



**Strategic Performance Management, Jakarta Tomcat, and
Microsoft Internet Information Services**

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1 Executive Summary

Organizations have been faced with challenges like never before. Increasing world competition has meant that businesses must be much more careful about the choice of strategies to remain competitive. The entire organization must ensure that strategies are implemented effectively. This situation has put more focus on effectiveness. All of the results across the organization must be aligned to achieve the overall results desired by the organization.

For this reason, performance management has increasingly become the focus of many organizations. Performance management includes activities to ensure that goals are consistently being met in an effective and efficient manner and SAS Strategic Performance Management (SPM) has been the accepted solution by many organizations.

With the release of SAS version 9 and the delay of SPM version 2, many SPM implementations have moved toward the use of SPM version 1.4 and the SPM Framework for SAS 9. This combination in itself comes with some interesting challenges and in rare cases when the customer wishes to use Microsoft Internet Information Services (IIS) as the web server the implementation becomes even more interesting.

2 Strategic Performance Management, Jakarta Tomcat, and Microsoft IIS

Microsoft Internet Information Services (IIS) is a powerful Web server that provides a highly reliable, manageable, and scalable Web application infrastructure. The purpose of this document is to provide a road map for implementing SPM 1.4 with the SPM history servlet using Microsoft IIS, and Jakarta Tomcat.

A number of online references can be found containing information on setting up the Microsoft IIS web server with Jakarta Tomcat. While these guides can be easily adapted for various versions of Tomcat, IIS, and the JK connector used to bridge them, some details are usually missing. This white paper has been written to fill in these details as well as assist in identifying some of the common issues related to this environment.

The information presented in this document was collected from various sources and experience gained during SPM implementation at Sub-Zero Freezer Company. A list of resources exists at the end of this document.

This white paper assumes that the reader has a basic knowledge of Windows administration and configuration as well as IIS administration. The information within this document should be used in conjunction with vendor literature such as those listed in the Resources section of this document.

For the purposes of this document, <DEFAULT WEB> will identify the default web site URL and <SCORECARD> will identify the path to the published scorecard. Also, <SERVER NAME> will identify the server name.

2.1 Environment

The information within this document is based on the following environment:

- Microsoft Windows 2003 Professional, version 5.2.3790
- Microsoft IIS version 6
- SAS 9.1.2 (v 9.1 Level1 M2)
- SAS Strategic Performance Management, version 1.4.0.42
- Tomcat version 4.1.18
- Java™ 2 SDK, version 1.4.2_02
- isapi_redirector.dll, version 1.2.8

3 Initial Preparation

One of the most important aspects of this entire process is the identification of appropriate versions of third party software required. Once identified, each must be downloaded, installed, and in some cases configured. This chapter identifies each of the required components and where to obtain them as well as some background information where appropriate.

3.1 SAS Install Center

A reliable resource for identifying appropriate versions of third party software is the SAS Install Center web page which contains links to recommended versions of all third party software. The information here is grouped by SAS version and operating environment. The SAS Install Center web page can be found at the following URL:

<http://www.sas.com/installcenter>

Select Microsoft Windows, then under SAS 9.1.2 select Installation and Administration Information and then select Third Party Software Reference Links.

This page contains links for downloading the recommended versions of the Java™ 2 SDK (under the Java Software Development Kits heading), Tomcat (under the Application Servers heading), and the Tomcat hotfix.

3.1.1 Java™ 2 SDK

Tomcat officially requires the full Java™ 2 SDK since it needs javac (the Java compiler) in order to compile JSP. For this particular installation, the recommended version of the Java™ 2 SDK, Standard Edition is 1.4.2_04 (j2sdk-1_4_2_04-windows-i586-p.exe). Use the link provided on the SAS Install Center Third Party Software Reference Links page to download this software.

Note that the byte size of the self-installing executable downloaded from Apache is provided on the download page. Once the download has completed, check that you have downloaded the full, uncorrupted software file by comparing these sizes.

3.1.2 Jakarta Tomcat

Internet Information Services, like other traditional web servers, handles static content such as HTML but does not support Servlets or JSP. Servlets allow programmers to develop platform independent extensions that can be integrated with an existing web server. You must use a servlet container in order to use servlets and JSP pages.

SPM history is implemented using a servlet and Tomcat is the recommended servlet container. For this installation, the recommended version of Jakarta Tomcat is 4.1.18 (jakarta-tomcat-4.1.18-LE-jdk14.zip). This can be downloaded using a link provided on the SAS Install Center Third Party Software Reference Links page.

3.1.2.1 Tomcat Hot Fix

A race condition in the session recycling code has been identified in Tomcat 4.1.18, which could cause two different browser clients to share the same session object on the server. This results in different users seeing, and possibly overwriting each other's session data. A Tomcat 4.1.18 fix is available.

This hotfix (tomcat-4.1.18-hotfix1.zip) as well as installation instructions can be found using a link on the SAS Install Center Third Party Software Reference Links page. The hotfix link will display the Technical Support Hot Fixes page. Under SAS Hot Fixes for Open Source Software select Apache Tomcat to go to the hotfix download page. The hotfix can be downloaded from this page by selecting Tomcat-4.1.18 for Windows.

3.1.3 Web Server Connector

The Tomcat Internet Server API (ISAPI) redirector is an IIS plug-in. ISAPI is an API for Microsoft's IIS Web server that enables programmers to develop Web-based applications. Using ISAPI, these applications run much faster than conventional CGI programs since they are more tightly integrated with the Web server.

IIS loads the ISAPI redirector plug-in and calls its filter function for each in-coming request. The filter then tests the request URL against a list of URI-paths held inside the uriworkermap.properties file (discussed later). If the current request matches one of the entries in the list of URI-paths, the filter transfers the request to the plug-in extension. The extension collects the request parameters and forwards them to the appropriate worker using AJP13 protocol. The plug-in extension then collects the response from the worker and returns it to the browser.

For this particular installation, version 1.2.8 of the ISAPI redirector was downloaded (isapi_redirect-1.2.8.dll). The Tomcat ISAPI web server connector can be downloaded using the following URL:

<http://apache.towardex.com/jakarta/tomcat-connectors/jk/binaries/win32/>

3.1.4 COM Permissions

Microsoft COM (Component Object Model) technology in the Microsoft Windows-family of Operating Systems enables software components to communicate. COM is used by developers to create re-usable software components, link components together to build applications, and take advantage of Windows services. The family of COM technologies includes COM+, Distributed COM (DCOM) and ActiveX® Controls.

Since SPM history functionality requires Internet Explorer ActiveX controls, COM permissions for users or groups must be set to 'Allow'. Initially, even the administrator account may not have appropriate COM permissions. To verify user COM permissions perform the following steps:

- Select Start > Run and enter dcomcnfg, then select OK.

- Open the Component Services > Computers entry and select "My Computer".
- Select the computer icon to the right in the toolbar. This will open the Default DCOM Security dialog.
- Choose the Edit Default button. The dialog that displays will list the users, and their permissions. Check each user and/or user group that will need access to the SPM scorecard and history. Verify that 'Allow' is checked for those requiring access.
- If adding a new user or group, add the appropriate user or group to the list and make sure to check the 'Allow' checkbox.
- Apply the changes.

4 Component Installation

With all components downloaded, the next step is installation and configuration. This chapter provides information on the installation of the Java™ 2 SDK, Tomcat, the Tomcat hotfix, and the ISAPI redirector. With the exception of the ISAPI redirector, configuration and setup is also discussed where appropriate. The configuration and setup of the ISAPI redirector is covered in the following chapter.

Note that administrative permissions are required in order to perform many of the activities required. Also note that when the Java™ 2 SDK installation is complete, a system reboot is required.

4.1 Java™ 2 SDK

This section provides installation and configuration information for the Java™ 2 SDK. For SDK system software and hardware requirements, disk space requirements, or issues related to Windows Installation, refer to the documentation on the Java website (java.sun.com). Also, see the Windows Installation and Java Update FAQ located at this URL:

<http://java.sun.com/j2se/1.4.2/docs/guide/deployment/installation/windows/iftw-update/faq.html>

4.1.1 Installation

The file `j2sdk-1_4_2_04-windows-i586-p.exe` is the Java™ 2 SDK installer. Double-click on the installer icon and follow the instructions provided. For this installation, the Java™ 2 SDK was installed in the `C:\j2sdk1.4.2_04` directory.

The self-installing executable will unpack and install the Java™ 2 SDK software bundle. As part of the Java™ 2 SDK, the installation includes the Java Plug-in and Java Web Start as well as an option to include the public Java™ 2 Runtime Environment (The Java™ 2 SDK also contains a private J2RE for use only by its tools).

If a public Java™ 2 Runtime Environment already exists on the system, do not install the Java™ 2 Runtime Environment when prompted.

4.1.2 Set the JAVA_HOME Environment Variable

The `JAVA_HOME` environment variable is needed for Tomcat to find the Java™ 2 SDK. Failing to properly set this variable prevents the execution of JSP pages. This variable should list the root SDK installation directory.

- Select Start > Settings > Control Panel > System
- Select the Environment Variables button
- Add the variable name: `JAVA_HOME`

- And the value: C:\j2sdk1.4.2_04

4.2 Tomcat Installation

This section focuses on Tomcat installation, which is more download and configuration than actual installation. The configuration of Tomcat for use with the ISAPI redirector is discussed in the following chapter.

To install Tomcat for this particular environment, create a C:\TOMCAT4.1 folder and extract the compressed file into this directory. Note that for SAS 9, as well as various other applications, it is important that the directory name have no spaces.

4.2.1 Hot Fix

The following instructions describe the steps for installing the tomcat-4.1.18-hotfix1.zip file. Note that Tomcat must be installed and the JAVA_HOME environment variable must exist. Also, to verify the hotfix installation, the Tomcat examples must be available from the default web.

Extract the contents of the tomcat-4.1.18-hotfix1.zip file into the C:\TOMCAT4.1 directory.

4.2.2 Starting and Stopping Tomcat

For test purposes two .BAT files (Startup.bat and Shutdown.bat), located within the C:\TOMCAT4.1\bin directory may be used to start and stop Tomcat. For production operation, the server should be configured to start Tomcat as a service; however a description of this setup is not within the scope of this document.

4.3 Web Server Connector

Physical installation of the ISAPI redirector is relatively simple, however setup and configuration is rather involved and is discussed in the following chapter.

To install the ISAPI redirector, copy the recently downloaded isapi_redirect-1.2.8.dll file to the C:\TOMCAT4.1\bin directory and rename this file to isapi_redirect.dll.

5 ISAPI Redirector Setup and Configuration

The following sections describe the setup and configuration process that allows IIS, Tomcat, and the ISAPI redirector to work together.

5.1 Verify the Tomcat Connector Configuration

Since the ISAPI redirector uses the AJP13 protocol, Tomcat must be configured to use the AJP13 connector type. Open the server.xml file located in C:\Tomcat4.1\conf folder. Verify the contents of the following section:

```
<!-- Define a Coyote/JK2 AJP 1.3 Connector on port 8009 -->
<Connector className="org.apache.coyote.tomcat4.CoyoteConnector"
    port="8009" minProcessors="5" maxProcessors="75"
    enableLookups="true" redirectPort="8443"
    acceptCount="10" debug="0" connectionTimeout="20000"
    useURIVValidationHack="false"
    protocolHandlerClassName="org.apache.jk.server.JkCoyoteHandler" />
```

Note that there are two available AJP13 connector configurations within the server.xml file. Use only the connector with the “CoyoteConnector” class name. Only one connector need be defined, thus ‘comment out’ the second connector or remove it completely.

5.2 Modify the Registry for the ISAPI Redirector

The ISAPI redirector operates based on configuration settings contained in the Windows registry. These registry additions affect only the redirector, however a registry backup is recommended prior to making any changes.

5.2.1 The server.xml File

A special IISConfig module comes with Tomcat to help in generating the registry entries required for the ISAPI redirector. In the server.xml file, find the following line:

```
<Server port="8005" shutdown="SHUTDOWN" debug="0" >
```

Add the following line directly under the line shown above.

```
<Listener className="org.apache.jk.tomcat4.config.IISConfig" />
```

Start (or shutdown and restart) Tomcat. The Tomcat startup console window should appear containing startup, debug, and any error messages. In addition, new directories and files should now exist.

The new directories include:

- C:\Tomcat4.1\conf\auto

➤ C:\Tomcat4.1\conf\jk

The new files, iis_redirect.reg and uriworkermap.properties, are located in the C:\TOMCAT4.1\conf\auto directory.

5.2.2 The iis_redirect.reg File

The iis_redirect.reg file contains commands for modification of the system registry for IIS and the ISAPI redirector. The necessary registry information includes the name of the ISAPI redirector file, the location and name of the redirector log file, and the location of the redirector configuration files.

5.2.2.1 Edit the iis_redirect.reg File

Edit the iis_redirect.reg file such that it reflects the specifics of the configuration. The modifications should look like the following:

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SOFTWARE\Apache Software Foundation\Jakarta Isapi
Redirector\1.0]

"extension_uri"="/jakarta/isapi_redirect.dll"
"log_file"="C:\\Tomcat4.1\\logs\\iis_redirect.log"
"log_level"="debug"
"worker_file"="C:\\Tomcat4.1\\conf\\jk\\workers.properties"
"worker_mount_file"="C:\\Tomcat4.1\\conf\\auto\\uriworkermap.properties"
```

5.2.2.2 Execute the iis_redirect.reg file

With the changes made to the iis_redirect.reg file, actual modifications to the registry can proceed. Execute the iis_redirect.reg file by double-clicking the file name in Windows Explorer. The following message will appear:

```
"Are you sure you want to add the information in
C:\TOMCAT4.1\conf\auto\iis_re~.reg to the registry?"
```

Select Yes to create the values in the registry.

5.2.2.3 Verify New Registry Keys

Verification of the registry additions is recommended. Open the registry using the regedit.exe utility (Start > Run). Verify the registry entry keys that were created under HKEY_LOCAL_MACHINE\SOFTWARE.

```
HKEY_LOCAL_MACHINE\SOFTWARE\Apache Software Foundation\Jakarta Isapi
Redirector\1.0

➤ (Default) - (value not set)
➤ extension_uri - /Jakarta/isapi_redirect.dll
➤ log_file - C:\TOMCAT4.1\logs\iis_redirect.log
➤ log_level - debug
➤ worker_file - C:\TOMCAT4.1\conf\jk\workers.properties
```

➤ worker_mount_file - C:\TOMCAT4.1\conf\auto\uriworkermap.properties

5.2.2.4 Restore the server.xml File

The 'Listener' entry previously added to the server.xml file instructs Tomcat to create the .reg and .properties files. Unless this entry is removed, Tomcat will overwrite these files every time it is started, which is not desirable since changes needed by the ISAPI redirector will be made to the uriworkermap.properties file. Edit the server.xml file and 'comment out' or remove the added listener entry.

5.3 ISAPI Redirector Configuration

The ISAPI redirector's job is to redirect specific web requests to Tomcat. Information on how to identify these requests as well as information on who performs the redirect must be defined. Also, IIS must be setup to use the redirector.

5.3.1 The uriworkermap.properties Configuration File

The uriworkermap.properties configuration file is used by the ISAPI redirector, to determine whether to redirect URL's to Tomcat, or to serve them inside IIS. When IIS is started, the ISAPI redirector reads this file, based on the registry entry created in the steps above.

Edit the uriworkermap.properties file (located in C:\TOMCAT4.1\conf\auto) such that it contains the following mount information:

```
# ***** Begin uriworkermap.properties *****
# Mount the servlet context
/servlet/*=ajp13
# Mount the examples context
/examples=ajp13
/examples/*=ajp13
/examples/servlet/*=ajp13
# Mount the SPM history context
/SVHistory/*=ajp13
# Mount all JSP pages
/*.jsp=ajp13
# ***** End uriworkermap.properties *****
```

Among other things, this will allow the ISAPI redirector to work with the Tomcat examples and the SPM history servlet (SVHistory). This indicates to the redirector that all incoming requests with any of these pathnames should be sent to Tomcat. Otherwise, IIS should serve the request.

5.3.2 The workers.properties Configuration File

This file tells the ISAPI redirector where to find Tomcat and lists the ‘workers’ to create for communication with Tomcat. Using a text editor (i.e. Notepad), create a workers.properties configuration file containing the list of workers and their parameters. This file must be saved in the C:\TOMCAT4.1\conf\jk\ directory and should contain the following information:

```
# ***** Begin workers.properties *****
worker.ajp13.type=ajp13
# Tomcat directory
worker.tomcat_home=C:\TOMCAT4.1
# Java 2 SDK directory
worker.java_home=C:\j2sdk1.4.2_04
# Path separator for Windows
ps=\
# Worker that the isapi redirector should use
worker.list=ajp13
# Worker definition
worker.ajp13.port=8009
worker.ajp13.host=<DEFAULT WEB>
# ***** End workers.properties *****
```

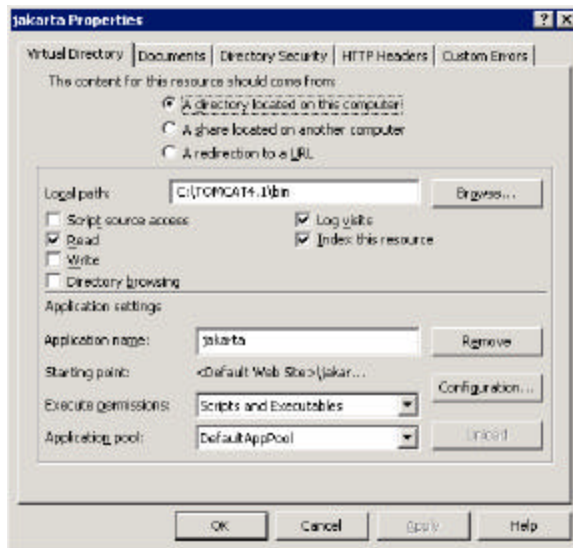
There are two important details related to previously discussed file changes to note. The name ‘ajp13’ must match the name in the uriworkermap.properties file. Also, port 8009 is specified. This is listed in the server.xml file as the Tomcat AJP13 CoyoteConnector listener port.

5.3.3 IIS Virtual Directory for the ISAPI Redirector

An IIS Virtual Directory is essentially an alias to a physical directory which may be accessed from the Internet. Virtual directories provide several advantages, one being an added level of security inherent with a physical directory.

In this particular implementation, IIS will access the redirector via its own virtual directory, which must be created. It can be given any name, however for this installation the name 'jakarta' was used. Note that this name must match the extension_uri parameter in the registry additions described in a prior section. To create this virtual directory, open the IIS console (Start > Administrative Tools > Internet Information Services). Open the Web Sites folder and right click the Default Web Site. Select New > Virtual directory. This opens the Virtual Directory Creation Wizard. Follow the instructions and enter the following information:

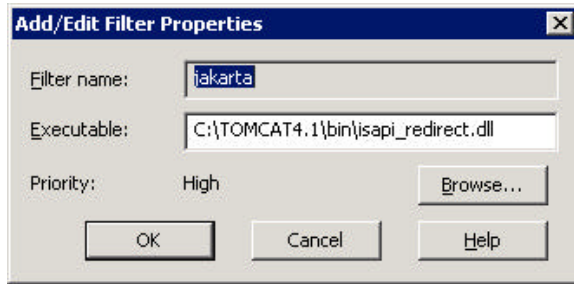
- Alias: jakarta
- Path: C:\TOMCAT4.1\bin (where the isapi_redirect.dll file is now located)
- Access Permissions: Read, Run scripts (such as ASP), Execute (such as ISAPI applications or CGI)



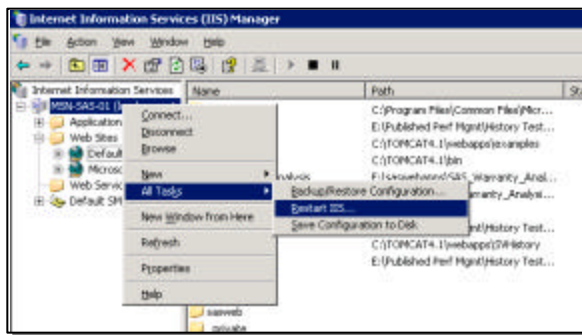
To verify these settings, right click on the newly created jakarta virtual directory and select properties.

5.3.4 Install the ISAPI Redirector

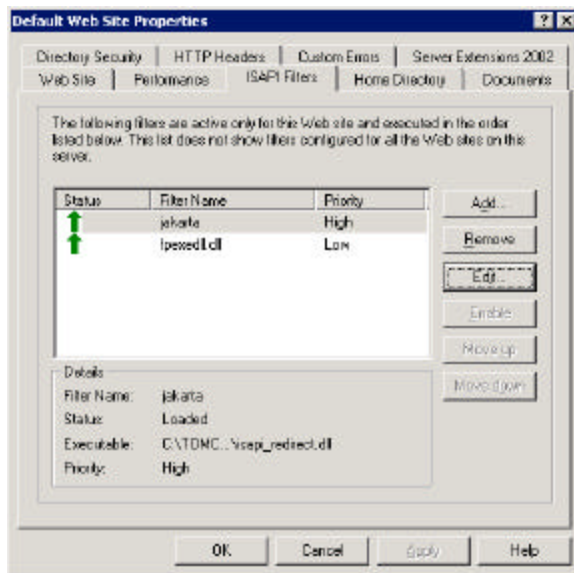
The ISAPI redirector must be installed within IIS as an ISAPI filter. To install the redirector, open the IIS console (Start > Administrative Tools > Internet Information Services) and then open the Web Sites folder, right click the Default Web Site and select Properties. In the properties window select the ISAPI filters tab. Click the Add button to add a filter.



For filter name, specify 'jakarta'. For location of the executable, browse to the location of the redirector (C:\TOMCAT4.1\bin\isapi-redirect.dll). Select OK.



To activate the ISAPI redirector, IIS must be restarted. Close the property sheet and restart IIS by right-clicking on the machine name in the folders portion of the window. Select All Tasks > Restart IIS.

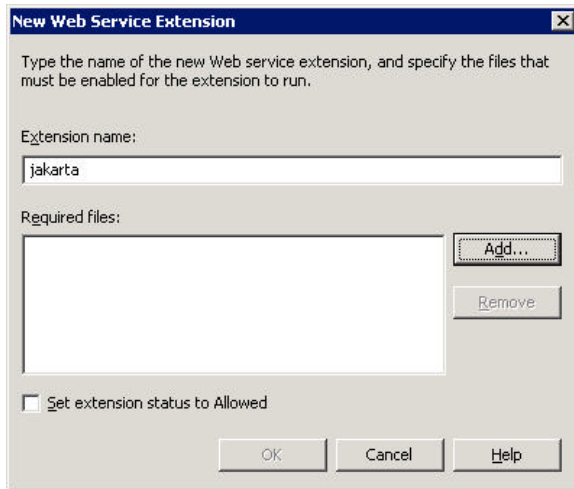


To verify that the ISAPI redirector has been installed properly, right-click on Default Web Site and select properties from the drop-down menu. Select the ISAPI Filters tab. The jakarta filter should have a green arrow pointing upwards displayed.

5.3.5 Add an ISAPI Redirector Web Service Extension

Web services are a standardized way for one application to invoke a method of another application. These applications may reside on different computers that are in some way connected, such as by a local area network or, more commonly, by the Internet. Web service extensions, such as the ISAPI redirector, are programs that extend the basic IIS functionality of serving static content.

To add the ISAPI redirector as a web service extension, open the IIS console (Start > Administrative Tools > Internet Information Services). Then open the Web Sites folder and right click Web Service Extensions.



To add this new extension, select “Add a new Web Service Extension...”.

In the New Web Service Extension dialog box, enter ‘jakarta’ as the Extension name and check the ‘Set extension status to Allowed’ (checkbox).

Select the Add button and enter the path to the ISAPI redirector as a required file.

Select OK as many times as required to exit the New Web Service Extension process.

For this particular installation, the redirector path was:

```
C:\TOMCAT4.1\bin\isapi-redirect.dll
```

6 SAS/SPM Configuration

The purpose for entire process described in the preceding chapters is to enable the use of the SPM history servlet (SVHistory). This section presents the setup and configuration of this SPM component.

6.1 SPM History

The History Servlet is a server-side Web application that generates dynamic pages of historical data when requested by the published Map environment known as Compass. This section describes the steps required for setup of SPM metric history functionality.

6.1.1 History Servlet

The History Servlet requires an application server, which is a Java application that is used to run special Java programs called servlets. Application servers (Tomcat in this environment) can run in cooperation with a Web server (IIS in this environment), or as standalone entities. The History Server, which is implemented as a servlet, requires such a container to be installed and running on the machine requiring history functionality. A Web server is not required to run the History Server unless you wish to implement a security policy for access to history data.

During the installation of Strategic Performance Management, the history servlet web archive file (SVHistory.war) was copied to a folder specified by the installer. To install the history servlet, follow these steps:

- Copy the SVHistory.war file to the Tomcat web application directory (C:\TOMCAT4.1\webapps).
- Start Tomcat to extract the history files and folders from the .war file.
- Stop Tomcat.

After extracting the contents of the SVHistory.war archive, a new folder, SVHistory, should exist within the webapps folder. Verify the process by reviewing the directory structure.

- C:\TOMCAT4.1\webapps
 - \SVHistory
 - \includes
 - \META-INF
 - \WEB-INF
 - \classes
 - \lib

Delete the copy of SVHistory.war from the Tomcat web application directory (do not delete the original).

6.1.2 History Datastore

SPM History requires a folder for storage of metric history data. For this particular installation, the history data store will be on the E: drive. Using Windows Explorer, create the folder E:\svhist_data.

6.1.3 Configuring the History Servlet

After installing the History Server, modification of the servlet configuration file (web.xml) is necessary. This file is located in the following folder:

```
C:\TOMCAT4.1\webapps\SVHistory\WEB-INF
```

Open the web.xml file in any text editor (i.e. Notepad) and change the value of the data_path application variable to the history data store directory created previously. The new data_path information should look as follows:

```
<context-param>
    <param-name>data_path</param-name>
    <param-value>E:\svhist_data</param-value>
</context-param>
```

Immediately below the data_path parameter is the graph_view application variable. SPM allows display of history information as either Ocx (ActiveX) or Applet (Java Applet). For Microsoft environments, ActiveX is the recommended method of displaying history graphs.

Change the value of the graph_view application variable to limit the view of history graphs to ActiveX. The new graph_view information should look as follows:

```
<context-param>
    <param-name>graph_view</param-name>
    <param-value>activex</param-value>
</context-param>
```

6.1.4 IIS Virtual Directory for SPM History Content

A Virtual Directory must be defined in IIS for the SPM History Static content. Repeat the steps described in the ISAPI Redirector Setup and Configuration chapter for creating a virtual directory in IIS using SVHistory as the name and C:\TOMCAT4.1\webapps\SVHistory as the location.

6.2 SPM Environment Settings

Start the SPM MAP and open the scorecard environment. Select Template > Setup > Publishing. To publish the scorecards effectively, SPM needs to know some basic information about the server environment where the published scorecard will reside.

The Compass (browser) needs to know where it must look for published scorecard files. Set this variable to \$publish, which indicates that links are relative to the directory in which the published scorecard resides.

- URL Root: \$publish

The Compass also requires the URL for retrieval of data from the history servlet.

- Compass History Servlet URL: <http://<DEFAULT WEB>/SVHistory/histapp>

The MAP must also know the URL required to transfer data to the history servlet. Note that specifying the actual port (:8080) bypasses the Web Server (IIS) and uses the history servlet and Tomcat directly. This does not affect the Compass or the published scorecard; however it avoids any publishing issues that may arise due to the Web Server.

- Map History Servlet URL: <http://<DEFAULT WEB>:8080/SVHistory/histapp>

7 Testing

In the preceding sections, information related to the installation, setup, and configuration of various software components has been provided. Once this process is complete, the next step is to verify that these components were configured correctly. In most cases this can be accomplished using Internet Explorer. Note that Tomcat must be running during these tests.

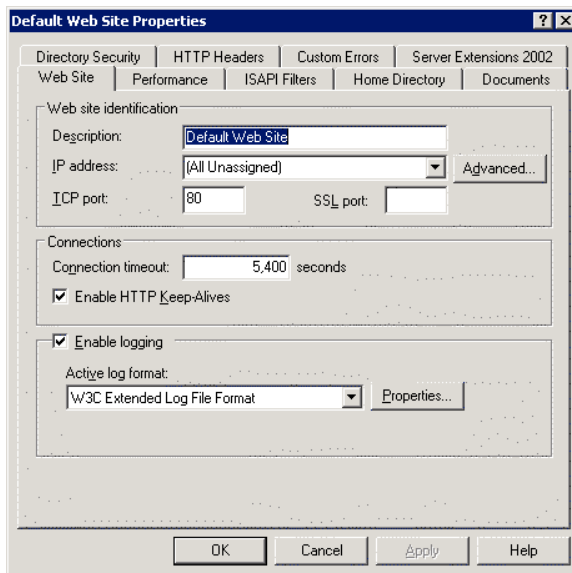
7.1 Java™ 2 SDK

After the successful installation of the Java™ 2 SDK, confirmation that everything is configured properly can be accomplished by opening a Windows Command Prompt and typing “java -version”. The correct version information should be displayed.

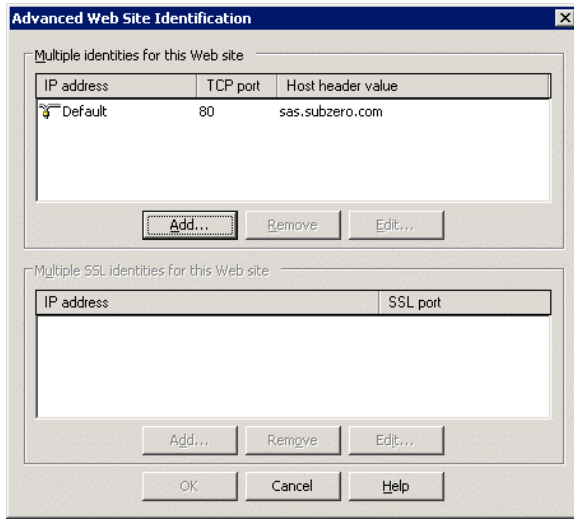
Note that a Java Web Start icon should exist on the desktop and an entry for Java Web Start should exist in the Start > Programs menu.

7.2 IIS Web Server

If the web server is not functioning properly, the remaining tests that do not use the :8080 port will not work. To test the web server, the default web site URL is required. To find the default web site, open the IIS console (Start > Administrative Tools > Internet Information Services). Open the Web Sites folder and right click the Default Web Site and select properties.



Select the Web Site tab. Then select the Advanced button.



The web site identity, Host header value, contains the URL of the default web site.

Open Internet Explorer and enter the URL for the default web site. This should access the default web site defined in IIS and the default web page should display. The default web page will differ depending on the environment implemented by the organization that the web site represents.

7.3 Tomcat

Open Internet Explorer and enter the following URL. This should access Tomcat, bypassing IIS.

<http://<DEFAULT WEB>:8080/examples/jsp>



The JSP Samples page should display.

Now verify the IIS > ISAPI redirector > Tomcat path by entering the following URL:

<http://<DEFAULT WEB>/examples/jsp>

The same JSP Samples page should display with one exception, the URL will not have the :8080 port designator.

7.3.1 Tomcat Examples

Execute a few of the examples listed on the JSP Samples page. These examples should run without error.

7.3.2 Tomcat Hotfix

To verify that the patch has been installed correctly, use the following procedure.

- In the C:\TOMCAT4.1\webapps directory, create a patchtest.xml file which will serve the Tomcat examples Web application under the context name "patchtest".

```
<!-- ===== patchtest.xml ===== / -->
<Context path="/patchtest" docBase="examples">
<Logger className="org.apache.catalina.logger.FileLogger"
prefix="patchtest_log." suffix=".txt"/>
<Manager
className="org.apache.catalina.session.PersistentManager"
debug="2"/>
</Context>
<!-- ===== patchtest.xml ===== / -->
```

- Start Tomcat and access a JSP page in the "patchtest" context using the following URL:

<http://<DEFAULT WEB>:8080/patchtest/jsp/snp/snoop.jsp>

Note that the JSP file accessed must create a session. For this reason, do not use the Date example.

- Stop Tomcat and examine the "patchtest_log.<date>.txt" file in the C:\TOMCAT4.1\logs directory. The presence of the following text in this log file indicates the patch was successfully installed.

```
Using modified version of StandardSession that disables session
recycling.
```

- Delete the patchtest.xml and patchtest_log.<date>.txt files.

7.4 ISAPI Redirector

Open Windows Explorer and navigate to the Tomcat log directory (C:\TOMCAT4.1\logs). The ISAPI redirector was configured to create a log file here. An iis_redirect.log file should exist.

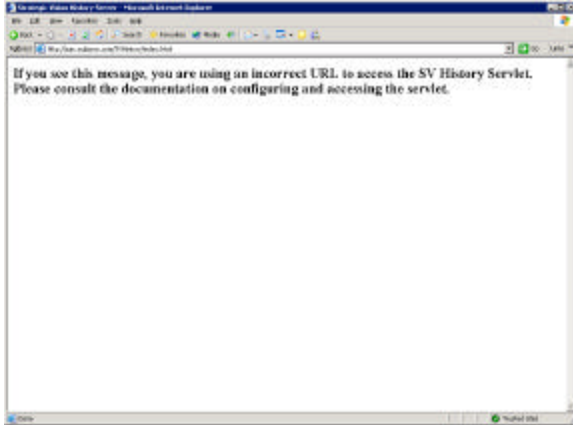
7.5 Virtual Directories

During setup and configuration several virtual directories were created. These can be tested using Internet Explorer.

7.5.1 SPM History Servlet

Open Internet Explorer and enter the following URL.

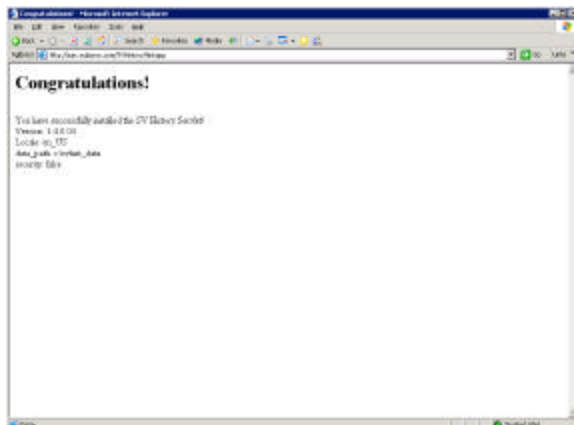
<http://<DEFAULT WEB>/SVHistory>



This should access the SVHistory virtual directory and the SV History Servlet error page should display.

Now verify the history servlet itself by entering the following URL:

<http://<DEFAULT WEB>/SVHistory/histapp>



The SV History Servlet congratulations page should display.

7.6 Scorecard History

Testing scorecard history requires publishing new metric data for multiple periods. This can be an involved process since the time periods for the data must be changed for each publish. Manually changing time periods clears all metric data requiring re-entry of all data, including data that does not change during the new time period.

Using the 'Load Data Source' tool within the MAP makes this task less cumbersome; however it requires an XML file for each period. These files can be created manually or programmatically. The following is an example of an XML file containing data for the actual and target values for one metric for a single time period (START / END). In this example, Card-0 is the scorecard key, S+r_0+r_0_0 is the row or metric key, c_1 is the Actual column key, and c_2 is the Target column key. These keys will be different for each scorecard environment and can be found in the export.xml file created by exporting the environment from the MAP.

```
<CELLS>
  <DATA>
    <TABLE>Card-0</TABLE>
    <ROW>S+r_0+r_0_0</ROW>
    <START>01JAN2004</START>
    <END>31JAN2004</END>
  </DATA>
  <DATA>
    <TABLE>Card-0</TABLE>
    <ROW>S+r_0+r_0_0</ROW>
    <COLUMN>c_1</COLUMN>
    <VALUE>4</VALUE>
  </DATA>
  <DATA>
    <TABLE>Card-0</TABLE>
    <ROW>S+r_0+r_0_1</ROW>
    <START>01JAN2004</START>
    <END>31JAN2004</END>
  </DATA>
  <DATA>
    <TABLE>Card-0</TABLE>
    <ROW>S+r_0+r_0_0</ROW>
    <COLUMN>c_2</COLUMN>
```

<VALUE>5</VALUE>
</DATA>
</CELLS>

8 Summary

The information presented within this document focuses on the use of the SPM history servlet with Jakarta Tomcat and the Microsoft IIS web server. The description of many of the implementation steps required as well as the illustrations reflect one client site environment.

Finding specific information on the implementation of Jakarta Tomcat with the Microsoft IIS web server can take almost as much time as the implementation itself. Although some of the details will vary depending on the implementation, this document contains the details missing from other public information.

The key to the entire process is acquiring the appropriate component versions for the specific implementation environment. Once these are identified, the task of configuring each individual component is greatly simplified.

Appendix A: Troubleshooting

Java™ 2 SDK

Dll_.ini Error

If the following error occurs on a Windows 2003 Server,

Failed to extract file Dll_.ini from the binary table.

It indicates a DCOM permissions problem. Run dcomcnfg.exe and add either a group or user to use that has permission.

- Select Start > Run and enter dcomcnfg, then select OK.
- Open the Component Services > Computers entry and select "My Computer".
- Select the computer icon to the right in the toolbar. This will open the Default DCOM Security dialog.
- Choose the Edit Default button. The dialog that displays will list the users, and their permissions.
- Add the appropriate user/group to the list and make sure to check the allow checkbox.
- Apply the changes.
- Start the SDK install again.

More Information

<http://support.installshield.com/kb/view.asp?pcode=ALL&articleid=Q104985>

<http://support.microsoft.com/support/kb/articles/Q142/2/71.asp>

<http://java.sun.com/j2se/1.4.2/docs/guide/deployment/installation/windows/iftw-update/faq.html>

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<http://web.archive.org/web/20031213032137/www.rit.edu/~ack5504/tomcat-iis6-howto/jason-dravet-guide.txt>
- IIS How To , Apache Jakarta Project
<http://web.archive.org/web/20040219225309/jakarta.apache.org/tomcat/tomcat-4.1-doc/jk2/jk/iishowto.html>
- Tomcat/IIS How-To, Unlimi-Tech Software Inc.
<http://www.unlimitedftp.ca/support/resources/tomcat-iis.html>
- Tomcat IIS HowTo , Gal Shachor
<http://web.archive.org/web/20040204221050/jakarta.apache.org/tomcat/tomcat-3.3-doc/tomcat-iis-howto.html>

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