

Installing FuelsManager v12.x at a Base Site

Use the following procedure to install FuelsManager v12.x at a base Site.

If you are installing FuelsManager at the Enterprise, refer to the *Installing FuelsManager v12.x at the Enterprise*.

Prerequisites: If you are installing Inventory Management (IM)/SCADA, you must set up Cassandra, Java, and SQL, which are used for database management.

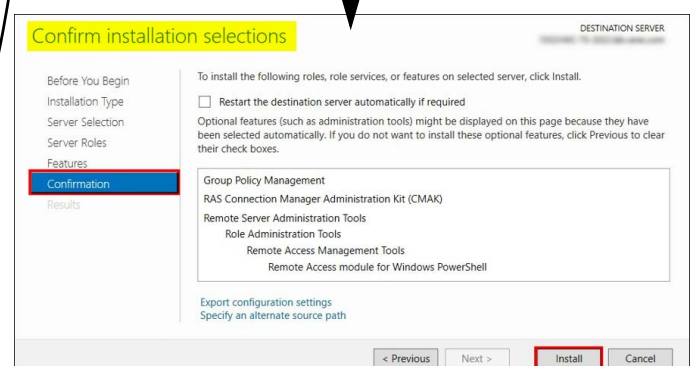
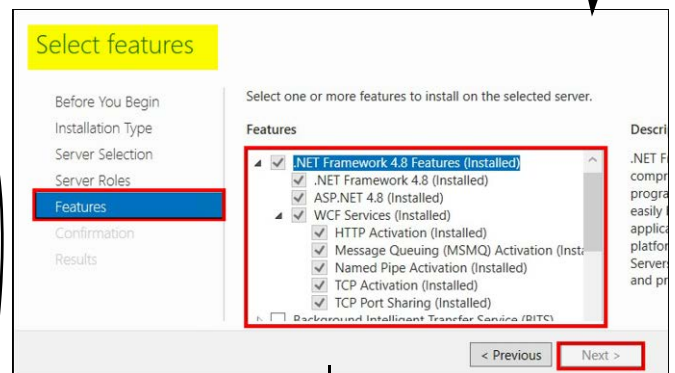
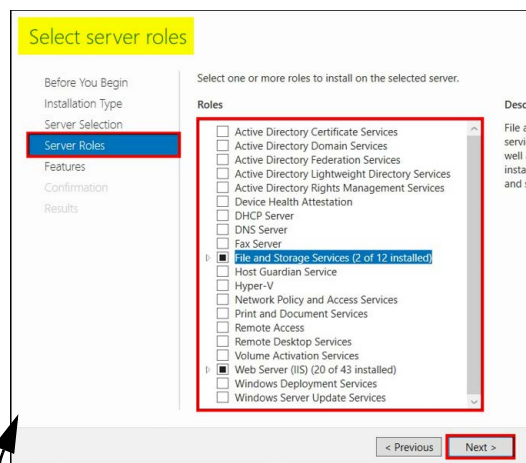
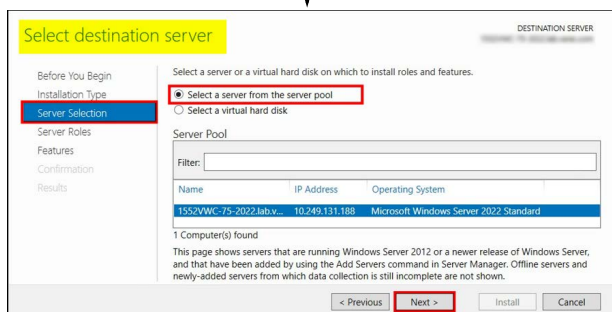
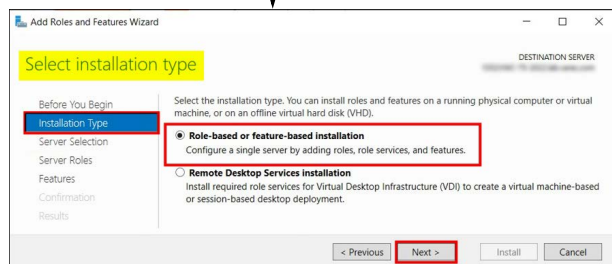
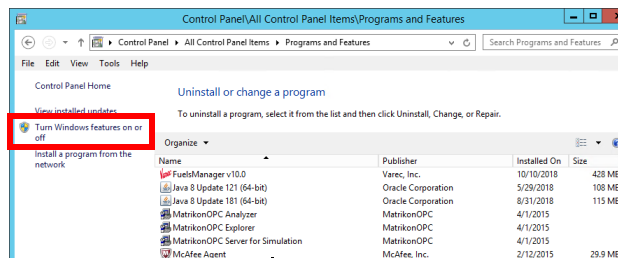


1 Enable Roles and Features

Roles and Features should be enabled according to the operating system. Refer to the [Standard Configurations](#) spreadsheet. To reach the Roles and Features configuration, follow these steps:

- 1) Open **Control Panel > Programs > Programs and Features**.
- 2) Select **Turn Windows features on or off**. This launches the Server Manager.
- 3) In the *Before you begin* window, click **Next**.
- 4) When prompted to *Select installation type*, ensure that **Role-based or feature-based installation** is selected.
- 5) Click **Next**. This highlights *Server Selection*. Ensure that **Select a server from the server pool** is selected.

- 6) Click **Next**. This highlights *Server Roles*. Select the required roles.
See [Appendix A: Prerequisite Roles and Features](#) for more information.
- 7) Click **Next**. This highlights *Features*. Select the required features.
See [Appendix A: Prerequisite Roles and Features](#) for more information.
- 8) Click **Next**. This highlights *Confirmation* and prompts you to confirm your selections.
- 9) Click **Install**.



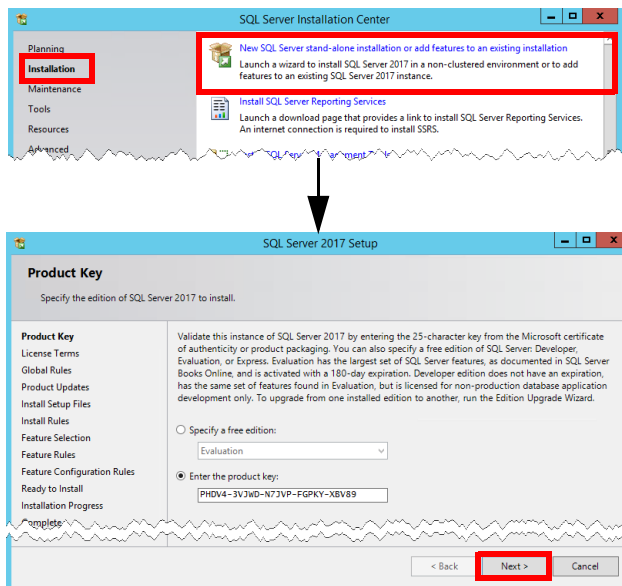
2 Install and Configure Java and Cassandra

See the *Cassandra Quick Reference Guide* for more information.

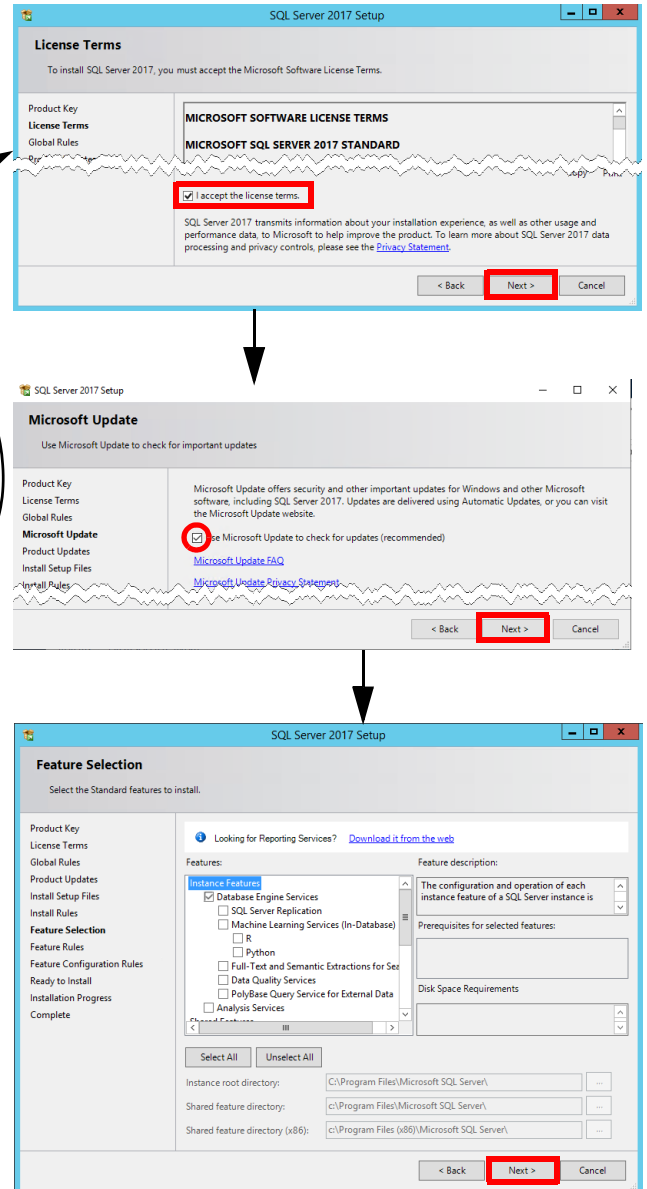
3 Set Up SQL

SQL Server 2017 is used for this example. For more information on setting up SQL, refer to Microsoft's [website](#).

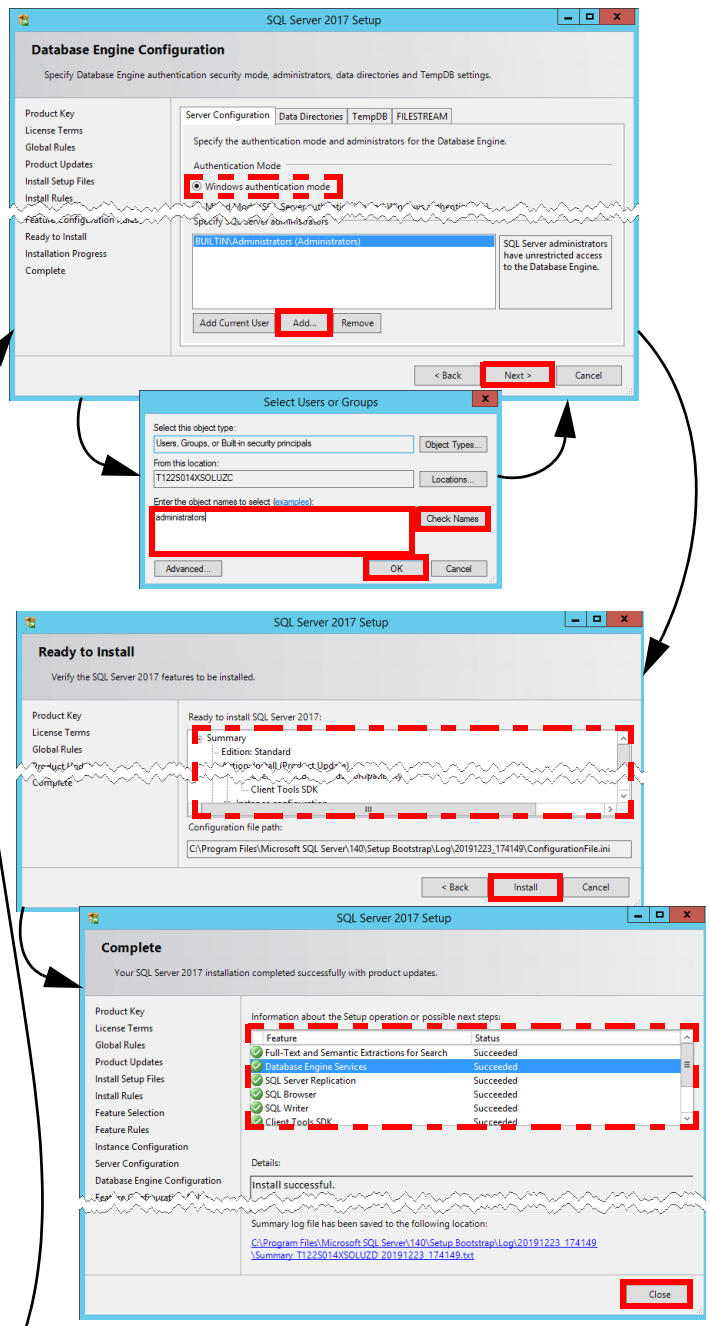
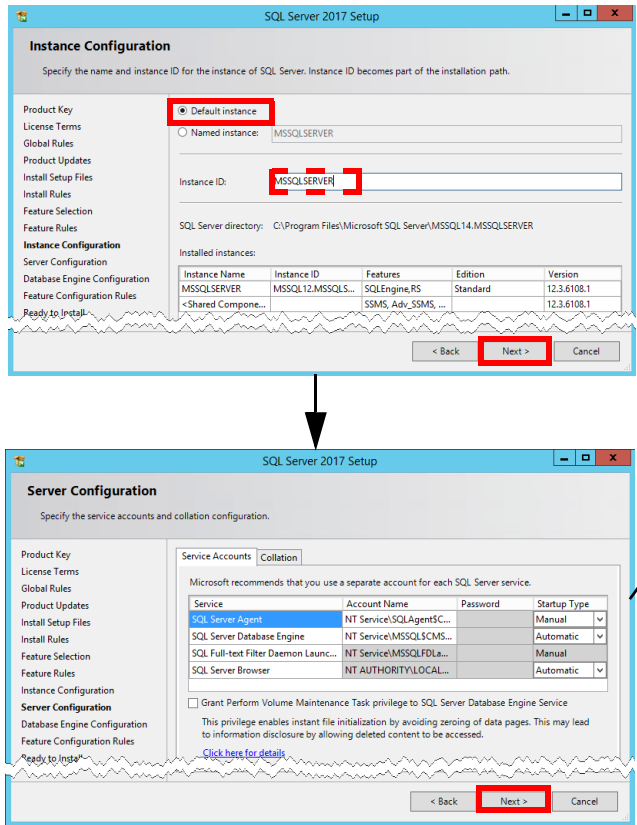
- 1) Locate the folder where the SQL Server Installation files are stored, right-click **SETUP.EXE**, and select **Run as Administrator** to set up SQL. The SQL Server Installation Center window displays. The location varies depending on where SQL is stored. The SQL version may also vary.
- 2) In the left panel, select **Installation**.
- 3) In the right panel, select the **New SQL Server stand-alone installation or add features to an existing installation** link.
- 4) When prompted for the Product Key, update the key as needed or accept the default and click **Next**.



- 5) On the License Terms screen, check the box next to **I accept the license terms**, and then click **Next**. The Install Setup Files window shows the progress bar of the install setup, which will take a few minutes.
- 6) On the Microsoft Update screen, check the **Use Microsoft Update to check for updates (recommended)** box, and then click **Next**.
- 7) On the Feature Selection screen, select the features to install, and then click **Next**.



- 8) On the Instance Configuration screen, select **Default Instance** or update as needed. This should auto-populate the Instance ID. Click **Next** to continue.
- 9) On the Server Configuration screen, accept the defaults and click **Next**.
- 10) On the Database Engine Configuration screen, accept the default: **Windows authentication mode**, and then click **Add** to add an administrator. The Select Users or Groups dialog displays.
- 11) Enter **administrators** in the text box, and click **Check Names**. This shows the group path in the text box. Click **OK** to confirm and close the dialog box. The administrator should now be listed in the Database Engine Configuration screen. Click **Next**.
- 12) On the Ready to Install window, click **Install**.
- 13) The Installation Progress screen shows the progress bar of the install process, which will take a few minutes.
- 14) The Complete screen displays the Status of the installation, which should show *Succeeded* for each feature. Click **Close**.

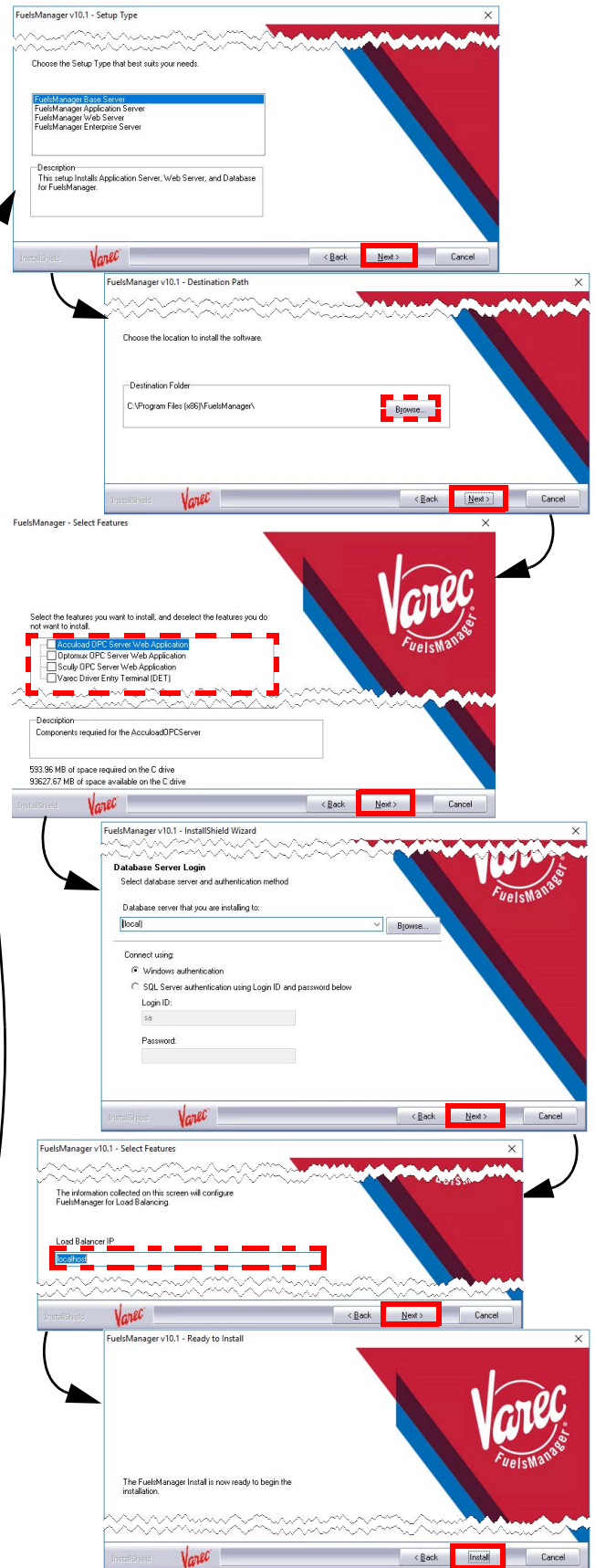
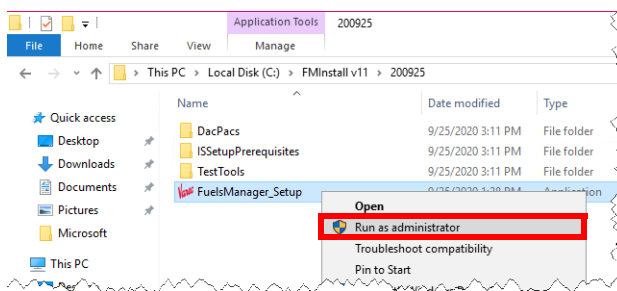


4 Install FuelsManager

Users running the FuelsManager installer must have permissions on the SQL database in order to configure the system as *Windows Authentication*. If FuelsManager is installed with *SQL Authentication*, the SQL User and password will be included in the web.config file in plain text.

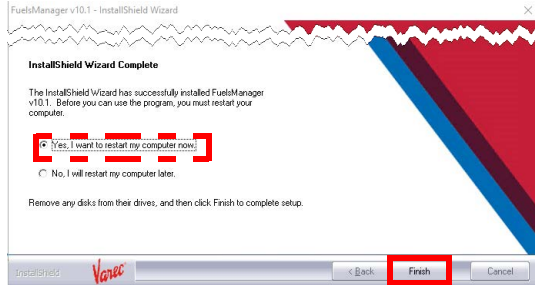
- 1) Open the folder where the FuelsManager installer is located, right-click **FuelsManager_Setup.exe**, and select **Run as Administrator** to start the install.
If any prerequisite files are found missing, the installer will prompt you to install them. Click **Install**.
- 2) On the Setup Type window, accept the default selection: **FuelsManager Base Server** and click **Next**.
- 3) On the Destination Path window, accept the default Destination Folder or click **Browse** and select an alternate path for installation, and then click **Next**.
- 4) On the Select Features window, select the Terminal Automation Services (TAS) features you want to install and click **Next**. Otherwise, if you are not installing TAS, accept the defaults and click **Next**.
- 5) On the Database Server Login screen, accept the defaults and click **Next**.
- 6) When prompted for the Load Balancer IP, accept the default: **localhost** or if using a load balancer, enter the **IP address**, and then click **Next**.
- 7) On the Ready to Install window, click **Install**.

If the FuelsManagerDB already exists, you will be asked whether to apply the dacpac or not. In most cases, you will select **Yes** for this option.



- On the InstallShield Wizard Complete screen, accept the default: **Yes, I want to restart my computer now**, or you can choose to restart the system yourself, and then click **Finish**.

A restart is required in order to successfully complete the installation process. Your computer reboots to finalize the installation.



If needed, you can install reports using the Reports Installer. See step 5 of the *Installing FuelsManager v12.x at the Enterprise* document for more information.

If Reporting Services is configured to connect with a user other than a Built In user, the reports installer will only work properly when run by the configured user.

When running the FuelsManager or Dacpac installers using Windows Authentication, the user logged on to the server must have permissions on the SQL Databases. When creating the FuelsManagerDB for the first time, this user needs db_owner permissions on 'master'.

Currently, the installer will set the sessionState mode to **InProc**. This is appropriate for TAS installations. However, for IM/SCADA only installations, it may be appropriate to update the following statement in C:\Program Files (x86)\FuelsManager\FuelsManager\Web.config:

- Change the parameter from

```
<sessionState mode="InProc" cookieless="true" timeout="20" />
```

to

```
<sessionState mode="StateServer" cookieless="true" timeout="20" />
```

This update will prevent active FuelsManager sessions from timing out when the application pool is recycled.

5 Activate FuelsManager Software License

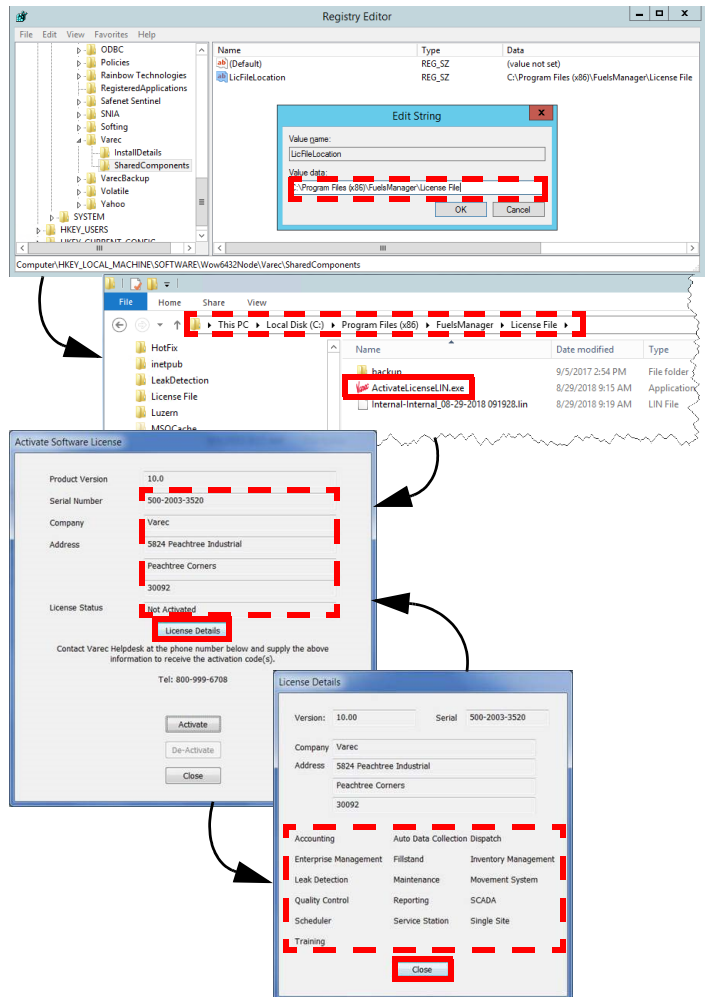
Complete a Software Request and send to Varec Help Desk so they can create the license (.lin) file.

- Copy the .lin file in the directory specified by the value in the **LicFileLocation** registry entry in **HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Varec\SharedComponents**.

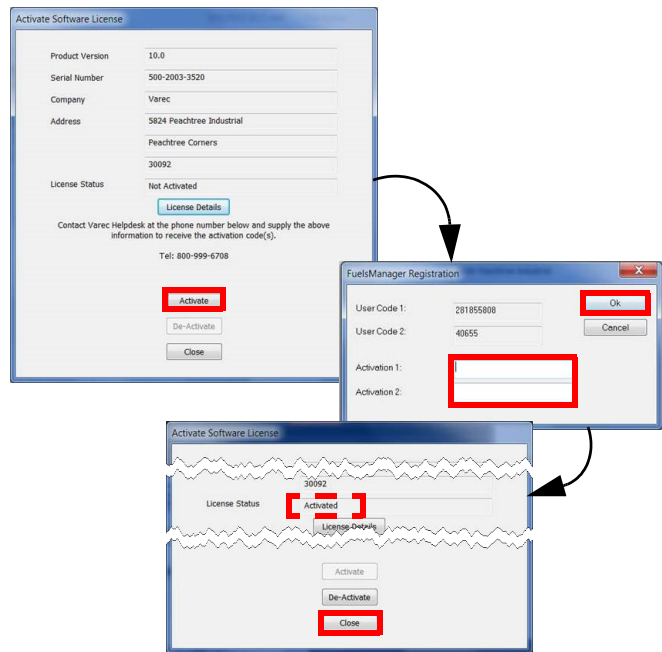
By default, the LicFileLocation is set to:
C:\Program Files (x86)\FuelsManager\License File

Make sure only one .lin file is in this directory. The system looks for and only uses the first .lin file it finds.

- Open the folder where the license activation application is located, and double-click **ActivateLicenseLIN.exe** to activate the software license.
- Verify that the **Company** and **Address** fields reflect the company name and address of the end user the license was created for.
- Verify that the License Status shows **Not Activated**.
- Skip to step 5 if the status shows **Activated**.
- Click **License Details** to verify that the license has the correct settings for the specified end user. Enabled options are shown in black font while options that are not enabled are shown in gray font (grayed out).
You may have to secure another .lin file if the license details do not show the correct settings.
- Click **Close** to close the License Details window.



- 7) On the Activate Software License window, click **Activate**. The FuelsManager Registration dialog displays.
- 8) Call the Varec Help Desk at **1-800-999-6708**. Be ready to provide the **Serial Number**, **User Code 1** and **User Code 2**. Help Desk will then provide the activation code(s).
- 9) Enter the **activation code(s)** provided by Help Desk in the appropriate fields: *Activation 1* and/or *Activation 2*.
Typically, this is just one value.
- 10) Click **OK** to activate the license and close the dialog.
The License Status should show Activated.
- 11) Click **OK** to close the Activate Software License window.



6 Update WebConfig File

- 1) Open the **web.config** file in C:\Program Files(x86)\FuelsManager\FMBusinessServices.
- 2) Update the binding name setting `<binding name="WsHttpsBindingForSync"` to:
`<transport clientCredentialType="Windows"/>`

7 Update LoadRackService.exe.Config File

- 1) Open the **LoadRackService.exe.config** file in C:\Program Files (x86)\FuelsManager\FMServices.
- 2) Locate the **appSettings** section.
- 3) Update the **LoadRackSiteID** value from Site 001 to the Site ID.
- 4) `<add key="LoadRackSiteID" value="Site 001" />`
- 5) You may also modify the **LoadRackUserName** and **LoadRackPassword** values, if necessary.
`<add key="LoadRackUserName" value="administrator" />`
`<add key="LoadRackPassword" value="*****" />`

You need to restart the FuelsManager Terminal Automation service to finalize your changes to the config file.

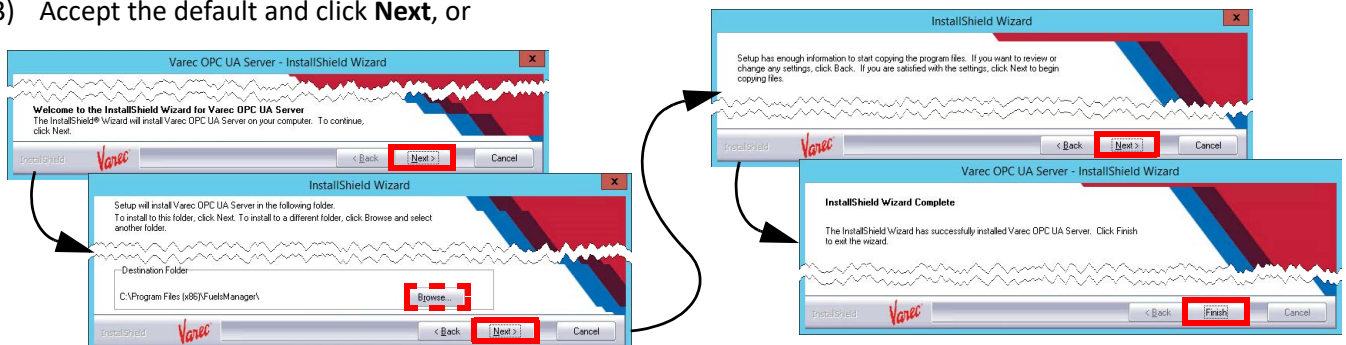
8 Install OPC UA Server

Install Varec OPC UA Server to integrate FuelsManager with the RTU.

- 1) Open the folder where the OPC UA installer is located, right-click **Varec OPC UA Server Setup.exe**, and select **Run as Administrator**.
- 2) On the *Varec OPC UA Server InstallShield Wizard*, click **Next**.
- 3) Accept the default and click **Next**, or

click **Browse** to install in a different Destination folder.

- 4) When prompted if you are satisfied with the Settings, click **Next**. The Setup Status screen displays a progress bar.
- 5) On the InstallShield Wizard Complete screen, click **Finish**.



9 Set Up the Configuration Settings

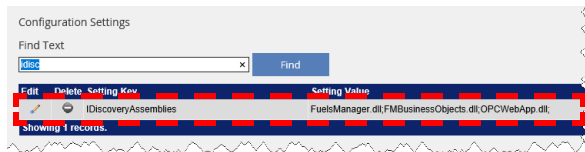
To access the Configuration Settings, follow these steps:

- 1) Open **FuelsManager**.
- 2) From the menu, select **Administration > System Settings**.
- 3) On the System Settings Configuration page, click **Configuration Settings**.

OPC Menu Configuration Settings

Verify that the iDiscoveryAssemblies setting includes OPCWebApp.dll.

The OPC menu items will not appear in the FuelsManager Configuration menu if this is missing.



Enterprise Setting and Sync Node

Verify that the following settings are set:

- IsEnterprise - set to **1** appropriately by the installer, according to the license key in place.
Enterprise Activation enabled will cause the IsEnterprise setting to be set at 1.
- InstallDetailsSynchronizationNodeName - must be configured with the **DNS name** for the URL of the Network Load Balancer.

Help File Configuration Settings

Verify that the DefaultHelpURL is set to the host name or host IP. This allows the end user to access the online help.

Example: <http://10.33.33.100/FMHelp/>

Edit	Delete	Setting Key	Setting Value
		Cassandra_Configuration	127.0.0.1
		Cassandra_ConsistencyLevel	One
		Cassandra_Password	*****
		Cassandra_ReplicationFactor	1
		Cassandra_Username	cassandra
		Common Access Card (CAC) Enable	1
		CustomClientScriptName	
		CustomTransactionFieldAssemblyPath	
		DataDictionaryAssemblies	FuelsManager.dll
		DefaultHelpURL	http://11228014XSOLU2/FMHelp/
		DISPATCH_PollTime	3

Edit	Delete	Setting Key	Setting Value
		IsEnterprise	1

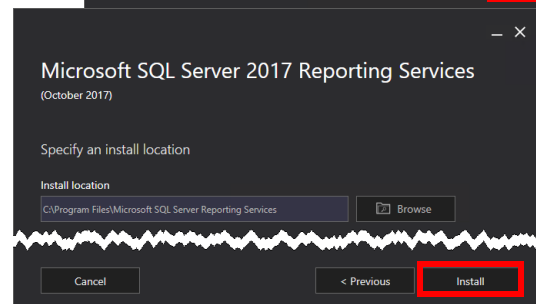
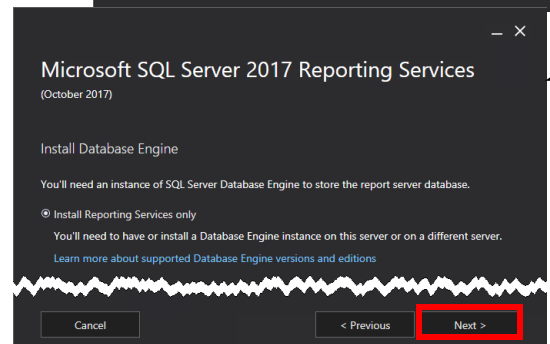
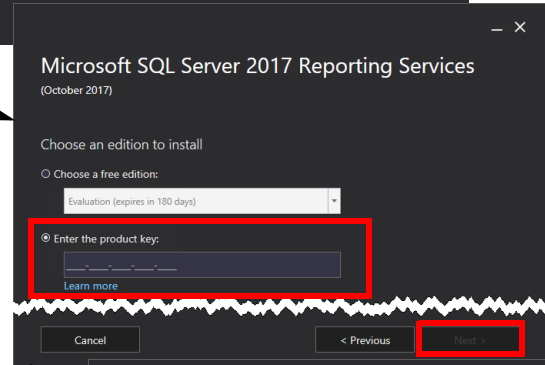
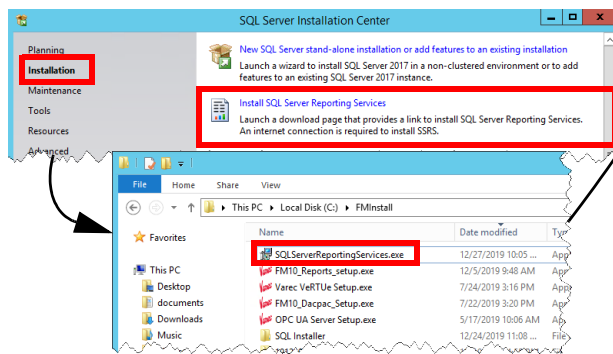
Edit	Delete	Setting Key	Setting Value
		InstallDetailsSynchronizationNodeGuid	5d90d54b-1a6c-48f-9221-645a229bc5ad
		InstallDetailsSynchronizationNodeName	QATEST-LUZ-9386
		InstallDetailsSynchronizationProfileID	

10 Install SQL Reporting Services

If you will be creating default report assignments when you configure FuelsManager, ensure that the database server selected in this procedure is the same database server hosting FuelsManager. Refer to the *Creating Default Report Assignments Quick Reference Guide (QRG)* for more information. Also, you may refer to Microsoft's [website](#) for additional information.

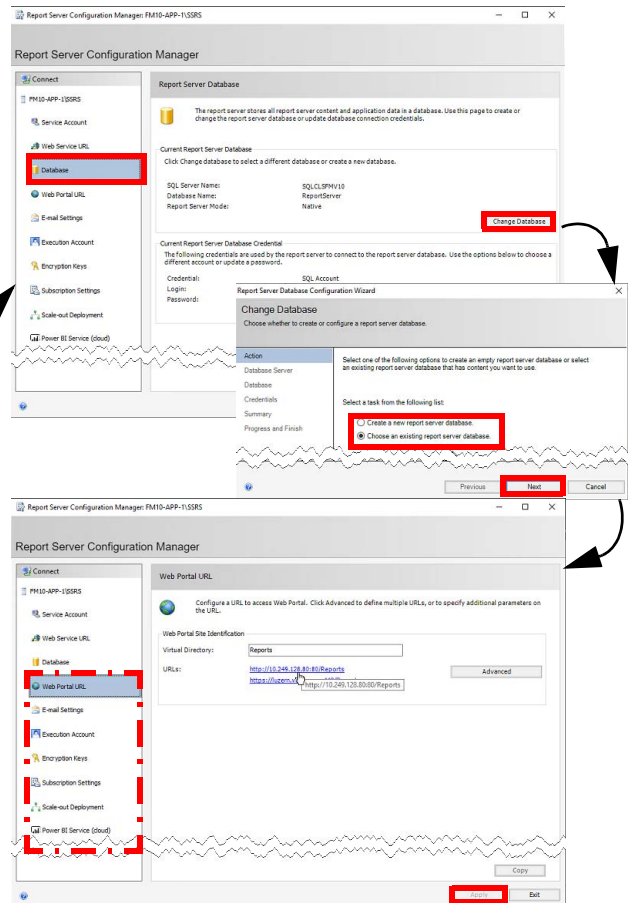
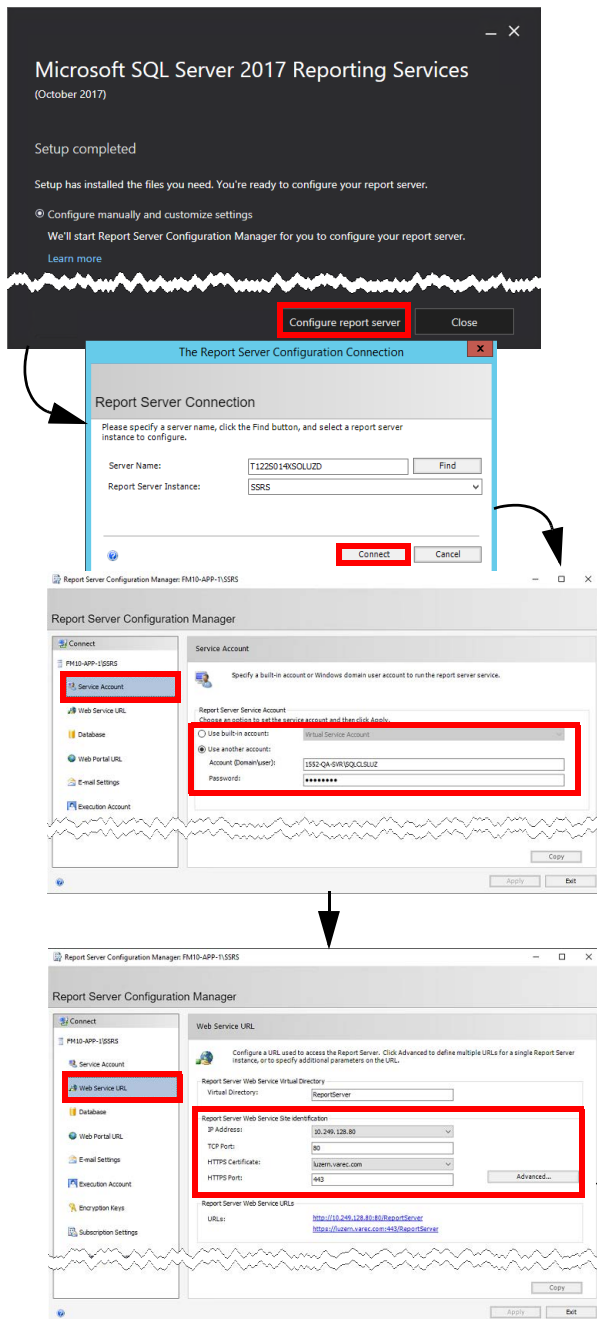
- 1) Access the **SQL Server Installation Center**.
- 2) In the left panel, select **Installation**.
- 3) In the right panel, select the **Install SQL Server Reporting Services** link. This opens a Microsoft web page to download the .exe file.
- 4) **Download** the .exe file.
- 5) Open the folder where you downloaded the file.
- 6) Right-click **SQLServerReportingServices.exe**, and select **Run as Administrator**.
- 7) On the Welcome screen, select **Install Reporting Services**.
- 8) On the *Choose an edition to install* screen, enter the **product key**, and then click **Next**.
- 9) Review the license terms and select **I accept the license terms**. Click **Next**.
- 10) Accept the defaults on the Install Database Engine screen, and then click **Next**.
- 11) Specify an install location or accept the defaults, and then click **Install**.

The installer will load the packages and show the progress bar of the install process, which will take a few minutes.



- 12) On the Setup completed screen, accept the default and select **Configure report server**.
- 13) On the Report Server Connection dialog, accept the defaults and click **Connect**. This opens the Report Server Configuration Manager window, which shows the Report Server Status.
- 14) In the left panel, select **Service Account**, and then enter the service account credentials in the right panel.
- 15) In the left panel, select Web Service URL, and then enter the IP Address, TCP Port, HTTPS Certificate, and HTTPS Port for the Report Server Web Service.

- 16) In the left panel, select **Database**, and then click **Change Database**.
- 17) On the Change Database dialog, you can choose to **Create a new report server database** or **Choose an existing report server database**. Click **Next**.
- 18) In the left panel, select **Web Portal URL** and ensure that the Reports URL is correct.
- 19) You may go through the rest of the options in the left panel and update them or accept the defaults for each one.
- 20) Click **Apply** to save your changes.

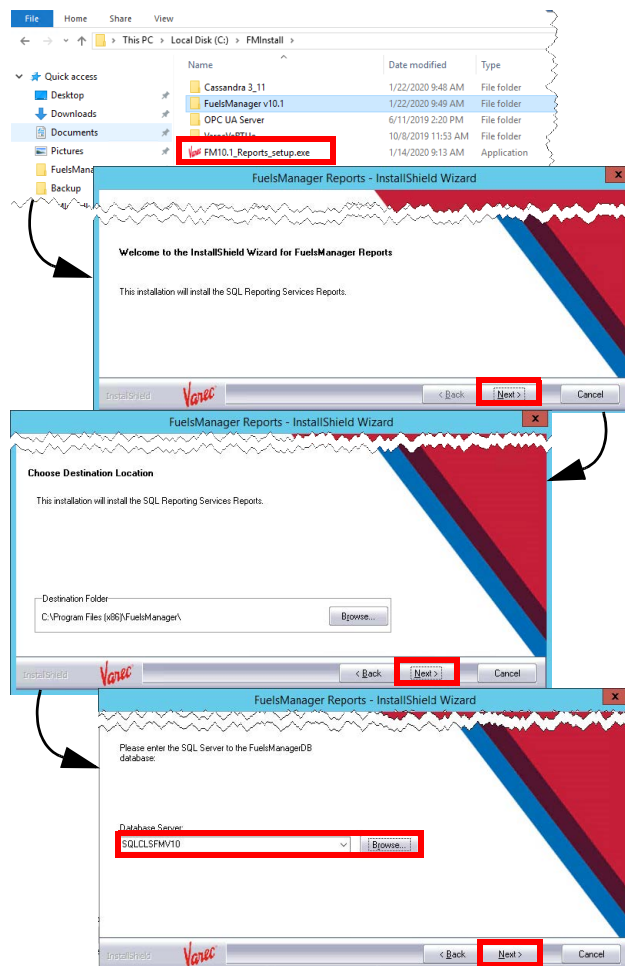


11 Install and Configure Reports

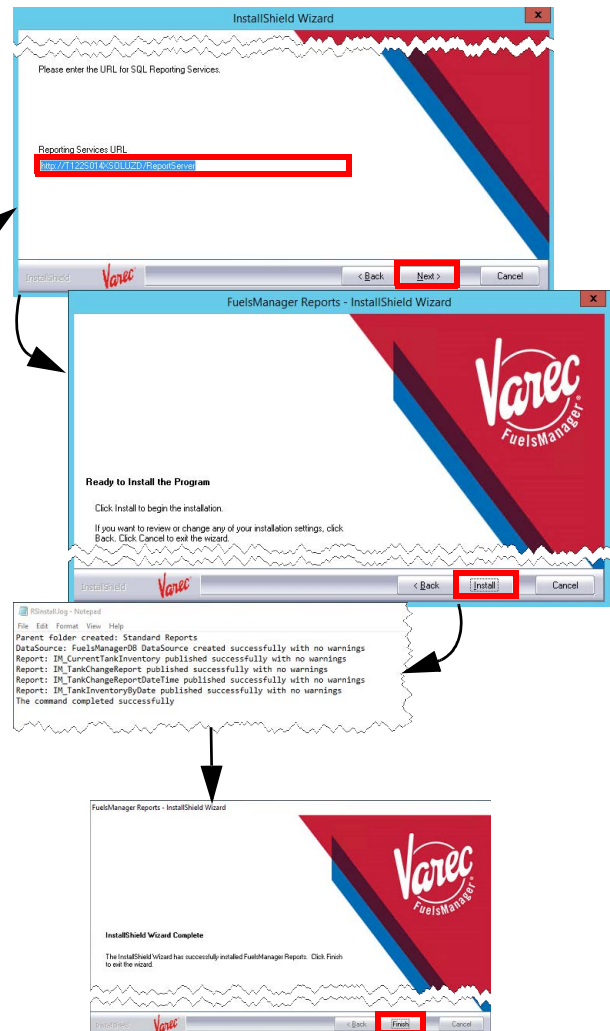
Installation of the reports cannot proceed without knowledge of the location of the RS.exe file. See the *Helpful Tips* section at the end of this document for more information.

Run the Reports Installer

- 1) Ensure that SQL Reporting Services has been installed and configured prior to performing the next steps.
If Reporting Services is configured to connect with a user other than a Built In user, the reports installer will only work properly when run by the configured user.
- 2) Open the folder where the FuelsManager Reports installer is located, right-click **FM[ver]_Reports_Setup.exe**, and select **Run as Administrator**.
- 3) On the Welcome page, click **Next**.
- 4) Browse to select a Destination Folder, or leave this as the default. Click **Next**.
- 5) Browse or enter the SQL server to the FuelsManager DB. Click **Next**.

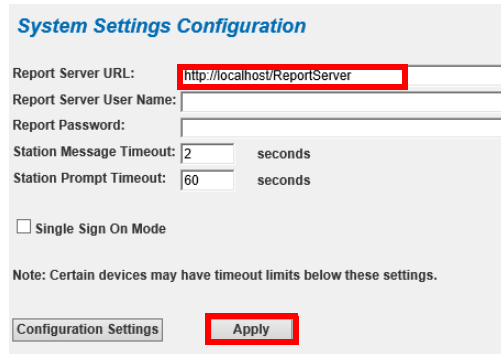


- 6) Provide the **Reporting Services URL**, and then click **Next**.
- 7) On the Ready to Install the Program window, click **Install**.
- 8) The Setup Status shows the progress bar, which will take a few minutes.
- 9) The Reporting Services install log displays. Click **X** in the upper-right corner to close the log file.
- 10) On the InstallShield Wizard Complete screen, click **Finish**.



Configure the Report Server URL

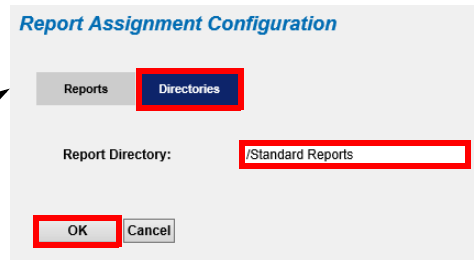
- 1) Launch **FuelsManager**.
- 2) From the menu, select **Administration > System > System Settings**.
- 3) On the System Settings Configuration page, ensure the **Report Server URL** is configured.
- 4) Click **Apply** to save changes, if any.



The screenshot shows the 'System Settings Configuration' page. The 'Report Server URL' field is highlighted with a red box and contains the text 'http://localhost/ReportServer'. Other fields include 'Report Server User Name', 'Report Password', 'Station Message Timeout' (set to 2 seconds), and 'Station Prompt Timeout' (set to 60 seconds). There is a checkbox for 'Single Sign On Mode' and a note at the bottom: 'Note: Certain devices may have timeout limits below these settings.' At the bottom right, the 'Apply' button is highlighted with a red box.

Configure the Report Directory

- 1) From the menu, select **Configuration > Reports/Queries > Report Assignment**.
- 2) Select the **Directories** tab. Ensure that the **Report Directory** is configured.
By default, the directory should be /Standard Reports.
- 3) Click **OK** to save changes.

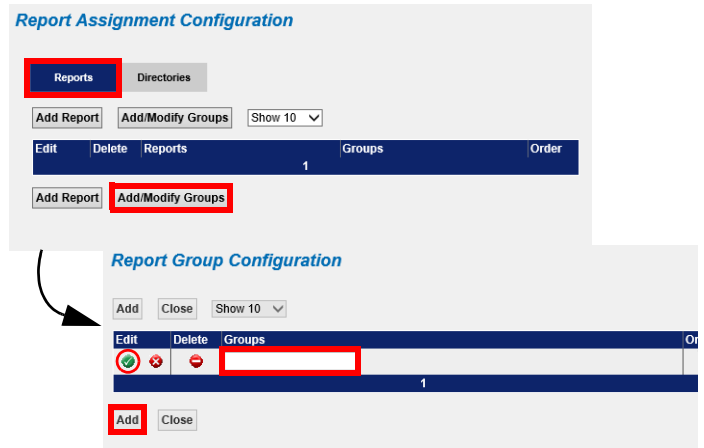


The screenshot shows the 'Report Assignment Configuration' page. The 'Directories' tab is selected and highlighted with a red box. The 'Report Directory' field is highlighted with a red box and contains the text '/Standard Reports'. At the bottom, the 'OK' button is highlighted with a red box.

Add Report Groups

Perform the **Add Report Groups and Assign Reports to Report Groups** (below) procedures within each site, once those are created.

- 1) Select the **Reports** tab to add one or more Report Groups.
- 2) Click **Add/Modify Groups**. The Report Group Configuration page displays.
- 3) Click **Add** to add a Report Group.
- 4) Enter the **name** of the Group, and then click the **green check icon** to save changes.
Repeat steps c and d to add more Report groups.
You may also click the arrow icon under the Order column to change the order of how your report groups display.
- 5) Click **Close** to close the Report Group Configuration page.



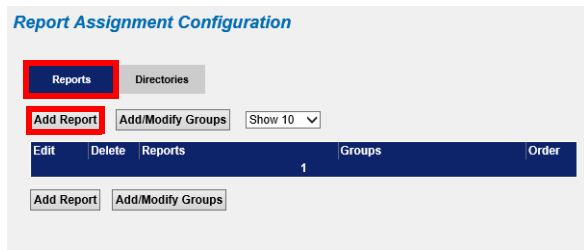
The top screenshot shows the 'Report Assignment Configuration' page with the 'Reports' tab selected and highlighted with a red box. The 'Add/Modify Groups' button is highlighted with a red box. Below it is a table with columns 'Edit', 'Delete', 'Reports', 'Groups', and 'Order'. The 'Add/Modify Groups' button is highlighted with a red box. An arrow points from this button to the bottom screenshot.

The bottom screenshot shows the 'Report Group Configuration' page. The 'Add' button is highlighted with a red box. Below it is a table with columns 'Edit', 'Delete', and 'Groups'. The 'Add' button is highlighted with a red box.

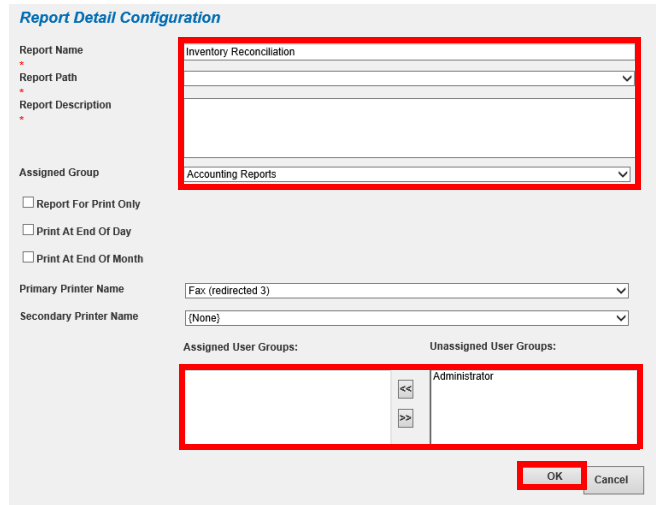
Assign Reports to Report Groups

Perform the Add Report Groups (above) and Assign Reports to Report Groups procedures within each site, once those are created.

- 1) Select the **Reports** tab.
- 2) Click **Add Report**. The Report Detail Configuration page displays.
- 3) Enter a **Report Name**.
- 4) Select the report from the **Report Path** drop down list.
- 5) Enter the **Report Description**.
- 6) Expand the **Assigned Group** drop down list, and then select the **Report Group** in which you want to assign the selected report.



- 7) Assign the User Groups that may be able to view the report.
- 8) Click **OK** to save your changes.

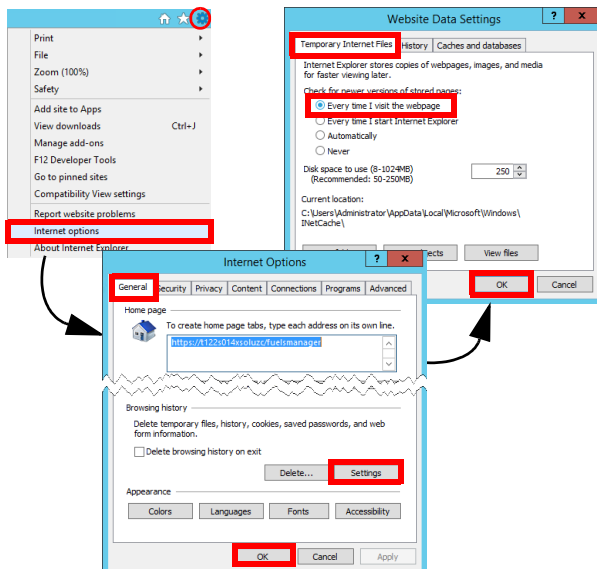


12 Set Up Internet Explorer (optional)

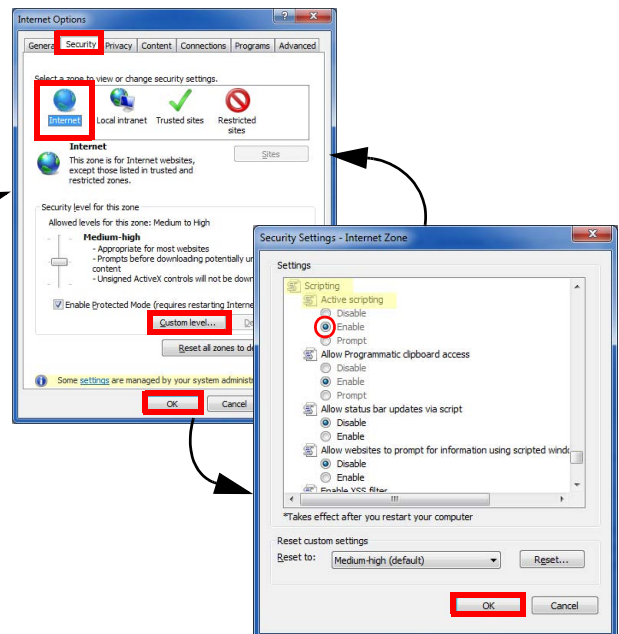
Chrome and Edge browsers are preferred.

To set IE to check for newer versions of stored pages and enable active scripting, follow these steps:

- 1) Open **Internet Explorer**.
- 2) Click the **gear** icon at the top right section of the window and select **Internet Options**.
- 3) On the Internet Options window, in the General tab, click **Settings**.
- 4) On the Website Data Settings window, in the Temporary Internet Files tab, select **Every time I visit the webpage**, and then click **OK**.



- 5) On the Internet Options window, select the **Security** tab.
- 6) In the *Select a zone to view or change security settings* area, select **Internet**.
- 7) Click **Custom Level**.
- 8) In the *Security Settings - Internet Zone* window, locate *Scripting* and set *Active Scripting* to **Enable**, and then click **OK**.
- 9) Click **OK** in the Internet Options window to finalize the Internet Explorer setup.

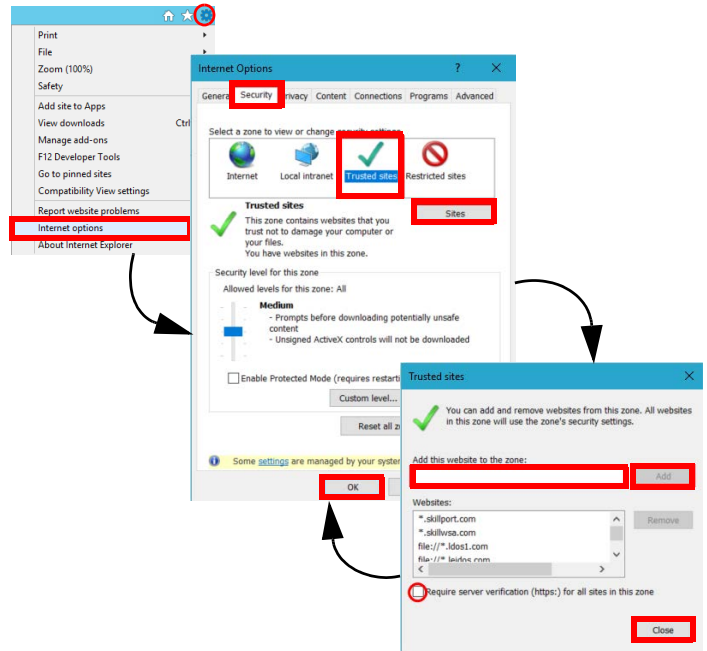


Add IE as a Trusted Site

If client machines have *Font Download* set to Disable, then FuelsManager needs to be added to the IE Trusted Sites configuration. Otherwise, skip this step.

Follow the steps below:

- 1) Click the **gear** icon at the top right section of the window and select **Internet Options**.
- 2) On the Internet Options window, select the **Security** tab.
- 3) Select the **Trusted sites** zone.
- 4) Click **Sites** to add FuelsManager as a Trusted Site.
- 5) On the Trusted sites window, add the FuelsManager url (Example: *http://10.2.2.10/fuelsmanager*) to the zone, and then click **Add**.
- 6) Uncheck **Require server verification (https:)** for all sites in this zone, if needed.
- 7) Click **Close** to confirm your changes.
- 8) In the Internet Options window, click **OK** to save changes.



Helpful Tips

- When displaying a graphic on a smaller monitor, you may need to use your browser's zoom setting, or pan the drawing (by clicking and dragging) to view the graphic properly.
- Videos embedded in the Help file require Adobe Flash Player. You must enable Flash in the browser. When using Chrome, access the browser **Settings > Site Settings**, and set **Flash** to **Ask First**. When you play the embedded video, it will prompt you to use Flash. Click **Yes**, to start the video.
- If a client cannot resolve the configured host name to an IP address, FuelsManager Help will not load. Ensure your DNS server is configured properly, or change the *DefaultHelpURL* in Configuration Settings from *localhost* to an IP address.
- If custom sound files are used, the sound files must be put on all application servers, and at the base site in this folder: *C:\Program Files (x86)\FuelsManager\FuelsManager\FMWebApp\sounds*.
- When creating transaction aliases, do not use special characters (ex: &,#, etc.). The Ledger report does not support transaction alias IDs with special characters.
- The application *RS.exe* is used by the FuelsManager report installer. When Microsoft Shared Tools are available on the C: drive, the *RS.exe* application is detected and used automatically during report installation. When SQL Server Reporting Services is installed on the C: drive, this is the typical path of *RS.exe*: "*C:\Program Files\Microsoft SQL Server Reporting Services\Shared Tools*"
- When *SQL Server Reporting Services* has been installed on another drive (such as the E: drive), the *RS.exe* file is not detected automatically by the report installer. The typical path of *RS.exe* is "*E:\Program Files\Microsoft SQL Server Reporting Services\Shared Tools*" on these systems.
- Installation cannot proceed without knowledge of the location of the *RS.exe* file. To resolve this issue an Administrator must set the **PATH** environment variable:
 - a) Select **Control Panel > System > Advanced system settings > Environment Variables**.
 - b) In *System variables*, select the **Path**.
 - c) Click **Edit > New** and add the **path** to the location of *RS.exe* (for example *E:\Program Files\Microsoft SQL Server Reporting Services\Shared Tools*).
 - d) Click **OK**. You may proceed with the report install after this prerequisite has been met.
- Equipment Types must be created and owned at the SiteAdmin level. FLC requires configuration by Equipment Type.
- Within IM, avoid using names that match for Point Template ID, Module ID, Tag ID and Setting ID, even if different spaces are included. The software generally detects these issues but there may be cases where it does not. This situation will cause unexpected failures in point execution.
- Alarms & Events log record limit can be manually configured in the web.config file in the FuelsManager folder (*C:\Program Files (x86)\FuelsManager\FuelsManager*). The limit is 10000 events.
- Field Level Control - Global Control Propagation is directed by rows in *erv.tblTempCompanyRecordVersioningFlag*. At the Enterprise, the FuelsManager Service drives the process. The following app settings in *FuelsManagerService.exe.config* control the process.

```
<add key="RecordVersionPropagationEnabled" value="true" />
<add key="RecordVersionPropagationIntervalSeconds" value="30" />
```

The rows are processed by *_RowIndex*. Sync will control the order in which they are inserted at the Enterprise and hence the order they are processed.

Helpful Tips (continued)

- A new tag, *Density Product Gauge*, was added to the Volume Correction module. If importing or using templates from a version prior to FM 12, you'll need to update the *Volume Correction* and *Standard Tank Calculator* modules on any template where they reside. Follow these steps:
 - 1) Edit the **template**.
 - 2) Navigate to the **Modules** tab.
 - 3) Select **Volume Correction** and click **Remove Module**.
 - 4) Click **OK**.
 - 5) Click **Add Module**.
 - 6) Select **Volume Correction**, and then click **OK**.**NOTE:** Repeat the above steps for the *Standard Tank Calculator* module.
- To update the synchronization Node name for an existing Site, use the *Configuration\Synchronization Settings* page to revise the **Sitename**. Revise it once and **Apply**. Revise it back to the desired **Sitename** and **apply** again. You'll see the updated node name under *Configuration Settings*, **InstallDetailsSynchronizationNodeName**.
NOTE: Do not modify the synchronization node name directly within Configuration Settings because the *SynchronizationNodeGuid* will not be updated and will cause an error.
- If rerunning initial sync, set *Configuration Settings* **InstallDetailsSynchronizationNodeName** back to previous so there is only one node to review data under.
- When configuring Companies, ensure the optional fields are populated for **Name** and **Code**.

Appendix A: Prerequisite Roles and Features

Internet Information Services (IIS) 10.0 Setup Requirements

When performing this procedure, if you are prompted to "Add features that are required," click **Add Features**.

- 1) Select **Start** → **Server Manager**.
- 2) Select **Manage** in upper right hand corner, and select **Add Roles and Features**.
- 3) In the *Before you begin* window, click **Next**.
- 4) Select **Role-Based** or **feature-based** installation.
- 5) Click **Next**.
- 6) Ensure **Select a server from the server pool** is selected and your server name appears in the box below.
- 7) Click **Next**.
- 8) In the *Select server roles* window, under *Roles*, verify that only the following roles are selected:
 - File and Storage Services
 - Storage Services
 - Web Server (IIS)
 - Common HTTP Features
 - Default Document
 - Directory Browsing
 - HTTP Errors
 - Static Content
 - Health and Diagnostics
 - HTTP Logging
 - Performance
 - Static Content Compression
 - Dynamic Content Compression
 - Security
 - Request Filtering
 - URL Authorization
 - Windows Authentication
 - Application Development
 - .NET Extensibility 4.7 (4.6 for Windows 2016)
 - ASP.NET 4.7 (4.6 for Windows 2016)
 - .NET Extensibility 4.8 (4.8 for Windows 2022)
 - ASP.NET 4.8 (4.8 for Windows 2022)
 - ISAPI Extensions
 - ISAPI Filters
 - WebSocket Protocol
 - Management Tools
 - IIS Management Console
- 9) If prompted, select the following in the *Select features* window, under *Features*, and verify that only the following are selected:
 - .NET Framework 4.6 Features (Server 2016)
 - ASP.NET 4.6
 - WCF Services
 - HTTP Activation
 - Named Pipe Activation
 - TCP Activation
 - TCP Port Sharing
 - .NET Framework 4.7 Features (Server 2019)
 - .NET Framework 4.7
 - ASP.NET 4.7
 - WCF Services
 - HTTP Activation
 - Named Pipe Activation
 - TCP Activation
 - TCP Port Sharing
 - .NET Framework 4.8 Features (Server 2022)
 - .NET Framework 4.8
 - ASP.NET 4.8
 - WCF Services
 - HTTP Activation
 - Named Pipe Activation
 - TCP Activation
 - TCP Port Sharing
 - Remote Server Administration Tools
 - Role Administration Tools
 - Remote Access Management Tools
 - Remote Access module for Windows PowerShell
 - Windows PowerShell
 - Windows PowerShell 5.1
 - Windows PowerShell ISE
 - Windows Process Activation Service
 - Process Model
 - Configuration APIs
 - WoW64 Support
- 10) Click **Next** and review selected features for accuracy.
- 11) Check the box at the top of the window for **Restart the destination server automatically if required**.
- 12) Click **Yes** in the pop-up window.
- 13) In the *Confirm installation selections* window, verify all components are selected and then click **Install**.

The installation progress bar displays and you will receive messages indicating the installation progress. Once the installation is complete, *Installation succeeded* appears below the progress bar.
- 14) Click **Close** to exit the *Add Roles and Features Wizard*.
- 15) **Close** the *Server Manager* window.

Restart the machine if it does not restart automatically.