



Smarten
Augmented Analytics

Smarten Working with On-Premise-Gateway

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Disclaimer

This document is intended to support administrators, technology managers or developers using and implementing Smarten. The business needs of each organization will vary and this document is expected to provide guidelines and not rules for making any decisions related to Smarten. The overall performance of Smarten depends on many factors, including but not limited to hardware configuration and network throughput.

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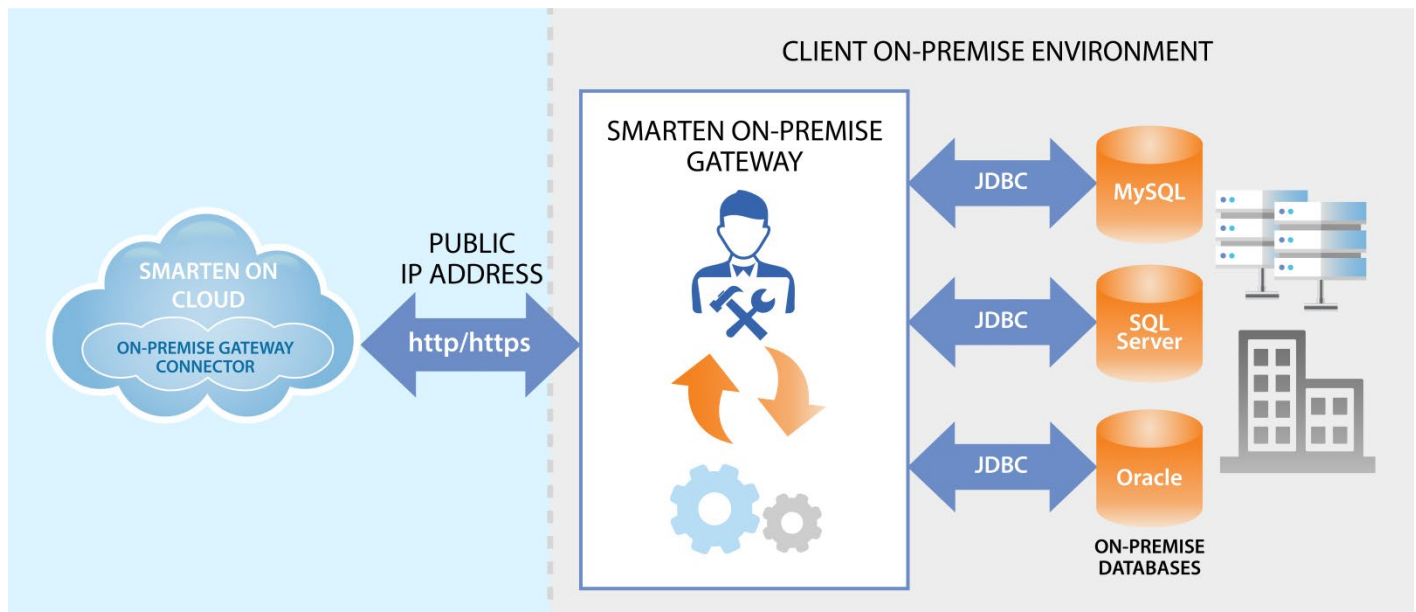
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1. Smarten On-premise Database Gateway Overview

Smarten On-Premise Database Gateway acts as a secure bridge between **on-premise databases** (hosted within a local network or private data center) and Smarten running on cloud. It enables seamless, secure, and controlled access to local data without exposing databases directly to the public internet.

- **Enhanced Security:** Keeps database servers hidden from the internet.
- **Seamless Integration:** Works transparently with various cloud services.
- **Compliance Friendly:** Data in database stays within your network until explicitly requested.
- **Ease of Deployment:** Minimal configuration and installed as a service.
- **Hybrid Compatibility:** Ideal for hybrid cloud architectures.

How it works



Step 1. Install the Smarten On-Premise Gateway

- Download and install the Smarten On-Premise Gateway package on your on-premise computer.

Step 2. Configure your on premise database connection parameters in the Gateway

- Configure your database connection parameters (e.g., database name, connection URL, username, password) in on-premise gateway configuration file (smarten-gateway-server.properties).

Step 3. Enable on-premise gateway URL access on Public IP address

- Configure firewall and network rules to allow the Smarten On-Premise Gateway server URL to be accessible through a public IP address.

Step 4. Create a Data Source in Smarten running on cloud

- Create a new data source using the Smarten On-Premise Gateway connector and configure data source parameters to connect your on-premise database.

Step 5. Create a Dataset

- Use the configured data source to create a dataset in Smarten running on cloud.

2. Smarten On-premise Database Gateway Installation Kit

The Smarten On-premise Gateway installation kit is delivered in a compressed zip file that includes all the required files for installation. You can download the file from following URL:

<https://www.smarten.com/downloads-smarten-on-premise-database-gateway.html>

The Smarten On-premise Gateway installation kit contains the following file:

- smarten-On-premiseGateway.zip file

Note:

Review all prerequisites for installation and configuration settings before installing Smarten On-premise Gateway.

3. Prerequisites and Compatibility

Please refer to the following prerequisites and compatibility with hardware and software platforms for installing Smarten On-premise Gateway.

a. System Requirements

System Resource	Description
CPU	Intel/AMD Processor (Quad Core or Higher)
RAM	4 GB RAM or Higher
Hard Disk	20 GB Space or Higher, depending upon size of data
Operating System	32 bit Operating System (Windows or Linux) 64 bit Operating System(Windows/Linux) – Recommended
Java environment	Oracle JDK 1.8 or OpenJDK 1.8

b. Related considerations

- Do not install a gateway on a computer, like a laptop, that might be turned off, asleep, or disconnected from the internet. The gateway cannot run under any of those circumstances.
- If a gateway uses a wireless network, its performance might suffer. We recommend that you set the gateway on a wired device for best network performance.
- If you use a virtualization layer for your virtual machine, performance might suffer or perform inconsistently.

- You could install other applications on the gateway machine, but these applications might degrade gateway performance. If you do install other applications on the gateway machine, be sure to monitor the gateway closely to check if there's any resource contention.

4. Extracting the smarten-On-premiseGateway.zip file

Installation instructions should be followed in the correct sequence to complete successful installation of Smarten On-premise Gateway.

Extract the **smarten-On-premiseGateway.zip** file on system using zip extraction software. After extraction, the extracted files are stored in the smarten-On-premiseGateway directory.

The smarten-On-premiseGateway directory contains the following directories/files:

Wildfly—Contains all the required Smarten On-premise Gateway files. This folder contains application server with Smarten On-premise Gateway.

5. Deploying Smarten-On-Premise-Gateway

a. Install Java Environment

Smarten On-Premise Gateway is only compatible with Oracle or OpenJDK JDK, and the recommended version is JDK 1.8.X.

Download and install the version from

<https://www.oracle.com/in/java/technologies/javase/javase8-archive-downloads.html>

Choose Windows or Linux 32-bit or 64-bit version of JDK, depending on your operating system.

Platform specific installation instructions are available at

<http://docs.oracle.com/javase/8/docs/webnotes/install/>

Setting JAVA_HOME on Windows environment:

Windows OS is a GUI-based operating system, and The JAVA_HOME variable is used by Smarten On-Premise Gateway to find the Java Development Kit installation.

Follow the instructions below to edit PATH of system variable from GUI.

- 1) Open System property Window
- 2) Click Advanced --> Environment variables
- 3) Click New on System Variable section
- 4) Add Variable Name: JAVA_HOME and Variable value: C:\Program Files\Java\JDK1.8.x\
- 5) Add Java into PATH as: %JAVA_HOME%/bin

Setting JAVA_HOME on Linux environment:

The Linux Operating System is a command-based operating system, so users will need to run command to export JAVA_HOME variable and its value.

Run the following command to edit PATH of system variable on Linux.

```
Shell:> export JAVA_HOME=/opt/java/jdk_1.8
```

```
Shell:>export PATH= ${PATH}:{JAVA_HOME}/bin
```

b. Running Smarten-On-premise-Gateway-Server from command prompt

On Windows

To start WildFly AS on Windows Server, run standalone.bat file from command prompt

WILDFLY_HOME/bin/standalone.bat

To stop WildFly AS on Windows Server, run jboss-cli.bat file from command prompt

WILDFLY_HOME/bin/jboss-cli.bat --connect command=:shutdown

On Linux

To start WildFly AS on Linux run standalone.sh file from shell prompt

WILDFLY_HOME/bin/standalone.sh

To stop WildFly AS on Linux run standalone.sh file from shell prompt

WILDFLY_HOME/bin/jboss-cli.sh --connect command=:shutdown

c. Running Smarten-On-premise-Gateway-Server as system service

On Windows

WildFly comes with Windows service executable as part of WildFly installation package to run the WildFly Smarten-On-premise-Gateway-Server as a windows service.

Launch the Windows command line and execute the following command to install and register the service:

WILDFLY_HOME/bin/service/service.bat install

Open Server Manager > Configuration > Services and verify that the WildFly service was registered.

Change the Startup Type for this service to Automatic if you wish to keep this service Automatic.

Start the WildFly service.

On Linux

RPM Based Linux (Red Hat , Centos , Fedora)

- cp wildfly/bin/init.d/wildfly-init-redhat.sh /etc/init.d/wildfly
- mkdir -p /etc/default
- cpwildfly/bin/init.d/wildfly.conf /etc/default
- cd /etc/default
- Edit file wildfly.conf and uncomment following parameters
- vi /etc/default/wildfly.conf

JAVA_HOME=/usr/java/jdk1.8.0_21 (The default path of JDK Installed in your system)

JBOSS_HOME=/usr/share/wildfly.11.Final (Location of Wildfly folder)

JBOSS_USER=root(Change user from wildfly to user having rights on wildfly folder.

Recommend user will be root)

JBOSS_MODE=standalone

JBOSS_CONFIG=standalone.xml

JBOSS_CONSOLE_LOG="/var/log/wildfly/console.log

- chmod 775 wildfly/bin/standalone.sh

- `chmod 755 /etc/init.d/wildfly`
- `chkconfig --add wildfly`
- `chkconfig --level 2345 wildfly on`
- Use command `/etc/init.d/wildfly start` or `service wildfly start` command to start wildfly service

Debian Based Linux (Ubuntu , debian)

- `cpwildfly/bin/init.d/wildfly.conf /etc/default/wildfly`
- Edit file `wildfly.conf` and uncomment following parameters
- `vi /etc/default/wildfly.conf`

JAVA_HOME=/usr/java/jdk1.8.0_21 (The default path of JDK Installed in your system)

JBOSS_HOME=/usr/share/wildfly.11.Final (Location of Wildfly folder)

JBOSS_USER=root(Change user from wildfly to user having rights on wildfly folder.

Recommend user will be root)

JBOSS_MODE=standalone

JBOSS_CONFIG=standalone.xml

JBOSS_CONSOLE_LOG="/var/log/wildfly/console.log

- `cp wildfly/bin/init.d/wildfly-init-debian.sh /etc/init.d/wildfly`
- `sudo chown root:root /etc/init.d/wildfly`
- `sudo chmod +X /etc/init.d/wildfly`
- `sudo update-rc.d/wildfly defaults`
- `sudo chown -R root:root /wildfly`
- `chmod 755 wildfly`
- `chmod 755 /etc/init.d/wildfly`
- `chmod 755 -R wildfly/bin/`

d. Verify Smarten-On-premise-Gateway-Server is running

Make sure the Smarten-On-premise-Gateway server is running and Smarten-On-premise-Gateway application is successfully installed.

Open web browser and type URL

`http://<host name>:<port number>/smarten-gateway/getData`

For example, <http://localhost:9090/smarten-gateway/getData>

You will get below response in your web browser. This means Smarten on-premise gateway server is up and running.

```
{
  "status": "OK"
}
```

e. Enable Smarten-On-premise-Gateway Server on a public IP Address

Smarten-On-premise-Gateway is typically deployed **behind a firewall** and accessed internally. To enable **external access** (e.g., from internet users), you need to:

1. Bind the gateway to a public-facing IP address

2. Open get-way ports (default port 9090) in the firewall (If there is any firewall in the local networks)
3. Secure it with HTTPS (Recommended)
4. Restrict access (if needed) via IP allow lists

6. Configuring your on-premise database connection properties

Smarten-gateway-server.properties file configures the Smarten On-Premise Gateway Server, managing on-premise databases connection parameters. If you have multiple databases running in your on-premise, you can configure multiple databases connection properties in this file.

Open file smarten-gateway-server.properties from path shown below and make changes:
SMARTEN_ON_PREMISES_GATEWAY_HOME/standalone/deployments/smarten-gateway.war
/WEB-INF/smarten-gateway-server.properties

```
# Database names separated by commas  
databases =demo_db,sales
```

```
# MySQL example  
demo_db.driverClassName = com.mysql.jdbc.Driver  
demo_db.url= jdbc:mysql://localhost:3306/demo_db  
demo_db.username= root  
demo_db.password= elegant@123
```

```
# SQL Server example  
sales.driverClassName = com.microsoft.sqlserver.jdbc.SQLServerDriver  
sales.url= jdbc:sqlserver://10.0.0.121:1433;database=sales  
sales.username= ba  
sales.password= elegant@123
```

1. Databases

Key: databases

- **Description:** Lists all database identifiers that are used in the server. As shown in the above image step 1.
- **Format:** Comma-separated values
- **Example:**
databases = demo_db, sales

2. JDBC Configuration

Defines connection parameters for each database listed in the databases key. As shown in the above image step 2 and step 3.

MySQL Configuration (demo_db) properties

```
demo_db.driverClassName = com.mysql.jdbc.Driver  
demo_db.url dbc:mysql://localhost:3306/sampled  
demo_db.username = root  
demo_db.password = root
```

3. Connection Pool Configuration

Specific settings to manage JDBC connection pooling.

Pool Settings for demo_db:

```
demo_db.initialSize = 10      # Initial connections on pool startup
demo_db.minIdle = 10         # Minimum number of idle connections
demo_db.maxIdle = 125        # Maximum number of idle connections
demo_db.maxActive = 125     # Maximum active (in-use) connections
demo_db.defaultAutoCommit = true # Enables auto-commit by default
demo_db.rollbackOnReturn = true # Ensures cleanup of unfinished transactions
demo_db.testOnBorrow = true  # Test connection before use
demo_db.validationQuery = SELECT 1 # SQL query to validate connection health
demo_db.removeAbandoned = true
demo_db.removeAbandonedTimeout = 120 # Time in seconds to consider a connection abandoned
```

7. Connecting on-premise gateway from Smarten running on cloud

a. Creating an on-premise database profile

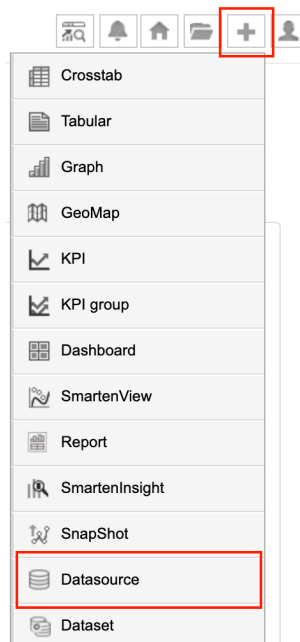
Smarten provides on-premise database connector which connects to Smarten on-premise database gateway server installed in your local or private environment. You can use this connector to create on-premise database data source profile. You can configure required connection parameters in data source profile and you can query and retrieve data from your on-premise database to create and refresh dataset using this data source profile.

About this task

Use this task to create an on-premise database data source profile.

Procedure

1. Click the New icon and select **Datasource** from the menu.



MENU OPTION—NEW DATA SOURCE

The system displays the **New Datasource profile** page.

New Datasource profile

Select Datasource type

FILE

- Text (e.g. txt, csv, tsv)
- Google Sheet
- XLS / XLSX
- JSON
- XML

DATABASE

- SQL server
- MySQL
- Amazon redshift
- Hive SQL
- Google BigQuery
- OnPremise Databases**
- Oracle
- Postgre SQL
- SAP HANA
- Oracle(PDB)
- SnowFlake
- Maria DB
- IBM DB2
- Sybase
- SQL server(JTDS)
- Athena DB
- Oracle(ATP)
- Impala

Please contact your administrator to add other databases

OTHER

- Google Analytics
- SmartenInsight
- Creatio
- SAP
- BI Objects
- R script
- Custom script

NEXT **CANCEL**

THE NEW DATASOURCE PROFILE PAGE—SELECTING A DATA SOURCE TYPE

- Select the “On-premise databases” connector to create data source profile for your on-premise database. Click **NEXT** to create data source. The system displays the new data source profile configuration screen. You can specify connection parameters as per your Smarten on-premise gateway configuration in your environment.

New Datasource profile

OnPremise Databases

Name

Description (Optional)

On-Premise gateway configuration details

Host

Port

Database

Username

Password

Other connection parameters (optional)

Number of threads

ResultSet fetch size

OK **TEST CONNECTION** **CANCEL** **BACK**

THE NEW DATASOURCE PROFILE PAGE—CREATING ON-PREMISE DATABASE PROFILE

3. Provide information in the following fields:
 - **Name:** Name for the data source profile.
 - **Description:** Description for the data source profile.
 - **Host:** Specify Smarten on-premise gateway URL which is installed and configured in your on-premise environment. This URL must provide the public IP address or the public domain name through which on-premise gateway is accessible from the Smarten running on cloud.
 - **Port:** Specify Smarten on-premise gateway port number. Default port number is 9090.
 - **Database:** Specify database name which is configured in the on-premise gateway configuration. You need to specify database name which you have mentioned in “**databases**” attribute in **smarten-gateway-server.properties** file during **chapter 6-Configuring your on-premise database connection properties** configuration steps.
 - **Username:** Specify username that will be used to connect to the database.
 - **Password:** Specify password that will be used to connect to the database.
 - **Other connection parameters:** Provide any other connection parameters that are required to connect with the database.
 - **Number of threads:** Provide a value to specify the number of threads to be established with the database.
 - **ResultSet fetch size:** Provide a value to specify the number of records to be fetched in chunks from the database.
 4. Click **TEST CONNECTION** to verify that the connection to the source is successful.
 5. Click **OK**.
- The system displays a confirmation message after the data source is successfully created. It also allows you to create a dataset using the data source profile.

The data source profile is now available in the repository.

b. Creating a Dataset Using an on-premise Database Profile

You can use an on-premise database profile to create a dataset and retrieve data from your on-premise databases. You can retrieve data using either a ready to use query or using a step-by-step wizard.

For more detailed steps for creating dataset, please refer “Creating dataset using database profile” chapter in Smarten SSDP user manual document.

8. Uninstalling Smarten-On-premise-Gateway

To uninstall Smarten-On-premise-Gateway , follow the steps below:

For Application Server

- Stop Smarten-On-premise-Gateway server if it is already running
- Go to Smarten-On-premise-Gateway server deployment directory containing the **smarten-On-premiseGateway** directory as referred on **Deploying Smarten-On-premise-Gateway Servers**.
- Now delete smarten-On-premiseGateway directory to uninstall Smarten

9. Appendix

a. Setting the Heap Size

System performance is greatly influenced by the size of the Java heap available to the JVM. This section includes key guidelines to help determine the optimal heap size for Smarten-On-premise-Gateway implementation.

Setting the Initial and Minimum Heap Size

-Xms<size>

-Xms sets the initial and minimum size of the heap. It is recommended to set maximum heap size.

For example,

```
java -Xmx64m -Xms64m myClass
```

Setting the Maximum Heap Size

-Xmx<size>

As a rule, set the maximum heap size as high as possible. Make sure it is not high enough to cause page faults for the application or certain other applications on the same system. Set the maximum heap size by using the -Xmx command-line option.

For example,

```
java -Xmx64m -Xms64m myClass
```

A normal initial heap size is recommended to be 80% of the physical available memory.

Heap Sizing Guidelines

Heap size should be determined based on hardware platform, operating system, and other applications running on hardware, and the available resources—mainly physical memory available to Smarten. Some guidelines based on these criteria are listed below.

Table 1: Heap Limitation by Platform

Platform	Amount of Heap You Can Run
32-bit platforms (IA32)	On 32-bit platforms running on normal operating systems, processes are limited to less than 2GB. Additionally, the heap must share this memory with memory used, including JNI memory used by the application, generated code, thread stacks, heap control, and other internal structures. Although it can run with 1.8GB of heap, it is seldom recommended.

	<p>On Windows, start with /PAE or /3GB, which enables the process size to be larger. For more information in /PAE and /3G, refer to http://www.microsoft.com/whdc/system/platform/server/PAE/PAEmem.msp</p> <p>The heap should be in consecutive memory, which limits it to less than 2GB.</p> <p>Some Linux operating systems support larger process size by default (for example, Red Hat Enterprise Linux 4.0), and others can be started with the huge page kernel, which allows process to run with heaps as large as 2.7GB.</p>
64-bit platforms (x86_64 and IA64)	<p>64-bit platforms are not physically limited by the pointer size, and the process size can grow to the supported limit. The limit is usually the amount of memory installed, but there can be further limitations imposed by different versions of the operating system (different releases support different amounts; for example, Windows 2003/Itanium only support 16GB, unless running the EE variant).</p>

Encountering OutOfMemory Errors

When encountering out of memory errors, it is recommended to increase the maximum heap size by following the guidelines listed above.

b. Configuring HTTPS on Smarten-On-premise-Gateway server

Smarten-On-premise-Gateway uses the Undertow subsystem for HTTP and HTTPS services and the Elytron subsystem for security.

1. Obtain or Create an SSL/TLS Certificate

As with the Smarten-On-premise-Gateway server, you'll need a certificate.

- **CA-Issued Certificate (Production):** Recommended. Get a certificate (and its private key, and any intermediate CA certificates) from a trusted CA.
- **Self-Signed Certificate (Development/Testing):** You can generate one using keytool (comes with Java).

```
keytool -genkeypair -alias wildflyserver -keyalg RSA -keysize 2048 -validity 3650 -keystore
/path/to/your/wildfly/standalone/configuration/wildfly.jks -storepass your_keystore_password -
keypass your_key_password
```

wildfly.jks: This will be your Java KeyStore file.

your_keystore_password: The password to access the keystore.

your_key_password: The password for the private key within the keystore (can be the same as the keystore password).

Fill in the Distinguished Name (DN) information carefully, especially the "What is your first and last name?" which should be your server's fully qualified domain name (FQDN) or IP address for the certificate to be valid.

2. Configure WildFly with the Certificate (using standalone.xml or jboss-cli.sh)

1. **Locate standalone.xml:** \$WILDFLY_HOME/standalone/configuration/standalone.xml
2. **Add a security-realm for SSL (if using older WildFly or prefer this approach):** Locate the

```

<security-realms> section and add a new realm for your SSL configuration:
  <security-realm name="ssl-realm">
    <server-identities>
      <ssl>
        <keystore path="wildfly.jks" relative-to="jboss.server.config.dir" keystore-
          password="your_keystore_password" alias="wildflyserver" key-
          password="your_key_password"/>
        </ssl>
      </server-identities>
    </security-realm>

```

- Adjust path, keystore-password, alias, and key-password to match your certificate details.

3. Modify the Undertow https-listener: Locate the <subsystem xmlns="urn:jboss:domain:undertow:..."> section. You'll find an http-listener. Uncomment or add an https-listener:

```

<server name="default-server">
  <https-listener name="default" socket-binding="https" security-realm="ssl-realm"/>
</server>

```

- Ensure security-realm matches the name you defined (ssl-realm in this example) or ssl-context points to your Elytron SSL context.

4. Restart WildFly.

3. Test HTTPS Access

Open your web browser and navigate to <https://your-wildfly-ip-or-hostname:8443/your-application>.

- The default HTTPS port for WildFly is 8443.
- If you used a self-signed certificate, your browser will show a warning about the certificate being untrusted. You'll need to accept it to proceed. For production, a CA-issued certificate prevents this.

c. Changing HTTP port (default 9090) on Smarten-On-premise-Gateway

Use this setting to modify WildFly HTTP port value (by default port 9090). If another program running on your server uses port 9090, WildFly cannot use port 9090. In such cases, change this setting to allocate some other port number to WildFly.

Open file standalone.xml from path shown below and make changes.

WILDFLY_HOME/standalone/configuration/standalone.xml

```

<socket-binding-group name="standard-sockets" default-interface="public" port-
offset="{jboss.socket.binding.port-offset:0}">

```

.....

```

<socket-binding name="http" port="9090"/>

```

```

</socket-binding-group>

```

d. Configuring HTTP Post-related parameters (max-post-size and max-parameters)

In Wildfly, maximum post size and maximum number of parameters are defined on listener for HTTP POST requests. By default max-post-size is limited to 10 MB and max-parameters is limited to 1000, but you can change that by configuring these parameters as shown below.

Turn off the Wildfly server , while modifying this file.

Open file standalone.xml from path shown below and make changes.

WILDFLY_HOME/standalone/configuration/standalone.xml

```
<subsystem xmlns="urn:jboss:domain:undertow:1.2">
<buffer-cache name="default"/>
<server name="default-server">
<http-listener name="default" max-post-size="5000000"max-parameters="2000" socket-
binding="http"/>
<host name="default-host" alias="localhost">
<location name="/" handler="welcome-content"/>
<filter-ref name="server-header"/>
<filter-ref name="x-powered-by-header"/>
```

e. Bypass antivirus for Smarten-On-premise-Gateway folders on windows server

When you initially download Smarten-On-premise-Gateway, your antivirus software automatically detects java files and does not let the files bypass through the software because it considers them to be a potential threat to your system. This is done to provide security to your system and you can override it by adding an exclusion in your antivirus package. To ensure that Smarten-On-premise-Gateway is run smoothly, it is important to make sure that you bypass java files through your antivirus software. Adding an exclusion in your antivirus software depends upon what antivirus software you use.

Below steps show you how you can add an exclusion and are done in reference to **McAfee** antivirus

Steps to bypass files from Antivirus for Smarten execution:

In order to exclude a folder from your custom or scheduled scan so McAfee doesn't check it for threats please follow below steps:

1. On the Home Page, open the Virus and Spyware Protection drawer
2. Do one of the following:
 - To exclude an item from your custom scan, click **Scan Your PC**, then click **Run a custom scan**.
 - To exclude an item from your scheduled scan, click **Scheduled Scan**.
3. Open the Excluded Files and Folders drawer.
4. Click **Add Folder**.
5. Choose the file you want to exclude from you scan, then click **Open**.

The following are the list of files and folders that needs to be excluded from your antivirus software:

- Smarten-On-premise-Gateway installation directory including subfolder
- Java installation folder - **C:\Program Files\Java** including subfolders
- All Java Server Pages files (*.jsp)
- All JavaScript files (*.js)

By following the above steps, it will be ensured that all excluded files and folders are successfully bypassed through your antivirus and hence, will allow Smarten-On-premise-Gateway to run smoothly.

Please Note: Sometimes, even after you bypass the above folders and files, your antivirus signature might still block java application. In this case, you will get an error saying *Permission denied* when you try to run Smarten-On-premise-Gateway. Please contact your antivirus support team to troubleshoot the issue from their end when this happens.

10. Product and Support Information

Find more information about Smarten-On-premise-Gateway and its features at www.smarten.com

Support: support@smarten.com

Sales: sales@smarten.com

Feedback & Suggestions: support@smarten.com

Support & Knowledgebase Portal: support.smarten.com