FORTRA

Powertech Multi-Factor Authentication 1.7.1

Installation & Upgrade Guide

Copyright Terms and Conditions

202510011008

Table of Contents

Installing Powertech Multi-Factor Authentication

These instructions describe how to install Powertech Multi-Factor Authentication.

Before You Begin

Read this section before you install Powertech Multi-Factor Authentication.

System Requirements

The following requirements are necessary in order to install and run Powertech Multi-Factor Authentication.

Authentication Manager System Requirements

For Linux:

- the /opt drive must have at least 20 GB of free disk space
- Supported Linux OS Versions:
  - RedHat Enterprise/Centos 7 & 8
    - X86_64
    - PPC64
    - PPC64LE
  - RedHat Enterprise Linux 9
    - X86_64
  - Suse Enterprise Linux 12 & 15
    - X86_64
    - PPC64LE
  - Ubuntu Linux 19 & 20
    - X86_64
    - PPC64LE

For Windows:

- Allow for at least 20 GB of disk space for the install and related files
- Supported Windows OS Versions:
  - Windows Server 2016
  - Windows Server 2019
  - Windows Server 2022
- Version R01M09 of the Powertech Multi-Factor Authentication IBM i Agent (shipped with Powertech Multi-Factor Authentication 1.7.1).
- Version 3.5 of Fortra's Insite.
- Version 1.7.1 of the Multi-Factor Authentication Desktop Agent (if authenticating on a PC).

> **NOTE:** For Ubuntu systems that experience an issue with Tomcat (or any other application) returning a *Package libssl1.0.0 is not available* error, please refer to this article for resolution.

> **IMPORTANT:** When the Authentication Manager is configured in a Linux environment, improved reliability has been observed.

Connectivity Requirements

This release of Multi-Factor Authentication requires at least Transport Layer Security (TLS) 1.2 and above.

Further connectivity requirements for using Powertech Multi-Factor Authentication with Insite can be found in the article, Ports and URLs User by Insite and referencing the sections:

- General Insite Server Ports
- Insite Integration Service Ports
- Browser Connection
- Powertech Multi-Factor Authentication

The Authentication Manager installer will check if certain ports are open on the Insite system. See Port Assignment for more information.

The remaining system requirements for the Authentication Manager are the same as Fortra's Insite. See Insite System Requirements.

IBM i Agent System Requirements

Powertech Multi-Factor Authentication requires IBM i 7.3 or higher.

The minimum supported IBM i agent for Powertech Multi-Factor Authentication 1.7.1 is R01M09.

> NOTE: During installation an FTP connection is initiated. The FTP server responds with messages that prompt for FTP login credentials. The standard port reserved to establish an FTP connection to the IBM i is port 21. Consequently, it is required that this port is open and 'listening' on the server in order to establish a connection with the Installation Wizard and facilitate a successful installation. Any firewall or exit program technology on the PC or the IBM i system could potentially block the FTP file upload and remote commands running the installation. Ensure any such firewall or program is configured to permit an FTP connection on port 21. If standard FTP is not permitted, contact Technical Support for instructions on how to manually install the product without the installation wizard.

Desktop Agent System Requirements

- Windows 10 64-bit, Windows 7 64-bit
- 2 GB RAM

> NOTE: A new error handling and messaging mechanism was added to the Desktop Agent that enables important messages about upgrades to be displayed. Fortra recommends all Powertech Multi-Factor Authentication users upgrade to the latest Desktop Agent as soon as possible.

Compatibility with Fortra's Insite

Powertech Multi-Factor Authentication 1.7.1 requires Insite 3.5.

To use Fortra's Insite to access your products through a web browser, you must meet the following browser and/or operating system requirements.

Hardware Type	Minimum Browser and/or OS Requirements
Desktop/Laptop	Firefox 11 or higher Chrome 21 or higher Internet Explorer 11 Safari 6.1 or higher Microsoft Edge
Mobile Device	iOS: Browsers on iOS 8 or higher Android: OS 6.0 Marshmallow or higher Windows: OS 10 using Edge
IBM i	V7R3 or higher operating system

For more details, see Insite System Requirements.

System Values

It is Fortra's' goal not to change system values on customer systems because we recognize that security-conscious organizations have rigorous change control processes in place for even small changes to system values. Therefore, we ask you to make any system value changes that are needed. However, the Powertech Multi-Factor Authentication IBM agent installation process could change a system value to allow the install to proceed if a system value is not set as specified below. If the Installation Wizard changes a system value during install, it changes it back to its original value when the install completes.

To install the Powertech Multi-Factor Authentication IBM i agent on your system, the following system values that control object restores must be configured as shown.

- Set QALWOBJRST to *ALWPGMADP (at a minimum) to allow the system to restore programs that adopt authority. Many Powertech programs adopt the authority of the product owner, rather than forcing you to give authority directly to administrators and end users. (Note: For some system configurations, *ALL is required temporarily.)

- QALWUSRDMN controls which libraries on the system can contain certain types of user domain objects. You should set the system value to *ALL or include the name of the Powertech Multi-Factor Authentication install library (PTMALIB) for the product to function properly.
- Set QVFYOBJRST to 1, 2, or 3. This allows Powertech Multi-Factor Authentication to restore all objects regardless of their signature. (Note: If you normally check signatures, remember to check this system value after the Powertech Multi-Factor Authentication install process completes.)
- Set QFRCCVNRST (Force conversion on restore) to 0, Do not convert anything.

Installing Powertech Multi-Factor Authentication

Powertech Multi-Factor Authentication installation on your network is a multi-step process that requires several installation procedures. The following entities should be installed in the order listed here:

- Fortra's Insite**.** This is required for administrator setup and the User Portal.

  > **NOTE:** You must create an Insite user profile before creating the Insite Product Connection to Powertech Multi-Factor Authentication. See "Profiles" in the Fortra Insite User Guide.

  > WARNING: Credential validation requests are made using the Insite connection profile. If the TCP Signon Server is active and the Insite connection profile has been configured to be prompted to authenticate, the authentication process will interfere with the user credential validation process. We therefore recommend that the Insite connection profile is not set up to be authenticated using Powertech Multi-Factor Authentication.

- **Powertech Multi-Factor Authentication Authentication Manager and Data Services.** The Authentication Manager is Powertech Multi-Factor Authentication's central processing component. Data Services include database and high-availability services used by the Authentication Manager. See Installing the Authentication Manager and Data Services.
- **Powertech Multi-Factor Authentication IBM i agent.** The IBM i agent software must be installed on all systems to be secured by Powertech Multi-Factor Authentication. See Installing the IBM i Agent.

After Powertech Multi-Factor Authentication has been installed and started, network users need to install up to two applications, depending on the method of authentication being used:

- **Powertech Multi-Factor Authentication Mobile app.** The mobile app is required in order to authenticate with a mobile device. (This installation is not necessary if a YubiKey is being used for the second authentication factor.)
- **Powertech Multi-Factor Authentication Desktop Agent.** The Desktop Agent allows users to authenticate using a desktop computer as an alternative to the IBM i green screen agent for Exit Point sign on.

Installing the Authentication Manager and Data Services with Failover Support

While Powertech MFA can be operated with a single Authentication Manager instance, in order to provide redundancy in the case of server failure, Fortra provides a multi-server deployment that allows for two, three, or more Authentication Manager instances.

Before installing the Powertech Multi-Factor Authentication Authentication Manager, identify the systems that will be used for failover support. These must be configured as part of the installation process. One-, two-, and three-system deployments are possible. A three-system deployment is recommended. Additional systems can be added, further enhancing the integrity of the implementation. At this time, failover is not supported on heterogenous environments—all systems must have like operating systems (all Windows or all Linux).

If this is an upgrade, a previous two-system deployment already includes a Primary and Secondary server. If this is a new installation, commission the available servers that will be used for your Powertech Multi-Factor Authentication implementation.

> NOTE: While Powertech MFA does not require the configuration to use more than one system, failover processes run in the background in all installations.

Application Layer

The application layer in the context of Powertech MFA failover is the mechanism that controls the location of the PostgreSQL master, and the list of the standby systems.

Two-system vs three-system deployment

A three-system deployment is the ideal configuration for Powertech Multi-Factor Authentication failover because, in this environment, replication is always running. In the standard two-system deployment, it is possible for processes to lose the provided High Availability. For example, if an implementation includes only two systems, and maintenance is required on one of those systems, failover processes start when the first system is taken down for maintenance. At that point, there is no replication running for the second system as it is promoted to a master server. While no implementation is guaranteed, a three-system deployment provides continuous replication and HA capabilities.

Primary and Secondary definitions

In previous Powertech MFA versions, a server was designated as either Primary or Secondary. These terms are still used, but they have a slightly different meaning as of Powertech MFA 1.5. "Primary" was previously a static definition, such as 'System1 is the primary server and System2 is the secondary.' Failing over to the Secondary did not make it the new “Primary.” Instead, the Secondary had its database promoted to be the master. When the “Primary” system was restored to service, the process would “Failback,” promoting System1's database back to master.

As of Powertech MFA 1.5, the process is more dynamic. The Primary server is the node in which the database is assigned to master. When failover is initiated, whatever node has its database promoted becomes the Primary server. There is no longer a “Failback” procedure. Instead, the status of the server configuration can be updated manually.

Port Assignment

During the installation process, you will be asked to designate the ports that are required for Powertech MFA's services. While the default ports can be changed as might be required by, for example, institutional policies, the port numbers for each service should be the same in each installation. As such, prior to installation, designate a port number for each service that is available on each server you intend to use in your Powertech MFA deployment. Firewall setting must allow for communication over these ports.

The default port numbers are:

- Shutdown Port: 3039
- Connector Port: 3040
- Messenger SSL Port: 4707
- Messenger TCP Port: 61616
- Database Port (PostgreSQL): 6432

Transport Layer

ActiveMQ natively supports HA. As indicated in the following installation procedure, the IP address for each node must be entered for each server installation in a deployment. However, once complete, HA is available across all nodes for ActiveMQ. Active MQ is a critical support function for the application layer.

Since the application is using the native HA capability with ActiveMQ, the master database (application layer controlled) can exist on a different node than the transport layer.

EXAMPLE: In a three-system layout (sys1, sys2, sys3), consider the broker fails on sys1. Powertech MFA automatically switches to the next node in the list, which is generated at startup time for the ActiveMQ address list. Failover is *not* random. It proceeds through each node in the given list. In this example, sys2 would be the next available node. However, once the broker has been restored on sys1, HA moves the connections back to that node since it is the first node in the list, and is considered the Primary node.

Failover Notifications

Powertech MFA can be configured to send notifications anytime failover is triggered automatically due to a system outage. Configure failover notifications in the Failover Notification section of the Settings screen.

NOTE: When failover is triggered, Powertech MFA's authentication service will be interrupted for several seconds, up to a minute. This delay is the amount of time required for the services to restart on the new Primary server.

Installing the Authentication Manager and Data Services with Failover Support on Linux

1. Log in as root on the server you want to use as your Primary installation. The installer must be run as root or with sudo.
2. Download the Powertech Multi-Factor Authentication for Linux file (installPowertechMFA.tgz) to a temporary directory on the system from the Powertech Multi-Factor Authentication Downloads page. (The "Trial" download is the full product, which can be unlocked with a valid License Key.) If you intend to deploy failover with two or more servers, the installer must be downloaded (or otherwise transferred) to each server being used. The installation procedure must be run on each server being included in the Powertech MFA deployment.
3. Use the following command to extract the contents of the file:

   ```
   tar xvzf installPowertechMFA.tgz
   ```

   Files are extracted to the directory installPowertechMFA.
4. Use the following commands to start the installer:

   ```
   cd installPowertechMFA
   ./serverInstall
   ```

   WARNING: If you need to terminate the installation process before finishing, delete the `/opt/helpsystems/PowertechMFA` directory and start the installer again.

5. When prompted to choose whether you want to use the default ports, either indicate **y** accept and proceed, or **n** to change the ports used.

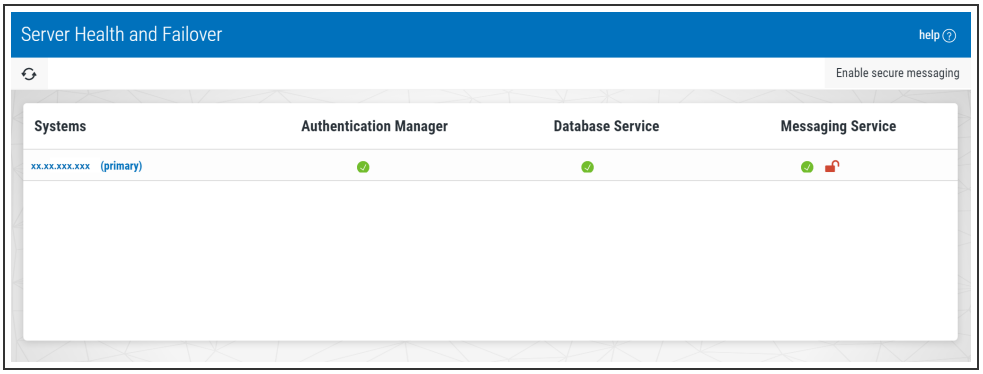
   > **NOTE:** In order to use Powertech MFA, your firewall must allow communication over the ports configured here.

6. When prompted to provide the ActiveMQ IP address list, enter the IP addresses of the servers being used for this implementation, separated by semicolons (;). The order of the IP addresses entered here must be the same for each Powertech MFA Authentication Manager installation included in this deployment.

   EXAMPLE:

   ```
   Configuring ActiveMQ addresses:
           ActiveMQ IP address list - the list should be delimited by a semi-colon
   (;)
           and should be entered in the same order on all systems:
              xx.xx.xxx.xxx ;      xx.xx.xxx.xxx ;      xx.xx.xxx.xxx
   ```

7. When prompted to verify the server IP, confirm it is correct. Or, if it is not correct, enter **n**, then enter the correct IP.
8. Powertech Multi-Factor Authentication creates the Primary database and starts the product. It installs to /opt/helpsystems/PowertechMFA.
9. Open Fortra's Insite and open the Powertech MFA module.
10. In the Navigation Pane, click **Managers**.
11. Click **Add**. The New Manager screen appears. Enter the IP Address of the first server in this deployment, enter the license key, and click **Save**. Repeat this step for the additional servers in this deployment.
12. In the Navigation Pane, choose **Server Health and Failover**. All servers configured should appear in this table. The Primary server's name is listed in blue. A ✓ in the Authentication Manager and Database Service columns indicate the services are active and ready for you to proceed with the remaining secondary installations.



As mentioned previously, the application layer handles governance of the leader. The terms *leader* and *master* are basically synonymous. Leader pertains to the application layer, which determines the database master. The leader and master are synchronized with one another. If the leader changes, as does the master database, and vice versa. In our recommended three-system deployment, when system 1 fails for any reason, system 2 becomes the leader, and the database is promoted to the master. All other instances are designated secondary and stream from the new master (system 2).

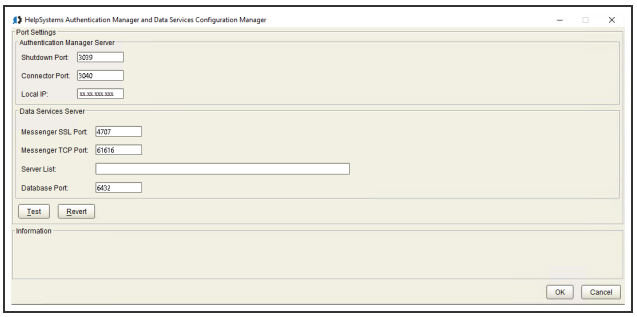
13. After you have confirmed the Primary server's Authentication Manager and Database Service are active, repeat steps 2-8 for all additional servers included in this deployment. Be sure the ports and Server List entry is identical for each installation.

Installing the Authentication Manager and Data Services with Failover Support on Windows

1. Download the Powertech Multi-Factor Authentication installer (**setupPowertechMFA.exe**) from the Powertech Multi-Factor Authentication Downloads page. (The "Trial" download is the full product, which can be unlocked with a valid License Key.) If you intend to deploy failover with two or more servers, the installer must be downloaded (or otherwise transferred) to each server being used. The installation procedure must be run on each server being included in the Powertech MFA deployment.
2. Double-click the installer file to begin the installation process.

   > WARNING: If you need to terminate the installation process before finishing, delete the `C:\Program Files\Help Systems\Powertech MFA` folder and start the installer again.

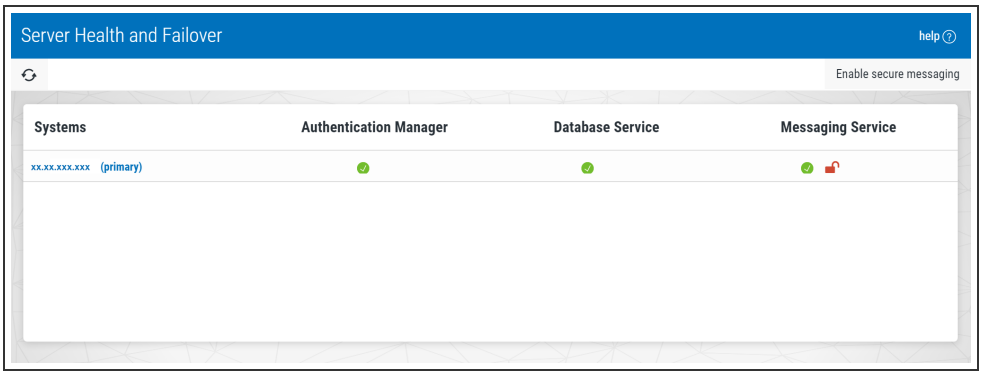
3. Follow the instructions to continue the installation.
4. When the HelpSystems Access Manager and Data Services Configuration Manager appears, configure ports for the manager and services.



> **NOTE:** In order to use Powertech MFA, your firewall must allow communication over the ports configured here.

The installer informs you if the default ports are available. If a port is not available, enter a new port number and click **Test** to see if it is available.

5. For Server List, enter the IP addresses of the servers being used for this implementation, separated by semicolons (;). The order of the IP addresses entered here must be the same for each Powertech MFA Authentication Manager installation included in this deployment.
6. Click **OK** to save the ports and continue installation.
7. Click **Finish** to complete installation on the Primary server.
8. Open Fortra's Insite and open the Powertech MFA module.
9. In the Navigation Pane, click **Managers**.
10. Click **Add**. The New Manager screen appears. Enter the IP Address of the first server in this deployment, enter the license key, and click **Save**. Repeat this step for the additional servers in this deployment.
11. In the Navigation Pane, choose **Server Health and Failover**. The server you have just configured should appear in this table, and be marked "primary." A ✓ in the Authentication Manager and Database Service columns indicate the services are active and ready for you to proceed with the remaining secondary installations.



As mentioned previously, the application layer handles governance of the leader. The terms *leader* and *master* are basically synonymous. Leader pertains to the application layer, which determines the database master. The leader and master are synchronized with one another. If the leader changes, as does the master database, and vice versa. In our recommended three-system deployment, when system 1 fails for any reason, system 2 becomes the leader, and the database is promoted to the master. All other instances are designated secondary and stream from the new master (system 2).

12. After you have confirmed the Primary server's Authentication Manager and Database Service are active, repeat steps 2-7 for all additional servers included in this deployment. Be sure the ports and Server List entry is identical for each installation.

Enabling Secure Messaging

Enable secure messaging to set the 'use SSL' flag to true on each node and automatically import the SSL certificates into each node's Keystore.

> **NOTE:** All instances should be installed before performing the certificate creation as the ActiveMQ Broker must be active on each node.

To enable secure messaging

1. In the Navigation Pane, choose **Server Health and Failover**.

   A  icon indicates secure messaging is not enabled for a server.
2. Click **Enable Secure Messaging**. A message appears indicating that submitting this request will secure the messaging service on all servers that are currently using an insecure connection, and that this will restart the authentication managers.

   > **NOTE:** Authentication may be unavailable for a few seconds when enabling secure messaging.

3. Click **Yes** to confirm. A  icon in the Messaging Server column indicates secure messaging has been enabled for the server.

Installing the IBM i Agent

Ensure the following servers are available and running prior to installation:

- FTP Server
- Remote Command Server

Do the following to perform the installation or update:

1. Download the Powertech Multi-Factor Authentication installer (**setupPowertechMFA_IBMi.exe**) to your PC from the Powertech Multi-Factor Authentication Downloads page.
2. On the Choose Components panel, select which components you want to install. You can choose to install the Manuals and the Software for IBM i. Click **Next**.
3. If you are installing the Manuals only, the process completes and the installer closes. The Manuals have been installed. You can skip the rest of these steps.

   > **NOTE:** The manuals are installed to the following location: C:\Program Files\PowerTech\MFA\manuals

4. On the IBM i Details panel:
   a. Select or enter the IBM i system.
   b. Enter a user profile and password that is a member of the user class *SECOFR and has at least the following special authorities: *ALLOBJ, *SECADM, *JOBCTL, *IOSYSCFG, and *AUDIT. The user profile should have Limit capabilities set to *NO.
   c. (Optional) In the Advanced Settings section:
      - Enter a port number or use the arrows if you want to change the FTP port number to something other than the default of 21.
      - Select **Secure File Transfer** if you want to use FTPS (FTP over SSL) during the file transfer. The default FTPS secure port is 990, but it can be changed to the required secure port for your environment.
      - In the **Timeout (seconds)** field, enter the number of seconds the session should be kept active during an FTP transfer. You can choose anywhere between 25 and 1800 seconds (30 minutes).

        > **NOTE:** If the transfer takes longer than the amount of time specified, the session will expire.

   d. Click **Next**.

5. You have two options on the Product Load Options panel:
   a. Click **Immediate Load** if you'd like to load the product on the IBM i now.
   b. Click **Staged Load** if you'd like to transfer the objects now and load them on the IBM i at a later time.

   > **NOTE:** See "Loading Staged Objects on the IBM i" (below) for instructions on how to load the staged objects on your selected IBM i system.

6. The Product Load Progress panel for Powertech Multi-Factor Authentication launches.

   If the Product Load Progress panel ends with an overall Failed message, the product upload could not complete properly. To find the reason the upload failed, click **View Logs** and review your logs. You can also use **Download** at the top of the logs to save the information for future review.

   When the processing is complete, you have two choices:
   - If this is the only installation or update of Powertech Multi-Factor Authentication that you're doing, click **Finish**.
   - If you have installs or updates to do on other IBM i systems, click **Restart**. Then, return to step 4.

Loading Staged Objects on the IBM i

If you chose to stage your objects during step 5b of the installation or update process, do the following to manually load them on the IBM i you identified above.

1. On the IBM i, execute the following command to display the Work with Loads panel:

   HSLOADMGR/HSWRKLOAD
2. Enter option **1**, Load, next to the Load Name for Powertech Multi-Factor Authentication and press Enter.

   The installation program installs Powertech Multi-Factor Authentication, including the required user profiles and libraries (see table below for details).

The installation process displays the job log name, user, and job log number. Use the WRKSPLF command to display the job log for complete information on the Powertech Multi-Factor Authentication install.

Objects Installed on System

Installed on System	Description
Product Library	PTMALIB
User Profiles	PMAADMIN, which has special authorities *ALLOBJ, *AUDIT, *IOSYSCFG, *JOBCTL, *SAVSYS, *SECADM, *SERVICE, and *SPLCTL PMAUSER, which has no special authorities (These profiles are set to Password = *NONE so that they can't be used to sign on to the system.)
Authorization List	PMAADMIN - Powertech Multi-Factor Authentication Administrators
Subsystem	PMASBS
Job Queue Entries	PTMALIB/PMAJOBQ added to PMASBS
Objects in QGPL:	Depending on the exit points that are being monitored, there could be up to four programs starting with PMA created in QGPL.
Powertech-created Unregistered Exit Points:	POWERLOCK_AA

After You Install

After you have installed Powertech Multi-Factor Authentication, complete the required tasks below. Note the optional task.

> **NOTE:** The Powertech Multi-Factor Authentication User Guide is available in the Powertech Product Manuals on the Fortra Support Portal.

Configuring the IBM i Agent (Required)

After installation, add any profiles that will require access to the IBM i agent's configuration settings to the PMAADMIN authorization list. Then, configure the IBM i agent to synchronize with Insite and the Authentication Manager.

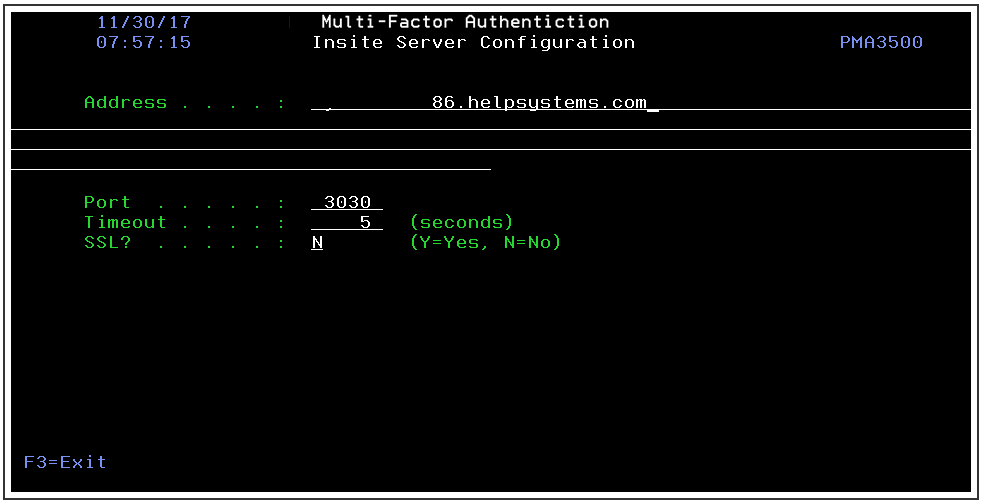
1. Sign on to the IBM i system and add the product administrator's user profile to the PMAADMIN authorization list:

   ```
   WRKAUTL PMAADMIN
   ```

2. Choose **2** to edit for the PMAADMIN authorization list.
3. Press **F6** and add the user profile. Object Authority should be set to *ALL.
4. Repeat steps 1-3 for any other product administrators.
5. Use the following command to open the Main Menu:

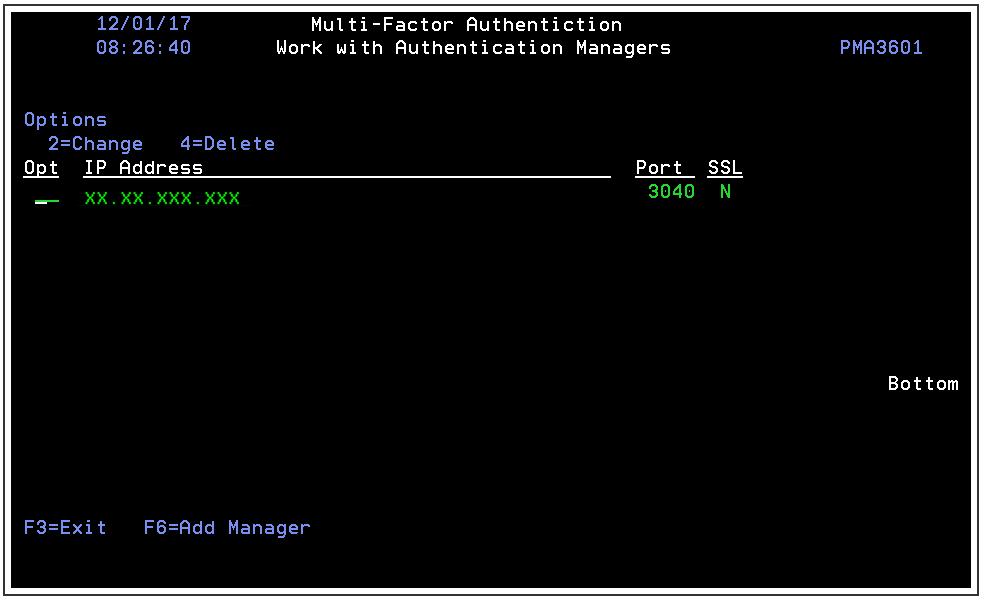
   ```
   PTMALIB/WRKPTMA
   ```

6. Choose option **1** to open the Insite Server Configuration screen.
7. Enter the IP address or DNS name (e.g. on Windows, the full computer name) and the port of the Insite server. The default port is 3030.



   Press Enter to save changes.

8. Press **F3** to return to the Main Menu, then choose option **2**. The Work with Authentication Managers screen appears. If you have already installed the Authentication Manager and Data Services, and added the Authentication Manager IP (s) to Insite, they appear here automatically.



> **NOTE:** If you have not yet installed/configured an Authentication Manager, you can press **F6** to add it here manually before it has been installed/added to Insite. (You will need to know the IP and port it will be installed on.)

9. Press **F3** to return to the Main Menu, then choose option **4**. The Emergency Override Setup screen appears.
10. Enter any profiles that will be allowed to bypass authentication in case of an emergency. Press Enter. The IBM i agent has been configured.

> **NOTE:** Choose option **3** to stop authentication on this IBM i system.

Next, you need to add the IBM i agent to Powertech Multi-Factor Authentication in Insite.

11. Open Fortra' Insite and choose **Powertech Multi-Factor Authentication** from the Navigation Pane on the left. Then, choose **Agents**.
12. Ensure the IBM i system has been added as a product connection in Insite. See "Product Connections" in the Insite documentation.
13. If IBM i agent is Disabled, click ⋮ on the right side of the IBM i agent row and select **Enable**.
14. Click **IBM i agent**, then click **Add**. The Agents > New System screen appears.
15. For System, choose **Select System** and choose the system you just configured.
16. Configure any system settings and click **Save**. You return to the Agents > IBM i agent screen.
17. To activate the system, click ⋮ (on the right side of the screen) and choose **Enable**.

When the necessary components have been installed, see Administrator Setup Procedure in the Powertech Multi-Factor Authentication User Guide to begin configuring and using Powertech Multi-Factor Authentication.

Starting and Stopping the IBM i Agent for Backups (Required)

When started, the Powertech Multi-Factor Authentication IBM i agent places a lock on ptmalib, which can interfere with system backup procedures. For this reason, and also in order to facilitate the addition of Powertech Multi-Factor Authentication into the startup program, the following commands are available:

- **PMASTRMON** - Start Powertech Multi-Factor Authentication
- **PMAENDMON** - Stop Powertech Multi-Factor Authentication

When backing up your system, use PMAENDMON to deactivate the agent and remove the object lock. After the backup is complete, use PMASTRMON to start the agent. If you are performing a backup with IPL, you can incorporate these commands into your backup procedure either manually or using scripts in a backup tool like Robot Save or BRMS.

> **NOTE:** When the Powertech Multi-Factor Authentication agent is ended, it is still fully configured, but inactive. While inactive, registered users are not asked to authenticate.

Adding a Failover Server to an Existing Installation (Optional)

> **WARNING:** Step 4d below prompts your servers to restart. Complete these instructions only during a maintenance window.

1. Ensure Powertech Multi-Factor Authentication Manager is installed on a new system.
2. When the port configurator displays, enter the <initial system> ; <new system>. For example, xx.xx.xxx.001; xx.xx.xxx.002.
3. After setup is complete, log in to Insite.
4. In Insite, do the following:
    a. Open the Managers menu.
    b. Add the newly added system.
    c. Open the Server Health and Failover menu. The Messaging configuration problem dialog appears.
    d. In the dialog, accept the string with the newly added system by selecting it and clicking **Update**. The servers will restart after you accept the string.

Upgrading Powertech Multi-Factor Authentication

These instructions guide you through the process of upgrading Powertech Multi-Factor Authentication.

> **NOTE:** For IBM i Agent system values, see the Data Service System Requirements earlier in this guide.

> **WARNING:** The Authentication Manager must be stopped to be upgraded, which means Powertech Multi-Factor Authentication will be out of service for a short period of time during the upgrade procedure. We recommend scheduling the upgrade at a time with minimal server activity.

System Requirements

The following requirements are necessary in order to install and run Powertech Multi-Factor Authentication.

Authentication Manager System Requirements

For Linux:

- the /opt drive must have at least 20 GB of free disk space
- Supported Linux OS Versions:
  - RedHat Enterprise/Centos 7 & 8
    - X86_64
    - PPC64
    - PPC64LE
  - RedHat Enterprise Linux 9
    - X86_64
  - Suse Enterprise Linux 12 & 15
    - X86_64
    - PPC64LE

- Ubuntu Linux 19 & 20
  - X86_64
  - PPC64LE

For Windows:

- Allow for at least 20 GB of disk space for the install and related files
- Supported Windows OS Versions:
  - Windows Server 2016
  - Windows Server 2019
  - Windows Server 2022
- Version R01M09 of the Powertech Multi-Factor Authentication IBM i Agent (shipped with Powertech Multi-Factor Authentication 1.7.1).
- Version 3.5 of Fortra's Insite.
- Version 1.7.1 of the Multi-Factor Authentication Desktop Agent (if authenticating on a PC).

> **NOTE:** For Ubuntu systems that experience an issue with Tomcat (or any other application) returning a *Package libssl1.0.0 is not available* error, please refer to this article for resolution.

> **IMPORTANT:** When the Authentication Manager is configured in a Linux environment, improved reliability has been observed.

Connectivity Requirements

This release of Multi-Factor Authentication requires at least Transport Layer Security (TLS) 1.2 and above.

Further connectivity requirements for using Powertech Multi-Factor Authentication with Insite can be found in the article, Ports and URLs User by Insite and referencing the sections:

- General Insite Server Ports
- Insite Integration Service Ports
- Browser Connection
- Powertech Multi-Factor Authentication

The Authentication Manager installer will check if certain ports are open on the Insite system. See Port Assignment for more information.

The remaining system requirements for the Authentication Manager are the same as Fortra's Insite. See Insite System Requirements.

Upgrade Procedure Overview

Like installation, the Powertech Multi-Factor Authentication upgrade procedure on your network is a multi-step process. Perform the upgrade in the order listed below.

- **Fortra's Insite.** This is the same as the installation process. The latest version of Fortra's Insite is required for compatibility with the latest Authentication Manager.
- **Powertech Multi-Factor Authentication Authentication Manager and Data Services.** The Authentication Manager must be stopped on the Primary and Secondary systems prior to installing the upgrade.
- **Powertech Multi-Factor Authentication IBM i agent.** The latest IBM i agent software must be installed on all systems to be secured by Powertech Multi-Factor Authentication to ensure compatibility.

Upgrading the Authentication Manager and Data Services

The following instructions demonstrate how to upgrade the Authentication Manager and Data Services on a Primary and Secondary system in order to provide replication and failover capability. If you intend to upgrade on a single system only, use the initial steps of the following procedure for your platform (stopping when directed to repeat steps for a Secondary system).

As of Powertech MFA 1.5, the process used to support failover has changed. See Installing the Authentication Manager and Data Services with Failover Support for details.

To upgrade the Powertech Multi-Factor Authentication Authentication Manager and Data Services on Linux

Prepare Systems for Update

The Linux database must be put in primary mode before updating the database.

> NOTE: If there are multiple nodes, continue the process until all nodes are stopped and have been stopped with the database as a primary.

1. **Stop the Primary Manager**

- `systemctl stop HelpSystemsPowertechMFAManager`
- `systemctl stop HelpSystemsPowertechMFADatabase.service`
- `systemctl stop HelpSystemsPowertechMFAAMQ.service`

Allow the system to fail-over to the secondary node.

Make sure the secondary system has been promoted to primary. You can view this in the Server Health and Failover Insite menu.

Once the failover process has completed proceed to the next step.

2. Stop Promoted Secondary Node

For the node that was promoted to primary through the previous step repeat the instructions to stop all services.

- `systemctl stop HelpSystemsPowertechMFAManager`
- `systemctl stop HelpSystemsPowertechMFADatabase.service`
- `systemctl stop HelpSystemsPowertechMFAAMQ.service`

> **NOTE:** If there are additional nodes repeat this step until all nodes have been stopped.

Upgrading MFA on the Linux Server

1. Login as root on the server you want to use as your Primary installation. The installer must be run as root or with sudo.
2. Run the command **backupdatabase.sh** and put the backup file in a directory outside the product files.
3. Download the Powertech Multi-Factor Authentication for Linux file (installPowertechMFA.tgz) to a temporary directory on the system from the Powertech Multi-Factor Authentication Downloads page.
4. Use the following command to extract the contents of the file:

   ```
   tar xvzf installPowertechMFA.tgz
   ```

   Files are extracted to the directory installPowertechMFA.
5. Use the following commands to stop the Authentication Manager service:
   - If your Linux system supports systemctl, use:

     ```
     systemctl stop
     HelpSystemsAccessAuthenticatorManager.service
     ```

- If your Linux system does not support systemctl, use:

```
/etc/init.d/HelpSystemsAccessAuthenticatorManager.sh stop
```

6. Use the following commands to start the installer:

```
cd installPowertechMFA
./serverInstall
```

> **WARNING:** If you need to terminate the installation process before finishing, delete the `/opt/helpsystems/PowertechMFA` directory and start the installer again.

7. When prompted to choose whether you want to use the default ports, either indicate **y** accept and proceed, or **n** to change the ports used.

> **NOTE:** In order to use Powertech MFA, your firewall must allow communication over the ports configured here.

8. When prompted to provide the ActiveMQ IP address list, enter the IP addresses of the servers being used for this implementation, separated by semicolons (;). The order of the IP addresses entered here must be the same for each Powertech MFA Authentication Manager installation included in this deployment.

> **EXAMPLE:**
>
> ```
> Configuring ActiveMQ addresses:
>        ActiveMQ IP address list - the list should be delimited by a semi-colon
> (;)
>        and should be entered in the same order on all systems:
>           xx.xx.xxx.xxx ;     xx.xx.xxx.xxx ;     xx.xx.xxx.xxx
> ```

9. When prompted to verify the server IP, confirm it is correct. Or, if it is not correct, enter **n**, then enter the correct IP.
10. Powertech Multi-Factor Authentication creates the Primary database and starts the product. It installs to /opt/helpsystems/PowertechMFA.
11. Open Fortra's Insite and open the Powertech MFA module.
12. In the Navigation Pane, click **Managers**.
13. Check the version number of the Powertech Multi-Factor Authentication software to confirm that the upgrade has been successful.
14. If you have any issues after updating MFA, contact support with the details.

Additional Notes for Upgrading MFA on Red Hat Enterprise Linux 9

When performing an upgrade of a legacy version of Powertech Multi-Factor Authentication to version 1.7.1 on Red Hat Enterprise Linux 9, there are some additional steps to take in order for the upgrade to progress smoothly.

Ensure that the following packages are installed :

- `yum install compat-openssl11 -y`
- `yum install -y perl-lib-0.65-480.el9`
- `yum install perl-File-Find-1.37-480.el9.noarch -y`
- `yum install perl-File-Copy-2.34-480-el9.noarch -y`

The following command is necessary to create a symbolic link from a legacy version of the shared object libreadline.so.7 so that it points to libreadline.so.8.1

ln -s /usr/lib64/libreadline.so.8.1 /usr/lib64/libreadline.so.7

> **NOTE:** Failure to run this command will result in the upgrade failing with the error; Unable to update the Powertech MFA database.

To upgrade the Powertech Multi-Factor Authentication Authentication Manager and Data Services on Windows

Stop Secondary Nodes

Regardless of the number of failover nodes, all nodes not designated as primary (shown in the Insite Server Health and Failover Menu Option) should be stopped. Note: The order in which services are stopped on both Linux and Windows is important. On the secondary nodes, the services should be stopped in the following order:

Stop Manager

- Windows -`stop service HelpSystems Powertech MFA Manager`

Stop Database

- Windows -`stop service HelpSystems Powertech MFA PostgreSQL Database Server`

Stop ActiveMQ

- Windows -`stop service HelpSystems Powertech MFA Message Broker`

Stop Primary Node

Now stop all the services on the primary node. Again, order is important.

Stop Manager

- Windows -`stop service HelpSystems Powertech MFA Manager`

Stop Database

- Windows -`stop service HelpSystems Powertech MFA PostgreSQL Database Server`

Stop ActiveMQ

- Windows -`stop service HelpSystems Powertech MFA Message Broker`

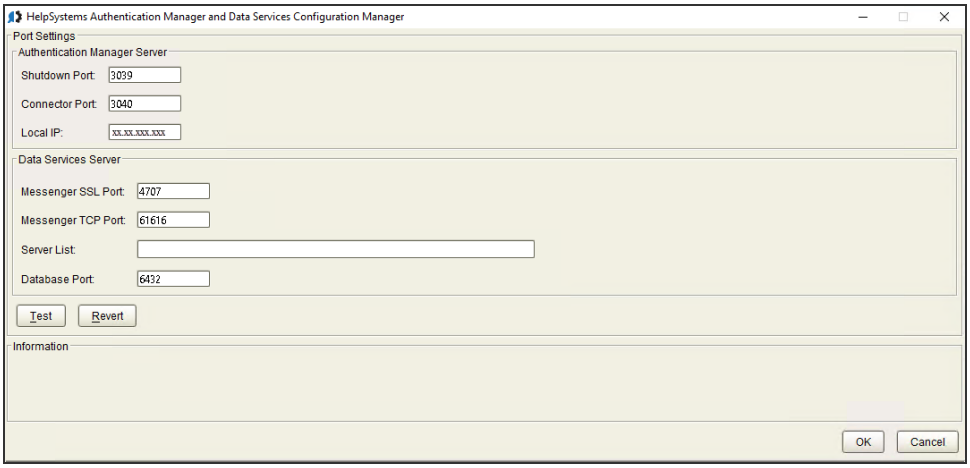
Upgrading MFA on the Windows Server

1. Login to the Windows server of your Primary installation.
2. Using the Windows command prompt, run the command **backupdatabase.bat** and put the backup file on the desktop.
3. Download the Powertech Multi-Factor Authentication installer (**setupPowertechMFA.exe**) to your PC from the Powertech Multi-Factor Authentication Downloads page.
4. Stop the Authentication Manager service. To do so:
   a. In the search bar type "services.msc" and press Enter. Or, click the **Start** menu and choose **Run**, then type "services.msc".
   b. Right-click HelpSystems Powertech Multi-Factor Authentication Manager and choose **Stop**.
   c. Close the Services window.
5. Double-click the installer file to begin the installation process.

   > WARNING: If you need to terminate the installation process before finishing, delete the `C:\Program Files\Help Systems\Powertech MFA` folder and start the installer again.

6. Follow the instructions to continue the installation.

7. When the HelpSystems Access Manager and Data Services Configuration Manager appears, configure ports for the manager and services.



> **NOTE:** In order to use Powertech MFA, your firewall must allow communication over the ports configured here.

   The installer informs you if the default ports are available. If a port is not available, enter a new port number and click **Test** to see if it is available.
8. For Server List, enter the IP addresses of the servers being used for this implementation, separated by semicolons (;). The order of the IP addresses entered here must be the same for each Powertech MFA Authentication Manager installation included in this deployment.
9. Click **OK** to save the ports and continue installation.
10. Click **Finish** to complete installation on the Primary server.
11. Open Fortra's Insite and open the Powertech MFA module.
12. In the Navigation Pane, click **Managers**.
13. Check the version number of the Powertech Multi-Factor Authentication software to confirm that the upgrade has been successful.
14. If you have any issues after updating MFA, contact support with the details.

Insite Updates

Linux

The MFA 1.7.1 release contains 2 Insite Updates that are specific to the MFA product. The Linux update will automatically detect if the install system has Insite installed, and if so, apply the updates to respective locations.

If the Insite server is located on a system that does not contain a MFA manager, then the Insite fixes need to be applied manually.

Manually Applying Linux Insite Fixes

1. Copy the insite-fixes directory to the system where Insite is installed.
2. Navigate to the base insite-fixes directory
3. Run the command -> `chmod +x insite-fixes.sh`
4. Run the Fix Command -> `./insite-fixes.sh <mode>`

   Modes

   - **0** – Used for Automatic Default
   - **1** – Used for Standard Installation Directory /opt/insite
   - **2** – Used for Custom Installation Directory /custom/insite where <custom > can be any multi-level path but must end with /insite. E.g /my/custom/path/insite. **DO NOT** put a trailing slash after the insite path.

Windows

The MFA 1.7.1 release contains 2 Insite Updates that are specific to the MFA product. The Windows update will automatically detect if the install system has Insite installed, and if so, apply the updates to respective locations.

If the Insite server is located on a system that does not contain an MFA manager, then the Insite fixes need to be applied manually.

Upgrading Notes

- Start by upgrading the primary node/system.
- Verify that there are no installation issues, and that the MFA manager has been updated in the Insite Managers menu.
- The running version should now be displayed as 1.7.1. Once the primary node upgrade is confirmed, repeat the process for all subsequent nodes.

> **NOTE:** Depending on system performance, upgrades may take longer than usual, particularly on the secondary nodes. Additionally, at the point the primary manager has been updated, authentication can remain active.

Contacting Us

For additional resources, or to contact Technical Support, visit the Fortra Support Portal at https://support.fortra.com.