

Configuration Guide

Configuring IBM HTTP Server as a Reverse Proxy Server for SAS® 9.3 Web Applications Deployed on IBM WebSphere Application Server

This document is revised for SAS 9.3. In previous versions of this document, SAS Web applications that had an administrative purpose and SAS Web applications that provided services, rather than an end-user interface, were not proxied through IBM HTTP Server. In this version of the document, all of the SAS Web applications are proxied through IBM HTTP Server.

This document describes how to configure IBM HTTP Server as a reverse proxy server to an IBM WebSphere Application Server Network Deployment that is hosting SAS 9.3 Enterprise BI Web applications. In particular, this document highlights steps specific to SAS that are required when you set up an HTTP server for SAS Enterprise BI Server Web applications. You can set up an HTTP server in many ways, depending on your individual operating environment and business needs. However, this document focuses on one possible configuration as an example.

IBM HTTP Server is also configured to serve the static content from the SAS Themes Web application. This document assumes a starting configuration of a single WebSphere Application Server that was configured by the SAS Deployment Wizard with an application server instance that is named SASServer1.

This document describes configuring a topology that is shown in the following figure. The figure shows the protocol and port number for the connections amongst the software applications.



Overview

The following list identifies the high-level tasks that you must perform to configure IBM HTTP Server as a reverse proxy server:

- Install IBM HTTP Server and IBM WebServer Plug-In for WebSphere Application Server.
- Ensure that the IBM HTTP Server and IBM WebSphere Plug-In for WebSphere Application Server are at the same fix pack maintenance level as the associated WebSphere Application Server (minimum fix pack level is 13).
- Configure the Web server definition in WebSphere Application Server. This step registers the IBM HTTP Server with WebSphere Application Server. If IBM HTTP Server is deployed on a

different machine than WebSphere Application Server, then the machine is added as a node to the cell.

- Configure IBM HTTP Server to serve the HTML and static content from the SAS Themes application.
- Generate and propagate the Web server plug-in configuration file from WebSphere Application Server to the IBM HTTP Server. This configuration file identifies the SAS Web applications that the IBM HTTP Server will proxy.
- Reconfigure SAS metadata for the SAS Web applications with the host name and port of the IBM HTTP Server.
- Verify the configuration by starting the software products in the correct order and logging on to a SAS Web application.

Required Software

In addition to SAS 9.3 software that includes the SAS Enterprise Business Intelligence Web applications, you must have these IBM software products:

- IBM WebSphere Application Server v7.0 (installed with Fix Pack 13 (7.0.0.13) or later)
- IBM HTTP Server v7.0
- IBM WebServer Plugin for WebSphere Application Server (can be installed as part of installing IBM HTTP Server)
- Fix Packs for IBM HTTP Server v7.0 and the WebServer Plug-in (must be the same fixpack level that was applied to the WebSphere Application Server)

These software products are available on your IBM WebSphere Application Server installation media or as downloads from IBM. Make sure that IBM HTTP Server and the WebServer Plug-in are at the same fix pack level as WebSphere Application Server.

Install IBM HTTP Server and WebServer Plug-in

For information about installing IBM HTTP Server and the WebSphere Plug-in for WebSphere Application Server, follow the installation instructions that are provided at the WebSphere Application Server Version 7.0 InfoCenter (available at pic.dhe.ibm.com/infocenter/wasinfo/v7r0/index.jsp?topic=/com.ibm.websphere.ihs.doc/info/ihs/ihs/welc6miginstallihsdist.html). When the plug-in is installed, the installation wizard provides a default name of **webserver1**. This document assumes that you used this default value.

After installing the software, use the update installer to install the latest fix packs.

Configuring the Web server plug-in is described later in this document. But, you can confirm that the plug-in software is installed properly by viewing the `httpd.conf` file for IBM HTTP Server and locating the `LoadModule` and `WebSpherePluginConfig` directives. See the following example:

```
LoadModule was_ap20_module "c:\ibm\httpserver\plugins\bin\
mod_was_ap20_http.so"
WebSpherePluginConfig "c:\ibm\httpserver\plugins\config\webserver1\
plugin-cfg.xml"
```

If the directives are not in the configuration file, either re-install the Web server plug-ins so that the installation wizard can run again, or add the lines manually to the httpd.conf file.

Configure the Web Server Definition

The WebServer Plug-in installation wizard creates a script that includes all the information that is needed to define the IBM HTTP Server within WebSphere Application Server. The script is located in `PLUGINS_ROOT/bin` and is named according to the Web server name (`configurewebserver1.sh` for UNIX or `configurewebserver1.bat` for Windows). If you cannot locate the script, then the installation wizard did not run successfully. Either re-install the Web server plug-ins so that the installation wizard can run again, or manually define the Web server in the WebSphere administration console.

To run the configuration script that defines the Web server within WebSphere Application Server, follow these steps:

1. Copy the `configurewebserver1.bat` script to the `bin` directory for WebSphere Application Server:

From location: `c:\IBM\HTTPServer\Plugins\bin\configurewebserver1.bat`

To location: `c:\IBM\WebSphere\AppServer\bin`

2. Run the `configurewebserver1.bat` command.

As the script runs, it performs the following configuration tasks:

- Defines a node, if IBM HTTP Server is installed on a machine that does not have WebSphere Application Server installed on it, and adds it to the cell.
 - Creates a Web server definition for the IBM HTTP Server.
 - Generates a `plugin-cfg.xml` file that includes the SAS Web applications that are deployed on WebSphere Application Server and stores it in the WebSphere Application Server repository.
3. If IBM HTTP Server is installed a different machine than WebSphere Application Server, log on to the WebSphere administrative console and set the credentials for the IBM HTTP Server administrative server:
 - a. Select **Servers ► Web servers**.
 - b. Click **webserver1**.
 - c. Click **Remote Web server management**.
 - d. Provide or confirm the settings for **Port** (default value is 8008), **Username**, and **Password**. Click **OK**.

Deploy SAS Web Application Themes and SAS Flex Application Themes to an HTTP Server

SAS Web Application Themes (SAS Themes) enable you to apply uniform visual customization to your SAS Web applications. Similarly, *SAS Flex Application Themes* (SAS Flex Themes) provide more visual

customization and interactivity for Flex applications. These theme sets, which are collections of HTML resources such as images and cascading style sheets, reside on the same Web application server. SAS recommends that you deploy SAS Themes and SAS Flex Themes content to an HTTP server in order to shift the processing load of serving static HTML files from the Web application server to the HTTP server.

The following steps explain how to deploy SAS Themes and SAS Flex Themes to the open-source Apache HTTP Server. The process for deploying the themes to other HTTP servers is similar.

To deploy the SAS Themes:

1. Navigate to **`APACHE_HOME/htdocs/en_US`** and create a new directory named **`SASTheme_default`**.
2. Navigate to **`SAS-configuration-directory/Levn/Web/Staging/exploded/sas.themes9.3.ear`**. From this directory, copy the contents of **`sas.themes9.3.war`** into **`APACHE_HOME/htdocs/en_US/SASTheme_default`**.
3. Remove the **`sas.themes9.3.ear`** directory from the WebSphere application server, as follows:
 - a. In the WebSphere administrative console, select **Applications ► Enterprise Applications**.
 - b. Select the **`SASThemes9.3`** check box and click **Uninstall**.
 - c. Click **OK** on the confirmation page.

To deploy the SAS Flex Themes:

1. Navigate to **`APACHE_HOME/htdocs/en_US`** and create a new directory named **`SASFlexThemes`**.
2. Navigate to **`SAS-configuration-directory/Levn/Web/Staging/exploded/sas.flexthemes2.5.3.ear`**. From this directory, copy the contents of **`sas.flexthemes2.5.3.war`** into **`APACHE_HOME/htdocs/en_US/SASFlexThemes`**.
3. Remove the **`sas.flexthemes2.5.3.ear`** directory from the WebSphere application server, as follows:
 - a. In the WebSphere administrative console, select **Applications ► Enterprise Applications**.
 - b. Select the **`SASFlexThemes2.5.3`** check box and click **Uninstall**.
 - c. Click **OK** on the confirmation page.

Change the Connections for the SAS Web Applications

After SAS Themes is deployed to the IBM HTTP server and the plug-in configuration file is in place, information about access to the SAS Web applications, such as host and port number, must be updated in SAS metadata. Change the connection information for each SAS Web application to a URL that includes the host name and port number for the IBM HTTP Server.

To change the connection information, follow these steps in SAS Management Console:

1. Select **Application Management ► Configuration Manager**.
2. Right-click on the SAS Web application you want to reconfigure, and select **Properties**.
3. Click the **Connection** tab, set **Host Name** and **Port Number** to the host name and port number of the IBM HTTP Server, and then click **OK**.

SAS® Web Report Studio 4.3 Specific Update

By default, SAS Web Report Studio 4.3 uses a special redirection filter. When used with a proxy server, this filter must be disabled. To disable the filter, perform the following steps with SAS Management Console:

1. Select **Application Management ► Configuration Manager**.
2. Right-click **Web Report Studio 4.3**, and select **Properties**.
3. Click **Advanced**, and then click **Add**.
4. Enter a property name of **App.RedirectionFilterDisabled** and a value of **true**.
5. Restart SAS Web Report Studio 4.3 from the WebSphere administrative console.

SAS Content Server Related Changes

Configure IBM HTTP Server to Accept Content for All Requests

IBM HTTP Server must be configured to accept content, such as attachments from the WebDAV repository provided by SAS Content Server, with HTTP requests. Follow these steps in the WebSphere administrative console:

1. Select **Servers ► Web servers ► webserver1 ► Plug-in properties ► Request and Response**.
2. Select the **Accept content for all requests** check box.

Change the Connection for SAS Content Server

Perform these steps to change the connection information for the SAS Content Server application. This change is similar to the change required for each of the SAS Web applications. SAS metadata must be changed to identify the host name and port of the IBM HTTP Server. To reconfigure the host name and port of the SAS Content Server in SAS metadata, perform the following steps in SAS Management Console:

1. Select **Server Manager ► SAS Content Server**.
2. Right-click the **Connection: SAS Content Server** icon in the right panel and select **Properties**.

3. Click the **Options** tab and set the **Host name** and **Port number** fields to the host name and port number of the IBM HTTP Server.
4. Click **OK**.

Change the WebDAV Repository URL

There are five applications that use SAS metadata to identify the connection information for the SAS Content Server. These applications are identified in the following list:

- Remote Services
- SASPackageViewer4.3 Local Services
- SASPortal4.3 Local Services
- SASStoredProcess9.3 Local Services
- SASWebReportStudio4.3 Local Services

To reconfigure the WebDAV URL for the applications, perform the following steps in SAS Management Console:

1. Select **Environment Management ► Foundation Services Manager**.
2. Select the application and then select **Core ► Information Service**.
3. Right-click **Information Service** and select **Properties**.
4. In the **Information Service Properties** dialog box, click the **Service Configuration** tab and then click **Configuration**.
5. In the **Information Service Configuration** dialog box, click the **Repositories** tab.
6. Select **WebDAV** and then click **Edit**.
7. Change the **Host** and **Port** values to the host name and port of the IBM HTTP Server.
8. Click **OK** to close the **Information Service Configuration** dialog box.
9. Click **OK** to close the **Information Service Properties** dialog box.

Generate and Propagate the Web Server Plug-in Configuration File

IBM HTTP Server reads a configuration file that is named plugin-cfg.xml. This file identifies the location of the SAS Web applications that are deployed on WebSphere Application Server. Because SASThemes9.3 was removed and the Accept content for all requests setting is changed, this file must be regenerated. This configuration file must also be propagated to the IBM HTTP Server configuration directory. Follow these steps in the WebSphere administrative console:

1. Select **Servers ► Web servers**.
2. Enable the check box for **webserver1** and then click **Generate Plug-in**.
3. Enable the check box for **webserver1** again, and click **Propagate Plug-in**.
4. Restart IBM HTTP Server so that it reads the updated configuration file.

Verify the Configuration

Start the software applications in the following order:

1. SAS Remote Services
2. IBM HTTP Server (if it wasn't restarted after propagating the plugin-cfg.xml file)
3. SASServer1

Once SASServer1 is running, log on to a sample Web application to confirm the configuration is valid by opening a Web browser to `http://httpserver.example.com:port/SASBIDashboard` (or any SAS Web application that is deployed on SASServer1). You are challenged for log on credentials. Provide credentials and then click **Log On**.

Troubleshooting

Follow these steps to assist with troubleshooting:

1. Open a browser to `httpserver.example.com:port` and confirm that IBM HTTP Server is running.
2. Enable debugging for the WebSphere Plug-In to IBM HTTP Server. Select **Servers ► Web servers ► webserver1 ► Plug-in properties**. Select Detail from the **Log level** menu. Generate and propagate the plug-in.

Restart IBM HTTP Server, make a request for one of the SAS Web Applications, and then view the `http_plugin.log` file.

- a. An entry like the following example indicates that the IBM HTTP Server attempted to serve the content, rather than sending the request to WebSphere Application Server. This means that the requested URL is not included in the plugin-cfg.xml file:

```
[Wed Mar 25 15:25:22 2009] 000044b0 eec96b90 - DETAIL:  
ws_common: websphereShouldHandleRequest: No route found
```

If you run IBM HTTP Server on ports other than 80 (HTTP) and 443 (HTTPS), then you need to add your preferred port on the virtual host (the default virtual host is `default_host`). View the WebSphere Application Server logs for a `SRVE0250I` log. If the IBM HTTP Server port is not listed in the log, then use WebSphere administrative console to select **Environment ► Virtual Hosts ► default_host ► Host Aliases** and then use the **New** button to add your preferred port. Regenerate and propagate the Web server plug-in. Restart IBM HTTP Server.

- b. The `GET` and `lib_htresponse` entries show the requested resource and the response:

```
[Wed Mar 25 09:42:51 2009] 00007c2e f6ed9b90 - DETAIL:  
GET /hello HTTP/1.1  
.  
.  
.  
lib_htresponse: htresponseRead: Reading the response:  
e6906a04  
[Wed Mar 25 09:42:51 2009] 00007c2e f6ed9b90 - DETAIL:  
HTTP/1.1 404 Not Found
```

Response 404: A response like the previous example indicates that IBM HTTP Server accepted the request from the Web browser, found the requested resource in the plugin-cfg.xml file, and sent the request to WebSphere Application Server. WebSphere Application Server does not have an application mapped to the requested URL.

Check that the requested URL matches a SAS Web application. You might receive this error if you changed your topology, redistributed the SAS Web applications to different WebSphere Application Server profiles, but did not generate and propagate the Web server plug-in.

Response 403: This response indicates that you do not have credentials to access the SAS Web applications. One possible scenario is that WebSphere Application Server is using the same user registry as the SAS Web application and the Web browser is caching credentials that are recognized by WebSphere Application Server, but are not authorized for the SAS Web applications. Check the WebSphere Application Server logs for a SECJ0129E log.

Response 302: This response typically indicates that the metadata connection information is incorrect. In the http_plugin.log file, check the Location value that follows the 302 Found message. The host name or port for the SAS Logon Manager application is usually incorrect for this error response. See section “Change the Connections for the SAS Web Applications” for information about setting the connection information in SAS metadata.

Recommended Reading

IBM Corporation. 2011. *IBM HTTP Server, Version 7: User's Guide*. IBM Corporation. Available at ftp://software.ibm.com/software/webserver/appserv/library/v70/ihp_70.pdf.

IBM Corporation. 2011. “Non-root installations.” Available at pic.dhe.ibm.com/infocenter/wasinfo/v7r0/index.jsp?topic=/com.ibm.websphere.installation.nd.doc/info/ae/ae/cins_nonroot.html. Accessed May 4, 2012.

IBM Corporation. 2011. “WebSphere Application Server Version 7.0 Information Center.” Available at pic.dhe.ibm.com/infocenter/wasinfo/v7r0/index.jsp. Accessed May 4, 2012.

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