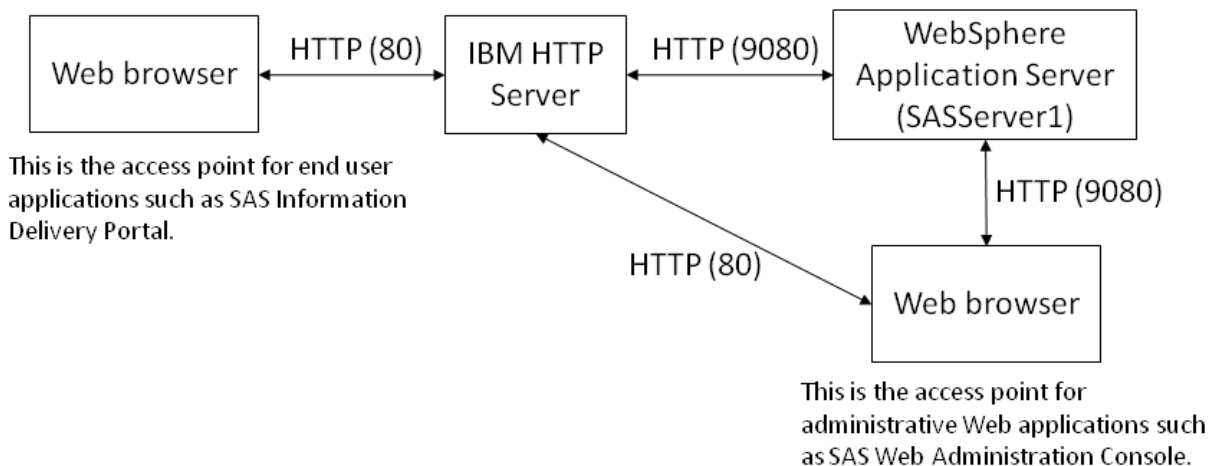


Configuration Guide

Configuring IBM HTTP Server as a Reverse Proxy Server for SAS 9.2 Web Applications Deployed on IBM WebSphere Application 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 the SAS 9.2 Web applications. The 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. Notice that a Web browser used for administration must have access to the HTTP port on the IBM HTTP Server. This is because the administrative applications that are accessible from SASServer1 still need to perform authentication to SAS Logon Manager, which is accessed from IBM HTTP Server. This is an important consideration if you choose to add a firewall to the topology.



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.
- 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.
- Add a virtual host to WebSphere Application Server and assign SAS Web applications that do not have an end-user interface to it. This is so that IBM HTTP Server does not provide access to these applications that do not have end-user interfaces.
- Configure IBM HTTP Server to serve the HTML 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 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 9.2 software that includes the SAS Web applications, you must have these IBM software products:

- IBM WebSphere Application Server v6.1 (installed with Fix Pack 21 or later)
- IBM HTTP Server v6.1
- IBM WebServer Plugin for WebSphere Application Server (can be installed as part of installing IBM HTTP Server)
- Fix Packs for IBM HTTP Server v6.1 and the WebServer Plug-in

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 Plugin

Follow the installation instructions provided in *IBM HTTP Server, Version 6: User's Guide* for information about installing IBM HTTP Server and the WebSphere Plugin for WebSphere Application Server. When the plugin 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 this UNIX example:

```
LoadModule was_ap20_module /opt/IBM/HTTPServer/Plugins/bin/  
mod_was_ap20_http.so  
WebSpherePluginConfig /opt/IBM/HTTPServer/Plugins/config/webserver1/  
plugin-cfg.xml
```

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). Follow these steps:

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

From location: `/opt/IBM/HTTPServer/Plugins/bin/configurewebserver1.sh`

To location: `/opt/IBM/WebSphere/AppServer/bin`

2. Run the `configurewebserver1.sh` 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. For users that are familiar with the Web server plug-in, do not use the configuration file yet.
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**. Then, click **OK**.

Create a Virtual Host

This step describes how to add a virtual host to WebSphere Application Server. The SAS Web applications that do not have an end-user interface are assigned to this new virtual host in the next step. The purpose of creating the virtual host and assigning applications to it is that IBM HTTP Server provides access only to SAS Web applications with an end-user interface, such as SAS Information Delivery Portal. Applications that do not need to be proxied in the sample topology, such as SAS Web Infrastructure Services, are not accessible to end-users from IBM HTTP Server. Follow these steps in the WebSphere administrative console:

1. Select **Environment > Virtual Hosts**.
2. Click **New**.
3. Provide a name, such as `sasinternal_host`, and click **OK**.
4. Click the `sasinternal_host` link, and then click **Host Aliases**.
5. Click **New**, and then provide a Host Name value of `*` and a Port value of `9080`. Click **OK**.
6. If the WebSphere Application Server is using HTTPS, then also define another host alias with a Host Name of `*` and a Port value of `9443`.

Do not add a host alias with the HTTP port that IBM HTTP Server uses.

Assign SAS Web Applications to the Virtual Host

To assign SAS Web applications that do not have an end-user interface to the new virtual host, follow these steps in the WebSphere administrative console:

1. Select **Enterprise Applications > SASBIDashboard4.2 > Virtual hosts**.
2. Use the menu to set the **Dashboard Event Generator** Web module to use `sasinternal_host`.
3. Perform the same steps for the following SAS Web applications and Web modules:

SAS Web application	Web module
SASContentServer9.2	SAS Content Server
SASSharedServices9.2	<code>sas.shared.services.war</code>
SASWebInfrastructurePlatformApplications9.2	<code>sas.wip.admin.war</code>
SASWebInfrastructurePlatformServices9.2	<code>sas.wip.soapservices.war</code> <code>sas.wip.services.war</code> <code>sas.wip.access.war</code>

Configure IBM HTTP Server to Serve SASThemes Static Content

The SAS Themes Web application is actually a collection of static HTML resources such as images and cascading style sheets. This step removes the SASThemes9.2 application from WebSphere Application Server and configures IBM HTTP Server to serve that content. By serving the SAS Themes content through the HTTP server, the processing load is shifted from WebSphere Application Server to the IBM HTTP Server. Follow these steps:

1. In a temporary directory, extract the contents of SAS-config-dir/Levn/Web/Staging/sas.themes9.2.ear:

```
jar xf /opt/SAS/Config/Lev1/Web/Staging/sas.themes9.2.ear
```

The WAR file, sas.theme.default.war is extracted.
2. Change directory to the htdocs/en_US directory for the IBM HTTP Server and make a new directory named SASTheme_default.
3. Extract the sas.theme.default.ear file into htdocs/en_US/SASTheme_default.
4. Remove the sas.themes9.2.ear application from WebSphere Application Server:
 - a. In the WebSphere administrative console, select **Applications > Enterprise Applications**.
 - b. Select the check box for **SASThemes9.2** and then click **Uninstall**.
 - c. Click **OK** on the confirmation page.

If IBM HTTP Server is running on a different machine than WebSphere Application Server, then you need to transfer the sas.themes9.2.ear file to the machine hosting IBM HTTP Server. The location, htdocs/en_US/SASTheme_default, is used because SASTheme_default matches the value of the <context-root> that is defined in the META-INF/application.xml file for the sas.themes9.2.ear file.

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 SASThemes9.2 was removed in the previous step and some SAS Web applications were assigned to the sasinternal_host virtual host, 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.

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. You must change the connection information for the SAS Web applications that have an end-user interface. Change the connection information to a URL that includes the host name and port number for the IBM HTTP Server. The following list identifies the SAS Web applications that must be reconfigured:

- BI Dashboard 4.2
- BI Web Services for Java 9.2
- Help Viewer Meta Config 9.2
- Information Delivery Portal 4.2
- Logon Manager 9.2
- Package Viewer 4.2
- Preferences Manager 9.2
- SASTheme_default
- Shared Applications 9.2
- Shared Portlets 9.2
- Stored Process Web App 9.2
- Web OLAP Viewer 4.2
- Web Report Studio 4.2

To change the connection access point, 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 4.2 Specific Update

By default, SAS Web Report Studio 4.2 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 4.2**, 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 4.2 from the WebSphere administrative console.

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 <http://httpserver.example.com:port> and confirm that IBM HTTP Server is running.
2. Enable debugging for the WebSphere Plug-In to IBM HTTP Server. Edit the `plugin-cfg.xml` file and change the log level from Error to Detail:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!--HTTP server plugin config file for the webserver
SASDmgr01Cell.httpserver.example.com-node.webserver1 generated on
2009.03.25 at 01:54:54 PM GMT-05:00-->
<Config ASDisableNagle="false" AcceptAllContent="false"
AppServerPortPreference="HostHeader" ChunkedResponse="false"
FIPSEnable="false" IISDisableNagle="false" IISPluginPriority="High"
IgnoreDNSFailures="false" RefreshInterval="60"
ResponseChunkSize="64" VHostMatchingCompat="false">
  <Log LogLevel="Detail" Name="/opt/IBM/HTTPServer/Plugins/logs/
webserver1/http_plugin.log"/>
```

3. 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. 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
```

In this case, regenerate and propagate the Web server plug-in.

- 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 attempted a request to WebSphere Application Server.

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. Restart WebSphere Application Server.

You might also 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.

Alternative Configurations

The previous configuration task provides instructions about how to use IBM HTTP Server to proxy the end-user SAS Web applications in a simple deployment. Some deployments might choose, or need, to proxy additional SAS Web applications.

If you need to offer SAS Web services through the proxy server, then also proxy the SAS SOAP services application to secure the SAS Web services in the same way that other SAS applications are secured. Change the connection information for **Web Infra Platform Soap Svcs 9.2** in SAS metadata. Change the virtual host for `sas.wip.soapservices.war` (part of the `SASWebInfrastructurePlatformServices9.2` application) to `default_host`. Regenerate and propagate the Web server plug-in configuration file. Restart Remote Services, `SASServer1`, and IBM HTTP Server.

For sites that have SAS solutions that use clients (typically Java desktop applications), you might need to proxy the **Web Infra Platform CIntAccss 9.2** application. The Web module is named `sas.wip.access.war`, and it is part of the `SASWebInfrastructurePlatformServices9.2` application. You need to reconfigure the connection information in SAS metadata, change the virtual host, regenerate and propagate the Web server plug-in, and restart the Remote Services, SASServer1, and IBM HTTP Server.

You can choose to provide access to the **Web Administration Console 9.2** application through the proxy server. The Web module is named `sas.wip.admin.war` and it is part of the `SASWebInfrastructurePlatformApplications9.2` application. You need to reconfigure the connection information in SAS metadata, change the virtual host, regenerate and propagate the Web server plug-in. You also need to perform the steps in the next sections that are related to reconfiguring SAS Content Server and the WebDAV repository URL. Then, restart Remote Services, SASServer1, and IBM HTTP Server.

Accept Content for All Requests

For sites that proxy the SAS Content Server application, some WebSphere Application Server settings must be changed so that SAS Content Server is available from IBM HTTP Server, and so that the IBM HTTP Server accepts content, such as attachments, with HTTP requests. Follow these steps in the WebSphere administrative console:

1. Change the virtual host for the SAS Content Server application to the default host.
2. Select **Servers > Web servers > webserver1 > Plug-in properties > Request and Response**.
3. Select the **Accept content for all requests** check box.
4. Generate and propagate the Web server plug-in configuration file.

Change the Connection for SAS Content Server

If you choose to proxy the SAS Web Administration Console 9.2 application or SAS Content Server, then 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
- SASPackageViewer4.2 Local Services
- SASPortal4.2 Local Services
- SASStoredProcess9.2 Local Services
- SASWebReportStudio4.2 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. On the **Information Service Properties** dialog box, select the **Service Configuration** tab and then click **Configuration**.
5. On 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.

Recommended Reading

The following URLs are valid as of March 2009.

IBM Corporation, 2004. *IBM HTTP Server, Version 6: User's Guide*. IBM Corporation. Available at ftp://ftp.software.ibm.com/software/webserver/appserv/library/v60/ihs_60.pdf.

IBM Corporation, 2005. *IBM HTTP Server for WebSphere Application Server, Version 6.1*. IBM Information Center. Available at http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/index.jsp?topic=/com.ibm.websphere.ihs.doc/info/welcome_ihs.html.

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