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Preliminary Notes

This document provides details on the installation of HR Vision and the configuration of an HR Vision warehouse. Although other, non-SAS software is mentioned, only specific HR Vision-related details are given for the software.

Many of the instructions in this document contain references to various directory paths for installation. The first usage of a directory path is always followed by a shorthand name in parentheses. An example of this is the “HR Vision install directory,” which is followed by an italicized shorthand name of (*HRV install path*). From that point on, substitute the actual directory path any place that refers to (*HRV install path*). Use a similar substitution for other italicized shorthand names.

Notes on UNIX Installations

Many of the directory paths in this document are written specifically for Windows. In some cases, the equivalent path for UNIX is the same except the back slashes (\) should be replaced by forward slashes (/). In those cases, only the Windows path is shown. In other cases where the directory path would be different in ways other than the direction of the slashes, both the Windows and UNIX directory paths are shown.

Installation Overview

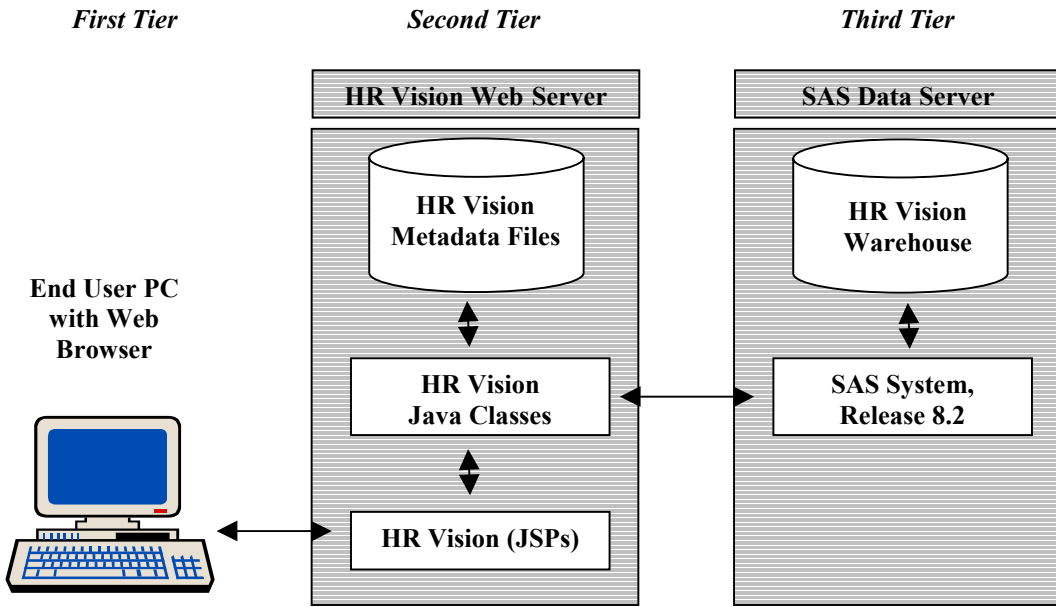
HR Vision is a three-tier application.

The *first tier* consists of the end-user’s PC with a supported Web browser installed.

The *second tier*, known as the HR Vision Web Server, runs HR Vision software and hosts various metadata files. These metadata files contain information about the configuration of HR Vision and the configuration of the warehouses to which it has access. Information about this tier is provided in Section 2.

The *third tier*, known as the SAS data server, hosts the SAS System and the actual data tables in the warehouses. Information about this tier is provided in Section 1.

Once the HR Vision Web Server and the SAS data server are configured, the warehouse must be refreshed. This is the process by which HR Vision reads the operational and transaction files and creates the data tables in the HR Vision warehouse. Additionally, any supplied reports and key metrics are executed and their output is stored in the HR Vision warehouse. Information about these actions is provided in Section 3.



Section 1: Configuration of the SAS Data Server

Section 1 contains instructions for the installation and configuration of the SAS System and the creation of an HR Vision warehouse template. The SAS System must be set up to act as a data server for HR Vision and will do almost all of the actual data processing. Initially a template, the HR Vision warehouse is actually a set of directories holding the warehouse data, the display formats, the operational and transaction data, the SAS source code to build the warehouse, and the SAS code to create various reports. In addition, there are several directories holding miscellaneous files needed for the SAS System.

1. Install and configure the SAS System, Release 8.2.

Note the DNS name (*DNSname*) for each machine to be set up as a SAS data server for HR Vision. Additionally, select a userid (*HRVuserid*) and the appropriate password (*HRVpwd*) for HR Vision to use to log on to the selected SAS data server. Although the SAS data server will be servicing multiple individual users of HR Vision, only one userid is necessary for HR Vision to log into the SAS data server.

If necessary, perform the following steps on each machine that will serve as a SAS data server. These steps need to be performed only one time for each SAS data server, even if the SAS data server is used for multiple warehouses. For these steps, log into the SAS data server using the actual userid (*HRVuserid*) that HR Vision will be using to access the SAS System.

- From the SAS software media, install the supplied SAS System products for Release 8.2. Note the install path (*SAS install path*) if it is different than the default install path. On UNIX systems, you must have root privileges to install the SAS System, Release 8.2 or you must later configure user authorization as root. For more information on configuring user authorization as root after you have completed your SAS System installation, see “Chapter 3, Post-Installation Instructions” in the section “Configuring User Authorization” in the *Installation Instructions and System Administrator’s Guide for Release 8.2 (TS2M0) of the SAS System under UNIX Environments*.
- Set up the SAS System to act as a data server.
 1. Invoke the SAS System.
 2. Submit the following statements:

```
proc cimport lib=sashelp force
              infile="(HR Vision Media)/appdev.cpo";
run;
```

where (*HR Vision Media*) is the appropriate path to the supplied media for HR Vision.

- Set up the SAS Repository Manager.
 1. From the command line, use the `EIS` command to invoke SAS/EIS software, which will initialize the Repository Manager. Exit out of SAS/EIS software.
 2. From the command line, use the `REPOSMGR` command to invoke the Repository Manager.
 3. Press the button labeled `Setup Repository Mgr`.
 4. There may already be values in the `Library` and `Path` fields. If necessary, enter the value `RPOSMGR` in the `Library` field.
 5. Select the `Restore Default` button if it is not grayed out. The `Path` field should contain a valid path accessible by the SAS data server. The system userid (*HRVuserid*) must have read and write access to this path. A recommended path is to use the same path currently used by the `SASUSER` libref. Make sure the checkbox labeled `Write values to system registry` is checked.

6. Press the OK button. A prompt may be displayed with the following text:

```
Path does not contain all Repository system files. Do you want to
install these files and continue?
```

If this prompt is displayed, press the Yes button.

7. Press the button labeled Setup Repository Mgr. to verify that the changes have been saved.

- Exit the SAS System.
- Insure that the HTTPD service is defined in the `services` file for all machines being used as SAS data servers. If necessary, locate the `services` file on that machine and add the following line:

```
httpd 80/tcp
```

On Windows NT and Windows 2000, this file is usually in:

```
C:\WINNT\system32\drivers\etc\services.
```

On UNIX, this file is usually in:

```
/etc/services
```

- For Windows NT and Windows 2000, the (*HRVuserid*) must have specific NT user rights assigned. See Appendix 6: “Windows System Requirements for (*HRVuserid*)” for details of these settings.

2. Create the HR Vision Warehouse Template.

From the HR Vision media, run the setup program for the appropriate operating system:

Windows:	setup.exe
AIX:	aixpower.bin
HP-UX, Release 10.20:	hpux1020.bin
HP-UX, Release 11.0:	hp8x11x.bin
Solaris:	sunsparc.bin

This must be the same operating system and on the same network as the SAS data server that will be used with this warehouse. Install the Data Warehouse Template into the desired HR Vision warehouse directory (*Data location*) on the SAS data server. (*Data location*) will hold the actual data tables in the HR Vision warehouse. The default value for (*Data location*) is:

```
C:\Program Files\SAS Institute\HR Vision\dataserver\warehouse for Windows, and:
```

```
opt/SAS Institute/HR Vision/dataserver/warehouse for UNIX.
```

See Appendix 1: “Directories in (*Data Location*)” for descriptions of each of the directories installed into the HR Vision warehouse directory.

Note that this directory path and its subdirectories should be secured from unauthorized access. HR Vision only requires that (*HRVuserid*) have read/write access to these directories. Access by other userids is optional, but should be limited to those who are authorized to see the data in these directories. For UNIX, the files installed in the (*Data location*) directory are installed with world and group read and write permissions. Use the appropriate `chmod` command to remove these world and group read and write permissions.

3. Configure the SAS Spawner.

The files `spawner.bat`, `spawner.sh`, and `HRVserv.cfg` contain the information to execute the SAS Spawner program. In addition to the options shown, the `objspawn` program can also receive additional options described in Appendix 7: “Additional Configuration Options for the SAS Spawner”. Depending on the specific UNIX operating system used, some of these options are required and a review of these options described in Appendix 7: “Additional Configuration Options for the SAS Spawner” is recommended.

- For Windows, edit `(Data Location)\spawner.bat` to contain the single line below. Other options can be added to this line based on site preferences. See Appendix 7: “Additional Configuration Options for the SAS Spawner” for descriptions of other options.

```
"(SAS install path)\inttech\sasexe\objspawn.exe" -sasverbose -configFile "HRVserv.cfg"
```

- For UNIX, edit `(Data Location)/spawner.sh` to contain the single line below. Other options can be added to this line based on site preferences and some specific UNIX operating system requirements.

```
(SAS install path)/utilities/bin/objspawn -sasverbose -configFile HRVserv.cfg
```

Use the appropriate `chmod` command to mark `spawner.sh` as an executable file.

- Edit `(Data Location)\HRVserv.cfg`.
 1. The `sasMachineDNSName` should be set to `(DNSname)`, although it can remain `localhost` if the `(DNSname)` is the same as where the SAS Spawner is running.
 2. The `sasCommand` should be set to `"(SAS install path)\sas"` for Windows or `(SAS install path)/sas` for UNIX.
 3. On the `sasCommand` line, the `-MAPS` parameter should be set to a directory containing the supplied SAS maps. By default, these maps are installed to the `(Data Location)\maps` directory. A copy of these maps can also be found in `(HRV install path)\Appl\warehouse\maps`. If more than one HR Vision warehouse is being set up, this directory can be placed anywhere accessible by all of the multiple HR Vision warehouses and, therefore, not be replicated for each HR Vision warehouse.
 4. As the SAS data server is operating, various temporary tables are created to support HR Vision. Although these tables are deleted when a HR Vision user logs out, while they exist, they may contain data from the HR Vision warehouse. Although this is not required, the `-work` parameter can be added to the `sasCommand` line to specify a directory path to be used for these temporary tables. If used, the directory path specified on the `-work` parameter should be secured from unauthorized access. HR Vision only requires that `(HRVuserid)` have read/write access to these directories. Access by other userids is optional, but should be limited to those who are authorized to see the data in the HR Vision warehouse.

Section 2: Installation and Configuration of the HR Vision Web Server

HR Vision resides on and is executed by a Web server. Based on the instructions sent to it by the user, it retrieves any necessary information from its own metadata and from the SAS data server, restructures that information into appropriate HTML, and sends the results to be displayed on the user's Web browser. Because HR Vision is a server-based Java application, it requires a Web server to execute and the Web server must support servlet and JSP technology.

Configuration of HR Vision consists of defining HR Vision as an application to the Web server and specifying paths to:

- the directory containing the warehouse configurations, known as the Configuration Metadata Template or (*WHConfig location*),
- the directory containing security information, known as the Security Metadata Template or (*SEC location*), and the
- the directory containing information on the HR Vision warehouse, known as the Warehouse Metadata Template or (*MD location*).

If these paths are all on the same processor, it may be convenient to run the setup process and perform steps 3, 4, 5, and 6 in the steps below at the same time. This will save having to execute the setup process four different times.

1. Install JDK 1.3. No additional configuration should be necessary.
2. Install and configure the Web server to be used for HR Vision.

Before you deploy the HR Vision Web Server, make sure that your production environment meets the following requirements. You can deploy to any application server and/or Java Servlet engine that provides full support for the Servlet 2.2/JSP 1.1 specification using Java Runtime Environment 1.2.2 or higher (JRE 1.3.0_01 is recommended). An application server is a Java application that is used to run special Java programs called servlets. Application servers can run in cooperation with a Web server or as standalone entities. The HR Vision Web Server, which is implemented as a servlet, requires that such a servlet engine container be installed and running on the HR Vision Web Server machine.

3. Install HR Vision, Version 3.0.

From the HR Vision media, run the setup program for the appropriate operating system:

Windows:	setup.exe
AIX:	aixpower.bin
HP-UX, Release 10.20:	hpux1020.bin
HP-UX, Release 11.0:	hp8x11x.bin
Solaris:	sunsparc.bin

This must be the same operating system and on the same network as the HR Vision Web Server. Install the HR Vision Program Files into the desired installation directory (*HRV install path*). The default value for (*HRV install path*) is:

C:\Program Files\SAS Institute\HR Vision\3.0 for Windows, and:

opt/SAS Institute/HR Vision/3.0 for UNIX.

For UNIX, the files installed in the (*HRV install path*) directory are installed with world and group read and write permissions. Use the appropriate `chmod` command to remove these world and group read and write permissions.

Define HR Vision as a Web application to the Web server and define an alias (*HRV*) to (*HRV install path*).

Test the HR Vision Web Server configuration on (*HRV*)/Jsp/helloWorld.jsp and (*HRV*)/Jsp/HRVHelloWorld.jsp.

4. Create the Configuration Metadata Template.

From the HR Vision media, run the setup program for the appropriate operating system:

Windows:	setup.exe
AIX:	aixpower.bin
HP-UX, Release 10.20:	hpux1020.bin
HP-UX, Release 11.0:	hp8x11x.bin
Solaris:	sunsparc.bin

This must be the same operating system and on the same network as the HR Vision Web Server. Install the *Configuration Metadata Template* into the desired configuration metadata directory (*WHConfig location*) on the HR Vision Web Server. The default value for (*WHConfig location*) is:

C:\Program Files\SAS Institute\HR Vision\metaserver\configuration for Windows, and:

opt/SAS Institute/HR Vision/metaserver/configuration for UNIX.

For UNIX, the files installed in the (*WHConfig location*) directory are installed with world and group read and write permissions. Use the appropriate `chmod` command to remove these world and group read and write permissions.

5. Create the Security Metadata Template.

From the HR Vision media, run the setup program for the appropriate operating system:

Windows:	setup.exe
AIX:	aixpower.bin
HP-UX, Release 10.20:	hpux1020.bin
HP-UX, Release 11.0:	hp8x11x.bin
Solaris:	sunsparc.bin

This must be the same operating system and on the same network as the HR Vision Web Server. Install the *Security Metadata Template* into the desired security metadata directory (*SEC location*) on the HR Vision Web Server. This directory contains information to initially set up two HR Vision users – `SYSADM` and `HRVUSER`. The passwords for these HR Vision users are `sysadm` and `hrvuser` respectively. The default value for (*SEC location*) is:

C:\Program Files\SAS Institute\HR Vision\metaserver\security for Windows, and:

opt/SAS Institute/HR Vision/metaserver/security for UNIX.

For UNIX, the files installed in the (*SEC location*) directory are installed with world and group read and write permissions. Use the appropriate `chmod` command to remove these world and group read and write permissions.

6. Create the Warehouse Metadata Template.

From the HR Vision media, run the setup program for the appropriate operating system:

Windows:	setup.exe
AIX:	aixpower.bin
HP-UX, Release 10.20:	hpux1020.bin
HP-UX, Release 11.0:	hp8x11x.bin
Solaris:	sunsparc.bin

This must be the same operating system and on the same network as the HR Vision Web Server. Install the Warehouse Metadata Template into the desired warehouse metadata directory (*MD location*) on the HR Vision Web Server. The default value for (*MD location*) is:

C:\Program Files\SAS Institute\HR Vision\metaserver\warehouse for Windows, and:

opt/SAS Institute/HR Vision/metaserver/warehouse for UNIX.

For UNIX, the files installed in the (*MD location*) directory are installed with world and group read and write permissions. Use the appropriate `chmod` command to remove these world and group read and write permissions.

Note that the paths for the configuration metadata directory (*WHConfig location*), security metadata directory (*SEC location*), and warehouse metadata directory (*MD location*) templates and their subdirectories should be secured from unauthorized access. HR Vision only requires that the HR Vision Web Server process have read/write access to these directories. Access by other userids is optional, but should be limited to those who are authorized to see the data in these directories.

7. Create a Warehouse Configuration.

Each HR Vision warehouse must be defined to HR Vision with a warehouse configuration file. A warehouse configuration file is an XML file stored in the (*WHConfig location*) directory. By default, the file `p000001.xml` is stored in this directory. To define a warehouse, the contents of this file can be modified or a new file can be created.

Edit the desired warehouse configuration file with any standard text editor. If necessary, change the value for each of the attributes shown below. See Appendix 2: "Definitions of Attributes in a Warehouse Configuration File" for a definition of all the attributes in a warehouse configuration file.

<code>type=</code>	This is the warehouse security type and can be one word, with no blanks or special characters. The type attribute must correspond to the name of the security configuration file stored in the (<i>WHConfig location</i>)\seclocs directory.
<code>desc=</code>	This is any desired description for the warehouse and will appear on the warehouse selection list on the logon screen.
<code>datapath=</code>	(<i>Data Location</i>) – This is the directory path to the HR Vision warehouse location.
<code>path=</code>	(<i>MD location</i>) – This is the directory path to the warehouse metadata location.
<code>pubtran=</code>	This is the directory containing site-specific operational and transaction data. By default, this path will be set to (<i>Data location</i>)/tran. This path does not need to change if operational and transaction data is placed in this directory. Otherwise, this path should be changed to the directory where the actual operational and transaction data is located.
<code>bldsrc2=</code>	This is a directory containing a SAS catalog named BLDSRC. By default, this path will be set to (<i>Data location</i>)/sitesrc. The BLDSRC catalog in this directory must contain the SAS source statements to read the data in the <code>pubtran</code> directory. Do not confuse this directory with (<i>Data location</i>)/bldsrc, which also contains a SAS catalog named BLDSRC. This particular catalog is supplied by HR Vision, but does not contain any SAS source statements to read operational data.

Insure that the warehouse key - p000001 - in the example warehouse configuration file matches the name of the XML file it resides in. As an example, if the warehouse key is changed to ACME, then the XML file holding this text must be acme.xml.

8. Create a Security Configuration.

Each warehouse must be associated with a security location defined with a security configuration file. The security configuration file is an XML file stored in the *(WHConfig location)\seclocs* directory. By default, the file demo.xml is stored in this directory. To define a security configuration, the contents of this file can be modified or a new file can be created.

Edit the desired security configuration file with any standard text editor. The general format of the file looks like:

```
<secloc
  path="C:\program files\sas institute\hr Vision\metaserver\security"
  desc="Default Security Files Location"
>
demo
</secloc>
```

If necessary, modify the values for:

Path= (*SEC location*)
Desc= any descriptive text. This text is not used within HR Vision and is for documentation purposes only.

Insure that the warehouse key in the security configuration file, demo, in the example above matches the warehouse type attribute in the warehouse configuration file from the previous step. Additionally, this type key must match the name of the XML file it resides in. As an example, if the warehouse type key is changed to ACME, then the XML file holding this text must be acme.xml.

9. Create a SAS Workspace Pool Configuration.

Each warehouse must be associated with a SAS workspace pool defined with a SAS workspace pool configuration file. The SAS workspace pool configuration file is an XML file stored in the *(WHConfig location)\workspacepools* directory. By default, the file c000001.xml is stored in this directory. To define a SAS workspace pool, the contents of this file can be modified or a new file can be created. By default, this file references a SAS data server defined by the s000001.xml file located in the *(WHConfig location)\servers* directory. The contents of the file c000001.xml need to be changed only if the server definition file s000001.xml is not used. See Appendix 4: “Definitions of Attributes in a SAS Workspace Pool Configuration File” for further descriptions of the contents of this file.

10. Create a SAS Data Server Configuration.

Each SAS workspace pool must be associated with a SAS data server defined with a SAS data server configuration file. The SAS data server configuration file is an XML file stored in the *(WHConfig location)\servers* directory. By default, the file s000001.xml is stored in this directory. Each SAS data server configuration file defines an actual connection to a SAS data server. To define a SAS data server, the contents of this file can be modified or a new file can be created. See Appendix 3: “Definitions of Attributes in a SAS Data Server Configuration File” for further descriptions of the contents of this file.

Edit the desired SAS data server configuration file with any standard text editor. The general format of the file looks like:

```
<server
  host="localhost"
  port="5310"
  userName="domainname \ (HRVuserid)"
  password=" (HRVpwd)"
  sasMaxPerWorkspacePool="6"
  sas-RecycleActivationLimit="0"
  sas-ServerRunForever="false"
  sas-ServerShutdownAfter="3">
s000001
</server>
```

Generally, the following attributes must be set:

host= should be set to *(DNSname)*. "localhost" is valid if the SAS data server is the same machine as the HR Vision Web Server.

userName= specify the username that HR Vision will use to log into the SAS data server. This should be set to *(HRVuserid)*. See Appendix 6: "Windows System Requirements for *(HRVuserid)*" for specific user attributes for this userid.

password= specify the password *(HRVpwd)* for *(HRVuserid)*.

Insure that server key - s000001 - in the default example file matches the name of the XML file it resides in. As an example, if the server key is changed to ourserver, then the XML file holding this text must be ourserver.xml.

Note that the SAS data server configuration file contains system password information. For this reason, the system security on this file should be set such that only the HR Vision Web Server process, plus any appropriate people, can see the contents of this file.

11. Modify *(HRV install path)\Config\HRVision.cfg*.

In general, only the values of whlocs=, connections=, servers=, and seclocs= need to be modified. whlocs= should be set to the configuration metadata directory *(WHConfig location)*. In most cases, the paths for connections=, servers=, and seclocs= are subdirectories of *(WHConfig location)*.

```
whlocs=          (WHConfig location)
connections=     (WHConfig location)/workspacepools
servers=        (WHConfig location)/servers
seclocs=        (WHConfig location)/seclocs
```

See Appendix 5: "Definitions of Settings in the HRVision.cfg File" for further descriptions of the entries in this file.

12. Configure the Batch Warehouse Build Process.

- If the HR Vision Web Server is on a Windows operating system, edit the file:

```
(MD location)\batchrefresh.bat
```

If the HR Vision Web Server is on a UNIX operating system, edit the file:

```
(MD location)/batchrefresh.sh
```

- Modify the following parameters at the beginning of the program as appropriate for the HR Vision implementation:

<code>user</code>	is any valid HR Vision userid for the specified warehouse.
<code>pw</code>	is the password for the specified HR Vision userid.
<code>Wh</code>	must be a valid warehouse key.
<code>productdrive</code>	is the drive letter where HR Vision is installed (Windows only).
<code>product</code>	specifies the HR Vision install path.
<code>vproduct</code>	specifies the URL to HR Vision, for example, <code>http://someserver/HRV/HRVision.jsp</code> .
<code>hrvbuildlog</code>	specifies a SAS log file for which the SAS warehouse refresh program to write log messages.
<code>hrvlog</code>	specifies a SAS log file for which the <code>batchrefresh</code> Java program to write log messages.
<code>hrvregrepositlog</code>	specifies a SAS log file for which the repository registration program to write log messages.
<code>hrvrrlog</code>	specifies a SAS log file for which the repository registration Java program to write log messages.

Because the files `batchrefresh.bat` and `batchrefresh.sh` contain a password, appropriate operating system security measures should be taken to keep this password from being exposed to anyone unauthorized to see HR Vision data.

Additionally, the files that hold log messages occasionally contain information extracted from the tables in the HR Vision warehouse. Appropriate operating system security measures should be taken to keep the contents of these files from being exposed to anyone other than the designated system administrators for HR Vision.

- For UNIX, use the appropriate `chmod` command to mark `batchrefresh.sh` as an executable file.

Section 3: Refreshing an HR Vision Warehouse and Running HR Vision

Before the first use of HR Vision, the HR Vision warehouse must be refreshed. When a template warehouse is created, the directories *(Data location)\data*, *(Data location)\formats*, and *(Data location)\output* are empty. Refreshing the warehouse will build the HR Vision warehouse tables, formats, and report output and place them into the appropriate directories.

At most installations, the `pubtran=` attribute and the `blsrc2=` attribute, located in the warehouse configuration file in the *(WHConfig location)* directory, must be set to appropriate values to read the transaction and operational data appropriate for that installation.

Note: To simply set up a demonstration warehouse using the provided sample transaction and operational data, follow the instructions in Appendix 8: “Setting up an HR Vision Warehouse Using the Supplied Demonstration Data”.

1. Execute the SAS Spawner.

If the SAS data server is installed on a Windows operating system, run the SAS Spawner by executing:

```
(Data Location)\spawner.bat
```

If the SAS data server is installed on a UNIX operating system, run the SAS Spawner by executing:

```
(Data Location)/spawner.sh
```

2. Insure that the HR Vision Web Server is running. Note the HR Vision Web Server name (*Web Server Name*) and the alias to HR Vision (*HRV*).
3. Refresh the HR Vision warehouse.

If the HR Vision Web Server is running on a Windows operating system, refresh the HR Vision warehouse by executing:

```
(MD location)\batchrefresh.bat
```

If the HR Vision Web Server is running on a UNIX operating system, refresh the HR Vision warehouse by executing:

```
(MD location)/batchrefresh.sh
```

4. Execute HR Vision with the following URL:

```
http://(Web Server Name)/(HRV)/Jsp/HRVision.jsp
```

where *(Web Server Name)* is the name of the server hosting the Web server and *(HRV)* is the alias defined to that Web server that points to *(HRV install path)*. This should display the HR Vision logon screen. Select the appropriate warehouse and enter the appropriate userid and password.

Appendix 1: Directories in *(Data Location)*

Directory	Contains...
bldsrc	the source code for all non-detail tables. It is a supplied SAS catalog named BLDSRC. This SAS catalog must be in this directory and generally should not be modified.
data	the HR Vision warehouse tables. Initially, this directory will be empty, but when an HR Vision warehouse is refreshed, the resulting warehouse tables will be in this directory.
dw	detailed table definitions for use by SAS/Warehouse Administrator software.
formats	the display formats available to HR Vision. Initially, this directory will be empty, but when an HR Vision warehouse is refreshed, the SAS catalog containing the display formats will be in this directory.
maps	map files required by HR Vision.
output	the HR Vision report output. Initially, this directory will be empty, but when an HR Vision warehouse is refreshed, the report output will be in this directory.
proxy	the PROXY catalog containing various SAS SCL classes required by the SAS System.
reports	the source code for HR Vision reports.
sasautos	autocall macro files supplied by HR Vision.
sitesrc	a BLDSRC catalog, supplied by the site, containing source code to read various operational and transaction tables.
tran	the various operational and transaction files.
userdata	one subdirectory each to hold the private data of each user of HR Vision.

Appendix 2: Definitions of Attributes in a Warehouse Configuration File

Attribute	Definition
type	<p>This is the warehouse security type and can be one word, with no blanks or special characters. This type must correspond to a security configuration file stored in the <i>(WHConfig location)\seclocs</i> directory. The default value of demo corresponds to a file named demo.xml. If the desired security configuration file for this warehouse was named acmesecurity.xml, then the value of this attribute would be acmesecurity.</p> <p>It is possible to have multiple warehouse definition files using the same security type. This allows multiple warehouses to share one set of userids, as well as the security code assignments for those users.</p>
desc	This is any desired description for the warehouse and will appear on the warehouse selection list on the logon screen.
path	This is the directory path to the warehouse metadata location - <i>(MD location)</i>
datapath	This is the directory path to the HR vision warehouse location - <i>(Data Location)</i> .
pubtran	This is the directory containing site-specific operational and transaction data. By default, this path will be set to <i>(Data location)/tran</i> . This path does not need to change if operational and transaction data are placed in this directory. Otherwise, this path should be changed to the directory where the actual operational and transaction data are located.
bldsrc2	<p>This is a directory containing a SAS catalog named BLDSRC. By default, this path will be set to <i>(Data location)/sitesrc</i>. The BLDSRC catalog in this directory must contain the SAS source statements to read the data in the pubtran directory. Do not confuse this directory with <i>(Data location)/bldsrc</i>, which also contains a SAS catalog named BLDSRC. This particular catalog is supplied by HR Vision, but does not contain any SAS source statements to read operational data.</p> <p>Additional build source directories can be specified by including lines with the format of:</p> <p>BLDSRCx <i>(path)</i></p> <p>where x is a number and <i>(path)</i> is the desired directory path. Each directory specified by a BLDSRCx path must contain a catalog named BLDSRC.</p>
connection	This defines the SAS workspace pool used by this warehouse and must correspond to a SAS workspace pool configuration file located in the <i>(WHConfig location)\workspacepools</i> directory. The default value of c000001 corresponds to a file named c000001.xml. If the desired SAS workspace pool configuration file for this warehouse was named allservers.xml, then the value of this attribute would be allservers. See Appendix 4: "Definitions of Attributes in a SAS Workspace Pool Configuration File" for details on SAS workspace pool configuration files.
pubdata	"{datapath}/data"
userdata	"{datapath}/userdata"
Prvdata	"{datapath}/userdata/{user}/data"
Pubout	"{datapath}/output"
Prvout	"{datapath}/userdata/{user}/output"
Bldsrc*	"{datapath}/bldsrc"
Proxy	"{datapath}/proxy"

Attribute	Definition
formats*	"{datapath}/formats"
Autocall*	"{datapath}/sasautos"
rprtsrc*	"{datapath}/reports"
Urlopts	This defines additional URL options that may be necessary on a SAS filename statement.
Pubdataopts	"access=readonly". This can be set to any valid LIBNAME statement option. This string will be placed on the LIBNAME issued for PUBDATA for non-administrative users.
Pubtranopts	"access=readonly". This can be set to any valid LIBNAME statement option. This string will be placed on the LIBNAME issued for PUBTRAN for non-administrative users.
Admindataopts	This can be set to any valid LIBNAME statement option. This string will be placed on the LIBNAME issued for PUBDATA for system administrator users.
Admintranopts	This can be set to any valid LIBNAME statement option. This string will be placed on the LIBNAME issued for PUBTRAN for system administrator users.
Prvdataopts	This can be set to any valid LIBNAME statement option. This string will be placed on the LIBNAME issued for PRVDATA for non-administrator users.
Pubdataengine	This can be set to any valid LIBNAME statement engine and will be used on the LIBNAME issued for PUBDATA.
Prvdataengine	This can be set to any valid LIBNAME statement engine and will be used on the LIBNAME issued for PRVDATA.
Pubtranengine	This can be set to any valid LIBNAME statement engine and will be used on the LIBNAME issued for PUBTRAN.
Presubmit	This can be any set of valid SAS statements. These SAS statements will be submitted to the SAS System when HR Vision initially invokes it.
News	"../Html/News/news.html". This can be set to any valid HTML location. HR Vision will display the contents of the HTML page on the News link of each user's home page.

* The formats, autocall, and rprtsrc directories can have multiple entries similar to the bldsrc entry. An example would be autocall2, which would point to an additional directory containing autocall macros.

Appendix 3: Definitions of Attributes in a SAS Data Server Configuration File

The general format of a SAS data server configuration file looks like:

```
<server
  host="localhost"
  userName="domain\HRVuserid"
  password="(HRVpwd)"
  port="5310"
  sasMaxPerWorkspacePool="6"
  sas-RecycleActivationLimit="0"
  sas-ServerRunForever="false"
  sas-ServerShutdownAfter="3">
s000001
</server>
```

- The `host=` attribute specifies the name for a SAS data server. This should be set to *(DNSname)*. "localhost" is valid if the SAS data server is the same machine as the HR Vision Web Server.
- The `port=` attribute specifies the port number on the above SAS data server machine that the SAS Spawner will use to communicate with that SAS data server. Ultimately, the `port=` value must match the port number specified in the *(MD location)\HRVserv.cfg* file. By default, both port numbers are set to 5310 and this should only be changed if there is a conflict using this port.
- The `userName=` and `password=` attributes specify the operating system username and password that HR Vision will use to log into the SAS data server. These should be set to *(HRVuserid)* and *(HRVpwd)*. See Appendix 6: "Windows System Requirements for *(HRVuserid)*" for specific user attributes for *(HRVuserid)*. Note that these values, particularly the password, will be stored in the SAS data server configuration file. For this reason, the system security on this file should be set such that only the HR Vision Web Server process, plus any appropriate people, can see the contents of this file.
- The `sasMaxPerWorkspacePool` attribute specifies how many SAS sessions this SAS data server will support. This should be set taking into consideration the processing power of the machine, the amount of memory present, and the volume of data in the HR Vision warehouse. This property is optional and the default value is 10.
- The `sas-RecycleActivationLimit="0"` attribute specifies the number of times a connection to the SAS data server will be re-used in a SAS workspace pool before it is disconnected and recycled. If the value is 0, then there will be no limit on the number of times a connection to the SAS data server can be reused. This property is optional and the default value is 0.
- The `sas-ServerRunForever="false"` attribute must be either `true` or `false`. If the value is `false`, then unallocated live connections will be disconnected after a period of time (determined by the value of `sas-ServerShutdownAfter`) unless they are allocated to a user before that period of time passes. Otherwise, unallocated live connections will remain alive indefinitely. This property is optional and the default value is `true`.

- The `sas-ServerShutdownAfter="3"` attribute specifies the period of time, in minutes, that an unallocated live connection will wait to be allocated to a user before shutting down. This property is optional and it is ignored if the value of `sas-ServerRunForever` is `true`. The value must not be less than 0 and it must not be greater than 1440. The default value is 3. If the value is 0, then a connection returned to a SAS workspace pool by a user will be disconnected immediately unless another user is waiting for a connection from the SAS workspace pool.
- The value of the `<server>` tag - `s000001` - in the above example must be the same as the XML file it resides in. The text in the example above must reside in a file named `s000001.xml`.

Appendix 4: Definitions of Attributes in a SAS Workspace Pool Configuration File

The general format of a SAS workspace pool configuration file looks like:

```
<connection desc="Pool of SAS data servers" type="remote" sasMinSize="1" sasMinAvail="0">
  <servers>
    <server>s000001</server>
  </servers>
c000001
</connection>
```

- The `desc=` attribute on the `connection` tag is arbitrary.
- The `type=` attribute specifies whether the SAS data server is on the same network as the HR Vision Web Server. Valid values are "remote" or "local". The default is "remote".
- The `sasMinSize=` attribute specifies the minimum number of SAS data servers that are maintained for a SAS workspace pool (after the initial startup period). This number includes both the connections that are in use and the connections that are idle. Under normal circumstances, this value should be set to 1.
- The `sasMinAvail=` attribute specifies the minimum number of idle connections that are maintained in a SAS workspace pool. This number includes only the connections that are idle. This property is optional and the default value is 0.
- The value of the `<connection>` tag - `c000001` - in the above example must be the same as the XML file it resides in. The text in the example above must reside in a file named `c000001.xml`, located in the *(WHConfig location)\workspacepools* directory.
- The value of the `<server>` tag - `s000001` - in the above example must match a SAS data server configuration file called `s000001.xml` stored in the *(WHConfig location)\servers* directory.
- It is possible to have multiple `<server>` tags nested in the `<servers>` tag. Each `<server>` tag specifies a server definition file in the *(WHConfig location)\servers* directory. For example, if there were two SAS data servers available for use by HR Vision, the contents of this file might look like this:

```
<connection desc="Pool of SAS data servers" type="remote" sasMinSize="1" sasMinAvail="0">
  <servers>
    <server>alpha</server>
    <server>beta</server>
  </servers>
allservers
</connection>
```

This configuration must be stored in a file called `allservers.xml`, located in the *(WHConfig location)\workspacepools* directory. Additionally, this configuration references two SAS data servers defined by the files `alpha.xml` and `beta.xml`, located in the *(WHConfig location)\servers* directory.

Appendix 5: Definitions of Settings in the HRVision.cfg File

The file `HRVision.cfg` contains many configuration settings that affect the behavior of HR Vision. Many of the attributes in this file must be set to a correct value or HR Vision will not be able to operate.

<code>whlocs</code>	The directory containing the warehouse configuration files: (<i>WHConfig location</i>).
<code>connections</code>	The directory containing the workspace pool definition files.
<code>servers</code>	The directory containing the SAS server definition files.
<code>seclocs</code>	The directory containing the security definition files.

In most cases, the paths for `connections`, `servers`, and `seclocs` are subdirectories of (*WHConfig location*).

The following values do not need to be changed, but can be set based on site preferences:

<code>Lifespan</code>	sets the value in minutes after which unresponsive users are to be logged off.
<code>Metacache</code>	specifies whether the server should cache metadata.
<code>Lang</code>	sets the default language locale.
<code>Urllist</code>	defines a comma-delimited list of URLs that can invoke HR Vision.

In general, the remaining values in the file should not be modified.

The `HRVision.cfg` file is in the actual install location for HR Vision. As such, care must be taken to avoid losing site-specific changes to this file if a new version of HR Vision is installed. It may be preferable to move this file to the (*WH Metadata*) path and define an alias of `HRVconfig` to the Web server. This alias is recognized by HR Vision and will cause HR Vision to read its configuration information from this alias, rather than the file directly in the install location.

Appendix 6: Windows System Requirements for *(HRVuserid)*

For Window NT and Windows 2000, the *(HRVuserid)* must have specific NT user rights assigned.

For Windows NT:

1. From the Windows desktop, go to Start->Programs->Administrative Tools->User Manager.
2. Under the Policies pull-down menu, select User Rights....
3. On this screen, select the checkbox near the lower-left corner for Show Advanced User Rights.
4. In the Right: drop-down list, select Act as part of the operating system. Add *(HRVuserid)* to the Grant to list if it is not there.
5. In the Right: drop-down list, select Increase quotas. Add *(HRVuserid)* to the Grant to list if it is not there.
6. In the Right: drop-down list, select Replace a process level token. Add *(HRVuserid)* to the Grant to list if it is not there.
7. In the Right: drop-down list, select Log on as a batch job. Add *(HRVuserid)* to the Grant to list if it is not there.

For Windows 2000:

1. From the Windows desktop, go to Start->Programs->Administrative Tools->Local Security Policy.
2. In the Local Security Settings window, from the Tree tab, expand the Local Policies node and select the User Rights Assignment node.
3. Double-click on the policy Act as part of the operating system. In the Local Security Policy Setting window, press the Add... button to add *(HRVuserid)* to the Assigned To list. Press the Ok button when finished.
4. Double-click on the policy Increase quotas. In the Local Security Policy Setting window, press the Add... button to add *(HRVuserid)* to the Assigned To list. Press the Ok button when finished.
5. Double-click on the policy Replace a process level token. In the Local Security Policy Setting window, press the Add... button to add *(HRVuserid)* to the Assigned To list. Press the Ok button when finished.
6. Double-click on the policy Log on as a batch job. In the Local Security Policy Setting window, press the Add... button to add *(HRVuserid)* to the Assigned To list. Press the Ok button when finished.

Appendix 7: Additional Configuration Options for the SAS Spawner

The following options can be used in the command to start up the SAS Spawner for a SAS data server. Note that the SAS Spawner must be stopped and restarted in order to reflect configuration updates.

<code>-authProg</code>	For UNIX only and recommended for Solaris. Specifies a fully qualified path to the executable to use for authentication. Paths with embedded blanks must be quoted. Refer to the section titled "Configure User Authorization" in the SAS System Installation Instructions.
<code>-deinstall</code>	For Windows only and instructs the SAS Spawner to de-install as a Windows service.
<code>-dependent</code>	Instructs the SAS Spawner to launch as a Dependent Spawner Daemon.
<code>-install</code>	For Windows only and instructs the SAS Spawner to install as a Windows service. When asked to install as a Windows service, the SAS Spawner records all options specified at install time in the registry under the following key: <pre>"SYSTEM\CurrentControlSet\Services\SAS Object Spawner Daemon\Parameters"</pre> Options can also be specified in the Startup Parameters when the SAS Spawner service is manually started from the <code>Services</code> dialog box.
<code>-noSecurity</code>	For Windows only and instructs the SAS Spawner not to authenticate clients. Clients will execute as the user that launched the SAS Spawner. This option is useful during development. Warning: Because clients connected to the SAS Spawner using the <code>-noSecurity</code> option execute as the user that launched the SAS Spawner, it is strongly suggested that the host in which the SAS Spawner is executing not be connected to a network. Otherwise, data that is accessible by the user that launched the SAS Spawner is at risk.
<code>-sasDependentSpawnercn</code>	Specifies the <code>sasDependentSpawnercn</code> of the <code>sasDependentSpawner</code> object to utilize for this dependent SAS Spawner invocation configuration. When <code>sasDependentSpawnercn</code> is specified, the option <code>dependent</code> is assumed. When <code>sasDependentSpawnercn</code> is not specified (and <code>dependent</code> is), the first <code>sasDependentSpawner</code> definition with a <code>sasMachineDNSName</code> of the current host is used.
<code>-sasLogFile</code>	Specifies a fully qualified path to the file in which to log SAS Spawner activity. Enclose paths with embedded blanks in quotation marks.
<code>-sasSpawnercn</code>	Specifies the <code>sasSpawnercn</code> of the <code>sasSpawner</code> object to utilize for this SAS Spawner invocation configuration. When <code>sasSpawnercn</code> is not specified, the first <code>sasSpawner</code> definition with a <code>sasMachineDNSName</code> of the current host is used.
<code>-sasVerbose</code>	When present, this option causes the SAS Spawner or dependent SAS Spawner to record more detail in the log file.

Appendix 8: Setting up an HR Vision Warehouse Using the Supplied Demonstration Data

The HR Vision media contains sample transaction data to simulate an organization with approximately 4,000 employees. This data can be used to set up a sample HR Vision warehouse for testing or demonstration purposes.

To set up an HR Vision warehouse using the supplied demonstration data:

1. Configure a warehouse template according to the instructions in sections 1 and 2 of this document.
2. Replace the *(Data Location)*\tran directory with the directory:

```
demowh\dataserver\warehouse\tran
```

from the HR Vision media.

3. Replace the *(Data Location)*\sitesrc directory with the directory:

```
demowh\dataserver\warehouse\sitesrc
```

from the HR Vision media. If the data server is UNIX, the following SAS code must be submitted to the SAS System:

1. Invoke the SAS System.
2. Submit the following statements:

```
libname sitesrc '(Data Location)/sitesrc';  
proc cimport lib=sitesrc force  
            infile='(HR Vision Media)/demowh/dataserver/warehouse/sitesrc/sitesrc.cpo';  
run;
```

where *(Data Location)* is the appropriate path the data warehouse template and *(HR Vision Media)* is the appropriate path to the HR Vision media.

4. Follow the steps in Section 3 to refresh an HR Vision warehouse.