



# BeyondTrust

## **Privileged Remote Access Middleware Engine Installation and Configuration**

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# BeyondTrust Privileged Remote Access Middleware Engine Installation and Configuration

The BeyondTrust Middleware Engine is a Windows service that acts as the backbone for integrations with BeyondTrust Privileged Remote Access. The BeyondTrust Middleware Engine provides a plugin integration architecture - plugins can be developed and deployed to the product, and the product provides data and administrative services to the plugin.

# Install the BeyondTrust Privileged Remote Access Middleware Engine

To complete this installation, please ensure that you have the necessary software installed and configured as indicated in this guide, accounting for any network considerations.

## Applicable Versions

- BeyondTrust Privileged Remote Access: 15.x and newer
- BeyondTrust Middleware Engine: 1.0.0.0

## Network Considerations

The following network communication channels must be open for the BeyondTrust Middleware Engine to work properly.

Outbound From	Inbound To	TCP Port #	Purpose
BeyondTrust Middleware Engine Server	BeyondTrust Appliance	443	API calls from the BeyondTrust Middleware Engine server.
BeyondTrust Appliance	BeyondTrust Middleware Engine Server	8180 (if using default configuration)	This is needed for plugins which integrate with BeyondTrust outbound events. Please check the documentation for all plugins used. If no plugins use outbound events, then this port does not have to be open.

## Server Requirements

The BeyondTrust Middleware Engine requires installation on Windows Server 2012 R2 or higher. See specific requirements below.

Component	Recommended
Processor	2 GHz or faster
Memory	2 GB RAM or greater
Available Disk Space	80 GB or greater
OS	64-bit

## Prerequisite Installation and Configuration

### Visual C++ Redistributable Package for Visual Studio 2015 (x86)

- Visual C++ Redistributable Package for Visual Studio 2015 is required by the BeyondTrust Middleware Engine. If not already present when the BeyondTrust Middleware Engine setup file is run, this package is installed automatically.

### .NET 4.5.2

- .NET 4.5.2 or higher is required by BeyondTrust Middleware Engine. If not already present when the BeyondTrust Middleware Engine setup file is run, .NET 4.5.2 is installed automatically.

## BeyondTrust Middleware Engine Installation

- Run **bomgar-middleware-engine.exe**, following on-screen instructions.
- If Visual C++ Redistributable Package for Visual Studio 2015 and/or .NET 4.5.2 are not already installed on the server, they are installed at this time.

## BeyondTrust Middleware Engine Installation Verification

1. Open your services management console by typing **services.msc** in your Windows **Run** dialog.
2. Locate the service named **BeyondTrust Middleware Engine**.
3. Start the service.
4. Open a web browser on the server and go to **http://127.0.0.1:53231/**.

A page similar to the one pictured should be seen. This is the BeyondTrust Middleware Administration tool. The "No plugins were found!" message is normal at this point, as no plugins have yet been deployed.

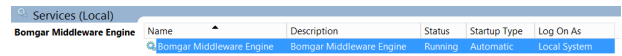


This tool is accessible only from the server where the BeyondTrust Middleware Engine is installed. If necessary, the tool can run on a different port, and it can be turned on/off as desired. For details, see "[Configuring the Middleware Administration Tool](#)" on page 8.

# Configure the BeyondTrust Privileged Remote Access Middleware Engine

## Starting and Stopping the BeyondTrust Middleware Engine

The BeyondTrust Middleware Engine runs as a Windows service. This service must be restarted whenever a new plugin is deployed or a plugin is removed.

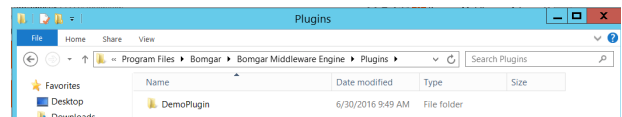


Name	Description	Status	Startup Type	Log On As
Bomgar Middleware Engine	Bomgar Middleware Engine	Running	Automatic	Local System

## Deploying the Plugin



**Note:** This section describes the general location and makeup of a plugin deployment. Deployment of specific plugins is beyond the scope of this document.



All plugins are deployed into the **Plugins** folder in the directory where the BeyondTrust Middleware Engine is installed. Each plugin is deployed into its own folder therein.

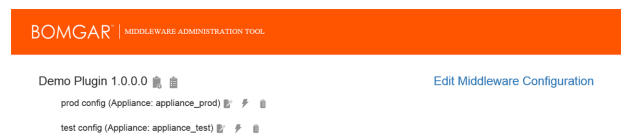
Once a plugin has been set up with configuration (described below), a file named **<plugin name>.config** is present. The plugin's folder may contain any number of other files and folders, depending on the plugin.

## Launching the Middleware Administration Tool

If the Windows service is running, the middleware administration tool can be launched. Open a web browser on the server and go to **http://127.0.0.1:53231/**. This tool is accessible only from the server where the BeyondTrust Middleware Engine is installed. If necessary, the tool can run on a different port, and it can be turned on/off as desired. For details, see "[Configuring the Middleware Administration Tool](#)" on page 8.

## Overview of the Middleware Administration Tool

The front page of the middleware administration tool displays all deployed plugins as well as each plugin's configuration(s). Multiple plugin configurations can be created. Creating multiple plugin configurations allows a single plugin to integrate with multiple systems, such as two different BeyondTrust Appliances.



## Working with plugin configurations

To add a new configuration for a plugin, click on the copy icon next to the plugin name. A screen is presented in which a number of configuration items are collected, including connection information to a BeyondTrust Appliance and any plugin-specific settings. This screen includes an option to disable a plugin configuration.



For a specific plugin configuration, the following options are available:

Edit the plugin configuration.

Test the plugin configuration. Testing confirms that the plugin is configured correctly and that network resources can be accessed.

**Note:** Test output varies between plugins.

**IMPORTANT!**

Please be careful! The configuration cannot be recovered after deletion.

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MIDDLEWARE ADMINISTRATION TOOL

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Demo Plugin

prod config (Appliance: appliance\_prod)

SUCCESS

Test: XML API Test  
Result: Success  
Can use Command API? True  
Can use Reporting API? True  
Can use Real Time State API? True  
Is Administrator? True  
Can provide remove support? True  
Can view recordings? True  
Can view license reports? True  
View support reports: all\_sessions  
View presentation reports: all\_sessions  
Api Version: 1.15.0

Delete the plugin configuration.

**IMPORTANT!**

Please be careful! The configuration cannot be recovered after deletion.

**Note:** Configuration changes made via the middleware administration tool are immediately effective. It is not required to restart the Windows service.

### Working with the event history for a plugin

To view the event history for a plugin, click the history icon next to the plugin name. A page is displayed listing the key details of each event the plugin has processed. The amount of history available depends on the event retention configuration. The default is seven days. For details on how to change this setting, see ["Configuring the Middleware Administration Tool"](#) on page 8.

On the plugin events page, the following functionality is available:

- Paging and text filtering.
- Viewing the raw event data.
- Viewing the error data if event processing failed.
- Finding the event GUID, an identifier attached to every log message for the event.
- Replaying an event (i.e., sending the event to the plugin to reprocess). This can be useful for events that fail for transient reasons such as a network issue.

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Demo Plugin Events

Search:  Items per page:

Status	Timestamp	Event Type - Source	Id	External Key	Appliance	Event GUID	Raw Event Data	Error Detail	Reply Event
Processed	2016-05-18 09:35:23.202	Support Session End - real_time	ac89b33ea04e4c5aa12090e0ba07ba50		appliance_prod	99c79d71-d48a-4341-89cd-7026462590	Show		Reply
Processed	2016-05-18 09:35:16.000	Support Session Start - real_time	ac89b33ea04e4c5aa12090e0ba07ba50		appliance_prod	403b4c45-5206-432e-af6d-40152066a263	Show		Reply

### Working with the event retries for a plugin

To view the active retries for a plugin, click the clipboard icon located next to the history icon. A page displays listing details about each retry.

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The retry is removed from this page when the plugin:

- Successfully processes the event.
- Reaches the retry limit.

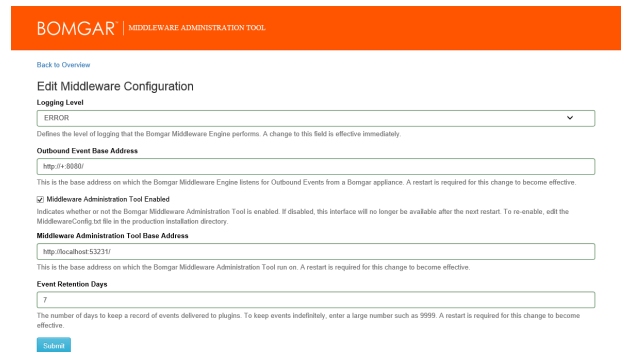
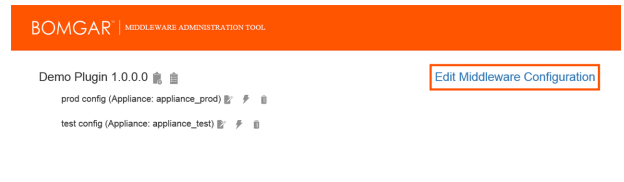
The retries are attempted using a Fibonacci back off strategy. This strategy spaces out the retries with the first attempt being five (5) seconds after the initial failure. The maximum number of retries are set per plugin configuration. The **Retry Events** page provides the functionality required to replay the event before the next attempt time.

BOMGAR <sup>™</sup>   MIDDLEWARE ADMINISTRATION TOOL				
<a href="#">Back to Overview</a>				
Demo Plugin Retries				
Event Guid	Attempt Number	Last Attempt Timestamp	Next Attempt Timestamp	Replay Event
f3362f16-717d-498e-abe2-ba86a89cc6ef	4	2017-08-11 17:17:49.007	2017-08-11 17:18:10.007	<a href="#">Replay</a>

## Configuring the Middleware Administration Tool

You can modify the middleware administration tool to run on a different port, and you can turn it on/off as desired. You also can change the length of time that events are stored.

1. From the home page of the middleware administration tool, click the **Edit Middleware Configuration** link.
2. The following configuration options are available:
  - **Logging Level:** Defines the logging level for the BeyondTrust Middleware Engine. Modifications to this value take effect immediately. For maximum logging, select **DEBUG**. For minimum logging, select **ERROR**.
  - **Outbound Event Base Address:** The base address BeyondTrust Middleware Engine listens to for outbound events from a BeyondTrust Appliance. If this value is changed, the Windows service must be restarted.
  - **Middleware Administration Tool Enabled:** If disabled, the web-based tool will not be available. If this value is changed, the Windows service must be restarted.
  - **Middleware Administration Tool Base Address:** The base address on which the administration tool runs. If this value is changed, the Windows service must be restarted.
  - **Event Retention Days:** The number of days to keep a record of events delivered to plugins. If this value is changed, the Windows service must be restarted.





3. This same configuration can be edited from a file if desired, such as if the administration tool is disabled.
  - a. Go to the directory where the BeyondTrust Middleware Engine is installed.
  - b. In a text editor, open **MiddlewareConfig.txt**.
  - c. Edit the file as needed. The file is in JSON format. Valid **LogLevel** values are **ERROR**, **INFO**, **WARN**, and **DEBUG**.



**Note:** When changing the **LogLevel** from the text file, the change is not immediately effective. The log level can change dynamically only when it is changed from the administration tool user interface.

Below is the default configuration:

```
{
  "LogLevel": "ERROR",
  "EngineBaseAddress": "http://+:8180/",
  "AdminToolEnabled": true,
  "AdminToolBaseAddress": "http://127.0.0.1:53231/",
  "EventRetentionDays": 7
}
```

- d. After making any changes, restart the Windows service.

# BeyondTrust Privileged Remote Access Middleware Engine Common Issues and Causes

Issue/Symptom	Possible Causes	Resolution
<p>BeyondTrust Middleware Engine Windows service fails to start.</p>	<p>Installation prerequisites have not been met. For information, please see "<a href="#">Install the BeyondTrust Privileged Remote Access Middleware Engine</a>" on page 4.</p> <p>Invalid configuration in <code>&lt;install_dir&gt;\MiddlewareConfig.txt</code>.</p>	<p>For additional troubleshooting information, open the Windows event viewer and look for any messages in the application log with a source of <b>MiddlewareEngineService</b> or <b>BeyondTrustMiddlewareEngine</b>.</p> <p>You may also go to the directory where the BeyondTrust Middleware Engine is installed and look in <b>\Logs\BomgarMiddlewareEngineService.log</b> for additional error messages.</p> <p>If this is a new installation, you may go to Windows <b>Programs and Features</b>, uninstall the BeyondTrust Middleware Engine, and then reinstall it.</p> <p>If the service no longer starts after the <b>MiddlewareConfig.txt</b> file has been modified, either fix the <b>MiddlewareConfig.txt</b> file and try again or delete the <b>MiddlewareConfig.txt</b> file and start the service. The BeyondTrust Middleware Engine will use the default values for configuration. The service should now start, and the admin tool can be used to modify the configuration.</p>
<p>Events are not being delivered to a plugin as expected.</p>	<p>Invalid configuration of the plugin.</p> <p>Invalid API configuration on the BeyondTrust Appliance (e.g., the API account not having proper privileges or incorrect outbound event configuration).</p> <p>Invalid network configuration.</p>	<p>Enable <b>DEBUG</b> logging by opening the administration tool, clicking <b>Edit Middleware Configuration</b>, changing the log level, and saving.</p> <p>Run a test on the plugin configuration in the middleware administration tool.</p> <p>Read the documentation for the specific plugin and ensure the configuration is correct.</p>
<p>An events is delivered to a plugin but is failing.</p>	<p>Invalid configuration of the plugin.</p> <p>Invalid network configuration.</p> <p>Other issues.</p>	<p>Enable <b>DEBUG</b> logging by opening the administration tool, clicking <b>Edit Middleware Configuration</b>, changing the log level, and saving.</p> <p>Run a test on the plugin configuration in the middleware administration tool.</p> <p>Read the documentation for the specific plugin and ensure the configuration is correct.</p> <p>In the administration tool, click the history icon next to the plugin. View the list of events and find the one that is failing. Click the link to view the error detail. If the error detail is not enough to diagnose the issue, note the <b>Event GUID</b> for the event, navigate to the logs under <code>&lt;install_dir&gt;\Logs</code>, look through the logs, and find the log message for the event. All log messages for the event will have the event GUID in the message.</p>

If unable to resolve the issue, contact BeyondTrust Support.