FME® Server 2013 Administrator's Guide

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Version Information

FME Server 2013 is Version 7.2 of the FME software.

Contents

Chapter 1 Introduction

1.1 About This Guide

The *FME® Server Administrator's Guide* is intended for system administrators and those who are responsible for installing and configuring FME Server in a Windows, Linux, or UNIX environment.

This document assumes that system and FME Server administrators have knowledge of or access to resources in the following areas:

- The location and structure of the spatial data resources you want to work with in FME Server
- Your web application architecture
- FME Workbench, if you plan on installing FME Desktop and authoring workspaces

1.2 Additional FME Server Resources

Safe Software provides the following resources to assist with your learning about FME Server:

- FMEpedia

  FMEpedia is the online source for all information on Safe Software products including documentation, demos and support resources:

  http://FMEpedia.com

- Product documentation

  The most up-to-date product documentation is available on FMEpedia.

  Installed product documentation is available in the FME Server installation directory > Docs.

  FME Server product documentation includes:

- FME Server Administrator's Guide: Information on installation, licensing, upgrading and common configurations.
- FME Server Tutorial: An introductory course on authoring and publishing in FME Server.
- FME Server Reference Manual: Developer resources and detailed technical documentation.
- FME Server REST API Specifications: Developer reference for working with the REST API.
- FME Server Developer's Guide: Quick-start, tutorial and sample code for working with the FME Server APIs.

- Training

  Training courses on FME Desktop and FME Server (offered by Safe Software and our reseller network)

  The current public training calendar is available from:

  http://www.safe.com/learning > Course Schedule

  Contact your Safe Software account manager or your FME reseller to arrange a private training course for your organization.

1.3 About FME Server

FME Server lets your organization address diverse spatial and non-spatial data requirements using a single enterprise solution. FME Server provides a Service-Oriented Architecture (SOA) that brings all the capabilities of the FME platform to a server environment, creating a full Spatial Extract, Transform, and Load (ETL) capability.

The capabilities of FME Server are presented through a number of interfaces. These interfaces include:

- Web-based services provided with FME Server – for example, Data Download

- Application interfaces including the Web User Interface, FME Server Console, and FME Workbench
- Programmatic interfaces, such as C++, Java, .NET, and REST APIs

Through these interfaces, organizations can apply the power of FME at the organization or web level for the first time.

Like the FME Desktop product, FME Server tasks are authored in FME Workbench and published to FME Server directly from Workbench. It's very easy to move tasks from FME Desktop to FME Server or to run tasks using both applications.

1.4 FME Server Roles

There are four distinct server roles in the FME Server context:

- Administrator—person who installs and maintains FME Server and its related services. Administrators' tasks include:
  - Planning system architecture
  - Installing prerequisites
  - Installing FME Server
  - Setting up services
  - Monitoring services and jobs
  - Troubleshooting
  - Scaling, as required

  Administrators use this guide for information pertinent to their role.
- Author—person who creates workspaces and publishes them to FME Server for use by users. Typically, authors are experienced FME users with a good understanding of Workbench, published parameters, and the source data formats they use.

- User—person who accesses data using an FME Server Service. There is no expectation that a user has any experience with FME, nor do users need to be aware of FME Desktop or FME Server.
- Developer—person who develops applications that submit jobs to FME Server and handle the results. Developers can include FME Server services within their own applications or create their own services using the FME Server API.

Chapter 2 Before You Begin

This chapter describes the steps for installing FME Server on any of the supported platforms. If you are upgrading from a previous version of FME Server, see "Upgrading FME Server" on page 73.

2.1 Obtaining the Installer

The download web page, which contains the FME Server installation package, is located here: http://www.safe.com/support/support-resources/fme-downloads/. The web page also includes download links to release and beta installation packages for various platforms.

To request a 60-day trial license of FME Server, visit http://www.safe.com/fme/fme-technology/fme-server/trial-download/.

You can also contact sales@safe.com to get access.

2.2 System Requirements

For system requirements for the Windows, Linux, or UNIX operating systems, see www.safe.com/products/server/specifications.php.

2.3 Installation Options

The FME Server installer provides three options for installation: express, engine and custom. These options are described below.

2.3.1 Express

The express option installs all prerequisites, so you can immediately license and start working with FME Server. The express option is the easiest to get started with, and we recommend that you use this option unless there is a compelling reason to do otherwise.

2.3.2 Engine

This option allows you to install an FME Engine and configure it to use an FME Server Core you have deployed on another Server.

2.3.3 Custom

The custom option is more flexible. It allows you to select which prerequisites to install yourself and which should be installed automatically. The custom option is mainly useful for installing FME Server in a distributed environment.

Both the Engine and Custom options are useful in the following scenarios:

- "Performing an Installation for High Capacity" on page 23
- "Performing an Installation for High Availability" on page 27

2.3.3.1 License Server

Note: *We recommend using the Default License Server provided with FME Server.*

You have the option to use a separately installed License Server or have one installed by the FME Server Installer. The license request process is the same either way. However, if you want to use a separate License Server, you must install it prior to installing FME Server, or, if it is already installed and running, you must know its host name.

2.4 File Permissions

The user account that starts the FME Server services must have permission to read and write files in the FME Server installation directory. This user account also requires permission to access any directories or resources required by a workspace.

If you specify any UNC paths or mounted directories in the FME Server installation, the user that starts the FME Server services needs write access to those directories.

If you are not using the Application Server included with FME Server, then the user that is running your Application Server needs the same permissions as the user that starts the FME Server services above.

2.5 Requirements for Email Notification

If you want FME Server to send notification emails after jobs are complete, you must know the IP address and port number of your SMTP server, as well as any required authentication information. Instructions for configuring email notification after the installation are available in "Configuring FME Server to Send Email Notifications" on page 106.

2.6 Requirements for FME Workspaces

To perform data transformations, FME Server runs workspaces. When a workspace runs on FME Server, it is referred to as a job.

2.6.1 FME Workbench

FME Workbench is used to author and publish the workspaces used by FME Server. FME Workbench is not part of FME Server; rather, it is part of the FME Desktop product. Contact your Safe Software account manager or your local Safe Software reseller, if you would like more information about FME Desktop.

If you don't have access to FME Desktop, you cannot publish workspaces to FME Server, although you can still perform and test the installation.

2.6.1.1 Connecting to FME Server

There are two methods for connecting FME Workbench to FME Server:

- Direct connection allows communication between the FME Workbench computer and the FME Server computer on your local area network. It requires the TCP/IP port 7071 to be open to communication between the FME Workbench computer and the FME Server computer.
- Web connection allows FME Workbench to connect to FME Server using the HTTP protocol. It requires the Web Application Server port to be open to communication between the FME Workbench computer and the FME Server computer.

2.6.1.2 Version of FME Workbench

The version of FME Workbench you use must match the FME Server version you have installed. This requirement ensures that the workspaces you author will run when published to FME Server.

If you are running an FME Server version that is older than your FME Workbench, it is possible to upgrade the FME Engines used by FME Server to match your FME Workbench version. Instructions for upgrading the FME Engine only are available in "FME Engine Only Upgrade" on page 91

2.6.2 Custom Coordinate Systems

If you have a custom coordinate system defined for your FME Desktop installation, repeat the configuration process on the FME Server computer. Instructions for installing custom coordinate systems are available in "Custom Coordinate Systems" above.

2.6.3 GridShift Files

If you plan to run workspaces that transform data between the datums NAD27 and NAD83, you can use datum shift files for Canada or the US. Instructions for configuring GridShift files are available in the "Configuring Grid Shift Files" on page 108.

2.6.4 Third-Party Applications for FME

FME Workspaces often rely on third party applications for connecting to data sources. Examples include an Oracle client for connecting to an Oracle database and an ArcGIS installation for connecting to Esri Geodatabases.

If you must install a third-party application for your FME Desktop installation, repeat that installation on your FME Server computer.

2.7 Default User Accounts and Passwords

The FME Server installer prompts you for an administrator account username and password. This account has permission to use all FME Server resources, including the Web User Interface. Make sure to write down what you enter. In addition to that account, three other accounts are provided by default.

Username/Password	Description
user/user	An account intended for Web User Interface

Username/Password	Description
author/author	An account intended for FME Workbench authors
guest/guest	An account that provides unauthenticated access to the web services

Chapter 3 Performing an Express Installation

3.1 Express Installation for Windows

This chapter provides information for an express installation of FME Server for Windows. Before getting started, take a few minutes to review "Before You Begin" on page 5.

If this FME Server installation will be external facing (e.g. fmeserver.com), then you should do the following:

1. Configure Windows to route FME Server communication requests internally instead of over the internet. To do this:
   - Open the following file:

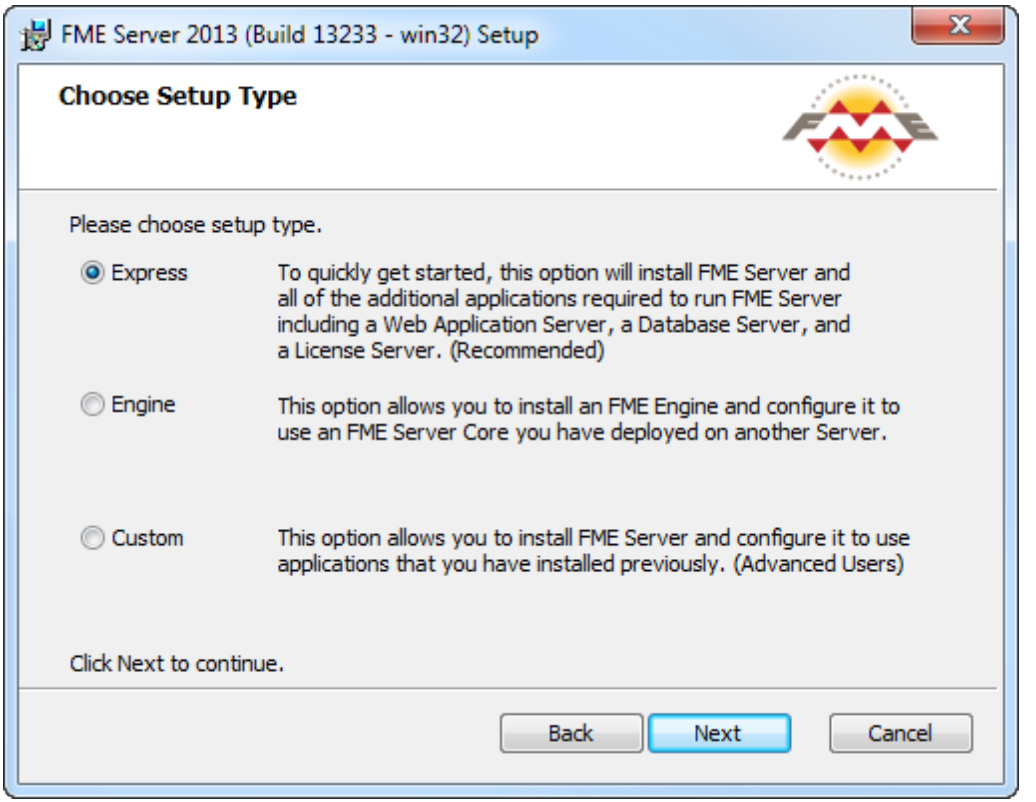
     C:\windows\system32\drivers\etc\hosts
   - Add an entry from 127.0.0.1 to the external hostname. Here is the entry for fmeserver.com:

     127.0.0.1 fmeserver.com
2. During installation, specify the external hostname that users will enter when connecting to FME Server (e.g. fmeserver.com).

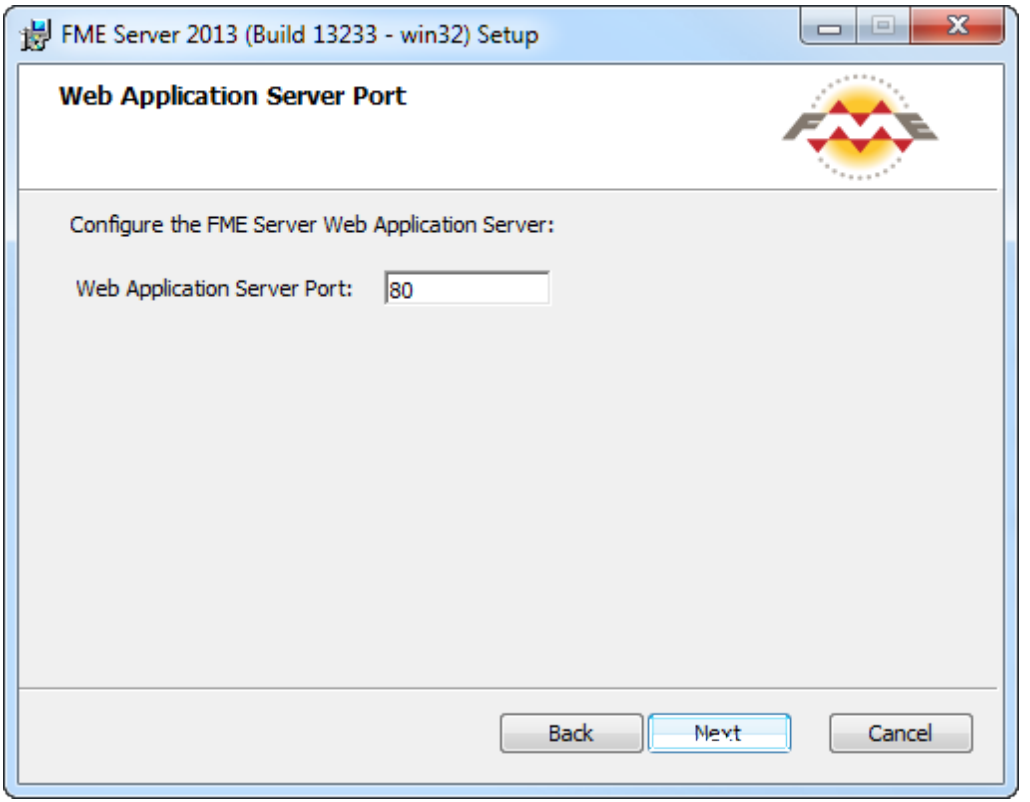
3.1.1 Run the Installer

Run the installer logged in as the user who will be running your FME Server Service. This user must have write privileges to the installation directory.

Start the installer, and proceed through to the Choose Setup Type prompt. Select the Express option.



Follow the instructions on the screen. We recommend that you use port 80 when prompted. Don't forget to note the password you enter for the administrator account. On the last screen, click Finish.



Note: *If you already have an existing web server, such as IIS, it is likely to already be using port 80. In that case, turn off IIS or select a different port, such as 8080.*

Proceed to "Starting and Stopping FME Server" below.

3.1.2 Starting and Stopping FME Server

After performing the installation, the FME Server service and associated applications start automatically. You might have to start and stop these applications at some point. See "Starting the Services" on page 97 for instructions.

Note: *If UAC (User Account Control) is enabled on your Windows system and the installation was not run from an elevated prompt (that is,*

Run as administrator), you might need to start the FME Server Windows Services. See "Configuring Start-up" on page 95.

3.1.3 Licensing

If you are performing an express install or installing FME Engines with the custom install option, the FME Engines must be licensed. See "Licensing" on page 61 for instructions on acquiring a license.

3.1.4 Verify the Installation

For instructions on starting and stopping FME Server, the Database Server, the Web Application Server, and the License Server, if installed, see "Starting the Services" on page 97.

Confirm that the Web Services are available:

Open the Web User Interface in a web browser:

```
http://<host>:<port>/fmeserver
```

If you see a login form, it means that the Web Application Server is running, the web applications have been deployed, and you specified the correct port when accessing the Web User Interface.

Note: *If you are using a non-standard port, enter the port number after the host name, for example:*

```
http://localhost:8080/fmeserver
```

Confirm that FME Server is available:

Log in to the Web User Interface with the username and password you entered during installation.

- If you are able to log in , it confirms that FME Server is installed and running.
- If you cannot access the Web UI, the page shows a Server error, or you can confirm that FME Server is not running, you might have a problem with installation. Contact fmeserversupport@safe.com.

Confirm that the FME Engines are licensed:

Log in to the Web User Interface with the username and password you entered during installation.

The home page lists the licensed and running FME Engines.

If there are no FME Engines, your FME Server might not be licensed. Confirm that you have an FME Engine floating license available. See "Licensing" on page 61for instructions on acquiring a license.

If you confirm that you have a floating license available, reconfigure the license server that FME Engines are using, and restart FME Server. See "Licensing" on previous page and "Starting and Stopping FME Server" on page 13.

If you still do not see active FME Engines in the Web User Interface, send the following information to fmeserversupport@safe.com:

- From the License Server directory, include the following files :

  `<FMEServerDir>\Utilities\flexserver\safe.log`
  `<FMEServerDir>\Utilities\flexserver\safe.lic`

- From the FME Server computer, include the most recent copy of the following logs:

  `<FMEServerDir>\Logs\processMonitor_xx.log`
  `<FMEServerDir>\Logs\fmeServer_xx.log`

Confirm that FME Server can run a job:

After you confirm that your FME Engines are licensed, confirm that FME Server can perform its primary function–running a job.

1. Open the Web User Interface in a web browser by going to:

   ```
   http://<host>/fmeserver
   ```

   Note: *If you are using a non-standard port, enter the port number after the host name, for example:*

   ```
   http://localhost:8080/fmeserver
   ```

2. Log in with the administrator account that you created during install.
3. Click Repositories > Samples > austinApartments.fmw. Under Job Submitter, click Run.

   If you see a success message, your install was a success.

3.1.5 Uninstalling

Note: *Before you upgrade to a newer version of FME Server, see "Upgrading FME Server" on page 73 for instructions on backing up your existing configuration. You must uninstall any previous versions of FME Server before installing an upgrade.*

Ensure that FME Server, FME Server SMTP Relayer, FME Server Application Server, or other Web Application servers are shut down before proceeding.

You can uninstall FME Server as you would any other program by selecting Start menu > Control Panel > Programs and Features > FME Server.

Note: *Uninstalling FME Server removes the contents of your Tomcat directory if you installed the default Web Application Server. This folder is located in the FME Server installation directory under* `Utilities\tomcat`. *If you made custom modifications to this Tomcat, these modifications should be backed up before uninstall.*

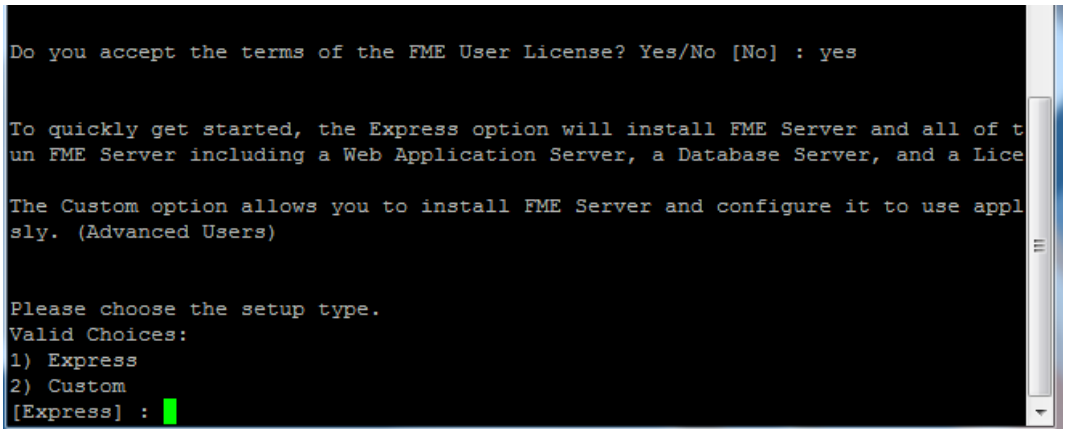
3.2 Performing the Installation for Linux/UNIX

This chapter provides information for an express installation FME Server for Linux or UNIX. Before getting started, take a few minutes to review "Before You Begin" on page 5.

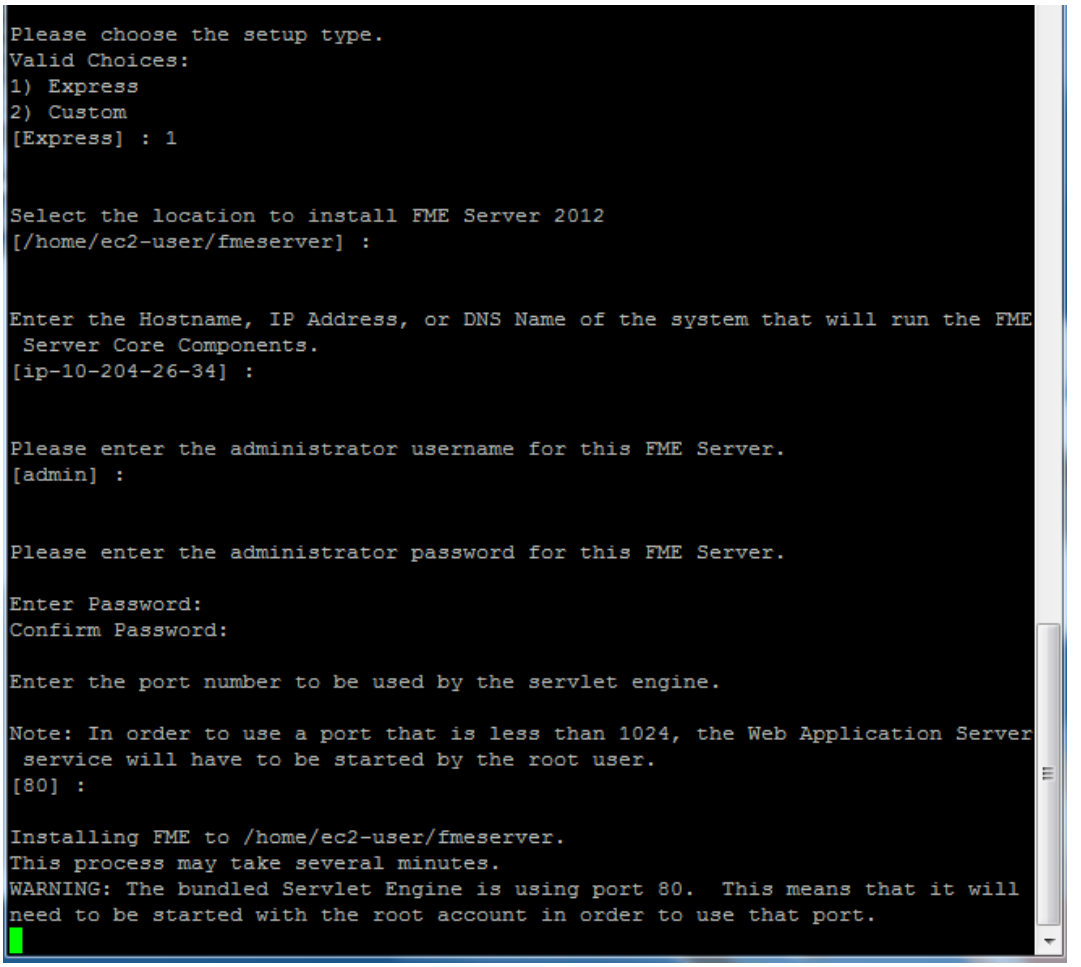
3.2.1 Run the Installer

Run the installer logged in as the user who will be running your FME Server Service. This user must have write privileges to the installation directory.

Start the installer, and proceed through to the Choose Setup Type prompt. Select the Express option.



Proceed through all the prompts. We recommend that you use port 80 when prompted.



Don't forget to note the password you enter for the administrator account. For each prompt, the default answer appears in square brackets, such as `[default]`. If you press Enter without typing an answer, you are accepting the default answer.

> ***Note:*** *If you select port 80 or any port number less than 1024 for the default Web Application Server, start that service as root.*

Proceed to "Starting and Stopping FME Server" on next page.

3.2.2 Starting and Stopping FME Server

After performing the installation, manually start FME Server, the Database Server, the Web Application Server, and the License Server, if installed. For instructions on starting and stopping these applications and for configuring the applications to start at boot time, see "Starting the Services" on page 97.

3.2.3 Licensing

If you are performing an express install or installing FME Engines with the custom install option, the FME Engines must be licensed. See "Licensing" on page 61 for instructions on acquiring a license.

3.2.4 Verify the Installation

For instructions on starting and stopping FME Server, the Database Server, the Web Application Server, and the License Server, if installed, see "Starting the Services" on page 97.

Confirm that the Web Services are available:

Open the Web User Interface in a web browser:

```
http://<host>:<port>/fmeserver
```

If you see a login form, it means that the Web Application Server is running, the web applications have been deployed, and you specified the correct port when accessing the Web User Interface.

Note: *If you are using a non-standard port, enter the port number after the host name, for example:*

```
http://localhost:8080/fmeserver
```

Confirm that FME Server is available:

Log in to the Web User Interface with the username and password you entered during installation.

- If you are able to log in , it confirms that FME Server is installed and running.

- If you cannot access the Web UI, the page shows a Server error, or you can confirm that FME Server is not running, you might have a problem with installation. Contact fmeserversupport@safe.com.

Confirm that the FME Engines are licensed:

Log in to the Web User Interface with the username and password you entered during installation.

The home page lists the licensed and running FME Engines.

If there are no FME Engines, your FME Server might not be licensed. Confirm that you have an FME Engine floating license available. See "Licensing" on page 61 for instructions on acquiring a license.

If you confirm that you have a floating license available, reconfigure the license server that FME Engines are using, and restart FME Server. See "Licensing" on previous page and "Starting and Stopping FME Server" on previous page.

If you still do not see active FME Engines in the Web User Interface, send the following information to fmeserversupport@safe.com:

- From the License Server directory, include the following files :

  ```
  <FMEServerDir>\Utilities\flexserver\safe.log
  <FMEServerDir>\Utilities\flexserver\safe.lic
  ```

- From the FME Server computer, include the most recent copy of the following logs:

  ```
  <FMEServerDir>\Logs\processMonitor_xx.log
  <FMEServerDir>\Logs\fmeServer_xx.log
  ```

Confirm that FME Server can run a job:

After you confirm that your FME Engines are licensed, confirm that FME Server can perform its primary function–running a job.

1. Open the Web User Interface in a web browser by going to:

   ```
   http://<host>/fmeserver
   ```

Note: *If you are using a non-standard port, enter the port number after the host name, for example:*

```
http://localhost:8080/fmeserver
```

2. Log in with the administrator account that you created during install.
3. Expand Job Submitter, Samples, and click Run next to `austinApartments.fmw`.

   If you see a green success message, your install was a success.

3.2.5 Uninstalling

Note: *Before you upgrade to a newer version of FME Server, see "Upgrading FME Server" on page 73 for instructions on backing up your existing configuration. You must uninstall any previous versions of FME Server before installing an upgrade.*

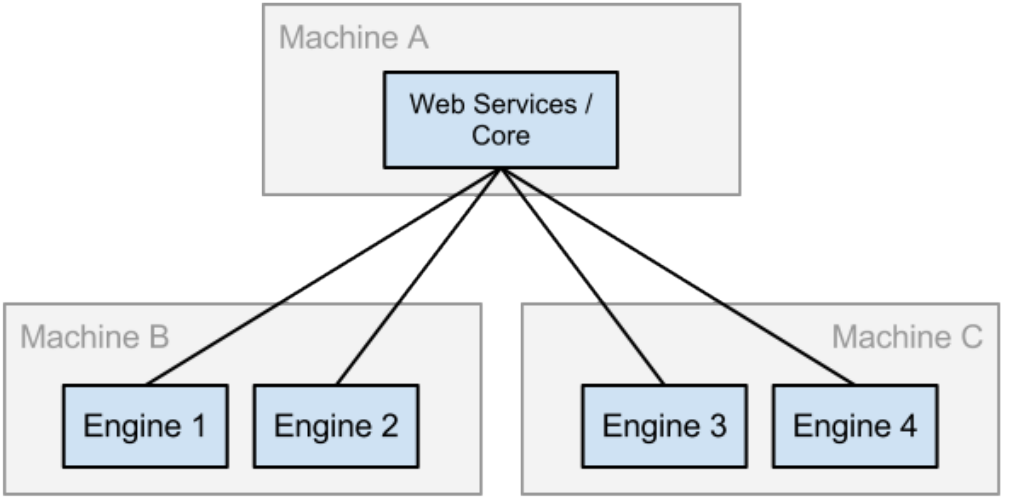
Ensure that FME Server, FME Server SMTP Relayer, FME Server Application Server, or other Web Application servers are shut down before proceeding.

Run the `uninstall.sh` script in the FME Server installation directory. To ensure that everything gets uninstalled, run this script as root.

Note: *Uninstalling FME Server removes the contents of your Tomcat directory if you installed the default Web Application Server. This folder is located in the FME Server installation directory under `Utilities\tomcat`. If you made custom modifications to this Tomcat, these modifications should be backed up before uninstall.*

Chapter 4 Performing an Installation for High Capacity

If you want to add processing capacity to your FME Server installation, you can install additional FME Engines on a separate computer from the FME Server Core.



The FME Server Core contains a Software Load Balancer (SLB) that distributes jobs to FME Engines. A single active Core that supports multiple engines is all that is required to scale processing capacity.

The computer that hosts the FME Server Core where jobs are sent and where jobs are queued from is referred to as the *<coreHost>*. The computer that hosts the FME Engines is referred to as the *<engineHost>*.

4.1 Install the FME Server Core

Install the FME Server core by running the FME Server installer (*<coreHost>*).

1. Start the FME Server Installer.
2. When prompted, select either the Express or Custom setup type.

3. Follow the remaining dialogs to complete the installation. If Custom setup was selected, make sure FME Server Core Components is selected on the Custom Setup dialog.

You might have to disable any firewalls that are running on this computer.

4.2 Install the FME Engines

Install the FME Engines by running the FME Server installer on another computer (*<engineHost>*).

4.2.1 Windows

1. Start the FME Server Installer.
2. Select the Engine setup type.
3. On the FME Server Hostname dialog, enter the hostname of the *<coreHost>* computer.
4. On the Existing Repository Directory dialog, provide the UNC path to the repository directory. (In most cases, the directory is the same as the *<coreHost>* repository directory.)

4.2.2 Linux/UNIX

1. Mount the FME Server Core installation directory shared by *<coreHost>*:

   ```
   mount <coreHost>:<FMEServerDir>/home/FMEServer
   ```

2. Start the FME Server Installer.
3. Select the Engine Install.
4. Choose to install only the FME Engine component by selecting Yes to the FME Engine component prompt and No to the other component prompts.

   The installer prompts you for the path to the *<coreHost>* installation directory.

5. Enter the path to the mounted directory.

   The installer prompts you for the name of the FME Server Host.

6. Enter the host name of the *<coreHost>* computer.

7. Manually start FME Server, and configure it to start automatically.

   See "Configuring Start-up" on page 95.

You may have to disable any firewalls that are running on this computer.

The installation on `<engineHost>` starts two FME Engines by default. The FME Engines start and then register with the FME Server Core running on *`<core-Host>`*. You can confirm that the FME Engines were added by logging into the Web User Interface and looking for active FME Engines that are from the `<engineHost>`.

If you want this computer to start more or less FME Engines, follow the steps in "Licensing" on page 61.

To verify the installation, see "Verify the Installation" on page 14 (Windows) or "Verify the Installation" on page 20 (Linux).

Chapter 5 Performing an Installation for High Availability

This chapter provides information on performing an installation for maintaining FME Server in a high availability/failover environment.

5.1 About FME Server High Availability

5.1.1 Job Recovery

Job recovery ensures that submitted jobs are not dropped completely, if the connection to the FME Engine is lost for any reason.

After FME Server submits a translation request to an FME Engine, it monitors the connection to that engine until a response is returned. If the connection to the engine is lost, FME Server can resubmit the job.

The default configuration is to retry a failed job three times only, which prevents FME Server from indefinitely retrying a job that fails.

5.1.1.1 Configuring Job Recovery

On the FME Server host computer, the `MAX_FAILED_TRANSACTION_REQUEST_RETRIES` parameter in the `<FMEServerDir>\Server\fmeServerConfig.txt` file determines the number of times any transaction is resubmitted before FME Server stops resending the request.

It is important to remember that a failed translation request could cause an FME Engine to shut down improperly. When no maximum limit is imposed, this translation is resent indefinitely, which causes repeated FME Engine failures. A value of 0 means that no maximum limit is imposed and failed transaction requests are resubmitted indefinitely. If this parameter is absent, a default value of 3 is used.

1. FME Server Core submits a translation request to an FME Engine
2. FME Server monitors its connection to that FME Engine until the Engine returns a response
3. If a job fails, FME Server can resubmit this job automatically. This provides job recoverability for cases where an FME Engine, or the machine it's running on, fails.

5.1.2 Automatic Restart of FME Server Core and Engines

The Process Monitor is responsible for ensuring that the FME Server Core and the FME Engines are always up and running. The Process Monitor provides fault tolerance by restarting the FME Server Core and any FME Engines when needed. No intervention is required.

5.1.3 Managing Job Distribution Between FME Engines

Job Routing is a mechanism for sending specific jobs to specific FME Engines. The reasons for doing this include:

- Reserving an FME Engine for a scheduled task
- Reserving an FME Engine for quick jobs
- Sending jobs to an FME Engine that supports a particular format (for example, MS Access is not supported on UNIX)

Job routing can be configured after installation. For more information, see "Configuring Job Routing" on page 109.

5.1.4 Core Failover

FME Server includes a number of failover mechanisms that allow various components to connect to backup components in the event of failure. However, FME Server administrators must understand that a standard FME Server cluster does not provide complete fault tolerance. Configuring a fault tolerant cluster requires the following components:

- FME Server Core—Configure the primary FME Server and a failover FME Server to use the same common database and a common repository directory.
- FME Server Services—Configure FME Server services to switch to the failover FME Server when the connection to the primary FME Server is lost. A Web Application Server must be installed on a separate machine and configured for high availability.
- FME Engines—Configure one set of engines for the primary Core and one set for the failover Core. Further, to ensure there is no single point of failure, you should install at least one FME Engine on a machine separate from the FME Server Core.

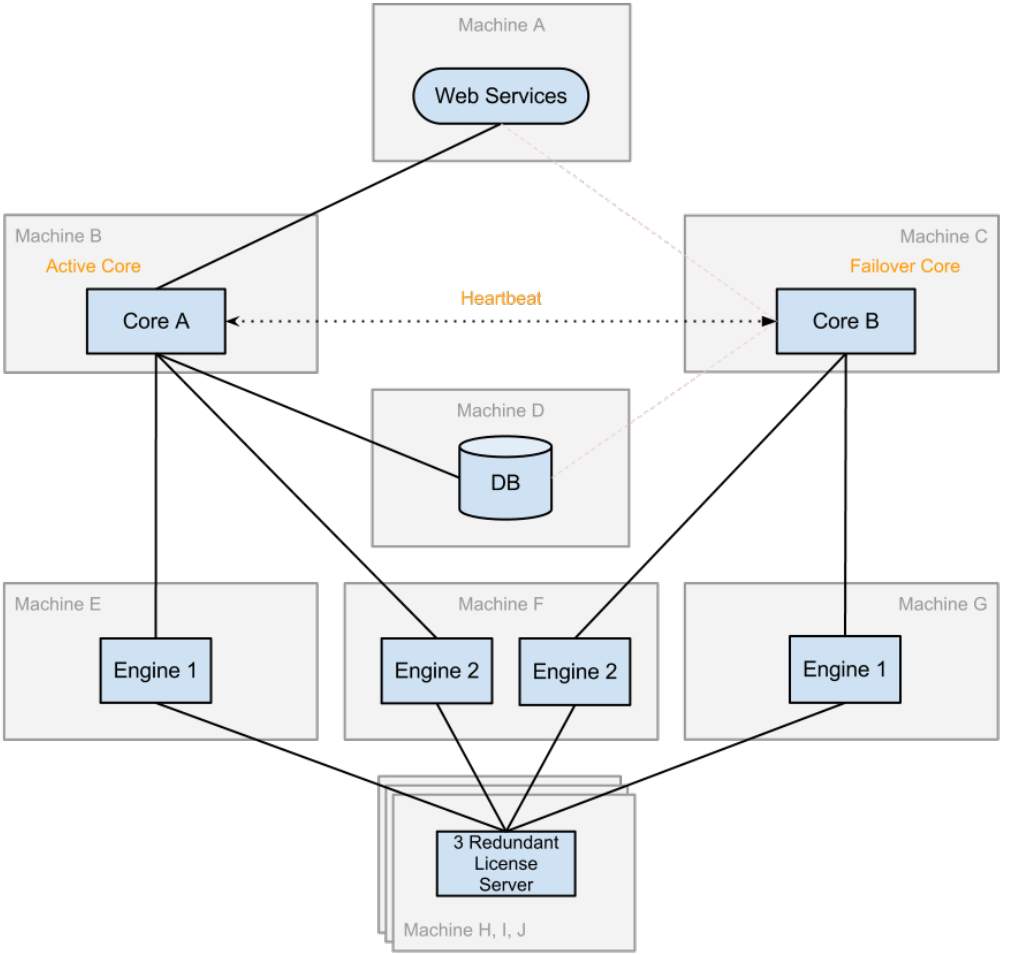
Note: *To ensure failover capability of any source data files or databases used in your FME workspaces, the following additional components are required:*

- *A database server installed on a separate machine*
- *A file system installed on a separate machine..*

5.1.4.1 Failover Architecture

The following diagram shows the basic structure of FME Server failover.

Note: *To limit hardware costs, two instances of Engine 1 can be on the same machine, with one instance connected to the Primary host and the other to the Failover host. See "Configuring FME Engines for Failover" on page 34 below.*



When the Core A machine fails, clients connecting to Core A failover to Core B. Because the Failover Core is now the "active" Core of the cluster, clients subsequently always connect to the Failover Core so that processing continues. When a heartbeat failure is detected, this Faillover Core takes over Jobs and Schedules.

When the Core A machine and associated Engines are restored, Core B remains the Active Core, while Core A is now online as the Failover Core.

Note: *Notification Service publishers (including UDP, Email and JMS clients) do not failover. These clients must be manually reconfigured to connect to the active core.*

5.1.4.2 Configuring FME Server Core for Failover

The first FME Server Core that starts up in a fault tolerant cluster automatically becomes the Primary "active" Core. The second FME Server Core to start up becomes the Failover Core. When configured, the fault tolerant cluster automatically reconfigures itself depending on the state of the system.

Prior to installation, you must create and share the directory where the common FME Server files will exist (repository directory), so that each FME Server Core can access it (read and write). The repository directory should be on its own redundant file server, not the same machine as the FME Server Core installation. Then, during installation, provide the UNC/mount path to the repository directory, ensuring that you use the same directory for each FME Server Core installation.

When you bring the primary server back online, it is not necessary to shutdown the secondary server unless you want clients to fail back to the primary server. You might want to fail back if the primary server is a more capable system than the failover server.

The following instructions apply to both the primary and failover server. Additional parameters to configure a failover cluster can be found in the FME Server configuration file.

1. Open the FME Server configuration file at:

   `<FMEServerDir>\Server\fmeServerConfig.txt`

2. Comment-out the Default Cluster directive `CLUSTER_TYPE=DEFAULT`:

```
#CLUSTER_TYPE=DEFAULT
```

3. Uncomment the Failover Cluster directive `#CLUSTER_TYPE=FAILOVER`:

   ```
   CLUSTER_TYPE=FAILOVER
   ```

4. Uncomment the `FAILOVER_MONITOR_HOST` directive and specify the name of the host to monitor. If working on the primary server, then specify the name of the failover server. If working on the failover server, then specify the name of the primary server.

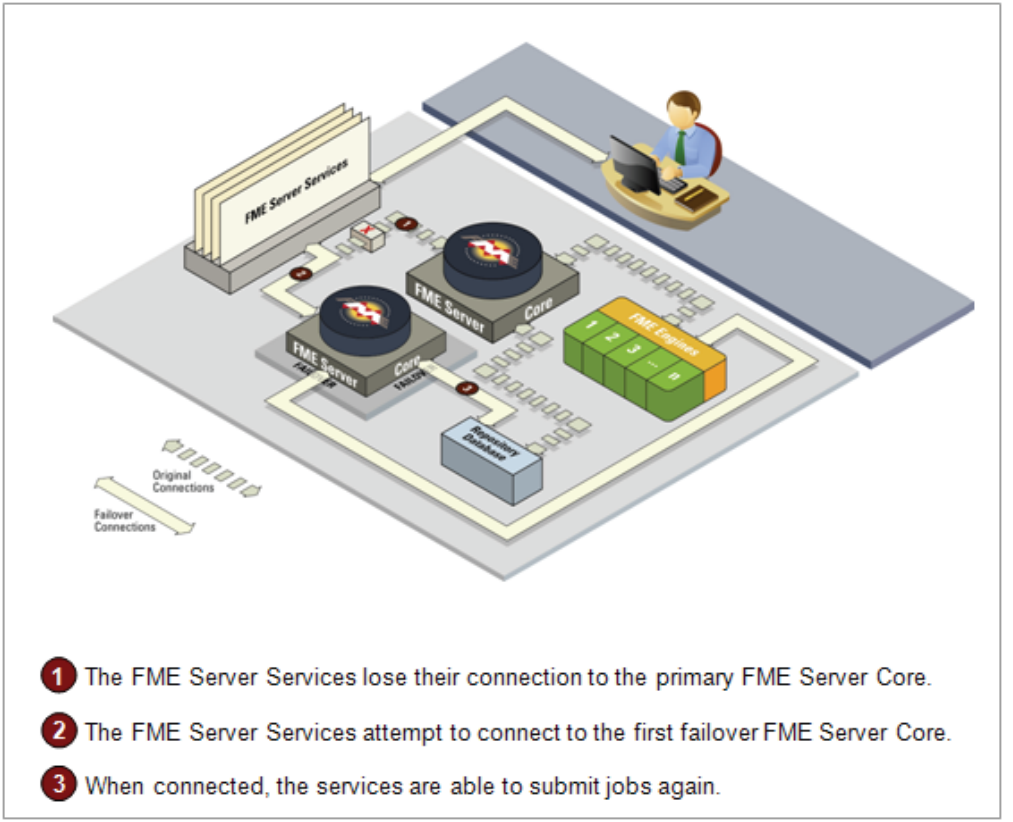
   The host name value corresponds to the FME_SERVER_HOST_NAME setting of the monitored host. This value is case sensitive and is typically all upper case in a default installation. It is best to confirm by checking the FME_SERVER_HOST_NAME value of the monitored host.

   ```
   FAILOVER_MONITOR_HOST=<FME_SERVER_HOST_NAME>
   ```

5.1.4.3 Configuring FME Server Services for Failover

You can configure individual FME Server services to switch to a backup FME Server Core when the connection to the primary FME Server Core is lost. This capability is called "service failover".

When a service loses its connection to the primary FME Server Core, the service attempts to connect to a backup FME Server Core you define. In a fault tolerant cluster, a primary FME Server Core can only have one backup FME Server Core.



1. Open each web application properties file located at:

   ```
   <WebAppDir>\<fmeServiceName>\WEB-
   INF\conf\propertiesFile.properties
   ```

2. Find the following line in this file:

   ```
   #FAILOVER_SERVER_NAMES=<failoverServerName>
   ```

3. Uncomment this line and replace `<failoverServerName>` with a host name.

   The host name must be running an FME Server, for example:

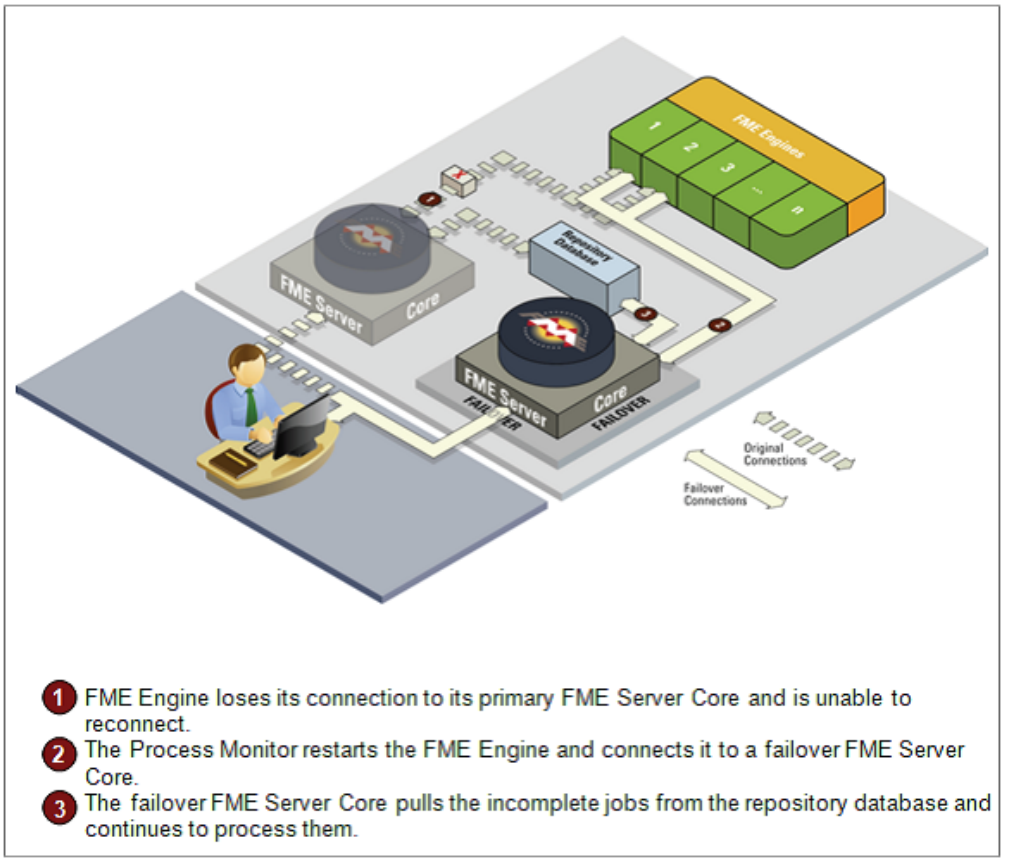
   ```
   FAILOVER_SERVER_NAMES=red
   ```

This example defines an FME Server system–red–which must be running an FME Server.

4. Restart the web application server.

5.1.4.4 Configuring FME Engines for Failover

We recommend configuring redundant FME Engines for both the primary FME Server Core and the secondary FME Server Core. If you wish to limit the number of machines used, you can start up FME Engines with the same name on the same machine, with one engine connected to the primary FME Server Core and the other connected to the failover FME Server Core.



5.1.4.5 Configure a Notification When Failover Occurs

System notifications, such as via an email or a mobile client subscription, can be configured so that you are alerted of the status of the Failover cluster. Status notifications can include when the FME Server starts up, when a host fails to detect the host it is monitoring, and when a failover operations occurs.

Perform the following steps for both the FME Server primary and failover server. We recommend that topic names be different between servers to distinguish notification messages.

1. Open the FME Server configuration file

   `<FMEServerDir>\Server\fmeServerConfig.txt`

2. Specify the topic name to send failover notifications to

   `NOTIFY_FAILOVER=<topicName>`

For more information about configuring notifications, see the Notification Service section of the FME Server Reference Manual.

5.2 Installing for Core Failover

5.2.1 Before Installation

5.2.1.1 Provide a Database Server

If you have a supported Database Server installed already, you can use it for FME Server's repository database. Otherwise, you can install one of the supported databases on a separate machine. The database referred to here is used by FME Server for managing FME Server jobs and workspace information and does not refer to a source or destination data source for FME workspaces.

The option to use your own database can only be made during installation. Prior to installation you should have a Database Server running, the connection information, and the ability to create a new database using SQL scripts.

Supported database servers include:

- Oracle
- PostgreSQL

- SQL Server

Note: *For information about configuring the Database Server for failover, see "Create the FME Server Database on a Separate Database Server" on the facing page.*

5.2.1.2 Provide a Web Application Server

The FME Server web services must switch to the failover FME Server when the connection to the primary FME Server is lost. A Web Application Server must be installed on a separate machine and configured for high availability.

5.2.1.3 Provide a Remote File System

Each of the procedures in this chapter requires that specific directories be shared to enable access from different computers.

Create the directory where the FME Server Core components will be installed and share it so that the other computers involved in the installation can access and write to it.

5.2.2 Perform the Installation

Note: *The computer that hosts the FME Server Core where jobs are sent and where jobs are queued from is referred to as the `<coreHost>`. The computer that hosts the Web Services is referred to as the `<webHost>`.*

5.2.2.1 Install the FME Server Core (Primary and Secondary)

Install the FME Server core—*on both the primary machine and the secondary machine*—by running the FME Server installer (`<coreHost>`).

1. Start the FME Server Installer.
2. Select the Custom install option.
3. On the Custom Setup dialog, be sure to select, at minimum, the FME Server Core Components.
4. Follow the remaining dialogs to complete the installation.

You might have to disable any firewalls that are running on this computer.

5.2.2.2 Create the FME Server Database on a Separate Database Server

This section provides instructions on how to configure FME Server to use a separate Database Server. Configuring Microsoft SQL Server, PostgreSQL and Oracle running on both Windows and Linux/UNIX are described.

> ***Note:*** *If you chose the Express Install option or selected to use the default FME Server Database Server with Custom Install then you already have all that is required to run FME Server and there is no need to read this appendix.*

Configuring FME Server to use a separate database server involves the following steps:

1. Database Configuration – This involves setting up FME Server database tables and database users with permissions to access the FME Server database.

   > ***Note:*** *The specific way to set up database tables and user permissions on various production databases may differ depending on the available database tools and intended target platform.*

2. Post-configuration scripts - These scripts enable the installed services, sample workspaces, and notification subscribers.

   > ***Note:*** *FME Server connects to the Database Server when it starts. Therefore, ensure that this Database Server is running before FME Server is started.*

<u>Database Configuration</u>

Microsoft SQL Server

It's assumed that SQL Server has been installed.

One notation used is `<FMEServerDir>`, which is the installation directory of FME Server. In Windows, this is typically `C:\Program Files\FMEServer`.

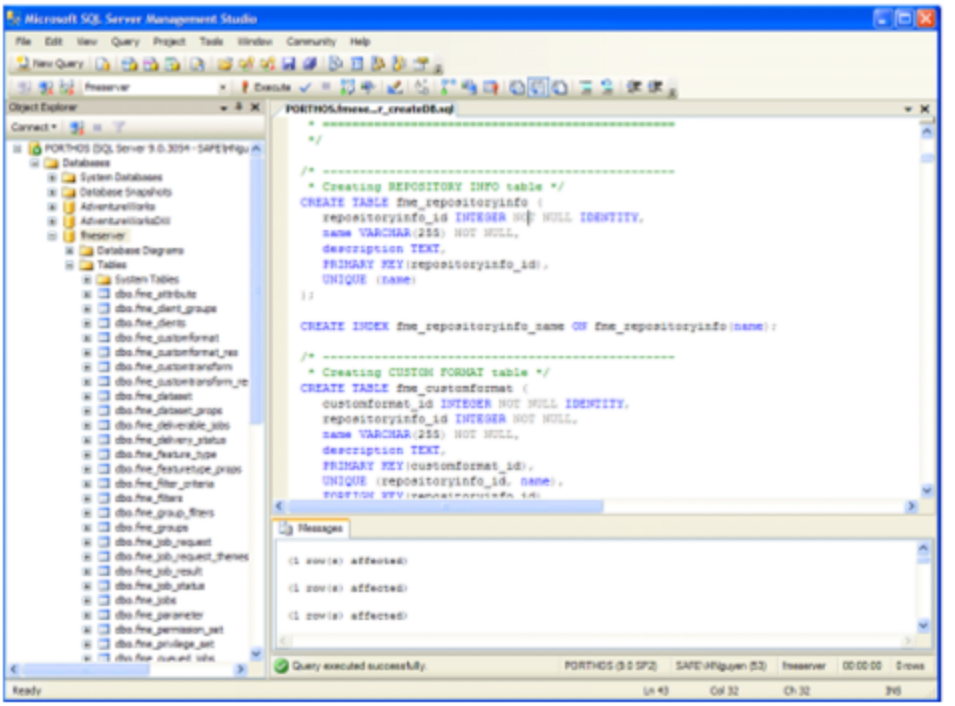
SQL scripts are provided to help with SQL Server database configuration. These SQL scripts are located in the <FMEServerDir>`\Server\-database\sqlserver\` directory.

If you are upgrading, you should back up any job history you want to keep. You will also need to drop the existing FME Server database using the following SQL scripts:

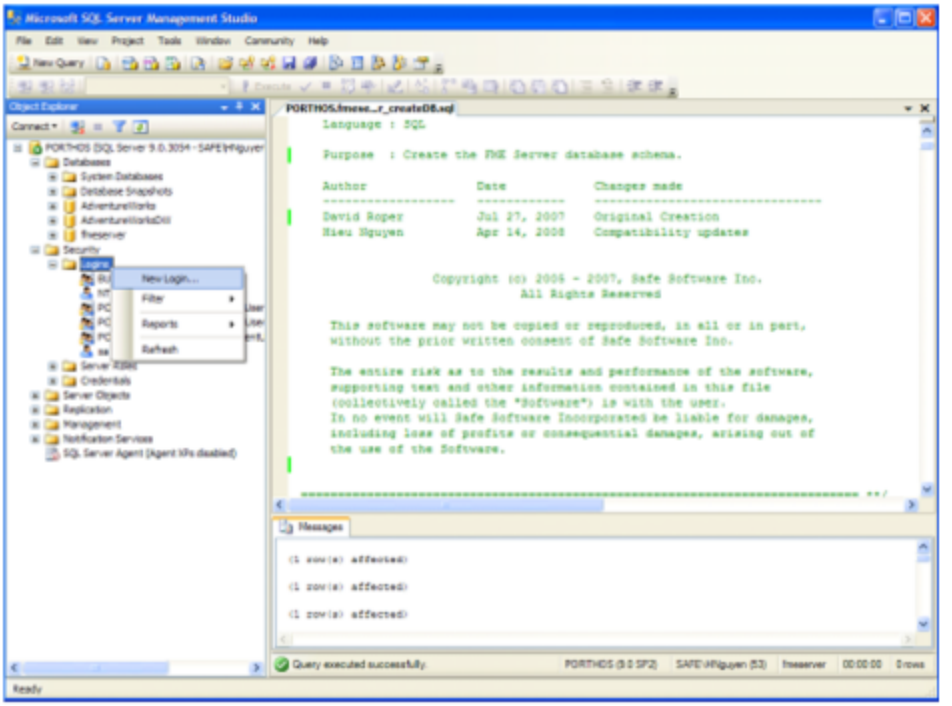
```
<FMEServerDir>\Server\database\sqlserver
  sqlserver_dropUser.sql
  sqlserver_dropDB.sql
```

The `SQLServer_createDB.sql` script creates the required FME Server tables.

1. Install Microsoft SQL Server if you haven't already.
2. Open the SQL Server Management Studio and connect to the SQL Server database engine.
3. Open `sqlserver_createDB.sql` and run the script against the `fme-server` database, as shown below:

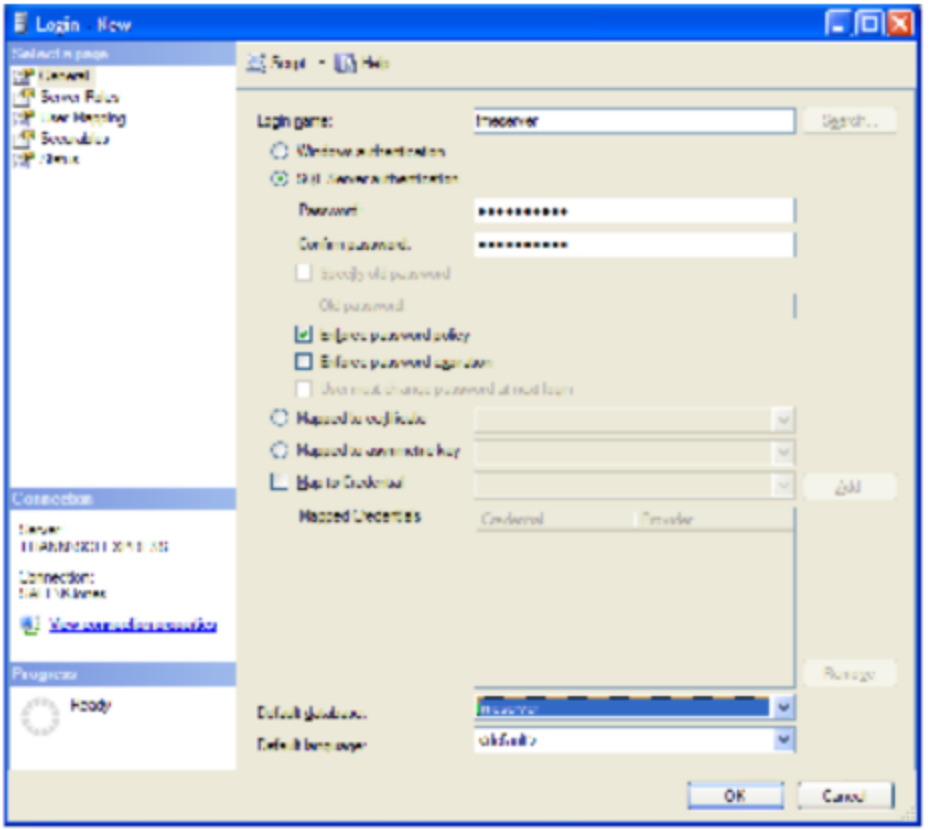


4. On the Object Explorer pane, expand the Security folder, right-click Login, and then select New Login:



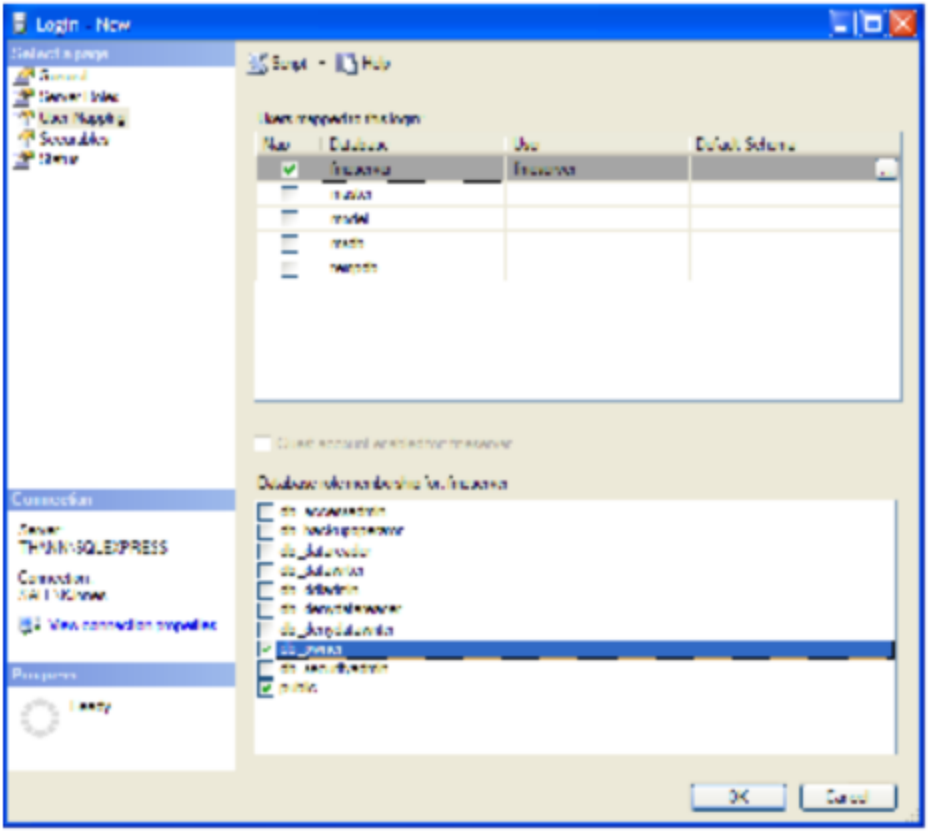
5. On the Login - New page, click General to open the page shown in the example below.
    - At the Login name field, enter `fmeserver`.
    - Make sure the option button is active for SQL Server authentication.
    - In the Password field enter the password of your choice, and in the Confirm password field enter the same password again.
    - Make sure the Enforce password policy is active. If not, click the checkbox to activate it.
    - If required, click the checkbox for Enforce password expiration to clear it.

- At the Default database field enter fmeserver.



6. On the same Login – New page, click User Mapping to open the page shown in the next figure.
    - At the Users mapped to this login location, in the Map column click the checkbox to activate it and map the login name to the `fmeserver` database.
    - At the Database role membership for location, notice that the fme-server database is specified and check `db_owner` to assign that role to this database.

- Click OK to close this page.



Oracle

It's assumed that Oracle database is installed.

One notation used is `<FMEServerDir>`, which is the installation directory of FME Server. In Windows, this is typically `C:\Program Files\FMEServer`.

If you are upgrading, you should back up any job history you want to keep. You will also need to drop the existing FME Server database using the following SQL script:

```
<FMEServerDir>\Server\database\oracle
```

`oracle_dropUser.sql`

Windows

This section describes how to configure an Oracle database. You can configure the Oracle database from other Oracle database tools depending on your personal preference.

For an Oracle database configuration, various SQL scripts are provided to help.

These SQL scripts are located in the `<FMEServerDir>\Server\database\oracle` directory.

- `oracle_createUser.sql` - This script creates FME Server database user and password, and grants all required permissions to the FME Server database user. By default, the user and password are both named fmeserver.
- `oracle_createDB.sql` - This script creates all FME Server related database packages, tables, indexes, views, and triggers.
- `oracle_dropUser.sql` - This script drops the FME Server database user and the database packages, tables, indexes, views, and triggers associated with the FME Server database user.

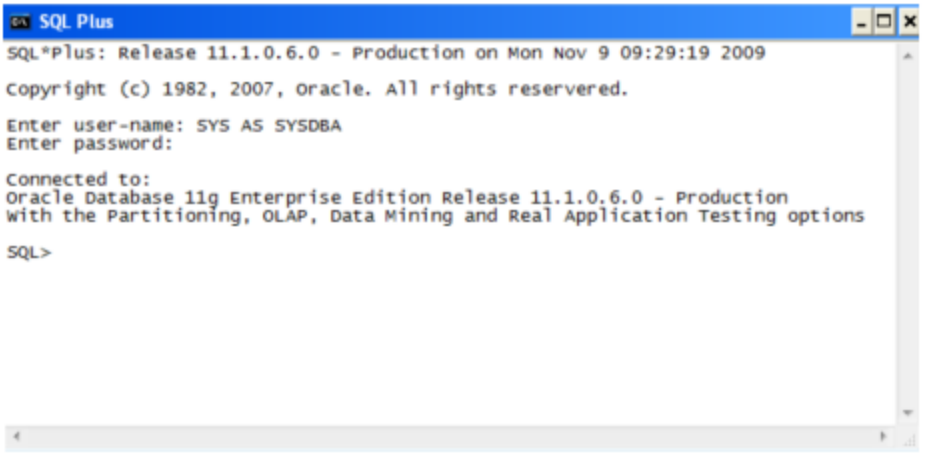
Using the Command Prompt

To use the command prompt to configure the database, follow these instructions:

1. Install Oracle SQL*Plus, if you haven't already.
2. Open Oracle SQL*Plus and log on as a user with adequate privileges, such as SYSDBA.

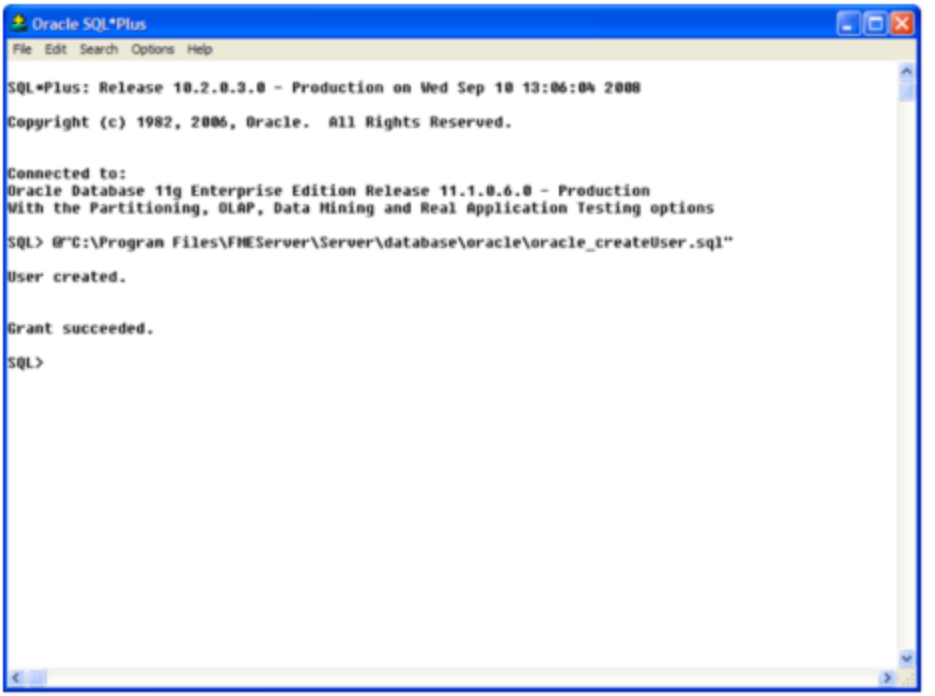
   In this example, the following parameters were used and entered:

   - User: SYS AS SYSDBA
   - Password: fmeserver
   - String: BD-ORACLE11G:1521/ORCL AS SYSDBA



3. Create an FME Server database user as follows:
   - From the SQL prompt, run the `oracle_createUser.sql` script by entering the following command:

     ```
     @"<F-
     MEServerDir>\Server\database\oracle\oracle_
     createUser.sql"
     ```



By default, the provided SQL script creates an FME Server database user named `fmeserver` with the password `fmeserver`. The default TABLESPACE is the Oracle DB configured default. If the created user doesn't have read/write permissions on the default TABLESPACE, change the default TABLESPACE or create an appropriate TABLESPACE.

This command creates a TABLESPACE on the Oracle DB server called FMESERVER shown in the following example:

```
CREATE SMALLFILE TABLESPACE FMESERVER
DATAFILE 'E:\ORADATA\FMESERVER01.DBF' SIZE
100000K REUSE AUTOEXTEND ON NEXT 2048K
MAXSIZE 1024M LOGGING EXTENT MANAGEMENT LOCAL
SEGMENT SPACE MANAGEMENT AUTO DEFAULT
NOCOMPRESS;
```

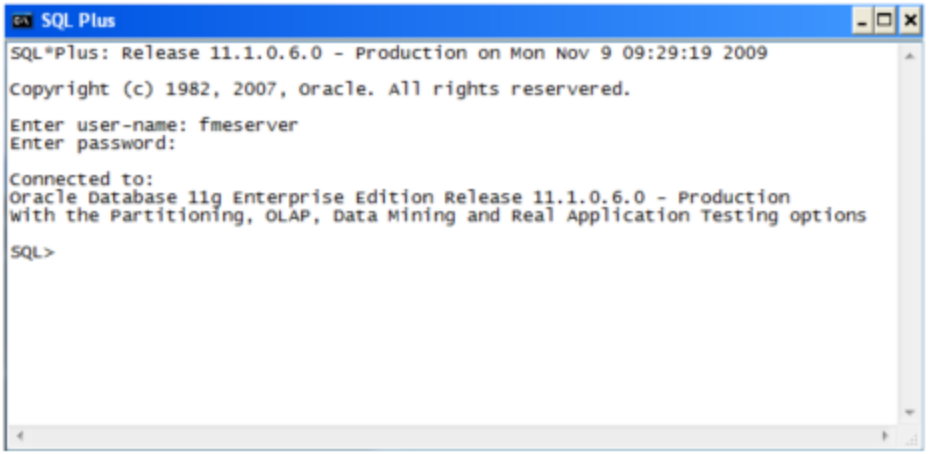
By default this command uses the TABLESPACE "FMESERVER" as shown in the following example:

```
CREATE USER fmeserver IDENTIFIED BY
fmeserver DEFAULT TABLESPACE "FMESERVER"
TEMPORARY TABLESPACE "TEMP";
```

4. When an FME Server database user is created, you can connect to it by logging on again to SQL*Plus.

   In this example, the following parameters were used and entered on the user interface:

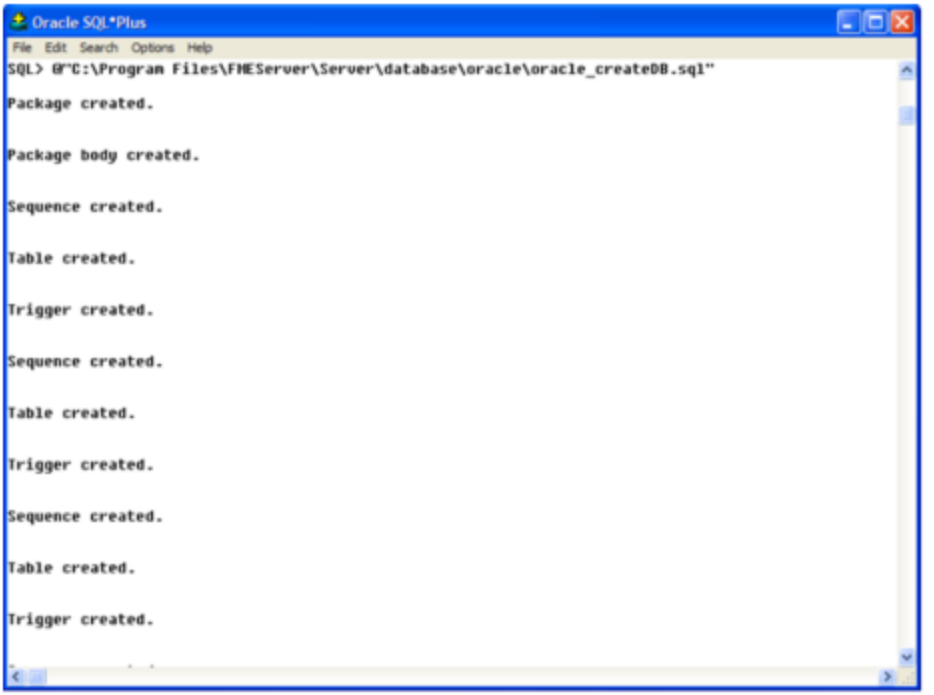
   - User: fmeserver
   - Password: fmeserver



Note: *The preceding example assumes your user name and password are fmeserver.*

5. When connected to the FME Server database, run the `oracle_createDB.sql` script by entering the following command:

   ```
   @"<FMEServerDir>\Server\database\oracle\oracle_
   createDB.sql"
   ```



Note: *If you drop the FME Server database and login user, run the* `oracle_dropUser.sql` *script.*

Linux

Oracle SQL*Plus is a freeware client for connecting to an Oracle database. You can download it from the Internet using the following address:

http://www.oracle.com/technology/software/tech/sql_plus/index.html

For more information, see the Oracle web site at:

http://www.oracle.com/technology/sample_code/tech/sql_plus/htdocs/demobld.html

As an FME Server Administrator, you may want to use an Oracle database with FME Server rather than the HSQL database, which is installed by default.

The instructions that follow describe how to configure Oracle for use with FME Server. These instructions describe using SQL*Plus for the database setup.

Depending on your personal preference, you can also configure the Oracle database using other Oracle tools.

For Oracle configurations, various SQL scripts are provided to help with Oracle database configuration. These SQL scripts are located in the `<FMEServerDir>/Server/database oracle/` directory.

- `oracle_createUser.sql` - This script creates FME Server database user and password, and grants all required permissions to the FME Server database user. By default, the user and password are both named fmeserver.
- `oracle_createDB.sql` - This script creates all FME Server related database packages, tables, indexes, views, and triggers.
- `oracle_dropUser.sql` - This script drops the FME Server database user and the database packages, tables, indexes, views, and triggers associated with the FME Server database user.

Using the Command Prompt

To use the command prompt to configure the database, follow these instructions:

1. Install the Oracle Client Tools, which includes SQL*Plus, if you haven't already.
2. Run `sqlplus` and log on as a user with adequate privileges, such as SYSDBA.

   For example:

   ```
   sqlplus SYS/<password>@<Host>:<Port>/<service> AS SYSDBA
   ```

3. Create an FME Server database user. From the SQL prompt, run the oracle_createUser.sql script by entering the following command:

   ```
   @"<FMEServerDir>/Server/database/oracle/oracle_createUser.sql"
   ```

By default, the provided SQL script creates an FME Server database user named fmeserver with the password fmeserver. The default TABLESPACE is the Oracle DB configured default.

If the created user doesn't have read/write permissions on the default TABLESPACE, you need to change the default TABLESPACE or create an appropriate TABLESPACE.

This command creates a TABLESPACE on the Oracle DB server called FMESERVER shown in the following example:

```
CREATE SMALLFILE TABLESPACE FMESERVER DATAFILE
'/ORADATA/FMESERVER01.DBF' SIZE 100000K REUSE
AUTOEXTEND ON NEXT 2048K MAXSIZE 1024M LOGGING
EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT
AUTO DEFAULT NOCOMPRESS;
```

By default this command uses the TABLESPACE "FMESERVER" shown in this example:

```
CREATE USER fmeserver IDENTIFIED BY fmeserver
DEFAULT TABLESPACE "FMESERVER" TEMPORARY
TABLESPACE "TEMP";
```

4. When an FME Server database user has been created, you can connect to it by logging on again to SQL*Plus or by entering the following command:

   ```
   CONNECT
   fmeserver/fmeserver@<Host>:<Port>/<service>;
   ```

5. When connected to the FME Server database, run the oracle_createDB.sql script by entering the following command:

   ```
   @"<FMEServerDir>/Server/database/oracle/oracle_
   createDB.sql"
   ```

PostgreSQL

PostgreSQL is an open source database that can be downloaded from the Internet. For more information, see the PostgreSQL web site at:

http://www.postgresql.com

It's assumed that PostgreSQL is already installed .

One notation used is *<FMEServerDir>*, which is the installation directory of FME Server. In Windows, this is typically `C:\Program Files\FMEServer`.

It's also assumed that you have JRE 5 or higher and PostgreSQL database installed before you proceed further. If you want to use the JDBC driver, there are several steps to perform.

If you are upgrading, you should back up any job history you want to keep. You will also need to drop the existing FME Server database using the following SQL scripts:

```
<FMEServerDir>\Server\database\postgresql
  postgresql_dropUser.sql
  postgresql_dropDB.sql
```

Windows

This section describes how to configure a PostgreSQL database. You can configure this database from other PostgreSQL database tools, depending on your personal preference.

For a PostgreSQL database configuration, various SQL scripts are provided to assist you. These SQL scripts are located in the following directory:

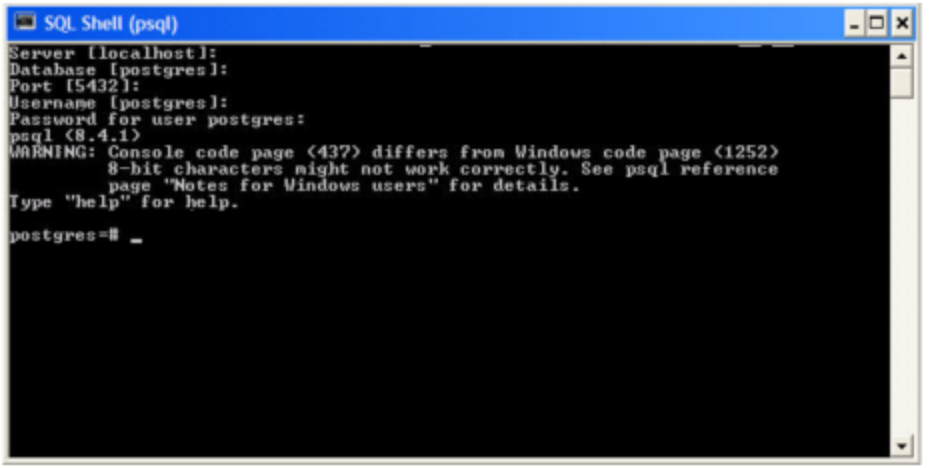
<FMEServerDir>`\Server\database\postgresql`

- `postgresql_createUser.sql` - This script creates the FME Server database user and password, and grants all required permissions to this user. By default, both the user and password are names fmeserver.
- `postgresql_createDB.sql` - This script creates the FME Server database.
- `postgresql_createSchema.sql` - This script creates all FME Server related tables, indexes, views, and triggers.
- `postgresql_dropUser.sql` - This script drops the FME Server database user.
- `postgresql_dropDB.sql` - This script drops the FME Server database.

Using the Command Prompt

To use the command prompt to configure the database, follow these instructions:

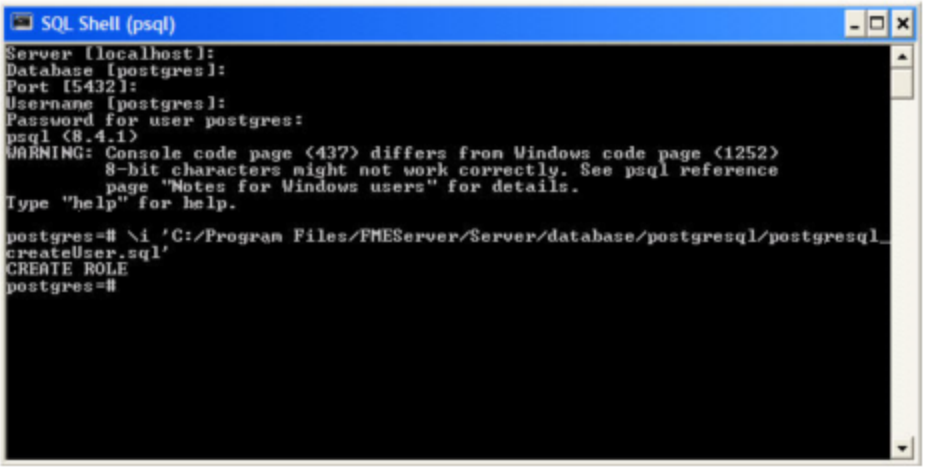
1. Install PostgreSQL SQL shell (`psql`) if you haven't done so already.
2. Open `psql` and log on as a user with the appropriate privileges:



3. Create an FME Server database user as follows:
   - From the SQL prompt, run the `postgresql_createUser.sql` script by entering the following command:

     ```
     \i
     '<FME-
     Server-
     DIR>/Server/database/postgresql/postgresql_
     createUser.sql'
     ```

   - By default, the provided SQL script creates an FME Server database user named fmeserver with the password fmeserver:

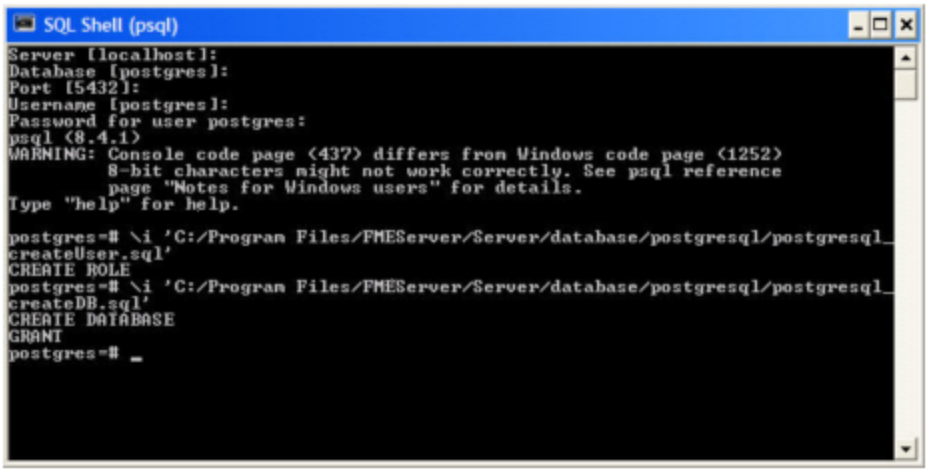


4. Create an FME Server database.

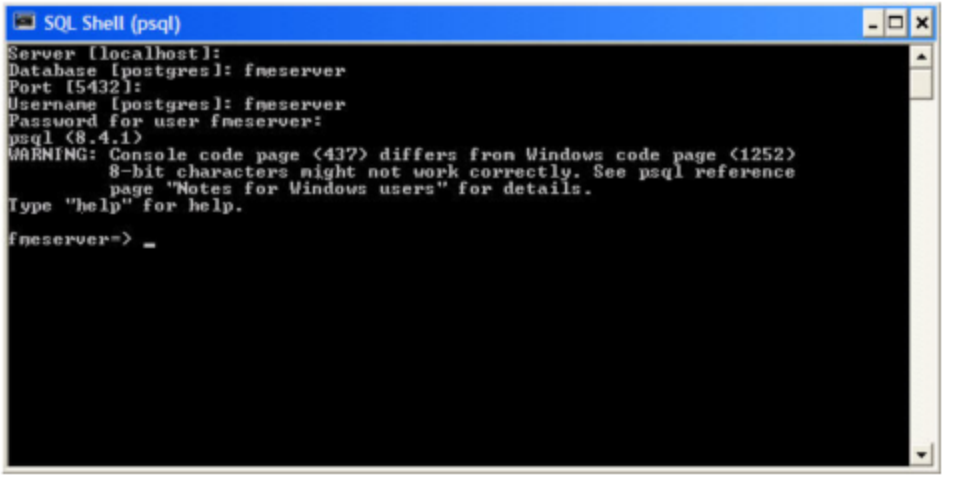
   From the SQL prompt, run the `postgresql_createDB.sql` script by entering the following command:

   ```
   \i
   '
   <FMEServerDIR>
   /Server/database/postgresql/postgresql_
   createDB.sql'
   ```

   By default, the provided SQL script creates an FME Server database named fmeserver and grants all privileges on the database to user fmeserver.



5. Quit `psql` and log on as the FME Server database user.



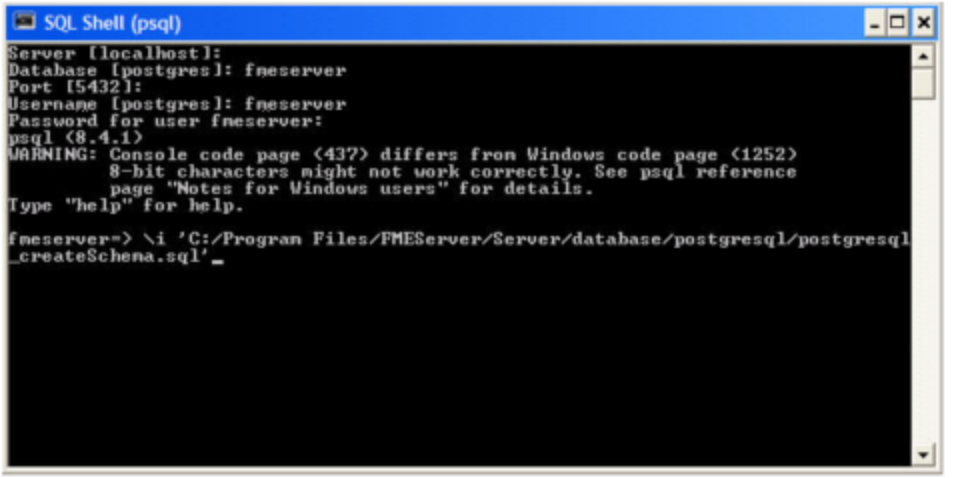
6. Create the FME Server database schema as follows:

   From the SQL prompt, run the `postgresql_createSchema.sql` script by entering the following command:

   ```
   \i
   '
   <FMEServerDir>
   ```

```
/Server/database/postgresql/postgresql_
createSchema.sql'
```

By default, the provided SQL script creates all FME Server related tables, indexes, views, and triggers.



Note: *The preceding example assumes your user name and password are fmeserver.*

Linux

This section describes configuring PostgreSQL from both the command prompt and a user interface, such as the PostgreSQL Query Browser and the PostgreSQL Administrator.

For PostgreSQL configurations, various SQL scripts are provided to help with PostgreSQL database configuration. These SQL scripts are located in the *<FME-ServerDir>*`/Server/database/postgresql/` directory.

- `postgresql_createUser.sql` - This script creates the FME Server database user and password, and grants all required permissions to the FME Server database user. By default the user is named **fmeserver** and the password is **fmeserver**.

- `postgresql_createDB.sql` - This script drops the FME Server database and creates a new one with the required FME Server tables. By default this database is named fmeserver. Be careful when running this script because it drops the existing FME Server database.
- `postgresql_createSchema.sql` - This script creates all FME Server related tables, indexes, views, and triggers.
- `postgresql_dropDB.sql` - This script drops the existing FME Server database, which is named fmeserver by default.
- `postgresql_dropUser.sql` - This script drops the FME Server database user.

Using the Command Prompt

To use the command prompt to configure the database, follow these instructions:

1. Install PostgreSQL Server if you haven't already.
2. Open a command prompt and change to the following directory, which contains the PostgreSQL SQL scripts:

   ```
   <FMEServerDir>/Server/database/postgresql/
   ```

3. Run the postgresql program with the postgresql_createDB.sql script:

   ```
   psql" -d postgres -h <hostname> -p <port> -f
   postgresql_createDB.sql
   ```

4. Run the postgresql program with the postgresql_createUser.sql script:

   ```
   psql -d postgres -h <hostname> -p <port> -f
   postgresql_createUser.sql
   ```

Note: *If you drop the FME Server database and login user, run the* `postgresql` *program with the appropriate* `postgresql_dropDB.sql` *or* `postgresql_dropUser.sql` *scripts.*

After Database Creation

After the database has been created, see Post-Configuration Scripts for an additional step.

Post-Configuration Scripts

After configuring the database, you must run three scripts to finish completing the installation. These scripts enable the installed services, sample workspaces, and notification subscribers.

1. Ensure that FME Server is running.
2. On Windows, run the following scripts:
   - Start menu > All Programs > FME Server > Install > Add Sample Workspaces
   - `<FMEServerDir>\Clients\utilities\addSubscribers.bat`
   - Start > All Programs > FME Server > Install > Enable Installed Services
3. On Linux, run the following scripts:
   - `<FMEServerDir>/Clients/utilities/configureDemoWorkspaces.sh`
   - `<FMEServerDir>/Clients/utilities/addSubscribers.sh`
   - `<FMEServerDir>/Clients/utilities/addServices.sh`

5.2.2.3 Install the FME Server Web Services

Note: *We recommend using the Default Web Application Server provided with FME Server.*

Although we recommend using the provided Web Application Server, you can use your own web application server for running FME Server's Java web services. You must know the port number on which your web application server receives incoming requests and the path to the directory where your web application server stores web application `.war` files. (This directory is sometimes called `webapps`.)

Supported web application servers include:

- Tomcat
- WebLogic

- JBoss

Note: *The OGC web services are not supported when using WebLogic.*

Windows

1. Start the FME Server Installer on the *<webHost>*.
2. Select the Custom Install.
3. On the Custom Setup dialog, select only the Web Services component for installation.
4. The installer prompts you for the name of the FME Server Host, enter the hostname of the *<coreHost>* computer
5. The installer prompts you for the path to the *<coreHost>* installation directory. Provide the path (UNC or mapped drive) to the *<coreHost>* installation directory you shared on the *<coreHost>* computer.

   The installer prompts you to install a Web Application Server.

   It is recommended that you use the FME Server Web Application Server and enter port 80 when prompted.

   If you have a Web Application Server already installed on this host, you can use it instead of the built-in FME Server version. In this case, it is recommended that you shut down the service during installation.

Linux

1. On the *<webHost>*, mount the FME Server installation directory shared on the *<coreHost>*:

   ```
   mount <coreHost>:<FMEServerDir>/home/FMEServer
   ```

2. Start the FME Server Installer.
3. Select the Custom install option.
4. At the feature selection dialog, select only the Web Services component.

   The installer prompts you for the name of the FME Server Host.

5. Enter the host name of the *<coreHost>* computer.

   The installer prompts you for the path to the *<coreHost>* installation directory.

6. Enter the path to the mounted directory.

   The installer prompts you to install a Web Application Server.

   We recommend that you use the FME Server Web Application Server and enter port 80 when prompted.

   > ***Note:*** *If you select port 80 or any port number less than 1024 for the built-in Web Application Server, start that service as root.*

   If you have a web application server already installed on this host, you can use it instead of the built-in FME Server version. In this case, it is recommended that you shut down the service during installation.

7. Manually start FME Server and configure it to start automatically.

   See "Configuring Start-up" on page 95.

8. In order for the Data Download and Data Streaming web services to reference the correct web host location when outputting results that are returned from an FME Engine, you must manually change this location in your FME Engine configuration files:

   a. Locate your FME Engine configuration files, under `<FME-ServerDir>\Server\fmeEngineConfig*.txt`

   b. For each file, under the SUB_SECTION for FILE_DOWNLOAD_SERVICE and STREAM_DOWNLOAD_SERVICE, modify the SUCCESS_RESPONSE directive as follows:

   From:

   ```
   SUCCESS_RESPONSE 0:Translation
   Successful|OutputLocation=!FME_AUTO_DIR_NAME!
   ```

   To:

```
SUCCESS_RESPONSE 0:Translation
Successful|OutputLocation=
<webHost>/DefaultResults/!FME_AUTO_DIR_NAME_
SIMPLE!
```

Following the installation on `<webHost>`, the FME Server Web Application Server automatically starts. If you used your own web application server, you can restart that service.

To verify the installation, see "Verify the Installation" on page 14 (Windows) or "Verify the Installation" on page 20 (Linux).

5.2.2.4 Install the FME Engines

Install the FME Engines by running the FME Server installer on another computer (`<engineHost>`). For more information, see "Install the FME Engines" on page 24.

> ***Note:*** *In a high availability environment, we recommend assigning unique names to FME Engines. However, if multiple FME Engine hosts have the same FME Engine name, the job routing server configuration applies to all FME Engines with the same name in the same way regardless of which host it resides on. For more information about job routing, see "Managing Job Distribution Between FME Engines" on page 28.*

Chapter 6 Licensing

This chapter provides information for licensing FME Engines. Instructions for configuring the number of FME Engines to run are also included.

If you used the express install option or chose to install a License Server with the custom install option, a FLEX*lm* license server is already installed. In that case, see "Request and Install a License" on page 65. If you want to install a separate external license server, see "Install a Separate License Server" below.

6.1 Install a Separate License Server

A FME floating license allows a networked license server to provide FME floating licenses to multiple FME users on a network.

You can use the floating license capability for all FME editions, and a single license server can serve different FME licenses. For example, if a site requires floating licenses for both FME Base Edition and FME Server Edition, you can serve both licenses from one floating license server.

Note: *The preceding paragraph does not apply to floating licenses with different expiry dates.*

If you need to transfer an existing floating license server to a different computer, install the floating license server on the new computer first, and then request a new license file from Safe Software.

6.1.1 Before You Begin

Ensure that the following requirements are met before beginning the installation:

- Ensure that you are running a TCP/IP network.
- Designate one computer on the network as the license server. The license server can be any computer on the network that is visible to all computers that are dependent on it for their FME licenses. Select a computer that is always running and always connected to the network, so that client computers can always communicate with the license server to get licenses for FME. The processing load on the licensing server is negligible.

- On Windows, ensure that you have administrator privileges to install the FME floating license server.
- If the computer you want to use as your floating license server has a firewall, open a range of ports through which the FlexServer can communicate. By default, the range of ports used is 27000-27009, although you can also configure other ports.
- If FLEX*lm* is already installed on your license server, you still need to perform a new installation. FME 2011 requires the version of FLEX*lm* that is included in the installer. In addition, if your organization is configuring license borrowing, use LMTOOLS version 11.8 or newer.

Note: *The FME license server cannot be installed on a virtual computer that might be moved around to different physical computers. It must be locked to a single fixed MAC address.*

6.1.2 Download and Run the Installer

6.1.2.1 Windows

You can download the installer from Safe Software's site:

http://www.safe.com/fme/fme-technology/fme-server/download/

On the computer that acts as the license server:

1. Run (double-click) the installer to create a FlexServer directory.

   The following table lists the shortcuts that are created in the Safe Software program group.

Shortcut	Description
Generate hostid.txt	Creates text file to send to codes@safe.com.
Launch LMTOOLS	Launches LMTOOLS. Used for debugging or changing configuration.

Shortcut	Description
License Administration Guide	Opens Flexera Software's License Administration Guide.
Start - Restart FME License Server	Starts the license manager process.
View FME License Server Log	Opens the license manager log file. Used for debugging.
View hostid.txt	Reopens text file to send to codes@safe.com.
View Readme	Opens the installation and configuration instructions.

Note: *Current versions of* `lmgrd` *license manager and* `lmutil` *end user utilities are also available from the Downloads area of* *www.flexera.com*.

6.1.2.2 Linux/UNIX

Locating the FLEX*lm* License Server Files

Read and understand the following steps before attempting to use FLEX*lm* licensing on Solaris™ or Linux on x86 and x64.

If you purchased an FME floating or single-fixed license for UNIX, copy the `solaris2\FlexServer` or `Linux\FlexServer` directories from the FME installation disk, or go to Safe Software's FTP site and save one of the following files:

- `ftp://ftp.safe.com/fme/floatingLicense/FlexServer11_8-linux-x64.tar.gz`
- `ftp://ftp.safe.com/fme/floatingLicense/FlexServer11_8-linux-x86.tar.gz`
- `ftp://ftp.safe.com/fme/floatingLicense/FlexServer11_8-solaris-sparc64.tar.gz`

This directory contains the `lmutil` and `lmgrd` files required to set up a FLEX*lm* server on UNIX, and it contains the FLEX*lm* license server software. Install this

software on your license server computer, which is the computer that manages the licenses.

Note: *Current versions of* `lmgrd` *license manager and* `lmutil` *end user utilities are also available from the Downloads area of* www.flexera.com.

Creating a Directory for the FLEX*lm* License Server

Create a directory for the FLEX*lm* license server, and extract the contents of `flexServer11_8-solaris-sparc64.tar.gz` or `flexServer11_8-linux-x64.tar.gz` into that directory. For example:

```
% mkdir /opt/FlexServer
% cd /opt/FlexServer
% gunzip < ~/flexserver11_8-solaris-sparc64.tar.gz |
tar xf -
```

This directory is referred to as the *FlexServer directory* for the remainder of these instructions.

Starting the License Server

Note: *To start the Flex Server, verify that the* `/usr/tmp` *directory exists. If it does not exist, create it by entering:*

```
% mkdir /usr/tmp
```

To start the license server, enter:

```
% <FlexServerDir>/lmgrd -c <FLEXServerDir>/safe.lic
```

This action runs the server in the foreground, logging activity to the terminal. To store the log to a file instead, use the `-l` option:

```
% ./lmgrd -c ./safe.lic -l safe.log
```

When a log file is used, `lmgrd` detaches as a background process, so there is no need to explicitly put the application in the background . However, you must start the server each time the license server host is rebooted. The system

administrator can make sure the preceding command is run at system start-up time.

6.2 Request and Install a License

6.2.1 Windows

On the computer that acts as the license server:

1. Open your hostid.txt file:

   Click Start > Programs > FME Server > Install > Generate hostid.txt

2. Complete the online license request form:

   http://www.safe.com/activation/floating/

   You will need either:

   - A trial activation code (e.g. EDHAKQ5W) or
   - A product serial number (e.g. BEGP-F7MG-21YL).

   Note: *If you don't have a trial activation code or product serial number, please email your hostid.txt file to codes@safe.com*

3. You will receive an email with instructions for installing the license:

   a. Save the safe.lic:

   - <FMEServerDir>\Utilities\flexserver\safe.lic

   b. Restart FME Server and FME License server:

   - Start Menu > Programs > FME Server > Windows Service > Restart

If you are using the built-in FME Server License Server, the following start menu items apply:

- Start > All Programs > FME Server > Install > View hosted.txt
- Start > All Programs > FME Server > Windows Service > Restart

6.2.2 Linux/UNIX

6.2.2.1 Providing the Information to Generate a Floating License

Safe Software requires three pieces of information to generate a floating or node-locked license:

- Hostname
- Host ID
- FME serial number

The following sections provide details about these requirements.

Obtaining the Hostname

To obtain the hostname, type the `hostname` command. For example:

```
% hostname
worf
```

In this example, the host name is `worf`.

Determining the Host ID

To determine the host ID, use the `lmutil lmhostid` command within the `FlexServer` directory. The output is an eight-character alphanumeric string (or a 12-character alphanumeric string on Linux/UNIX). For example:

```
% ./lmutil lmhostid
lmutil - Copyright (c) 1989-2009
The FLEXlm host ID of this computer is "807abc12"
```

In this example, the host ID is `807abc12.`

Determining the FME Serial Number

To determine the serial number, look at your welcome letter or your invoice.

Send an email message to codes@safe.com, and include the host ID, the host name, and the FME serial number. Safe Software will email you a file called `safe.lic` that contains the key code file for the license code server.

Copy the `safe.lic` file into the `FlexServer` directory on your license server computer.

Note: *The filename must remain in lower case text. We recommend that you do not change the filename. If you want to change the file contents (for example, change a port number), refer to the FLEXlm User's Guide, available on your FME installation disk.*

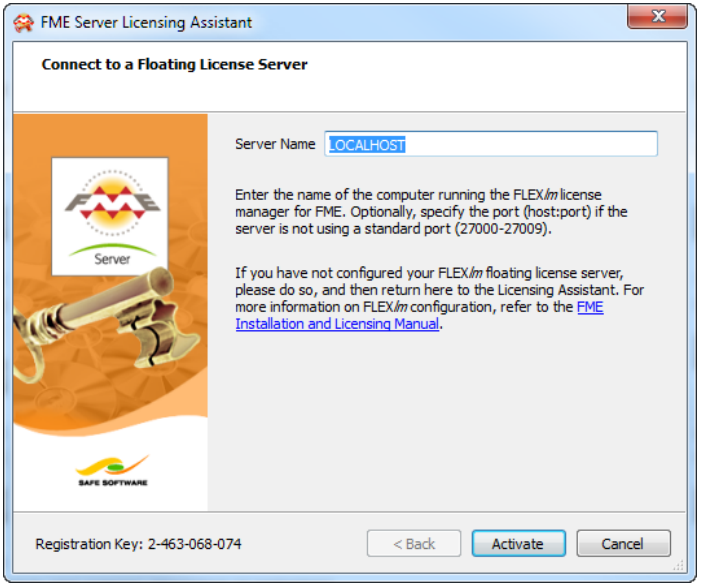
If you are using the built-in FME Server License Server, the License Server directory is:

```
<FMEServerDir>/FMEServer/Utilities/flexserver
```

6.3 Configuring FME Server to Use a License Server

6.3.1 Windows

1. To open the FME Licensing Assistant, click Start > Programs > FME Server > Licensing > FME Licensing Assistant.



2. Enter the name of the computer that is hosting the FME licenses.

FME Server requires an Engine license and takes that type automatically. If no Engine licenses are available, FME Server cannot be licensed.

3. Click Activate to complete the connection.

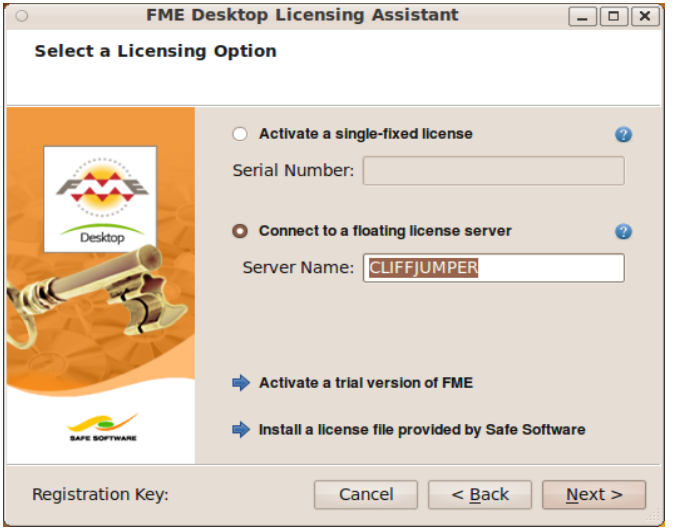
You must restart FME Server to use the license. See "Starting and Stopping FME Server" on page 13 for details.

6.3.2 Linux

6.3.2.1 From the graphical user interface

1. When FME Server is installed on Linux, log in as the same user who installed FME Server.
2. Navigate to Applications > FME Desktop > Administration Tools > FME Licensing Assistant.

   The FME Licensing Assistant opens.
3. On the FME Licensing Assistant, select Connect to a floating license server button.



4. In the Server Name field, enter the name of the license server, and then click Next.

   FME Server requires an Engine license and takes that type automatically. If no Engine licenses are available, FME Server cannot be licensed.

6.3.2.2 From the command line

1. Open a terminal window.
2. Change to the FME Engine directory:

   ```
   cd <FMEServerDir>/Server/fme
   ```

3. Run the following command to configure the FME Engines to use the License Server:

   ```
   ./fmelicensingassistant --floating
   [LicenseServerHost> server
   ```

6.3.3 UNIX

6.3.3.1 To license an installation of FME Server on UNIX

1. Create a text file called `fme_license.dat` in `<FMEServer>/Server/fme/licenses`.

   There might be a template file already in this directory called `flexlm_config.dat.template`. If so, you can simply rename this file to `fme_license.dat`. This is the file that tells FME which computer to connect with when looking for license information.

2. Edit the file that contains the following information:

   ```
   SERVER <ServerHostName> Any
   USE_SERVER
   ```

   where `<ServerHostName>` is replaced by the name of your floating license server computer. (This might or might not be the same computer.)

   In the previous examples, the license server was installed onto a host named `worf` on a local network, using the default port number. The following command uses this example to create the needed license file.

```
% cd /opt/fme
% cat > fme_license.dat
SERVER worf Any
USE_SERVER
<Ctrl+d>
```

(Typing `Ctrl+d` ends the input to `fme_license.dat`.)

3. Restart FME to use this license.

   See "Starting and Stopping FME Server" on page 13 for details.

   Note: *Any examples shown here are simple configurations based on default port numbers. However, FLEXlm allows you to set up other configurations, as well as specify locations for the license server using environment variables. If you want to do this, skip the following procedure and refer to detailed instructions in the FLEXlm User's Guide.*

6.4 Configuring the Number of FME Engines to Start

FME Engines connect to an FME Server Core and process requests from the Core. Adding FME Engines connected to the Core increases its ability to perform concurrent processing of requests.

The number of licensed FME Engines you can add is limited only by the host's CPU and memory resources which constrain the maximum concurrent request throughput.

By default, FME Server is configured to start two FME Engines, if two licenses are available. If only one license is available, only one FME Engine starts.

The following method is available for adding an FME Engine to an existing FME Server installation. It is applicable to Windows, Linux, and UNIX.

6.4.1 Editing the Process Monitor Configuration

To add an FME Engine by editing the Process Monitor configuration:

1. Open the following file using a text editor:

   ```
   <FMEServerDir>\Server\processMonitorConfig.txt
   ```

2. Add a new FME Engine by locating and commenting out the two lines that start with:

   ```
   CMDFMEEngine_Engine3=...
   WAITFMEEngine_Engine3=...
   ```

   Similarly, if you would like to remove an FME Engine, you can comment out these lines.

3. Save and close the file.
4. Restart FME Server.
5. You can confirm that the FME Engines are licensed and running using the Web User Interface and the instructions in "Verify the Installation" on page 14.

Chapter 7 Upgrading FME Server

This chapter provides information for upgrading to newer versions of FME Server on Microsoft Windows, Linux, or UNIX platforms. The basic steps are:

- Back-up your configuration.
- Uninstall FME Server.
- Install the newer version.
- Replace your configuration.

Details about upgrading only FME Engines are also included in this chapter.

7.1 Full FME Server Upgrade

7.1.1 Backup Configuration

This section explains how to back up your FME Server 2012 repository, job history, and any customizations you have done.

Note: *For information on backing up FME Server versions 2013 and later, see "Backing Up an FME Server Configuration" on page 113*

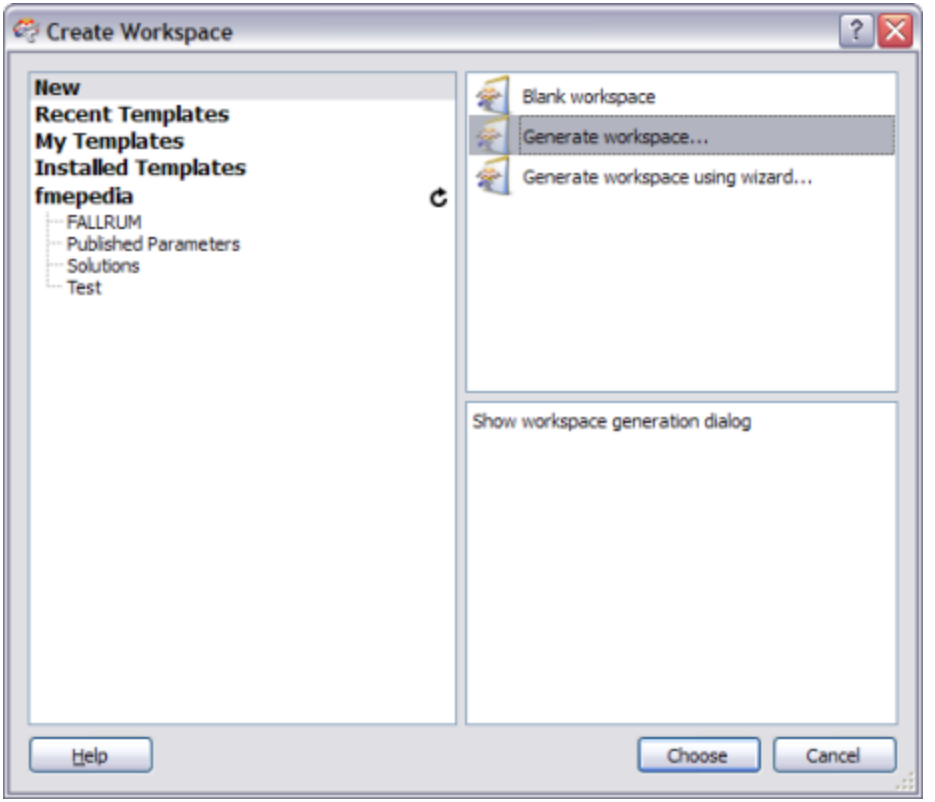
7.1.1.1 Export Repositories

You can use the FME Server Repository Reader/Writer in FME Workbench to back up and restore your existing workspaces, data, and templates. Use FME Desktop 2012 to back up your FME Server 2011 repository and restore it to FME Server 2012.

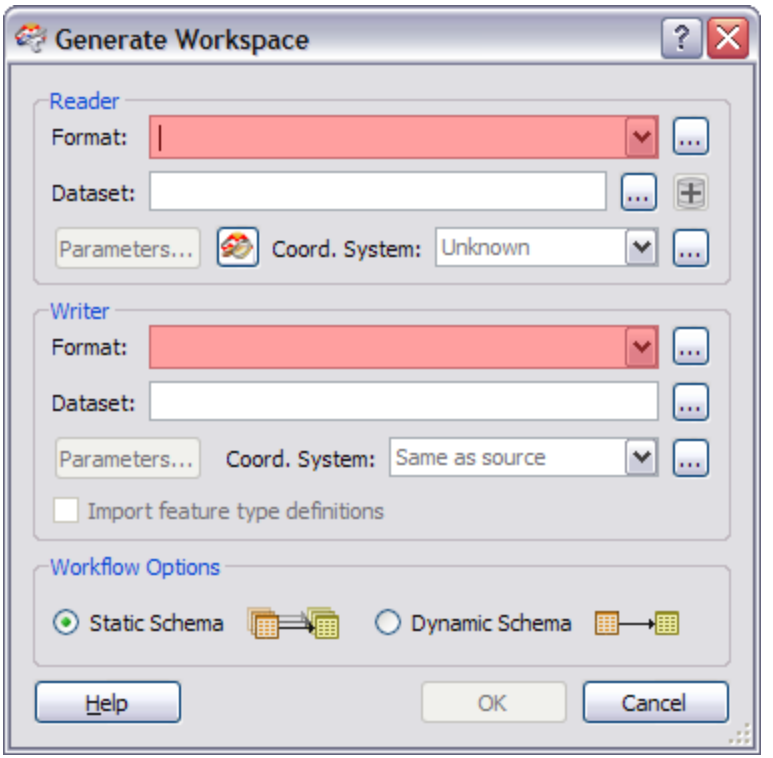
The following procedure does not back up the FME Server job history in the database.

To back up your FME Server repository from Workbench:

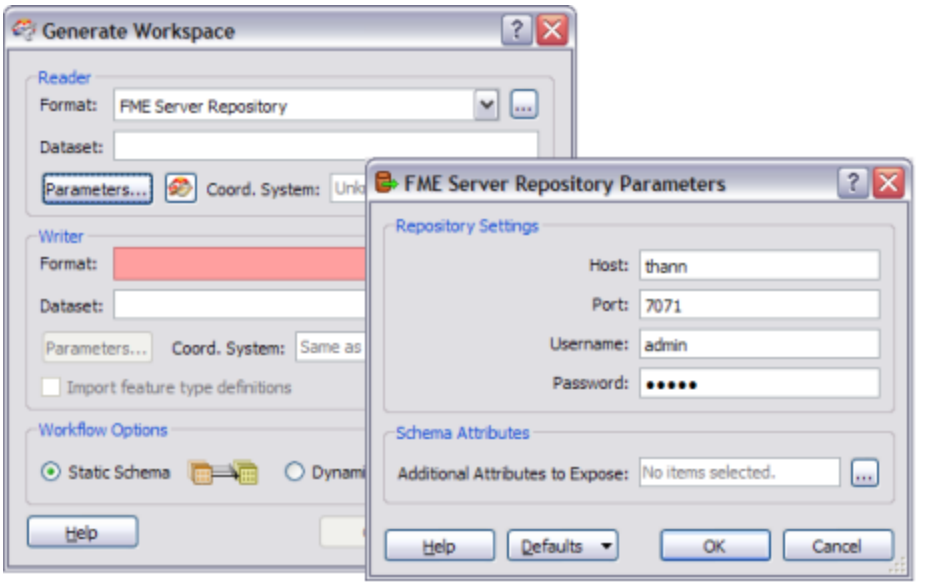
1. Start FME Workbench 2012.
2. Create a new workspace by selecting File > New.
3. In the Create Workspace dialog, select Generate workspace and click Choose.



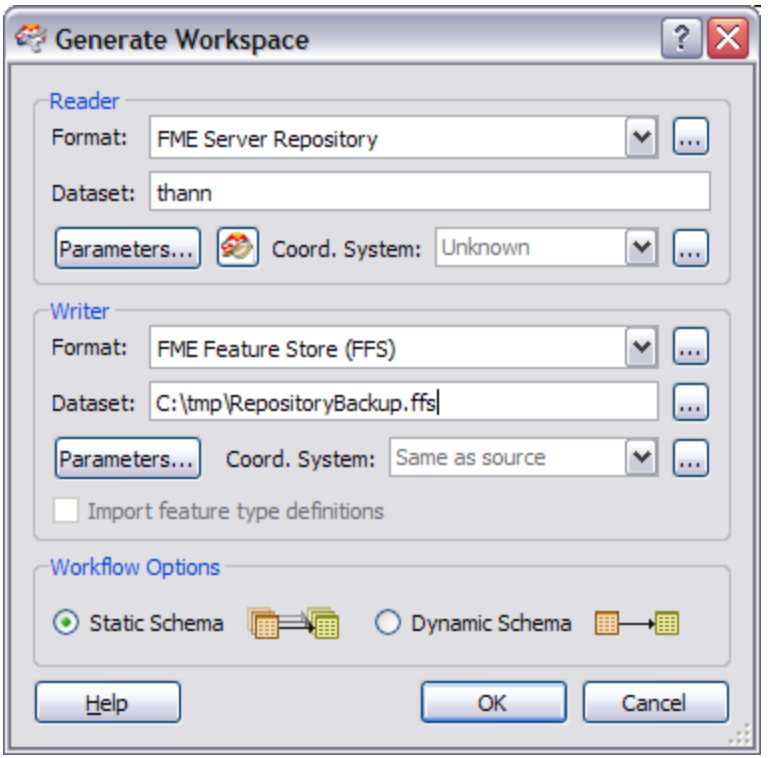
The Generate Workspace dialog opens.



4. Select FME Server Repository as the Reader Format, and click the Reader Parameters button to display the Repository parameters dialog.

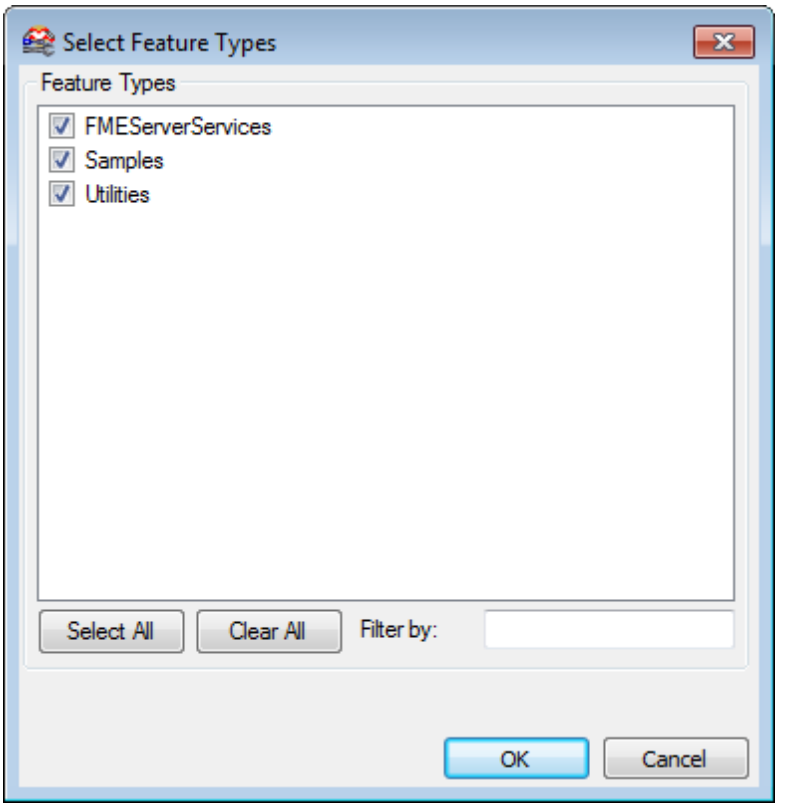


5. Enter the information required to connect to a running FME Server, and then click OK.
6. Select FME Feature Store (FFS) as your Writer Format, and enter a Writer Dataset file path to the FFS file where you want to store the backup.



7. Click OK.

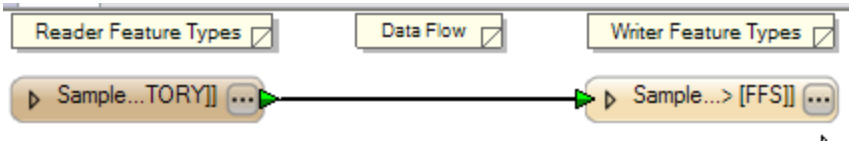
   The Select Feature Types dialog opens.



Each feature type represents an FME Server repository. The FMEServer Services feature type contains the workspace service registration information, which you should keep, in most cases.

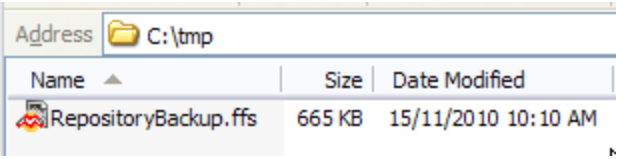
8. Select the feature types (repositories) you want to export, and then click OK.

   The initial workspace opens.



Note: *When the workspace is created, you can still remove repositories that you do not need to export. Select them in the workspace, and then click Delete.*

9. Click to run the workspace.
10. When the translation completes, navigate to the Writer Dataset file path to see the results:



Note: *For instructions for restoring your repository after you upgrade FME Server, see* *"Restore Configuration" on page 82*.

7.1.1.2 Backing Up User Accounts, Topics and Subscriptions

Currently, there is no way to back up and replace user accounts, roles, topics, subscriptions or configured resources. Make a note of your existing set-up, so you can reconfigure it after the upgrade.

Backing up the Web User Interface Configuration Files

This section applies if you have customized the appearance of any of the FME Server web pages.

FME Server administrators can configure the cascading style sheets (CSS), JavaServer pages (JSP), or HTML template provided with FME Server. Upgrading FME Server overwrites these files. These files may be stored in the following locations:

- JavaServer pages:

  <Web App Install DIR>\webapps\<webApp>\styles\WEB-INF\jsp*

- Cascading Style Sheets:

  <Web App Install DIR>\webapps\<webApp>\styles

All files installed by FME Server in your web server public root directory are removed on uninstall.

Backing Up the Service Configuration Files

Often, when configuring the FME Server services, changes are made to the `propertiesFile.properties` files. FME Server overwrites these files before install, so be sure to back them up:

```
<webAppDir>\webapps\<Servlet name>\WEB-
INF\conf\propertiesFile.properties
```

Backing Up the FME Server Configuration Files

It is a good idea to back up the various configuration files that are used by FME Server, in case you need to refer to them later:

- *<FMEServerDir>*`\Server\processMonitorConfig.txt`
- *<FMEServerDir>*`\Server\fmeServerConfig.txt`
- *<FMEServerDir>*`\Server\fmeEngineConfig_#.txt`

7.1.2 Backup History

7.1.2.1 Job History

You can preserve the FME Server job history when upgrading FME Server, if desired.

Create and run a workspace that reads the following tables directly from your repository database and writes to FFS:

- fme_jobs
- fme_job_result
- fme_job_request

Note: *If you are using the Default Database Server, connection information can be found under 'Database Connection' in the fmeServerConfig.txt file, located in the Server folder of your FME Server installation directory.*

Log Files

To preserve the log files, make a backup of the `<FMEServerDir>\Logs` directory.

7.1.3 Uninstall

After you back up your repository and any configurations and before you install the newest FME Server version, you must uninstall the previously installed version of FME Server.

7.1.3.1 Stopping FME Server and the Web Application Server

For the uninstall process to complete properly, you must first stop both FME Server and your web application server:

To stop FME Server:

- For Windows environments, select Start > All Programs > FME Server > Windows Service > Stop.
- For Linux/UNIX environments, run the `stopServer.sh` script in `<FME-ServerDir>/Server`. It should display:

```
Shutdown status = Shutdown Success
```

The procedure for stopping the web application server depends on which one you have installed. For further information, refer to the documentation for your application server.

For the uninstall process to complete properly, you must first stop both FME ServerIf you installed FME Server using the "Express Installation for Windows" on page 11:

- For Windows environments, select Start > All Programs > FME Server > Windows Service > Stop.

Note: *If you have not used the Express Installer and have used an existing Web Application Server and another repository database option, please shut down those services in addition to FME Server service before uninstalling.*

7.1.3.2 Uninstalling Previous Versions of FME Server

Uninstall the previous version of FME Server:

- For Windows environments, uninstall FME Server through the Control Panel.
- For Linux/UNIX environments, remove the following:
  - Your FME Server directory
  - All FME `.war` files and their associated FME servlet directories from the web application deployment directory of your application server
  - The `fmedatadownloadresults` directory from your web server public root directory, if it exists

7.1.4 Install

Depending on your operating system, perform the installation and licensing procedures in the following sections:

- For Windows environments, see the Windows section in "Express Installation for Windows" on page 11.
- For Linux/UNIX operating environments, see the Linux/UNIX section in "Performing the Installation for Linux/UNIX" on page 17.

7.1.5 Restore Configuration

Perform the following procedure to use FME Workbench to restore the repository data that you backed up previously. See "Backup Configuration" on page 73.

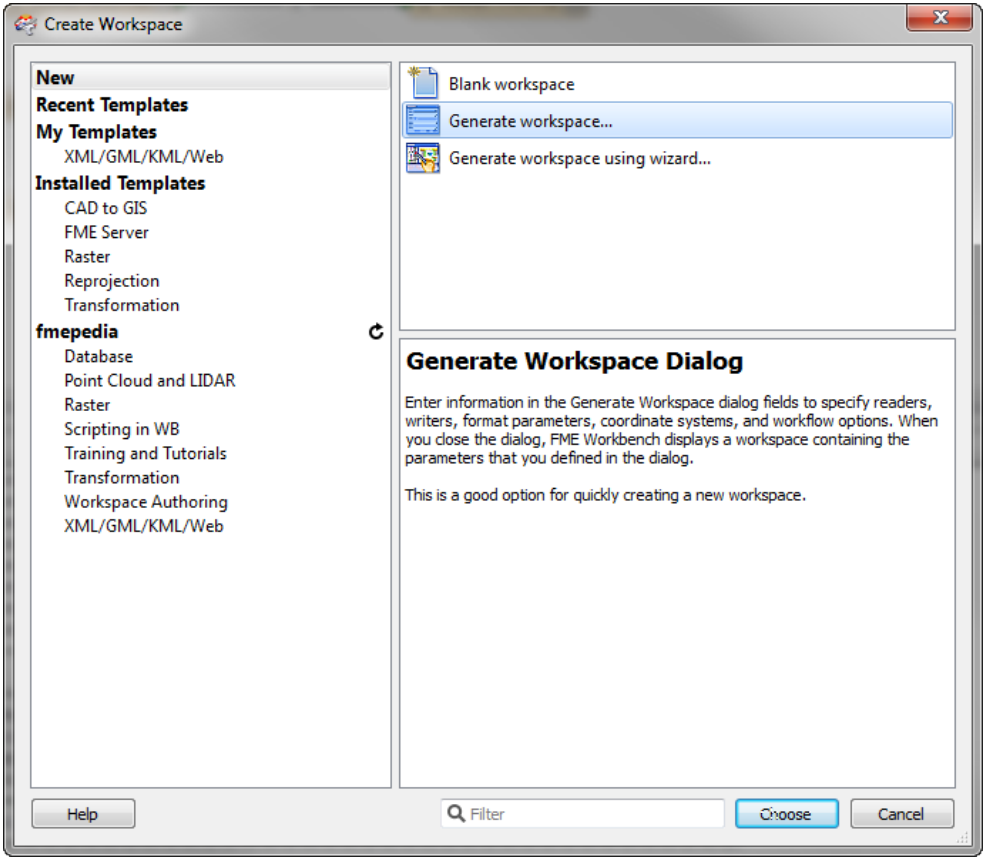
Note: *This procedure assumes that you are using FME Desktop 2013 to restore a repository to FME Server 2013. For instructions for other scenarios, contact fmeserversupport@safe.com.*

For Linux/UNIX users, a Windows FME Desktop is required for these steps.

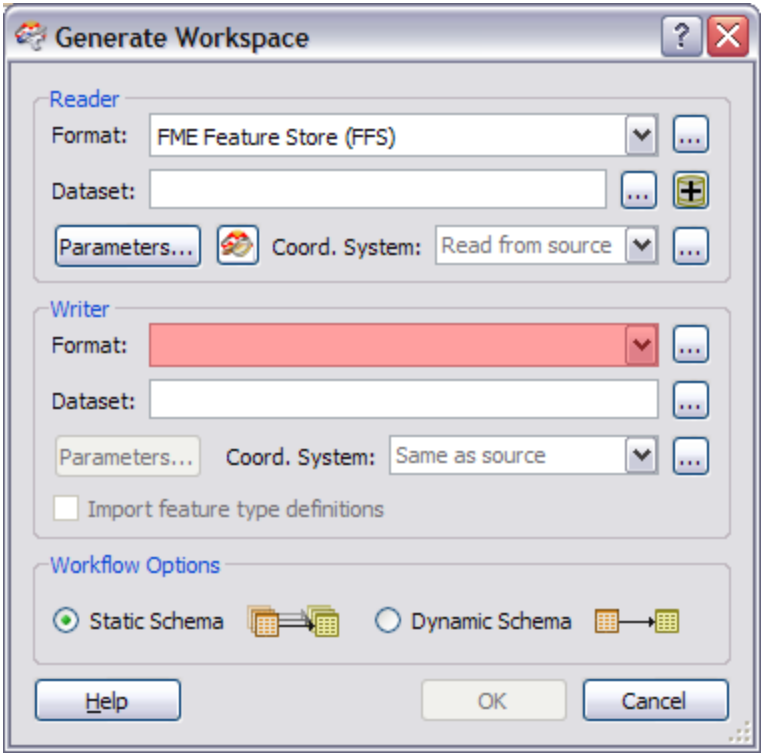
1. Start FME Workbench.
2. Select File > New.

3. Select Generate workspace.

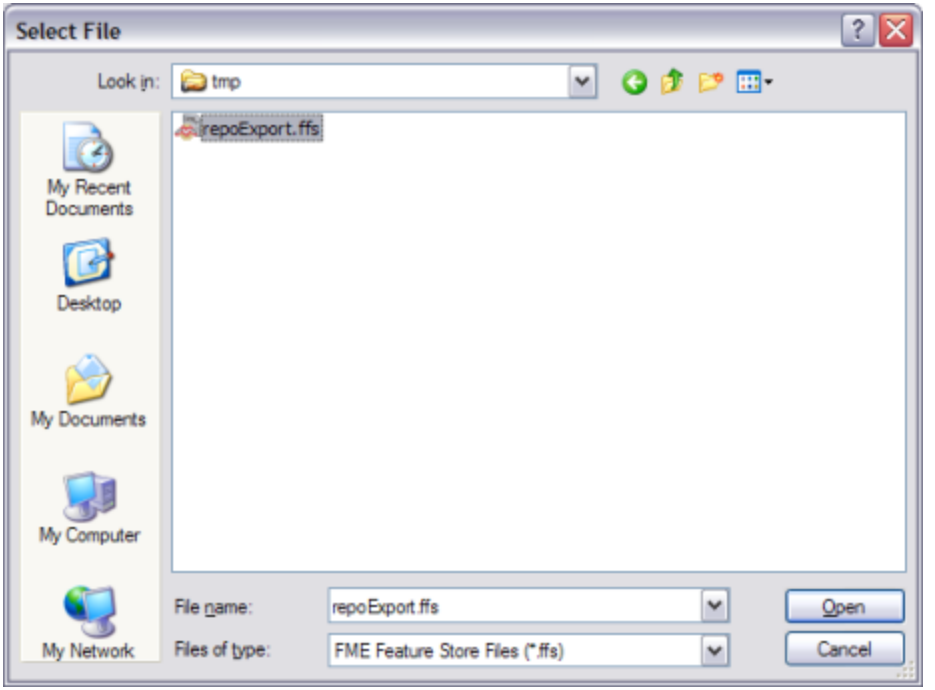
   The Create Workspace dialog opens.



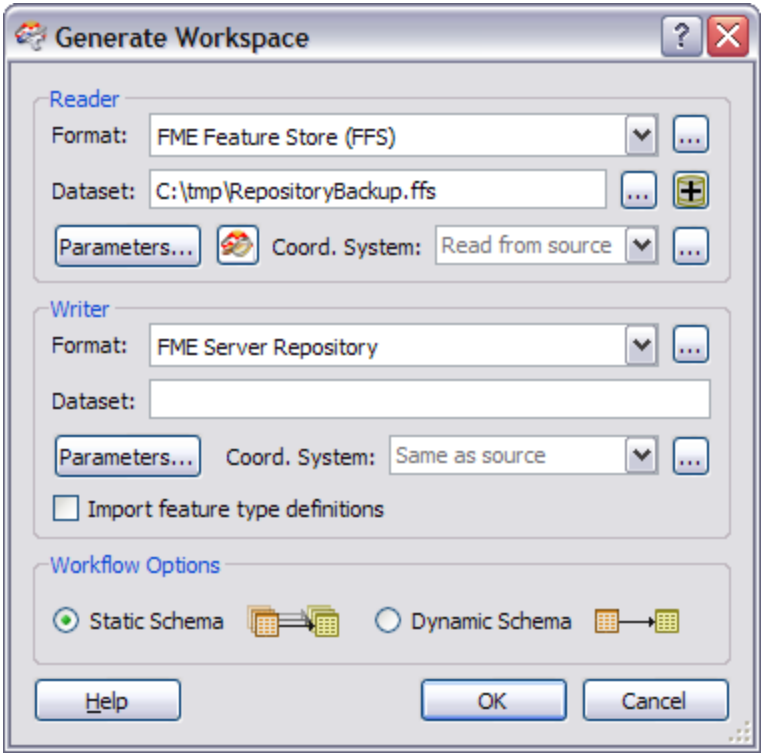
4. Click Choose to open the Generate Workspace dialog.



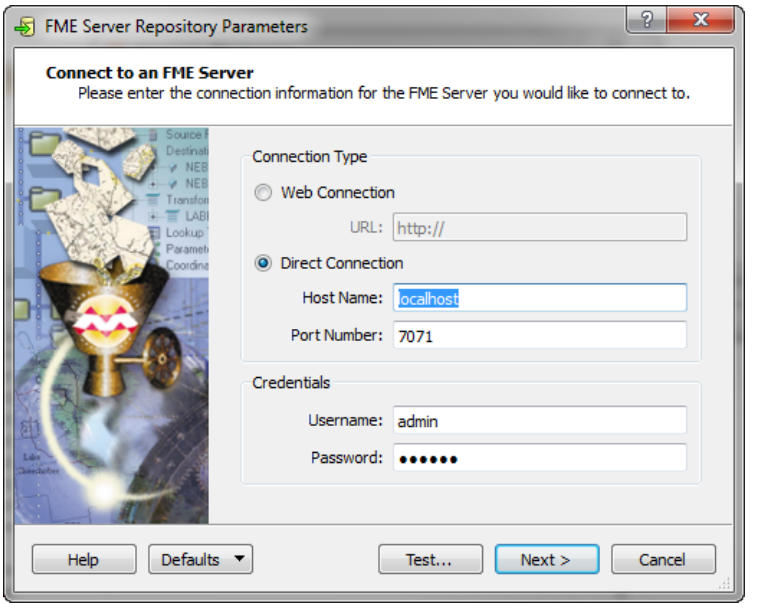
5. Select FME Feature Store (FFS) as your Reader Format.
6. Click ... to open the Select File dialog.



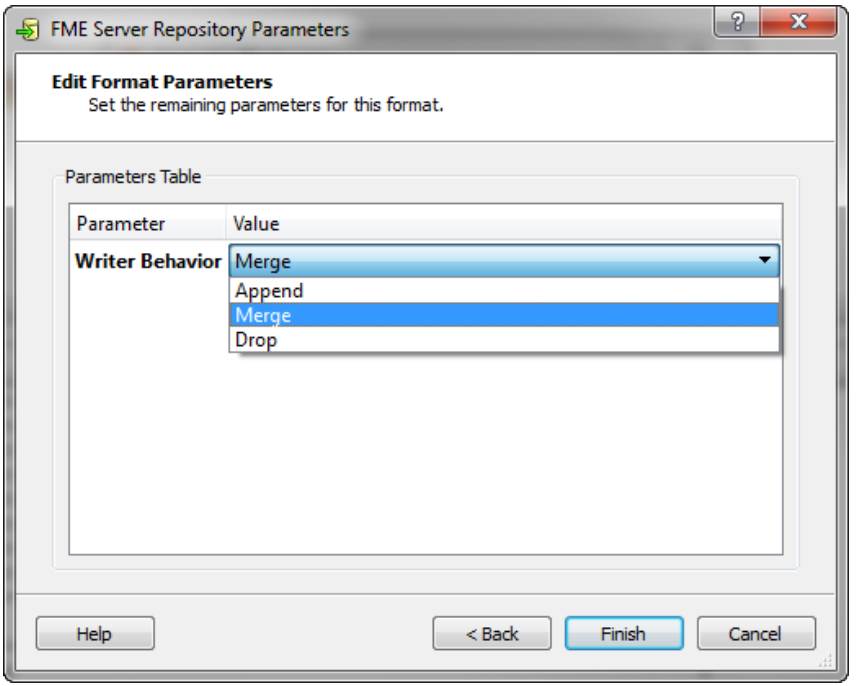
7. Select the FME Feature Store (FFS) files containing the FME Server repositories that you want to import, and then click Open.



8. In the Generate Workspace dialog, select FME Server Repository as the Writer Format.
9. Click the Writer Parameters button to open the Repository Parameters dialog.



10. Specify the information required to connect to your running FME Server, and then click Next.



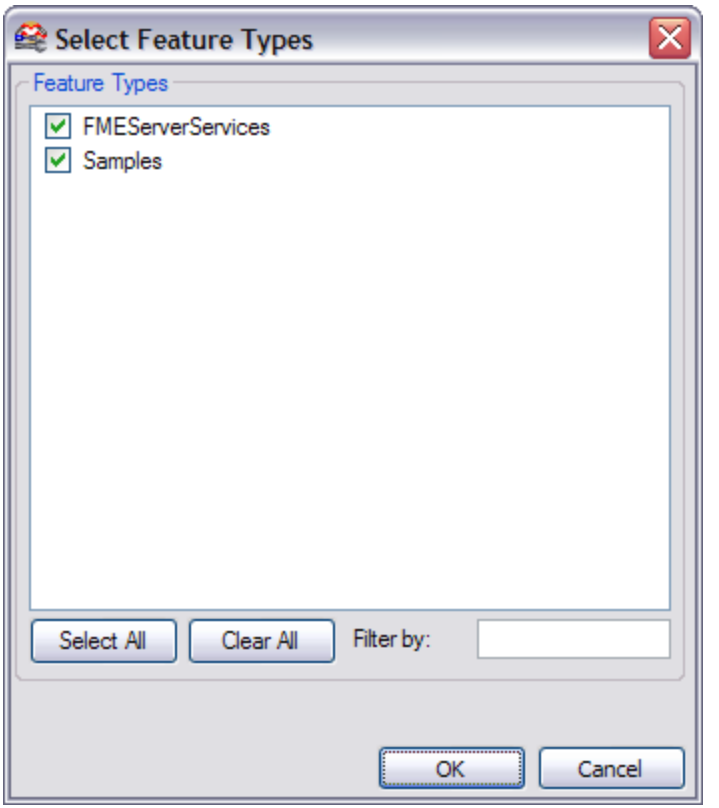
11. Specify the action to be taken when a repository, item, or resource already exists:
    - **Append:** If a repository already exists, the Writer attempts to add the new items only. If an item or resource already exists, the Writer skips it.
    - **Merge:** If a repository already exists, the Writer adds new items and updates to those that already exist. The Writer also updates a resource, if it already exists.
    - **Drop:** If a repository already exists, the Writer drops it. Then the Writer adds the new items and resources.
12. Click Finish.
13. In the Generate Workspace dialog, click OK.

This causes the Select Feature Types dialog to open. Each feature type represents an FME Server repository (except for the one named `FME-ServerServices`, which contains metadata related to FME Server services).

14. Select the feature types (repositories) that you want to import, and then click OK.

    When the workspace is created, you can still remove repositories that you do not need to import. Select them in the workspace, and press the Delete button.

    Note: *FME Server always includes the Samples repository. Rather than restoring this repository from your previous FME Server version, we recommend that you use the Samples repository included with the new FME Server version.*



15. Click to run the workspace.

    This creates the respective repositories, copies the workspaces, and registers the workspaces with the FME Server.

16. If the hostname of the new FME Server installation differs from the hostname of the previous FME Server installation, you will need to modify the Web Service URL patterns because they will be preserved from the previous installation. Log into the Web User Interface, click the Services tab, and modify each Service URL pattern to use the new hostname.

7.1.5.1 Restoring User Accounts, Topics and Subscriptions

If you backed up your user accounts, roles, topics, subscriptions and resources, as defined in "Backup Configuration" on page 73, set up the security using these

settings.

7.1.5.2 Restoring Web User Interface Configuration Files

If you backed up your cascading style sheets (CSS), Java Server pages (JSP) or HTML templates, as instructed in"Backup Configuration" on page 73, replace these files.

7.1.5.3 Restoring Service Configuration Files

If you backed up your service configuration files (`propertiesFile.properties`), as instructed in"Backup Configuration" on page 73, you might have to reconfigure any changes you made to the default properties. Because new service properties might be added with each release, do not simply replace the new properties files with your backed-up files. The best approach is to find the properties edited in the previous installation and edit these properties in the new version of these files.

7.1.5.4 Restoring Job History

Create and run a workspace that reads the FFS file you created from the FME Server repository database and writes directly to your repository database:

```
fme_jobs
fme_job_result
fme_job_request
```

7.1.5.5 Restoring Log Files

Copy the backed up logs directory into the new Logs directory:

```
<FMEServerDir>\Logs
```

7.2 FME Engine Only Upgrade

FME Engine is the component of FME Server that performs the actual data translations and transformations. At times, you might want to upgrade only your FME Engines and not any other FME Server components. For example, you might want to provide support for recently added formats or other newer functionality included in a new release of FME without upgrading other FME Server components.

The procedure described in this section uses the standard FME installer provided on the Safe Software web site and can be performed with an official or beta release of the FME Engine installer.

7.2.1 Obtaining the Installer

Install the upgraded FME Engine in its own path rather than overwriting the existing FME Engine. This way, you can reverse the upgrade if required.

To upgrade only the FME Engine component when installing an FME Server environment, use a stand-alone FME Engine installer, not the FME Server installer, and follow these steps.

You can get the appropriate FME Engine Installer from this location: http://www.safe.com/support/support-resources/fme-downloads/fme-server/. The web page also includes download links to release and beta installation packages for various platforms.

7.2.2 Install on Windows

7.2.2.1 To install FME Engine in a Windows environment

1. Run the FME installer on any computers that are running FME Engines that you want to upgrade.

   We recommend that you leave the existing FME Engine in place as a backup:

   <FMEServerDir>\Server\fme

   and create a new directory for the upgraded FME:

   <FMEServerDir>\Server\FMEEngineUpgrade

2. You must license your new FME Engines with an FME Engine-level floating license.

   For detailed licensing instructions, see "Licensing" on page 61.

3. Open Windows Explorer.

4. Make a copy of the file *<FME-ServerDir>\Server\FMEEngineUpgrade\fme.exe*, place that copy in

the same *<FMEServerDir>\Server\FMEEngineUpgrade* directory, and rename it FMEEngine.exe.

5. Edit the *<FMEServerDir>\Server\processMonitorConfig.txt* file.

   Look for lines that start FME Engines, such as the following:

   ```
   CMDFMEEngine_
   Engine1="C:/apps/FMEServer/Server/FMEEngine.exe
   ```

   and change the path to the new FME, for example:

   ```
   CMDFMEEngine_
   Engine1="C:/app-
   s/FMEServer/Server/FMEEngineUpgrade/FMEEngine.exe
   ```

   Look for the line:

   ```
   ENGINE_EXEC_
   PATH=C:\\App-
   s\\FMEServer\\Server\\fme\\FMEEngine.exe"
   ```

   and change it to the new FME:

   ```
   ENGINE_EXEC_
   PATH=C:\\App-
   s\\F-
   MEServer\\Server\\FMEEngineUpgrade\\FMEEngine.exe"
   ```

6. Restart FME Server.
7. To confirm that you are using the upgraded FME Engine from the new path and that you are using the FME build that you require, check the process monitor log on any computer running an FME Engine:

   <FMEServerDir>\logs\processMonitor<date>.log

   In the log, you should see your new FME Engine path and build number reflected in the FME Start-up sections.

7.2.3 Install on Linux/UNIX

To install FME Engine in a Linux/UNIX environment:

1. Run the FME installer on any computers that are running FME Engines that you want to upgrade.

   We recommend that you leave the existing FME Engine in place as a backup:

   ```
   <FMEServerDir>/Server/fme
   ```

   and create a new directory for the upgraded FME:

   ```
   <FMEServerDir>/Server/FMEEngineUpgrade
   ```

2. You must license your new FME Engines with an FME Engine-level floating license.

   For detailed licensing instructions, see "Licensing" on page 61.

3. Edit the `<FMEServerDir>/Server/processMonitorConfig.txt` file.

   Look for lines that start FME Engines such as the following:

   ```
   CMDFMEEngine_
   Engine3="/opt/fmeserver/Server/fme/runfme"
   ```

   and change the path to the new FME, for example:

   ```
   CMDFMEEngine_
   Engine3="/opt-
   /fmeserver/Server/FMEEngineUpgrade/runfme"
   ```

4. Restart FME Server.

5. To confirm that you are using the upgraded FME Engine from the new path and that you are using the FME build that you require, check the process monitor log on any computer running an FME Engine:

   ```
   <FMEServerDir>/logs/processMonitor<date>.log
   ```

   In the log, you should see your new FME Engine path and build number reflected in the FME Start-up sections.

Chapter 8 Common Configurations

8.1 Configuring Start-up

8.1.1 Account/User

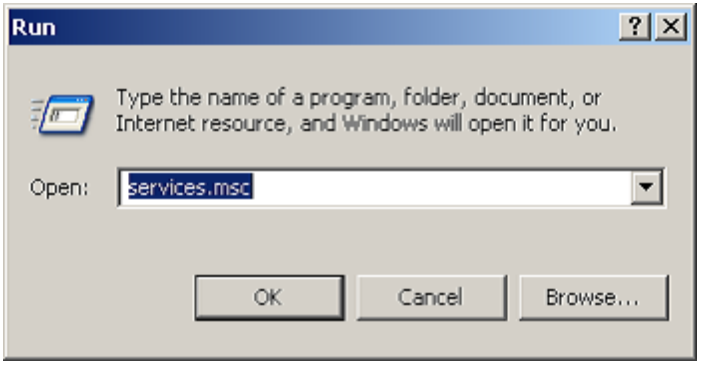
By default, the FME Server Windows Service is set to use the local system account, which does not have network permissions.

If FME Server requires access to network directories to read or write data, or if you use UNC paths to specify a remote repository or upload directory location, you might need to run the FME Server Windows Services with a different account.

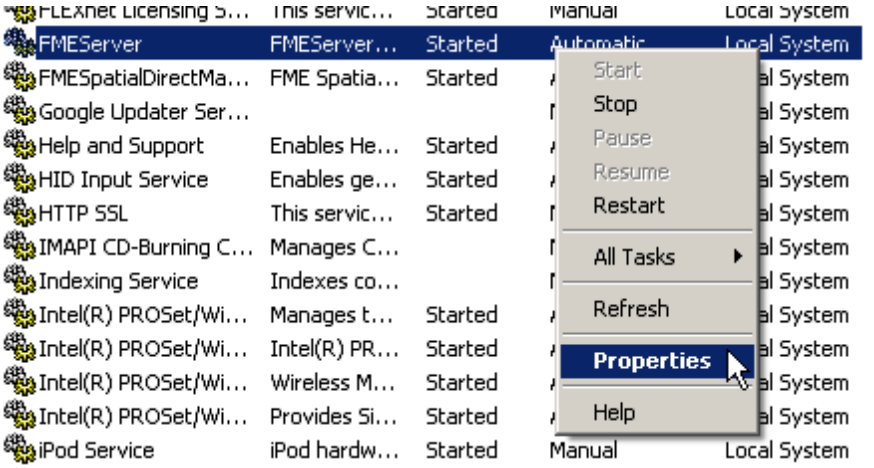
1. Perform either of the following steps:
    1. Select Start > Control Panel > Administrative Tools > Services.

       or

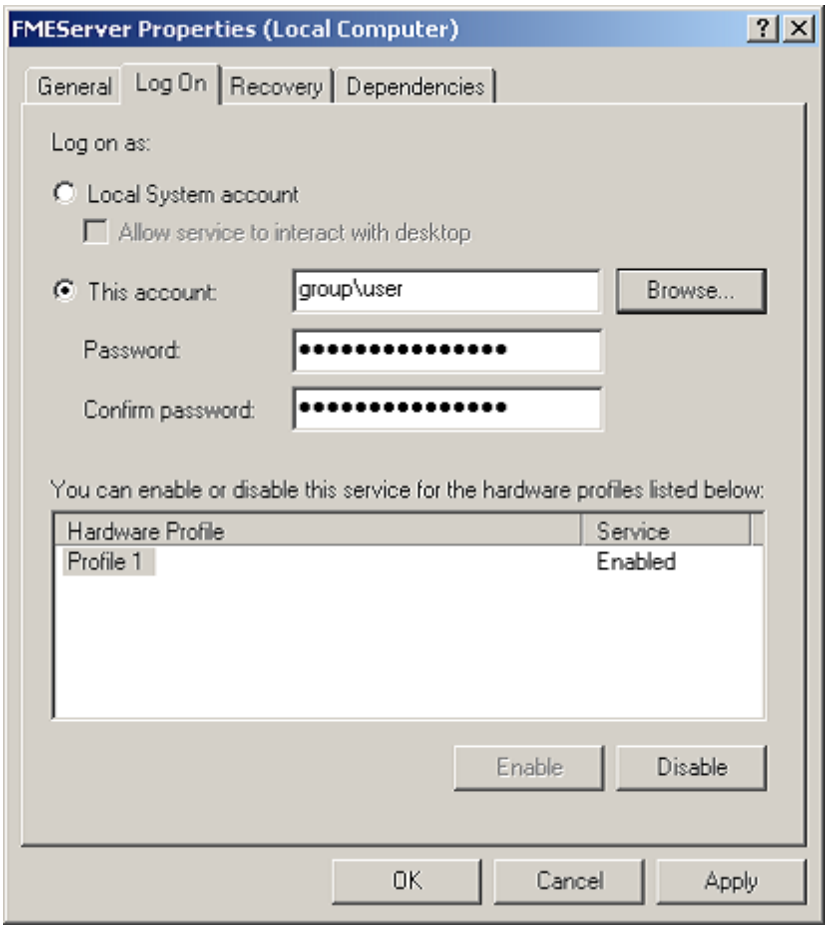
    2. Run `services.msc` to open the Windows Services panel.



2. In the Services list, right-click FMEServer service, and select Properties from the context menu.



3. Click the Log On tab.
4. Select this account, and enter a user account and password that provides the required network permissions to the FMEServer service.



5. Click OK.

8.2 Starting the Services

8.2.1 Windows

FME Server is composed of a series of components, and each component is installed as a standard Windows service. There are a maximum of four services that can be associated with FME Server. The following sections describe each of the services.

8.2.1.1 FME Server Service

This service is the main FME Server service and should always be running. By default, this service is started at system boot time.

8.2.1.2 FME Server Database Service

On install, if you use the default FME Server database, it creates a service called FME Server Database, which automatically starts at system boot time. If you used your own database, such as Oracle, ensure that the service starts prior to the FME Server Service starting.

8.2.1.3 FME Server Application Server Service

On install, if you use the default FME Server Web Application Server, the service automatically starts at system boot time. If you are using your own web application server, it is important to note that the FME Server Web Services are deployed and run by your web application server, not by FME Server itself. Ensure that your web application server is started for users to access any FME Server web services including the Web User Interfaces.

8.2.1.4 FME Server SMTP Relay

This service provides FME Server with the ability to receive email messages. By default, this service is started at boot time.

8.2.1.5 FME License Server

This service starts the FLEX*lm* License Server, which provides licenses to FME Engines. By default, this service is started at system boot time.

Starting and Stopping FME Server Manually

Although the FME Server services start automatically, you can start and stop the services manually using the standard Windows services control panel.

To access the services control panel from Windows, perform the following steps. (Other Windows operating systems have a similar procedure for accessing the services panel).

1. Select Start menu > Control Panel > Administrative Tools > Services or Start menu > Run > services.msc.
2. On the Services panel, scroll down the services list, select the FMEServer, FME Server Database, FME Server Application, or FME License Server entry, and start or stop it as required.
3. Start the FME Server service after starting the other services.

> ***Note:*** *You can also start and stop or restart the FME Server service manually by going to Start > Programs > FME Server > Windows Server > Start, Stop, Restart.*

Determining FME Server Processes

Based on your specific environment, you might need to determine if FME Server processes are running or not. To do this, launch the Windows Task Manager and examine its process list. Ensure that the Task Manager is set to show processes from all users.

The following FME Server processes might be listed:

- `FMEEngine.exe` - one for each running FME Engine
- `FMEServer.exe` - FME Server Core
- `FMEScheduler.exe` - FME Server scheduler - requires the core to be running
- `FMENotifier.exe` - FME Server notifier - requires the Core to be running
- `FMEPublisher.exe` - FME Server Publication
- `FMERelayer.exe` - FME Server Relay Manager
- `FMESMTPRelay.exe` - FME Server Email receiver
- `FMESubscriber.exe` - FME Server subscriber - requires the core to be running
- `FMEServer_Service.exe` - FME Server Process Monitor - running as a Windows Service

- `FMEServer_ApplicationServer.exe` - FME Server Web Application Server
- `postgres.exe` - FME Server Database Server
- `lmgrd.exe` - FME License Server

8.2.2 Linux/UNIX

You can install FME Server as a system service that starts when you start your system. You should do this only if you have set up system services before and understand the different run levels on your system.

Warning: Configuring scripts to run at start-up on Linux/UNIX is an advanced task. The steps for doing so vary, depending on your configuration. Use the steps listed in this section as a guide only.

FME Server is composed of a series of components, and each component has its own script. There are a few scripts that must be modified, depending on the choices you made during installation. If you performed an express installation or installed the built-in Database and Web Application Server, ensure that all scripts are moved.

8.2.2.1 Installing FME Server as a System Service

To install FMEServer as a system service, you must make some changes to the `init.d` and `rc*.d` files:

- Modify the startup script:
  - *`<FMEServerDir>/Server/startup/FMEServerDatabaseStart`*

  and replace all occurrences of *`<user>`* with the name of the user that ran the installation of FME Server.
- Make a copy of the FME Server start-up scripts:
  - *`<FME-ServerDir>/Server/startup/FMEServerAppServerStart`*
  - *`<FMEServerDir>/Server/startup/FMEServerDatabaseStart`*

- *<FMEServerDir/Server/startup/FMEServerSMTPRelayStart*
- *<FMEServerDir>/Server/startup/FMEServerStart*

placing the scripts here:

- /etc/init.d/FMEServerAppServerStart
- /etc/init.d/FMEServerDatabaseStart
- /etc/init.d/FMEServerSMTPRelayStart
- /etc/init.d/FMEServerStart

- Create links from the scripts you just copied to a script in the correct run level, depending on your distribution and configuration.

  For Debian, this is typically 2 (rc2.d), and for Red Hat and Fedora, this is typically 5 (rc5.d). If you are unsure what run level you should use, we recommend that you contact your system administrator before proceeding.

  If you are on a Debian based distribution such as Ubuntu, you can run the following commands:

  ```
  update-rc.d FMEServerStart start 99 2 . stop 98 6
  .
  update-rc.d FMEServerAppServerStart start 99 2 .
  stop 99 6 .
  update-rc.d FMEServerDatabaseStart start 98 2 .
  stop 99 6 .
  update-rc.d FMEServerSMTPRelayStart start 98 2 .
  stop 99 6 .
  ```

  On Red Hat, you can use the `chkconfig` command. This automatically adds them to runlevel 3. If you need to use a different run level, you need to modify the `chkconfig` header of these scripts, or manually:

  ```
  chkconfig --add FMEServerStart
  chkconfig --add FMEServerAppServerStart
  chkconfig --add FMEServerDatabaseStart
  chkconfig --add FMEServerSMTPRelayStart
  ```

On other distributions, or to manually set up the startup scripts, create the proper links in the appropriate run level directory.

The following steps use a run level of 2.

- Create the Web Application Server startup link:

```
sudo ln -s
/etc/init.d/FMEServerAppServerStart
/etc/rc2.d/S99fmeserverappserver
```

- Create the Database Server startup link:

```
sudo ln -s
/etc/init.d/FMEServerDatabaseStart
/etc/rc2.d/S98fmeserverdatabase
```

  Note: *It is important that this is S98, not S99.*

- Create the SMTP Relay startup link:

```
sudo ln -s
/etc/init.d/FMEServerSMTPRelayStart
/etc/rc2.d/S98fmeserversmtprelay
```

  Note: *It is important that this is S98, not S99.*

- Create the FME Server startup link:

```
sudo ln -s /etc/init.d/FMEServerStart
/etc/rc2.d/S99fmeserver
```

- Create the Web Application Server shutdown link:

```
sudo ln -s
/etc/init.d/FMEServerAppServerStart
/etc/rc6.d/K99fmeserverappserver
```

- Create the Database Server shutdown link:

```
sudo ln -s /etc/init.d/FMEServerDatabaseStart
/etc/rc6.d/K99fmeserverdatabase
```

- Create the SMTP Relay shutdown link:

```
sudo ln -s
/etc/init.d/FMEServerSMTPRelayStart
/etc/rc2.d/K99fmeserversmtprelay
```

- Create the FME Server shutdown link:

```
sudo ln -s /etc/init.d/FMEServerStart
/etc/rc6.d/K98fmeserver
```

Note: *It is important that this one is K98, not K99.*

- The License Server you use must be configured to start up prior to FME Server starting. If you are using the License Server provided by the FME Server install, the command to start the license server is:

```
<FMEServerDir>/FMEServer/Utilities/flexserver/lmgrd
-c ./safe.lic -l safe.log
```

Starting and Stopping FME Server Manually

Although you can configure FME Server to start automatically, you can start and stop it manually by using shell scripts. To start the server, there are up to three different scripts that must be run, depending on whether you performed the express installation or installed the built-in Database and Web Application Server.

To start FME Server, run the following scripts:

Note: *If the port specified during installation is a lower number than 1024, run the Application Server start-up script as the root user. Run the other scripts as the same non-root user that ran the installation of FME Server, with the exception of startFME-ServerSMTPRelay.sh, which should be run as the root user.*

- `<FMEServerDir>/Server/startApplicationServer.sh`
- `<FMEServerDir>/Server/startDatabaseServer.sh script`

- `<FMEServerDir>/Utilities/flexserver/lmgrd -c ./safe.lic -l safe.log`
- `sudo <FMEServerDir>/Server startFMEServerSMTPRelay.sh`
- `sudo sh <FMEServerDir>/Server/startServer.sh > /dev/null 2>&1 &`

  Note: *`> /dev/null 2>&1` prevents messages from outputting to the console window. These messages can still be accessed in the log file written to <FMEServerDir>/Logs. The final `&` runs the command in the background, returning control of the console to the user while FME Server is running.*

To stop FME Server, run the following scripts:

- `<FMEServerDir>/Server/stopServer.sh`
- `<FMEServerDir>/Server stopFMEServerSMTPRelay.sh`
- `<FMEServerDir>/Server stopApplicationServer.sh`
- `<FMEServerDir>/Server stopDatabaseServer.sh`

Determining FME Server Processes

Based on your specific environment, you might need to determine if FME Server processes are running or not.

You can determine which FME Server processes are running by examining the output of:

```
ps -A | grep -i fme
```

The following FME Server processes might be listed:

- `fme` - one for each running FME Engine
- `FMEServer` - FME Server Core
- `FMEScheduler` - FME Server scheduler - requires the core to be running

- `FMENotifier` - FME Server notifier - requires the core to be running
- `FMESubscriber` - FME Server subscriber - requires the core to be running
- `FMERelayer` - FME Server Relay Manager
- `FMESMTPRelay` - FME Server Email receiver
- `tomcat7` - FME Server Web Application Server
- `postgres` - FME Server Database Server
- `lmgrd` - FME License Server

8.3 Configuring FME Server to Receive Email

To use the email server, you need to change the host to the public DNS name you plan on assigning to the FME Server. For example, if you are using an AMI the host name could be ec2xxxx.amazon.com but the public DNS name may be demo.safe.com. You want to set the Email host name to the second one in this case.

1. To change the name, open this file:

   ```
   <FME Server Install DIR>\Uti-
   lities\emailserver\james\apps\james\SAR-INF\config.xml
   ```

2. Find the following tags:

   ```
   <postmaster>Postmaster@localhost</postmaster>
   <servername>localhost</servername>
   ```

3. Update to the public DNS:

   ```
   <postmaster>
   Postmaster@alertdemo.safe.com</postmaster>
   <servername>alertdemo.safe.com</servername>
   ```

4. Restart the FME Server SMTP Relay service.
5. If you wish to make the email server accessible to the Internet the following ports must be open:

- Non-secure: SMTP: 25
- Secure with SSL: SMTP: 465

8.4 Configuring FME Server to Send Email Notifications

The Data Download and Job Submitter services can send email messages on job completion to notify a user of either job success or job failure. To configure your email, you need access to an SMTP server.

1. Log in to the FME Server web user interface:

   `http://<host>/fmeserver`

2. Click the Notifications tab, and then click the Subscriptions tab.
3. Select DataDownload_Email_JobFailure.
4. In the resulting form, configure the parameters.

   For details on the parameters, see the help available in the FME Server Web User Interface.

5. Repeat this procedure for the JobSubmitter_Email_JobFailure, Data-Download_Email_JobSuccess and JobSubmitter_Email_JobSucess subscriptions.

For more information, see "Email Subscriber" in the FME Server Reference Manual.

8.5 Configure FME Engine Resources

8.5.1 Shared Resources

FME Server workspaces can use shared custom formats and transformers in the same way that FME Workbench does. There are two ways to upload your custom resources to FME Server.

You can publish these custom resources to FME Server for use within a specific repository by following these steps:

1. Open the custom format or custom transformer in FME Workbench:

   File > Open > Select custom format/transformer

2. Publish the resource to FME Server as you would publish a workspace.

   The resource then becomes available to workspaces within the repository to which you published it.

You can make the these custom resources accessible to all workspaces on FME Server by following these steps:

1. Manually place the transformer in the shared resource directory.

   Each FME Engine used by FME Server can have a shared resources directory defined for it. The location of the directory is based on the `FME_SHARED_RESOURCE_DIR` parameter in the FME Engine's configuration file:

   ```
   <FMEServerDir>\Server\fmeEngineConfig_
   <instanceName>.txt
   ```

2. Locate the value of the parameter in the configuration file:

   ```
   FME_SHARED_RESOURCE_DIR
   "C:/Apps/FMEServer/Server/Resources/shared"
   ```

3. Create a sub-directory called "Transformers" for custom transformers and "Formats" for custom Formats, and then place your resources in those directories.

   Note: *If there are two definitions of the same custom transformer, one in the repository directory and the other in the shared directory, FME Server tries to find the transformer in FME_SHARED_RESOURCE_DIR first and use that. If it is not there, it looks for the transformer defined in the resource directory.*

8.5.2 Custom Coordinate Systems

Although a custom coordinate system cannot be published to FME Server, there are two ways they can be made available to the FME Server:

- Modify the `MyCoordSysDefs.fmw` file:

  Add its definition to the following file where you have an FME Engine installed:

  ```
  <FMEServerDir>
  \Server\fme\Reproject\MyCoordSysDefs.fme
  ```

  `MyCoordSysDefs.fme` is a file that contains custom coordinate systems defined by the user.

- Add to the shared resource directory:

  Place custom coordinate systems in the `CoordinateSystems` shared resources directory.

  Each FME Engine used by FME Server can have a shared resources directory defined for it. The location of the directory is based on the `FME_SHARED_RESOURCE_DIR` parameter in the Engine's configuration file:

  ```
  <FMEServerDir>\Server\fmeEngineConfig_
  <instanceName>.txt
  ```

  - Locate the value of the parameter in the configuration file:

    ```
    FME_SHARED_RESOURCE_DIR
    "C:/Apps/F-
    MEServer/Server/Resources/shared"
    ```

  - Within this directory, create a subdirectory called "CoordinateSystems", and place your custom coordinate systems in that directory.

8.5.3 Configuring Grid Shift Files

If you plan to run workspaces that transform data between the datums NAD27 and NAD83 without explicitly choosing a transformation in a CsmapReprojector transformer, you must decide whether to use datum shift files for Canada or the US. Run one of the following from a command prompt to tell FME which Grid Shift file to use:

- Canada: `<FMEServerDir>Server/fme/fme APPLY_SETTINGS [SYSTEM] "CoordSys/NAD2783 Datum Shift" "canada only"`
- US: `<FMEServerDir>/Server/fme/fme APPLY_SETTINGS [SYSTEM] "CoordSys/NAD2783 Datum Shift" "us only"`

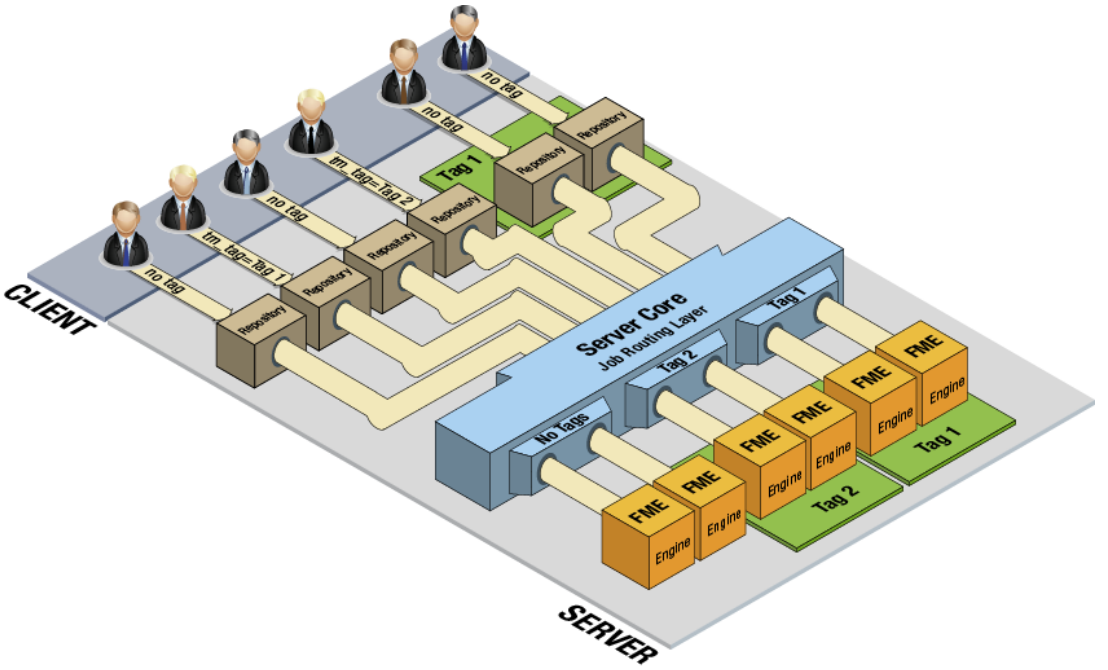
If `SYSTEM` is specified, the setting applies to all FME processes run on the machine. If not specified, the setting applies only to FME processes run by the current user.

8.6 Configuring Job Routing

Job Routing is a mechanism for sending specific jobs to specific FME Engines. The reasons for doing this include:

- Reserving an FME Engine for a scheduled task
- Reserving an FME Engine for quick jobs
- Sending jobs to an FME Engine that supports a particular format (for example, MS Access is not supported on UNIX)

Job routing uses tags to assign jobs to a subset of available FME Engines. With tags, you can associate specific jobs with certain engines, or associate all jobs in a repository with certain engines.



The first step in configuring job routing is determining the names of the FME Engine instances.

8.6.1 Determine the FME Engine Names

To redirect a job to a specific FME Engine, you must know the FME Engine's name. To determine the name:

1. Open the `<FMEServerDir>\Server\ processMonitorConfig.txt` configuration file.
2. Scroll down to the bottom of the file to the FME Engine start-up definitions.
3. Find the FME Engine definition to which you want to assign the job.

8.6.2 Assigning Jobs to a Subset of Available FME Engines

You can configure the FME Server Core to direct jobs with specific tag to specific FME Engines. To do so:

1. Open the *<FMEServerDir>*\Server\fmeServerConfig.txt configuration file.
2. Under "Job Routing" (at the very end of the file, under "FME SERVER SETTINGS START"), add the following syntax to configure the FME Engines to accept or reject jobs with certain tags:

```
TM_ENGINE_
<
ConfigNumber
>=<EngineHostName>:<EngineInstanceName>:<TagName>
```

   Note: *<ConfigNumber> should start at 1 and increment sequentially.*

   Note: *<EngineHostName> and <EngineInstanceName> are case-insensitive. <TagName> is case-sensitive.*

3. Restart FME Server.

Note: *If a high availability environment is configured with multiple FME Engine hosts having the same FME Engine name, the job routing server configuration applies to all FME Engines with the same name in the same way regardless of which host it resides on.*

8.6.2.1 Example

In this example, any job with the tag"fast" would be processed (accepted) by engine1 or engine2 (on host "panaka"), while engine3 would process jobs with the "utility" tag. Any jobs with any other tag or no tag will be processed by any other engines that have not been explicitly associated with a tag. (By default, these engines are associated with the TM_DEFAULT_TAG tag.)

```
TM_ENGINE_1=panaka:engine1:fast
TM_ENGINE_2=panaka:engine2:fast
TM_ENGINE_3=panaka:engine3:utility
```

8.6.2.2 Submit a Request with a Tag

The next step is to submit a job with a tag. You can submit a job with a tag using the web services and HTTP or directly using the FME Server Console.

FME Server Web Services

Open the Web UI, navigate to the service you want, and get the Show Request value, such as:

`http://<host>/fmejobsubmitter/Samples/austinDownload.fmw`

Append `tm_tag=` and the tag to the end of the URL, for example:

```
http:/-
/localhost/fmejobsubmitter/Samples/austinDownload.fmw?tm_
tag=fast
```

The FME Server core uses the tag to determine whether FME Engines can accept the request.

FME Server Console

Append the following text to the `submit_job` or `run_workspace` command:

```
tm_outputFormatTag fast
```

For example:

```
run_workspace Samples/austinDownload.fmw tm_tag fast
```

8.6.3 Configure All Jobs in a Repository with a Tag

You can direct the FME Server Core to assign all jobs submitted from a repository to whatever engine is specified in the `TM_ENGINE_<ConfigNumber>` parameter, regardless of the tag that is associated with a client-side job request. To do so, use the following syntax in the `fmeServerConfig.txt` configuration file:

```
TM_REPOSITORY_<ConfigNumber>=<
RepositoryName>:<TagName>
```

8.6.3.1 Example

In this example, any jobs from the "Samples" repository are assigned the "fast" tag. This tag will override any tag assigned to a job in the "Samples" repository by the client-side job request.

```
TM_REPOSITORY_1=Samples:fast
```

8.7 Migrating an FME Server Configuration

You can migrate the configuration of an FME Server instance to another instance.

To migrate the configuration of an FME Server 2013 instance, create a workspace in FME Workbench using the FME Server Configuration reader and writer. The FME Server Configuration format supports migrating repositories, services, notifications, security and scheduling.

Note: *To use the FME Server Configuration format, your user account must be assigned to the fmesuperuser role.*

Note: *The FME Server Configuration format does not migrate or backup the contents of the FME Server configuration files: fmeEngineConfig.txt, fmeServerConfig.txt, processMonitorConfig.txt*

Note: *The FME Server Configuration format is not compatible with FME Server version 2012 or earlier.*

In the reader, specify the FME Server instance whose configuration you are migrating. In the writer, specify the FME Server instance to which you are migrating the configuration.

For more information about how to use the FME Server Configuration format, see the FME Readers and Writers Help, included with your FME Desktop installation.

8.8 Backing Up an FME Server Configuration

Beginning with FME Server 2013, a workspace is provided that can be scheduled to perform a backup of the Server configuration to an FME Feature Store (FFS) file. The configuration back up includes repositories, services, notifications, security settings and schedules.

Note: *To backup the configuration of an FME Server version 2012 or earlier, see "Backup Configuration" on page 73.*

To Enable a Schedule Backup

1. Log into the FME Server Web User Interface:

   `http://<host>/fmeserver`

2. Click the Schedules tab.
3. Click the Backup_Configuration entry.
4. On the Editing page, check "true" beside Enabled.
5. Edit other parameters as necessary
6. Click OK.

The following parameters are specific to the Backup_Configuration schedule:

- **FME Server Username**: The user performing the backup. The user must belong to the the fmesuperuser role.
- **FME Server Password**: Password of the user.
- **Backup File (FFS)**: The file to store the backup. The location must be accessible by the engine running the workspace. It can refer to a UNC path.
- **Backup Password**: Password to access the backup file.
- **Append Date**: If Yes, the date and time of the backup is appended to the filename.

8.9 Purging Logs and History

As FME Server processes jobs, the history of these jobs is stored as records in the repository database and as log files in the file system. Eventually, the volume of these records and logs can build up and cause issues, such as slow web interface response time and low disk space. Therefore, FME Server ships with two workspaces that you can scheduled to purge job history from the database and log files from the file system.

To enable scheduled purging:

1. Log into the Web User Interface:

   `http://<host>/fmeserver`

2. Click the Schedules tab.
3. Then:
   - To enable log purging, select the Purge_Logs schedule and click Enable .
   - To enable job history purging, select the Purge_Jobs schedule and click Enable.

     By default these schedules are configured to run once per day.
4. To adjust the frequency of the purging, select the schedule, click Configure, and then adjust the repeat interval and frequency.

8.10 Changing the Hostname and Web Application Server Port

Often you install FME Server and then need to update the hostname or web application server port. To change the hostname and/or web application server port used by FME Server, you must modify a few configuration files and the FME Server Services definitions. It's important to know that there may be more than one location in each file where the hostname needs to change. Using the find and replace feature in a text editor may provide an easy way to ensure all instances are updated.

8.10.1 FME Server Services

To change the hostname used by FME Server, you need to update the service's URL patterns. To use the web user interface to do this, follow these steps.

1. Navigate to the FME Server Web User Interface `http://<host>/fmeserver`.
2. Log in and click Services on the left-hand side.
3. In the URL Pattern field, make the appropriate changes and click OK when done.

8.10.2 FME Server

Modify the *<host>* values in the following files:

<FMEServerDir>\Server\processMonitorConfig.txt

```
CMDStartFMEEngine_1="C:\\Program
Files\\FMEServer\\Server\\fme\\ FMEEngine.exe"
REGISTER_SOCKET <host> 7070 "C:\\Program
Files\\F-
MEServer\\Server\\f-
meEngineConfig.txt"|log|attempts=5
```

You will need to repeat this for each FME Engine you are running. There is a `CMDStartFMEEngine_n` block of text for each Engine.

<FMEServerDir>\Server\stop\Server.bat

```
"<FME-
ServerDir>\Server\..\Utilities\jre\bin\java.exe" -
Xrs COM.safe.processwatcher.SDShutdownAgent <host>
7500 %ADMIN_PASSWORD% MainApplication
```

8.11 Configuring International Character Encoding

By default, FME Server tries to detect how your web service handles international character encodings. Beginning with FME Server 2013, you can manually configure the services and the Web User Interface for international character encoding. To do this, you must configure each service and web application separately.

To configure international character encoding for a particular service or for the Web User Interface:

1. Open the web application's deployment descriptor web.xml file. This file is installed at `<webAppDir>/WEB-INF/web.xml`.
2. Find the `<filter>` element with `<filter-name>i18nFilter` and `<filter-class>COM.safe.web.-servlet.CharsetEncodingFilter`.

3. Add/modify the <init-param> directives to configure international character encodings for this web application according to the table below:

Parameter Name	Type	Description
charset	string	Sets the character set to use. UTF-8 is recommended.
detect-encodings	boolean	"true" to automatically detect encodings. "false" to disable.
auto-encoded	list	A list of comma-separated keywords that specify what should be encoded by the specified character set (see charset). Available keywords: • querystring – Encode query strings in the URI. • path – Encode the path component of the URI. • body – Encode the request body for each request.

For further instructions, see the J2EE Servlet Specification v2.5.

Chapter 9 Securing FME Server

FME Server contains a security component that can prevent unauthorized users from accessing your services and applications, which we refer to as *resources*. You use FME Server Security to provide groups within your organization access to different resources. You can also configure FME Server to work with your organization's existing security infrastructure, such as Active Directory.

9.1 Overview of Securing FME Server

By default, FME Server uses basic authentication to provide the username and password to the server. This authentication is not encrypted. To ensure that sensitive information is encrypted, we recommend that you use a Secure Sockets Layer (SSL) connection. SSL encrypts the data, protecting user names and passwords from malicious interception of transactions.

When working with FME Server security, you must make two main decisions:

- Which resources should provide unauthenticated access?
- Which resources should users have access to and what permissions should they have on those resources?

9.2 Disabling FME Server Security

Note: *We recommend that security be enabled unless there is a compelling reason to disable it.*

FME Server enables security by default. When security is enabled, the Web User Interface has log in and log out capabilities. Also, a Security tab appears on the Web User Interface to allow you to administer security.

To disable FME Server security, set the `ENABLE_SECURITY` option to false in the following configuration files:

- FME Server - `<FMEServerDir>\Server\fmeServerConfig.txt`
- Web User Interface - `<WebAppDir>\fmeserver\WEB-INF\conf\propertiesFile.properties`

9.3 Choosing Your Security Framework

The decision about which framework you decide to use depends primarily on who will be using FME Server resources. For example, if you are creating Internet applications and your web users are not in your Active Directory, you might want to use the default FME Server framework. However, if you are building applications to be deployed on your intranet, you might want to leverage your existing Active Directory to grant access to FME Server resources.

9.3.1 Default Framework

By default, FME Server ships with a built-in security module. Only FME Server uses this default security module and, as a result, it must be managed using the FME Server Web User Interface. All users and security information is stored in the FME Server repository database.

9.4 Connecting to Active Directory

FME Server's security framework can be configured to use Active Directory for user authentication and user grouping. In this manner, a server administrator can utilize an existing user account database and associated security permissions.

In Active Directory, user accounts are given security permissions by placing them in one or more security groups. The integration works by effectively mapping Active Directory security groups to FME Server roles. In the Web User Interface, a role is then given a set of resources it can access and permissions on those resources. Therefore, if a security group has access to a particular resource, so do its member users.

9.4.1 Getting Started

To configure FME Server to use Active Directory, three steps are required:

1. Identify security groups to allow access.
2. Add each security group as a user role.
3. Enable Active Directory integration in the FME Server configuration file.

These steps are described in detail in the following sections.

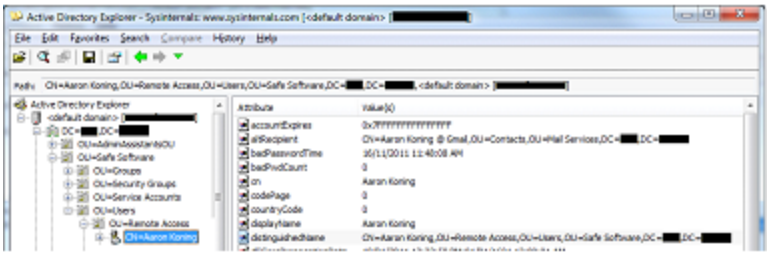
This document assumes that you have not modified FME Server security components and that you are using the default security settings that ship with FME Server (that is, the built-in database security module).

9.4.2 Identify Security Groups

Identify the security groups to which you want to allow access to FME Server, and compile a list their distinguished names (DNs).

You can acquire DNs from the domain administrator or through an Active Directory browser, such as ADExplorer (http://technet.microsoft.com/en-us/sysinternals/bb963907). The DN of a security group takes on the general form:

```
CN=groupname,OU=organizationunit,...,DC=mydomain,
DC=com
```



Add Security Groups as Roles

Through the FME Server web user interface, add each security group's DN as a user role. For each user role, specify the FME Server resources that the role can access.

1. Using a web browser, access the FME Server Web Interface–for example, `http://localhost/fmeserver`.
2. If you are not already authenticated, enter your credentials, and click Login.
3. Click Security on the left-hand side to access the security page.
4. Click the Roles tab.
5. Click New, and then specify the the security group's DN.

6. Click OK to add the new user role.

   The user membership is maintained in Active Directory.

7. Click Permissions, and select the newly added role.
8. Specify the FME Server resources that you want to make accessible to this security group, and then click Apply.
9. Repeat steps 4 through 8 for each security group you want to add.

9.4.3 Enable Active Directory

Edit the FME Server configuration file to use Active Directory. Then restart the server.

1. Open the FME Server configuration file, `fmeServerConfig.txt`, located in the subdirectory Server of your FME Server install directory.
2. Under the Security heading, comment out (#) the following line:

   ```
   SECURITY_LOGIN_TYPE=database
   ```

3. Uncomment (#) the following lines:

   ```
   SECURITY_LOGIN_TYPE=activedirectory
   SECURITY_AD_SERVER_AUTODETECT=true
   ```

   FME Server will attempt to automatically detect Active Directory. If this fails, provide the host and port for your Active Directory using the following lines:

   ```
   SECURITY_AD_SERVER_AUTODETECT=false
   SECURITY_AD_SERVER_COUNT=1
   SECURITY_AD_SERVER_HOST1=<host>
   SECURITY_AD_SERVER_PORT1=<port>
   ```
   (typically 636)

4. If you would rather not have to enter your domain name each time you log in (<domain>\<user>), uncomment the following line and provide your domain:

   ```
   SECURITY_AD_NT_DOMAIN=<yourDomain>
   ```

5. If you are connecting to Active Directory over a Secure Sockets Layer (SSL), add the following line:

   ```
   SECURITY_AD_USE_SSL=true
   ```

6. Save the configuration file.
7. Restart FME Server.

   For more information, see "Starting and Stopping FME Server" on page 13.

8. Log in using your Active Directory credentials.

9.4.4 Security Management Using Active Directory

When using Active Directory for user authentication and authorization, the Security Management interface has some modifications.

- The User Accounts view displays a live list of Active Directory users who can access components of FME Server.
- The User Roles view continues to display all available user roles, including those that are not Active Directory security groups.

9.4.4.1 User Accounts View

The User Accounts view is a live list of Active Directory users that can access components of FME Server. A server administrator cannot modify this list, since it is fetched from Active Directory. The list includes all users implicated by the enabled Active Directory security groups specified in user roles.

Note: *FME Server populates this view by using Lightweight Directory Access Protocol's (LDAP) virtual list view (VLV) control. Your Active Directory server must have this feature enabled in order to display a live User Accounts view.*

9.4.4.2 User Roles View

The User Roles view is a live list of Active Directory security groups who can access components of FME Server. A server administrator can modify this list, which is stored in the local security database, to add Active Directory security groups or remove existing groups.

Note: User roles can accept Active Directory security groups only. It is possible through the user interface to add user roles that are not security groups; however, they are ignored. Examples of invalid user roles when using Active Directory include:

- *Active Directory user accounts*
- *Built-in database user roles (for example, fmeadmin)*

9.4.5 Troubleshooting

Active Directory-based security might be easier to set up in some server environments, due to the high degree of variability of the security hierarchy. If you are having difficulty configuring FME Server's security framework to use Active Directory, check the following troubleshooting tips for options.

9.4.6 Enabling Debug Logging

Enabling debug logging for FME Server's security framework allows more verbose logging during many Active Directory operations. Examining log messages might provide insight into the failing operation.

1. Open the FME Server configuration file, `fmeServerConfig.txt`, located in the subdirectory Server of your FME Server install directory.
2. Under the Security heading, locate the parameter `SECURITY_DEBUG` and set it to true.
3. Restart FME Server.

   For more information, see "Starting and Stopping FME Server" on page 13.
4. Examine the log files for additional information pertaining to Active Directory operations.

9.5 Default User Accounts

To get you up and running quickly with the FME Server Security, default user accounts are provided with default permissions. (See "Before You Begin" on

page 5 for details.) As an administrator, you can reset these accounts using the FME Server Web User Interface.

Note: *If you would like all of the web services to prompt for authentication, remove the guest account after you configure your own set of users and access control for your server.*

9.6 Securing FME Server and Applications/Services

FME Server allows you to secure your Web applications and Web services. There are three main tasks you need to perform when configuring access to your Web services and applications:

- Configuring which components require authentication
- Configuring permissions for resources
- Implementing Secure Sockets Layer (SSL)

9.6.1 Disable/Enable Authentication for Resources

You can configure FME Server so that some web services require user credentials and others do not. For example, you might want to allow open access to the Data Download service but restrict access to the Data Streaming service.

This can be accomplished by using the guest user account, which is a member of the fmeguest role. If the fmeguest role has been assigned access to a resource, that resource does not require or request authentication.

By default, the fmeguest role has access to all of the web services, which means that the web services provide unauthenticated access by default. You can adjust the resources that the fmeguest role has access to using the Web User Interface.

9.6.2 Configuration

You configure security configuration, including authentication and access control, using the FME Server Web User Interface, where a Security tab appears, if security is enabled. The Help link in the Web User Interface provides further details on any of the configuration steps described below, such as adding and removing users, changing passwords, and granting access to components.

9.6.2.1 Users and Roles

FME Server allows you to assign access rights to different roles for the web services, applications, and components associated with FME Server. A role is a group of one or more users. A user is the person who accesses the applications or services, and a user can belong to one or more roles.

Before assigning permissions to users and roles, you must define where those users and roles originated. See "Choosing Your Security Framework" on page 120 for details on how to do this.

The Security page of the Web UI is where administrators define permissions. It uses the following hierarchy:

- User Accounts
- User Roles
- Resources
- Permissions

9.7 Repository Security

Repositories provide a way to group and manage workspaces on FME Server in a meaningful way. FME Server allows an administrator to assign finely grained permissions on a repository to specific roles. That means that different users can have varying levels of access to different repositories.

Details on how to assign permissions to repositories are provided in the web help within the Web User Interface.

9.8 Topic Security

Topics are a Notification Service tool for managing Publishers and Subscribers. Role-based permissions for topics include Read, Write, Publish and Remove.

Details on how to assign permissions to topics are provided in the web help within the Web User Interface.

9.9 Configuring for HTTPS

HTTPS ensures that communication between the client and server is encrypted, so that if it is intercepted, the third party cannot easily view or use the information. For FME Server, you can use HTTPS to ensure that sensitive log in information is not exposed. This is especially important if you are using the Active Directory integration.

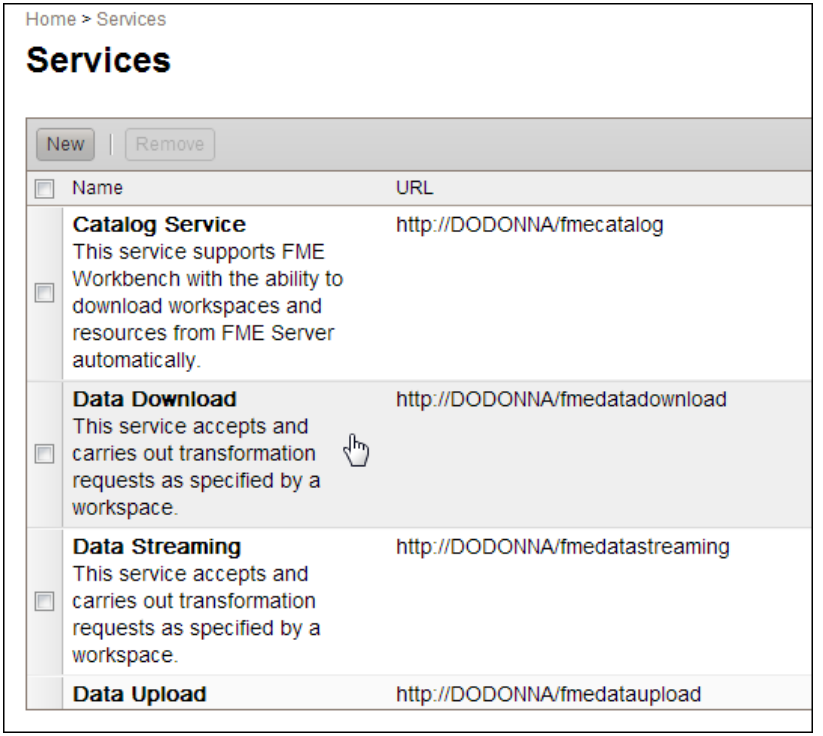
9.9.1 Enabling FME Server SSL Support

To enable SSL support:

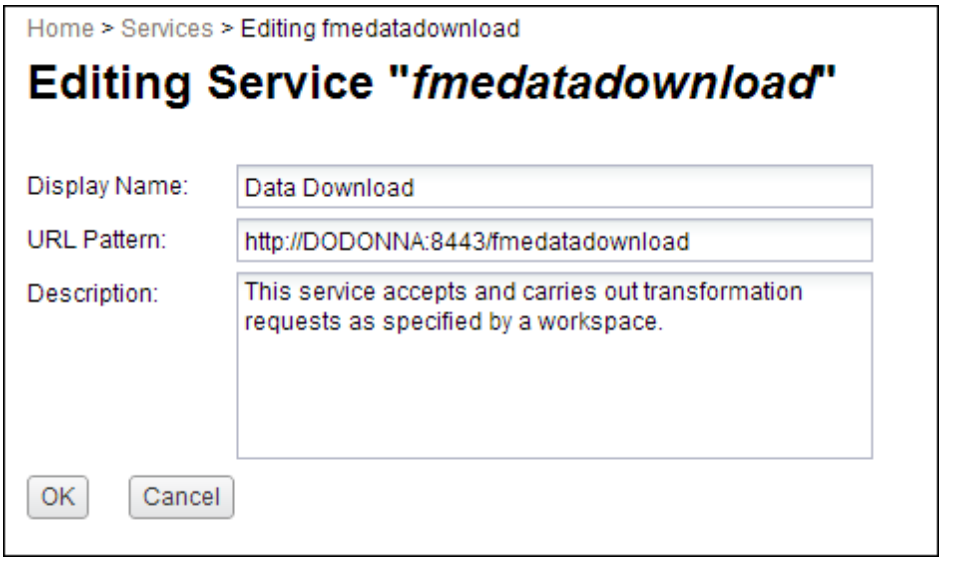
1. Modify service URLs to use HTTPS instead of HTTP.
2. Enable SSL on the web and/or application server.

9.9.2 Modifying Service URLs to Use HTTPS

To enable SSL for a service, open the FME Server Web User Interface, click Services, and click the desired service in the table.



The Editing Service page opens.



In the URL field, change HTTP to HTTPS, and modify the port number, if required. Typically SSL is configured on either port 8443 or 443.

9.9.3 Enable SSL on the Web and/or Application Server

Depending on the method, instructions to set up SSL on different application servers vary. The following example provides steps for setting up SSL for Apache Tomcat 7, using self-signed certificates.

For development and testing purposes, self-signed certificates are supported. For production use, we recommend that you use SSL certificates from a verified SSL certificate authority.

For any HTTPS (SSL) page, a certificate is required. First, you must generate a keystore that contains a certificate chain using the `keytool` command from the Java Developer Kit (JDK).

To set up SSL for Apache Tomcat 7 using self-signed certificates, follow these steps:

1. Open the command prompt.
2. Type the following command:

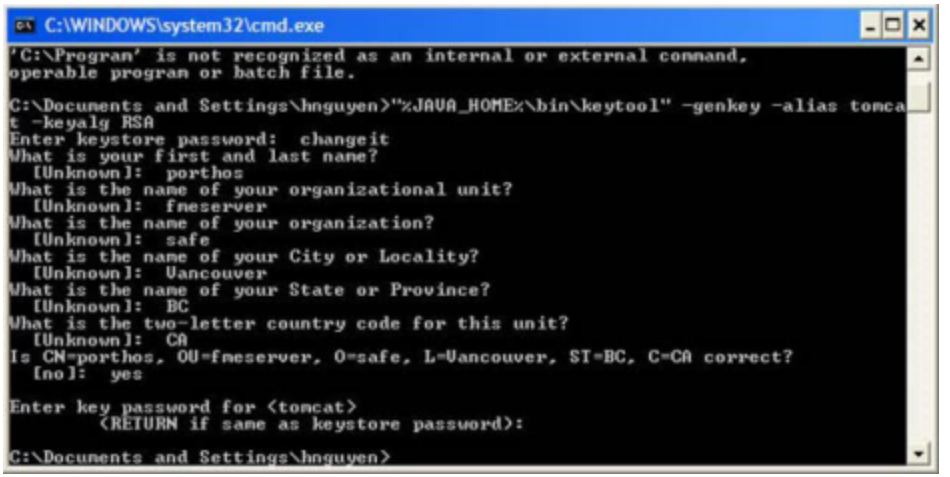
   ```
   keytool -genkey -alias tomcat -keyalg RSA
   ```

   If your path is not set to the Java `bin` directory, navigate to that directory and type the appropriate command.

   Note: *A JDK must be installed to use the keytool command.*

   A message prompts you to enter a keystore password.
3. Enter `changeit`.

   You can give the keystore password a different name; however, if you do, you must make some changes later.
4. Enter the required details, shown here:

   A message prompts you to enter the alias password, which must be the same as the keystore password.
5. Enter the same password you entered in step 3.

   A keystore is generated in the following location:

   ```
   <drive>:\Users\<username>\.keystore
   ```

where `<drive>` is C: and `<username>` is hnguyen.

6. Copy the `.keystore` file to the Tomcat directory, and then copy the path to the file.

   If you are using the default web application included with FME Server, Tomcat is located at:

   ```
   <FME Server Install DIR>\Utilities\tomcat
   ```

7. Open the `server.xml` file:

   ```
   <TomcatDir>\conf\server.xml
   ```

8. Locate the Connector code block, and replace it with the following:

   ```
   <Connector
   pro-
   tocol="org.apache.coyote.http11.Http11Protocol"
     port="443" minSpareThreads="5"
     enableLookups="true"
     disableUploadTimeout="true"
     acceptCount="100" maxThreads="200"
     scheme="https" secure="true" SSLEnabled="true"
     keystoreFile="C:\Program Files\Apache Software
     Foundation\Tomcat 6.0 2010
   beta\conf\.keystore"
     keystorePass="changeit"
     clientAuth="false" sslProtocol="TLS" />
   ```

9. Be sure to set the `keystoreFile` path to the correct location and the `keystorePass` to the password you entered in step 3.

10. In the Apache Tomcat's `server.xml` file change the `Listener className` line (found at the beginning of the file) to how it's written below:

    ```
    <Listener
    class-
    Name="org.apache-
    .catalina.core.AprLifecycleListener"
    SSLEngine='off'/>
    ```

11. Your configuration is complete so save the `server.xml` file.

12. Restart your Tomcat application.
13. If you are using the default FME Server Application Server, restart that service.
14. Open a browser and navigate to `https://localhost`.

    This should show you the same Tomcat home page, but in a secured format.

    Note: *If you use port 443 in your Tomcat `server.xml` file, you're able to omit the port number in your URL links; that is, you only need to type `https://localhost`.*