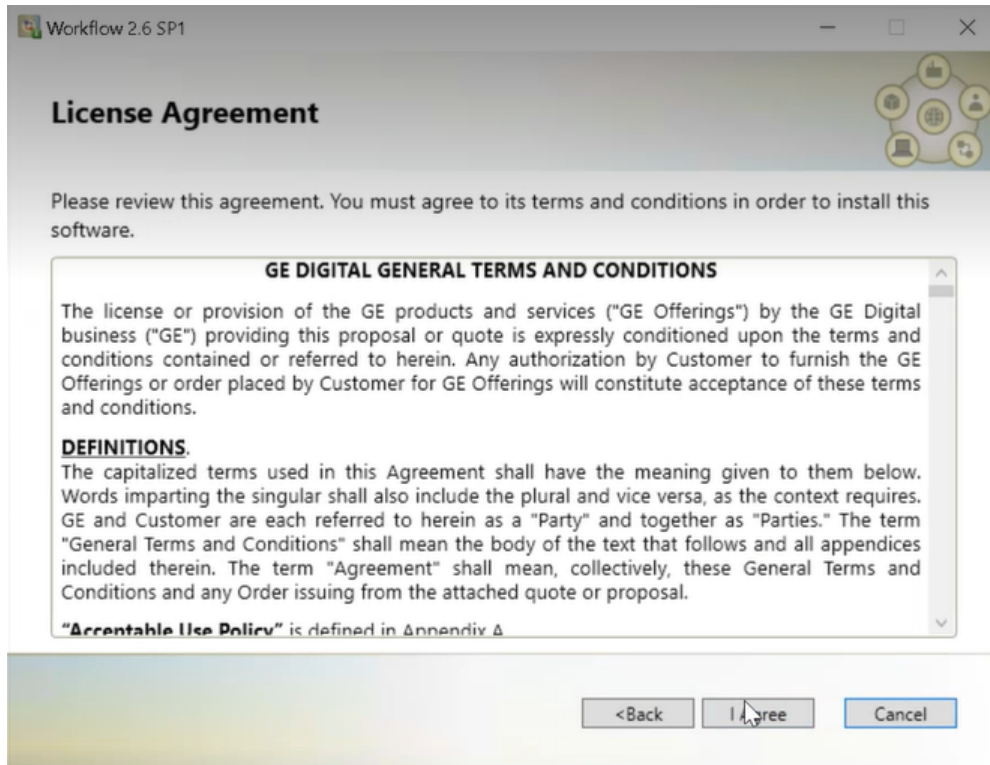
6. Select **I Agree** to accept the agreement.

The **Installation Folders and Architecture** page appears.
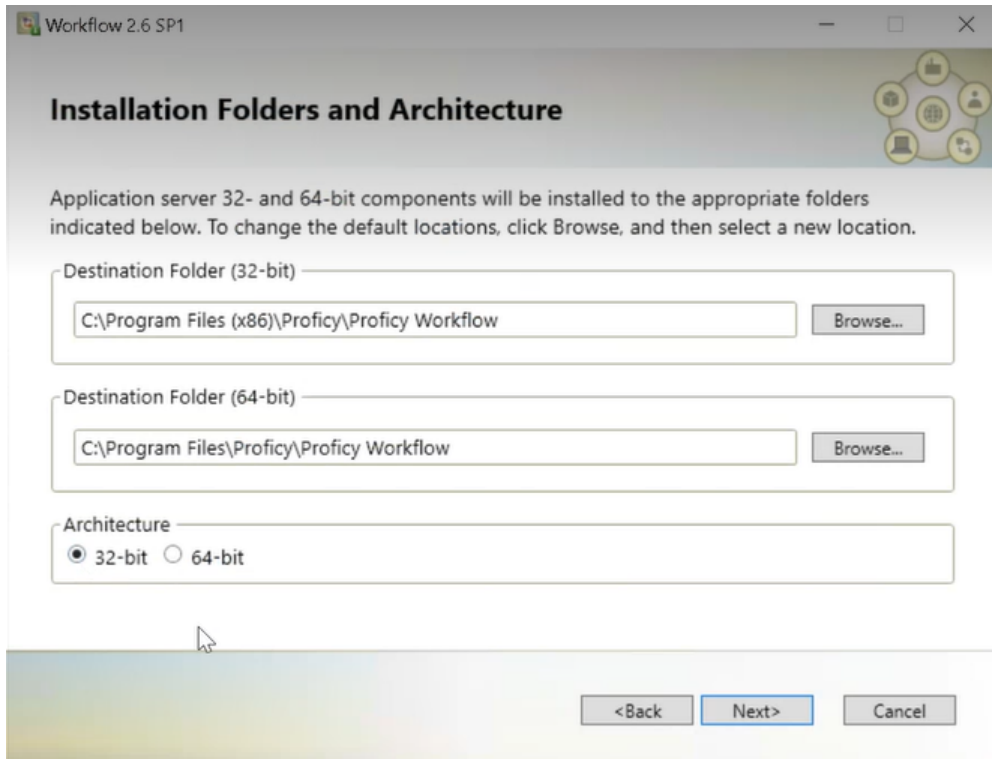
7. Select **32-bit** as the architecture type, and then select **Next** to install the Application server 32-bit components to the default folder or select **Browse** to select a different location.

📄 **Note:** Plant Applications does not support 64-bit architecture.

The **AD LDS Integration** page appears.
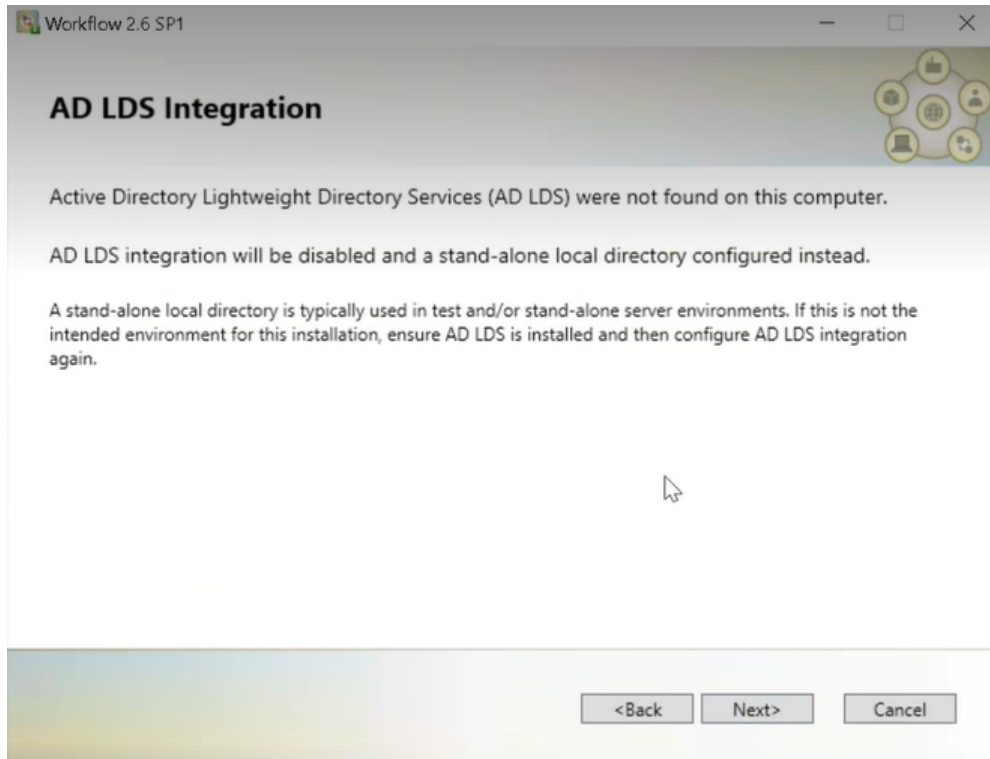
8. When **Active Lightweight Directory Services (AD LDS)** is not configured, then select **Next** to use a stand-alone local directory.

The **Database Configuration** page appears.

9. In the SQL Server area, enter the following information.

Field	Description
Server	Enter the server name where SQL is installed.
Database	Select the database. When you install a UMDB from a SOA database, the **Database** field populates the name as SOADB. When upgrading from an existing Plant Applications database, specify its name or enter a new name for the UMDB.
Authentication	Select one of the following: • **Windows Authentication** • **SQL Server Authentication**
User Name	Enter the user name you added during the SQL installation.

Field	Description
Password	Enter the password you added during the SQL installation.
	📄 **Note:**
	The SQL User account used for the database when installing Plant Applications requires, at minimum, system administrator privileges. To review login permissions and connection properties set up in SQL Server:
	a. Select **Properties** by right-clicking a server name in Object Explorer in SQL Server Management Studio.
	b. Review the **Security and Permissions** pages in the **Server Properties** window.
	c. Select **View connection properties** in the **Connections** pane.

10. Select **Next**.

The **Configure Security** page appears.

11. Do the following:
    • Enter the administrator credentials for Workflow.
    • In the Advanced user authentication settings area, select the required options.

12. Select **Next**.

The **Service Certificates** page appears.
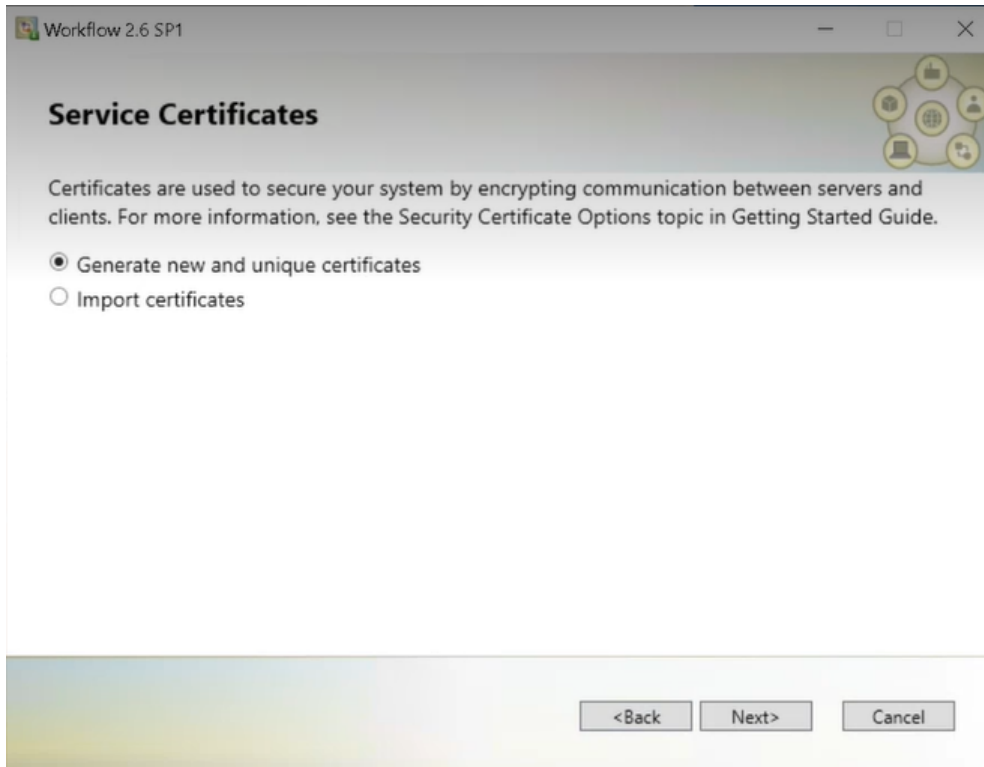
13. Select **Generate new and unique certificates**, and then select **Next**. For more information, see, SSL Security Certificates *(page 30)*.
The installation program places a certificate into the trusted root store on the server where the Application Server is installed.

14. When the installation wizard displays a `Firewall Detected` message, disable your firewalls or configure your computer to communicate with the server, then select **Next** to continue.

    The **Installation Confirmation** page appears.
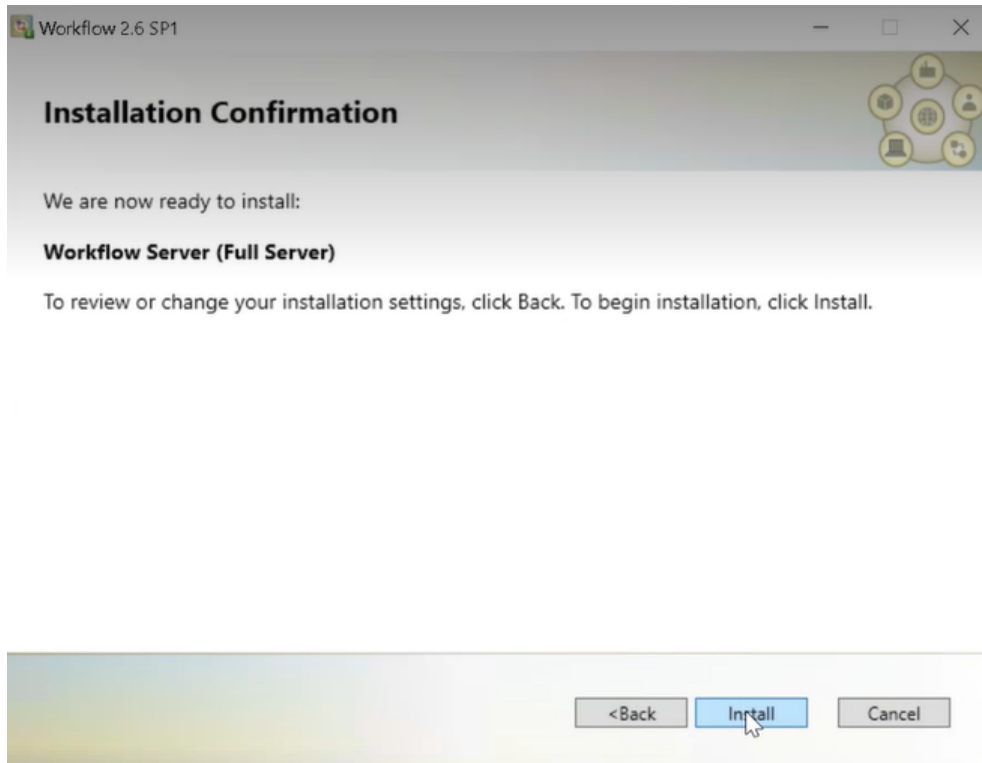
15. Select **Install** to install Proficy components.

    📝 **Note:** The installation program times out after 10 minutes if the Proficy Server service does not start, and a message prompts you to manually start the service. When the service starts, the installation automatically continues.

    The **Installing Workflow 2.6SP1** page displays the installation progress bar.

    When installation is complete, the window displays a confirmation message. Select **Exit** to close the installation wizard.

    📝 **Note:** When Microsoft visual C++ is available, and you upgrade Plant Applications Workflow from 2.6.0 to 2.6.1, the system displays a message: `Failed to install Microsoft visual C++ 2015-2019 redistribution package(X64)`. To install Workflow successfully, first uninstall **Microsoft visual C++ 2015-2019 redistribution package(X64)**, and then install Workflow.

16. To verify that the SQL Server installed successfully, check the `SQL server setup failed` status in the `SetupDataPlantAppsTemplateFile.xml` file under `Program Data/ Proficy`.

Binding HTTPS

After IIS is installed and basic setup completed, you might need to bind an SSL certificate to HTTPS on the machine where the web server is installed.

A certificate is installed when the Proficy Application Server is installed and downloaded to the machine where the web server resides as part of its installation. For more information, see the *Proficy Workflow Getting Started Guide*.

1. Start the Internet Information Services (IIS) Manager.

2. Navigate to and select **Default Web Site**. Select **Bindings**.
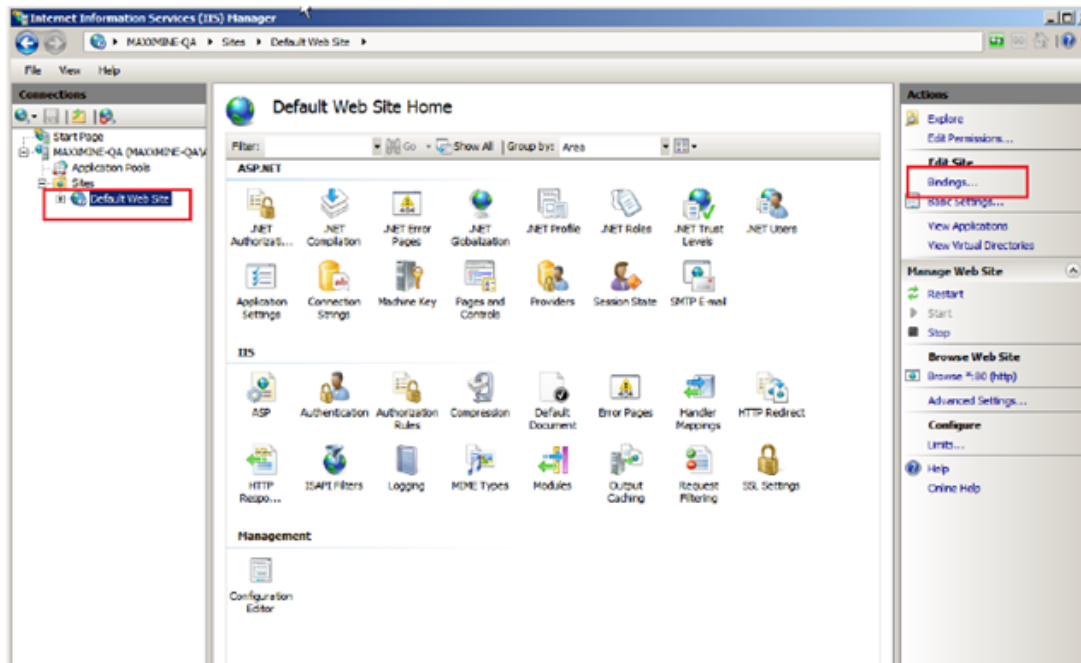
The **Site Bindings** dialog box is displayed.
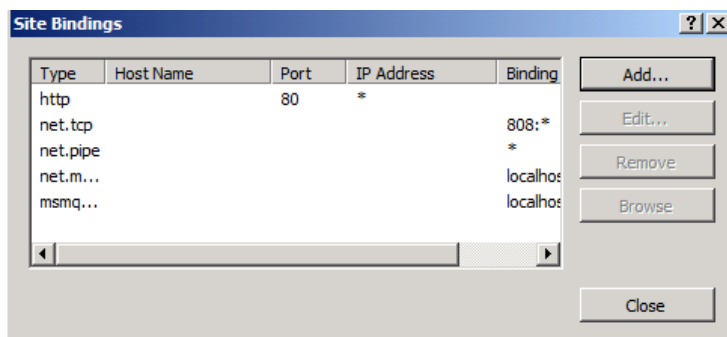
3. Bind the certificate to HTTPS.

a. Select **Add** to display the **Add Site Binding** dialog box.
If you are re-binding the HTTPS certificate, select `https` from the **Site Bindings** dialog box, then select **Edit**.

b. Select `https` in the **Type** field.
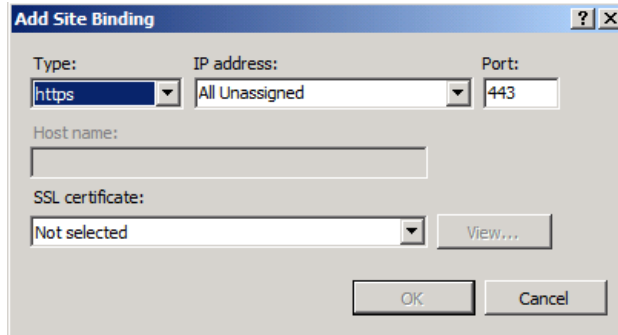
c. In the **SSL certificate** field, enter the fully-qualified domain name of the server that received the certificate.

For the Proficy Application Server, the server is typically the host that the Web Server uses to connect to the server.

If you are re-binding the HTTPS certificate, the port remains 443. Select your SSL certificate from the list. Select **View** to verify that you have a private key that corresponds to the certificate.

d. Select **OK** to add HTTPS binding to the list of bindings in the **Site Bindings** dialog box.

4. Close the **Site Bindings** dialog box.

5. Close the Internet Information Services (IIS) Manager.

After installing Plant Applications Administrator, change the `Global Configuration/Plant Applications Site Parameters/Client/UseHttps` value to `True`.

Install the Plant Applications Server

Verify that you have installed Proficy Application Workflow.

1. Copy the software and extract files to the computer where you want to install the Plant Applications Server, then run `InstallFrontEnd.exe` as an administrator.

The **Proficy Plant Applications 2022** page appears.
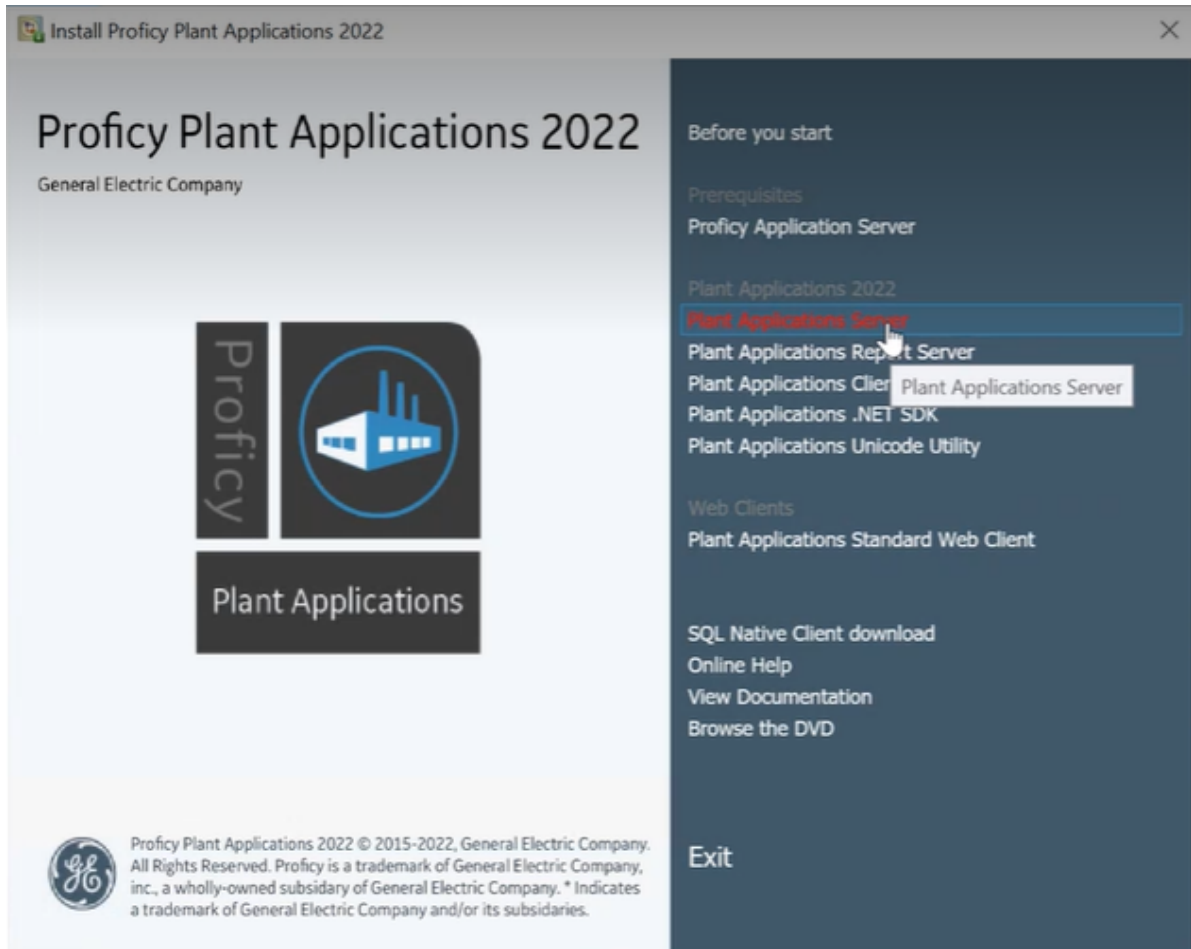
2. From the **Installation Menu**, under the **Prerequisites** group, select **Plant Applications Server**. If the installation does not start automatically, then locate and double-click the `PlantAppsSetup.exe` file.

The **License Agreement** page appears.
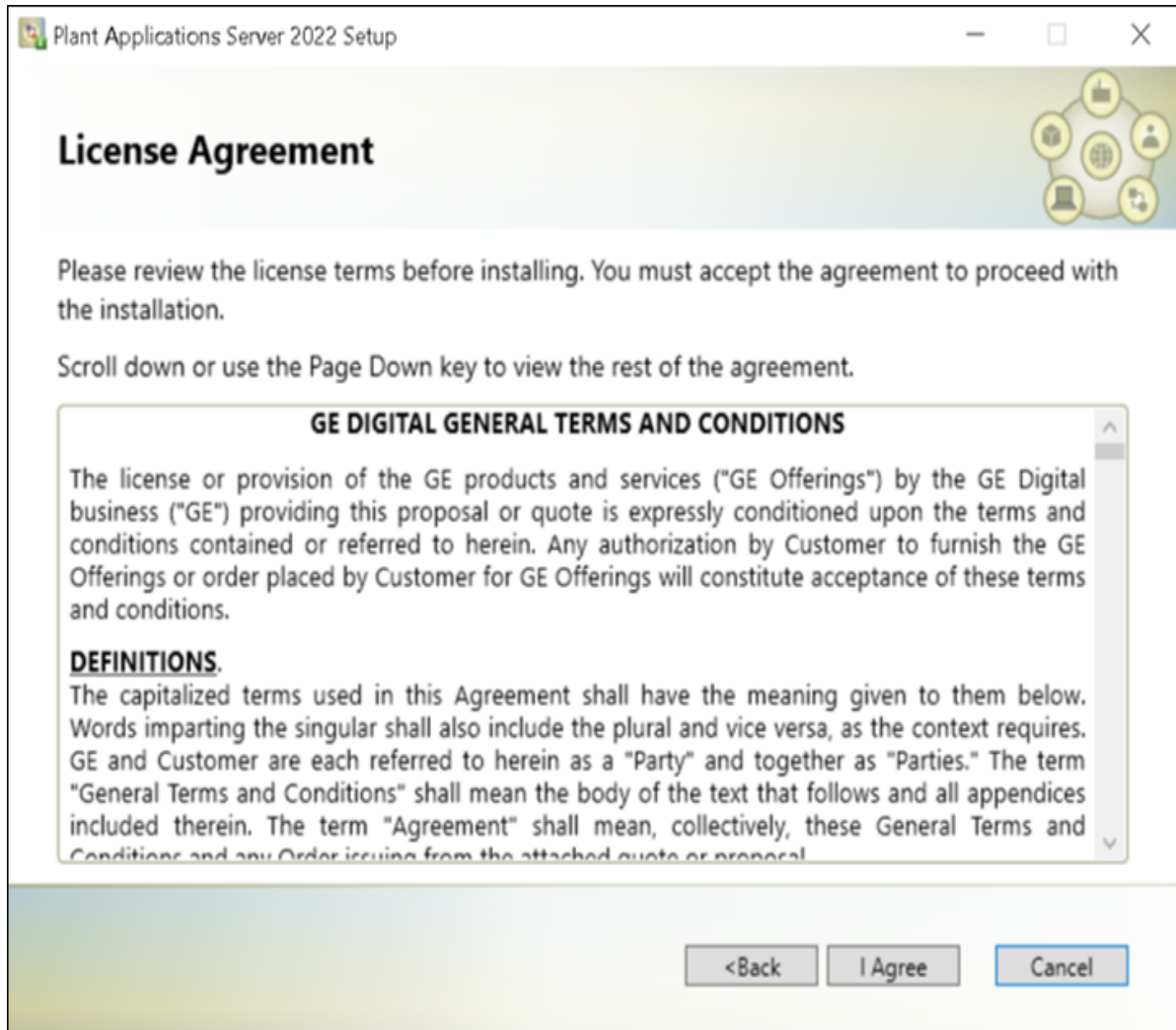
3. Select **I Agree** to accept the agreement.

   The **Configure Security** page appears.
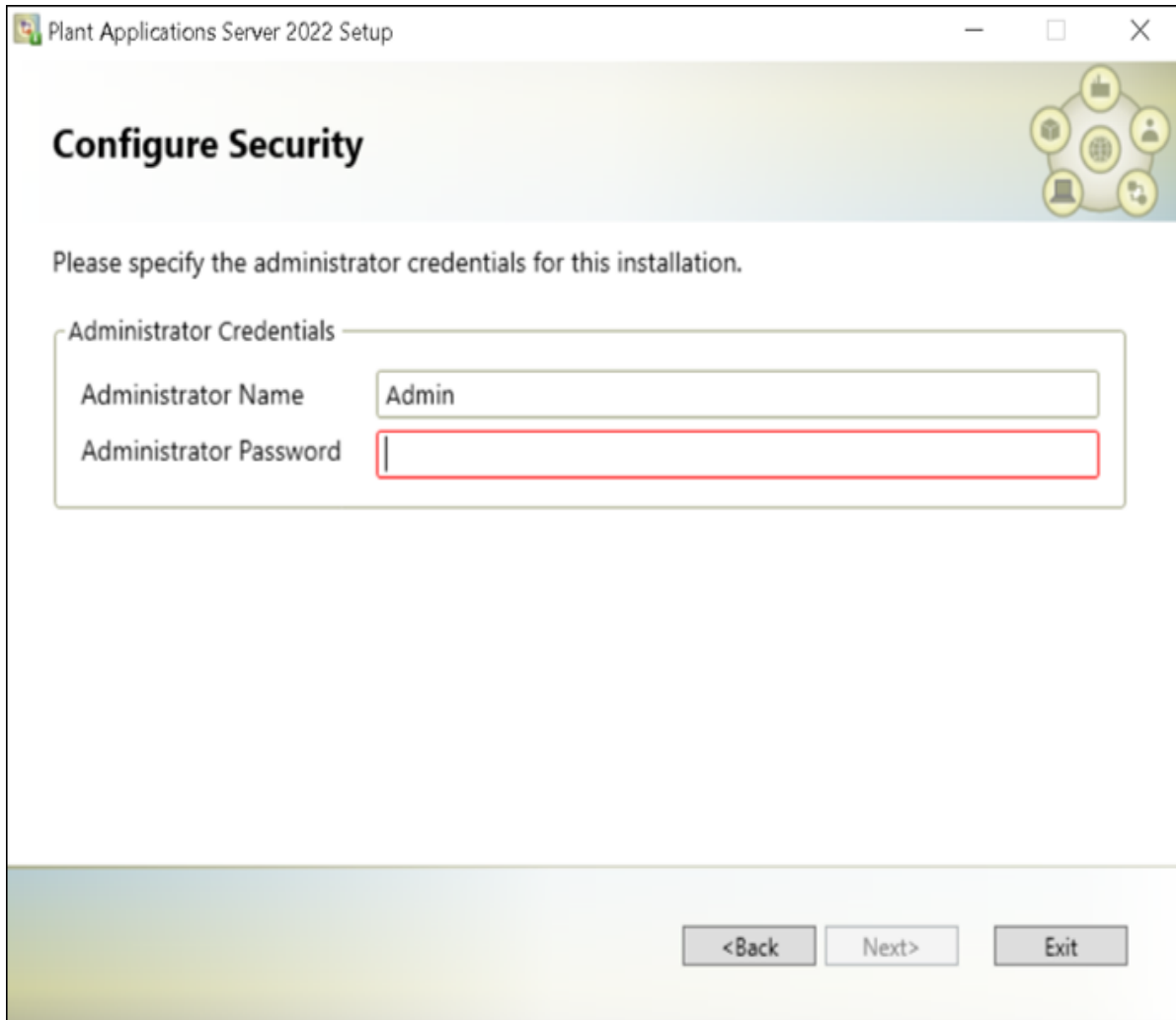
4. Enter the administrator credentials, then select **Next**.

   You must enter the credentials that you used when installing Workflow, for example, the Proficy (Workflow) SOA Server or Proficy (Workflow) Client.

   The **RabbitMQ Credentials - MessageBridge Service** page appears.

5. Enter the following details, and then select **Next**.

Credential	Description
Username	Enter the user login name to log into the application during installation.
Password	Enter the password to log into the application.
Confirm Password	Reconfirm the password.

📝 **Note:** When you add credentials for a user in RabbitMQ, the system performs the following:
   • Installs Erlang OTP and RabbitMQ Server.
   • Deletes the default RabbitMQ users having "guest" as the username and password, and creates the new user based on above entered user details.

The **Install PASP** page appears.

6. To install the Plant Applications Service Provider, select the **Install Plant Apps Service Provider** checkbox, then select **Next**.

📑 **Note:** The PASP supports Plant Applications versions 4.4.1 and 5.0 for customers using interface methods published with the old version of the service provider. A standalone installation program is available if you install the PASP at a later time. The new MESCore Service Provider, which supports the UMDB, is installed with Plant Applications 6.0 or higher. Methods for the PASP remain documented in the Proficy Workflow help. You must install the PASP to run any workflow applications developed to run against Plant Applications 6.0 and earlier, as they will not run with the new MESCore SP.

The **Ready to Install** page appears.
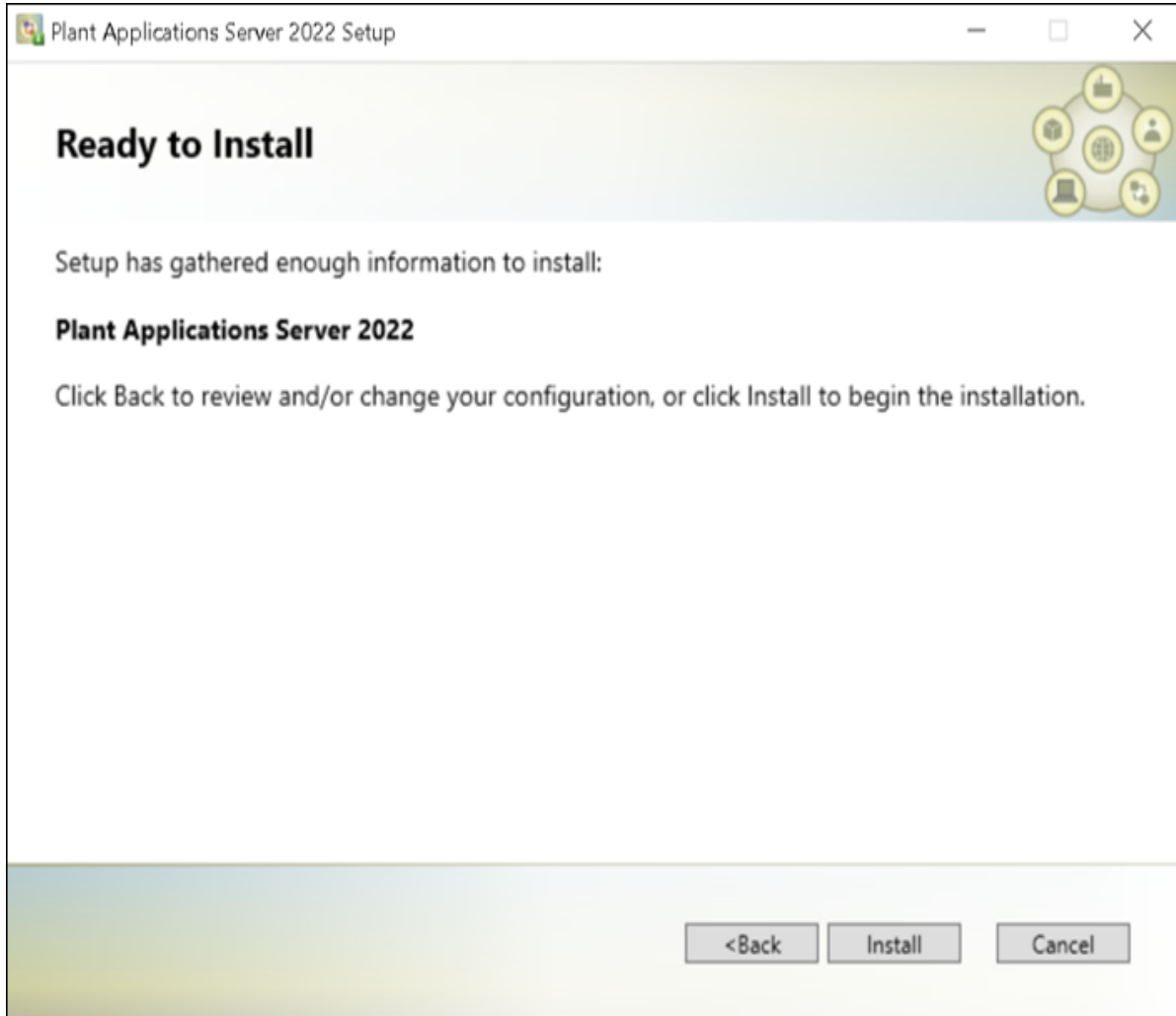
7. Select **Install** to start the installation.
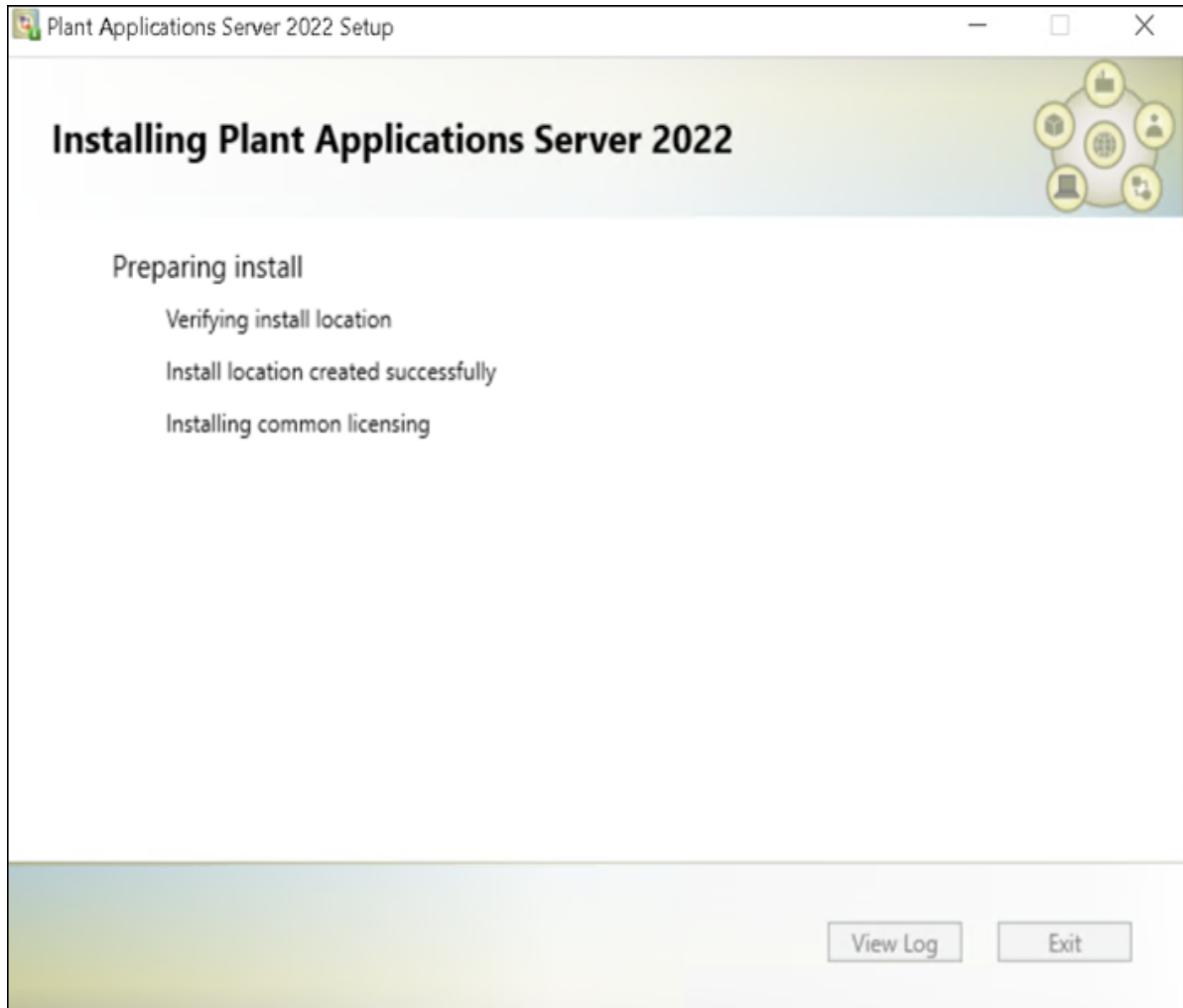
The installation script times out after 10 minutes if the Proficy Server service does not start, and prompts you to manually start the service. Once the service is started, the installation automatically continues.

8. Verify your installation by checking the installation log files.

Directory	Action
`<Drive>:\<Program Files(x86)>\Proficy \Proficy Server\ Database\SetupLogFiles`	Verify that `VerifyDB` and `StoredProcedures.log` files for the UMDB contain no errors.
`<Drive>:\<Program Files(x86)>\Proficy \Proficy Server\ Database\SetupLogFiles`	Verify that its `StoredProcedures.log` file contains no errors.
`<Drive>:\<Program Files>\Proficy\Proficy Server\LogFiles`	Verify that the Plant Applications Service log files, `CalculationMgr-xx.log` files, and `Gateway-xx.log` files contain a `Connected to Router` notification. This notification indicates that the TCP/IP communications are functioning successfully on the Plant Applications Server.

Directory	Action
`<Drive>:\<Program Files>\Proficy\Proficy Server\LogFiles`	Verify that the `Router-xx.log` file initialized successfully and does not contain any errors.

How to Install Plant Applications Core in Silent Mode

Use this procedure to install Plant Applications Server in silent mode. The silent mode installation includes two types of methods:

- **Passive**: A loader and a progress bar appears and displays the status of the installation. To verify the successful installation of Plant Application Server, check the log file.
- **Quiet**: The status of the installation is verified by checking the log file.

The silent installation consists of configuring settings in a configuration file. Use the configuration file `paconfiguration.ini` to configure the same settings that you configure during interactive installation.

📝 **Note:**

To edit the configuration file `paconfiguration.ini`, copy the `.ini` file to a location on your machine. For example, `C:\New Folder`.

1. Navigate to the `paconfiguration.ini` file.

2. Right-click, and then select **Edit**.

3. In the configuration file, edit the following:
   - For Workflow user credentials, edit these:
     - **AdministratorName**
     - **AdministratorPassword**
   - For RabbitMQ credentials, edit these:
     - **RabbitAdmin**
     - **Rabbitpwd**
   - To install PlantApps Service Provider, update the **InstallPASP** flag to true. By default the **InstallPASP** is set to false.

   📝 **Note:** You do not require to update the remaining fields for a clean install.

4. Select **Save**.

5. Open the command prompt in the administrator's mode, and then navigate to the location where the `PlantAppsSetup.exe` resides, then run the `PlantAppsSetup.exe`.

The command prompt window appears. In the command prompt window, you can launch and install the `PlantAppsSetup.exe`, using any one of the following silent installation methods with `paconfiguration.ini` file location as a parameter:

- Passive
- Quiet

6. On the command line interface, type the following, and then press Enter.
   - To install Plant Applications using Passive method, type the following:
     `PlantAppsSetup.exe C:\New folder\paconfiguration.ini/passive`, where `C: \New folder` is the location of the `paconfiguration.ini` file.

     A loader and a progress bar appears indicating the progress of the installation.

   - To install Plant Applications using Quiet method, type the following:
     `PlantAppsSetup.exe C:\New folder\paconfiguration.ini/quiet`, where `C: \New folder` is the location of the `paconfiguration.ini` file.

     The system does not display any loader or progress bar to indicate the progress of the installation. To verify that installation is complete, refer to the log files.

   The `paconfiguration.ini` file contains the log file path: `C:\programdata \Proficy\Logs\PlantAppsSetup.log`. You must not change the log file path in the `paconfiguration.ini` file.
   When you enter invalid commands on the command line interface, a message appears to enter valid commands.

   📄 **Note:** The silent installation takes about 20 minutes to complete the installation. When the installation is in progress, do not close the command prompt window or click anywhere in the command prompt window.

Install the Plant Applications Client and Administrator

📄 **Note:** If you are using Web Server reports, install the Plant Applications Report (Web) Server after installing the Plant Applications Server, but before installing a Plant Applications Client.

The client installation installs the Plant Applications Client and Administrator, Plant Applications Excel Add-in, Downtime Supervisor Screens, and Help files. It also installs Development tools and remote services, including the Plant Applications OPC Server and Remote Data Services. Plant Applications Administrator is the primary means of maintaining and managing the Plant Applications software. You can control system security by limiting the number of computers with the Administrator program installed.

To make it easier for technical support to quickly correct any potential problems, install the Plant Applications Administrator and Client software on the same computer as the Plant Applications

Server. Also, install the Administrator and Client software on workstations that maintain the Plant Applications configuration.

1. Select **Plant Applications Client** from the **Installation** Menu, then select **Next** on the **Welcome** screen.

2. When prompted, select **OK** to review the **Important Product Information** page.

3. From the **Custom Setup** page, select **Plant Applications Client** and **Plant Applications Excel Add-in** from the list of options.

   You can also select **Plant Applications Administrator**, **OPC Server**, and **Remote Data Services** to install.

   No prerequisite software is required to install the Proficy OPC Server. However, you can use an OPC test client such as Matrikon OPC Explorer to test connections to the OPC Server. See *Plant Applications Help* to set up a user account.

   Select **Space** to display the available and required space for features.

4. Select **Next** to continue.
   You are prompted to install Microsoft Excel, if needed.

5. Enter the name of the SQL database server, or select **Browse** button to select one. Select **Next** to continue.

6. On the next page, accept or change the destination folder.
   You are prompted to install desktop shortcuts. Select **Yes** if you want to install desktop shortcuts.

7. Select **Yes** to allow Plant Applications to bypass firewall and port settings, or to make appropriate setup changes.

8. From the **Ready to Install** page, select **Install**.
   The **Installing Plant Applications Client** screen is displayed as the wizard installs the software and completes post-installation tasks.

9. When the wizard displays the **InstallShield Wizard Completed** page, select **Finish**. Ignore an error message related to a file unzip action not responding.

Start the Plant Applications Administrator and Client. See Maintenance and Troubleshooting *(page 99)* topics in the event of any server connection failures.

Data Authorization for Events Configured for Each Event Type

Follow these rules to set up authorization access for event properties:

- If the time stamp of the event for which you want to edit property data is before the **MaxEdit** window and the user does not have Read/Write access to the Administrator group, lock the cell for editing.
- A security group can be assigned directly to a variable, sheet or sheet group. If there is no security group assigned to the sheet, it inherits the security group assigned to the sheet group. When determining the access level, use the lowest access level between the variable and sheet.
- Determine the **AccessLevel** for a specific Property. If the **PropertyAccessLevel** is less than the **SheetAccessLevel** and a security group is assigned to the variable, use the **PropertyAccessLevel**. Otherwise, use the **SheetAccessLevel**. If the **PropertyAccessLevel** is greater than the **SheetAccessLevel** and a security group is assigned to the sheet or sheet group, use the **SheetAccessLevel**. Otherwise, use the **PropertyAccessLevel**.
- Determine the write access. If the **AccessLevel** is the same as the level for the Administrator of the security group or the user has Read/Write access to the Administrator group, set the **WriteAccess** as `True` regardless of data source. If the **AccessLevel** is less than the level for the Administrator and the DataSource is 2 (Autolog), set the **WriteAccess** to `True`, but only if the **AccessLevel** is greater than or equal to the Read/Write level.

Install the Plant Applications SDK

The Plant Applications SDK is a DLL that exposes methods to read and write Plant Applications data to use with VB.NET applications, Excel reports, and so forth.

A functional change has been introduced for Plant Applications SDK to address the incorrect message issue. In the event a message is sent to the database manager with Write Direct = False and Pending = False, a "pre" message was issued. Now, with the introduction of the messaging bridge a "post" message is issued, which is the proper implementation.

Existing functionality where Write Direct = True is unchanged.

Plant Applications 6.1 added a COM wrapper to the .NET SDK to use with C# or VB.NET applications. Refer to the *Plant Applications Help* for coding examples. When upgrading from the .COM SDK, SDK applications must be completely rewritten to use the .NET SDK. For more information, see the knowledgebase at the Support site.

📄 **Note:** The COM wrapper does not support `BigInt` (long integers) in the Tests table because Visual Basic and COM do not support 64 bits.

1. Select **Plant Applications .NET SDK** from the **Installation** Menu.
2. Select **Next** on the **Welcome** screen.
3. From the **Setup Type** page, select **Typical** to install DLLs or **Custom** to provide options to install help or the SDK test application.
4. Select **Next**. If you selected the Custom installation options, make the applicable selections.
5. Select **Finish**.

Install the Plant Applications Web Client

You must install the Plant Applications Web Client to access the applications within the Plant Applications Web Client. For more information about installing Plant Applications Web Client, refer to the *Web Client Installation Guide*.

Access the Plant Applications REST APIs

The Plant Applications Web Client provides a Swagger-based UI to view and run the Representational State Transfer (REST) APIs.

You can access the UI from the list of supported Web browsers by entering a URL in the following format: `https://<server_name>:<port_number>/<micro_service_name>/swagger-ui.html`.

Where:

- `<server_name>`: Represents the name of the server on which the Plant Applications Web Client is installed.
- `<port_number>`: Represents the network port used by the Plant Applications Web Client.

  📄 **Note:**

  By default the Web Client installs on port 443. When port 443 is not available, then the Web Client tries to install on port 5059.

  If the Web Client is running on 443, then you do not need to specifically provide the port number in the URL. For example, `https://<server_name>/<micro_service_name>/swagger-ui.html`.

  If the Web client is running on 5059, then you must provide the port number in the URL. For example, `https://<server_name>:5059/<micro_service_name>/swagger-ui.html`.

- `<micro_service_name>`: Represents the name of the microservice for which you want to run the REST APIs. The microservice and the corresponding applications where you can run the microservice are listed in the following table.

Microservice
`access-control-service`
`activities-app-service`
`activities-service`
`alarm-app-service`
`alarm-service`
`analysis-uapp`
`approval-cockpit-app-service`
`approval-cockpit-service`
`assignment-service`
`bom-management-app-service`
`comment-app-service`
`comment-service`
`document-management-service`
`downtime-app-service`
`downtime-service`
`erp-export-service`
`erp-import-service`
`erp-scheduler-service`
`erp-transformation-service`
`esignature-app-service`
`esignature-service`
`external-config-app-service`
`external-config-service`
`gateway-service`
`labor-service`
`mes-dataservice`
`mes-service`
`mymachines-service`

Microservice
`nonconformance-app-service`
`nonconformance-service`
`operator-app-service`
`pa-mymachines-service`
`plant-execution-service`
`process-order-service`
`processanalyzer-app-service`
`product-service`
`productionmetrics-app-service`
`productionmetrics-service`
`productionscheduler-app-service`
`property-definition-app-service`
`property-definition-service`
`reasons-service`
`receiving-inspection-app-service`
`receiving-inspection-service`
`route-app-service`
`route-service`
`security-administration-app-service`
`security-service`
`segments-definition-service`
`spc-app-service`
`supervisor-app-service`
`time-booking-app-service`
`usersettings-service`
`waste-management-app-service`
`waste-management-service`
`webgenealogy-app-service`
`work-order-history-service`
`work-order-service`

1. Access the following URL: `https://<server name of web client>:<port number>/ <application service name>/swagger-ui.html`
   - **For Workorder Service**: `https://webclientservername:5059/workorder- service/apidocs/index.html`
   - **For Esignature-app-service Service**: `https:// webclientservername:<port>/ esignature-app-service/swagger-ui/`

   The Swagger UI appears.

2. **Only for Work Order Service**: To access the Swagger UI for Work Order Service, you must perform following steps in the Operations Hub Server:
   a. Go to the `C:\ProgramData\GE\Operations Hub\uaa-config` location.
   b. Using a text editor, update the **uaa.yml** file by adding the below lines at the end of file with proper indentation.

   ```
   cors:
     xhr:
       allowed:
         headers:
           - X-Requested-With
           - Authorization
         methods:
           - POST
   ```

   c. Restart the **GE Operations Hub UAA Tomcat Web Server** service.

3. Select **Authorize**.
   You will be prompted to enter the client ID and client secret.

4. Enter the following values, and select **Authorize**:

Field	Description
User Name	Enter the Plant Applications login user name.
Password	Enter the Plant Applications login password.
client_id	Enter a client id value that was used during the installation.
	By default <node name of Plant Applications Web Client>_mes.
client_secret	Enter the password. This password is set during the Web Client installation.

📒 **Note:** If you are not able to see the username and password fields, refer to Swagger URL Authorization Issue.

You can now access the REST APIs for the application that you have entered in the URL.

⚠ **Important:**

The following REST API microservices are deprecated. These REST API microservices will be permanently removed in the future release.

- In `mes-service`:
    ◦ `GET /downtime/v1/downtimeRecords`
    ◦ `GET /downtime/v1/downtimeRecords/{id}`
    ◦ `GET /downtime/v1/downtimeStatistics`
    ◦ `GET /downtime/v1/faults`
    ◦ `GET /downtime/v1/faults/{id}`

Swagger URLs of Rest Services

Sno	Service Name	Swagger URLs
1	access-control-service	`https://<FQDN or Hostname>:5059/access-control-service/swagger-ui.html`
2	activities-app-service	`https://<FQDN or Hostname>:5059/activities-app-service/swagger-ui.html`
3	activities-service	`https://<FQDN or Hostname>:5059/activities-service/swagger-ui.html`
4	alarm-app-service	`https://<FQDN or Hostname>:5059/alarm-app-service/swagger-ui.html`
5	alarm-service	`https://<FQDN or Hostname>:5059/alarm-service/swagger-ui.html`
6	approval-cockpit-app-service	`https://<FQDN or Hostname>:5059/approval-cockpit-app-service/swagger-ui.html`
7	approval-cockpit-service	`https://<FQDN or Hostname>:5059/approval-cockpit-service/swagger-ui.html`
8	assignment-service	`https://<FQDN or Hostname>:5059/assignment-service/swagger-ui.html`
9	bom-management-app-service	`https://<FQDN or Hostname>:5059/bom-management-app-service/swagger-ui.html`
10	comment-app-service	`https://<FQDN or Hostname>:5059/comment-app-service/swagger-ui.html`
11	comment-service	`https://<FQDN or Hostname>:5059/comment-service/swagger-ui.html`
12	document-management-service	`https://<FQDN or Hostname>:5059/document-management-service/swagger-ui.html`
13	downtime-app-service	`https://<FQDN or Hostname>:5059/downtime-app-service/swagger-ui.html`

Sno	Service Name	Swagger URLs
14	downtime-service	`https://<FQDN or Hostname>:5059/downtime-service/swagger-ui.html`
15	erp-export-service	`https://<FQDN or Hostname>:5059/erp-export-service/swagger-ui.html`
16	erp-import-service	`https://<FQDN or Hostname>:5059/erp-import-service/swagger-ui.html`
17	erp-scheduler-service	`https://<FQDN or Hostname>:5059/erp-scheduler-service/swagger-ui.html`
18	erp-transformation-service	`https://<FQDN or Hostname>:5059/erp-transformation-service/swagger-ui.html`
19	esignature-app-service	`https://<FQDN or Hostname>:5059/esignature-app-service/swagger-ui.html`
20	esignature-service	`https://<FQDN or Hostname>:5059/esignature-service/swagger-ui.html`
21	external-config-app-service	`https://<FQDN or Hostname>:5059/external-config-app-service/swagger-ui.html`
22	external-config-service	`https://<FQDN or Hostname>:5059/external-config-service/swagger-ui.html`
23	labor-service	`https://<FQDN or Hostname>:5059/labor-service/swagger-ui.html`
24	mes-dataservice	`https://<FQDN or Hostname>:5059/mes-dataservice/swagger-ui.html`
25	mes-service	`https://<FQDN or Hostname>:5059/mes-service/swagger-ui.html`
26	mymachines-service	`https://<FQDN or Hostname>:5059/mymachines-service/swagger-ui.html`
27	nonconformance-app-service	`https://<FQDN or Hostname>:5059/nonconformance-app-service/swagger-ui.html`
28	nonconformance-service	`https://<FQDN or Hostname>:5059/nonconformance-service/swagger-ui.html`
29	operator-app-service	`https://<FQDN or Hostname>:5059/operator-app-service/swagger-ui.html`
30	pa-mymachines-service	`https://<FQDN or Hostname>:5059/pa-mymachines-service/swagger-ui.html`
31	plant-execution-service	`https://<FQDN or Hostname>:5059/plant-execution-service/swagger-ui.html`
32	process-order-service	`https://<FQDN or Hostname>:5059/process-order-service/swagger-ui.html`
33	processanalyzer-service	`https://<FQDN or Hostname>:5059/processanalyzer-service/swagger-ui.html`
34	product-service	`https://<FQDN or Hostname>:5059/product-service/swagger-ui.html`
35	productionmetrics-app-service	`https://<FQDN or Hostname>:5059/productionmetrics-app-service/swagger-ui.html`

Sno	Service Name	Swagger URLs
36	productionmetrics-service	`https://<FQDN or Hostname>:5059/productionmetrics-service/swagger-ui.html`
37	productionscheduler-app-service	`https://<FQDN or Hostname>:5059/productionscheduler-app-service/swagger-ui.html`
38	property-definition-app-service	`https://<FQDN or Hostname>:5059/property-definition-app-service/swagger-ui.html`
39	property-definition-service	`https://<FQDN or Hostname>:5059/property-definition-service/swagger-ui.html`
40	reasons-service	`https://<FQDN or Hostname>:5059/reasons-service/swagger-ui.html`
41	receiving-inspection-app-service	`https://<FQDN or Hostname>:5059/receiving-inspection-app-service/swagger-ui.html`
42	receiving-inspection-service	`https://<FQDN or Hostname>:5059/receiving-inspection-service/swagger-ui.html`
43	route-app-service	`https://<FQDN or Hostname>:5059/route-app-service/swagger-ui.html`
44	route-service	`https://<FQDN or Hostname>:5059/route-service/swagger-ui.html`
45	security-administration-app-service	`https://<FQDN or Hostname>:5059/security-administration-app-service/swagger-ui.html`
46	security-service	`https://<FQDN or Hostname>:5059/security-service/swagger-ui.html`
47	segments-definition-service	`https://<FQDN or Hostname>:5059/segments-definition-service/swagger-ui.html`
48	spc-app-service	`https://<FQDN or Hostname>:5059/spc-app-service/swagger-ui.html`
49	supervisor-app-service	`https://<FQDN or Hostname>:5059/supervisor-app-service/swagger-ui.html`
50	time-booking-app-service	`https://<FQDN or Hostname>:5059/time-booking-app-service/swagger-ui.html`
51	usersettings-service	`https://<FQDN or Hostname>:5059/usersettings-service/swagger-ui.html`
52	waste-management-app-service	`https://<FQDN or Hostname>:5059/waste-management-app-service/swagger-ui.html`
53	waste-management-service	`https://<FQDN or Hostname>:5059/waste-management-service/swagger-ui.html`
54	webgenealogy-app-service	`https://<FQDN or Hostname>:5059/webgenealogy-app-service/swagger-ui.html`
55	work-order-history-service	`https://<FQDN or Hostname>:5059/work-order-history-service/swagger-ui.html`
56	work-order-service	`https://<FQDN or Hostname>:5059/work-order-service/apidocs/index.html`

Unicode Utility

Unicode Utility can be used to apply schema changes in the Plant Applications database to accept the Unicode characters.

📝 **Note:**

- You must run this utility only after **completing** installation of all the Plant Applications components.
- You must run the Unicode utility where Plant Applications Server is installed.
- This utility installer modifies the Plant Applications database. The schema changes made to the Plant Applications database cannot be reverted. Please make sure to take a backup of your database before running this utility.
- It is recommended to run the utility on the database backup to know the exact downtime required to upgrade from non-Unicode to Unicode.

Install Unicode Utility

Perform the following steps where you have installed Plant Applications Server.

1. Select **Plant Applications Unicode Utility** from the Installation Menu.
   The **Important Information** screen appears.
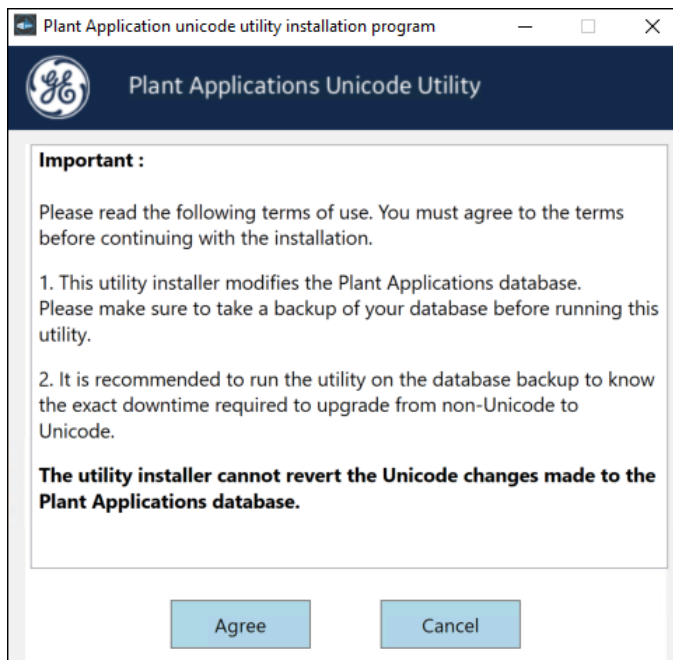
2. Read the important information and then select **Agree**.
   The **Plant Applications Database Credentials** screen appears.

3. In the **Plant Applications Database Credentials** screen, enter the Plant Applications database credentials as described in the following table.

Credential	Description
Server name	Enter the server name where the Plant Applications database is installed in the format `HOST_NAME\INSTANCE`. Where `HOST_NAME` is the host name (either a fully qualified domain name or IP address, of the server) and `INSTANCE` is the instance of the server used by the database. 📝 **Note:** If there is no instance for the server, you can enter `HOSTNAME` as the server name. `Localhost` is not an acceptable value for `HOSTNAME`.
Database	Enter the name of the Plant Applications database for which you want to apply the schema changes to accept the Unicode characters.
User name	Enter the user name that has permissions to access the database you entered in the **Database** box. By default, the user name appears as `sa`.
Password	Enter the password for the user name you entered in the **User name** box.
Port	**Optional**: Enter the number of the port that the instance uses to listen for client connections. 📝 **Note:** The default port is 1433.

4. Select **Deploy** to apply the schema changes.

Based in the database size, the time to complete the deployment varies. Once the deployment is completed, you can see the status being updated as **Unicode: Successfully Deployed** at the bottom of the screen. On successful deployment, the Plant Applications database will accept the Unicode characters.

Task Lists for ActiveX and SOA Web Client

ActiveX Task List installation is available as a separate option in a Workflow installation.

The Web Task List associated with the SOA Web Client is installed as part of the Workflow. After Workflow installation, refer to the *Workflow Help* for the link to connect to the Web Task List.

Preparing a SOA Database for UMDB Integration

If you are upgrading an existing SOA database to a UMDB, prepare the database for migration by running the CreateAspect command from the command line with any required aspect options.

Ensure that Plant Applications is installed.

The script prepares the SOA data structures to work in the unified data model of the UMDB. For more information, see <u>Database Setup Strategies</u> *(page 34)*.

📝 **Note:** Setting the **UseProficyClient** site parameter to `True` enables aspecting and disables the renaming of aspected items. Aspected user names require a fully-qualified domain name (FQDN) as specified for a Windows account. See the *Plant Applications help* for more information.

1. From a command prompt, enter the Plant Applications installation path. For example: .
   `C:\<Program Files location>\Proficy\Proficy Workflow\Program`

2. Run the `Proficy.MESCore.Utils.CreateAspect.exe` program to create Equipment and Material aspects, or add the following options to create aspects:

Option	Description
/addEquipProp	Creates the Equipment Property aspect.
/addEquipProp /addMatProp	Creates Equipment and Material aspects as well as the Equipment Property and Material Property aspects.
/addEquipProp /addMatProp	Creates Equipment and Material aspects as well as the Equipment Property and Material Property aspects.

For example: Proficy.MESCore.Utils.CreateAspect.exe /addEquipProp /addMatProp

Chapter 4. Installing the Report (Web) Server

Report Server Installation Overview

Plant Applications offers Web Reports for access through a browser and specialized Web Parts for access through a portal using the Report (Web) Server. The Report (Web) Server is required for Web Server reports. Before installing, verify that the required IIS roles are installed. When installing IIS, make sure that WebDAV is not installed. If an error occurs when loading the ISAPI filters, check the ISAPI file path.

The Plant Applications Report Server must be installed after the Plant Applications Server, but before installing a Plant Applications Client. For information about setting up and using Web Reports and Web Parts, see the *Plant Applications help*.

Web Client Reports offer another means to access similar data. See *Plant Applications Client Interfaces* for information about accessing the Plant Applications Web Server Administrator and the Web Server.

You must also determine the account that the Plant Applications services uses to start. The account must have `Log on as a service` rights.

For information about installing and using SSRS, see the *Proficy Plant Applications SSRS Report Configuration and Report Creation Guide*, which is posted with KB16011.

📄 **Note:** The Plant Applications services do not start when using the Local System account.

Windows Installation Limitations

By default, Windows Server OS versions do not install the Web Server (IIS), FTP, and ASP components required for Web Reports. Before you install the Proficy Application Server, you must install the necessary components by following the steps in .

IIS Metabase Configuration Backup

Metabase backup files contain copies of the metabase configuration file. You can create a portable backup if needed.

Set Up Internet Explorer Security for Web Reports

Install web reports.

1. From Internet Explorer, select **Tools > Internet Options**.

2. Select **Internet** on the **Security** tab, then click **Custom Level** to display the **Security Settings** dialog.

3. Scroll down to **User Authentication**, then select **Automatic logon with current username and password**. Click **OK**.

4. Select **Local Intranet** on the **Security** tab, then click **Custom Level** to display the **Security Settings** dialog.

5. Scroll down to **User Authentication**, then select **Automatic logon with current username and password**. Click **OK**.

6. Select **Trusted sites on the Security** tab, then click **Custom Level** to display the **Security Settings** dialog.

7. Scroll down to **User Authentication**, then select **Automatic logon with current username and password**. Click **OK**

8. Select **Trusted sites on the Security** tab, then click **Sites** to modify the **Trusted sites** dialog.
   a. Verify that the web server name and localhost are included in the list of trusted sites in the format `http://servername`.
   b. To add the web server or local host to the list of trusted sites, enter the server in the **Add this website to the zone** field in the format `http://servername`, then click **Add**.
   c. Click **Close**.

9. On the **Privacy** tab, click **Advanced** to display the **Advanced Privacy Settings** dialog.

10. Select **Override automatic cookie handling**, then click **OK**.

11. Scroll down to **Security** on the **Advanced** tab, and verify that **Enable Integrated Windows Authentication (requires restart)** is selected. Click **OK**.

   📄 **Note:**
   • When **UseHttps** site parameter is True (i.e. Web Reports is enabled with Https), then **Create Definition/Edit Default Parameters/View** options produces errors if Internet Explorer Enhanced Security is enabled on Plant Applications Web Reports Server. To resolve the issue, disable Internet Explorer Enhanced Security in Windows Server Manager on the machine that is running the Plant Applications Web Report Server. On Windows11

PA Client environment, these options (**Create Definition/ Edit Default Parameters/ View**) work only if Plant Applications Web Server SSL certificate is installed under Trusted Root Certification Authorities.

• Windows 11 does not allow Internet Explorer to run. Use the Internet Explorer mode in Edge Browser instead using the following steps:

    a. Open Settings of Edge Browser and then access **Default Browser** under Internet Explorer Compatibility.

    b. Allow sites to be reloaded in Internet Explorer mode, and select **Allow**. Select **Restart**.

    c. Select the **Add** button from the Internet Explorer mode pages section and type or paste the address of the Web Reports URL `https://<Servername>/ PAReporting/` and add.

Now when you access Web Reports URL in Edge, it loads in IE mode.

Install the Plant Applications Report Server

After installing IIS roles, you can install the Plant Applications Report Server.

Determine which components to install and complete the required prerequisites.

• Verify that role services have been installed as described in the *Setting up IIS Web Services* section in the *Plant Applications Getting Started Guide* in [Setting up IIS Web Services *(page 25)*](#).

• If planning to use a web portal (for example, Proficy Portal or SharePoint Services), verify the portal has been installed before installing the Web Server.

• A PDF distiller is installed to generate reports in PDF format. A default printer must be installed on the computer, and the PDF service must start with its own Windows user account (Login As Service policy required) for the report engines to print or produce reports in PDF format. For more information, see *Adding a Printer* in the *Web Server and Web Client* section of the *Plant Applications Help*.

• Microsoft Excel is required to install Plant Applications Web engines.

    📄 **Note:** After installing the Plant Applications Web Server, you must start Excel under the same login account used by the Plant Applications Report engine services.

📄 **Note:** By default, SharePoint Portal Services 3.0 uses port 80, also used by Plant Applications Web Server. You must change SharePoint to use an open port, such as port 81.

Web Reports can use the following components:

- Plant Applications Server – Interacts with the Web Server and maintains a profile of Web Client users.
- Plant Applications Web Server – Framework to schedule and distribute standard and adhoc web reports by means of the Plant Applications Web Client.
- Plant Applications Web Parts – Customizable web components for use in a portal to view relevant plant information in real time.
- Plant Applications Web Content and Web Report Engines – Generate content data for Web Parts and reports. When report generation time increases or CPU usage is high, you should place another engine into service.

> **Note:**
> ◦ If you are installing Plant Applications in a production environment, you must install the Plant Applications Web Server, engines, and Plant Applications Server on different computers. You can install all components on a single computer for testing.
> ◦ Engine services do not start unless assigned their own Windows user account. **Login As Service** policy required.

1. Run `InstallFrontEnd.exe` to display the Plant Applications **Installation Menu**.

2. Select **Plant Applications Report Server** to start the installation program. If the installation does not start, run the `PlantApplicationsWebServer.exe` file.

3. Click **Next** at the **Welcome** screen, click **OK** at the next screen to proceed, and then click **Yes** to override firewall settings.

4. At the **Custom Setup** screen, select the components to install on this server. Click **Next** to continue.
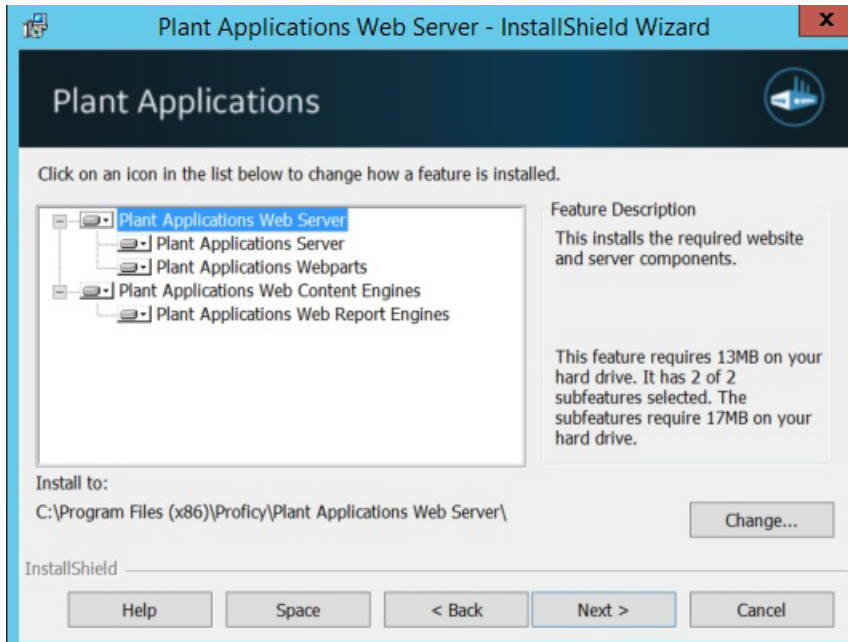
5. If a dialog opens to acknowledge installation of a distiller to produce PDF documents, click **OK**

6. Accept default port numbers for the HTTPS port, or enter different ports as needed. Click **Next**.
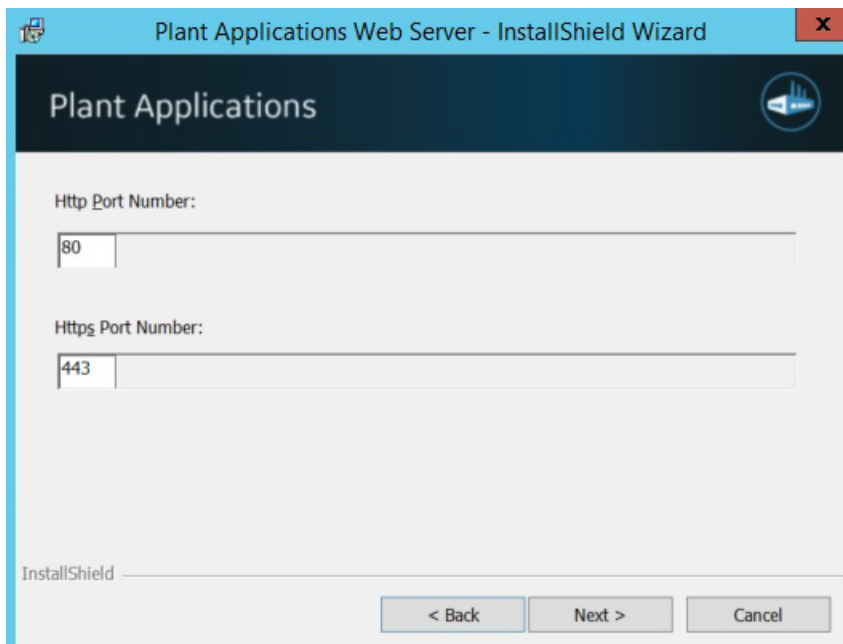
7. Enter the name of the SQL Database server if prompted, and select the authentication method. If using Server authentication, enter the server credentials, then click **Next**.
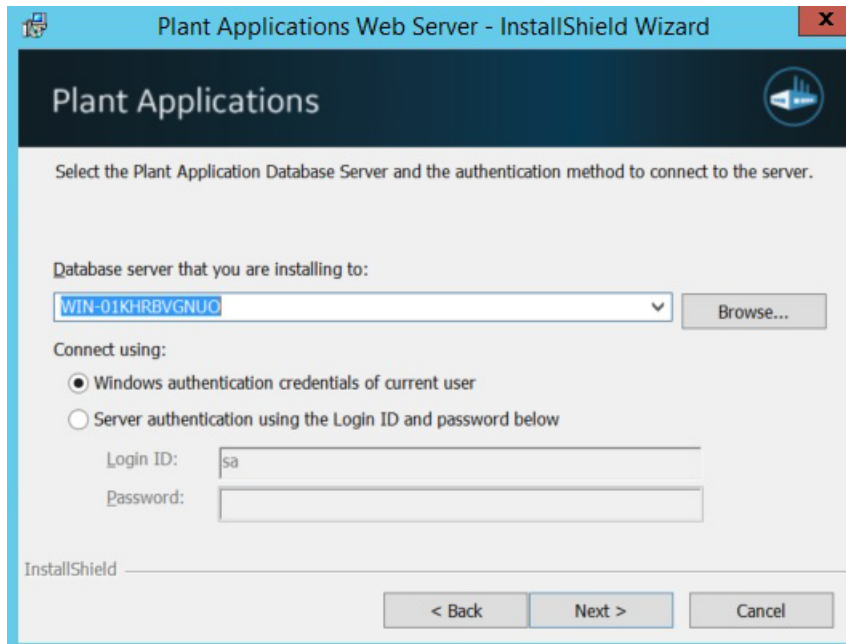
The Web Server installation program checks a specific registry key for an existing SQL Server name.

8. Click **Next** to continue. Record any listed tasks that you may need to complete.

9. Click **Next** to continue, and complete the dialog when prompted:
    a. Confirm whether you want to install the Plant Applications Web Reporting engines on the same computer as the Plant Applications Server.
    b. If the Plant Applications Web Server already exists, confirm that you want to overwrite its configuration.
    c. Click **Next**.

10. Enter the Windows Account (username) and Password of the local Windows user account for the machine where the Plant Applications Report engines and Plant Applications services will be running. Click **Next**.

    📝 **Note:** Although the Plant Applications services run under the Local System account, you should use a local Windows user account.

11. At the **Destination Folder** screen, accept the default location for the web server destination folder, or click **Browse** to select another location. Click **Next**.

12. Click **OK** to acknowledge that SharePoint Portal Services are required to access SharePoint dashboards.

    📝 **Note:** See for steps to use a port other than port 80.

13. Click **Install** at the **Ready to Install the Program** screen to begin copying files.
    The installation program sets up the web server. The program installs the Microsoft SOAP if
    needed, imports the Web Part templates, and populates the database.

    📝 **Note:** If a portal is not found, a prompt notifies you that Web parts will be available only
    through the Plant Applications Web Server or Proficy Real-time Information Portal (RTIP).

14. Click **Finish**.
    Report Server instances are displayed under the `Sites` folder in the **IIS Manager**.

15. Restart your computer to complete the installation.

    1. Log into the computer with the newly installed Report Server using the Windows User Account
       that was selected during the installation.
    2. Verify that the `DashboardImport.log` and `ExecuteScripts` installation log
       files contain no errors. By default, the log files are located in `C:\Program Files
       (x86)\Proficy\Plant Applications Web Server\SetupLogs`.
    3. Access the **Site** Parameters sheet by selecting **Administer Site** Parameters under **Global
       Settings** in the Plant Applications Administrator, and set `UseHttps` in the **Client** section to
       `True`.

These additional steps may be required to complete installing the Report Server:

- Follow the steps in *Configuring the Plant Applications Report (Web) Server* to set up a different
  user only if the Report Server is installed on a non-local machine.
- Follow the steps in [Secure Socket Layer and Certificate Requirements *(page 83)*](#) *Secure
  Socket Layer and Certificate Requirements* available in *Plant Applications Getting Started
  Guide* to support the functionality of secure (HTTPS) URLs.
- Configure Excel as described in [Set Up the Plant Applications Excel Add-In *(page 84)*](#)
  Setting Up the Plant Applications Excel Add-In available in *Plant Applications Getting Started
  Guide*.
- Perform the steps for Setting Up for Using and SSO Login, if required.

📝 **Note:** Set **UseFTP** site parameter to true/false if you want to configure Web Server Reports
Engine with/without using FTP. If **UseFTP** is set to false, users must place the templates at
this location (if the template is not published through Plant Applications Excel Add-in) `C:
\Program Files (x86)\Proficy\Plant Applications Web Server\Report
Server\Templates`, and reports will be generated at this location `C:\Program Files
(x86)\Proficy\Plant Applications Web Server\Report Server\Reports`.
(The **ServerFileLocation** parameter in Plant Applications Web Server must match the path where
reports are generated).

However, the above mentioned default path depends on the installation directory.

When **UseFTP** is set to False, the Engine uses **ServerFileLocation** parameter and reports are generated in the web server.

1. Log in to the Web Administrator.
2. Access the `Web Server` folder, and then select the `Parameters` folder.
3. In the right pane, right-click the parameter **'ServerFileLocation'**, and then select **Properties**. The **Report Parameter Properties** dialog box appears.
4. In the **Default Value** field, type the file path: `C:\Program Files (x86)\Proficy \Plant Applications Web Server\Report Server\Reports` where reports will be generated.
5. Select **OK**.

When **UseFTP** site parameter is set to True, the Engine uses **FileLocation web server** parameter to generate reports in the FTP path. The FTP path should be in the following format: `<name of ftp server>/<sub folder name>`.

1. Log in to the Web Administrator.
2. Access the `Web Server` folder, and then select the `Parameters` folder.
3. In the right pane, right-click the parameter **'FileLocation'**, and then select **Properties**. The **Report Parameter Properties** dialog box appears.
4. In the **Default Value** field, type the FTP path where reports will be generated. The FTP path should be in the following format: `<name of ftp server>/<sub folder name>`.
5. Select **OK**.

After installing the Plant Applications Report (Web) Server, return to [Installing the Plant Applications Client and Administrator](#) *(page 62)*.

Set Up the Plant Applications Report Server

- Install the Plant Applications Report (Web) Server.
- In the **Services** screen, verify that the Plant Applications Report Engine services are logging in under the domain user you specified when installing the Report Server. Check the **Log On As** column for each service.
- If the Proficy Server Remote Data Service resides on the Plant Applications server, verify that the service logs in under the domain user. If the Proficy Server Remote Data Service resides on another server, such as the Plant Applications Web server, use a Windows user account or a local administrator account with Log on as a Service rights instead of Local System.
- Verify that the domain user has Log on as a Service rights.

1. Start Excel under the same login account used by the Plant Applications Report Engine services.

2. Under the **Internet Information Services (IIS) Manager**, verify that **Anonymous access** has been enabled for the three virtual FTP directories (`Templates`, `Reports`, and `PAReporting`) by enabling **Anonymous Authentication** for the `PAReportingFTP` site.
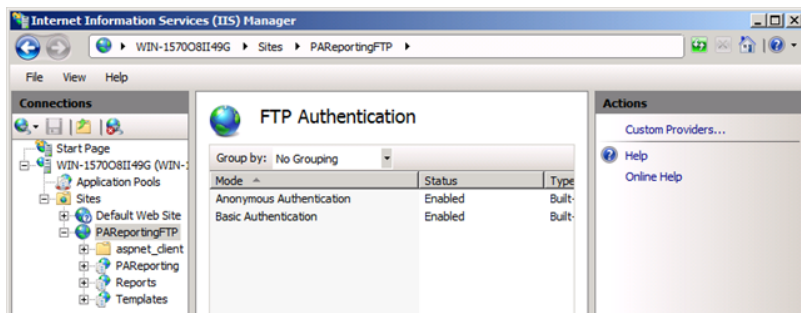
> 📄 **Note:** By default, this action occurs when installing the Web Server for Plant Applications.

3. Verify that the anonymous users (IUSR_*) have full control.

4. Verify that you can use FTP, and log in as `anonymous`.

5. Right-click the `..\inetpub\wwwroot` folder in Windows Explorer, select **Properties**, and then open the **Security** tab. Grant full control under Permissions to all users including `Users` `<computer name>`, `IIS_IUSR_<computer name>` (Internet Guest Account) and `IIS_WPG` (Launch IIS Process Account).

6. In **Local Users and Groups** (access from Computer Management, or search for "Local Users" from the Windows **Start** menu), add the following users to the **Administrators group**:
   - `IUSR_<computer name>` (Internet Guest Account)
   - `IWAM_<computer name>` (Launch IIS Process Account)

Secure Socket Layer and Certificate Requirements

The Plant Applications Report Server requires a valid IIS server certificate to work in SSL mode.

When you install and access the Report Server across different machines, the certificate should be validated across machines and preferably signed by a Certificate Authority (CA) known to these machines.

Set Up IIS for Remote Use

When the Plant Applications Report Server has been installed on a different machine from the Plant Applications Web Client, you must configure Plant Applications Report Server applications (PAReporting, Apps, and ProficyDashBoard) to use different X-Frame-Options.

1. Start the **Internet Information Services (IIS) Manager**.

2. In the **IIS Manger**, drill down in the Connections tree to **Sites > Default Web Site > Apps**, and then select **HTTP Response Headers**.
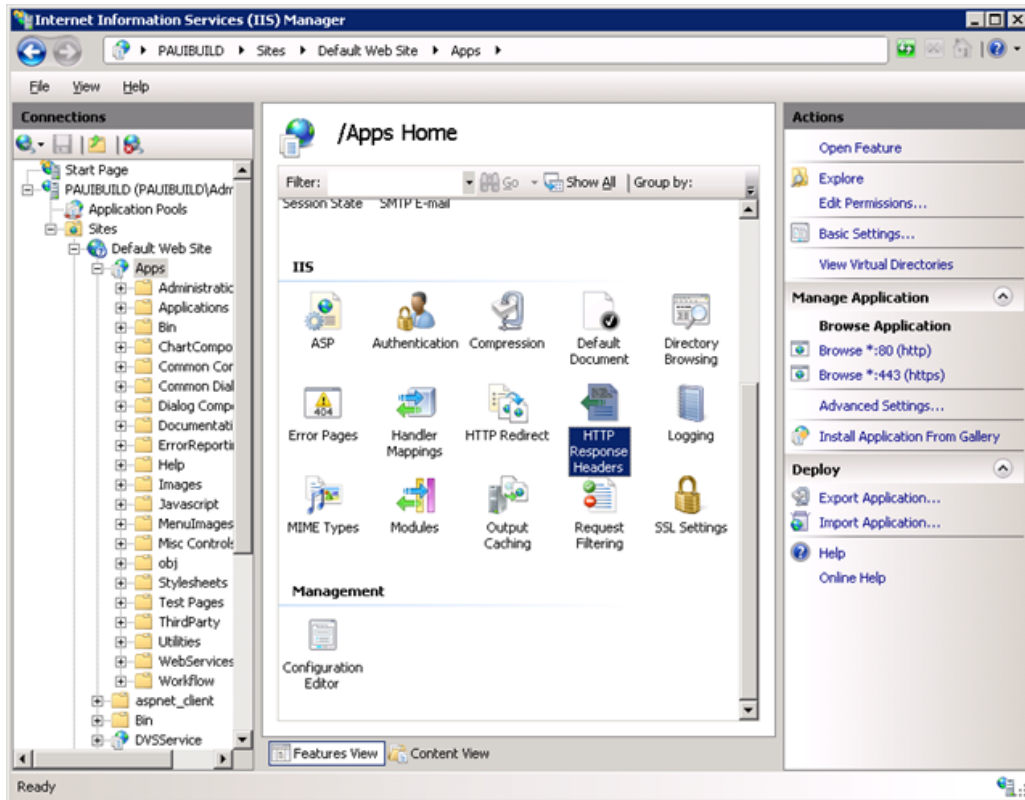
Set Up the Plant Applications Excel Add-In

1. Start Excel from the command line.
   a. Click **Start > Run**.
   b. Type `excel.exe` in the **Open** field, then click **OK**.

2. Click **Microsoft Office**, then click **Excel Options**.

3. Click the **Add-Ins** category

4. In the Manage box, click **Excel Add-ins**, then click **Go** to display the **Add-Ins** dialog box.

5. Select the **Plant Applications Excel Add-In** check box, then click **OK**.
   A message verifies the Plant Applications Add-in has been installed.

6. Click **Plant Applications** on the **Add-ins** ribbon, then click **Options** to display the Plant Applications **Add In Options** dialog box.

7. Under **Server Access**, verify the following three items in the display:
   - Correct default server.
   - Correct user.
   - `Connected` status.

   If not:

   a. Click **Edit** to display the **Connect Server** dialog to edit the user details. If necessary, log in with Plant Applications Administrator credentials.
   b. Right-click the server, then click **Edit** to update the Add-in connection details.
   c. In the **Server** dialog, click **Advanced**, and verify that the Default Server is selected. Click **OK**.
   d. If the Add-In is not connected to the server, right-click the server. Select **Connect**, then click **Close**.
   e. Click **Save** to update the registry settings.

8. Click the **Microsoft Office** button, then select **Excel Options** to display the **Excel Options** screen.

9. Click **Trust Center**, then click **Trust Center Settings** to display the **Trust Center** screen.

10. Click **Add-ins**, and verify that all options are not selected.

11. Click **Macro Settings**, then select **Enable all macros**.

12. Click **OK**, then click **Save**.

13. Clear the **Save AutoRecover information every** option, then select the **Disable AutoRecover for this workbook only** option.

14. Click **OK** and close Excel.

Verify the virtual directories have been created:

1. Open **Administrative Tools** from the **Control Panel**, then select **Internet Services Manager** or **Internet Information Services (IIS) Manager**.
2. Expand the IIS tree, then open the `Web Sites` folder.
3. Expand **Default Web Site** to display the virtual directories. Verify that the following three virtual directories have been created in IIS:
   - Apps
   - Reports
   - PAReporting

For information about installing and using SSRS, refer to the *Proficy Plant Applications SSRS Report Configuration and Report Creation Guide*, which is posted with KB16011.

If you installed the Plant Applications Web Parts, also verify that the virtual directories `ProficyWebParts` and `ProficyDashboard` have been created.

Local Client Application Support

You can install local copies of the Plant Applications Administrator, Plant Applications Client, and Workflow Client and directed them to an installed server to access the Unified Manufacturing Database (UMDB), a historian, and Web Server reports.

Use the **Plant Applications Client** selection from the Plant Applications **Installation** Menu.

Chapter 5. Post-installation Tasks

UTC Support

Plant Applications supports Coordinated Universal Time (UTC) as an option on a fresh installation of the Proficy Server.

When you install a new Proficy Server, you can use the time zone of the server to store your data or you can use the UTC option. The UTC option is required to support a Regional Server where plants span time zones. It is also required to support storage of time across the Daylight Saving Time (DST) boundary. UTC is similar to using GMT +0:00 as your time zone, with the exception that UTC does not acknowledge Daylight Saving Time. For example, GMT -6:00 is minus five hours from UTC, when adjusting for Daylight Saving Time. When you choose the UTC option, all the data is stored on your server in UTC time regardless of the time zone of the server.

Visit this Knowledge Base article to understand how to implement Coordinated Universal Time. https://digitalsupport.ge.com/communities/en_US/Article/To-Leverage-The-UTC-Functions-in-The-Latest-50-Release.

Reporting and UTC

Plant Applications displays support UTC including displaying data across the DTS boundary. When data comes into a display, the timestamp is converted to the time zone of the client. For example, a test value with a UTC timestamp of 07:00:00 would be displayed with a timestamp of 02:00:00 on a client with a time zone of GMT -6:00 (assuming Daylight Saving Time). For data that crosses the Fall DST boundary, you see multiple rows and columns arranged in UTC order, depending on the display, in the same time range. For example, you can set up a time-based Autolog display which includes columns of 30-minute samples. Assuming your DST boundary is at 2:00 AM, the first 1:30 AM column in Autolog precedes 2:00 AM, while the second 1:30 AM column presents its sample after the DST boundary.

Plant Applications 6.1 or higher supports UTC-enabled standard reports and a UTC-enabled Excel Add-in.

📄 **Note:** To use custom reports with UTC, you must rewrite the reports.

Default Time Zone Site Parameter

Use the Default Time Zone site parameter to specify UTC or the time zone of the server. You cannot edit this option after entering data in the Plant Applications database. This option is not available when upgrading directly from an earlier version of Plant Applications.

Upgrade Plant Applications to Use UTC

You must manually upgrade your system to use UTC on an existing Plant Applications installation.

Make a copy of your production database. You can use the production database copy as a backup or for reporting.

📋 **Note:** These options require advanced knowledge of both SQL Server and Plant Applications. You should test the results of either action before implementing them in a production environment.

• Create a gap in your data, based on your server time.

1. Change the UTC.

Server time	Do this	Example
GMT	Switch to UTC. The gap is created automatically when you switch to UTC time.	If you are at GMT -5:00 and your last data was recorded at 14:22, when you switch to UTC (GMT) the data is stored at 19:22, creating a gap in your data of five hours.
+GMT	Wait until the UTC time is newer than the last time stamp in the database. This prevents data from being overwritten.	If you are at GMT +3:00 and your last data was recorded at 11:00:00, you can shut down the server, wait for four hours and switch to UTC. The system stores your data at 12:00:00, providing a one-hour gap.

2. Move the server as described in the Knowledgebase article KB5427 at the Support web site: https://digitalsupport.ge.com.

• To eliminate the runtime data from the copy of your database, move the server as specified in KB5427 and truncate your runtime data. See the support website https://digitalsupport.ge.com for the additional truncation procedure.

Set Up Languages for Plant Applications Displays

After installing Plant Applications, you can implement support for additional languages using its Native Language Support (NLS) features.

1. Select **All Programs** from the Windows **Start** menu.

2. In the `Proficy` folder, select `Configure Plant Applications Language Support`. Alternatively, you can also run `ConfigurePALanguages.exe` located at `<installation_directory>\Proficy\Proficy Workflow\Program` to set up language support.

3. At the **Configure Plant Applications Database** screen, modify any server settings as needed.

4. Select one or more languages to include, then click **Save**.

   ⓘ **Tip:** Use these options to set up language support after any subsequent Service pack or SIM upgrade.

Manage Port 12280 Conflicts

Communication conflicts can arise when some third-party applications use port 12280, also used by Plant Applications, which can cause the application to disconnect from the router.

If necessary, update the default communications port inside Plant Applications INI files. See Proficy Router Conflicts *(page 104)* to modify the default port values.

Security Modification for Proficy Plant Server

See *Security Management* in the *Plant Applications Help* for additional details on setting up your security.

Database Purges

Plant Applications provides a Unified Manufacturing Database (UMDB) that combines a Workflow (SOA) database with a Plant Applications database.

Purging data reduces the amount of used space in the database. It does not reduce the size of the database. For instructions to reduce the size of the database, consult SQL Server documentation.

Purging the database is a two-step process involving the Plant Applications and SOA purge utilities. Contact Support at https://digitalsupport.ge.com/ for more information.

The following notes apply to a purge of the Plant Applications database:

• Perform online purges to Plant Applications databases before upgrading.

- For sites using only the Plant Applications data model, you can perform cursor purges to trim the database as an interim solution.
- For sites incorporating both the Plant Applications and S95 data models, do not purge the Plant Applications database. Doing so orphans data in the SOA environment, and can introduce other issues.

You can use the Plant Applications Purge Utilities to conduct database purges online or offline. When creating an online purge plan, you should perform an initial database purge based on your site's desired retention limit. For more information, see KB14802 on https://digitalsupport.ge.com/.

Customize Your Application

You can edit the values in the Plant Applications configuration file to customize your installation.

Change any of the following parameters in the configuration file as needed.

Table 1. `<filename>` Parameters

Parameter	Description
EventNumIsNumber	For the Excel Add-in to translate numeric values, set this value to `True`. The default value is `False`. See the **EventNumIsNumber** site parameter in the *Plant Applications Help*.
ProdCodeIsNumber	For the Excel Add-in to translate numeric values, change this value to *True*. (The default value is *False*.) See the **ProdCodeIsNumber** site parameter in *Plant Applications Help*.
AllowPasswordSave	To prevent users from saving their client passwords to local workstations, change this value to *False*. The default value is *True*. See **AllowPasswordSave** in the *Plant Applications Help*.
LanguageNumber	By default, the site language is set to U.S. English. To change the default language, edit this value. See the **LanguageNumber** parameter in the *Plant Applications Help*.
StartupSetBack	By default, the Event Manager service looks back three days (4320 minutes) to look for events at startup. To change this interval, edit the **EventMgr** system value. The suggested configuration is 6 to 12 hours. Services must be restarted for changes to take effect. See the *System Users* in *Plant Applications Help*.

Parameter	Description
SpecificationSetting	The Autolog display uses this parameter to color-code test values by comparing them to the specification limits defined for each variables. When the value is 1 (the default) and the Test Values limit is greater than the Triggering Specification Limit, it triggers a specification flag updating the Test Values Color. When the value is 0 and the Test Values limit is greater than or equal to the Triggering Specification Limit, it triggers a specification flag updating the Test Values Color.
UseProficyClient	Set this site parameter to `True` to merge the Plant Applications and SOA equipment models using the Workflow Client. Refer to *Enabling the Proficy Client UI and Aspecting* in the *Plant Applications Help*.
MinEventTimeSpan	To reduce the frequency of event generation, set this value to `0`. The default value of this parameter is four minutes. For more information, see the **MinEventTimeSpan** site parameter in the *Plant Applications Help*.

Chapter 6. Plant Applications Client Interfaces

Plant Applications Administrator

The Plant Applications Administrator is the main client application for administrators configuring the system.

Use the Plant Applications Administrator to perform the following tasks:

- Configure data captured from the plant floor and other sources.
- Create security rights for data input, changes, verification, and viewing.
- Process collected information using calculations and many other data functions.
- Provide the link and the structure to the SQL database where the data is stored.
- Design displays viewed through the Plant Applications Client application.
- Provide a method for importing and exporting Plant Applications data.

The Plant Applications Administrator environment is similar to Windows Explorer. On the left side of the main screen is the Plant Applications Administrator tree. From this hierarchical tree all tasks can be performed. For the most part, every object in the Administrator tree can be right-clicked to view a menu of the available commands. The center pane displays additional details about objects directly below the currently selected level. The right pane displays the hyperlink menu, if you have that option enabled.
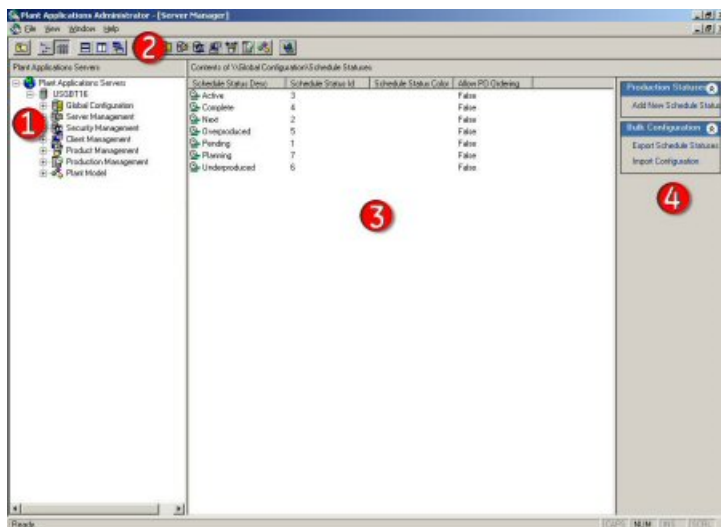
Legend:

1. Right-click objects in the Plant Applications Administrator tree to view a menu of available commands.

2. The Plant Applications toolbar provides a shortcut to the various levels in the Administrator tree.
3. The **Detail** pane displays the contents of the object selected in the Administrator tree.
4. If the **Hyperlink** button is active, all tasks that can be performed on the object selected in the Administrator tree are presented as hyperlinks.

Plant Applications Client

The Plant Applications Client provides a customizable environment for using Plant Applications Views and Displays to access your plant data. For more information about using the Plant Applications Client, refer to *Plant Applications Help*.

Legend:

1. A View is a group of displays that can be opened at the same time. Views are created in the Plant Applications Client.
2. The toolbar provides a quick way to perform tasks specific to the active display. The toolbar automatically changes depending on which display is active.
3. The box indicates the status of the connection to the Plant Applications Server. Green indicates the connection is active.

4. This area displays the name of the person who is currently logged in to the Plant Applications Client.
5. Click the tabs to switch between displays.

Workflow Client

Use the Proficy (Workflow) Client interface to define resources and execute workflows when working with a UMDB.

For more information about using the Proficy (Workflow) Client, see the *Workflow Help*. For more information about new Plant Applications features accessed through the Proficy (Workflow) Client refer to the *Plant Applications Help*.

📝 **Note:** Set the **UseProficyClient Site Parameter** to `True` to merge the Plant Applications model with the SOA Equipment Model when preparing to use the Workflow Client.
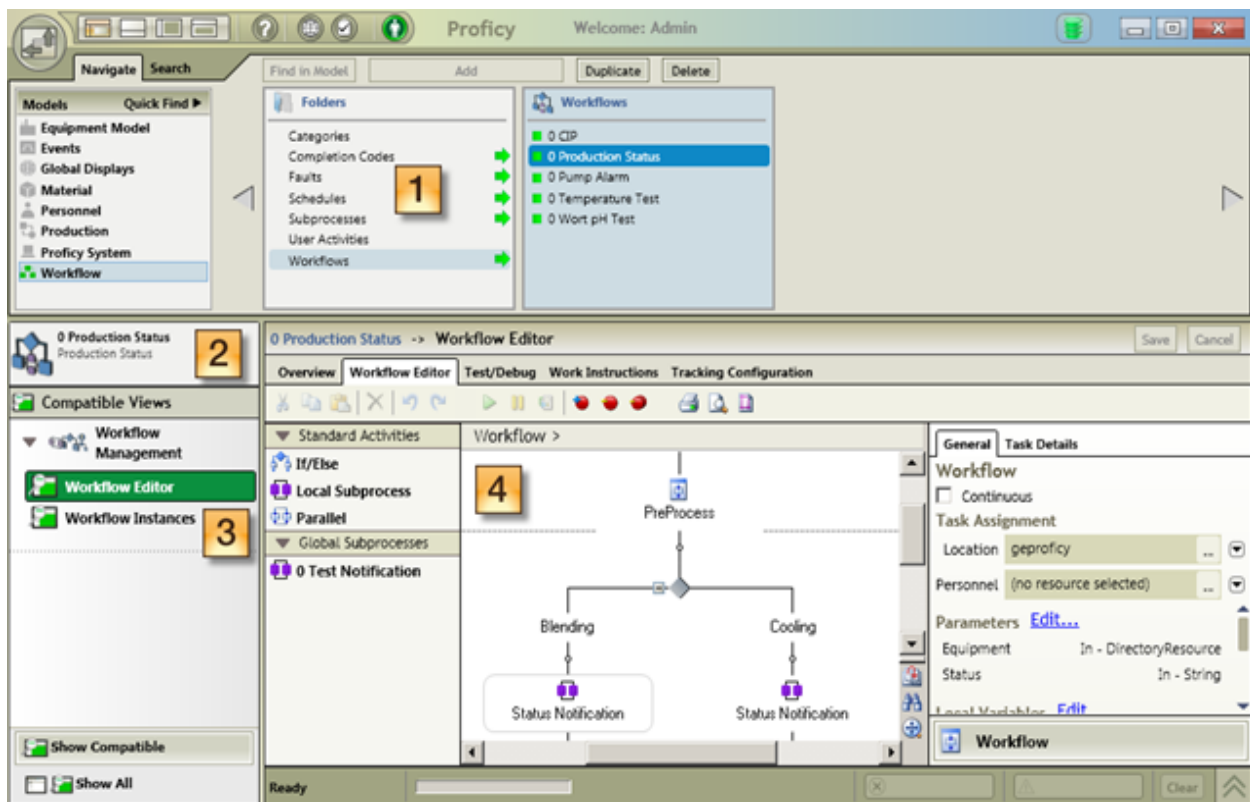
Legend:

1. Use the Navigator to change the focus between objects in a model.
2. Use solution panels to view collections of editors, views, and reports specific to each model resource.
3. Use displays (Views) to show options after a resource object is selected.

4. Use the Workspace to view details of a selected object, and to present editors used to configure and modify model resources.

Plant Applications Report Server Administrator

Use the Web Server Administrator, accessed through the Plant Applications Administrator, to set up the Plant Applications Report (Web) Server. The Web Administrator can be started from any computer with Plant Applications Administrator installed.

To start the Web Server Administrator, expand Server Management in the Plant Applications Administrator tree and double-click **Administrator Web Server**.
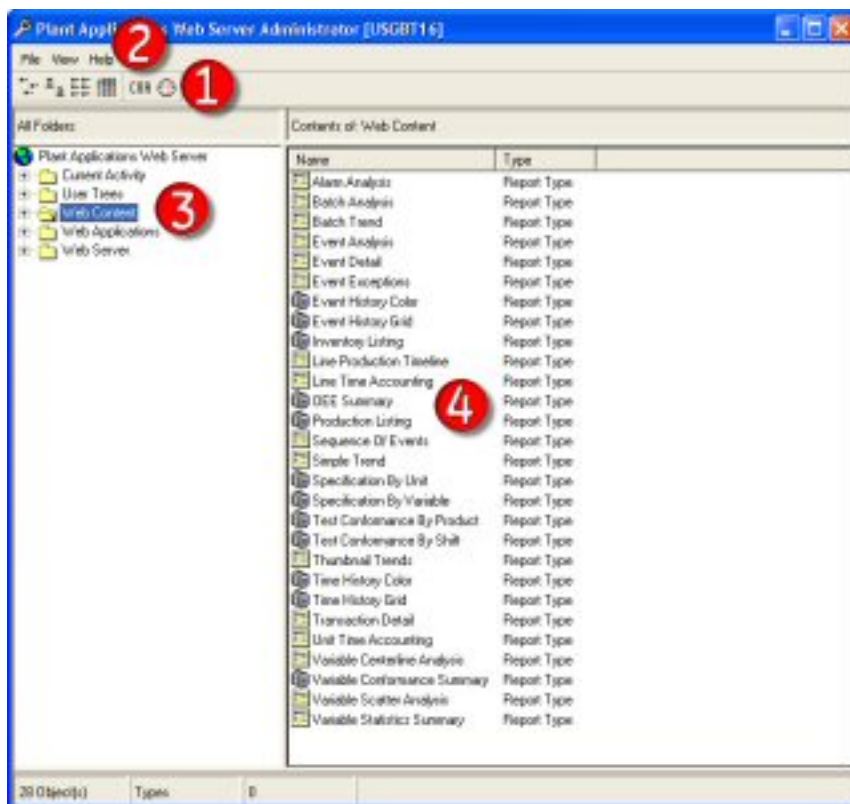
Legend:

1. Use the toolbar to change the view of the contents in the right pane, start the Automated Certificate of Analysis (COA) applications, and schedule a report.
2. From the **File** menu, you can import Web report packages and exit the application. From the **View** menu, you can refresh the view. From the **Help** menu, you can access the online help file and view information about your version of the Web Administrator.
3. The left pane displays the Web Administrator tree for you to add users, schedule reports, manage the Web Server, and manage Web reports.

4. The right pane displays the contents of the node that you have selected in the left pane.

Plant Applications Web Server Client

The left pane of the two-pane display shows the reports and web content available to the current user.

Select a report definition or web content to display the information in the right pane. Select a report type to display the report dialog boxes in the right pane.

Use a browser to access the Plant Applications Web Server client from a URL:

```
https://<server>/PAReporting
```
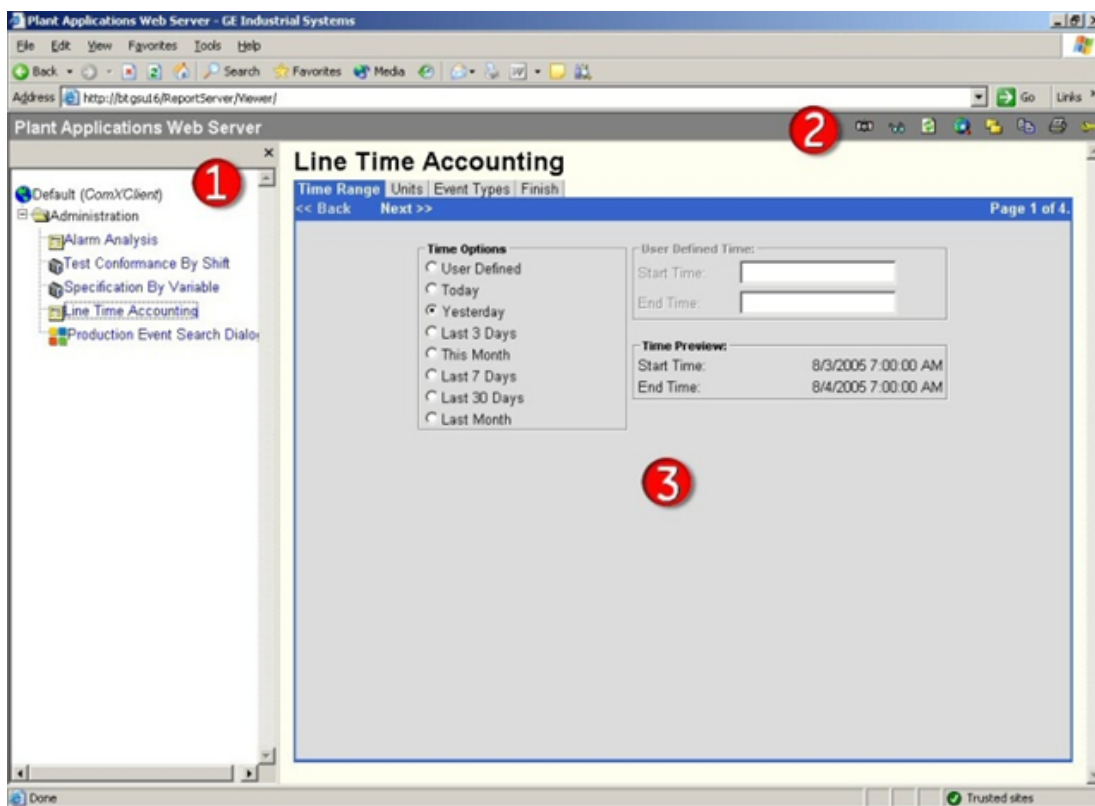

Legend:

1. Lists the Web Reports and Web Parts available to the user.
2. Web Server toolbar.
3. Web Report or dialog boxes for creating the selected Web Report.

Web Part Administrator

Use the Web Part Administrator to configure and manage Web Parts, create new Web Parts, change default parameters, and access a variety of statistical reports.

Expand Server Management in the Plant Applications Administrator tree, then double-click Administrator Web Parts to open the Web Administrator.
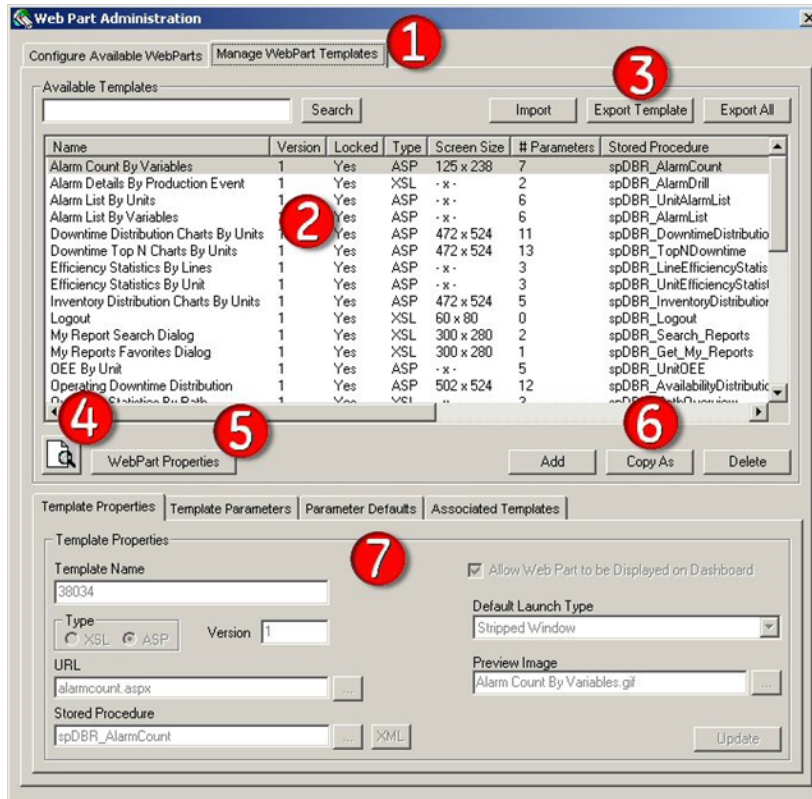
Legend:

1. The **Manage** tab lists the templates used to create user-defined Web Parts. Use the **Configure** tab to set up Web Parts.
2. Lists of Web Parts or Web Part templates and information about each Web Part or template.
3. Click to import or export Web Parts and Web Part templates.
4. Click to preview the selected Web Part or Web Part template.
5. Click to specify parameters that control properties such as the placement of your Web Part or Web Part template in your portal.
6. Click to create new Web Part templates, and to copy or delete existing templates.
7. Provides information about the selected Web Part or Web Part template. You can also use the tabs to edit the default parameters for the associated Web Part or template.

Chapter 7. Maintenance and Troubleshooting

Plant Applications Server Installation Failure

While installing Proficy Plant Applications Server in your machine, if the installation fails, you must follow the below steps:

1. Select **View Log** to view the causes of the failures.
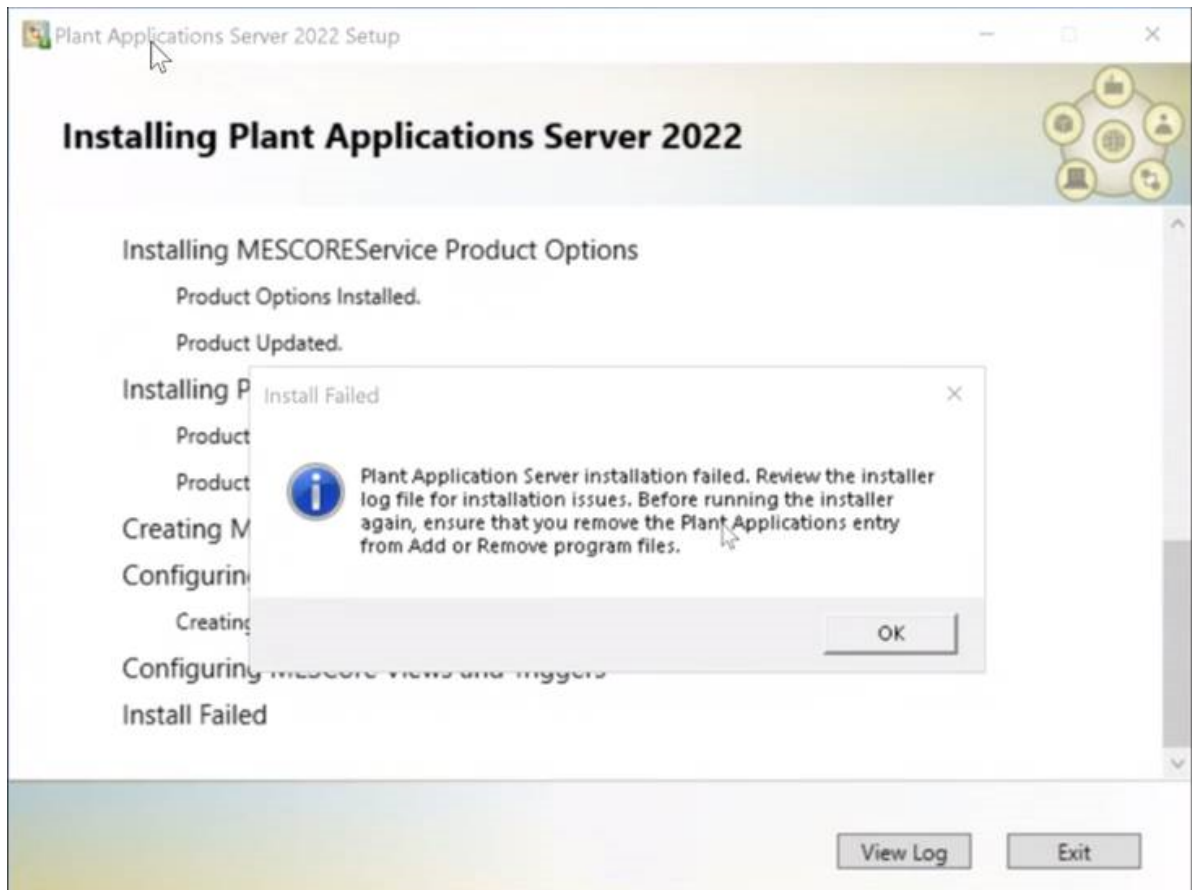
2. Fix the installation issues listed in the log file.

3. Remove the Plant Applications entry from **Add or remove program files**.

4. Restart Plant Applications installer.

Verifying Plant Applications Service Startup

After installing the Plant Applications Server, the Plant Applications Server services should start automatically.

Verify that the Plant Applications Server services have started.

1. Open the Windows **Control Panel**, and double-click **Administrative Tools**.

2. Double-click **Services**.

3. Scroll through the list of services and verify that the Plant Applications Server services have all started. If they have not started, start them manually.
Another method for verifying that the Plant Applications Server services have started is to view the server log files. These text files are created during the Plant Applications Server installation. Each service has its own log file. By default, the log files are located on the Plant Applications Server in the following directory:

```
C:\<Program Files>\Proficy\Proficy Server\LogFiles
```

Verifying the Server Connection

When using Plant Applications, the connection to the server can be lost for a number of reasons.

1. Start Plant Applications **Administrator** and log in with username `comxclient`.
2. Start Plant Applications client and log in with username `comxclient`.
3. Start Microsoft Excel.
4. Load the Plant Applications Add-in for Excel, click **Tools > Add-ins > Plant Applications Excel Add-in**.
5. Connect to the Plant Applications Server. For more information, see *Connecting to a Server* topic in the online help for the Add-in.

Changing the SharePoint Port Number

SharePoint Services 3.0 uses port 80 by default, which is the port used by the Plant Applications Web server.

You must change the port used by SharePoint:

1. On the Plant Applications Web server, select **Start > Administrative Tools > Internet Information Services (IIS) Manager** to open Internet Information Services (IIS) Manager.

2. Expand the server and expand Web Sites.

3. Right-click **SharePoint - 80**, then select **Properties**.
   The SharePoint – 80 Properties dialog box appears.

4. Under web site identification on the Web Site tab, enter an unused port number in the **TCP Port** field. Click **OK**.

5. Right-click **SharePoint Central Administration v3**, then select **Browse** to display the **SharePoint Central Administration** page.

6. Select the **Operations** tab and select **Alternate access** mappings under Global Configurations.

7. Under Internal URL, select the URL for the server (for example: `http://<myservername>/`).

8. In the URL protocol, host and port field, append the port number used in step 5 to the end of the computer name. For example: `http://<myservername>:85/`.

9. Click **OK** and, if necessary, start the Default Web Site.

   📝 **Note:** Add the port number to the SharePoint URL. For example, if you used port 81, the URL would be: `http://<myservername>:81`.

Changing the Zookeeper Port Number

You must perform below changes only if have entered an invalid Zookeeper port number in the **Kafka TCP port assignments** screen when installing the Plant Applications Message Bridge.

1. Stop the CDC service.

2. Navigate to `<installation_directory>\Service-EventuateCDC`.

3. Open the `nssm-create-cdc-service.bat` file using a text editor.

4. Modify the Zookeeper port number in **CDCArguments** with a valid port number.

5. Save your changes to the `nssm-create-cdc-service.bat` file.
   The `nssm-create-cdc-service.bat` file is modified with the valid Zookeeper port number.

6. Restart the CDC service.

7. In the directory `<tomcat_home>/Apache Software Foundation/Tomcat 9.0/webapps/<service_name><version>/WEB-INF/classes`, access the `application.properties` file by using a text editor. Where:
   - *<tomcat_home>*: Is the directory where you installed Apache Tomcat. For example, `C:/ Program Files`.
   - *<service_name>*: Is the service for which you must modify the zookeeper port number. Below are the list of services for which you need to modify the Zookeeper port number.
     - Labour App service
     - Route service App
     - Operator App service
     - Plant Execution App Service
     - Work Order History Service
     - Approval cockpit App Service
     - Comment service
     - Comment App service
     - Product app service
     - ERP export App service
   - *<version>*: Is the version of the microservice created during the installation of the Plant Applications Web Client.

8. For the each service listed above, enter the valid Zookeeper port number in the respective `application.properties` files.

9. Save changes to the `application.properties` file for all the service listed above.

10. Restart Tomcat to apply the changes.

Backing Up and Restoring an SQL Database

You can use an SQL Server database as the Plant Applications database or Unified Manufacturing Database (UMDB).

You must back up and restore an SQL Server database.

1. Back up the database on the SQL Server instance.
   See *How to create a database backup (Enterprise Manager)* in the SQL Server Books Online.

2. Make a copy of the backup file.
   Because SQL Server Management Studio does not allow restoration from a network location, the backup file must be copied to the local disk of the SQL Server instance.

3. Restore the database to the SQL Server instance.
   See *How to: Create a New Database from an Existing Database Backup (SQL Server Management Studio* in the SQL Server Books Online.

4. After the database has been restored, ensure that permissions are set up correctly in the Plant Applications database. From SQL Server Management Studio, run the following script to rebuild the SQL permissions

```
exec sp_Revokedbaccess 'ProficyDBO'
        go
        exec sp_Revokedbaccess 'ComXClient'
        go
        exec sp_Revokedbaccess 'ProficyConnect'
        go
        exec SpSupport_ChangeDBOAccount 'Proficydbo','ProficyDBO'
```

Moving Database and Log Files

After installing the Plant Applications Server, you can move the Plant Applications or Unified Manufacturing Database (UMDB) database file and log file to a separate physical disk to optimize performance.

The physical disk should be part of the disk subsystem,

📄 **Note:**

- For more information on optimizing SQL Server performance, contact Support at Support *(page 136)*.
- If upgrading SQL Server to a newer version, run sp_revokeDBAccess for ProficyDBO, ComxClient, and ProficyConnect. Next, run spSupport_ChangeDBOAccount to reconfigure the SQL User Accounts.

An SQL Server database consists of MDF (database file) and LDF (log file) files. By default, these two files are located in the following directory:

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

1. Locate the MDF and LDF files.
    a. Start SQL Server Management Studio from the Windows **Start** menu.
    b. Navigate to the database, right-click it, then select **Properties** to display the **Database Properties** dialog box.
    c. Under **Select a page**, right-click **Files** to view the location of the MDF and LDF files.

2. Stop the following Plant Applications Server services:
    • Proficy Server Manager
    • Proficy Server Router
    • Proficy Server License Manager

3. Stop the Proficy Server, Proficy Publisher, and Proficy STS Services used for SOA.

4. In **SQL Server Management Studio**, take the database offline.
   a. Select **Plant Applications SQL Server**, then select **Databases**.
   b. Right-click the Plant Applications database, select **Tasks**, and then select **Take Offline**.

5. Detach the database (refer to SQL Server documentation).

6. Copy the MDF and LDF files to the SQL Server instance.

7. Attach the database to the SQL Server instance.

8. Bring the database online, then verify the location of the MDF and LDF files.

9. Restart the Plant Applications Server and SOA services.

10. After the database has been restored, verify that permissions are set up correctly in the Plant Applications database. From **SQL Server Management Studio**, run the following script to rebuild the SQL permissions:

```
exec sp_Revokedbaccess 'ProficyDBO'Plant Applications
go
exec sp_Revokedbaccess 'ComXClient'
go
exec sp_Revokedbaccess 'ProficyConnect'
go
exec SpSupport_ChangeDBOAccount 'Proficydbo','ProficyDBO'
```

Move an existing Plant Applications Database to New Server

If you move an existing Plant Application Database to a NEW server and you do not revoke permissions for the Plant Application SQL Users, then the installation fails and the log files indicate below error:

```
[] - <<processFiles>> C:\Program Files (x86)\Proficy\Proficy Server\Database
\PreConfigure\0000_ADDPLANTAPPSUSERS.SQ_, LineNumber: 41: User, group, or role
'comxclient' already exists in the current database.

[] - <<processFiles>> ADO Error: #-2147217900, User, group, or role
'comxclient' already exists in the current database., Source: Microsoft SQL
Server Native Client 11.0, SQL State: 42000, NativeError: 15023
```

To continue with the installation, you must perform the following steps before starting the Plant Application Install:

a. Log into SQL Query Analyzer under a SYSADMIN Account.

b. Set the Database to the appropriate Plant Applications Database Name.

c. Execute the following script:

```
EXEC SP_REVOKEDBACCESS 'ProficyConnect'
EXEC SP_REVOKEDBACCESS 'ProficyDBO'
EXEC SP_REVOKEDBACCESS 'ComXClient'
GO
EXEC sp_droplogin 'ProficyConnect'
EXEC sp_droplogin 'ProficyDBO'
EXEC sp_droplogin 'ComXClient'
GO
EXEC SPSUPPORT_CHANGEDBOACCOUNT
```

Once you run this script, then you can start the Plant Application Installation.

Proficy Router Conflicts

By default, Plant Applications uses port 12280, which is occasionally used by other software. This can cause communication conflicts causing the Plant Applications Server to disconnect from the Proficy Router.

The following four files must be edited on the Plant Applications Server:

- `cmConfigMgr.ini`
- `cmRtr.ini`
- `Message.ini`
- `PlantAppsMessaging.ini`

You must change the port used by Plant Applications.

1. On the Plant Applications Server, navigate to `<drive>:\Program Files\Proficy \Proficy Server\Messaging`. By default, this directory is on the `C:` drive.
2. Using a text editor, open each of the INI files.
3. Locate the following line: `Protocol0_Item0 = 12280`.
4. Change `12280` to an unused port number. You must use the same port number in each of the four files.
5. Save the file.
6. After you update all the files, restart the Plant Applications Server.

SQL Login Conflicts

When installing the Plant Applications Server, if the SQL user information cannot be validated, the installation program generates an error message.

Upon failing to validate the SQL user account, the installation program displays the following message before returning to the login validation screen:

```
Database Install Fatal Error encountered: Invalid SQL Username and Password
  Install aborted.
```

The error indicates a configuration conflict in the registry with the ADO Connection string used to instantiate a connection to the SQL Server. If the Plant Applications Server had been previously installed with a different server name, the **DatabaseNodeName** registry key may be pointing to an invalid SQL Server.

To resolve the error, open **REGEDIT** and validate that the String Value *<databasenodename>* exists in the following locations:

- HKey_LocalMachine\Software\Proficy\Plant Applications\Proficy Server
- HKey_LocalMachine\Software\MountainSystems\Proficy\Proficy Server\DataBaseNodeName

Runtime Error

Plant Applications Server or Common Licensing installation fails upon encountering a pre-existing installation.

This error typically occurs on machines that have Terminal Services enabled and where you are running a compressed setup that is not named `setup.exe`. The error occurs because the operating system fails to return the correct Fonts system folder, which causes a `setup.exe` exception during initialization.

In most cases, the operating system uses `C:\Documents and Settings\\Windows`, instead of a real Windows folder, and does not include a `Fonts` subfolder. The operating system fails when attempting to locate the Fonts subfolder. Refer to MSDN for additional information.

- Rename the single executable file to `setup.exe`, and run the installation again.
- Disable Terminal Services on the machine, and re-run the installation.
- Replace the compressed, single executable with a full DVD release.

- Run the installation from **Add/Remove Programs** rather than launching the installation directly. Create the `Fonts` folder in the location where the setup is checking under the current user at `Documents and Settings\\Windows\Fonts`.

SQL Server Blockage

The Plant Applications SQL Server can fail when running at the same time as an Online-Transaction Processing (OLTP) application and a reporting database.

Because SQL transactions are typically small for OLTP applications, a common practice is to disable parallelism to minimize conflicts between different processes. To improve the response of large complex reporting queries however, it is generally recommended to maximize parallelism. If the Plant Applications SQL Server starts to experience a significant amount of blocking that affects the timely interaction of Plant Applications with operators and control systems, reducing or disabling the parallelism option may alleviate the issue.

You should initially restrict the SQL Server parallelism option it to use half the number of processors available. If not adequate, try disabling parallelism altogether by setting the option to `1` so that one processor is used for a given query. For more about max degree of parallelism option, see the *SQL Server documentation*.

1. In SQL Server Management Studio, right-click the server, then click **Properties** to display the **Server Properties** dialog box.

2. Under **Select a page**, click **Advanced** to display the **Advanced** page.

3. Under **Parallelism**, edit the **Max Degree of Parallelism** value. The default is `0` (zero), which uses the actual number of available processors.

Option	Description
Edit	Recommended value: half the number of processors on the server.
1	Disables the option.

4. Click **OK**.

License Server Startup Failure

The Plant Applications Server License Manager service may not start due an incorrect database password stored in the registry.

As the Proficy Server License Manager service is used to change the password, you must reset the database passwords to correct this issue.

1. Set the `proficydbo` password to the default password in the SQL Server.

2. Set the `comxclient` password to the default password in the SQL Server.

3. Delete the encrypted passwords from the registry:
   - `HKEY_LOCAL_MACHINE\SOFTWARE\Proficy\Plant Applications
     \Proficy Server\DBParam1`
   - `HKEY_LOCAL_MACHINE\SOFTWARE\Proficy\Plant Applications
     \Proficy Server\DBParam2`

4. Start Proficy Server License Manager to initialize the registry to the default.

5. Reset the password using the Administrator.

Web Content Issues

If you are having difficulty viewing the web content tree or you are receiving errors when you try to view the tree in a web client, you may need to enable parent paths for the **PAReporting** virtual directory.

📄 **Note:** ASP.NET is required to log into the Web Report server.

1. Open **Internet Information Services** (IIS) Manager and expand the server.

2. Right-click the **PAReportingvirtual** directory, then click **Properties**.
   The PAReporting dialog box appears.

3. On the **Virtual Directory** tab, click **Configuration**.
   The Application Configuration dialog box appears.

4. On the **Options** tab, select **Enable parent paths**.
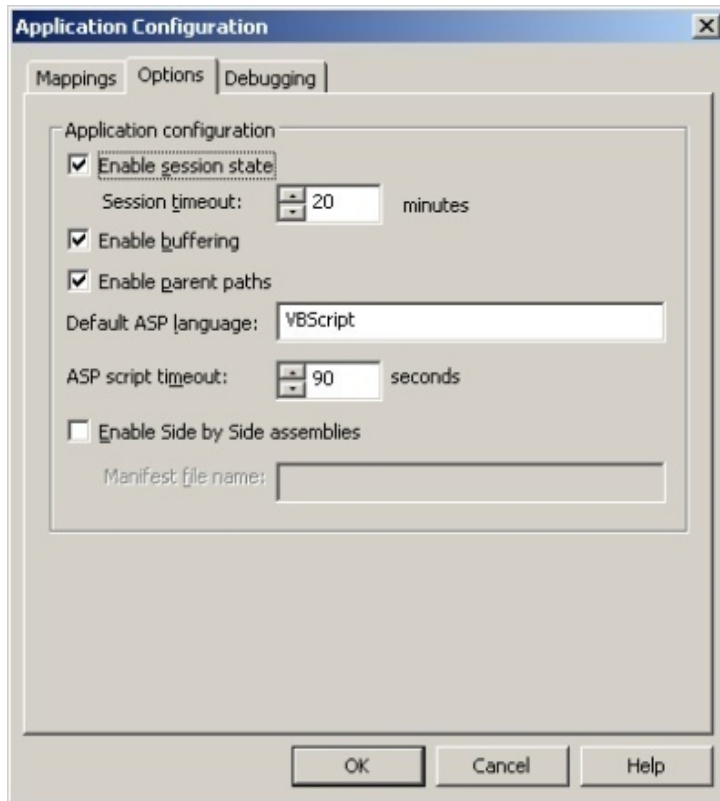
5. Click **OK** twice to return to the **Internet Information Services** window.

6. Close the **Internet Information Services** window.

Web Reports Issues

If the Plant Applications Web Reports are not working correctly, you may need to enable `HTTP Keep-Alives`.

For information about installing and using SSRS, refer to the *Proficy Plant Applications SSRS Report Configuration and Report Creation Guide*, which is posted in KB16011.

1. In the Internet Information Services (IIS) Manager, locate the local computer.
2. Expand Web Sites, right-click the website, and then select **Properties**. The Properties dialog box for the web site is displayed.
3. On the **Web Site** tab, click **Connections** and ensure **Enable HTTP Keep-Alives** is selected.
4. Click **OK**.

Proficy Server Shutdown Error

When stopping the Proficy Server, the system can generate a 1067 error message indicating that the process terminated unexpectedly. This error can be ignored.

Click **OK**, then confirm that the status of the service is no longer `started`.

Proficy Server Installation Script Failure

Proficy Server installation can fail when the scripts utility cannot log in with authentication for the previously installed version.

When the SQL script cannot run, the installation script generates the following message:

```
Script Execution- Login Failed
```

As a workaround, set the `sa` user login to a blank password in SQL Server Management Studio.

Database Connection Failure

After installation, the system displays a `failed to connect to database server` message when starting the Plant Applications Administrator or client.

📄 **Note:** If the server appears in the list of Plant Applications Servers in the Plant Applications Administrator, double-click the server name to display the list of nodes.
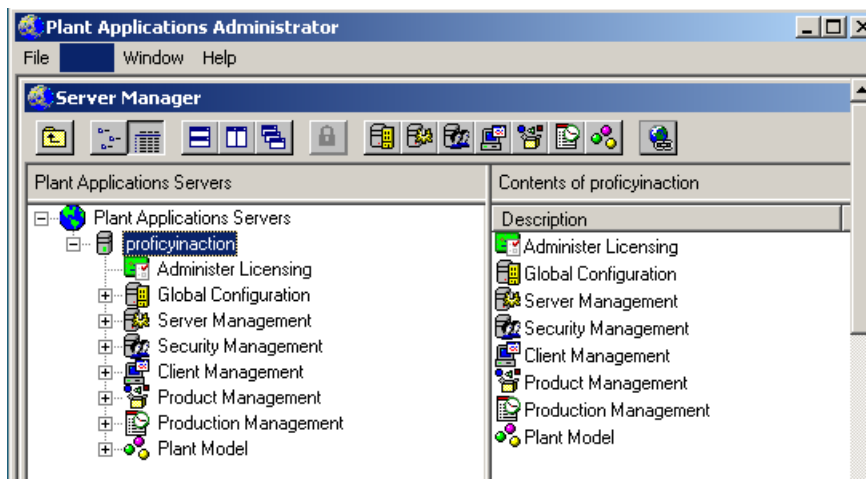
1. Verify that the Proficy Licensing and Proficy Server License Manager services are running. If not, start the services. Restart the Plant Applications Administrator or Client to see if it connects to the database.

2. If you are still unable to connect to the database, register the following controls using the command line:
   - `Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\PRMsgs.dll"`
   - `Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\ProfCDG.ocx"`
   - `Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\ProfSVR.dll"`
   - `Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\PRUtils.dll"`

   📝 **Note:** The `Program Files` location varies depending on whether the operating system is 32- or 64-bit. For a 64-bit operating system, the path is `Program Files (x86)`. For a 32-bit operating system, the path is `Program Files`.

License Manager Connection Failure

The License Manager depends on the ProficyConnect database user.

If the Proficy Server Router log file indicates that it is waiting for the license manager connection and the license is installed correctly as confirmed through the License Viewer, the database users are likely not synchronized.

To check whether database users are synchronized, connect to the database (for example, SOADB) using SQL Server authentication with `ProficyConnect` as the user and `proficy` as the password. If the connection attempt fails, you must fix the database users.

1. Stop the following services:
   - Proficy Server Manager
   - Proficy Server Router
   - Proficy License Manager

2. Connect to the SQL server as `sa`, under the main `Security\Logins` branch, then delete the `ComXClient`, `ProficyConnect`, and `Proficydbo` users.

3. Run the following command as a database query:
   exec spSupport_ChangeDBOAccount

4. Restart the Proficy License Manager and Proficy Server Manager services.

All the services controlled by Proficy Server Manager should start up.

Proficy Workflow Client Startup Failure

If the Workflow client does not start:

- Verify that all related services, including the licensing and Proficy Server services, are running.
- Stop and restart the services if necessary.

Plant Applications Client or Administrator Failure

This procedure is applicable if you installed GE Proficy Historian Server 8.1 on the same node as Plant Applications.

1. Verify whether the Historian is uninstalled.
2. Reinstall the Historian on the same node as Plant Applications.

Excel Add-in Import Export Tool

If you are working on the latest version of Plant Applications, and when you export the Plant Applications configuration data using the Excel Add-in Import Export tool, then you must first ensure that the new data (Headers/Column names) matches with the latest version of the Plant Applications Excel Add-in header format.

Uninstall Plant Applications

This procedure is applicable if you want to uninstall the Plant Applications and its components from your system.

1. From the Windows **Start** menu, select **Control Panel > Programs > Programs and Features**.

2. From the list of applications, uninstall programs in the following order.
   a. Proficy Plant Applications Client
   b. Proficy Plant Applications Web Server

> **Note:** When uninstalling Web Server, ensure that you close all the Plant Applications windows or instances. You may encounter an **Failed to unregister PRUtils.dll** error message during uninstallation. You can ignore this message and select **OK**.

    c. Proficy Plant Applications Server

3. **Optional:** If you have installed Service Packs or SIMs for Plant Applications, from REGISTRY (regedit.exe), you must manually remove SIM entries from the registry key: `HKEY_LOCAL_MACHINE\Software\Wow6432Node\Microsoft\Windows\CurrentVersion\Uninstall`.

Chapter 8. Test and Production Environments

Environment Overview

Installing Plant Applications involves installing several different servers that communicate with each other.

The servers can be installed on one computer for testing, or they can be distributed in a network to create production environments. Before installing the software for a new installation, decide what your environment will be and what its architecture will look like.

A list of prerequisite software for Plant Applications is included in the Preparing to Install Plant Applications *(page 30)* section. For information about using Plant Applications in a clustered environment with Microsoft server failover technology for highest availability of the Plant Applications Server, see Appendix B: Cluster Installation and Configuration *(page 125)*.

Test Environment

A simple Plant Applications installation employs a single computer for testing. In most cases, this environment is not suitable for production, because the architecture does not scale well. However, it may be satisfactory for very low-frequency and low-transaction environments.

Proficy Application Server
Proficy Plant Applications Server (Proficy Server)
Plant Applications Report (Web) Server
Proficy Vision Web Server with Web Client Displays
Unified Manufacturing Database (UMDB)
Plant Applications Administrator and Client

Windows Server
Microsoft IIS
SQL Server

Test Environment Checklist

Your environment should include the following installed or upgraded software:

- Supported version of Microsoft Windows Server
- Latest service pack update (Windows update)
- Microsoft .NET Framework 4.7 for Workflow 2.6 SP1
- Microsoft .NET Framework 3.5 for Plant Applications Client
- Microsoft .NET Framework 4.7.2 for Plant Applications Server
- SQL Server 2012 Native Client 11.4.7001.0
- IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. If necessary, uninstall WebDAV Publishing.
- Supported browser. Plant Applications legacy reports and web parts are not supported in Chrome.
- Microsoft Office with Excel for SQL Server and Web Engines
- SQL Server and latest service pack
- Hardware key and software licenses
- Proficy Application Server and Web Server, which installs Workflow
- Plant Applications Server software
- Plant Applications Report (Web) Server software for Web Server reports
- SSL Security Certificates
- Plant Applications client applications
- Historian or another historian, and all service packs.

📝 **Note:**

- Plant Applications can use the Remote Data Service (RDS) SQL instance hosted in AWS.
- For information on SQL Server User Access, refer to

Standard Production Environment

A standard production environment representing the most common architecture for production sites to deliver performance is shown in the image below.

Install the following servers and components on separate computers: Plant Applications Server, Plant Applications Report Server (Web Server) reports, historian, and clients. Although the Plant Applications Server and a Web Server can be installed on the same machine, performance may be affected.
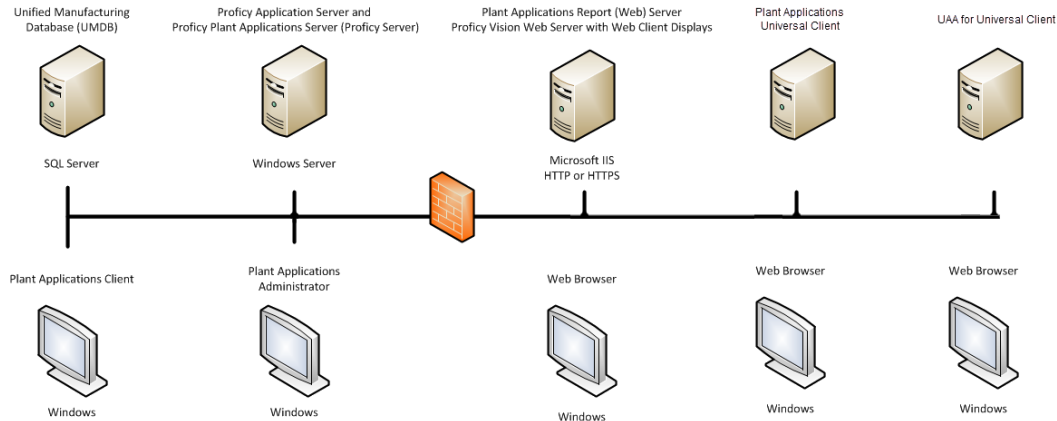
Unified Manufacturing Database (UMDB)

- Supported version of Microsoft Windows Server
- SQL Server
- Microsoft .NET Framework 3.5

Proficy Plant Applications Server Computer

Your environment should include the following installed or upgraded software.

- Supported version of Microsoft Windows Server
- Latest service pack update (Windows update)
- Microsoft .NET Framework 4.7 for Workflow 2.6 SP1
- Microsoft .NET Framework 3.5 for Plant Applications Client
- Microsoft .NET Framework 4.7.2 for Plant Applications Server
- SQL Server 2012 Native Client 11.4.7001.0
- IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. Ensure WebDAV Publishing is uninstalled.
- Microsoft Office with Excel for SQL Server and Web Engines
- Hardware key and software licenses
- Proficy Application Server which installs Workflow components
- Plant Applications Server software

Plant Applications Report (Web) Server

- Supported version of Microsoft Windows Server
- Latest service pack update (Windows update)
- Microsoft Office with Excel for Web Engines
- Microsoft .NET Framework 4.7 for Workflow 2.6 SP1
- Microsoft .NET Framework 3.5 for Plant Applications Client
- Microsoft .NET Framework 4.7.2 for Plant Applications Server

- SQL Server 2012 Native Client 11.4.7001.0
- IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. Ensure WebDAV Publishing is uninstalled.
- Plant Applications Report (Web) Server software for Web Server reports
- SSL Security Certificates
- Supported browser. Plant Applications legacy reports and web parts are not supported in Chrome.
- Install additional components:

Once software is installed, you need to create Services user accounts to start with their own Windows user account and apply the Login As Service policy.

Historian Server

- Windows Server (refer to Historian documentation for version requirements).
- Refer to Historian documentation for system requirements and software configuration.
- Historian or another historian, and all service packs.

Plant Applications Administrator Computer

These requirements typically apply to the client computer as well.

- Supported version of Microsoft Windows Server.
- Latest service pack update (Windows update).
- Microsoft Office with Excel.
- SQL Server and latest service pack.
- Plant Applications Administrator.
- Supported browser. Plant Applications legacy reports and web parts are not supported in Chrome.
- Plant Applications UI support in Workflow Client:
  - Microsoft .NET Framework 4.7 for Workflow 2.6 SP1
  - Microsoft .NET Framework 3.5 for Plant Applications Client
  - Microsoft .NET Framework 4.7.2 for Plant Applications Server
  - SQL Server 2012 Native Client 11.4.7001.0
  - IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. Ensure WebDAV Publishing is uninstalled.
  - Proficy Application Server, which installs Workflow.

Plant Applications Client Computers

- Supported version of Microsoft Windows Server
- Latest service pack update (Windows update)
- Plant Applications Web Client

OperationsHub UAA

• Supported version of Microsoft Windows Server or Client
• Latest service pack update (Windows update)

Plant Applications Web Client Computer

• Supported version of Microsoft Windows Server or Client

High-Volume Production Environment

In a high-volume production environment with a high number of transactions or a high reporting volume, Plant Applications web engines can be installed on separate machines to increase performance throughput.

High-production environments can also employ Plant Applications installations on multiple machines. The following image shows an example of a high-volume production environment for Plant Applications.
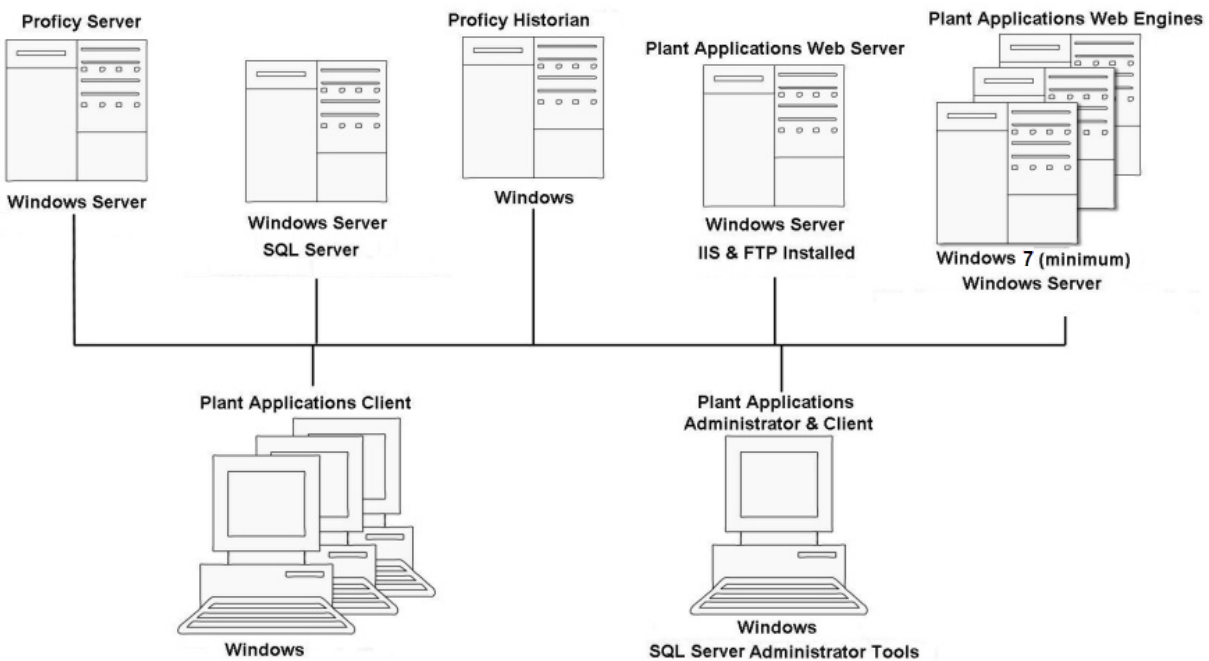
SOA services reside on the Proficy Server, which is also called the Plant Applications Server.

Chapter 9. Upgrading from Version 7.0 SP5 and Later

Upgrade Plant Applications Core in Silent Mode

Use this procedure to upgrade Plant Applications Server in silent mode. The silent mode of upgrading Plant Applications Server includes two types of methods:

- **Passive**: A loader and a progress bar appears and displays the status of the installation. To verify the successful installation of Plant Applications Server, check the log file.
- **Quiet**: The status of the installation is verified by checking the log file.

The silent mode of Plant Applications Server upgrade is applicable to only **Standard** method.

The silent mode of upgrading Plant Applications Server consists of configuring settings in a configuration file. Use the configuration file `paconfiguration.ini` to configure the same settings that you configure during interactive installation.

📝 **Note:**

To edit the configuration file `paconfiguration.ini`, copy the `.ini` file to a location on your machine. For example, `C:\New Folder.`

1. Navigate to the `paconfiguration.ini` file.

2. Right-click, and then select **Edit**.

3. In the configuration file, edit the following:
   - Workflow User Credentials
     - **AdministratorName**
     - **AdministratorPassword**
   - RabbitMQ Credentials
     - **RabbitAdmin**
     - **Rabbitpwd**
   - To install PlantApps Service Provider, update the **InstallPASP** flag to true. By default the **InstallPASP** is set to false
   - Plant Applications Administrator User Credentials

4. Select **Save**.

5. Open the command prompt in the administrator's mode, and then navigate to the location where the `PlantAppsSetup.exe` resides, then run the `PlantAppsSetup.exe`.

The command prompt window appears.

In the command prompt window, you can launch and install the `PlantAppsSetup.exe`, using any one of the following silent installation methods with `paconfiguration.ini` file location as a parameter:

- Passive
- Quiet

6. On the command line interface, type the following, and then press Enter.
    - To install Plant Applications using Passive method, type the following:
      `PlantAppsSetup.exe C:\New folder\paconfiguration.ini/passive`, where `C:\New folder` is the location of the `paconfiguration.ini` file.

      A loader and a progress bar appears indicating the progress of the installation.

    - To install Plant Applications using Quiet method, type the following:
      `PlantAppsSetup.exe C:\New folder\paconfiguration.ini/quiet`, where `C:\New folder` is the location of the `paconfiguration.ini` file.

      The system does not display any loader or progress bar to indicate the progress of the installation. To verify that installation is complete, refer to the log files.

The `paconfiguration.ini` file contains the log file path: `C:\programdata\Proficy\Logs\PlantAppsSetup.log`. You must not change the log file path in the `paconfiguration.ini` file.
When you enter invalid commands on the command line interface, a message appears to enter valid commands.

📝 **Note:** The time taken to upgrade Plant Applications Server in silent mode depends on database size. When the installation is in progress, do not close the command prompt window or click anywhere in the command prompt window.

Upgrade from Plant Applications Version 7.0 SP5 and Later

1. When upgrading the Plant Applications Server from earlier Plant Applications versions, you must have SQL Server 2016 (64-bit) and later, and the existing Plant Applications Database compatibility must be greater than or equal to 130.
2. The Workflow database SQL account that is used by the Plant Application Server Installer requires sysadmin privileges to continue the install. If you try to install without sysadmin privileges, an Invalid SQL User Access message appears. Make sure the Workflow database SQL account has sysadmin privileges before running an upgrade.

3. Ensure that you complete the following procedure specific to the Plant Applications Message Bridge:

📋 **Note:** Perform Step 2 if you are upgrading from 7.0 SP5, 8.0, and 8.1. If you are upgrading from 8.2, then skip Step 2 (a) through Step 2 (b), and then proceed from Step 3.

    a. Stop the Message Bridge, RabbitMQ, and Erlang services.
    b. Uninstall the earlier version of the Plant Applications Message Bridge, RabbitMQ, and Erlang.

      The Proficy Server Message Bridge service is disabled.

    c. Delete following directories:
        • `C:\Program Files (x86)\Proficy\Proficy Server \RabbitMQMessageBridgeService`
        • `C:\Users\{users who installed MessageBridge}\AppData \Roaming\RabbitMQ`
    d. Delete (if any) the RabbitMQ key from the registry:
        • `HKEY_LOCAL_MACHINE\SOFTWARE\Ericsson\Erlang\ErlSrv \1.1\RabbitMQ`

4. Run the `PREPDBUpdImpliedSequence.sql` SQL script.
    • Mount the ISO file for the Plant Applications or load the DVD if you created one from the ISO file on the application server for Plant Applications.
    • Execute the `PREPDBUpdImpliedSequence.sql` file on the Plant Applications database where the Plant Applications is installed.

      This will populate implied sequence as epoch date(with respect to the forecast start date) instead of integer number (starting from 1).

5. When the SQL password is updated, then you must first configure the database credentials in the Configure Database Utility before upgrading Plant Applications from previous versions to 2022.

📋 **Note:** If upgrading from a version of Plant Applications earlier than 7.0 SP5, contact Support to uninstall Plant Applications components.

1. Go to **Server Manager > Local Server > Tasks > Add Roles and Features**.

2. Add the following roles:
    a. Go to **Web Server (IIS) > Web Server > Common HTTP Features** and select the **HTTP Redirection** check box.
    b. Go to **Web Server (IIS) > Web Server > Security** and select the **Basic Authentication**, **URL Authorization** and **Windows Authentication** check boxes.

3. Add the following feature:
    a. Go to **.NET Framework 4.7 Features > WCF Services** and select the **HTTP Activation** feature.

4. Upgrade the Proficy license keys to include:
   - Plant Applications 2022
   - Historian
   - SOA/Workflow 2.6 SP1

5. Stop **Proficy License Manager** and **Proficy Server Manager** to upgrade.

   📝 **Note:** Ensure that the Proficy Server Manager service is running.

6. In the **Install Proficy Plant Applications 2022** window, select **Proficy Application Server**. The **Proficy Application Server** (Workflow 2.6 SP1) page appears. Follow the on-screen instructions to upgrade the client and the application server.

7. In the **Install Proficy Plant Applications 2022** window, select **Plant Application Server**, and then follow the on-screen instructions to upgrade the Plant Applications server. For instructions, refer to Install the Plant Applications Server *(page 53)*.

   📝 **Note:** After you restart your machine, ensure to install valid license key.

8. In the **Install Proficy Plant Applications 2022** window, select **Plant Applications Report Server**, and then follow the on-screen instructions to upgrade the report server. For instructions, refer to Install the Plant Applications Report Server *(page 77)*.

   📝 **Note:** For binding HTTPS with the fully-qualified domain name to a certificate, refer to Binding HTTPS *(page 52)*.

9. In the **Install Proficy Plant Applications 2022** window, select **Plant Applications Client**. For instructions, refer to Install the Plant Applications Client and Administrator *(page 62)*.

10. Start the **SQL Server Agent** service manually.

11. After installing Plant Applications Web Client, run the **Message Bridge Configuration** utility on the Plant Applications Server to update the Kafka details in the Message Bridge configuration. For more information, refer to the *Run Message Bridge Configuration Utility* section in the *Web Client Installation Guide*.

Flash Upgrade from Plant Applications Version 8.1 and Later

- You must have SQL Server 2016 (64-bit) and later for upgrading Plant Applications Server from earlier Plant Applications versions and existing Plant Applications Database compatibility must be greater than or equal to 130.

The Flash Upgrade allows you to upgrade the Plant Applications Version 8.1 and later with minimum downtime. This is a 2-step upgrade process that involves upgrading the database and then upgrading the Plant Applications Server components.

1. Upgrade the Proficy license keys to include:
   - Plant Applications 2022
   - Historian
   - SOA/Workflow 2.6 SP1

2. Stop **Proficy License Manager** and **Proficy Server Manager** to upgrade.

   📝 **Note:** Ensure that the Proficy Server Manager service is running.

3. In the **Install Proficy Plant Applications 2022** window, select **Plant Applications Server**.

   📝 **Note:** If you do not have .Net Framework 4.7.2 installed, a screen appears for you to install the same. You cannot proceed with the installation without .Net Framework 4.7.2 installed in your system.

4. Accept the `End User License Agreement (EULA)`, then click **I Agree** to continue.

5. In the **Upgrade Wizard** screen, you have the following options to upgrade to the latest version of Plant Applications:
   - Upgrade Plant Applications Database and Server separately to reduce the downtime. This is a 2-step upgrade process that involves upgrading the database and then upgrading the Plant Applications Server.
     a. **Database Only**: Select to upgrade the Plant Applications database only. When upgrading the Plant Applications database, the Plant Applications services are not affected thus achieving zero downtime. You can select this option if you want to upgrade **Plant Applications Server** at the later point of time. After selecting this option, follow the on-screen instructions to upgrade the database. After the Plant Applications database, you can select the **Plant Applications Server** option from the **Install Proficy Plant Applications 2022** window.

> **Note:** Before upgrading **Plant Applications Server**, you must stop both the Message Bridge and Kafka services. Uninstall the older version of Message Bridge and then restart the system. If you have not uninstalled Message Bridge, you will be prompted to uninstall the older version of Message Bridge and restart the system. This is applicable only to 8.1.

> **Note:** Do not uninstall RabbitMQ and Erlang applications.

    b. **Plant Applications Server**: After upgrading the Plant Applications database, uninstalling Message Bridge, and restarting the system, perform from Step-1 to Step-6. Select the **Plant Applications Server** option to upgrade the Plant Applications Server. This requires minimal downtime to restart the Plant Applications services. Skip to Step-7.

    • **Plant Applications Server** + **Database**: Select this option to upgrade both Plant Applications Server and the database. This requires system downtime to restart the Plant Applications services.

6. Follow the on-screen instructions to upgrade the Plant Applications Server. For instructions, refer to Install the Plant Applications Server *(page 53)*.

> **Note:** For the upgrade process, you are required to provide the user details in the **Plant Applications User Detail** screen that appears after providing the RabbitMQ details. In the **Plant Applications User Detail** screen, enter the user name and password for an administrator account in Plant Applications, and then select **Validate Connection** to validate the credentials. If the credentials are successfully validated, the **Next** button is enabled to continue with the upgrade process.

7. In the **Install Proficy Plant Applications 2022** window, select **Plant Applications Report Server**, and then follow the on-screen instructions to upgrade the report server. For instructions, refer to Install the Plant Applications Report Server *(page 77)*.

> **Note:** For binding HTTPS with the fully-qualified domain name to a certificate, refer to Binding HTTPS *(page 52)*.

8. In the **Install Proficy Plant Applications 2022** window, select **Plant Applications Client**. For instructions, refer to Install the Plant Applications Client and Administrator *(page 62)*.

9. Start the **SQL Server Agent** service manually.

10. After installing Plant Applications Web Client, run the **Message Bridge Configuration** utility on the Plant Applications Server to update the Kafka details in the Message Bridge configuration. For more information, refer to the *Run Message Bridge Configuration Utility* section in the *Web Client Installation Guide*.

Move an existing Plant Applications Database to New Server

When you move an existing Plant Application Database to a NEW server and you do not revoke permissions for the Plant Application SQL Users, then the upgrade fails and the log files indicate below error:

```
[] - <<processFiles>> C:\Program Files (x86)\Proficy\Proficy Server\Database
\PreConfigure\0000_ADDPLANTAPPSUSERS.SQ_, LineNumber: 41: User, group, or role
'comxclient' already exists in the current database.

[] - <<processFiles>> ADO Error: #-2147217900, User, group, or role
'comxclient' already exists in the current database., Source: Microsoft SQL
Server Native Client 11.0, SQL State: 42000, NativeError: 15023
```

To continue with the upgrade, you must perform the following steps before starting the Plant Application Upgrade:

a. Log into SQL Query Analyzer under a SYSADMIN Account.

b. Set the Database to the appropriate Plant Applications Database Name.

c. Execute the following script:

```
EXEC SP_REVOKEDBACCESS 'ProficyConnect'
EXEC SP_REVOKEDBACCESS 'ProficyDBO'
EXEC SP_REVOKEDBACCESS 'ComXClient'
GO
EXEC sp_droplogin 'ProficyConnect'
EXEC sp_droplogin 'ProficyDBO'
EXEC sp_droplogin 'ComXClient'
GO
EXEC SPSUPPORT_CHANGEDBOACCOUNT
```

Once you run this script, then you can start the Plant Application Upgrade.

Chapter 10. Appendix B: Cluster Installation and Configuration

Cluster Overview

Deploying Plant Applications in a clustered environment with Microsoft server failover cluster technology ensures the highest availability of the Plant Applications Server. For example, if the primary Plant Applications node in the cluster experiences difficulties, Plant Applications automatically starts on another node to take over. SQL Server, a historian, and the Plant Applications Web (Report) Server can also run as part of a cluster. Refer to Microsoft documentation for information to implement clustering for your particular environment.

System Requirements

To deploy Plant Applications in a clustered environment, you will need at least two cluster nodes. All the cluster nodes must be assigned to the same domain name, and must contain the following components:

- Windows 2016 server with the same service pack versions installed on them.
- SQL Server 2016 on a different Server
- Feature Failover Clustering
- All cluster nodes must be assigned to a domain
- An active Proficy license
- Proficy Workflow
- Plant Applications
- iSCSI Target Server, serving as a remote drive for Plant Applications Buffer Files and Log Files
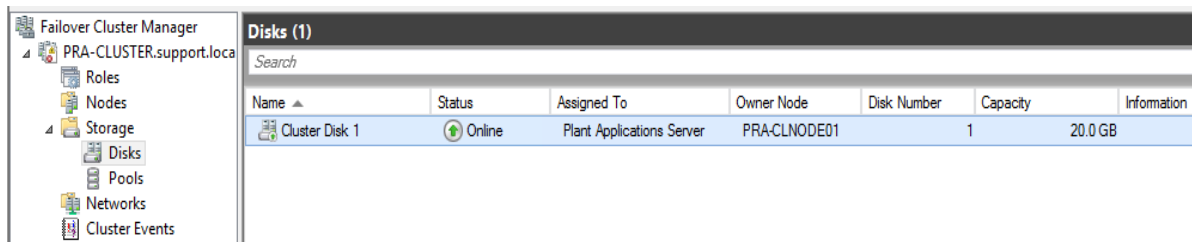- Configured Workflow Cluster

Configure iSCSI Initiator

On each cluster node, run iSCSI Initiator, and provide the address of an existing iSCSI target.
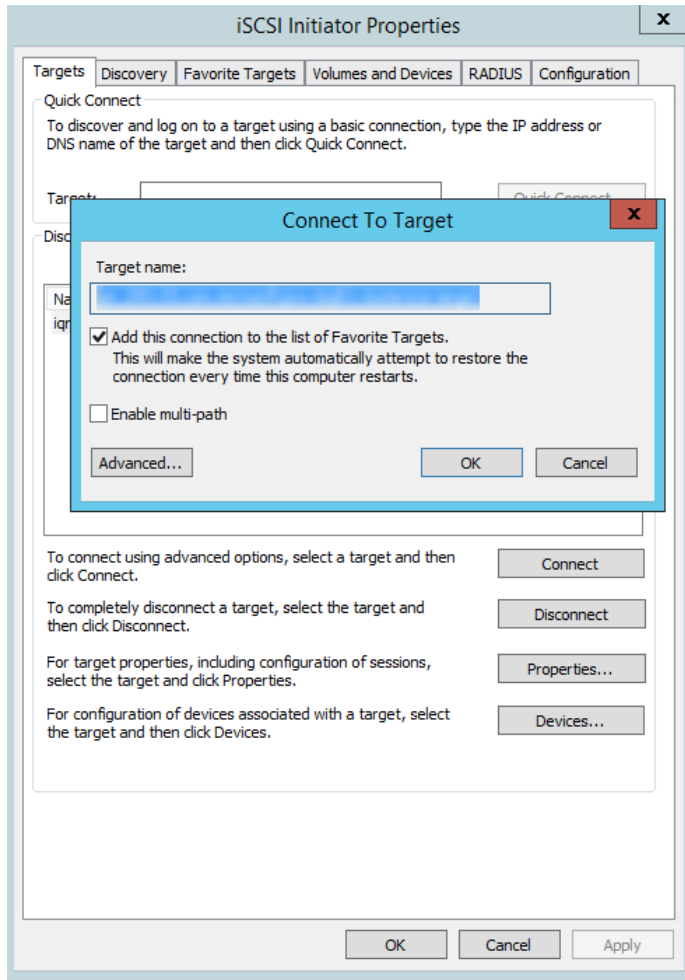
Create a New Storage Under Cluster

1. Under **Cluster > Storage Disks > Add Disk**

2. Select **iSCSI**.
   This will add the disk to the cluster configuration.

# Create a Plant Applications Role

1. Select **Roles node > Create Role > Other Server**.

2. Set the NetBios name of the Plant Applications server.

3. Right-click the shared drive, select **Assign to Role**, and then pick the Plant Applications Cluster role.
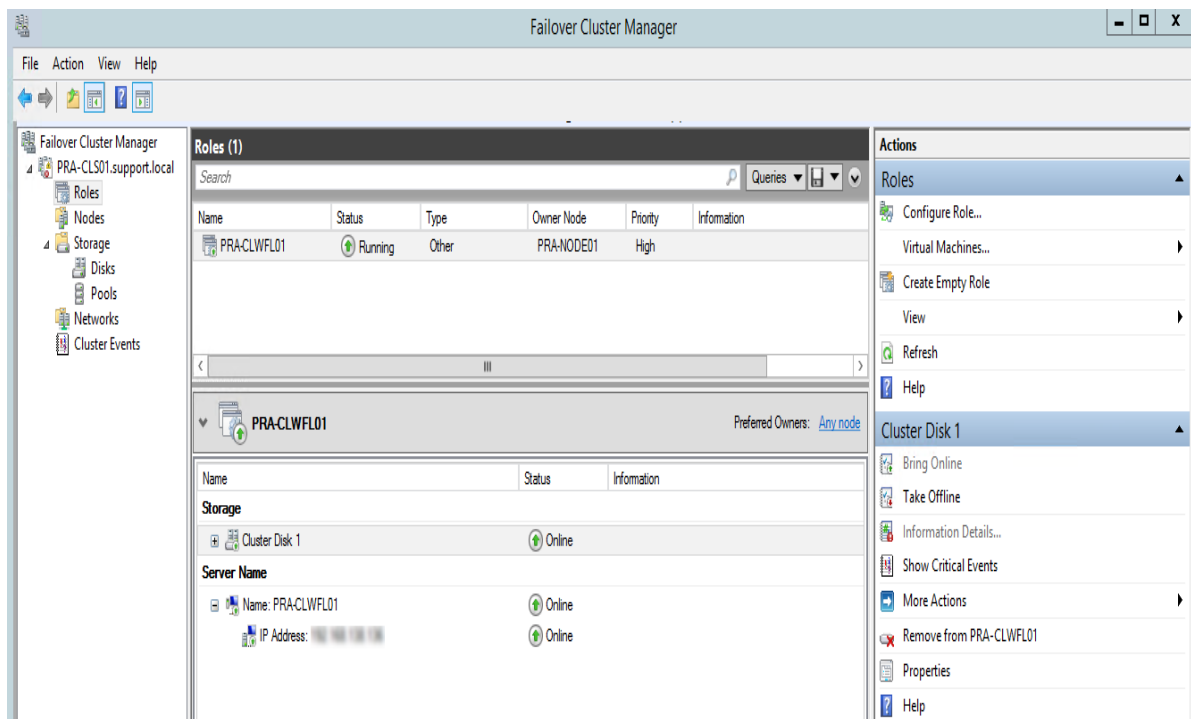

Configure Workflow Cluster

Perform the steps in the following KB article: KB15908

📄 **Note:** Add the Workflow 2.5 or later Added Proficy Certificate service to the configuration: Add Generic Service > Pick Proficy Certificate from Existing List of Services.
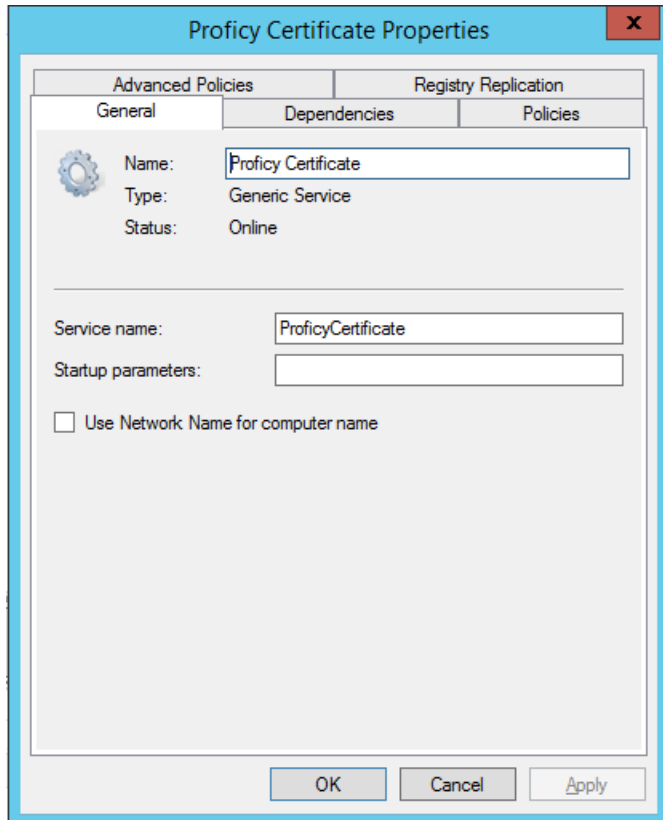
Configure Plant Applications Server Cluster

1. If you are using Windows Server 2016, install the Failover Cluster Automation Server and
   Failover Cluster Command Interface as features for the Local Server in the Server Manager.
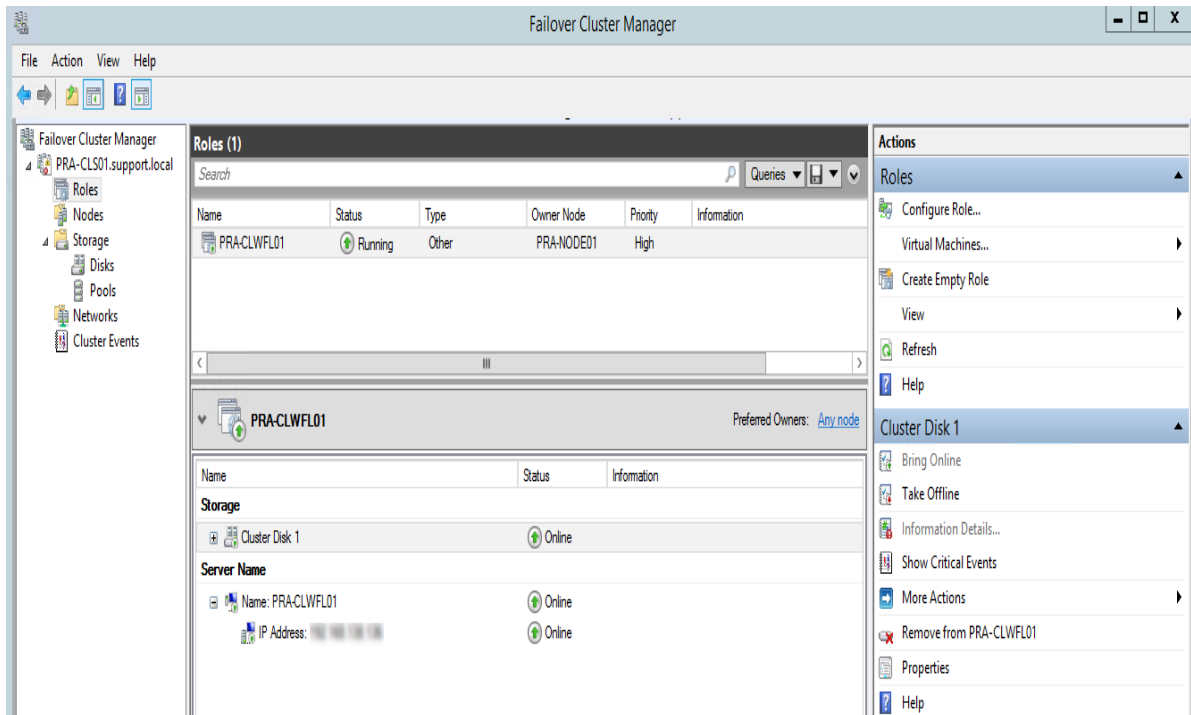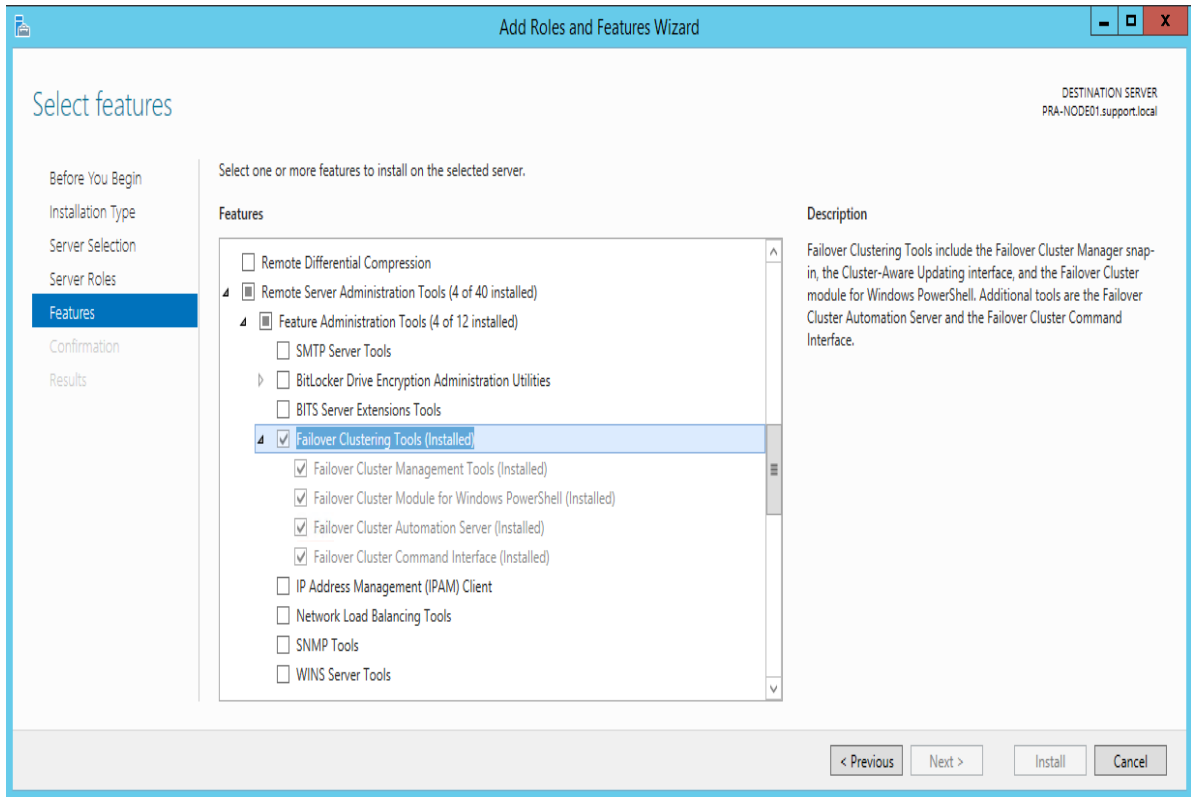
2. Manually add PlantAppsRes type on all Plant Applications nodes using Command Prompt. You can perform this step using PowerShell as well.

a. Register the `PlantAppsResEx.dll` file: `Regsvr32 "C:\Program Files (x86)\Proficy\Proficy Server\Server\PlantAppsResEx.dll" /s`

b. Create the PlantAppsRes Resource Type. You can perform this step using PowerShell as well.

3. **Optional:** Manually remove PlantAppsResType. This step is not required when installing only for clean up of the server. You can perform this step using PowerShell as well.

a. Delete the PlantAppsRes Resource type: `Cluster restype PlantAppsRes /delete / type`

b. Unregister PlantAppsRes type: `Regsvr32 "C:\Program Files (x86)\Proficy \Proficy Server\Server\PlantAppsResEx.dll" /u /s`

> 📑 **Note:** Steps 2 and 3 can be performed from PowerShell as well.

```
# Unregister Extension Dll
#Regsvr32 "C:\Program Files (x86)\Proficy\Proficy Server\Server
\PlantAppsResEx.dll" /u /s

# Delete Cluster Resource Type
#remove-clusterresourcetype `
# -cluster PRA-CLS01 `
# -name PlantAppsRes

# Register Extension Dll
Regsvr32 "C:\Program Files (x86)\Proficy\Proficy Server\Server
\PlantAppsResEx.dll" /s

# Configure Resource Type
add-clusterresourcetype -cluster myCluster -name PlantAppsRes
 -Dll "C:\Program Files (x86)\Proficy\Proficy Server\Server
\PlantAppsRes.dll"

#Confirm that PlantAppsRes type exists
get-clusterresourcetype
```
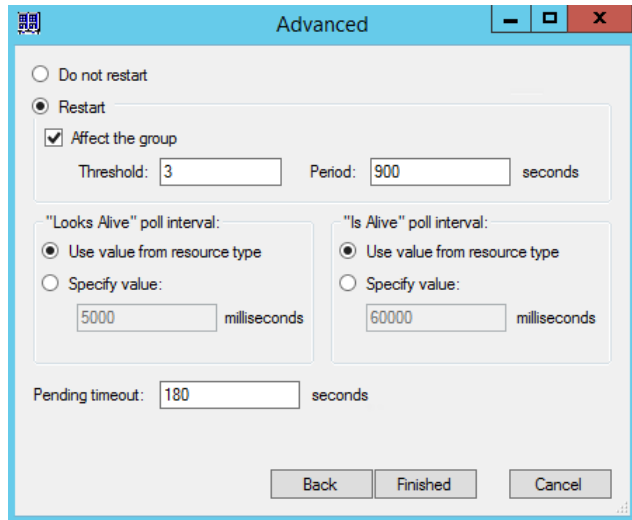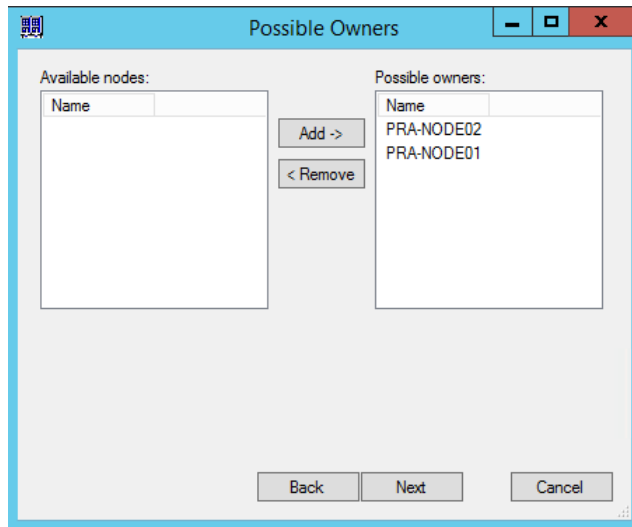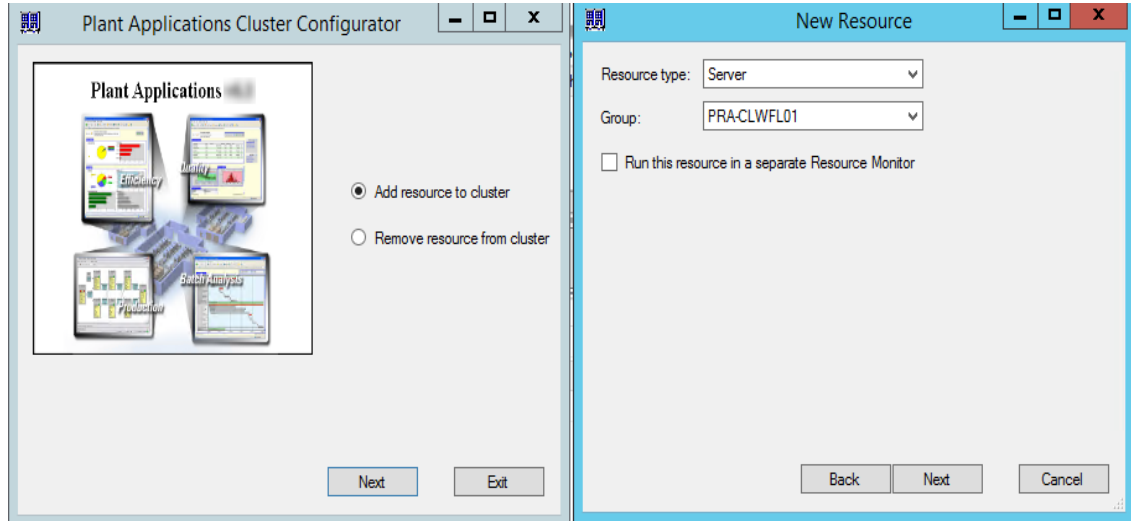
c. Run the Plant Applications Cluster Configurator (`C:\ProgramFiles (x86)\Proficy\Proficy Server\Server\ClusterConfigurator.exe`)

Change Registry to Reference Cluster Name

Registry changes required to reference cluster name when connecting to Plant Applications License Manager. This topic describes how to verify that the registry settings are correct. This procedure is optional.

On each Plant Applications node, the following registry key must be set to Plant Applications cluster name: `Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Proficy\Plant Applications\Proficy Server\LicenseMgrNode` must contain PA Cluster NetBios Name.
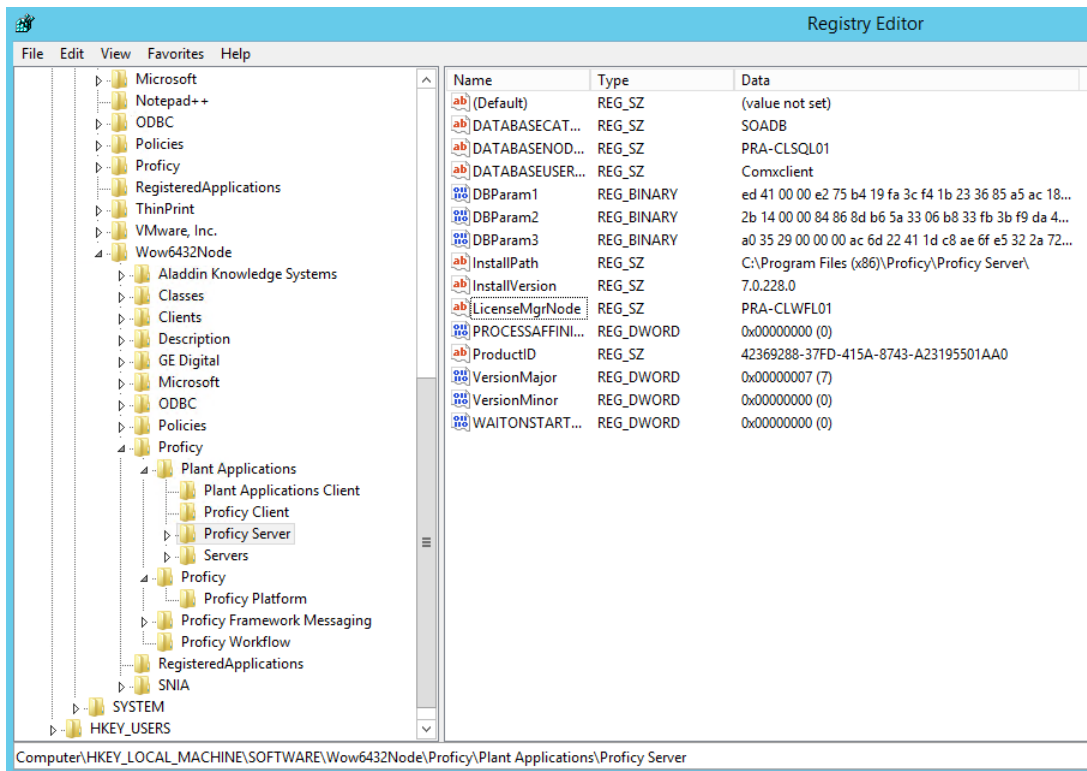
Change the Plant Applications Server Name to Cluster Name

Change the Plant Applications Server Name to Cluster Name. Perform this step on both node names and old Plant Applications server name (in case the database was moved). Use an existing spSupport store procedure to set Plant Applications Cluster name:

```
spSupport_UpdatePAServerReferences_Split '<old server name>', '<Cluster
 NetBios Name>'
```

Change the Path of the Log Files and Buffer Files

This topic describes how to change the path of the log files and buffer files to the cluster shared drive. This procedure is optional.

1. Check the current path value for site parameters and user parameters.

```
Select * from dbo.Site_Parameters where parm_id in (101, 102)
Select * from dbo.User_Parameters where parm_id in (101, 102)
```

2. Change the path to an existing folder on a shared Cluster drive:

```
Select * from dbo.Site_Parameters where parm_id in (101, 102)
Select * from dbo.User_Parameters where parm_id in (101, 102)
```

Note: The value must be set to an existing path.

```
UPDATE Site_Parameters
SET Value = '<Cluster Shared Drive Path to Log files>'
WHERE parm_id = 101

UPDATE Site_Parameters
SET Value = '<Cluster Shared Drive Path to Buffer files>'
WHERE parm_id = 102

UPDATE User_Parameters
SET Value = '<Cluster Shared Drive Path to Log files>'
WHERE parm_id = 101

UPDATE User_Parameters
SET Value = '<Cluster Shared Drive Path to Buffer files>'
WHERE parm_id = 102
```

Change the CXS Services Records

This topic describes how to change the CXS services records for all Plant Applications services. This procedure is optional.

Change the CXS services records. Plant Applications Manager must not start or stop Plant Applications services. To do so, run the following command:

```
Update dbo.CXS_Service
Set Auto_Start = 0, Auto_Stop = 0, Restart_Non_Responding = 0
```

```
where Service_Id between 2 and 25
```

Change All the .INI Files on All Nodes

1. Adjust router group and domain name to cluster name.

2. adjust LogFiles and BufferFiles path to shared drive.
    • cmRtr.ini
    • PlantAppsMessaging.ini
    • cmConfigMgr.ini
    • Message.ini

Set the ClusteredSystem Parameter to True

Run the following command to set the ClusteredSystem site parameter to true:

```
Select * from dbo.Parameters where Parm_Name like '%Cluster%'
Select * from Site_Parameters where Parm_Id = 131

Update Site_Parameters
Set Value = 1
Where Parm_Id = 131
```

Verification

Verify the following things to confirm that Plant Applications has been set up on a clustered environment:

- Log files and buffer files are stored on a shared drive.
- All services are creating log files with the cluster node as follows: <CLUSTER NODE NAME>_EventMgr-XX.log
- Plant Application Manager must not control Plant Applications Services. In Plant Applications log (high debug), the following records must exist:

```
Adding Service to monitor. [Name=PREventMgr] [ServiceId=4]
 [AllowRestarting=0] [AutoStart=0] [AutoStop=0] [StartCheck=15]
 [StopCheck=15] [RestartWaitTime=5] [ServiceName=EventMgr]
 [RestartNonResponding=0] [IsClustered=-1]
```

📝 **Note:** AllowRestarting and IsClustered is automatically set when services run as PlantAppsRes type.

• The defined failover rules work.

Chapter 11. Getting Assistance

General Contact Information

If you purchased this product through an Authorized Channel Partner, contact the seller directly.

GE Digital Support and Knowledge Base:

https://digitalsupport.ge.com

- GE Digital product offering: https://www.ge.com/digital/products

Technical Support

If you have technical problems that cannot be resolved using this guide, contact us by telephone, email, or on the web at https://digitalsupport.ge.com/.

Table 2. Americas

Online Technical Support	https://digitalsupport.ge.com/CC_Contact
Telephone	*1-800-433-2682*
International Americas Direct Dial	*1-780-420-2010* if the 800 option is not available
Technical Support email	digitalsupport@ge.com
Inside Sales email	GEDigitalSalesSupport@ge.com
Primary language of support	English

Table 3. Europe, the Middle East, and Africa (EMEA)

Online Technical Support	https://digitalsupport.ge.com/CC_Contact
Telephone	• *00800-1-433-2682* • *+420 239015850* (use if the 800 option is not available in your country or if dialing from a mobile telephone)
Technical Support email	digitalsupport.emea@ge.com
Primary language of support	English, French, German, Italian, Czech, Spanish

Table 4. Asia Pacific

Online Technical Support	https://digitalsupport.ge.com/CC_Contact

Telephone	• *+86-400-820-8208* • *+86-21-3877-7006* (India, Indonesia, and Pakistan)
Technical Support email	digitalsupport.apac@ge.com
Primary language of support	Chinese, Japanese, English

Required Support Information

Our first-level support representatives can answer questions dealing with setup or normal operations immediately.

When you call, have the following information ready at your workstation:

- Contract number – Your contract number is an eight-digit number that combines your company's six-digit identification number and a two-digit extension that identifies your product. It can be found on your invoice and in the body of your original packing from GE.
- Product documentation.
- Operating system and the version number of your software.
- Nature of the problem. Be as specific as possible.
    ◦ Can you reproduce the problem easily? List the steps.
    ◦ Can you still reproduce the problem after disabling all unnecessary third-party software?
    ◦ Do you encounter any error messages? What are they?
    ◦ What types of hardware are you using? List model numbers.