

HP Business Process Monitor

For the Windows operating system

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Business Process Monitor Administration Guide

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Chapter 1

Business Process Monitor Overview

Business Process Monitor (BPM) is one of the HP Business Service Management (BSM) data collectors. BPM proactively monitors enterprise applications in real time, identifying performance and availability problems before users experience them. It enables you to monitor sites from various locations, emulating the end-user experience, and so assess site performance from different client perspectives.

You install BPM on host machines on your local network or on the Internet. Once installed, BPM runs independently as a service on the host machine. You generally deploy BPMs on multiple host machines, but you can also use each BPM installed on a host machine as the basis for many logical BPM instances. For example, you may want to use each instance on the host machine to run tests for a different division of your organization, or use duplicate instances during the staging period for BSM upgrade to communicate with the different BSM versions.

Each instance can be connected to a different BSM platform, or there may be several instances connected to a single BSM platform (using a unique logical host name for each).

After installing BPM on a machine, the machine is added to the list of data collectors in BSM End User Management (EUM) Administration. Each additional BPM instance that you define is also added to the list of available data collectors. Each BPM can then be designated as a host for your business process applications and business transaction flows, which are defined in EUM Administration. For details on creating and managing applications and business transaction flows, see "Business Process Monitor Administration User Interface" in the BSM Application Administration Guide.

BPM monitors applications by executing the tasks specified in the applications and business transaction flows. This includes running scripts (transaction monitors) and collecting transaction performance data (application response time and availability), and running WebTrace and collecting server/network performance data. Performance data is collected from various points throughout the infrastructure, as well as from external locations. Business Process Monitor also reports error information during the execution of the tasks.

BPM sends the collected data to BSM, where you can use the applications to view and analyze the data, in order to monitor the performance of your business applications and infrastructure.

In general, BPMs do not require configuration and administration. Where configuration or troubleshooting is required, you generally access the web-based Business Process Monitor Admin tool (for details, see "[Business Process Monitor Admin](#)" on page 9). In addition, certain configuration changes can be made directly in the BPM files, as described in "[Business Process Monitor Configuration Files](#)" on page 97.

You install BPM on the Windows operating systems. For details on system requirements, see "System Requirements" in the Business Process Monitor Deployment Guide.

For a description of the process required to set up and use BPM to collect data on the performance of specific business processes, see "How to Set up Business Process Monitors" in the BSM User Guide.

Chapter 2

Business Process Monitor Admin

You use the web-based BPM Admin for managing and monitoring all BPM instances on the machine, and for customizing BPM settings. BPM Admin is installed on the host machine during BPM installation.

BPM Admin manages the run of BPM on the host machine. You can configure new instances, and then modify settings and view activity for each BPM instance. You can also use BPM Admin to view transaction and page component breakdown for web based scripts, transaction and component breakdown for non-web based (TCP) scripts, and to view reports for WebTrace requests.

All BPM Admin events are reported to a log file.

For details on accessing and working with BPM Admin, see "[Working with Business Process Monitor](#)" on page 15.

Chapter 3

Business Process Monitor Compatibility Matrixes

This section describes matrixes for various environments and components supported by BPM versions.

In each Table, ✓ =supported, X=not supported.

This section includes the following matrixes:

- "Business Process Monitor Compatibility Matrix" below
- "Business Process Monitor/QuickTest Professional (QTP) Compatibility Matrix" on next page
- "Business Process Monitor Protocol Support Matrix" on page 12
- "Supported protocols via QTP Add-ins" on page 14

Business Process Monitor Compatibility Matrix

For each BPM version, the latest supported HP Virtual User Generator (VuGen) version is mentioned. All previous versions of VuGen are supported as well.

Compatibility Matrix	HP Business Service Management 9.x	HP Business Availability Center 8.x	HP Business Availability Center 7.5x	HP Business Availability Center 7.0
BPM 9.22 (LR Replay 11.50 SP 1)	✓ (Recommended)	✓	✓	✓
BPM 9.13 (LR Replay 11 SP 3)	✓ (Recommended)	✓	✓	✓
BPM 9.03 (LR Replay 11 SP 3)	✓ (Recommended)	✓	✓	✓
BPM 9.02 (LR Replay 11 SP 1)	✓ (Recommended)	✓	✓	✓

Compatibility Matrix	HP Business Service Management 9.x	HP Business Availability Center 8.x	HP Business Availability Center 7.5x	HP Business Availability Center 7.0
BPM 9.01 (LR Replay 9.5 SP 2)	✓ (Recommended)	✓	✓	✓
BPM 9.00 (LR Replay 9.5 SP 2)	✓ (Recommended)	✓	✓	✓
BPM 8.03 and later (LR Replay 9.5 SP2)	✓	✓ (Recommended)	✓	✓
BPM 8.02 (LR Replay 9.5)	✓	✓ (Recommended)	✓	✓
BPM 7.5x (LR Replay 9.1)	✓	✓	✓ (Recommended)	✓
BPM 7.0 (LR Replay 9.0)	✓	✓	✓	✓ (Recommended)

Business Process Monitor/QuickTest Professional (QTP) Compatibility Matrix

Compatibility Matrix	Business Process Monitor 9.22	Business Process Monitor 9.0x, 9.1x	Business Process Monitor 8.03, 8.04, 8.05	Business Process Monitor 8.02	Business Process Monitor 7.5x	Business Process Monitor 7.0
QTP 11.0 with QTP_00944 and QTP_00994 patches	✓	X	X	X	X	X
QTP 11.0	X	✓	✓	✓	X	X
QTP 10.0	X	✓	✓	✓	X	X

Compatibility Matrix	Business Process Monitor 9.22	Business Process Monitor 9.0x, 9.1x	Business Process Monitor 8.03, 8.04, 8.05	Business Process Monitor 8.02	Business Process Monitor 7.5x	Business Process Monitor 7.0
QTP 9.5	X	X	X	✓	✓	X
QTP 9.1/2	X	X	X	X	✓	✓
QTP 9.0	X	X	X	X	✓	✓
QTP SAP R/3 7.31	X	X	X	X	✓	✓

Business Process Monitor Protocol Support Matrix

Protocol	Windows
.NET	✓
Ajax	✓
Ajax TruClient	✓
Ajax TruClient for Internet Explorer	✓
C VUser	✓
Citrix 1.8	✓
COM/DCOM	✓
CORBA-java	✓
DB2 CLI	✓
DNS	✓
EJB	✓
Flex	✓
FTP	✓
IMAP	✓
I-mode	✓
Informix	✓
acJada	✓
JAVA over HTTP	✓
JAVA Record\Replay	✓

Protocol	Windows
Java VUser	✓
JavaScript VUser	✓
JMS	✓
LDAP	✓
Mobile APP (HTML/HTTP)	✓
Mobile TruClient	✓
MSSQL Server	✓
Multi protocol Web	✓
ODBC	✓
Oracle (2-tier)	✓
Oracle NCA	✓
PeopleSoft - 8	✓
POP 3	✓
RDP	✓
Real	✓
RMI-java	✓
SAP Click and Script	✓
SAP GUI	✓
SAP Web	✓
Siebel – Web	✓
Siebel DB2 CLI	✓
Siebel MSSQL	✓
Siebel Oracle	✓
Silverlight	✓
SMTP	✓
SOAP	✓
Sybase CtLib	✓

Protocol	Windows
Sybase DBlib	✓
Terminal Emulation [RTE]	✓
Tuxedo 6	✓
Tuxedo 7	✓
VB User	✓
Voice XML	✓
WAP	✓
Web [HTTP/HTML]	✓
Web Click and Script	✓
Windows sockets	✓

Supported protocols via QTP Add-ins

Web
PerfectoMobile MobileCloud for QTP Add-in (For details, go to http://www.perfectomobile.com/portal/cms/resources/install_mobilecloud_for_qtp.html .)
QuickTest Professional Oracle Add-in (web-based & Java-based Oracle lications)app
QuickTest Professional Add-in for SAP Solutions (Windows-based & web-based SAP solutions)
QuickTest Professional Siebel Add-in
QuickTest Professional Web Services Add-in
QuickTest Professional PeopleSoft Add-in
QuickTest Professional Java Add-in
QuickTest Professional .NET Add-in
QuickTest Professional Terminal Emulator Add-in
QuickTest Professional Stingray Add-in
QuickTest Professional VisualAge Smalltalk Add-in

Note: Starting from BPM 7.50, QTP 9.5 is supported with the following new protocol: Power Builder Add-in

Chapter 4

Working with Business Process Monitor

The BPM service performs the following operations:

- retrieves business process configuration information (including applications, business transaction flows, transactions, and recorded scripts) from the profile databases via the BSM Gateway Server
- performs the work defined in the applications and business transaction flows (including running scripts and running WebTrace)
- monitors the task and aggregates relevant data, performing all necessary calculations
- sends samples to the BSM Gateway Server

Note that the scripts are sent over the network (from BSM End User Management Administration to the BPM machine) in zipped format. This improves performance and reduces network load.

BPM saves detailed log entries for every executed task, and for general BPM operation. For more information on the logs, see ["Workspace Directory and Log Files" on page 157](#).

BPM synchronizes time with the BSM Gateway Server once an hour (default Time Poll Interval setting). If you change the time on the BPM machine, the BPM reports may contain incorrect times until BSM is next polled for time synchronization. To avoid this, you should restart BPM/the relevant BPM instance, or change the Time Poll Interval setting for an instance to a value smaller than 60 minutes. (See ["Restart" on page 38](#), or ["Business Service Management Registration Properties Area" on page 43](#).)

Note: BPM saves persistency information after registration with BSM, and after each job update, enabling work to continue even if the Gateway Server is temporarily unavailable.

Supported Recording Tools

BPM 9.22 supports scripts recorded using the following HP tools. Each tool (with the exception of HP Virtual User Generator) must be installed on the BPM machine before BPM can run scripts recorded with that tool.

- **HP QuickTest Professional** (run on Windows platforms only)
- **HP Virtual User Generator**

For the supported versions, see ["Business Process Monitor Compatibility Matrixes" on page 10](#).

BPM supports the same client protocol versions as those supported by its compatible version of VuGen.

Note: You cannot use HP WinRunner scripts with BPM. All WinRunner scripts should be converted to QuickTest Professional scripts.

Requirements and Limitations for Running Tasks

Business Process Monitor has the following requirements and limitations when running scripts and WebTrace.

This section includes the following topics:

- "General" below
- "HP Virtual User Generator Scripts" on next page
- "QuickTest Professional Scripts" on next page
- "WinRunner Scripts" on page 19

General

Note: Refer to the LoadRunner/VuGen documentation to determine the proper configuration for running a specific script.

- It is recommended that you run scripts for all protocols (with the exception of web protocols) with the BPM instance /whole Business Process Monitor set to run as a specific user.
- If there is a problem with a script (for example, due to a missing client installation, a download failure, corruption in the script, and so forth), then the script may fail to initialize. In this case, the application or business transaction flow containing the script also fails to initialize, with the result that none of the application or business transaction flow scripts or WebTraces are run on BPM.
- When a script in an application or business transaction flow is run, but for some reason does not finish successfully (that is, it does not end with a status of **Finished properly** or **Finished (errors occurred)**), samples for transactions that were part of the script, but were not run, are sent to BSM for inclusion in the Triage report. For details on the Triage report, see "Triage Report" in the BSM User Guide.
- Scripts that include an HTML replay mode cannot download Active-X components.
- BPM is not case sensitive to transaction names, so you should ensure that each transaction within the same business transaction flow has a unique name. Two transactions that have the same name, but with case-sensitive differences, are handled as a single transaction by BPM. BPM reports both transactions to BSM using a single transaction ID, and the reports show results for only one transaction.
- Page component breakdown is supported only for certain VuGen protocols.
- WebTrace does not support the use of domain names that begin with a digit, for example, `www.1800hp.com`. An error message is displayed. Instead, use the IP address for the destination.
- Scripts of inactive applications or business transaction flows are still downloaded to BPM, so that if the application or business transaction flow is made active, the BPM does not need to

download the scripts. To avoid overload problem, BPM should be removed from the relevant application or business transaction flow configurations.

HP Virtual User Generator Scripts

- If you are running scripts recorded with VuGen that include protocols which require a client to run (for example, Oracle Client or RealPlayer), you must have the protocol's client installed on the BPM machine.
- Citrix recording and playback is supported only on Windows platforms.
- LoadRunner requires the installation of a Citrix registry patch to record and replay scripts on Citrix client version 10.0 and later. The first time a Citrix script runs on a BPM machine, LoadRunner prompts you to install the Citrix registry patch on that machine. When prompted, click OK to accept the installation.
- BPM supports VuGen scripts for all Oracle NCA protocols. If you run an Oracle NCA protocol task, you can view transaction breakdown data for tasks that use http or Servlet connection methods (breakdown data for Socket communication is not supported).
- You should install Java 1.6.x 32 bit version stand-alone for successful JavaOverHttp script runs.
- Before running a TruClient script recorded in VuGen versions earlier than VuGen LR11.50 SP1, open the script in Vugen LR11.50 SP1 and save it.
- If you have added jars or classes to the classpath in VuGen and are running a java based protocol in BPM, you must perform one of the following actions to ensure that the script can locate the jars:
 - Remove the jar names from the **run-time-settings > classpath** list and place the jar files in the script folder (where the **.usr** file is). The script searches for all jars in the script folder and automatically adds them to the classpath.
 - Specify a full path to the jar in the **run-time-settings > classpath** list. For example:

```
<workspace folder>\agent1\Site1\BPM_SANITY_
1bdf936f0f747829f519ff44808577b4\13\JPetStore_TABLE_
Param\wlclient.jar
```

QuickTest Professional Scripts

Note: For tips and recommendations on recording scripts in QuickTest Professional to run on BPM, see "Guidelines for Working with QuickTest Professional" in the BSM User Guide, part of the HP Business Service Management Documentation Library.

- If BPM is installed on Windows Server 2008 or Windows 7, you must carry out the following configuration steps before running QuickTest Professional scripts:
 - Stop BPM from the Start menu.
 - Disable Data Execution Prevention (DEP).
 - Disable Interactive Services Detection.

Note: For details on the above steps, refer to the Microsoft web site, or other reference sources.

- Start BPM as a process. Run **<BPM Install dir>launch_service\bin\magentproc.exe**.

Note:

- BPM must run as a process for executing QTP scripts.
- To stop BPM running as a process you must kill **magentproc.exe** in the Task Manager.

- Ensure that QuickTest Professional is closed on the computer before running a QuickTest Professional script in BPM.
- QuickTest Professional cannot run tests on a computer that is logged off, locked, or running QuickTest Professional as a non-interactive service.
- The last step (may also be multiple last steps) in a QuickTest Professional script should close the application being tested, as well as any child processes that are running. This cleanup step enables the next run of the script to open the application again.

However, if a script fails before it finishes running, it does not run the last step. From version 6.1, BPM supports a special close application mechanism that automatically closes the application being tested, when a QuickTest Professional script fails. This mechanism is intended for fallback purposes only. Although the mechanism closes the application being tested, it does not necessarily release all of the tested application's resources. Also, any unsaved data is lost

This mechanism is enabled by default. If required, you can disable it for a specific test, as described in "[Disabling the Close Application Mechanism](#)" on page 147.

- BPM does not support QuickTest Professional scripts that require access to external resources (such as shared object repository, function library, external Data Table, external actions, and so forth). Scripts that require external resources may fail to run on BPM. (However, if the resource can be found on the network, QuickTest Professional uses it.)
- BPM can run only one QuickTest Professional script at a time. Make sure there are not multiple applications or business transaction flows with QuickTest Professional scripts set to run concurrently, or an application or business transaction flow with more than one QuickTest Professional script set to run in Concurrent run mode. (For information on run modes, see "[Run Modes](#)" on page 92.)
- Transaction breakdown is not supported for transaction files recorded with QuickTest Professional.
- You cannot use the **ResultDir** QuickTest Professional environment variable when running a script in BPM.
- If BPM is installed on Windows Server 2008 or Windows 7, ensure the following when you record the script:
 - In the **Record And Run** Setting (in the Automation section), select the **Record and run on any open browser** option.
 - The first line of the script opens a browser and the last line of the script closes the browser. For example:

```
SystemUtil.Run "URL to open"
```

```
Script content
```

```
Browser("script browser name").Close
```

WinRunner Scripts

You cannot use WinRunner scripts with BPM. All WinRunner scripts should be converted to QuickTest Professional scripts.

Parent topic: ["Working with Business Process Monitor"](#) on page 15

Running Business Process Monitor

Once BPM is active on a host machine, it can continue running indefinitely. When BPM starts, it automatically starts each BPM instance.

When you install BPM on a host machine running on a Windows platform, **HP Business Process Monitor Service** is added as a service on the host. HP Business Process Monitor Service automatically starts BPM whenever the host machine is started.

To start BPM on a Windows platform:

Select **Start > Programs > HP Business Process Monitor > Start Business Process Monitor Service**.

To shut down BPM on a Windows platform:

Select **Start > Programs > HP Business Process Monitor > Stop Business Process Monitor Service**.

Accessing Business Process Monitor Admin

You access BPM Admin via a web browser, from any computer connected to your intranet or to the Internet. The BPM Admin console uses Java applet technology for which you must install JRE on each client machine.

To access BPM Admin, use one of the following options:

- In a browser window, enter the URL **http://<host machine>:2696**, for example, `http://cats:2696`.
- On the BPM host machine, you can select **Start > Programs > HP Business Process Monitor > Business Process Monitor Admin**. BPM Admin opens in a browser window.
- In BSM, you can access the **Admin > End User Management > Settings > BPM Agents** page and click the **Open a Business Process Monitor Agent's Console**  button for a BPM host to open the BPM Admin for that host in a new browser window. (You must have the necessary permissions to view and manage BPM agents in BSM. For details on permissions, see "Permissions" in the BSM Platform Administration Guide.)

Note: 2696 is the default port for BPM Admin. You can configure a new port if required. For details, see "Changing the Default Port" in ["Advanced Configuration Options"](#) on page 142.

This section also includes the following topics:

- ["Configure SSL Support for BPM Admin" below](#)
- ["Restrict Access to BPM Admin" on page 22](#)

Configure SSL Support for BPM Admin

When you connect to BPM Admin from a remote machine using a browser, information is sent using http. This means that the data that you configure in BPM Admin, including passwords (for example, when adding/configuring a BPM instance), is sent "as is", in plain text. The passwords are encrypted only after arriving at the BPM Admin machine.

If you want this data to be sent encrypted, it is possible to configure BPM Admin to work with SSL. This enables all communication between the remote browser and BPM Admin to be encrypted. The following procedure describes how to set BPM Admin to run using SSL configuration.

To configure BPM Admin to run using SSL:

1. Obtain or create the server certificate in one of the following methods:

Option 1: Obtain the server certificate from your corporate Certificate Authority in **.pfx (PKCS12)** format and skip to ["Modify the server.xml:" on next page](#).

Option 2: Create a java keystore with the server certificate as follows (replace the string "changeit" below with your password):

- a. Generate a keystore with a private key

```
keytool.exe -genkeypair -validity 1065 -keysize 2048 -keyalg rsa -keystore mykeystore -storepass changeit -alias myserver.mydomain
```

Where validity (in days) and keysize depend on your certificate authority requirements.

- b. Generate a server certificate request to have it signed by your internal certificate authority

```
keytool.exe -keystore mykeystore -storepass changeit -alias myserver.mydomain -certreq -file CERTREQFILE.csr
```

- c. Download the signed server certificate **cert_signed.cer** from your certificate authority.
- d. Obtain the root authority certificate **CA.crt** (and any intermediate authority certificates if applicable).
- e. Import the root certificate authority certificate (and any intermediate authority certificates if applicable) into the keystore created earlier in this procedure.

```
keytool.exe -import -trustcacerts -keystore mykeystore -storepass changeit -alias myRootCA -file CA.crt
```

- f. Import the signed certificate into the same keystore under the original alias.

```
keytool -import -v -alias myserver.mydomain -file cert_signed.cer -keystore mykeystore -keypass changeit -storepass changeit
```

- g. Verify that the keystore contains at least two entries: **Trusted Cert Entry** and **Private Key Entry**.

```
keytool -list -keystore mykeystore
```

2. Modify the server.xml:

- a. Open the **<Business Process Monitor root directory>\ServletContainer\conf\server.xml** file in a text editor.
- b. Uncomment the section with Connector port="8443":

```
<!--!  
<Connector port="8443" protocol="HTTP/1.1" SSLEnabled="true"  
maxthreads="150" scheme="https" secure="true"  
clientAuth="false" sslProtocol="TLS" />  
-->
```

- c. Add information about your keystore (location, password, type). If your server certificate is in PKCS12 format, the keystore type should be **"PKCS12"**. Otherwise, it should be **"JKS"**. For example:

```
keystoreFile="c:\mykeystore" keystoreType="JKS"  
keystorePass="myprivatekeypassword"
```

The section should now look similar to this:

```
<Connector port="8443" protocol="HTTP/1.1" SSLEnabled="true"  
maxthreads="150" scheme="https" secure="true"  
clientAuth="false" sslProtocol="TLS"  
keystoreFile="c:\mykeystore" keystoreType="JKS"  
keystorePass="myprivatekeypassword"  
</>
```

- d. Save your changes.
3. Import the root authority certificate into the truststore used by BPM:

```
cd <BPM root directory>/JDK/bin  
> keytool -import -alias <myCA> -file c:\myCArootcert.cer -keystore  
..\lib\security\cacerts -trustcacerts -storepass changeit
```

4. Restart BPM.
5. Verify that you can open the BPM Admin console using the secure connection:

```
https://<BPM server FQDN>:8443
```

6. When you have succeeded in connecting securely, close the unsecure port in the server.xml by commenting out the section with Connector port="2696".
7. Restart BPM.
8. On the BPM server, modify the shortcut to the BPM Admin Console to use the secure URL.
9. In End User Management Administration in BSM, modify the **BPM console URL** to use the secure connection. For details, see "Edit Business Process Monitor Properties Dialog Box" in the BSM Application Administration Guide.

Troubleshooting

If it is still impossible to access the BPM Admin console via SSL, check the latest **catalina.<current date>.log** file located in:

- **Windows Server 2003 and Windows XP**—C:\Documents and Settings\All Users\Application Data\HP\BPM\Tomcat\logs
- **Windows Server 2008, and Windows 7**—C:\ProgramData\HP\BPM\Tomcat\logs

Restrict Access to BPM Admin

You can configure secured access for BPM Admin, thereby controlling who can access the BPM Admin user interface.

When secured access is activated, access to BPM Admin is limited to:

- Local users (that is, those users who connect to BPM Admin on the actual BPM machine using the URL <http://localhost:2696>).
- Users who access a BPM Admin from BSM (select **Admin > End User Management > Settings > BPM Agents**, select a BPM and click the **Open a Business Process Monitor Agent's Console**  button) sending the configured authentication.

Any other attempt to access BPM Admin will fail.

When you access BPM Admin from BSM, a secured token is included in the URL sent by BSM, which is decrypted and validated by BPM. Only successful validation of the token enables access to BPM Admin.

The secured access mechanism uses HP LW-SSO to generate and validate the secured token that is passed between BSM and BPM. For details on working with LW-SSO, refer to the BSM Platform Administration Guide.

Notes and Limitations:

- Secured access is only applicable to BPM versions 9.22 and later, and BSM versions 9.21 and later.
- BSM sends the secured token to all BPM 9.22 or later installations, regardless of whether the BPM is configured for secured access. For BPM installations earlier than version 9.22, BSM sends the regular URL without a secured token.
- The request generated by the BSM is valid for only one minute.

- If BPM Admin is open in a browser tab, after having been securely accessed, access to the same BPM in other browser tabs is also possible as the session has already been validated.
- A BPM can only be configured for secure access with one BSM system, but a BSM system can securely access multiple BPMs.

Configure BPM for Secure Access

1. In BSM, select **Admin > Platform > Users and Permissions > Authentication Management**.
2. Copy the value of the **Token Creation Key (initString)** property.
3. On the BPM machine, paste the copied value in the **initString** parameter in the **<BPM installation directory>\ServletContainer\webapps\ROOT\WEB-INF\classes\lwssofmconf.xml** file. For example:

```
<lwssValidation id="ID000001">
    <domain></domain>
    <crypto cipherType="symmetricBlockCipher"
directKeyEncoded="false" directKeyEncoding="Hex"
    encodingMode="Base64Url"
engineName="AES" initString="<copied value from BSM>"
keySize="256" paddingModeName="CBC"/>
</lwssValidation>
```

4. On the BPM machine, edit the **<BPM installation directory>\configtopaz_agent_ctrl.cfg** file and in the **General** section, change the setting for the **SecureAccess** parameter to **1**.

Note: If this parameter does not exist, add it to the file.

Changing the Language of the Business Process Monitor User Interface

In BPM 7.00 and later, the BPM user interface can be viewed in the following languages in your web browser:

Language	Language Preference in Web Browser
Chinese	Chinese (China) [zh-cn]
English	English (United States) [en-us]
French	French (France) [fr]
Japanese	Japanese [ja]
Korean	Korean [ko]

Use the language preference option in your browser to select how to view BPM Admin. The language preference chosen affects only the user's local machine and not the BPM machine or any other user accessing the same BPM. The language is determined when you first open BPM Admin;

changing the language preference in your browser once you are working in BPM Admin has no affect until you close and reopen BPM Admin.

To view BPM Administration in a specific language using Internet Explorer

1. Select **Tools > Internet Options** and click **Languages**. The Language Preference dialog box opens.
2. Select the language in which you want to view BPM Admin.

If the language you want is not listed in the dialog box, click **Add** to display the list of languages. Select the language you want to add and click **OK**.
3. Click **Move Up** to move the selected language to the first row.
4. Click **OK** to save the settings.
5. Refresh the page: the BPM Admin user interface is displayed in the selected language.

Notes and Limitations

- Starting from BPM version 7.0, there is no language pack installation. All translated languages are integrated into BPM Multi-lingual User interface (MLU).
- Data stays in the language it was entered in, even if the language of the web browser changes. Changing the language of the web browser on your local machine does not change the language of BPM definitions and configurations.
- If a user selects a language which is not supported by the BPM Multi-lingual User interface, the BPM Admin user interface appears in English.

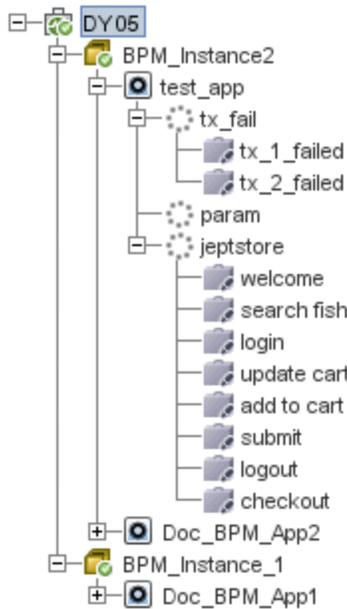
Navigating the Business Process Monitor Admin Window

The BPM Admin browser window is divided into three areas:

BPM Tree

The left pane of the BPM Admin window displays a hierarchical tree of the BPM instances, applications, business transaction flows, and transactions included on the host machine. Each entity included in the tree provides a link to a page displayed in the right pane of the BPM Admin window, in which you can view and configure relevant settings for the entity. You can search the tree for entities whose names contain a specific string. An icon is displayed for each entity in the tree, enabling you to identify the entity type. For user interface details on the BPM tree, see ["Business Process Monitor Tree Pane" on page 27](#).

The following is an example of the BPM Admin hierarchical tree:



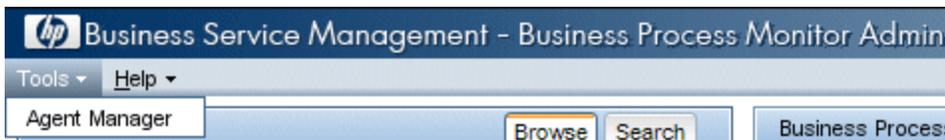
Top Bar

The top bar includes the following drop-down menus, with additional options for working with, and getting help in, BPM Admin:

- **Tools.** Includes an option for adding other Business Process Monitor agents to the tree so that you can manage them in Business Process Monitor Admin on one machine.
- **Help.** Includes help options for Business Process Monitor Admin.

For user interface details on the top bar, see "Top Bar" on page 68.

The following is an example of the top bar, with the Tools drop-down menu displayed:



Info Area

When you select an entity in the BPM tree in the left pane of the BPM Admin window, the relevant page for that entity is displayed in the right pane of the window. The page enables you to view and, where applicable, configure settings for the selected entity. The following sections describe the pages in BPM Admin:

- "Business Process Monitor Host Page" on page 30
- "Business Process Monitor Instance Page" on page 39
- "Business Process Monitor Application Page" on page 52
- "Business Transaction Flow Page" on page 57
- "Business Transaction Page" on page 66

Note: When a BPM instance connects to an HP Business Availability Center system earlier than version 9.00, profiles are included in the BPM tree displayed in the left pane of the BPM Admin console, instead of applications and business transaction flows. To access the BPM Profile page, select a profile in the BPM tree. The Profile page user interface is similar to the business transaction flow page user interface. For details, see "[Business Transaction Flow User Interface](#)" on page 58.

Notes and Limitations for Business Process Monitor on Windows 7

This section includes notes and limitations for BPM when it is installed on Windows 7.

User Type

BPM on Windows Server 2008 or Windows 7 must run under a user that has **Administrator** privileges.

Disabling User Account Control

To run BPM on Windows Server 2008 or Windows 7, **User Account Control (UAC)** must be disabled for users with **Administrator** privileges.

Notes and Limitations for Business Process Monitor on Windows Server 2008

This section includes notes and limitations for BPM when it is installed on Windows Server 2008.

User Type

Business Process Monitor on Windows Server 2008 or Windows 7 must run under a user that has **Administrator** privileges.

Disabling User Account Control

To run Business Process Monitor on Windows Server 2008 or Windows 7, **User Account Control (UAC)** must be disabled for users with **Administrator** privileges.

Manual Procedure Before Installing BPM on Windows Server 2008 R2 64 Bit Platforms

You must carry out the following procedure before installing BPM on a Windows Server 2008 R2 64 bit platform:

1. Open Server Manager (**Start > Administrative Tools > Server Manager**).
2. Click **Features** in the left tree and then click **Add Features** in the right panel.
3. Select the **.NET Framework 3.5.1 Features** check box and follow the online instructions.
4. Once .NET Framework 3.5.1 is installed, restart the computer and start the BPM installation.

Chapter 5

Business Process Monitor Tree Pane

The BPM tree pane is displayed in the left pane of the BPM Admin window and comprises the following tabs:

- ["Browse Tab" below](#)
- ["Search Tab" on page 29](#)

Browse Tab

The Browse tab of the BPM Tree pane displays a hierarchical tree of the BPM and its configured instances, and the various entities assigned to them. Each entity included in the tree provides a link to a page displayed in the right pane of the BPM Admin window, in which you can view and configure relevant settings for the entity. Action buttons enable you to refresh the tree, add additional instances to the BPM, and delete existing instances.

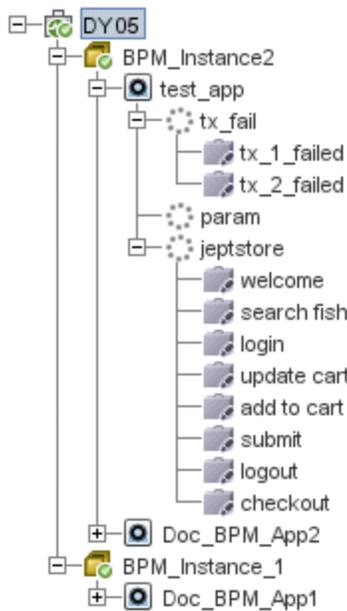
This section includes the following topics:

- ["BPM Tree" below](#)
- ["Entity Icons" on next page](#)
- ["Action Buttons" on page 29](#)

BPM Tree

The BPM tree is a hierarchical tree of the BPM instances configured on the host machine and the applications, business transaction flows, and transactions assigned to each instance. Instances that connect to BSM systems earlier than version 9.00 also include profiles. Hold the cursor over an entity to display its type and full name. Click an entity to select it and display its settings in the right-hand pane of the BPM Admin console. An icon is displayed next to each entity. For details, see ["Entity Icons" on next page](#).

The following is an example of the BPM Admin hierarchical tree:



Entity Icons

An icon is displayed for each entity in the tree, enabling you to identify the entity type. The following icons are used:

Icon	Represents
	BPM Host
	Instance – registration data received (from BSM or from persistency files), and no fatal errors occurred for this instance. Note: The displayed instance status is the status received in the last communication from BSM.
	Instance – problem occurred (for example, connectivity to BSM failed, or failed to create a specific user for that instance). Note: The displayed instance status is the status received in the last communication from BSM.
	Application
	Business Transaction Flow
	Business Transaction
	Profile Note: Profiles are shown only for instances that connect to BSM systems earlier than version 9.00.

Action Buttons

The tool bar of action buttons for BPM hosts and instances is located at the top of the **Browse** pane. Only the actions that are applicable to the entity selected in the tree are enabled.

For details on host actions, see ["Host Actions" on page 31](#).

For details on instance actions, see ["Instance Actions" on page 50](#).

The **Refresh**  button, which you click to refresh the BPM tree, is enabled for all entities.

Note: You can also access actions for a selected entity in the tree by right-clicking the entity to display a Shortcut menu of applicable actions.

Search Tab

In the Search tab, you can search for entities whose name contains a specified string. The search tab includes the following areas:

Search Definition Area

This area enables you to specify the string to search for in the entity names.

User interface elements are described below:

UI Element	Description
Entity name	Enter the string for which to search.
Search	Click Search to run the search.
Clear	Click Clear to clear the string in the Entity name element.

Search Results Area

This area enables you to view the search results (that is, the entities whose name include the specified string).

User interface elements are described below:

	Display in Business Process Monitor Tree. Displays the selected entity in the hierarchical tree in the Browse tab. For details, see "Browse Tab" on page 27 .
Entity Name	The entity name. Note: You can filter the list of search results by entering a string in the filter at the top of this column.
Entity Type	The type of entity. Note: You can filter the list of search results by selecting a specific entity type to display from the drop-down list in the filter at the top of this column.

Chapter 6

Business Process Monitor Host Page

The BPM Host page displays basic information about the BPM installation and the host machine on which it is installed.

To access the BPM Host page, select the host entity in the BPM tree displayed in the left pane of the BPM Admin console. The host entity is the highest entity in the tree (that is, the entity at the top of the tree).

User interface elements are described below:

UI Element	Description
Business Process Monitor name	The name of the BPM. The name is automatically assigned during installation and is derived from the name of the host machine on which the BPM is installed.
Health	The health of the BPM. The valid health statuses are: <ul style="list-style-type: none">• OK• Agent Launch Failed• The agent was killed, failed to set a timer for restarting it• Run as specific user – failed to switch to user• Run as specific user – invalid password
Business Process Monitor operating system	The operating system of the host machine on which the BPM is installed.
Configuration directory	The BPM configuration directory. Default value: <Business Process Monitor application directory>\config Note: The default BPM application directory is: <ul style="list-style-type: none">• Windows Server 2003 and Windows XP–C:\Documents and Settings\All Users\Application Data\HP\BPM• Windows Server 2008 and Windows 7–C:\ProgramData\HP\BPM

UI Element	Description
Workspace directory	<p>The BPM workspace directory, which you configure during the installation of BPM.</p> <p>Default value: <Business Process Monitor application directory>\workspace</p> <p>Note: The default BPM application directory is:</p> <ul style="list-style-type: none"> • Windows Server 2003 and Windows XP—C:\Documents and Settings\All Users\Application Data\HP\BPM • Windows Server 2008 and Windows 7—C:\ProgramData\HP\BPM
Number of scripts	The total number of scripts configured in all of the host's instances, and the number of those whose configuration status in End User Management Administration is set to Active .
Number of WebTraces	The total number of WebTraces configured in all of the host's instances, and the number of those whose configuration status in End User Management Administration is set to Active .
Number of transactions	The total number of transactions configured in all of the host's instances, and the number of those whose configuration status in End User Management Administration is set to Active .

Host Actions

When a BPM host is selected, the following action buttons are enabled in the Browse tab of the BPM Tree pane:

Button	Description	For details, see the relevant help section below.
	<p>Create New Instance. Opens the Create New Instance wizard, which you use to create a new instance on a BPM host.</p> <p>Note: You can create a maximum of 16 instances on a BPM host.</p>	"Create New Instance" on next page
	<p>Open BPM in a new window. Opens the BPM Admin Console for the selected BPM host, in a new window.</p>	N/A

		For details, see the relevant help section below.
Button	Description	
	Browse. Opens a menu with the following browse options:	
	Browse Workspace	"Browse Workspace" on next page
	Browse Configuration Folder	"Browse Configuration Folder" on next page
	Run. Opens a menu with the following run options:	
	Run Page Component Breakdown	"Run Page Component Breakdown" on page 34
	Run WebTrace	"Run WebTrace" on page 35
	Create Troubleshooting File.	"Create Troubleshooting File" on page 35
	Set User Credentials. Sets the user used to run the BPM.	"Set User Credentials" on page 36
	Restart BPM. Restarts the BPM. Note: Restarting BPM causes the loss of any data that has not yet been reported by BPM to BSM.	"Restart" on page 38

Note: You can also right-click a selected host in the tree to display a Shortcut menu of the applicable actions.

Create New Instance

The **Create New Instance** option enables you to create a new instance on a BPM host machine, using the **Create New Instance** wizard. After creating a new BPM instance, the host name for the instance is added to the list of available data collectors for running applications and business transaction flows in End User Management Administration. For details on specifying hosts for applications and business transaction flows, see the BSM Application Administration Guide, part of the HP Business Service Management Documentation Library.

Note:

- You add a default instance when you install BPM. For details, see "Deploying Business Process Monitor" in the Business Process Monitor Deployment Guide.
- You can create a maximum of 16 instances on a BPM host.

Create New Instance Wizard

The elements included in the wizard pages are the same as the corresponding elements in the Instance page, where you can view and edit an existing instance's settings. For details, see ["Business Process Monitor Instance Page" on page 39](#).

The wizard contains the following pages:

- Define Identification Parameters page. For user interface details, see "Business Service Management Registration Properties Area" in ["Instance Page User Interface" on page 40](#).
- Run Instance as User page. For user interface details, see "Run as a Specific User Area" in ["Instance Page User Interface" on page 40](#).
- Proxy Connection Settings page. For user interface details, see "Proxy Settings Area" in ["Instance Page User Interface" on page 40](#).
- Security Settings page. For user interface details, see "Security Settings Area" in ["Instance Page User Interface" on page 40](#).

Browse Workspace

The **Browse Workspace** option enables you to view the files stored in the Workspace directory. The Workspace directory consists of log files and other files that relate to BPM operation. The log files document event information and errors for BPM and its instances. For information on the contents of the log files, see ["Workspace Directory and Log Files" on page 157](#).

When you select the Browse Workspace option, the Browse Workspace dialog box opens in a new window, comprising the following areas:

- **Left pane.** Displays a hierarchical tree of the folders, subfolder, and files included in the Workspace directory (the root entry in the tree).
- **Right pane.** Displays the contents of the file you select in the tree in the left pane. If the selected file is empty, the right pane also remains empty.

Note:

- You cannot edit the files from BPM Admin, only view the file contents.
- Use CTRL+F to find a specific string in a file.
- If your log files contains non-English data, you must open them in a viewer that supports UTF-8 format parsing, for example, Notepad.

Browse Configuration Folder

The **Browse Configuration Folder** option enables you to view the files stored in the config directory. The config directory consists of configuration files that contain the options defined for

BPM. For information on the contents of the configuration files, see "[Business Process Monitor Configuration Files](#)" on page 97.

When you select the Browse Configuration Folder option, the Browse Configuration Folder dialog box opens in a new window, comprising the following areas:

- **Left pane.** Displays a tree of the files included in the config directory (the root entry in the tree).
- **Right pane.** Displays the contents of the file you select in the tree in the left pane. If the selected file is empty, the right pane also remains empty.

Note:

- You cannot edit the files from Business Process Monitor Admin, only view the file contents.
- Use CTRL+F to find a specific string in a file.

Run Page Component Breakdown

The Run Page Component Breakdown option enables you to run an on-demand page component breakdown (PCBD) request for any web page. BPM measures response time while running the request, and collects breakdown data for each component of the accessed web page. This information enables you to assess whether the response time was affected by page content. The data collected is reported only to BPM Admin (not to BSM).

When you select this option, the Run Page Component Breakdown dialog box opens. User interface elements are described below:

UI Element	Description
Address	The address for the target web page. This may be: <ul style="list-style-type: none"> • the name of a server on the local network • a Web address • the full URL for the page, for example: <code>http://www.hp.com/</code>
Authentication user name	If the destination requires authentication, type the name of a recognized user.
Authentication password	The password for the authentication user name (or leave empty if the URL requires a blank password).
Timeout	A timeout value, in minutes. This value determines how long BPM attempts to retrieve the page component data before timing out. Default value: 15 minutes
Run	Click to run the page component breakdown. The Invoke PCBD window opens, displaying the page component breakdown report. For details, see " Page Component Breakdown Report " on page 70.

Run WebTrace

The Run WebTrace option enables you to run a WebTrace to a destination web site and view the resulting report. The WebTrace report provides information on network performance, which helps you analyze application performance issues.

The data collected is reported only to BPM Admin (not to BSM).

Note: BPM cannot run WebTrace concurrently for more than 40 addresses, including both configured and on demand WebTraces.

When you select this option, the Run WebTrace dialog box opens. User interface elements are described below:

UI Element	Description
WebTrace address	The destination web address. Do not include the string http:// or https:// when typing the server address. For example: <code>www.hp.com</code>
Port	The port to access the web address. If BPM is accessing the Internet through a proxy server, or if the destination address requires access via https, specify port 443. Default value: 80
Timeout	A timeout value, in minutes. This value determines how long Business Process Monitor attempts to access the web address before timing out. Default value: 15 minutes
Run	Click to run the WebTrace. The Run WebTrace window opens, displaying the WebTrace report. For details, see " WebTrace Report " on page 85.

Create Troubleshooting File

The **Create Troubleshooting File** option enables you to create a zip file of various BPM directories and files for analysis or support purposes. When you select this option, the Create Troubleshooting File dialog box opens in a new window where you can select the following options:

- **Zip BPM Config and Workspace directories.** Select this to zip the entire contents of the Workspace and Config directories.
- **Include script directories.** The zip file is created by default without the script directories, minimizing the file size and enabling you to keep the script contents confidential. If the script directories are required, select this option to include them in the file, but note that this may considerably increase the size of the zip file.

Note: This option is enabled only when you select the Zip BPM Config and Workspace directories option.

- **Zip BPM client log files.** These are files generated by the BPM Admin GUI on the client machine and give information to assist in troubleshooting the application GUI.

By default, a file called **BPM-<host name>-<date>-<time>.zip** is created, but you can specify a different file name and also select the location in which to save the file.

Set User Credentials

The Set User Credentials option enables you to set the user as which the data collection mechanism used by BPM runs—the system user or a specific user.

This section includes the following topics:

- ["Set User Credentials Overview" below](#)
- ["Set User Credentials User Interface" on next page](#)
- ["Set Full Control Permissions" on next page](#)

• Set User Credentials Overview

By default, BPM is set to run as a system user. You can set BPM to run as a specific user (recommended), so that all BPM-related processes, as well as all tasks defined for all BPM instances, run as that user. Running it as a specific user limits access to resources, settings, and applications located on the local machine. (This may not be true for resources located on remote machines, where a specific user may have different privileges than the local system user.)

You can also set BPM to run as a specific user during BPM installation, or set an individual BPM instance to run as a specific user (as described in ["Run as a Specific User Area" on page 45](#)).

It is recommended that you run scripts for all protocols (with the exception of web protocols) with the BPM instance/whole BPM set to run as a specific user.

Notes and Limitations

When you set BPM to run as a specific user, note the following:

- You cannot set the whole BPM to run as a specific user if you have any individual BPM instances set as specific user. You must first revert all instances to run as system user.
- If you set BPM to run as a specific user, then you must set full control permissions for the user under the default Workspace directory and (for Windows platforms only) under the user Temp folder and the Windows installation folder. For details, see ["Set Full Control Permissions" on next page](#).
- If you set the whole BPM to run as a specific user on a Windows platform, whether during installation or from the **Actions** menu, the user must have administrator permissions on the local machine.
- If you want to run QuickTest Professional scripts, it is recommended that you set BPM to run as a specific user before assigning the QuickTest Professional scripts.

After running QuickTest Professional scripts as the system user, if you then set BPM to run as a specific user, the script may fail. In this case, restart the BPM machine.

For troubleshooting problems when setting BPM as a specific user, see "Deployment Troubleshooting" in the Business Process Monitor Deployment Guide

• **Set User Credentials User Interface**

When you select the Set User Credentials option in the **Actions** menu, the Set User Credentials dialog box opens. User interface elements are described below:

UI Element	Description
System user	Select this radio button to configure BPM to run as the system user.
Other user	Select this radio button to configure BPM to run as a specific user and enter the following information: <ul style="list-style-type: none"> ▪ Name. The specific user name. ▪ Password. The password for the specific user. ▪ Domain. The domain of the specific user.
Set and Restart BPM	Click to save the new user details and to restart BPM running as the new user. Note: This button is enabled only if you change the user credentials.

• **Set Full Control Permissions**

If you set BPM to run as a specific user, then you must set full control permissions for the user under the default Workspace directory and (for Windows platforms only) under the user Temp folder and the Windows installation folder.

To set full control permissions on the Temp and Workspace directories:

- a. Browse to the user Temp folder of the default user or the user that runs the BPM. The usual path of the Temp folder is:
 - Windows Server 2003 or Windows XP
C:\Documents and Settings\\Local Settings\Temp
 - Windows Server 2008 and Windows 7
C:\Users\\AppData\Local\Temp

In the Temp directory, perform the following actions:

 - Select **Properties** from the right-click menu for the folder.
 - In the displayed Temp Properties dialog box, select the **Security** tab.
 - Select the user in the **Name** area, then in the **Permissions** area select the **Allow** check box for **Full Control**.
 - Click **OK** to save your changes and close the dialog box.
- b. Browse to the Temp directory in the Windows installation folder (usual path **C:\<Windows installation folder>\Temp**) and repeat the actions described in step 'a' of this procedure.
- c. Browse to the default workspace directory for BPM and repeat the actions described in step 'a' of this procedure.

- d. Browse to the default application directory for BPM and repeat the actions described in step 'a' of this procedure.

Note: For details on the default application directory, see "How a Silent Installation Assigns Values" in the Business Process Monitor Deployment Guide.

- e. Browse to the default configuration directory (usual path **<Business Process Monitor application directory>\config**) and repeat the actions described in step 1 of this procedure.
- f. **(Windows Server 2003 and 2008 platforms)** Assign the user the logon right **Allow log on locally**. (For details, see [http://technet.microsoft.com/en-us/library/cc756809\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc756809(WS.10).aspx).)

Restart

The **Restart** option enables you to restart BPM. When you select this option, BPM Admin restarts all BPM instances on the host machine. Note that it may take a minute or longer for BPM Admin to reconnect to BPM.

Note: When multiple run units (applications and business transaction flows) are running on a host, BPM generates start offset values to distribute script runs optimally over time. Restarting BPM prompts the recalculation of the start offset values.

If you create or delete applications and business transaction flows in End User Management Administration, you can restart BPM to reset the automatic distribution of script runs. For more information on the automatic distribution feature, see "[Start Offset](#)" on page 90.

Chapter 7

Business Process Monitor Instance Page

A single BPM installation can communicate with multiple BSM installations, each with its own tasks. Each such connection is called an instance.

Your BPM installation can be used as the basis for multiple BPM instances on the host machine. For example, you may require additional instances on the host machine to work with different BSM Gateway Servers. Each instance runs its own tasks and reports independently to the relevant server. Multiple instances can also serve the same BSM installation with different logical host names.

The initial installation of BPM on the host machine automatically creates the first BPM instance in BPM Admin. During installation, you specify the Gateway Server details for this instance. If you create additional instances, you can specify the same Gateway Server, or, if you are using multiple Gateway Servers, you can specify a different Gateway Server for each BPM instance.

Each instance is assigned a unique host alias, referred to as the host name. This host alias is used when designating hosts to run transactions for your applications in BSM End User Management Administration. (Note that the host name does not imply the host machine name.) You also define a location name for each instance, used to help identify the instance in End User Management Administration and in End User Management reports. The same location name can be used for multiple instances, and does not need to be the location of the BPM host machine. Changing a location name in the Location Manager in BSM overrides the location configured for the instance in BPM Admin.

For each instance, you specify server authentication, SSL, and proxy server information, as necessary. BPM supports basic and NTLM authentication schemes. (If you receive an error message when the server tries to communicate with the instance, check which authentication scheme is in use, and that the correct authentication and proxy information is defined for the instance). For required parameter settings when configuring NTML authentication, see "[Parameters in sconn.cfg](#)" on page 132.

Note: You are required to specify the authentication user name and password parameters when creating or editing the instance.

In addition, you can configure the BPM instance to run as a specific user, so that all tasks defined for the instance run as a specific user. Running the BPM instance as a specific user may be necessary to solve access permission problems on your network.

Note: You can also set all BPM instances on the machine to run as a specific user, as described in "[Set User Credentials](#)" on page 36.

For details on creating and deleting instances, see "[Action Buttons](#)" on page 29.

Instance Page User Interface

This section describes the BPM Instance page in BPM Admin. The BPM Instance page displays status and configuration data for the selected instance.

To access the BPM Instance page, select an instance entity in the BPM tree displayed in the left pane of the BPM Admin console.

The BPM Instance page comprises the following tabs:

- "Status Tab" below
- "Configuration Tab" on page 42

Status Tab

The status tab displays general information about the instance, its monitoring status, and the run units included in the instance. The status tab includes the following areas:

- "General Information Area" below
- "Monitoring Status Area" on next page
- "Run Units Area" on next page

General Information Area

This area enables you to view general information about the instance.

User interface elements are described below:

UI Element	Description
Display name	The display name defined for the instance in BPM Admin. This name is only used within BPM Admin to identify the instance in the BPM tree displayed in the left pane of the BPM Admin console.
Health	The communication status for the instance with BSM. If an error is displayed, click the details link to display the original error message in its raw format.
Instance ID	BPM internal ID for the instance. Tip: The ID may help you identify relevant folders in the BPM workspace.
Last update configuration request	The last time that BPM polled for changes made in BSM End User Management Administration to BPM. Note: BPM also automatically polls for updates, according to the defined job poll interval (default = 2 minutes).
Last configuration update	The time of the last change made to the instance configuration.

Monitoring Status Area

This area displays information on the tasks for the instance.

User interface elements are described below:

UI Element	Description
Number of applications	The total number of applications associated with the instance, and the number of those whose status in End User Management Administration is Active .
Number of scripts	The total number of scripts associated with the instance, and the number of those whose status in End User Management Administration is Active .
Number of WebTraces	The total number of WebTraces associated with the instance, and the number of those whose status in End User Management Administration is Active .
Number of transactions	The total number of transactions associated with the instance, and the number of those whose status in End User Management Administration is Active .
Pending samples	The number of task reports (for completed runs of script transactions, WebTraces, and so forth) waiting to be relayed to the BSM Gateway Server. Note: There are no limitations to the size of the queue except for the amount of free disk space available.

Run Units Area

This area displays details of the run units included in the instance. Run units are applications, or business transaction flows with their own schedule. For details on run units, see ["Run Units" on page 88](#).

Note: An inactive business transaction flow that is part of an active application is considered to have its own schedule and is therefore considered as a separate run unit.

User interface elements are described below:

UI Element	Description
	Change visible columns. Opens a list of the available table columns, in a new window. Select a check box to display a column, or clear a check box to hide a column. Default value: All columns are displayed.
Type	The run unit type—application or business transaction flow.

UI Element	Description
Run Unit Name	<p>The run unit name (that is, the application or business transaction flow name).</p> <p>Tooltip: The run unit's schedule.</p> <p>Note:</p> <ul style="list-style-type: none"> Click the name to select the application or business transaction flow in the BPM tree and display the relevant page for it. For details on the Application page, see "Business Process Monitor Application Page" on page 52 and for details on the business transaction flow page, see "Business Transaction Flow Page" on page 57. This column is not visible when working in BPM versions earlier than 9.00.
Last Run Start Time	The start time of the last run of the run unit on this instance, according to the local time on the BPM machine.
Last Run Duration	The time, in seconds, it took to execute the last run of the run unit.
Status	<p>The current status of the run unit. Valid options are:</p> <ul style="list-style-type: none"> Currently running. The run unit is currently running tasks. Idle. The run unit is running, but has no tasks running at this time. Stopped. The run unit is stopped. Not initialized. The run unit has not yet started its initial run. <p>Note: If the status is Not initialized, the run unit is in the process of getting ready to run—creating the schedules, downloading the required scripts. If there is a problem (for example, if the script does not download or if there is an incorrect schedule definition) the run unit remains at this status and an error "failed to initialize profile X ..." is written in the agent log and in the agent_SiteX log.</p>
Application	The application name. If the run unit is an application, the run unit name and application are the same. If the run unit is a business transaction flow, this is the name of the application that includes the business transaction flow.

Configuration Tab

The configuration tab enables you to view and change the instance settings.

The configuration tab includes the following areas:

- "[Business Service Management Registration Properties Area](#)" on next page
- "[Run as a Specific User Area](#)" on page 45
- "[Proxy Settings Area](#)" on page 46
- "[Security Settings Area](#)" on page 47

Business Service Management Registration Properties Area

This area displays, and enables you to edit, the connection settings to the Business Service Management Gateway server.

Important information	The display, host, and location names must be entered in English. If you use non-English strings in any of the names, BPM must be installed on an operating system that supports these characters.
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User interface elements are described below:

UI Element	Description
Display name	<p>The display name defined for the instance in BPM Admin. This name is only used within BPM Admin to identify the instance in the BPM tree displayed in the left pane of the BPM Admin console.</p> <p>Syntax exceptions:</p> <ul style="list-style-type: none"> • Can be up to 50 characters. • Can include the following characters: 0-9, a-z, A-Z, hyphen (-), underscore (_). • Cannot start or end with a hyphen (-) or an underscore (_).
Gateway Server URL	<p>The full URL of the Gateway Server to which this instance sends collected data. The URL must be in the following format:</p> <p>http (or https)://<Gateway Server name or IP address>:<port number>/topaz.</p> <p>If you do not specify a port number, the default port is used (80 for http and 443 for https).</p> <p>Note: The URL is case sensitive.</p>

UI Element	Description
<p>Host name</p>	<p>The host name defined for the instance. The host name is used to identify the instance in End User Management Administration and reports in BSM.</p> <p>The host name must be unique within the BSM environment.</p> <p>If you change the host name for an instance, BSM assigns a new HostID value to the BPM instance. As a result, the BPM instance does not run applications or business transaction flows (or profiles for systems earlier than BSM version 9.00) that use the original host name. To enable applications and business transaction flows (or profiles) to run correctly after changing the host name, you must update your applications and business transaction flows (or profiles) in End User Management Administration to use the new instance host name.</p> <p>Syntax exceptions:</p> <ul style="list-style-type: none"> Do not use special characters if these characters are not supported in BSM. Unsupported characters are blocked by BPM Admin. Can be up to 50 characters. Can include the following characters: 0-9, a-z, A-Z, ` ~ ! @ # \$ % ^ & * () _ - + = [] { } / ? . , " ' : ; < > (space).
<p>Location name</p>	<p>The location defined for the instance.</p> <p>Note:</p> <ul style="list-style-type: none"> This field is displayed only for instances that include profiles. That is, instances that are configured for HP Business Availability Center (installations earlier than BSM 9.00). Do not change the location for a BPM instance that is designated as the host for a profile, when the database for the profile is down. Doing so removes the mapping from the profile to the instance, with no recovery. <p>Syntax exceptions:</p> <ul style="list-style-type: none"> Can be up to 50 characters. Can include the following characters: 0-9, a-z, A-Z, ` ~ ! @ # \$ % ^ & * () _ - + = [] { } / ? . , ; (space).
<p>Job poll interval (minutes)</p>	<p>The defined frequency (in minutes) with which BPM polls for assigned tasks (for example, running scripts or WebTrace) and changes to application configurations. This is an integer positive number of up to 4 digits.</p> <p>Default value: 2</p>

UI Element	Description
Time poll interval (minutes)	<p>The defined frequency (in minutes) with which BPM polls BSM for time synchronization. This is an integer positive number of up to 4 digits.</p> <p>Default value: 60</p> <p>Note: If a time change is made on the BSM Gateway Server, for example, for daylight saving time, then the time poll interval value should be changed to a value smaller than the default of 60 minutes, for each BPM instance.</p> <p>If this is not done, it may take up to an hour for BPM to be synchronized with the time change in BSM, and during this period the BPM samples are reported with the wrong time stamp.</p>

Run as a Specific User Area

By default, each BPM instance runs on the host machine as the system user, unless you configured the whole BPM to run as a specific user (as described in "Set User Credentials" in "Host Actions" on page 31).

This area enables you to configure an individual instance (and not the whole BPM) to run as a specific user. Running an instance as a specific user limits access to resources, settings, and applications located on the local machine. (This may not be true for resources located on remote machines, where a specific user may have different privileges than the local system user.)

Note: If you want to run QuickTest Professional scripts as a specific user, it is recommended that you set each relevant BPM instance to run as a specific user before assigning the QuickTest Professional scripts.

After running QuickTest Professional scripts as the system user, if you then set the BPM instance to run as a specific user, the script may fail. In this case, restart the BPM machine.

User interface elements are described below:

UI Element	Description
User name	<p>The specific user name.</p> <p>Syntax exceptions:</p> <ul style="list-style-type: none"> • Can be up to 24 characters. • Cannot include spaces, nor any of the following characters: (; : " < > * + = \ ? ,).
Password	The password for the user.

UI Element	Description
Domain	<p>The domain of the user.</p> <p>Syntax exceptions:</p> <ul style="list-style-type: none"> • Can be up to 67 characters long. • Can include the following characters: 0-9, a-z, A-Z, hyphen (-). • Cannot start or end with a hyphen (-), nor can it include spaces.

If you are running a BPM instance as a specific user without administrator permissions on the local machine, you need to set additional permissions for the user.

To set additional permissions for a specific user without administrator permissions:

1. Assign Read & Execute permissions to the BPM installation directory.
2. Assign Full Control permissions to the relevant directory for the instance. For example, the first instance must have access rights to the **..\Workspace\agent1\site1** directory.
3. Assign Write permissions to the **..\Workspace\agent1\data\snapshots** directory.
4. Assign Write permissions to the default user temp directory. All MDRV based programs in the system use this directory for certain processes, for example when using a script with parameters. The directory is usually located under:

- Windows XP

C:\Documents and Settings\LocalService\Local Settings\Temp

- Windows Server 2003

C:\Documents and Settings\Default User\Local Settings\Temp

- Windows Server 2008 and Windows 7

C:\Users\<User name>\AppData\Local\Temp

Proxy Settings Area

This area enables you to configure proxy settings, if the BPM instance accesses the BSM Gateway Server through a proxy server.

Important information	<ul style="list-style-type: none"> • To configure reverse proxy, do not use these proxy settings, but configure the reverse proxy server URL instead of the Gateway Server URL in "Business Service Management Registration Properties Area" on page 43. • If you create an instance with proxy settings and the instance gives errors and does not function properly, delete the instance, recreate it without proxy settings, and then add the required proxy settings to the recreated instance. • You cannot connect a forward proxy configured for NTLM authentication to a BSM server configured for SSL.
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User interface elements are described below:

UI Element	Description
Proxy user name	The user name for the proxy server. Note: To configure a user name, you must also configure the proxy server URL.
Proxy password	The password for the user.
Proxy domain	The domain of the user.
Proxy URL	The URL for the proxy server. Note: The proxy URL must be in the following format: http (or https)://<host name or IP address>:<port number>/URI path.
Proxy authentication type	The type of authentication— Basic or NTLM . Default value: Basic

Security Settings Area

This area enables you to configure authentication parameters for the BPM instance to support the authentication scheme in use by the BSM Gateway Server (basic or NTLM authentication). It also enables you to define SSL settings if the BPM instance is communicating with the BSM Gateway Server using SSL.

For more information on using basic authentication in BSM, see the BSM Hardening Guide, part of the HP Business Service Management Documentation Library.

For more information on supporting SSL communication, see ["Communication Using SSL" on page 151](#).

Note:

- To define basic authentication requirements for accessing BPM Admin, see ["Enabling User Authentication" on page 145](#).
- For required parameter settings when configuring NTLM authentication, see ["Parameters in sconn.cfg" on page 132](#).

User interface elements are described below:

UI Element	Description
Authentication Settings	
Authentication user name	The name of the user (recognized by the BSM Gateway Server) for authentication

UI Element	Description
Authentication password	The password for the configured user.
Authentication domain	The domain for the configured user.
Authentication type	The type of authentication— Basic or NTLM . Default value: Basic
<p>SSL Settings</p> <p>Note:</p> <ul style="list-style-type: none"> • All certificates must be Base64 encoded. • Self-signed certificates are not supported. • For details on obtaining a client certificate, see "Working with a CA Issued Client Certificate" on page 50. • For details on obtaining a CA root certificate, see "Obtaining a CA Root Certificate and Establishing Trust" on next page. 	
SSL client certificate file	<p>Note: This field is relevant if the BSM Gateway server requires client-side certification.</p> <p>The path of the PEM file that holds the client-side certificate. For details, see step 2b in "Working with a CA Issued Client Certificate" on page 50.</p> <p>Syntax exceptions: You cannot use a UNC (Uniform Naming Convention) path.</p>
SSL private key file	<p>Note: This field is relevant if the BSM Gateway server requires client-side certification.</p> <p>The path of the PEM file that holds the private key used as a public/private pair key for the public key in the client-side certificate. For details, see step 2c in "Working with a CA Issued Client Certificate" on page 50.</p> <p>Syntax exceptions: You cannot use a UNC (Uniform Naming Convention) path.</p>
SSL private key password	<p>Note: This field is relevant if the BSM Gateway server requires client-side certification.</p> <p>The password of the private key, if the private key was encrypted with a password.</p>

UI Element	Description
SSL authority certificate file	<p>If the BSM Gateway server to which BPM connects is configured for SSL, enter the full path to the CA root certificate file for the authority that issued the BSM server certificate. For details on obtaining a CA root certificate file, see "Obtaining a CA Root Certificate and Establishing Trust" below.</p> <p>Alternatively, you can add a CA root certificate file to BPM, in which case leave this field empty. For details on adding a CA root certificate to BPM, see the second option in step 3 of "Obtaining a CA Root Certificate and Establishing Trust" below.</p> <p>Syntax exceptions: You cannot use a UNC (Uniform Naming Convention) path.</p>
SSL host name validation	<p>The type of host name validation. Valid types are:</p> <ul style="list-style-type: none"> • Full • No host name validation • None <p>Default value: Full (recommended)</p>

• Obtaining a CA Root Certificate and Establishing Trust

To obtain a CA root certificate:

- a. Obtain the root certificate authority certificate (and any intermediate authority certificates if applicable) in **PEM** format (Base64 encoded). If there is more than one certificate authorities, combine the certificates in a single file.
- b. If you do not have a CA root certificate in PEM format:
 - i. Obtain a CA root certificate in **Base64** format (you can usually export it from the browser by loading the URL of the **BSM Server** to which you connect).
 - ii. Convert the certificate obtained in step a to **PEM** format using OpenSSL:
 - In BPM\bin\ directory, run openssl_10_x32.exe.
 - When prompted, enter x509 -in <Certificate file full path in Base64 format> -out <Certificate file full path in PEM format>.

For example: x509 -in c:\ca.cer> -out c:\ca.pem

Troubleshooting: If you receive an error during the x509 conversion, make sure your ca.cer is Base64 encoded. To check this, open the certificate in a text editor. If it starts with -----BEGIN CERTIFICATE----- then the file is Base64 encoded, otherwise the file is DER encoded.

- c. Establish trust using one of the following options:

Option 1 - Specify the path to the CA root certificate in the user interface:

- i. In the security settings area of the user interface, set the **SSL authority certificate file** field to point to the CA root certificate file in PEM format.
- ii. Click **Save** and wait for the instance to restart.

Option 2 - Add the CA root certificate to the BPM truststore directly:

- i. Open the **BPM\data\cert\default_auth_cert.pem** file.
- ii. Append the content of the CA root certificate file (in PEM format) to the default_auth_cert.pem file you opened, and save it.
- iii. Restart BPM.

• **Working with a CA Issued Client Certificate**

To work with a CA client certificate:

- a. Request a client certificate from your CA with keys marked as exportable, then export the certificate in PFX format with a password protected private key.
- b. Split the client certificate into two files in PEM format using OpenSSL:
 - i. In the **BPM\bin** directory, run openssl_10_x32.exe.
 - ii. For setting the **SSL client certificate file** field in the security settings, when prompted enter `pkcs12 -in <CA client certificate in PFX format> -clcerts -nokeys -out <BPM client certificate in PEM format>`.

For example, if the client certificate in PFX format is bpm_client.pfx, enter: `pkcs12 -in c:\bpm_client.pfx -clcerts -nokeys -out c:\bpm_client_cert.pem`.

Then set the **SSL client certificate file** field to point to `<BPM client certificate in PEM format>`.

- iii. For setting the **SSL private key file** field in the security settings, when prompted enter `pkcs12 -in <CA client certificate in PFX format> -out <BPM private key in PEM format> -nodes`.

For example, if the client certificate in PFX format is bpm_client.pfx, enter: `pkcs12 -in c:\bpm_client.pfx -out c:\bpm_client_key.pem -nodes`.

Then set the **SSL private key file** field to point to `<BPM private key in PEM format>`.

Instance Actions

When a BPM instance is selected, the following action buttons are enabled in the **Browse** tab of the BPM Tree pane:

Button	Description
	Remove Instance. Deletes the selected instance.
	Browse. Opens a Shortcut menu and click the Browse Instance Files option. The instance log files are displayed in a new window. For details, see " Browse Instance Files " on next page.
	Request Configuration Update. Updates changes made in End User Management Administration (in BSM) to the BPM instance. This button enables you to manually prompt BPM to poll for changes; BPM also automatically polls for updates, according to the defined job poll interval for the instance (default = 2 minutes).

Button	Description
	<p>Purge Samples. Removes all task reports waiting to be relayed to the BSM Gateway Server from the queue.</p> <p>Note: Once you click the Purge Samples button, all waiting data is purged from the BPM memory and cannot be retrieved.</p>

Note: You can also right-click a selected instance in the tree to display a Shortcut menu of the applicable actions.

Browse Instance Files

When you select the Browse Instance Files option, the **Browse Instance Files** dialog box opens in a new window, comprising the following areas:

- **Left pane.** Displays a tree of the files included in the instance's **Site(n)** directory (the root entry in the tree), where **(n)** is an internal number assigned by BPM Admin to the instance. The files included are configuration and script files.

Note: The following files are not included in the instance directory:

- log files for retrieving configurations from BSM
- log files for sending samples to BSM
- log files for BSM business logic

- **Right pane.** Displays the contents of the file you select in the tree in the left pane. If the selected file is empty, the right pane also remains empty.

Note:

- You cannot edit the files from BPM Admin, only view the file contents.
- Use CTRL+F to find a specific string in a file.

Chapter 8

Business Process Monitor Application Page

The BPM Application page enables you to view details of an application configured in BSM End User Management Administration to which an instance is assigned. To access the Application page, select an application in the BPM tree displayed in the left pane of the BPM Admin console.

Note: When you configure applications in End User Management Administration, application names, as well as the names of the included business transaction flows, transactions, and scripts, must be entered in the same language that is set for the operating system of the BPM on which they are run. For details on configuring applications in End User Management Administration, see "Business Process Monitor Application Configuration Wizard" in the BSM Application Administration Guide.

The Application page includes the following areas:

- "General Information Area" below
- "Schedule List Area" on next page
- "Monitoring Status Area" on next page
- "Business Transaction Flows Overriding Application Schedule Area" on page 55

General Information Area

This area enables you to view general information about the application.

User interface elements are described below:

UI Element	Description
Display name	The name of the application as configured in End User Management Administration in BSM.
Status	The current status of the application in BSM— Active , Inactive , or Downtime .
Location name	The location defined for the instance. Note: <ul style="list-style-type: none">• The location name represents the name set by the Location Manager, and is also used in End User Management in BSM.• The location name may be overridden by the Location Manager in BSM.

Schedule List Area

This area enables you to view the schedules configured for the application.

User interface elements are described below:

UI Element	Description
Schedule Description	The schedule for running the application on this BPM instance, as configured in End User Management Administration. If the application has multiple schedules, all schedules are shown. (For more information, see " Schedules " on page 89.)
Time Zone	The time zone to use for the BPM instance, as configured in End User Management Administration.
Start Offset	The start offset, which specifies the delay between the application schedule time and the actual run time. (For information on how the start offset is calculated, see " Start Offset " on page 90.)

Monitoring Status Area

This area enables you to view general information about the application, as well as the running order and dependencies of the selected application's tasks.

User interface elements are described below:

UI Element	Description
<General Information>	
Number of tasks	The number of tasks included in the application run unit.
Status	The application run unit status. Valid options are: <ul style="list-style-type: none"> • Not initialized – The run unit has not yet been initialized. • Running – The run unit is currently running on this BPM instance. • Idle – The run unit is not currently running on this instance and is waiting for the next scheduled run. • Downtime – The run unit is not currently running on this instance.
Last start time	The time that the run unit was last run.
Last run duration	The duration of the run unit's last run.
Run mode	The run mode configured for the application. For details on run modes, see " Run Modes " on page 92.
<Tasks>	

UI Element	Description
	<p>Task Properties. Opens a new window showing the script or WebTrace properties. For details, see "Script Properties Window" and "WebTrace Properties Window" in "Business Transaction Flow User Interface" on page 58.</p>
	<p>Browse Script. Displays the script log file (in case of error during last run then mdrv log file) for the last run of the task. For details on log files, see "Workspace Directory and Log Files" on page 157.</p> <p>Note: This element is disabled for all WebTraces and for scripts for which there is no Last Run Status data.</p>
	<p>Run Task. Runs a selected task. Details of the run are reported in a new window. For details on task reports, see "Business Process Monitor Task Reports" on page 70.</p> <p>When you run a script, the Run Script dialog box opens, where you can set the log level for the script run and add additional command line parameters. For details on setting log levels, see "Setting the Log Level" on page 70. Note that these changes are only applicable to this run of the script.</p> <p>Note:</p> <ul style="list-style-type: none"> • The task run data is not sent to BSM. • The task run does not affect the run unit's regular scheduling in BPM, or the run of any other run unit in BPM.
	<p>Change visible columns. Opens a list of the available task table columns, in a new window. Select a check box to display a column, or clear a check box to hide a column.</p> <p>Default value: All columns are displayed.</p>
Run Order	<p>The order in which the tasks are run. This is determined by the run mode configured for the BPM in End User Management Administration. For details on run modes, see "Run Modes" on page 92.</p>
Name	<p>The script or WebTrace name.</p>
Type	<p>The type of task—script, WebTrace, or single URL.</p>
BTF	<p>The business transaction flow in which the task is included, as configured in End User Management Administration.</p> <p>Note:</p> <ul style="list-style-type: none"> • WebTraces configured directly for the application are not included in a business transaction flow and in such cases, this cell displays n/a. • Click a business transaction flow link to select the business transaction flow in the BPM tree and display the relevant page.

UI Element	Description
Status	The current status of the task. Valid options are: <ul style="list-style-type: none"> • Not initialized – The task has not yet been initialized. • Running – The task is currently running on this BPM instance. • Idle – The task is not currently running on this instance.
Last Run Status	The status of the last run. Valid options are: <p>Finished properly – The task finished running with no errors.</p> <p>Finished (errors occurred) – The task finished running; however, there may be some errors in the task reports (for example, the traceroute server may report "progress aborted" for a WebTrace request). Check the network.txt and webtrace.txt files in the workspace\webtrace folder. For details of browsing the workspace folder, see "Browse Workspace" in "Host Actions" on page 31.</p> <p>Failed to start – The task failed to start running.</p> <p>Terminated unexpectedly – The task failed during the run.</p> <p>Error: Aborted – The task was aborted.</p> <p>Aborted (timeout) – The task was timed-out and stopped running.</p> <p>End status is not set – The task has not run yet, therefore no end status is available.</p> <p>n/a – Run status is not applicable for the task, for example, if the application is inactive.</p>
Last Run Time	The duration of the last run.

Business Transaction Flows Overriding Application Schedule Area

This area enables you to view general information about business transaction flows that are part of the application, but which have their own schedules, so are considered as separate run units.

User interface elements are described below:

UI Element	Description
	<p>Change visible columns. Opens a list of the available table columns, in a new window. Select a check box to display a column, or clear a check box to hide a column.</p> <p>Default value: All columns are displayed.</p>
BTF Name	The business transaction flow name.
Last Run Start Time	The time that the run unit was last run.

UI Element	Description
Last Run Duration	The duration of the last run of the run unit.
Status	The current status of the business transaction flow. Valid options are: Not initialized – The run unit has not yet been initialized. Running – The run unit is currently running on this BPM instance. Idle – The run unit is not currently running on this instance.

Chapter 9

Business Transaction Flow Page

A business transaction flow is a logical user flow in an application. For example, in a human resources application you may have a business transaction flow for registering a new employee. You assign a script to the business transaction flow (you can assign more than one script, although it is recommended to assign only one) that contains individual transactions. For example, the script for the business transaction flow for registering a new employee may include transactions for logging in to the application, entering the new employee's personal details, marking a check list to ensure that all necessary documents have been received from the new employee, and logging out of the system. For details on configuring business transaction flows in End User Management Administration, see "Business Transaction Flow Configuration Wizard" in the BSM Application Administration Guide.

By default, a business transaction flow uses the same schedules and run modes as its parent application, but you can configure different schedules and run modes specifically for a business transaction flow. If a business transaction flow has its own schedule, it is not included in the application run on the BPM instance, but is run as an independent unit. For details on run units, see "[Run Units](#)" on page 88.

The BPM Admin Business Transaction Flow page enables you to view details of a business transaction flow configured in BSM End User Management Administration to which an instance is assigned. There are slight differences in the Business Transaction Flow page depending on whether the business transaction flow uses its parent application's schedule or whether it has its own overriding schedule. To access the BPM Business Transaction Flow page, select a business transaction flow in the BPM tree displayed in the left pane of the BPM Admin console.

Note: When you configure business transaction flows in End User Management Administration, business transaction flow names, as well as the names of the included transactions and scripts, must be entered in the same language that is set for the operating system of the BPM on which they are run.

Profile Page

When a BPM instance connects to an HP Business Availability Center system earlier than version 9.00, profiles are included in the BPM tree displayed in the left pane of the BPM Admin console, instead of applications and business transaction flows. To access the BPM Profile page, select a profile in the BPM tree. The Profile page user interface is similar to the Business Transaction Flow page user interface for business transaction flows that have their own schedule (that is, business transaction flows that are independent run units). For details, see "[Business Transaction Flow User Interface](#)" on next page.

Business Transaction Flow User Interface

The Business Transaction Flow page includes the following areas:

- "General Information Area" below
- "Schedule List Area" below
- "Monitoring Status Area" on next page
- "Tasks Area" on next page
- "Tasks Included in the Business Transaction Flow and its Parent Application's Run Unit Area" on page 61

General Information Area

This area enables you to view general information about the business transaction flow.

User interface elements are described below:

UI Element	Description
Display name	The name of the business transaction flow as configured in End User Management Administration in BSM.
Status	The current status of the business transaction flow in BSM— active or inactive . Note: A message is displayed if the business transaction flow is active, but its parent application is inactive.

Schedule List Area

This area enables you to view the schedules configured for the business transaction flow.

User interface elements are described below:

UI Element	Description
Schedule Description	The schedule for running the business transaction flow on this BPM instance, as configured in End User Management Administration. If the business transaction flow has multiple schedules, all schedules are shown. (For more information, see "Schedules" on page 89.)
Time Zone	The time zone to use for the BPM instance, as configured in End User Management Administration.
Start Offset	The start offset, which specifies the delay between the business transaction flow schedule time and the actual run time. (For information on how the start offset is calculated, see "Start Offset" on page 90.)

UI Element	Description
Source	<p>The schedule source. Valid options are:</p> <ul style="list-style-type: none"> • Own Schedule. The business transaction flow has its own schedule and is therefore an independent run unit (that is, it is not included in its parent application's run unit). • Application Schedule. The business transaction flow is included in its parent application's run unit and uses its parent application's schedule.

Monitoring Status Area

This area enables you to view the general status and configuration of the business transaction flow.

This area is displayed only for business transaction flows that have their own schedule and therefore, their own run unit.

User interface elements are described below:

UI Element	Description
Number of tasks	The number of tasks included in the business transaction flow run unit.
Status	<p>The current status of the business transaction flow run unit. Valid options are:</p> <ul style="list-style-type: none"> • Not initialized – The run unit has not yet been initialized. • Currently running – The run unit is currently running on this BPM instance. • Idle – The run unit is not currently running on this BPM instance.
Last start time	The start time of the last run.
Last run duration	The duration of the last run.
Run mode	The run mode configured for the business transaction flow. For details on run modes, see "Run Modes" on page 92.

Tasks Area

This area enables you to view the tasks configured for the business transaction flow and to run them.

Note: This area is displayed only for business transaction flows that have their own schedule and therefore, their own run unit. For details on business transaction flows that use their parent application's schedule, see ["Tasks Included in the Business Transaction Flow and its Parent Application's Run Unit Area"](#) on page 61.

User interface elements are described below:

UI Element	Description
	Task Properties. Opens a new window showing the script or WebTrace properties. For details, see "Script Properties Window" on page 63 and "WebTrace Properties Window" on page 65 .
	Browse Script. Displays the BPM script folder in a new window. (If an mdrv log file exists, it is selected automatically.) For details on log files, see "Workspace Directory and Log Files" on page 157 . Note: This element is disabled for all WebTraces and for scripts for which there is no Last Run Status data.
	Run Task. Runs a selected task. Details of the run are reported in a new window. For details on the reports, see "Business Process Monitor Task Reports" on page 70 . When you run a script, the Run Script dialog box opens, where you can set the log level (Disabled, Brief, or Extended) to determine the extent of the information logged to the output for the script run, and add additional command line parameters. Note that these changes are only applicable to this run of the script. The task run data is not sent to BSM. The task run does not affect the run unit's regular scheduling in BPM, or the run of any other run unit in BPM.
Run Order	The order in which the tasks are run. This is determined by the run mode configured for the business transaction flow in End User Management Administration. For details on run modes, see "Run Modes" on page 92 .
Name	The task name, as configured in End User Management Administration.
Type	Script, WebTrace, or Single URL.

UI Element	Description
Last Run Status	<p>The status of the last run. Valid options are:</p> <ul style="list-style-type: none"> • Finished properly – The task finished running with no errors. • Finished (errors occurred) – The task finished running; however, there may be some errors in the task reports (for example, the traceroute server may report "progress aborted" for a WebTrace request). Check the relevant log files for further information on the errors encountered. For details on the log files, see "Workspace Directory and Log Files" on page 157. • Failed to start – The task failed to start running. • Terminated unexpectedly – The task failed during the run. • Error: Aborted – The task was aborted. • Aborted (timeout) – The task was timed-out and stopped running. • End status is not set – The task has not run yet, therefore no end status is available. • n/a – Run status is not applicable for the task, for example, if the application is inactive.
Last Run Time	The time of the last run.
Status	<p>The current status of the task. Valid options are:</p> <ul style="list-style-type: none"> • Not initialized – The task has not yet been initialized. • Running – The task is currently running on this Business Process Monitor instance. • Idle – The task is not currently running on this instance.

Tasks Included in the Business Transaction Flow and its Parent Application's Run Unit Area

This area enables you to view the scripts and WebTraces configured for the business transaction flow, as well as the scripts and WebTraces configured for the business transaction flow's parent application. You can also run a script or WebTrace.

Note: This area is displayed only for business transaction flows that are included in their parent application's run unit (that is, business transaction flows that do not have their own schedule).

User interface elements are described below:

UI Element	Description
	Task Properties. Opens a new window showing the script or WebTrace properties. For details, see " Script Properties Window " on next page and " WebTrace Properties Window " on page 65.
	Browse Script. Displays the BPM script folder in a new window. (If an mdrv log file exists, it is selected automatically.) For details on log files, see " Workspace Directory and Log Files " on page 157. Note: This element is disabled for all WebTraces and for scripts for which there is no Last Run Status data.
	Run Task. Runs a selected task. Details of the run are reported in a new window. For details on task reports, see " Business Process Monitor Task Reports " on page 70. When you run a script, the Invoke Script dialog box opens, where you can set the log level for the script run and add additional command line parameters. For details on setting log levels, see " Setting the Log Level " on page 70. Note that these changes are only applicable to this run of the script. Note: <ul style="list-style-type: none"> • The task run data is not sent to BSM. • The task run does not affect the run unit's regular scheduling in BPM, or the run of any other run unit in BPM.
Included in Selected BTF	A check mark denotes that the script or WebTrace is included in the selected business transaction flow and not in its parent application.
Run Order	The order in which the tasks are run. This is determined by the run mode configured for the business transaction flow's parent application in End User Management Administration. For details on run modes, see " Run Modes " on page 92.
Name	The task name, as configured in End User Management Administration.
Type	Script, WebTrace, or Single URL.
BTF	The name of the BTF in which the script or WebTrace is included.
Status	The current status of the task. Valid options are: <ul style="list-style-type: none"> • Not initialized – The task has not yet been initialized. • Running – The task is currently running on this BPM instance. • Idle – The task is not currently running on this BPM instance.

UI Element	Description
Last Run Status	<p>The status of the last run. Valid options are:</p> <ul style="list-style-type: none"> • Finished properly – The task finished running with no errors. • Finished (errors occurred) – The task finished running; however, there may be some errors in the task reports (for example, the traceroute server may report "progress aborted" for a WebTrace request). Check the relevant log files for further information on the errors encountered. For details on the log files, see "Workspace Directory and Log Files" on page 157. • Failed to start – The task failed to start running. • Terminated unexpectedly – The task failed during the run. • Error: Aborted – The task was aborted. • Aborted (timeout) – The task was timed-out and stopped running. • End status is not set – The task has not run yet, therefore no end status is available. • n/a – Run status is not applicable for the task, for example, if the application is inactive.
Last Run Time	The time of the last run.

• **Script Properties Window**

This window displays general details about a script and its included transactions.

To access the Script Properties window for a selected script, click the **Task Properties**  button in the Tasks area.

User interface elements are described below:

UI Element	Description
General Information	
Name	The script name, as configured in End User Management Administration.
Script Repository Version	The version of the script used.

UI Element	Description
Last Run Status	<p>The status of the last run. Valid options are:</p> <ul style="list-style-type: none"> ■ Finished properly – The task finished running with no errors. ■ Finished (errors occurred) – The task finished running; however, there may be some errors in the task reports. Check the MDRV log file for further information on the errors encountered. ■ Failed to start – The task failed to start running. ■ Terminated unexpectedly – The task failed during the run. ■ Error: Aborted – The task was aborted. ■ Aborted (timeout) – The task was timed-out and stopped running. ■ End status is not set – The task has not run yet, therefore no end status is available. ■ n/a – Run status is not applicable for the task, for example, if the application is inactive.
Last Run Time	The time of the last run.
Last Run Duration	The duration of the last run.
Transactions - lists the transactions included in the script and displays the following data for them:	
Name	The transaction name as used in the script.
Original Name	<p>The original transaction name.</p> <p>Note: If you change the name of a Business Transaction CI in End User Management Administration, the transaction name in existing scripts is not changed. Elsewhere, however, (for example, in Service Health, reports, and End User Management Administration) the transaction name is changed and persistent data for the CI is preserved.</p>
OK	The response time threshold below which the transaction's status is OK, as configured in End User Management Administration.
Minor	The response time thresholds between which the transaction's status is Minor, as configured in End User Management Administration.
Critical	The response time threshold above which the transaction's status is Critical, as configured in End User Management Administration.
Outlier	The response time threshold above which the transaction is considered to be an Outlier, as configured in End User Management Administration. Outliers are transactions whose response time exceeds a defined time range.

UI Element	Description
Availability	The availability threshold configured for the transaction in End User Management Administration.
Parameters - lists the parameters used in the script and displays the following data for them:	
Name	The parameter name.
Value	The parameter value.

• WebTrace Properties Window

This window displays general details about a WebTrace.

To access the WebTrace Properties window for a selected WebTrace, click the **Task Properties**  button in the Tasks area.

User interface elements are described below:

UI Element	Description
URL	The URL accessed by the WebTrace
Port	The port for the URL accessed by the WebTrace
Last Run Status	<p>The status of the last run. Valid options are:</p> <ul style="list-style-type: none"> ▪ Finished properly – The task finished running with no errors. ▪ Finished (errors occurred) – The task finished running; however, there may be some errors in the task reports (for example, the traceroute server may report "progress aborted" for a WebTrace request). Check the relevant WebTrace log files for further information on the errors encountered. For details on log files, see "Workspace Directory and Log Files" on page 157 ▪ Failed to start – The task failed to start running. ▪ Terminated unexpectedly – The task failed during the run. ▪ Error: Aborted – The task was aborted. ▪ Aborted (timeout) – The task was timed-out and stopped running. ▪ End status is not set – The task has not run yet, therefore no end status is available. ▪ n/a – Run status is not applicable for the task, for example, if the application is inactive.
Last Run Time	The time of the last run.
Last Run Duration	The duration of the last run.

Chapter 10

Business Transaction Page

The BPM Admin Business Transaction page enables you to view details of a transaction included in business transaction flow's script, as configured in BSM End User Management Administration, to which an instance is assigned. To access the BPM Business Transaction page, select a transaction in the BPM tree displayed in the left pane of the BPM Admin console.

When you configure transactions in a script or in End User Management Administration, the names of transactions must be entered in the same language that is set for the operating system of the BPM on which they are run. For details on configuring applications in End User Management Administration, see "Business Process Monitor Application Configuration Wizard" in the BSM Application Administration Guide.

The Business Transaction page includes the following areas:

- "General Information Area" below
- "Thresholds Area" below
- "Script Area" on next page

General Information Area

This area enables you to view general information about the transaction.

User interface elements are described below:

UI Element	Description
Display name	The name of the transaction as configured in End User Management Administration in BSM.

Thresholds Area

This area enables you to view the thresholds configured for the transaction. For details on configuring transaction thresholds in End User Management Administration, see "Business Transaction Business Process Monitor Configuration Page" in the BSM Application Administration Guide.

User interface elements are described below:

UI Element	Description
OK	The response time threshold below which the transaction's status is OK, as configured in End User Management Administration.
Minor	The response time thresholds between which the transaction's status is Minor, as configured in End User Management Administration.

UI Element	Description
Critical	The response time threshold above which the transaction's status is Critical, as configured in End User Management Administration.
Outlier	The response time threshold above which the transaction is considered to be an Outlier, as configured in End User Management Administration. Outliers are transactions whose response time exceeds a defined time range.
Availability	The availability threshold configured for the transaction in End User Management Administration.

Script Area

This area enables you to view the transaction name used in the script, as well as the scripts in which the transaction is included.

User interface elements are described below:

UI Element	Description
Name in script	<p>The name of the transaction as used in the script.</p> <p>Note: If you change the name of a Business Transaction CI in End User Management Administration, the transaction name in existing scripts is not changed. Elsewhere, however, (for example, in Service Health, reports, and End User Management Administration) the transaction name is changed and persistent data for the CI is preserved.</p>
Included in scripts	The scripts in which the transaction is included, within the same business transaction flow.

Chapter 11

Top Bar

The top bar includes drop-down menus with additional options for working with, and getting help in, BPM Admin. Click a menu to display the menu options and click an option to select it. The following menus are included in the top bar:

- **Tools.** Includes an option for adding additional agents to the BPM tree. For details, see "Tools Menu" below.
- **Help.** Includes help options for BPM Admin. For details, see "Help Menu" on next page.

Tools Menu

The Tools menu contains the **Agent Manager** option, which you use to add additional BPM agents to the BPM tree. Adding additional agents to the tree enables you to view and administer multiple BPM agents from the same BPM Admin console. When you add a BPM host in the Agent Manager, the host is displayed in the BPM tree and the configuration is persistent (that is, if you close the browser and then reopen BPM Admin, the BPM hosts that were added in the Agent Manager are still displayed). When you select the Agent Manager option (**Tools > Agent Manager**), the **Agent Manager** dialog box opens.

Agent Manager Dialog Box

User interface elements are described below:

UI Element	Description
Content Pane	
	Add Agent. Opens the Add Agent dialog box, where you configure an agent to add to the BPM tree. For user interface details, see "Add Agent Dialog Box" on next page. Note: You should configure hosts using their fully qualified domain name (FQDN) or their IP address. If you add the same host twice, once with the FQDN and once without, these are considered as separate hosts and multiple entries are created in the hierarchical BPM tree. The same behavior occurs if you configure the same host twice, once with an IP address and once with FQDN.
	Delete Agent. Removes a selected agent from the BPM tree.
	Refresh. Refreshes the list of agents that have been added to the BPM tree.
<Agents>	A list of the BPM agents that have been added to the BPM tree.

UI Element	Description
Agent Details Pane	
Protocol	The communications protocol used to communicate with the selected BPM agent— http or https .
Host	The host name of the selected BPM agent.
Port	The port number used to communicate with the selected BPM agent.
Basic authentication user name	The user name for the agent machine's Tomcat basic authentication, if used.
Server status	The current connection status of the selected BPM agent's host machine.

Add Agent Dialog Box

User interface elements are described below:

UI Element	Description
Protocol	The communications protocol used to communicate with the BPM agent you are adding— http or https . Default value: http
Host name	The host name of the selected BPM agent you are adding. Note: Use a fully qualified domain name (FQDN).
Port	The port number used to communicate with the BPM agent you are adding. Default value: 2696
Basic authentication user name	The user name for the agent machine's Tomcat basic authentication, if used.
Basic authentication password	The password for the agent machine's Tomcat basic authentication, if used.

Help Menu

The **Help** menu contains the following options for displaying the BPM Admin guide and other useful help information:

- **Business Process Monitor Administrator's Guide.** Opens the guide in a new browser window.
- **What's New?** Displays information on what's new for this BPM version.
- **About Business Process Monitor.** Displays information on the BPM version.

Chapter 12

Business Process Monitor Task Reports

This section describes the task reports you can run from BPM and includes the following topics:

- "Setting the Log Level" below
- "Page Component Breakdown Report" below
- "Page Component Breakdown User Interface" on next page
- "Understanding Response Time Breakdown Reports" on page 77
- "WebTrace Report" on page 85

Setting the Log Level

Many scripts (for example, HP LoadRunner scripts and HP Virtual User Generator scripts for web-based protocols) include runtime settings that determine the extent of the information logged to the output when the script is run. There are three settings for logging: **Disabled**, **Brief**, and **Extended**. By default, BPM runs the scripts using the Disabled log level; this means that only minimum information is logged to the MDRV log for each run of the script.

You can change the log level for a specific script run when you invoke a single run of the script in the Application or Business Transaction Flow page. Changing the log level to Brief or Extended introduces extra overhead in the MDRV log files, and may slow down the run of the script (so affecting the measured run times). An Extended log is helpful for debugging a script, but is otherwise not recommended. For details of invoking a single run of a script in the Application page, see "Monitoring Status Area" on page 53. For details of invoking a single run of a script in the Business Transaction Flow page, see "Tasks Included in the Business Transaction Flow and its Parent Application's Run Unit Area" on page 61.

Page Component Breakdown Report

The Page Component Breakdown (PCBD) report displays a breakdown of transaction response times (in milliseconds), for each component of a web page. You use the report to analyze network, server, and client health in real time. It helps you identify problematic elements of a web page (for example, images that download slowly, or broken links) for web based transactions, and problematic TCP activity (for example, failed connections to the server) for non-web based (TCP) transactions. The report can also help you identify where along the network problems are occurring (for example, during DNS Resolution, or during Time to First Buffer). Web based transactions consist of web components and TCP based transactions consist of TCP requests.

For scripts set to collect component breakdown data, BPM measures response time for each specific transaction in the script, and collects breakdown data—information about client, network, and server activity during the transaction—for each component of every web page accessed in web based transactions, and for each component (request) in non-web based (TCP) transactions. This information enables you to assess whether transaction response times were affected. For example,

in web based transactions, a page content may affect response times and in non-web based transactions, request size or the number of requests may affect response times.

For more information on the response time breakdown, see ["Understanding Response Time Breakdown Reports"](#) on page 77.

Note:

- Component breakdown is supported only for certain HP Virtual User Generator protocols. See ["Understanding Response Time Breakdown Reports"](#) on page 77.
- For non-web (TCP) based protocols, the page name has no relevance in breakdown reports.

You can run a Page Component Breakdown report by:

- invoking scripts from the **Tasks** area of the **Business Transaction Flow** page. For details, see ["Tasks Included in the Business Transaction Flow and its Parent Application's Run Unit Area"](#) on page 61.

Note: When invoking scripts, page component breakdown data is shown only if:

- in BSM End User Management Administration, the transaction monitor for the script was set to perform component breakdown.
 - the script was recorded using one of the configured protocols.
- performing an on-demand page component breakdown of any web page using the **Run Page Component Breakdown** action on the **Host** page. For details, see ["Run Page Component Breakdown"](#) on page 34.

For details on the Page Component Breakdown report user interface, see ["Page Component Breakdown User Interface"](#) below.

Page Component Breakdown User Interface

The Page Component Breakdown report is displayed in the Invoke Script dialog box, which is divided into the following two panes:

- **The Context (left) pane.** Displays the different reports that comprise the Page Component Breakdown report. These include a summary report for the entire script and individual reports for each transaction included in the script.

Note: When you run an on-demand page component breakdown for a web page, a default transaction called **PDBD transaction** is created for the report.

- **The main (right) pane.** Displays the content for the report selected in the Context pane—the summary, or a specific transaction.

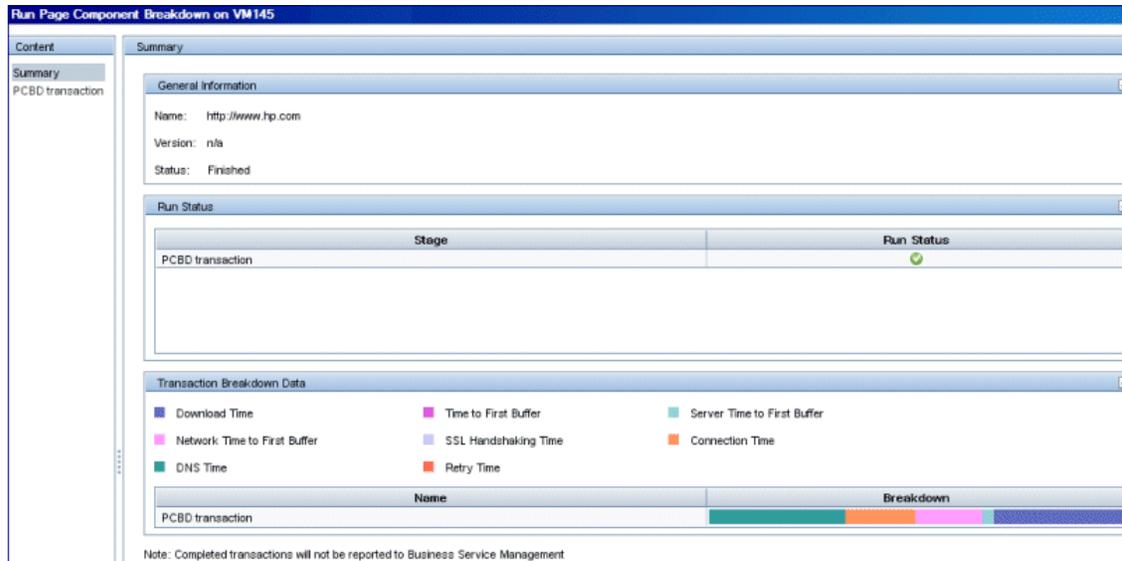
This section includes the following topics:

- ["Summary Report" on next page](#)
- ["Transaction Report" on page 74](#)

Summary Report

Note: This section is applicable for web based transactions. For the differences in breakdown reports for non-web based (TCP) transactions, see "[Understanding Breakdown Report Data for Non-Web Based \(TCP\) Transactions](#)" on page 83.

The summary of the Page Component Breakdown report includes general information about the script run, the run status of the transactions included in the script, and aggregated component data for each of the transactions included in the script.



The summary of the Page Component Breakdown report includes the following areas:

- "General Information Area" below
- "Run Status Area" on next page
- "Transaction Breakdown Data Area" on next page

- **General Information Area**

User interface elements are described below:

UI Element	Description
Name	The name of the invoked script, or for on-demand page component breakdown, the name of the accessed web page.
Version	The script version number. Note: This is not relevant for on-demand page component breakdown.
Status	The status of the script run. Valid statuses are: <ul style="list-style-type: none"> ▪ Running ▪ Finished

• **Run Status Area**

This area contains a line for each transaction included in the script, or for on-demand component breakdown, one line for the default transaction.

User interface elements are described below:

UI Element	Description
Stage	The transaction name.
Run Status	<p>The run status of the transaction. Valid options are:</p> <ul style="list-style-type: none"> ■  Pending. The transaction is waiting to run. ■  Passed. The transaction ran successfully. ■  Failed. The transaction did not run successfully. ■  No data arrived. The transaction ran successfully, but no data was received. ■  Timeout. BPM was unable to retrieve page component data within the configured timeout period. <p>Note: The default timeout is 15 minutes. When you run an on-demand page component breakdown you can configure the timeout value.</p>

• **Transaction Breakdown Data Area**

This area contains a line for each transaction included in the script, showing aggregated transaction breakdown data for all the components in the transaction.

User interface elements are described below:

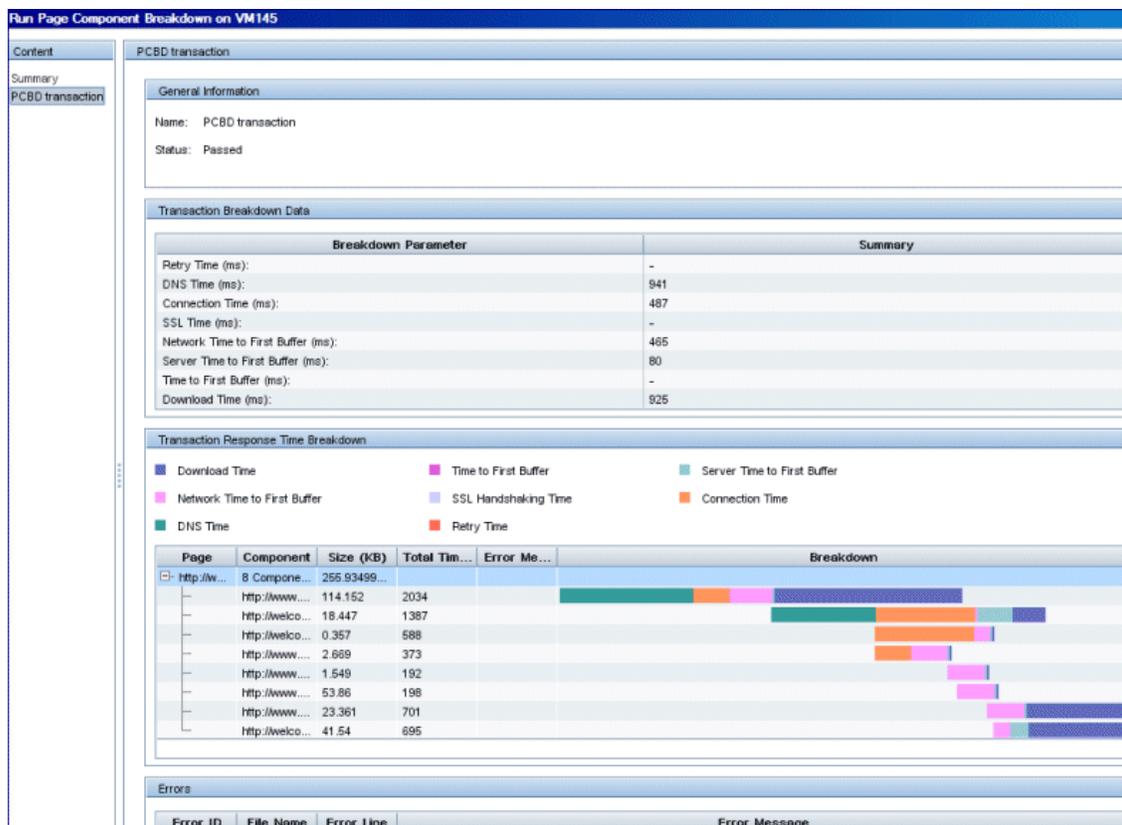
UI Element	Description
<Legend>	A legend describing the color coding used in the report.
Name	The transaction name.
Breakdown	<p>A bar that shows the total transaction time in milliseconds. The color-coded segments enable you to differentiate between the various breakdown categories for the transaction, with each colored segment representing the total time for its corresponding measurement. For example, you can view the overall DNS time for the transaction. (For explanations of the breakdown categories, see "Understanding Transaction Breakdown Categories" on page 77.)</p> <p>Tooltip: Hold the cursor over a colored segment to view the breakdown category name and the total time for that category.</p> <p>Tip: You can correlate the breakdown summary data with transaction response time information to assess whether poor transaction response times are being caused by DNS resolution or connection problems, network latency or server delay, or client delay.</p>

Transaction Report

Note: This section is applicable for web based transactions. For the differences in breakdown reports for non-web based (TCP) transactions, see ["Understanding Breakdown Report Data for Non-Web Based \(TCP\) Transactions"](#) on page 83.

The Transaction reports included in the Page Component Breakdown report enable you to assess whether transaction response times and service availability are being affected by page content. There is a separate report for each transaction included in the script and you display the report for a specific transaction by selecting the transaction in the Context pane.

The report displays general data about the transaction run, summary response time breakdown data for all of the components in the transaction, transaction response time breakdown data for each component in the transaction, and error data. For details of the breakdown categories, see ["Understanding Transaction Breakdown Categories"](#) on page 77.



The Transaction reports included in the Page Component Breakdown report include the following areas:

- ["General Information Area"](#) on next page
- ["Transaction Breakdown Data Area"](#) on next page
- ["Transaction Response Time Breakdown Area"](#) on next page
- ["Errors Area"](#) on page 76

• **General Information Area**

User interface elements are described below:

UI Element	Description
Name	The transaction name. Note: For on-demand component breakdown, there is one default transaction called PCBD transaction.
Status	The status of the transaction run. Valid statuses are: <ul style="list-style-type: none"> ▪ Pending. The transaction is waiting to run. ▪ Passed. The transaction ran successfully. ▪ Failed. The transaction did not run successfully. ▪ No data arrived. The transaction ran successfully, but no data was received. ▪ Timeout. BPM was unable to retrieve page component data within the configured timeout period.

• **Transaction Breakdown Data Area**

User interface elements are described below:

UI Element	Description
Breakdown Parameter	The transaction breakdown category name. For details of the breakdown categories, see "Understanding Transaction Breakdown Categories" on page 77.
Summary	The weighted time, in milliseconds, of all the components included in the transaction, for the breakdown category. For details on weighting, see "Understanding How BSM Breaks Down Transaction Response Times" on page 80.

• **Transaction Response Time Breakdown Area**

User interface elements are described below:

UI Element	Description
<Legend>	Describes the color coding used in the report.
Page	The URLs of the web pages accessed in the transaction. Tooltip: Hold the cursor over the name of a page to show the full name. Note: Click the plus (+) sign to expand a page and display its components.

UI Element	Description
Component	<p>The URLs of the components included in an accessed web page.</p> <p>Tooltip: Hold the cursor over the name of a component to show the full name.</p> <p>Note: If the parent web page is not expanded to display its components, this column displays the total number of components included in the page.</p>
Size (KB)	The total size, in kilobytes, of the page or component.
Total Time (ms)	The total time of the component, in milliseconds.
Error Message	If applicable, an error message related to the specific component.
Breakdown	<p>A bar that shows the total component time in milliseconds. The color-coded segments enable you to differentiate between the various breakdown categories for the component, with each colored segment representing the total time for its corresponding measurement. For example, you can view the overall DNS time for the component. (For explanations of the breakdown categories, see "Understanding Transaction Breakdown Categories" on next page.)</p> <p>Tooltip:</p> <ul style="list-style-type: none"> ■ Hold the cursor over a colored segment to view the breakdown category name and the total time for that category. ■ Hold the cursor over the white space to the left of a component's colored bar to show a tooltip with the offset time for that component. The offset time for a specific component is the time that passes from the start time of the first component on the page until the start time of the specific component. <p>Note: Gaps in time between components (time between one component finishing and the next one starting) represent processing time—client-side delays caused by browser think time, CPU think time, HTML page processing time, time needed to open sockets or threads, and so forth.</p>

• **Errors Area**

User interface elements are described below:

UI Element	Description
Error ID	The error Id number
File Name	The name of the file in which the error occurred.
Error Line	The line number in the file on which the error occurred.
Error Message	The error message.

Understanding Response Time Breakdown Reports

There are differences between breakdown categories and response times for web based transactions and non-web based transactions.

This section contains:

- ["Understanding Web Based Transaction Breakdown Reports" below](#), describing what each breakdown category is measuring in web based transactions.
- ["Understanding Non-Web Based TCP Transaction Breakdown Reports" on page 80](#), describing what each breakdown category is measuring in non-web based (TCP) transactions.
- ["Calculating Transaction Breakdown from Component Breakdown" on page 85](#), describing how component breakdown is used to calculate the transaction breakdown.

Understanding Web Based Transaction Breakdown Reports

The web based protocols for which BPM can perform transaction breakdown are configured in the **BdSupportedProtocols** setting in the **agent1.cfg** file on the BPM machine. For details on the agent1.cfg file, see ["Parameters in agent1.cfg" on page 104](#). If a script for which Business Process Monitor is configured to collect transaction breakdown data contains multiple protocols, and one of the protocols is a web based protocol configured in the **BdSupportedProtocols** configuration setting, web based breakdown is used.

Note:

- Transaction breakdown is not supported by BPMs running scripts recorded in wininet mode in HP Virtual User Generator.
- Page component breakdown does not function for streaming objects, such as Java Applets, sounds, and movies. This is because the engine that runs the page component breakdown uses technology that only handles components that can be parsed directly from the HTML code (for example, images).

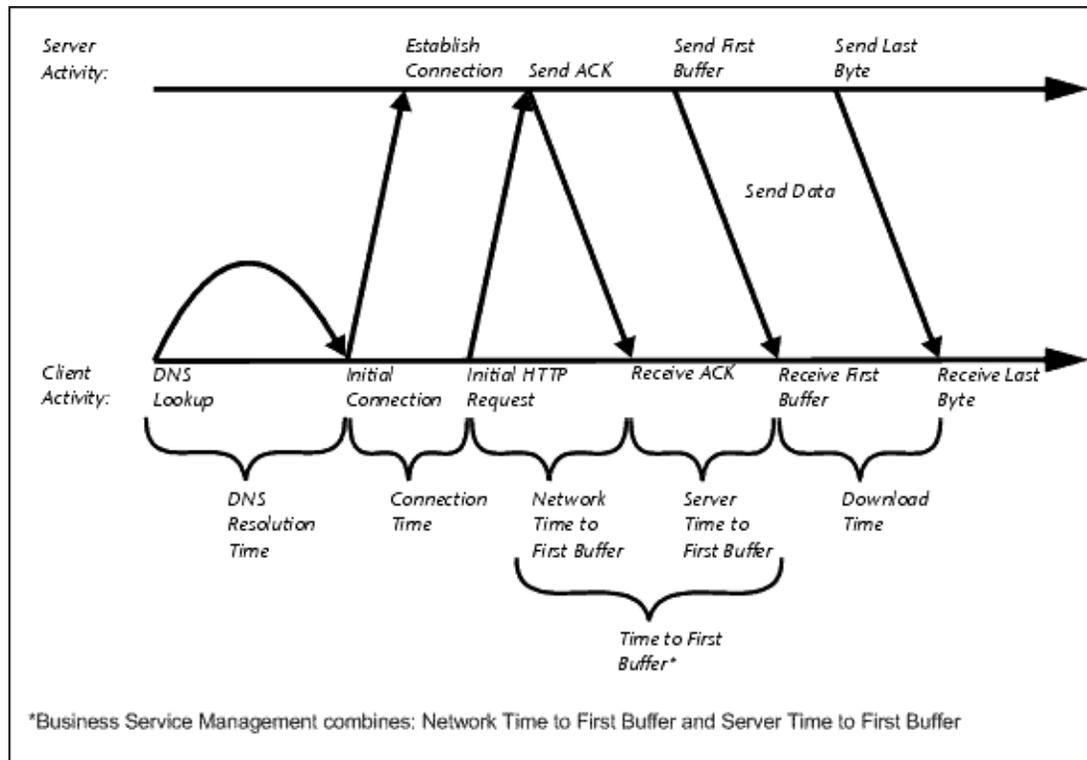
This section includes the following topics:

- ["Understanding Transaction Breakdown Categories" below](#)
- ["Understanding Download Time" on page 79](#)
- **Understanding Transaction Breakdown Categories**

The transaction breakdown component in reports displays a breakdown of average transaction response times (in milliseconds) over time, for the selected time frame. Response times are broken down by retry time, DNS resolution time, connection time, network time to first buffer, server time to first buffer, download time, and client time. If your site uses SSL authentication, SSL handshaking time is also displayed.

The diagram below illustrates the relationship between the component's main breakdown categories (shown along the bottom of the diagram) and client/server activity during transaction execution.

Note that retry time, SSL handshaking time, and client time are not shown in this diagram. They are described in the breakdown category table. For details, see "DNS Resolution" in the table below.



The following table describes the component's breakdown categories. Times are calculated by taking the average of all transaction runs within the specified time period.

Name	Description
Retry Time	Displays the overall amount of time that passes from the moment an http request is started until the moment an http or TCP error message is returned. Retry time only relates to http or TCP errors that execute a retry after the error.
DNS Resolution	Displays the average amount of time needed to resolve the DNS name to an IP address, using the closest DNS server. The DNS Lookup measurement is a good indicator of slow DNS resolution or other problems with the DNS server.
Connect Time	Displays the average amount of time needed to establish an initial connection with the web server performing the transaction. The connection measurement is a good indicator of problems along the network or whether the server is responsive to requests.

Name	Description
SSL Handshake Time	<p>Displays the average amount of time taken to establish an SSL connection (includes the client hello, server hello, client public key transfer, server certificate transfer, and other—partially optional—stages). After this point, all the communication between the client and server is encrypted.</p> <p>Note: The SSL handshaking measurement is only applicable for https communications.</p>
Network Time to First Buffer	<p>Displays the average amount of time that passes from the moment the first http request is sent until receipt of ACK. The network measurement is a good indicator of network quality (look at the time/size ratio to calculate download rate).</p>
Server Time to First Buffer	<p>Displays the average amount of time that passes from the receipt of ACK of the initial http request (usually GET) until the first buffer is successfully received back from the web server. The server time to first buffer measurement is a good indicator of web server delay.</p> <p>Note: Because server time to first buffer is being measured from the client, network time may influence this measurement if there is a change in network performance from the time the initial http request is sent until the time the first buffer is sent.</p>
Download Time	<p>Displays the time from the receipt of the first buffer until the last byte arrives.</p> <p>Download time is a combination of server and network time, since the server typically sends data over multiple connections, and therefore is usually working while data is being transmitted over the network. For more details, see "Understanding Download Time" below.</p>
Client Time	<p>Displays the average amount of time that passes while a request is delayed on the client machine. Client-related delays can include browser think time, CPU think time, HTML page processing time, time needed to open sockets, application delays caused by heavy applets, and so on.</p> <p>Note: Client time is calculated by subtracting all other measured times from the total transaction time.</p>

Note: In certain circumstances, for example, when the BPM is using a proxy server, the transaction breakdown mechanism cannot differentiate between server time to first buffer and network time to first buffer. In these cases, the report displays the time between initial http request and receipt of first buffer as Time to First Buffer.

• Understanding Download Time

When a BPM running a script communicates with a web server (specified by the URLs in the script), communication is carried out, by default, over four connections simultaneously.

As the web page is retrieved, its various components (images, applets, and so on) travel in data packets from server to client across these multiple connections.

As a result, at any point along the time line after the server sends the first buffer until the client receives the last byte for the page, data packets may be traveling over the network through some of the connections while others are being processed by the server through the remaining connections. The download time in the report represents the sum total of the time when network resources and server resources are in use at the same time, between the time the client receives the first buffer and the last byte.

Understanding Non-Web Based TCP Transaction Breakdown Reports

The non-web based (TCP) protocols for which BPM can perform transaction breakdown are configured in the **AdvancedTcpBdSupportedProtocols** setting in the **agent1.cfg** file on the BPM machine. For details on the agent1.cfg file, see "[Parameters in agent1.cfg](#)" on page 104. If a script for which BPM is configured to collect transaction breakdown data contains multiple protocols, and none of the web protocols are configured in the **BdSupportedProtocols** configuration setting, and at least one of the TCP protocols is defined in the **AdvancedTcpBdSupportedProtocols** configuration setting, TCP breakdown is used.

Note:

- Non-web based (TCP) transaction breakdown is supported on Windows only.
- Supported protocols must be TCP request/response based protocols.
- Non-web based (TCP) transaction breakdown cannot be used with VuGen Speed Simulation.

This section includes the following topics:

- "[Understanding How BSM Breaks Down Transaction Response Times](#)" below
- "[Understanding Transaction Breakdown Categories for Non-Web Based \(TCP\) Transactions](#)" below
- "[Understanding Time to First Buffer and Download Time for Non-Web Based \(TCP\) Transactions](#)" on page 83
- "[Understanding Breakdown Report Data for Non-Web Based \(TCP\) Transactions](#)" on page 83
- "[Notes and Limitation for Non-Web Based \(TCP\) Protocols](#)" on page 83

- **Understanding How BSM Breaks Down Transaction Response Times**

When BSM runs a BPM script and measures response time for a specific transaction, BSM collects breakdown data—information about TCP activities during the transaction—for each request (component) of the transaction. A TCP request (component) represents a sequence of measurements starting with a DNS resolution, TCP Connect operation, or a Send operation on an open connection and ending with the last Receive operation for the relevant starting operation.

Because some TCP based protocols can use multiple connections, at any given moment in time there can be an overlap in the various breakdown categories.

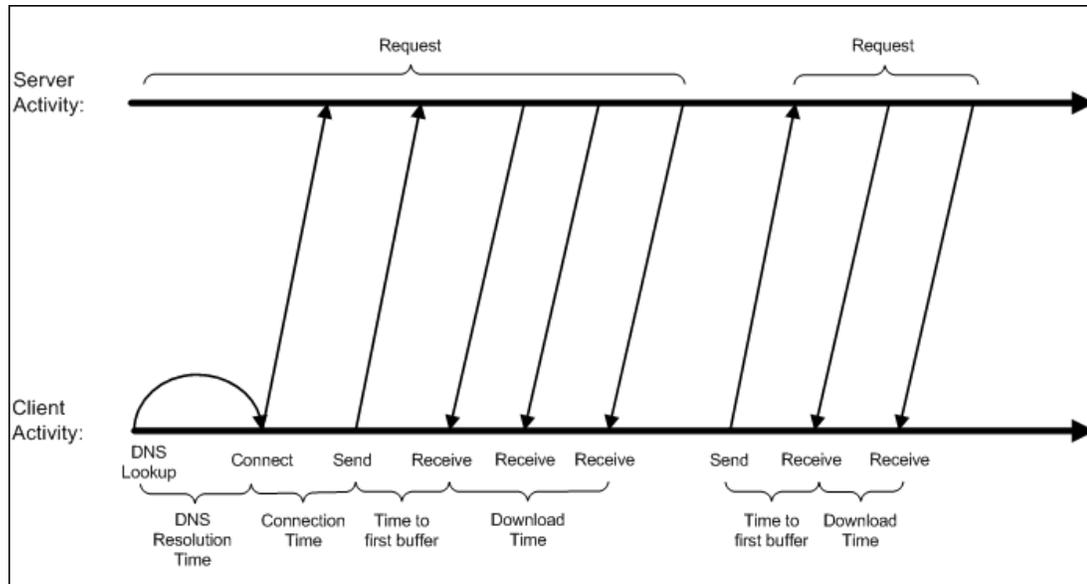
- **Understanding Transaction Breakdown Categories for Non-Web Based (TCP) Transactions**

The transaction breakdown reports display a breakdown of average transaction response times

(in milliseconds) over time, for the selected time frame. Response times are broken down by DNS resolution time, connection time, time to first buffer, download time, and client time.

The diagram below illustrates the relationship between the report's main breakdown categories (shown along the bottom of the diagram) and TCP client/server activity during transaction execution. In the diagram, there are two sequential TCP requests included in the same connection.

Note that client time is not shown in this diagram and is described in the breakdown category table. For details, see "Client Time" in the table below.



The following table describes the report's breakdown categories, which comprise a TCP request. Times are calculated by taking the average of all transaction runs within the specified time period.

Name	Description
DNS Resolution	<p>Displays the average amount of time needed to resolve the DNS name to an IP address, using the closest DNS server. The DNS Lookup measurement is a good indicator of slow DNS resolution or other problems with the DNS server.</p> <p>Note: If the DNS resolution is adjacent to a Connect for the same IP address, it is considered part of the request (component) and its time is displayed in the breakdown reports. Otherwise, the DNS resolutions of one or more hosts without an adjacent Connect are considered as a separate request (component). In such cases, only the DNS Resolution time is displayed for that request and for all other measurements, a minus sign (-) is displayed.</p>

Name	Description
Connect Time	<p>Displays the average amount of time needed to establish an initial connection with the TCP server performing the transaction. The connection measurement is a good indicator of problems along the network or whether the server is responsive to requests. Note: If a connection did not occur within a request's (component's) context, a minus sign (-) is displayed for the connection time in the breakdown reports.</p>
Time to First Buffer	<p>Displays the average amount of time that passes from the first TCP Send up to and including the first Receive of a component. This measurement includes both network time and server time that are required for handling the first TCP buffer and therefore, it is a good indicator of both network quality and server delay.</p> <p>Note: This measurement is only shown if both Sends and Receives are included in the request (component). If there are no Sends or Receives within a request (component), a minus sign (-) is displayed in the breakdown reports.</p>
Network Time to First Buffer	<p>Displays the time from the first Send up to and including the last Send. This measurement is a good indicator of network quality.</p> <p>Note: This measurement is only shown if there are Sends included in the request (component), but no Receives.</p>
Server Time to First Buffer	<p>This measurement is only shown if there are Sends included in the request (component), but no Receives. A minus sign (-) is displayed in the breakdown reports.</p>
Download Time	<p>Displays the time from the receipt of the second TCP buffer up to and including receipt of the last byte.</p> <p>Download time usually only includes network time and is influenced by both network quality and component size.</p> <p>For more details, see "Understanding Time to First Buffer and Download Time for Non-Web Based (TCP) Transactions" on next page.</p> <p>Note: If a download did not occur within a request's (component's) context, a minus sign (-) is displayed for the download time in the breakdown reports.</p>
Client Time	<p>Displays the average amount of time that passes while a request is delayed on the client machine. Client-related delays can include CPU think time, processing time, time needed to open sockets, time between the last Receive of a request and the first Send of the next request in the same connection, and so on.</p> <p>Note: Client time is calculated by subtracting all other measured times from the total transaction time.</p>

Note: Either Time to First Buffer or Network Time to First Buffer and Server Time to First

Buffer are displayed.

• Understanding Time to First Buffer and Download Time for Non-Web Based (TCP) Transactions

Time to First Buffer includes both network time (for sending the packet) and server time (for processing the packet), whereas Download time usually includes only network time (for downloading the rest of the reply packets). This means that if both Time to First Buffer and Download times increase, it is a good indicator of network quality problems and if only Time to First Buffer increases, it is usually a good indicator of server delay problems.

• Understanding Breakdown Report Data for Non-Web Based (TCP) Transactions

The same breakdown reports are used to display web based breakdown data and non-web based (TCP) breakdown data, but the following differences apply when viewing non-web based (TCP) breakdown data:

- The **Page** column (which displays page names for web based transactions) is not applicable for non-web based transactions and a minus sign (-) is displayed in this column for all non-web based components.
- The **Retry Time** and **SSL Handshake Time** columns are not applicable for non-web based transactions and a minus sign (-) is displayed in these columns for all non-web based components.
- In the **Component/Request** column (which displays URLs for web based breakdown data), the name of the TCP request (component) is displayed. The name can be one of the following:
 - **TCP_BdwnDns<nnn>**. For DNS only components (for example, a DNS component that does not have an adjacent Connect component correlated to the same IP address). The number in the display is sequentially incremented for each component entry. For such entries, only the DNS Resolution time is displayed and for all other measurements, a minus sign (-) is displayed.
 - **TCP_BdwnReq<nnn>**. For TCP request components. The number in the display is sequentially incremented for each component entry.
- For non-web based (TCP) components, there is no tooltip available for the **Page** column.
- You cannot click a non-web based (TCP) component to drill down to further information about it.

• Notes and Limitation for Non-Web Based (TCP) Protocols

The following table lists the TCP protocols for which breakdown data can be displayed, together with special notes and limitations where applicable:

Protocol	Notes and Limitations
SAP GUI	Multi-threaded protocol.
SMTP	N/A

Protocol	Notes and Limitations
POP3	The communication in a POP3 script usually starts with a server's greeting message. Consequently, the first TCP breakdown component (request) in the script is usually reported with valid DNS and Connect times, whereas the Download time is reported as 0 and all other time measurements are not applicable and are shown with a minus (-) sign in the reports.
IMAP	The communication in an IMAP script usually starts with a server's greeting message. Consequently, the first TCP breakdown component (request) in the script is usually reported with valid DNS and Connect times, whereas the Download time is reported as 0 and all other measurements are not applicable and are shown with a minus (-) sign in the reports.
Oracle 2-Tier	Some of the steps in an Oracle 2-Tier script end with data being sent by the client, without receiving any response. Consequently, there are TCP breakdown components reported with a Network Time to First Buffer value ≥ 0 and with all other measurements not applicable and shown with a minus (-) sign in the reports.
ODBC	N/A
FTP	Both FTP passive and FTP active modes are supported.
LDAP	The last step in an LDAP script (which terminates the connection to the server) usually ends with data being sent by the client, without receiving any response. Consequently, there is a corresponding TCP breakdown component reported with a Network Time to First Buffer value ≥ 0 and with all other measurements not applicable and shown with a minus (-) sign in the reports.
EJB	Multi-threaded protocol.
RMI Java	<ul style="list-style-type: none"> ■ Multi-threaded protocol. ■ Both RMI over IIOP and RMI over JRMP are supported. ■ Some Java applications which use the RMI protocol send many ping requests between application-driven RMI calls. Consequently, the TCP breakdown reports many components with a small Time to First Buffer value and with a Download size of approximately 1 byte. ■ The last step in an RMI script (which terminates the connection to the server) sometimes ends with data being sent by the client, without receiving any response. Consequently, there is a corresponding TCP breakdown component reported with a Network Time to First Buffer value ≥ 0 and with all other measurements not applicable and shown with a minus (-) sign in the reports.

Protocol	Notes and Limitations
<p>Java Record/Replay</p>	<ul style="list-style-type: none"> ■ A protocol which supports and combines the following Java protocols—RMI, CORBA, JMS, JACADA, and Custom Hooks. TCP breakdown is supported only when the script is recorded using RMI protocol calls. If the script includes other protocol calls, TCP breakdown results are not defined. ■ Multi-threaded protocol. ■ Both RMI over IIOP and RMI over JRMP are supported. ■ Some Java applications which use the RMI protocol send many ping requests between application-driven RMI calls. Consequently, the TCP breakdown reports many components with a small Time to First Buffer value and with a Download size of approximately 1 byte. ■ The last step in a Java Record/Replay script (which terminates the connection to the server) sometimes ends with data being sent by the client, without receiving any response. Consequently, there is a corresponding TCP breakdown component reported with a Network Time to First Buffer value ≥ 0 and with all other measurements not applicable and shown with a minus (-) sign in the reports.
<p>Oracle NCA</p>	<p>If the script works over http communications, you can run it using web breakdown (which is the default).</p> <p>If the protocol is run using TCP socket communications instead of http, web breakdown is not applicable and you can run it using TCP breakdown instead, providing that:</p> <ul style="list-style-type: none"> ■ the script is recorded in such a way so that the Active Types with which the script is recorded are Oracle NCA only (that is, the script does not include WEB (http/html)). ■ you move the Oracle NCA protocol from the BdSupportedProtocols list to the AdvancedTcpBdSupportedProtocols list in the agent1.cfg file on the BPM machine.

Calculating Transaction Breakdown from Component Breakdown

BSM uses a weighted algorithm to display the breakdown data that it collects. Every breakdown category for every element of the connection requests is taken into consideration, and weight is given to the element according to its value relative to the other elements in the concurrent time period. For example, the Connect time for each request in the connection is collected, weighted, and then displayed under the Connect time category.

WebTrace Report

WebTrace is a network diagnostics tool that provides traceroute information to a specified destination. WebTrace records the route through the Internet from your host machine to the destination web server.

The WebTrace report provides information on network performance, which helps you analyze application performance issues. For each destination, the WebTrace report breaks down route time from the host machine to the destination machine.

Run WebTrace

End time: 28/10/2009 17:19:43
 Reachable: Yes
 Destination name: www.hp.com
 Destination IP: 15.217.49.74
 Source IP: 16.59.89.29
 Round trip time: 218
 Retries: 2
 Number of hops: 25

Hop Name	Hop IP	Hop Reachable	Hop Retries	Round Trip Time
-	192.118.44.74	Yes	0	0
212.199.249.77.static....	212.199.249.77	Yes	0	0
core-1.pt-susita-vl22....	212.199.26.39	Yes	0	0
-	-	No	2	0
EDGE.LON-02-RE1-s...	80.179.165.21	Yes	0	78
-	62.189.148.33	Yes	0	78
...	...	Yes	0	78

<p>To access</p>	<p>Use one of the following:</p> <ul style="list-style-type: none"> • Select Application page > Monitoring Status area. Select a WebTrace and click the Run Task  button. • Select Business Transaction Flow page > Tasks area (or Tasks Included... area). Select a WebTrace and click the Run Task  button. • Select a host in the Business Process Monitor tree, click the Run  button, and then click the Run WebTrace  button. In the Run WebTrace dialog box, enter the destination address, port number, and timeout and then click Run.
<p>Important information</p>	<ul style="list-style-type: none"> • BPM supports WebTrace over TCP, UDP, and ICMP. By default, it is set to use TCP. For details on changing the protocol, see "Changing the Communication Protocol Used by WebTrace" on page 147. • BPM is set to access a maximum of 30 hops when using WebTrace to reach a site. If 30 hops are not enough to reach the site, it is reported as unreachable. For details on changing the maximum number of hops, see "Changing the Maximum Number of Hops for WebTrace" on page 146.

General WebTrace Information Area

User interface elements are described below:

UI Element	Description
End time	The time that the WebTrace finished.
Reachable	Whether it was possible to reach the destination address.
Destination name	The destination web address.
Destination IP	The IP address of the destination machine.
Source IP	The IP address of the BPM host machine.
Round trip time	The time it takes, in milliseconds, for a packet of data to be sent from the host machine to the destination web site.
Retries	The number of times a data packet tries, but fails, to reach its destination due to timeout, network difficulty, and so forth.
Number of hops	The number of intermediate servers the data packet encounters before it reaches its destination.

Hop Information Table

User interface elements are described below:

UI Element	Description
Hop Name	The name of the intermediate server.
Hop IP	The IP address of the intermediate server.
Hop Reachable	Whether it was possible to reach the specific hop.
Hop Retries	The number of times a data packet tries, but fails, to reach an intermediate server due to timeout, network difficulty, and so forth.
Round Trip Time	The time, in milliseconds, from the source to the specific hop and back.

Chapter 13

Run Schedules and Orders

You can configure how often and when a run unit (an application or business transaction flow) is run on a BPM instance by setting schedules and start offsets. You can also determine the order in which the tasks (scripts and WebTraces) included in a run unit are run by setting run modes.

This section also includes:

- "Run Units" below
- "Schedules" on next page
- "Start Offset" on page 90
- "Run Modes" on page 92

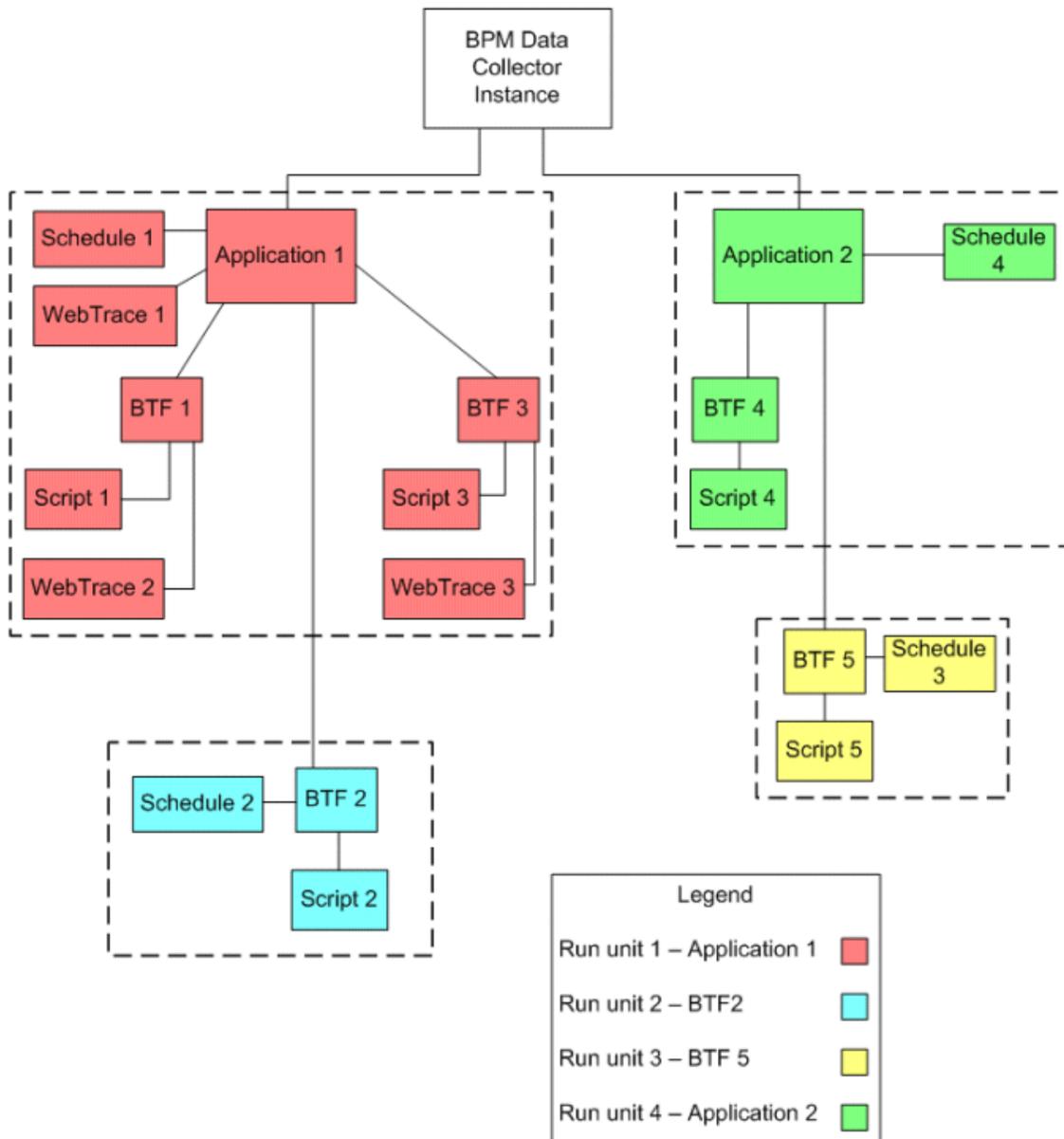
Run Units

A run unit is an application, or a business transaction flow with its own schedule, and all the entities contained within it. By default, business transaction flows are included in their parent application's run unit (using the same schedule and run mode), but you can configure different schedules and run modes for individual business transaction flows. If a business transaction flow has its own schedule, it is not included in the application run on the BPM instance, but is run as an independent unit.

The following diagram shows the run units for a BPM instance that includes two applications. The first application (Application 1) includes one application level WebTrace and three business transaction flows (BTF1, BTF2, BTF3). BTF1 includes one script and one WebTrace, BTF2 includes one script and has its own schedule, and BTF3 contains one script and one WebTrace. Since BTF2 has its own schedule, it is considered as a separate run unit from the application.

The second application (Application 2) includes two business transaction flows (BTF4 and BTF5). BTF4 and BTF5 each include one script, and BTF5 has its own schedule. Since BTF5 has its own schedule, it is considered as a separate run unit from the application.

Since each application is a separate run unit, there are a total of four run units in the Business Process Monitor instance—Application 1, BTF2, BTF5, and Application 2.



Schedules

Each run unit (an application or business transaction flow) running on a BPM instance runs according to a schedule defined in End User Management Administration (for details, see "Business Process Monitor Administration User Interface" in the BSM Application Administration Guide). Each application or business transaction flow can also have multiple schedules defined for it, as described in ["Multiple Schedules" on next page](#).

The schedule defines the frequency of iterations of the run unit after its first run. The actual run time of the run unit is determined by the start offset value configured for it, which specifies the delay between the run unit schedule time and the run time, as described in ["Start Offset" on next page](#).

Note that if a run unit run overruns the scheduled time for the next run iteration, then BPM skips the missed iteration and continues with the next scheduled iteration. For example, if an application

schedule is set to run every 5 minutes, and the application run actually takes 6 minutes, then BPM runs iteration 1, skips iteration 2, and continues with iteration 3 (10 minutes after the first iteration).

Information on skipped runs is logged in the **agent.txt** log for the BPM instance.

Multiple Schedules

In End User Management Administration, you can define multiple schedules for an application or business transaction flow running on a specific BPM instance. This enables you to have the application or business transaction flow run on BPM using different schedules at different times. For example, you can have an application run every 15 minutes during the working week and every hour during weekends.

When a run unit has multiple schedules defined for it, each schedule (and its start offset value) is shown in the **Schedule List** area on the corresponding Application or Business Transaction Flow page.

Note: If the multiple schedules for a run unit overlap, then BPM runs the run unit according to both schedules. If a run unit run (initiated according to one of the schedules) overruns the scheduled time of a run iteration according to the second schedule, then BPM skips the second iteration, and continues with the next scheduled iteration. Information on skipped runs is logged in the **agent.txt** log for the BPM instance.

Start Offset

BSM enables you to apply an offset to the start time of each run of a run unit (application or business transaction flow). This enables the optimal distribution of script runs over time, and minimizes the parallel running of many scripts (when there are different BPM hosts running the same run unit). Staggering the runs provides a more even distribution of the workload, avoiding overload on the monitored server and excessive bandwidth demand, and enabling better utilization of machine CPU and memory.

Note: It is recommended not to change the default start offset as this may reduce BPM performance and adversely affect the optimal distribution of tasks.

The start offset value, displayed in the **Schedule List** area on the Application or Business Transaction Flow page, specifies the delay between the run unit schedule time and the actual run time, for each run of the run unit. The start offset for each application can be calculated automatically by BPM, or can be user-defined; you determine the method and value when defining the application or business transaction flow schedule. When the start offset is configured manually, you can avoid the possibility that run units running on more than one BPM run at the same time.

After the initial run, BPM continues to run the run unit according to the original schedule defined for the application or business transaction flow (in End User Management Administration), and reapplies the start offset for every run of the run unit.

For example, an application has a start offset value of 120 seconds, and a schedule of every 15 minutes, every day from 10:00 to 16:00. Each day, the first run of the application begins after the start offset, at 10:02 AM. The next run is 15 minutes later, at 10:17 AM, and repeats every 15 minutes after that till the end of the day's schedule.

Note:

- For schedules that run all day, all week, the start offset is applied from 00:00 AM, so that for a schedule of 15 minutes and start offset of 120 seconds, the run unit (application or business transaction flow) runs at 15 minute intervals from 00:02 AM.
- If you define multiple schedules to run an application or business transaction flow on a single BPM, a different start offset value may be used for each schedule. For more information, see ["Multiple Schedules" on previous page](#).
- When you configure offsets for running applications or business transaction flow on BPMs in different locations, you must take into consideration the time zone setting for each location.

There are two methods for staggering the run start time:

User-Defined Start Offset

When defining an application or business transaction flow schedule (in End User Management Administration), you have the option to select User defined for the start offset, and enter a start offset value.

The start offset value is saved as part of the application or business transaction flow schedule data, and applied by each BPM that handles the run unit. If a BPM is restarted, the same offset value is applied again for the run unit.

If you define the start offset value as 0, then no offset is applied for the run unit in BPM; the run unit run starts at the time specified in the application or business transaction flow schedule.

Note: It is recommended not to override the default setting in general, and specifically not to set an offset of 0, as this can impact BPM performance and adversely affect the distribution of script runs.

Start Offset Determined by Business Process Monitor

BPM is able to generate start offset values for run units, so enabling staggered run times for the run units. Start offset values are allocated to all applications and business transaction flows that have **BPM default** defined for their schedule start offset in End User Management Administration.

The start offset is calculated when the run unit is initialized. The calculation takes into account all existing start offset values for the run units on the machine; this includes start offset values that were defined in End User Management Administration, and the start offset values of active applications or business transaction flows. BPM analyses where there is the lowest concentration of offsets over the distribution period, and allocates a start offset value in that area. The start offset value is always smaller than the schedule interval defined for the application or business transaction flow.

BPM uses an algorithm to calculate the dispersal rate, and to allocate start offset values to the run units in a balanced and semi-random manner. The random factor means that when there are two or more BPM instances running the same application or business transaction flow with the same schedule, each instance runs the run unit at a different time. (If there was no random factor, each BPM instance would run the run unit at exactly the same time.) The random factor does not change the order that the applications or business transaction flows run, and the interval between each run

of the run unit on each BPM instance remains constant. For example, on BPM A an application may run at 10:05, 10:20, 10:35, and on BPM B it may run at 10:10, 10:25, 10:40.

The algorithm calculation includes a distribution period value. This value is set by default to one hour, which is an optimum value if the most common schedule used for your applications or business transaction flows is every 15 minutes (the default schedule option when defining applications or business transaction flows in End User Management Administration), and all schedule intervals are less than an hour.

The default distribution period also functions if you are commonly using other schedule intervals for your applications or business transaction flows; however, if you would like to optimize the dispersion of the start offset values for your application or business transaction flow schedules, or if you experience load problems on the machine, you can change the default distribution value in order gain maximum efficiency. For information on changing the distribution value (OffsetDistPeriodSec), see "Parameters in agent1.cfg" on page 104.

Note that if BPM is restarted, it calculates new start offset values for the run units (except for applications or business transaction flows that have user-defined values from their schedule).

Run Modes

The **Monitoring Status** area of the Application or business transaction flow page shows the running dependencies for the scripts and WebTraces in the application or business transaction flow. This identifies the order that BPM uses when executing each script and WebTrace in the run unit, during each run on the BPM instance.

The order and timing for running the tasks (scripts and WebTraces) within the run unit are determined by the application or business transaction flow run mode. The application or business transaction flow run mode determines how BPM runs the tasks in a run unit when it begins an iteration. Some of the run modes run the tasks in a specific order according to predefined criteria; in this case, the scripts run in the order defined in the application or business transaction flow.

Both the run mode and the script order are defined for the application or business transaction flow in End User Management Administration (see "Business Process Monitor Administration User Interface" in the BSM Application Administration Guide).

Note: It is recommended only to change the default run modes when specifically needed. Some non default run mode configurations may adversely affect BPM performance.

The following run modes are supported and the examples shown are based on the following run unit configuration:

Application 1			
Application Level WebTraces	Business Transaction Flows		
WT1	BTF1	BTF2	BTF3
WT2	WT3	WT5	WT6
	WT4	Script 4	Script 5

Application 1			
	Script 1		Script 6
	Script 2		
	Script 3		

Classic

All scripts in the run unit run sequentially, according to the order defined in End User Management Administration. All WebTrace schemes in a business transaction flow start running concurrently with the first script of the business transaction flow. Application level WebTraces start running concurrently with the first script of the first business transaction flow.

Run Order Example

Each column (from left to right) represents the next stage in the running order.

1	2	3	4	5	6
BTF1 and Application Level WebTraces			BTF2	BTF3	
Script 1	Script 2	Script 3	Script 4	Script 5	Script 6
WT1			WT5	WT6	
WT2					
WT3					
WT4					

The tasks included in a business transaction flow start running, regardless of whether previously run WebTraces have finished running. For example, BTF2 (Script 4 and WT5) starts running after Script 3 finishes running, regardless of whether the WebTraces (WT1-WT4) have finished running.

Dialup

If a run unit has two or more scripts, the first script begins running when the run unit begins an iteration. When the first script completes its run, all WebTrace schemes and scripts, excluding the first and last scripts, run in Classic mode. When all tasks stop running, the last script runs. If a run unit has fewer than two scripts, it runs in Classic mode.

Note:

- If the first script in the run unit (the connect script) does not complete its run successfully, the rest of the scripts in the unit will not run.
- If the first script completes its run, the last script always runs.
- An application running in dialup mode must contain a business transaction flow that includes only a hang up script (that is, it must not include any other scripts or WebTraces). This business transaction flow must be the last one in the application.

Run Order Example

Each column (from left to right) represents the next stage in the running order.

1	2	3	4	5	6
BTF1			BTF2	BTF3	
First Application Script					Last Application Script
Script 1	Script 2	Script 3	Script 4	Script 5	Script 6
	WT1		WT5	WT6	
	WT2				
	WT3				
	WT4				

Sequential

All run unit tasks run sequentially (with only one task running at a time). The script tasks run according to the order defined in End User Management Administration. WebTrace tasks run after the last script is completed, with an undefined (though consistent) order.

Run Order Example

Each column (from left to right) represents the next stage in the running order.

1	2	3	4	5	6	7	8	9	10	11	12
BTF1			BTF2	BTF3		All WebTraces (application and business transaction flow levels)					
Script 1	Script 2	Script 3	Script 4	Script 5	Script 6	WT 1	WT2	WT3	WT4	WT5	WT6

Concurrent

All tasks begin running simultaneously when the run unit begins an iteration. (This is the same as selecting Stepped run mode and setting the Step value as 0.)

Run Order Example

Each column (from left to right) represents the next stage in the running order.

1
BTF1
BTF2
BTF3
All WebTraces (application and business transaction flows)

1
Script 1
Script 2
Script 3
Script 4
Script 5
Script 6
WT1
WT2
WT3
WT4
WT5
WT6

Stepped

Each task begins running after a defined time period (step) has passed from the time the previous task started. In this case, the **Running Dependencies** column in the BPM Admin Application or Business Transaction Flow page displays, for example: 5 seconds after the beginning of the following task: X_transaction, meaning that the task runs only after a step of 5 seconds has elapsed since X_transaction task started running. The scripts run according to the order defined in End User Management Administration. All WebTrace tasks (on both application and business transaction flow levels) also run in stepped mode after the last script has started, in an undefined (though consistent) order.

Run Order Example

BTF1
BTF2
BTF3
All WebTraces
Script 1
[step] Script 2
[step] Script 3
[step] Script 4
[step] Script 5
[step] Script 6
[step] WT1
[step] WT2
[step] WT3
[step] WT4
[step] WT5
[step] WT6

Chapter 14

Business Process Monitor Configuration Files

The BPM configuration files define default parameter values that are used for BPM functioning. Some of these values can be changed within the configuration files, while other parameter values should only be changed using BPM Admin, or should not be changed at all. Not all of the parameters automatically appear in the configuration files, but can be added manually if you want to override the default value used by BPM.

To change parameter values within a configuration file:

1. Stop BPM.
2. For Windows Server 2008 and Windows 7, copy the configuration file to a user temp folder (%temp%).
3. Open the configuration file in a text editor.
4. Modify the value of the parameter as required.
5. Save the file and restart BPM.
6. For Windows Server 2008 and Windows 7, copy the file back to its original location.

Note: When working on a Windows platform in languages other than English, do not edit and save configuration files in Notepad. Saving configuration files in UTF-8 format in Notepad may cause severe functionality problems in Business Process Monitor.

The BPM configuration files are located in the <BPM application directory>\config directory. The default BPM application directory is:

- Windows Server 2003 and Windows XP
C:\Documents and Settings\All Users\Application Data\HP\BPM
- Windows Server 2008 and Windows 7
C:\ProgramData\HP\BPM

Parameters in topaz_agent_ctrl.cfg

The <BPM application directory>\config\topaz_agent_ctrl.cfg file, which controls communication between the Gateway Server and BPM, contains the following parameters:

Section	Parameter	Description	Default Value	Changing the Value
comm-center	DisableSubLogs	<p>Instructs BPM on whether to create the commcenter_Site#.txt logs for the instance.</p> <p>The following two options are available:</p> <ul style="list-style-type: none"> • 0 – the logs are created • 1 – the logs are not created 	0	The value can be changed in the topaz_agent_ctrl.cfg file.
comm-center	LogMaxSize	<p>Determines the maximum <Business Process Monitor Workspace directory>\ commcenter\ commcenter.txt log file size (in kilobytes).</p>	5120 kilobytes	The value can be changed in the topaz_agent_ctrl.cfg file.
comm-center	LogLevel	<p>Instructs BPM to log only entries of the specified level or higher to the commcenter.txt file. The following levels exist:</p> <ul style="list-style-type: none"> • fatal • error • warning • flow • debug <p>If this parameter is set to debug, all entries are logged; if the parameter is set to flow, all entries aside from debug are logged; if the parameter is set to warning, both the flow and debug entries are not logged, and so forth.</p>	Flow	The value can be changed in the topaz_agent_ctrl.cfg file.

Section	Parameter	Description	Default Value	Changing the Value
comm-center	LogNumOfBackups	Determines the number of log history files to keep.	5	The value can be changed in the topaz_agent_ctrl.cfg file.
comm-center	LogBackupOnOpen	InstructsBPM to back up the existing commcenter.txt log file when opening a new log file.	True	The value can be changed in the topaz_agent_ctrl.cfg file.
comm-center	LogBackupOnMaxSize	Instructs BPM to back up the commcenter.txt log file when it reaches its defined maximum size.	True	The value can be changed in the topaz_agent_ctrl.cfg file.
comm-center	LogBackupDuration	Determines the duration (in hours) for which the backups of the commcenter.txt log file are kept.	168 hours	The value can be changed in the topaz_agent_ctrl.cfg file.
HTTPSender	HTTPSenderTimeoutSec	The timeout, in seconds, for http requests to BSM.	600 seconds	Do not change this value.
General	HostVersion	The version of BPM installed on the machine.	<Business Process Monitor version>	Do not change this value.
General	UserDomain	The domain of the user that is to run all the BPM processes, if they are to be run by a specific user.	""	The value can be changed in BPM Admin.

Section	Parameter	Description	Default Value	Changing the Value
General	UserPasswd	The encrypted password of the user that is to run all the BPM processes, if they are to be run by a specific user.	""	The value can be changed in BPMAAdmin.
General	UserName	The name of the user that is to run all the BPM processes, if they are to be run by a specific user.	""	The value can be changed in BPM Admin.
General	RegistrationHourInterval	The interval at which BPM communicates with BSM to re-register itself.	12 hours	Do not change this value.
General	Workspace	The directory in which the BPM work files are stored. Note that if you change this value, only some of the log files under the Workspace directory are moved to the new path (logs in commcenter and agent1 directories), not all.	For Windows: <Business Process Monitor application directory>\Workspace	If you want to change the location of all logs under the Workspace directory, see "Moving the Workspace Logs" on page 142.
Site#	SiteURL	The BSM URL.	<HP Business Service Management URL>	The value can be changed in BPM Admin.
Site#	JobPoll	The interval, in minutes, between requests to BSM for job updates.	2 minutes	The value can be changed in BPM Admin.

Section	Parameter	Description	Default Value	Changing the Value
Site#	TimePoll	The interval, in minutes, between requests to the Gateway Server to retrieve BSM's time.	60 minutes	The value can be changed in BPM Admin.
Site#	SiteVersion	The BSM version.	<HP Business Service Management version>	Do not change this value.
Site#	UserName	The name of the user that is to run the instance's transactions, if these are to be run by a specific user.	""	The value can be changed in BPM Admin.
Site#	UserPasswd	The encrypted password of the user that is to run the instance's transactions, if these are to be run by a specific user.	""	The value can be changed in BPM Admin.
Site#	UserDomain	The domain of the user that is to run the instance's transactions, if these are to be run by a specific user.	""	The value can be changed in BPM Admin.
Site#	HostLocation	The location defined for the host machine. This is a logical location that is used by BPM for registration to BSM. The default value is the name of the BPM host machine.	<Business Process Monitor machine location>	You can override the location using the Location Manager in BSM. Once overridden, this value is redundant.

Section	Parameter	Description	Default Value	Changing the Value
Site#	DisplayName	The name of the default instance displayed in the BPM Admin table and tree.	<display name>	The value can be changed in BPM Admin.
Site#	HostId	The ID allocated by BSM for this specific BPM instance.	<Business Process Monitor machine ID>	Do not change this value.
Site#	PauseCommunication	InstructsBPM to stop communication to BSM. When the value of this parameter is 0, communication with BSM is enabled; when the value is 1, communication is stopped.	0 (no pause)	
Site#	LocationId	The ID allocation by the Location Manager in BSM for this specific BPM instance.	<Business Process Monitor machine location ID>	Do not change this value.
Site#	HostName	The name defined for the host machine. This is a logical name that is used by BPM for registration to BSM. The default value is the actual name of the BPM host machine.	<Business Process Monitor machine name>	The value can be changed in BPM Admin.
Site#	PauseMeasurements	Instructs BPM to stop running transactions and WebTrace schemes. The following two options are available: 0 – no pause 1 – pause	0 (no pause)	Do not change this value.
Site#	TimeDelta	The difference, in seconds, between Gateway Server site time and BPM time.	<time difference>	Do not change this value.

Section	Parameter	Description	Default Value	Changing the Value
Site#	ForceVersion	<p>Instructs the BPM instance to behave as though it is connected to the BSMversion set in the SiteVersion parameter, and ignore the version returned by BSM itself.</p> <p>The following two options are available:</p> <ul style="list-style-type: none"> • 0 – do not force (use version returned by BSM) • 1 – force (use the version defined in SiteVersion) <p>Note that ForceLegacy can still be set, as it only affects communication, and not the rest of the behavior.</p>	0 (do not force)	Consult HP Software Support if you want to change this value.
Site#	HostIPForRegistration	<p>Sets a specific IP address to be used when the BPM instance is registered to BSM. For example, if the BPM machine has more than one network card, you can specify which card to use when registering the BPM instance.</p>	<Business Process Monitor machine default IP address>	The value can be changed in the topaz_agent_ctrl.cfg file.

Section	Parameter	Description	Default Value	Changing the Value
Site#	Com-mandLineAdditions	<p>To apply the Business Day Date Parameterization feature in BPM, you must include the param_non_working_days parameter as the value for this parameter using the following syntax:</p> <p>Com-mandLineAdditions=-param_non_working_days "<weekend day numbers separated by commas>"</p> <p>The following example configures Friday and Saturday as weekend days:</p> <p>Com-mandLineAdditions=-param_non_working_days "6,7"</p>	""	The value can be changed in the topaz_agent_ctrl.cfg file.
Agent1	DisplayName	The name of the BPM machine.	<Business Process Monitor machine name>	Do not change this value.
Agents	Agent1	The list of BPM instances.	<site1, site2,...>	Do not change this value.

Parameters in agent1.cfg

The **<Business Process Monitor application directory>\config\agent1.cfg** file, which controls BPM behavior, contains the following parameters:

Section	Parameter	Description	Default Value	Changing the Value
general	TaskTimeoutMinutes	Determines the amount of time after which BPM times out all scripts and WebTrace schemes that are still running.	15 minutes	The value can be changed in the agent1.-cfg file.
general	Concurrent Profiles	Determines the number of profiles that can be run concurrently. The following options are available: <ul style="list-style-type: none"> • 0 – An unlimited number of profiles can run concurrently. • A value other than 0 – The number specified is the maximum number of profiles that can run concurrently. 	0 (an unlimited number of profiles can run concurrently.)	The value can be changed in the agent1.-cfg file.
general	GlobalRunHandler	The run mode BPM allocates when the run mode is not previously defined for the profile. The run mode determines how BPM runs the tasks in a profile when the profile begins an iteration. <p>For an explanation of the run modes, see "Run Modes" on page 92. The following options are available:</p> <ul style="list-style-type: none"> • Classic • Dialup • Sequential • Concurrent 	Classic	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
general	WebreplayConcurrentConnectionBackwardCompatible	<p>Determines the WebReplay behavior for the VuGen scripts. The following options are available:</p> <ul style="list-style-type: none"> • Auto – Scripts created in VuGen 7.5 and below use old WebReplay behavior and scripts created in VuGen 7.6 and higher use new WebReplay behavior. • Always – scripts always use old WebReplay behavior. • Never – scripts always use new WebReplay behavior. 	Auto	The value can be changed in the agent1.-cfg file.
general	AdjustScheduleToDST	<p>Determines whether time settings in BPM are adjusted for Daylight Savings Time (DST). The following options are available:</p> <ul style="list-style-type: none"> • 1 or true – times are adjusted for DST. • 0 or false – times are not adjusted for DST. 	true	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
general	SaveHistoricLRWFiles	<p>If a script is configured to generate a logfilewrite log, this parameter determines whether to save only the current logfilewrite log file for the script, or to save previous logfilewrite log files as well. The following options are available:</p> <p>1 – historical files are saved.</p> <p>0 – historical files are not saved.</p> <p>Historical logfilewrite log files must be deleted manually. To avoid unnecessary use of disk space, delete old files and reset the parameter to 0 when not needed.</p>	0	The value can be changed in the agent1.-cfg file.
general	SendSOEToBAC	<p>Determines whether to send Snapshot on Error data to BSM, or to store it locally on the BPM machine. The following options are available:</p> <ul style="list-style-type: none"> • 1 – never send snapshots to BSM. • 2 – always send snapshots to BSM. • 3 – use the script configuration to determine whether or not to send snapshots to BSM. 	3	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
general	SendRumBeacon	Adds a special header to network requests created by scripts with protocols from the Coloring-SupportedProtocols parameter. The header enables the Real User Monitor probe to distinguish between synthetic user data and real user data.	false	The value can be changed in the agent1.-cfg file.
Offset Distributer	OffsetDistPeriodSec	Determines the offset distribution period (in seconds) used by the algorithm that calculates the start offset for the run of each profile. The value can be from 4 to 86400 seconds. For more information, see "Optimizing Run Unit Scheduling" on page 144.	3600 seconds	The value can be changed in the agent1.-cfg file.
agent	DisableSubLogs	Instructs BPM on whether to create the <code>agent_Site#.txt</code> logs for the instance. The following two options are available: <ul style="list-style-type: none"> • 0 – the logs are created. • 1 – the logs are not created. 	0	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
agent	LogLevel	<p>Instructs BPM to log only entries of the specified level or higher in the <Business Process Monitor application directory>\Workspace\agent1\agent.txt file. The following levels exist:</p> <ul style="list-style-type: none"> • fatal • error • warning • flow • debug <p>If this parameter is set to debug, all entries are logged; if the parameter is set to flow, all entries aside from debug are logged; if the parameter is set to warning, both the flow and debug entries are not logged, and so forth.</p>	Flow	The value can be changed in the agent1.-cfg file.
agent	LogBackupOnOpen	Instructs BPM to back up the existing agent.txt log file when opening a new log file.	True	The value can be changed in the agent1.-cfg file.
agent	LogBackupOnMaxSize	Instructs BPM to back up the agent.txt log file when it reaches its defined maximum size.	True	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
agent	LogMaxSize	Determines the maximum agent.txt log file size (in kilobytes).	5120 kilobytes	The value can be changed in the agent1.-cfg file.
agent	LogBackupDuration	Determines the duration (in hours) for which the backups of the agent.txt log file are kept.	168 hours	The value can be changed in the agent1.-cfg file.
agent	LogNumOfBackups	Determines the number of log history files to keep.	5	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
Agent_ Site# (This section can be manually added to set the log parameters for each instance.)	LogLevel	Instructs BPM to log only entries of the specified level or higher in the <Business Process Monitor application directory>\Workspace\agent1\agent_Site#.txt file. The following levels exist: <ul style="list-style-type: none"> fatal error warning flow debug If this parameter is set to debug , all entries are logged; if the parameter is set to flow , all entries aside from debug are logged; if the parameter is set to warning , both the flow and debug entries are not logged, and so forth.	Flow	The value can be changed in the agent1.-cfg file.
Agent_ Site#	LogBackupOnOpen	Instructs BPM to back up the existing agent_Site#.txt log file when opening a new log file.	True	The value can be changed in the agent1.-cfg file.
Agent_ Site#	LogBackupOnMaxSize	Instructs BPM to back up the agent_Site#.txt log file when it reaches its defined maximum size.	True	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
Agent_ Site#	LogMaxSize	Determines the maximum agent_Site#.txt log file size (in kilobytes).	5120 kilobytes	The value can be changed in the agent1.-cfg file.
Agent_ Site#	LogBackupDuration	Determines the duration (in hours) for which the backups of the agent_Site#.txt log file are kept.	168 hours	The value can be changed in the agent1.-cfg file.
Script-Launcher	ScriptLauncherUseTCP	Determines the protocol through which BPM communicates with the scripts. The following options are available: <ul style="list-style-type: none"> • 1 – TCP protocol • 0 – shared memory 	0 (shared memory)	Do not change this value.
Script-Launcher	ScriptLauncherSyncEnd	Determines whether the end of a script run is synchronized with the end of a BPM process. The following options are available: <ul style="list-style-type: none"> • 1 – there is synchronization. • 0 – there is no synchronization. 	0 (no synchronization)	Do not change this value.

Section	Parameter	Description	Default Value	Changing the Value
Protocols	BdSupportedProtocols	<p>List of web based protocols that BPM can run with the breakdown option.</p> <p>BPM runs a script with the breakdown option provided the script type is included in this setting.</p> <p>If a script contains multiple protocols, it runs with the breakdown option provided that one of the protocols is included in this setting.</p>	A list of applicable protocols	Do not change this value.
Protocols	SnapshotSupportedProtocols	Determines for which protocols BSM supports Snapshot on Error.	A list of the applicable VuGen protocols	Do not change this value.
Protocols	ColoringSupportedProtocols	<p>Determines for which protocols BPM transactions are colored for requests sent to an application monitored by HP Diagnostics or TransactionVision.</p> <p>If the protocol replay run by the BPM is changed, and contains an http-based protocol that is not included in this parameter, the protocol can be added to the list, separated by a comma.</p> <p>There should be no reason to remove protocols from the list.</p>	A list of all the web-based Vugen protocols (that is, those using http)	The value can be changed in the agent1.-cfg file.

Section	Parameter	Description	Default Value	Changing the Value
Protocols	AdvancedTcpBdSupportedProtocols	<p>List of non-web based protocols that BPM can run with the TCP advanced breakdown option.</p> <p>BPM runs a script with the TCP advanced breakdown option provided the script type is included in this setting.</p> <p>If a script contains multiple protocols, it runs with the TCP advanced breakdown option provided that one of the protocols is included in this setting and none of the protocols is included in the BdSupportedProtocols setting (in which case, the regular breakdown option is used).</p> <p>Note: For notes and limitations about the non-web based protocols, see "Notes and Limitation for Non-Web Based (TCP) Protocols" in "Understanding Response Time Breakdown Reports" on page 77.</p>	A list of applicable protocols	Do not change this value.

Parameters in topaz_data_server.cfg

The <Business Process Monitor application directory>\config\topaz_data_server.cfg file, which controls the transmission of data from BPM to the Gateway Server, contains the following parameters:

Section	Parameter	Description	Default Value	Changing the Value
data_depot	DisableSubLogs	<p>Instructs BPM on whether to create the data_depot_Site#.txt logs for the instance.</p> <p>The following two options are available:</p> <ul style="list-style-type: none">• 0 – the logs are created• 1 – the logs are not created	0	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
data_depot	LogLevel	<p>Instructs BPM to log only entries of the specified level or higher in the <Business Process Monitor application directory>\Workspace\agent1\data\ data_depot.txt file. The following levels exist:</p> <ul style="list-style-type: none"> • fatal • error • warning • flow • debug <p>If this parameter is set to debug, all entries are logged; if the parameter is set to flow, all entries aside from debug are logged; if the parameter is set to warning, both the flow and debug entries are not logged, and so forth.</p>	Flow	The value can be changed in the topaz_data_server.cf-g file.
data_depot	LogBackupOnOpen	Instructs BPM to back up the existing data_depot.txt log file when opening a new log file.	True	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
data_depot	LogBackupOnMaxSize	Instructs BPM to back up the data_depot.txt log file when it reaches its defined maximum size.	True	The value can be changed in the topaz_data_server.cf-g file.
data_depot	LogMaxSize	Determines the maximum data_depot.txt log file size (in kilobytes).	5120 kilobytes	The value can be changed in the topaz_data_server.cf-g file.
data_depot	LogBackupDuration	Determines the duration (in hours) for which the backups of the data_depot.txt log file are kept.	168 hours	The value can be changed in the topaz_data_server.cf-g file.
data_depot	LogNumOfBackups	Determines the number of log history files to keep.	5	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
data_depot	ReportAndForget	<p>Determines whether failed reports are resent to BSM. The following two options are available:</p> <ul style="list-style-type: none">• True – Failed reports are ignored and not resent to BSM.• False – BPM tries to resend failed reports to BSM.	False	Do not change this value.

Section	Parameter	Description	Default Value	Changing the Value
soadata	LogLevel	<p>Instructs BPM to log only entries of the specified level or higher in the <Business Process Monitor application directory>\Workspace\agent1\data\clients\soadata.txt file. The following levels exist:</p> <ul style="list-style-type: none"> • fatal • error • warning • flow • debug <p>If this parameter is set to debug, all entries are logged; if the parameter is set to flow, all entries aside from debug are logged; if the parameter is set to warning, both the flow and debug entries are not logged, and so forth.</p>	Flow	The value can be changed in the topaz_data_server.cf-g file.
soadata	LogBackupOnOpen	Instructs BPM to back up the existing soadata.txt log file when opening a new log file.	True	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
soadata	LogBackupOnMaxSize	Instructs BPM to back up the soadata.txt log file when it reaches its defined maximum size.	True	The value can be changed in the topaz_data_server.cf-g file.
soadata	LogMaxSize	Determines the maximum soadata.txt log file size (in kilobytes).	5120 kilobytes	The value can be changed in the topaz_data_server.cf-g file.
soadata	LogBackupDuration	Determines the duration (in hours) for which the backups of the soadata.txt log file are kept.	168 hours	The value can be changed in the topaz_data_server.cf-g file.
soadata	LogNumOfBackups	Determines the number of log history files to keep.	5	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
transdata	LogLevel	<p>Instructs BPM to log only entries of the specified level or higher in the <Business Process Monitor Workspace directory>\agent1\data\clients\transdata.txt file. The following levels exist:</p> <ul style="list-style-type: none"> • fatal • error • warning • flow • debug <p>If this parameter is set to debug, all entries are logged; if the parameter is set to flow, all entries aside from debug are logged; if the parameter is set to warning, both the flow and debug entries are not logged, and so forth.</p>	Flow	The value can be changed in the topaz_data_server.cfg file.
transdata	LogBackupOnOpen	Instructs BPM to back up the existing transdata.txt log file when opening a new log file.	True	The value can be changed in the topaz_data_server.cfg file.

Section	Parameter	Description	Default Value	Changing the Value
transdata	LogBackupOnMaxSize	Instructs BPM to back up the transdata.txt log file when it reaches its defined maximum size.	True	The value can be changed in the topaz_data_server.cf-g file.
transdata	LogMaxSize	Determines the maximum transdata.txt log file size (in kilobytes).	5120 kilobytes	The value can be changed in the topaz_data_server.cf-g file.
transdata	LogBackupDuration	Determines the duration (in hours) for which the backups of the transdata.txt log file are kept.	168 hours	The value can be changed in the topaz_data_server.cf-g file.
transdata	LogNumOfBackups	Determines the number of log history files to keep.	5	The value can be changed in the topaz_data_server.cf-g file.
transdata	MaxSnapshotSize	Determines the maximum size of the snapshot HTML file reported to Business Availability Center 4.5.2 and earlier.	60 kilobytes	Do not change this value.

Section	Parameter	Description	Default Value	Changing the Value
transdata	Num-berOfSavedSnapshotDays	Determines the number of days to keep old snapshot data that is stored locally on the BPM machine.	5	The value can be changed in the topaz_data_server.cf-g file.
transdata	MaxSnapshotSizeAM5	Determines the maximum size of the snapshot HTML file reported to Business Availability Center 5.0 and later.	256 kilobytes	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
transdata	ScriptEndStatusTimeOut	<p>Determines the behavior for transactions that were not run when a script ends with a status of END_STATUS_TIMED_OUT. The following are the valid options:</p> <ul style="list-style-type: none"> • default—For each transactions that was not run, a sample with a status of 6 (NOT_RUN_STATUS) is sent. • force_no_transdata—For the first transaction that was not run, a sample with a status of 1 (LR_FAIL) is sent. For all the other transactions that were not run, no data is sent. • force_fail_status—a sample with a status of 1 (LR_FAIL), and with the relevant error, is sent for each transaction that was not run. 	default	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
transdata	ScriptEndStatusError	<p>Determines the behavior for transactions that were not run when a script ends with a status of END_STATUS_ERROR. The following are the valid options:</p> <ul style="list-style-type: none"> • default <ul style="list-style-type: none"> ▪ If the script is configured to continue running after the failed transaction, relevant samples are sent accordingly. ▪ If the script is configured not to continue running after the failed transaction, then no data is sent for any of the subsequent transactions. • force_fail_status <ul style="list-style-type: none"> ▪ If the script is configured to continue running after the failed transaction, relevant samples are sent accordingly. ▪ If the script is configured not 	default	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
		<p>to continue running after the failed transaction, then a sample with a status of 1 (LR_FAIL), and with the relevant error, is sent for each subsequent transaction.</p>		
wtdata	LogLevel	<p>Instructs BPM to log only entries of the specified level or higher in the <Business Process Monitor Workspace directory>\ agent1\data\ clients\wtdata.txt file. The following levels exist:</p> <ul style="list-style-type: none"> • fatal • error • warning • flow • debug <p>If this parameter is set to debug, all entries are logged; if the parameter is set to flow, all entries aside from debug are logged; if the parameter is set to warning, both the flow and debug entries are not logged, and so forth.</p>	Flow	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
wtdata	LogBackupOnOpen	Instructs BPM to back up the existing wtdata.txt log file when opening a new log file.	True	The value can be changed in the topaz_data_server.cf-g file.
wtdata	LogBackupOnMaxSize	Instructs BPM to back up the wtdata.txt log file when it reaches its defined maximum size.	True	The value can be changed in the topaz_data_server.cf-g file.
wtdata	LogMaxSize	Determines the maximum wtdata.txt log file size (in kilobytes).	5120 kilobytes	The value can be changed in the topaz_data_server.cf-g file.
wtdata	LogBackupDuration	Determines the duration (in hours) for which the backups of the wtdata.txt log file are kept.	168 hours	The value can be changed in the topaz_data_server.cf-g file.
wtdata	LogNumOfBackups	Determines the number of log history files to keep.	5	The value can be changed in the topaz_data_server.cf-g file.

Section	Parameter	Description	Default Value	Changing the Value
PCBD	Policy	<p>Determines the page component breakdown reporting policy. The following two options are available:</p> <ul style="list-style-type: none"> • Runnum – Data is automatically reported after the specified number of runs. • Threshold – Data is only reported if during the transaction run, the threshold status changes to the Poor (red) status (because the previous run was less than the higher threshold, and the current run is over that threshold) and not when it changes from red status. <p>The transaction thresholds are defined as part of the business process profile properties within End User Management Administration.</p>	<p>Runnum</p> <p>Note: The default policy value for HP Software-as-a-Service is Threshold.</p>	<p>The value can be changed in the topaz_data_server.cf-g file.</p>

Section	Parameter	Description	Default Value	Changing the Value
PCBD	Runnum	Determines the number of runs after which BPM reports page component breakdown data (applicable when the value of the Policy parameter is Runnum).	4 runs	The value can be changed in the topaz_data_server.cf-g file.
soahttp	WakeupMinutesTime	Determines the amount of time, in minutes, after which all the SOA transaction samples in the queue are reported. After this amount of time has elapsed, the SOA transaction samples in the queue are reported, regardless of the number of samples in queue.	1 minute	Do not change this value without consulting HP Software Support.
soahttp	WakeupCount	Determines the number of SOA transaction samples that must be collected before all the SOA transaction samples in the queue are reported. After this number of SOA transaction samples are collected, all the SOA transaction samples in the queue are reported, regardless of the amount of time that has elapsed since the last report.	40 samples	Do not change this value without consulting HP Software Support.

Section	Parameter	Description	Default Value	Changing the Value
soahttp	MaxChunk	Determines the maximum number of SOA transaction samples that can be sent in one http request.	100 samples	Do not change this value without consulting HP Software Support.
soahttp	Priority	This parameter is not currently implemented.		
txhttp	WakeupMinutesTime	Determines the amount of time, in minutes, after which all the transaction samples in the queue are reported. After this amount of time has elapsed, the transaction samples in the queue are reported, regardless of the number of samples in queue.	1 minute	Do not change this value without consulting HP Software Support.
txhttp	WakeupCount	Determines the number of transaction samples that must be collected before all the transaction samples in the queue are reported. After this number of transaction samples are collected, all the transaction samples in the queue are reported, regardless of the amount of time that has elapsed since the last report.	40 samples	Do not change this value without consulting HP Software Support.

Section	Parameter	Description	Default Value	Changing the Value
txhttp	MaxChunk	Determines the maximum number of transaction samples that can be sent in one http request.	100 samples	Do not change this value without consulting HP Software Support.
txhttp	Priority	This parameter is not currently implemented.		
wthttp	WakeupMinutesTime	Determines the amount of time, in minutes, after which all the WebTrace samples in the queue are reported. After this amount of time has elapsed, the WebTrace samples in the queue are reported, regardless of the number of samples in queue.	1 minute	Do not change this value without consulting HP Software Support.
wthttp	WakeupCount	Determines the number of WebTrace samples that must be collected before all the WebTrace samples in the queue are reported. After this number of WebTrace samples are collected, all the transaction samples in the queue are reported, regardless of the amount of time that has elapsed since the last report.	1 sample	Do not change this value without consulting HP Software Support.

Section	Parameter	Description	Default Value	Changing the Value
wthttp	MaxChunk	Determines the maximum number of WebTrace samples that can be sent in one http request.	1sample	Do not change this value without consulting HP Software Support.
wthttp	Priority	This parameter is not currently implemented.		
HTTPSender	HTTPSenderTimeoutSec	The timeout, in seconds, for sending BPM samples to BSM.	300 seconds	Do not change this value without consulting HP Software Support.

Parameters in sconn.cfg

The <Business Process Monitor application directory>\config\sconn.cfg file, which controls the configuration options pertaining to the communication between BPM and the Gateway Server, contains the following parameters:

Section	Parameter	Description	Default Value	Changing the Value
Site#	AuthUser	Determines the user name to be used for basic authentication, if required by BSM.	"" (not defined)	The value can be changed in BPM Admin.

Section	Parameter	Description	Default Value	Changing the Value
Site#	AuthDelay	<p>If you defined authentication parameters for BPM, this parameter determines whether authentication is set only after http code 401 is returned, or from the first request to the web server. The following options are available:</p> <ul style="list-style-type: none"> • 0 (default behavior) – Set authentication parameters from the first request. • 1 – Set authentication parameters only after http code 401 is returned. 	0	Do not change this value without consulting HP Software Support.
Site#	AuthDomain	Determines the domain name to be used for basic authentication, if required by BSM.	"" (not defined)	The value can be changed in BPM Admin.
Site#	AuthPasswd	Determines the encrypted password to be used for basic authentication, if required by BSM.	"" (not defined)	The value can be changed in BPM Admin.
Site#	HandleBinaryContentType	<p>Determines whether to change the content type in the http header of requests sent by the BPM, when the post buffer is binary. The content type in such a case is application/octet-stream (and not application/x-www-form-urlencoded). The following two options are available:</p> <ul style="list-style-type: none"> • 0 – do not change content type • 1 – change content type 	0 (do not change)	Do not change this value without consulting HP Software Support.

Section	Parameter	Description	Default Value	Changing the Value
Site#	HeaderName	Determines the name of the header which should be added or changed, in order to add or override headers to the http request sent by BPM to BSM. For more information, see "Adding or Overriding HTTP Request Headers" on page 137. If this parameter is empty (or does not exist), it is ignored and no addition or change is made to the header.	"" (not defined)	The value can be added/changed in the sconn.cfg file.
Site#	HeaderValue	Determines the value of the header (as defined by parameter HeaderName , above) which should be added or changed.	"" (not defined)	The value can be added/changed in the sconn.cfg file.
Site#	ProxyName	Determines the user name to be used to connect to the proxy server, if you are connecting to BSM using a proxy server.	"" (not defined)	The value can be changed in Business Process Monitor Admin
Site#	ProxyDomain	Determines the domain name to be used to connect to the proxy server, if you are connecting to BSM using a proxy server.	"" (not defined)	The value can be changed in BPM Admin.
Site#	ProxyPasswd	Determines the encrypted user password to be used to connect to the proxy server, if you are connecting to BSM using a proxy server.	"" (not defined)	The value can be changed in BPM Admin.
Site#	ProxyUrl	Determines the proxy server URL to be used if you are connecting to BSM using a proxy server.	"" (not defined)	The value can be changed in BPM Admin.

Section	Parameter	Description	Default Value	Changing the Value
Site#	ResetConnection OnFailure	<p>Reset the caching data saved for the BPMconnection to BSM in case of a communication failure.</p> <p>Determines whether to re-open a new communication session to BSM in case of an http, TCP or SSL connectivity failure. This enables communication caching data (such as SSL or DNS cached data) to be saved.</p> <p>The following options are available:</p> <ul style="list-style-type: none"> • 0 – Do not open a new communication session when there is a connectivity failure. • 1 (default behavior) – Open a new communication session when there is a connectivity failure. • No value – The default option is used and a new communication session is opened when there is a connectivity failure. 	1	The value can be added/changed in the sconn.cfg file.
Site#	SSLClientCert	Determines the SSL client certificate file to be used if SSL client authentication is required by BSM. Note that this file must be in PEM format.	"" (not defined)	The value can be changed in BPM Admin.

Section	Parameter	Description	Default Value	Changing the Value
Site#	SSLServerCert	Determines the SSL authority certificate file to be used if the SSL protocol is required for BPM to communicate with BSM. Note that this file must be in PEM format.	"" (not defined)	The value can be changed in BPM Admin.
Site#	SSLPVK	Determines the SSL private key file used as the pair key of the public key in the SSL client certificate file. This file is required if SSL client authentication is required by BSM. Note that this file must be in PEM format.	"" (not defined)	The value can be changed in BPM Admin.
Site#	SSLPVKPasswd	Determines the encrypted SSL private key password to be used if SSL client authentication is required by BSM.	"" (not defined)	The value can be changed in BPM Admin.
Site#	SSLServerValidate	If you defined an SSL authority certificate file, this parameter determines whether to validate the certificate received in the SSL handshake. By default, the certificate is validated. If you do not want the certificate to be validated, set this parameter to 2.	1 (validate)	Do not change this value without consulting HP Software Support.

Section	Parameter	Description	Default Value	Changing the Value
Site#	SSLHostName Validate	This parameter determines how the host name in the server certificate is validated. The following options are available: <ul style="list-style-type: none"> • 1 – Full validation. • 2 – Validates the existence of the host name only. • 3 – Skips host name validation. 	1 (full validation)	Do not change this value without consulting HP Software Support.
Site#	UseNTLMAuth	Determines whether to use NTLM authentication when communicating with BSM. If authentication parameters are defined and this parameter is set to 1 , NTLM authentication is used. If this parameter is missing, or set to any value other than 1, basic authentication is used.	0	The value can be added/changed in the sconn.cfg file.
Site#	UseNTLMProxyAuth	Determines whether to use NTLM authentication when communicating with proxy. If authentication parameters are defined for proxy and this parameter is set to 1 , NTLM authentication is used. If this parameter is missing, or set to any value other than 1, basic authentication is used.	0	The value can be added/changed in the sconn.cfg file.

Note: To force the BPM to use NTLM authentication for communication with BSM or via a proxy server, you must make sure that under each Site# section (where NTLM authentication is required) one or both of the UseNTLMAuth and UseNTLMProxyAuth parameters are set to 1, as required.

Adding or Overriding HTTP Request Headers

To add or override headers to the http request sent by BPM to BSM, you define the parameters **HeaderName** and **HeaderValue** in the sconn.cfg file, as described in the above table.

Note the following guidelines:

- To add/change more than one header, use HeaderName2 for the second name, HeaderName3 for the third, and so forth. Follow the same principle for the HeaderValue parameter.
- The number of header names must match the number of header values. Otherwise all header names and values are ignored.
- The first header should be configured with the original parameter names (no index). BPM only reads additional headers if they are sequentially numbered. For example, if the following information is added to the sconn.cfg file, only the first two headers are handled. **HeaderName4** and **HeaderValue4** are ignored:

```
[Site1]
AuthDomain=""
ProxyPasswd=""
ProxyName=""
SSLClientCert=""
SSLHostNameValidate="1"
AuthDelay="0"
ProxyUrl=""
SSLServerCert=""
SSLPVK=""
ProxyDomain=""
SSLServerValidate="1"
SSLPVKPasswd=""
HeaderValue="Mozilla/4.0 (compatible; MSIE 5.5; Windows NT 5.0)"
HeaderName="User-Agent"
HeaderName2="Content-Type"
HeaderValue2="application/x-www-form-urlencoded;charset=UTF-8"
HeaderName4="Content-length"
HeaderValue4="100"
```

Parameters in encryption.properties

The **<Business Process Monitor application directory>\config\encryption.properties** file, which controls the configuration options pertaining to the encryption of all sensitive data in BPM, contains the following parameters:

Note: This file is read-only and you should not change any of the values.

Parameter	Description	Default Value	Changing the Value
crypt.secret.key.active.id	Determines the value of the active key id.	1	Do not change this value without consulting HP Software Support.
crypt.secret.key	Determines the encrypted secret key (encrypted by the seed key from the seed.properties file) to be used to encrypt/decrypt all sensitive data in BSM. Note: The secret key is generated automatically.	"" (not defined)	The value is generated once for each installation or upgrade.
crypt.conf.active.id	Determines the value of the configuration id.	1	Do not change this value without consulting HP Software Support.
crypt.conf.1	Determines the value of the encryption algorithm to be used to encrypt/decrypt all sensitive data in BSM.	AES/ECB/NoPadding	Do not change this value without consulting HP Software Support.

Parameter	Description	Default Value	Changing the Value
crypt.conf.2	Determines the value of the encryption algorithm to be used to encrypt/decrypt all sensitive data in BSM.	DESede/ECB/PKCS5Padding	Do not change this value without consulting HP Software Support.
crypt.generated.key.size	Determines the value of the generated key size to be used to generate new secret key.	256	Do not change this value without consulting HP Software Support.
mac.verification.algorithm	Determines the value of the mac algorithm to be used to verify all encrypted data.	HmacSHA256	Do not change this value without consulting HP Software Support.

Parameters in seed.properties

The <Business Process Monitor application directory>\config\seed.properties file, which controls the configuration options pertaining to the encryption of all sensitive data in BPM, contains the following parameters:

Note: This file is read-only and you should not change any of the values.

Parameter	Description	Default Value	Changing the Value
crypt.seed.conf	Determines the value of the encryption algorithm to be used to generate a new seed secret key	AES/ECB/NoPadding	Do not change this value without consulting HP Software Support.
crypt.seed.key	Determines the seed secret key to be used to encrypt/decrypt the crypt.secret.key in the encryption.properties file.	"" (not defined)	The value is generated once for each installation or upgrade.
crypt.generated.key.size	Determines the value of the generated seed key size to be used to generate a new seed secret key.	256	Do not change this value without consulting HP Software Support.
mac.verification.algorithm	Determines the value of the mac algorithm to be used to verify an encrypted secret key.	HmacSHA256	Do not change this value without consulting HP Software Support.

Chapter 15

Advanced Configuration Options

This section describes the following advanced configuration options for BPM:

- "Moving the Workspace Logs" below
- "Changing the Default Port" on next page
- "Optimizing Run Unit Scheduling" on page 144
- "Viewing the Catalina DOS Window" on page 145
- "Enabling User Authentication" on page 145
- "Running Tomcat as a Specific User" on page 146
- "Changing the Maximum Number of Hops for WebTrace" on page 146
- "Changing the Communication Protocol Used by WebTrace" on page 147
- "Disabling the Close Application Mechanism" on page 147
- "Configuring Snapshot on Error" on page 148
- "Adjusting Business Process Monitor Time to Daylight Savings Time" on page 149
- "Registering a Specific IP Address for a Business Process Monitor Host Machine" on page 150
- "Mapping Network Drives for Scripts" on page 151
- "Communication Using SSL" on page 151

Moving the Workspace Logs

If required, you can change the path for the Workspace directory in the **topaz_agent_ctrl.cfg** file, to store the log files in a new location. However, this only moves some of the log files under the Workspace directory (logs in commcenter and agent1 directories), not all.

If you want to change the location of all logs under the Workspace directory, use the following procedure. All file paths are under the **<Business Process Monitor root directory>**. Edit all files in a text editor.

To move all Workspace logs:

1. Stop BPM.
2. In the ..**<Business Process Monitor application directory>\config\topaz_agent_ctrl.cfg** file, change the path for the Workspace parameter to the required path.
3. In the ..**<Business Process Monitor root directory>\ServletContainer\config\agentview.props** file, change the path for the **mdrvfile** parameter to the new Workspace path.

4. In the ..<Business Process Monitor root directory>\launch_service\dat\nanny\topaz_agent_ctrl.nanny file, find the section that relates to your platform, and within the section change the path after **-out** to the new Workspace path.
5. In the ..<Business Process Monitor root directory>\launch_service\dat\nanny\webtrace.nanny file, find the section that relates to your platform, and within the section change the path after **-out** to the new Workspace path.
6. In the ..<Business Process Monitor root directory>\launch_service\dat\nanny.ini file, change the path for the **log_output_dir** parameter to the new Workspace path.
7. In the ..<Business Process Monitor root directory>\servletcontainer\bin\catalina.bat file, search for **-Dbpm.workspace**, and change the path for the parameter to the new Workspace path.
8. In the ..<Business Process Monitor root directory>\launch_service\dat\nanny\catallina.nanny file, change the path for the **bpm_admin_out.log** file in the **start_nt** parameter to include the new Workspace path.
9. Restart BPM.

Changing the Default Port

By default, BPM Admin uses port 2696 on the host machine. If required, you can change the port. Use the new port value in the URL when accessing BPM Admin from a browser window.

To change the default port:

1. Stop BPM and make sure that all processes are stopped.
2. Open <Business Process Monitor root directory>\ServletContainer\conf\server.xml in a text editor.
3. Look for the XML element **Connector** with an attribute scheme set to **http** or **https**. Change the attribute port to the required port value, and save the file.
4. (For Windows platforms only) Select **Start > Programs > HP Business Process Monitor**, then right-click the **Business Process Monitor Admin** link. Select **Properties** from the displayed menu to open the Business Process Monitor Admin Properties dialog box.
5. If the Business Process Monitor Admin Properties dialog box contains a **Web Document** tab, open the tab and change the port in the **URL** box to the new port value, then click **Apply**. Skip to [Step 13](#).

If the Business Process Monitor Admin Properties dialog box does not contain a Web Document tab, continue with the next step.

6. Open the **General** tab and find the **Location** field. Open a Windows Explorer window and browse to the path that appears in the **Location** field (for example, C:\Documents and Settings\All Users\Start Menu\Programs\HP Business Process Monitor).
7. Delete the Business Process Monitor Admin shortcut from the folder.
8. Select **File > New > Shortcut**. The first page of the Create Shortcut Wizard is displayed.
9. In the **Type the location of the item** box, enter the BPM Admin URL using the new port number: `http://localhost:<new port value>/`.

Click **Next**.

10. In the **Type a name for this shortcut** box, enter Business Process Monitor Admin.
Click **Finish**.
11. Check that a new Internet shortcut has been created in the folder.
12. Select **Start > Programs > HP Business Process Monitor**, right-click the **Business Process Monitor Admin** link, and select **Properties**. In the displayed Business Process Monitor Admin Properties dialog box, access the **Web Document** tab and check that the new port value is now displayed in the **URL** box.
13. Restart BPM.

Optimizing Run Unit Scheduling

BPM uses an algorithm to calculate the start offset for BPM run unit (applications or business transaction flows overriding the parent schedule) scheduling, as described in "[Start Offset](#)" on page 90. The distribution period for the algorithm is defined by the parameter **OffsetDistPeriodSec** in the **<Business Process Monitor application directory>\config\agent1.cfg** file. The default value for this parameter is one hour (3600 seconds), which is an optimum value when the majority of your run unit schedules use the default schedule option of every 15 minutes, or a multiple of 15, for example, 30 minutes or 7.5 minutes.

If you are commonly using other schedule intervals for your run units (meaning that the majority of your run unit schedule intervals are not multiples of 15 minutes), you can change the default distribution period to fine tune the offset balancing, enabling unit runs to be more evenly dispersed. The value you use for **OffsetDistPeriodSec** is calculated using the formula **common_unit_interval * (2^x)**, where the common unit interval represents the schedule interval most commonly used for your run units (or, if there is no predominant schedule interval, the highest schedule interval).

For example, if the majority of your run units are set to run every 20 minutes (schedule interval 20), then the parameter **OffsetDistPeriodSec** should be set to one of the following:

```
20 * 20 = 20 minutes = 1200 seconds
20 * 21 = 40 minutes = 2400 seconds
20 * 22 = 80 minutes = 4800 seconds
```

and so forth.

It is recommended that the distribution period value be equal or greater to the highest schedule interval used in your run units. For example, if the majority of your run units have a schedule interval of 20 minutes, but one has a schedule of 45 minutes, then you could set the distribution period to 80 minutes. The minimum value for the period is 4 seconds, the maximum is 24 hours.

If you need assistance in determining the distribution period value that gives you maximum efficiency, contact HP Software Support.

Note: If you do not configure the distribution period to fit the schedule intervals used in your run units, BPM uses the default value to schedule start offset values for the run units. In most cases, this value is adequate; however, there may be cases where the scheduling process is not optimum (run units do not run with equal distribution in the period).

Viewing the Catalina DOS Window

By default, the Catalina DOS window is hidden when running BPM. You can use the following procedure to keep it visible.

To view the Catalina DOS window:

1. Open the **<Business Process Monitor root directory>\launch_servicedat\nanny\catalina.nanny** file in a text editor.
2. Change the line:
`show_window= 0`
to
`show_window=1`
3. Save the file.
4. Restart BPM.

Enabling User Authentication

The following procedure enables you to define the web users permitted to access the BPM Admin tool using basic authentication.

Note: If you configure basic authentication for the BPM Admin console, you are unable to use the following utilities in the End User Management application in BSM:

- BPM Page Component Breakdown on Demand
- BPM WebTrace on Demand
- BPM Transaction Invocation

To define users for basic authentication:

1. Stop BPM and make sure that all processes are stopped.
2. Open the **<Business Process Monitor root directory>\ServletContainer\conf\web.xml** in a text editor.
3. Uncomment the section called **Security Constraint and Login Configuration** and save the file.
4. Open the **<Business Process Monitor root directory>\ServletContainer\conf\tomcat-users.xml** in a text editor and add the list of allowed users for Business Process Monitor. All users must be assigned **roles="bpm_admin"**.

For example, the line:

```
<user username="user1" password="abc" roles="bpm_admin" />
```

adds a user called "user1" with a password of "abc" to the users who are allowed to access BPM Admin.

5. Save the file.
6. Restart BPM.

Running Tomcat as a Specific User

BPM Admin uses Tomcat (Catalina) as its web server. In general Tomcat is not considered a secure web server. To improve security, it is recommended not to run Tomcat:

- as a system user
- on a Windows platform, as a user with administrator permissions

By default, Tomcat runs under the same user to which BPM is configured—the system user (default setting).

On a Windows platform, you can configure Tomcat to run as a specific user using one of the methods described:

- Run the Business Process Monitor service as a specific user (currently, Tomcat and the Business Process Monitor processes run under the same Business Process Monitor Service). This solution is not recommended, unless specifically advised by HP Software Support.

You configure the Business Process Monitor service as a specific user from the **Log On** tab in the HP Business Process Monitor Properties dialog box (**Control Panel > Administrative Tools > Services**, then right-click **Business Process Monitor** and select **Properties**).

This solution is suitable only for running all instances under the same user and is not suitable for any configuration that includes a WebTrace.

Note: Starting BPM from the Start menu recreates the Business Process Monitor Service as a system user. As such, after configuring the service to run as a specific user using the method described above, make sure to start the service itself—do not use the Start menu. (To start the service, select **Start > Settings > Control Panel > Administrative Tools > Services**, and then select **Start** from the **HP Business Process Monitor** right-click menu.)

- Configure the user to run Tomcat alone. This involves disabling nanny monitoring of Tomcat and then running Tomcat from a command line.

Note: Tomcat will not be monitored by Business Process Monitor **nanny** so it will shut down each time the user logs off.

To configure the user to run Tomcat alone:

- a. Stop BPM.
- b. Open the file **<Business Process Monitor root directory>\launch_service\data\nanny\catalina.nanny** in a text editor.
- c. Change `enable="1"` to `enable="0"`.
- d. Save the file and restart BPM.
- e. In a Command Prompt window, move to **<Business Process Monitor root directory>\ServletContainer\bin** and execute `catalina run`.

Changing the Maximum Number of Hops for WebTrace

BPM is set to access a maximum of 30 hops when using WebTrace to reach a site. If 30 hops are not enough to reach the site, it is reported as unreachable.

If required, you can increase or decrease the maximum number of hops by editing the default value in the **webtrace.ini** file.

To modify the maximum number of hops value:

1. On the BPM machine, open the **<Business Process Monitor root directory>\dat\webtrace.ini** file in a text editor.

Note: For Windows Server 2008 and Windows 7, you must copy the file to the user temp directory (%temp%), edit it there, and then copy it back to the original directory.

2. Look for:

```
[Request]
DefaultMaxTTL=30
```

3. Change the value for **DefaultMaxTTL** to the required number of hops.
4. Save your changes.
5. Restart BPM for the change to take effect.

Changing the Communication Protocol Used by WebTrace

By default, BPM is set to use TCP when running WebTrace. If required, you can change the default communication protocol by editing the default value in the **webtrace.ini** file.

To modify the default communication protocol value:

1. On the BPM machine, open the **<Business Process Monitor root directory>\dat\webtrace.ini** file in a text editor.

Note: For Windows Server 2008, and Windows 7, you must copy the file to the user temp directory (%temp%), edit it there, and then copy it back to the original directory.

2. Look for:

```
[Request]
DefaultProtocol=&lt;current protocol setting&gt;
```

3. Change the value for **DefaultProtocol** to the required protocol.
4. Save your changes.
5. Restart BPM for the change to take effect.

Disabling the Close Application Mechanism

The mechanism to automatically close the application being tested when running QuickTest Professional scripts (described in "QuickTest Professional Scripts" in ["Requirements and Limitations for Running Tasks" on page 16](#)) is enabled by default for scripts run on BPM.

If required, you can disable the mechanism for a specific script.

To disable the mechanism:

1. Browse to the **<QuickTest Professional>\Tests\<script name>** folder and open the **default.cfg** file in a text editor.

2. In the **General** section, add the following:

```
DisableEndProcessesOnFail=1
```

Note: To re-enable the mechanism, delete the statement.

3. Save the file. The mechanism no longer closes an application being tested if the QuickTest Professional script fails before it runs the last step (which closes the application).

Configuring Snapshot on Error

When recording scripts with HP Virtual User Generator or QuickTest Professional (QTP), you can enable the Snapshot on Error option.

For details on enabling Snapshot on Error in HP Virtual User Generator, see the HP Virtual User Generator documentation. For details on enabling Snapshot on Error in QuickTest Professional see the HP QuickTest Professional User Guide.

Once enabled, during a script run BSM saves a snapshot of a page as it appears when an error occurs during the script run. The snapshots can be viewed in the Error Summary Report and in the Triage Raw Data report. For details, see "BPM Error Summary Report" and "Triage Report" in the BSM User Guide.

The list of HP Virtual User Generator protocols for which BSM supports Snapshot on Error is configured in the **SnapshotSupportedProtocols** parameter in the **agent1.cfg** file. For details, see "[Parameters in agent1.cfg](#)" on page 104.

Note: When BSM records a snapshot for scripts recorded using one of the web protocols, it saves only HTML code. Resources such as images and JavaScript are not saved. Thus, errors that occur due to missing resources may be difficult to trace later on from the snapshot, especially in cases where the missing resource problem has been fixed. For example, if an image resource is missing during a script run, causing an error to be recorded, but the missing image problem is later fixed, the image is present when you open the snapshot of the page.

Storing Snapshots:

You can configure BPM to send snapshots to BSM or to store them locally on the BPM machine, and you can also configure how long to keep the locally saved snapshots.

Snapshots that are stored locally on the BPM machine are stored under the **<Business Process Monitor Workspace directory>\agent1\data\clients\saved_snapshots** directory. A subdirectory is created for each day on which snapshots are taken, in the format of day_month (for example, for snapshots taken on April 20 a subdirectory called **20_4** is created). A further subdirectory is created for each snapshot in the format of run unit name_transaction name_hour.minute. For example, for a snapshot generated at **11:25 PM** in transaction **trans1** in run unit **unit1**, the subdirectory **unit1_trans1_23.25** is created. The actual snapshot is stored in the directory as a zip file called **snapshot.zip**. For the example above, the full pathname and file is:

```
<Business Process Monitor workspace
directory>\agent1\data\clients\saved_snapshots\20_4\unit1_trans1_
23.25\snapshot.zip
```

If more than one snapshot file is generated for the same transaction in the same run unit within a single minute, the additional snapshot files are sequentially numbered in the format of `snapshot.number.zip` – for example, **snapshot.2.zip**.

To configure where snapshots are stored:

1. Edit the **SendSOEToBAC** parameter in the **[general]** section of the **<Business Process Monitor application directory>\config\agent1.cfg** file. The possible values for the parameter are:
 - **1**=Never send Snapshot on Error data to BSM.
 - **2**=Always send Snapshot on Error data to BSM.
 - **3**=Use the script configuration to determine where to send Snapshot on Error data (see step 2 below). This is the default option that is used if the **SendSOEToBAC** parameter has not been set.
2. If the BPM has been configured to use the script configuration to determine where to send Snapshot on Error data (that is, the **SendSOEToBAC** parameter has a value of **3**), then once a script has been saved, edit the **SendSnapshotDataToBAC** parameter in the **[WEB]** section of the **default.cfg** file of the script. The possible values for the parameter are:
 - **0**=Do not send Snapshot on Error data to HP Business Service Management (that is, store it locally on the Business Process Monitor machine).
 - **1**=Send Snapshot on Error data to HP Business Service Management.

To configure how long to keep locally stored snapshots:

Edit the **NumberOfSavedSnapshotDays** parameter in the **[transdata]** section of the **<Business Process Monitor application directory>\config\topaz_data_server.cfg** file and enter the number of required days to keep old snapshot data. The default setting is 5.

Since snapshot data may not be generated every day, the setting in this parameter actually refers to the number of old snapshot directories to keep (that is, the subdirectories whose name consists of the day and month they were created).

Adjusting Business Process Monitor Time to Daylight Savings Time

You can configure BPM to take into account Daylight Savings Time (DST) in its own time zone. When so configured, BPM uses DST when calculating the start and stop times for applications and business transaction flows that are configured with GMT offset schedules.

To configure Business Process Monitor to take DST into account:

Edit the **AdjustScheduleToDST** parameter in the **[general]** section of the **<Business Process Monitor application directory>\config\agent1.cfg** file. The possible values for the parameter are:

- **1. True** - take DST into account.
- **0. False** - do not take DST into account.

The following table shows the various options for an application with an offset from GMT of +2 hours, with a running time of 08:00 - 16:00, and running on a BPM with a time zone offset from GMT of -2 hours:

DST in Effect in the Business Process Monitor's Time Zone	AdjustScheduleToDST Flag Setting	Business Process Monitor Bias From Profile @@@Application	Start Time of Run
No	1	4 hours	04:00 BPM local time
Yes	1	The BPM bias is 4 hours, but since DST is in effect it is one hour ahead, so the real bias is 3 hours (4-1).	05:00 BPM local time
No	0	4 hours	04:00 BPM local time
Yes	0	The BPM bias is 4 hours and although the BPM time zone is in daylight savings time, since the AdjustScheduleToDST flag is set to 0, DST is ignored and the bias stays at 4 hours.	04:00 BPM local time

Note: The **AdjustScheduleToDST** configuration is only relevant for applications and business transaction flows which are schedule to run according to offset from GMT. If the scheduling is done according to BPM local time, the BPM starts running the application or business transaction flow at the hour configured in the schedule, regardless of DST or GMT bias.

Registering a Specific IP Address for a Business Process Monitor Host Machine

BSM communicates with BPM according to the IP address of the BPM host machine that is registered in BSM. If you have multiple network cards on your BPM host machine, you may want to specify a specific one to be used by BSM when communicating with BPM.

To register a specific IP address for a Business Process Monitor host machine:

1. Edit the **<Business Process Monitor application directory>\config\topaz_agent_ctrl.cfg** file on the BPM host machine.
2. Locate the relevant **SiteX** section in the file (you can search for it using the SiteURL key).
3. In the located SiteX section, add a new key called **HostIPForRegistration** with the IP address you want to use. For example:

```
HostIPForRegistration="16.16.16.16"
```

4. Save the file.
5. Restart BPM.

Mapping Network Drives for Scripts

To enable access to mapped network resources within a script, edit **<Business Process Monitor root directory>\ServletContainer\bin\catalina.bat** and add a batch script command to map the required resource. For example:

```
net use j: \\abc.xyz.com\ /USER:username pwd /PERSISTENT:NO
```

The mapped drive is common to all BPM scripts.

Communication Using SSL

You can configure BPM to support https communication with the Gateway Server over the SSL channel and can also configure SSL support for BPM Admin.

For details on configuring https communication with the Gateway Server, see the BSM Hardening Guide.

For details on configuring SSL support for BPM Admin, see "[Accessing Business Process Monitor Admin](#)" on page 19.

Chapter 16

Password Encryption

In Business Process Monitor 9.22, an AES (256-Bit) encryption algorithm enables you to use passwords with strong encryption.

- A UI application (aes_crypt_tool_gui.exe) enables you to encrypt plain text passwords, re-encrypt existing passwords, or decrypt AES passwords.
- A command line application (aes_crypt_tool_cmd.exe) enables you to:
 - Generate encryption keys for each machine
 - Encrypt passwords
 - Decrypt encrypted passwords
 - Re-encrypt previously old encrypted passwords
 - Convert AES encrypted passwords to old encrypted passwords
- A dll (aes_crypt.dll) enables BPM and VuGen scripts to use newly encrypted passwords.

Files Location

The aes_crypt_tool_gui.exe, aes_crypt_tool_cmd.exe, aes_crypt.dll files are located in the **<BPM installation directory>\bin** folder.

You can copy these files to other BPM 9.22 and VuGen 11.50 SP1 machines as necessary.

Generate and Deploy Encryption Keys

To generate and deploy encryption keys:

1. On one of the BPM or VuGen machines, select **Start > Run > cmd** to open the Command Prompt tool.
2. Move to the **<BPM or VuGen installation directory>\bin** folder.
3. Type the following command: **aes_crypt_tool_cmd.exe 1** <the number of BPM and VuGen machines for which you need keys>. For example, if you need keys for 20 machines the command is: **aes_crypt_tool_cmd.exe 1 20**
4. The **EncryptionKeysFile.txt** file is created in the same directory. The file contains a row with 2 keys for each machine, separated by commas. The first key is the VuGen key and the second is the machine key.
5. On each machine, in the **<BPM or VuGen installation directory>\config** folder, create the following sub folders:
 - a. VugenConf
 - b. MachineConf
6. On each of the machines, in the **VugenConf** folder created in step 5, create a file named **VugenInitConf.txt** that contains the key generated in the VuGen Key column of the **EncryptionKeysFile.txt**.

7. On each of the machines, in the **MachineConf** folder created in step 5, create a file named **MachinelnitConf.txt** that contains the corresponding key generated in the Machine Key column of the **EncryptionKeysFile.txt**.

Note for SaaS customers: If you want to have different encryption keys for each customer, repeat the steps 1–7 above for each customer and create the VugenConf and MachineConf folders in step 5 under the **config\<Customer Id>** folder instead of the config\ folder. For example, for customer ID 10, create the VugenConf folder with the following path: <BPM or VuGen installation directory>\config\10\VugenConf.

aes_crypt_tool_cmd.exe Usage and Examples:

Once you have generated and deployed the encryption keys, you can start encrypting and decrypting passwords and using them in scripts.

The `aes_crypt_tool_cmd.exe`, which resides in the <BPM or VuGen installation directory>\bin folder enables you to:

- Generate encryption keys as described above.
- Encrypt passwords (command option 2). For example, to encrypt the password MyPass:

```
aes_crypt_tool_cmd.exe 2 MyPass
```

- Decrypt passwords (command option 3). For example, to decrypt the encrypted password ab34fg:

```
aes_crypt_tool_cmd.exe 3 ab34fg
```

- Re-encrypt old encrypted passwords (command option 4). For example, to re-encrypt the old encrypted password ad424f:

```
aes_crypt_tool_cmd.exe 4 ad424f
```

- Convert AES encrypted passwords to old encrypted passwords (command option 5). For example, to convert the AES encrypted password af32d424f:

```
aes_crypt_tool_cmd.exe 5 af32d424f
```

aes_crypt_tool_gui.exe (GUI Tool) Usage and Examples:

This tool has a graphic user interface and enables you to:

- Encrypt passwords. When you enter a password and click **Encrypt Plain Text and Copy**, the password is encrypted and copied to the clipboard.
- Encrypt old passwords (that is, passwords that are already encrypted by the old encryption in VuGen). When you enter the old password and click **Encrypt Old Password and Copy**, the password is encrypted and copied to the clipboard.
- Decrypt passwords. When you enter the encrypted password and click **Decrypt Password and Copy**, the password is decrypted and copied to the clipboard.

Using Encrypted Passwords in Scripts:

Follow this procedure to use encrypted passwords in scripts:

1. Declare the encryption/decryption functions you want to use in the script. The declaration must be done before the start of **vuser_init()** or **Action()** functions. The declaration is necessary as LoadRunner requires a declaration for every external function that returns a value other than

int. The following example shows the declaration of both the available functions:

```
extern char * convertAESPAss2Old (char *, int);  
extern char * decryptAES(char *, int);
```

2. Before using the functions you must load the dll that handles the encryption/decryption (aes_crypt.dll). This dll is located in the \bin folder on the BPM and VuGen machines. The loading must be done in the **vuser_init()** or **Action()** funtions. The following is an example of how to load the dll:

```
lr_load_dll("aes_crypt.dll");
```

3. You can now call the functions. There are 2 functions as follow:
 - a. **convertAESPAss2Old("<The AES encrypted password>", <customer ID>)** – this function gets the AES encrypted password as a parameter and converts it to an old encrypted password. The second parameter is the customer ID (the customer ID is used for SaaS customers. For non-SaaS customers, the default ID is -1).

Use this function when the script requires a password encrypted in the old way as a parameter. The following is an example of this function:

```
convertAESPAss2Old("ab855cd354", -1) ;
```

- b. **decryptAES("<The AES encrypted password>", <customer ID>)** – this function gets the AES encrypted password as a parameter and converts it to plain text (that is, unencrypted). The second parameter is the customer ID (the customer ID is used for SaaS customers. For non-SaaS customers, the default ID is -1).

Use this function when the script requires a password in plain text as a parameter. The following is an example of this function:

```
decryptAES ("ab855cd354", -1) ;
```

Entering Passwords not Using Functions:

In some cases, you may need to enter passwords in a script, but cannot use functions.

1. The following is an example of a script that cannot use functions and requires a plain text password:

```
web_edit_field("PASSWORD",  
              "Snapshot=t2.inf",  
              DESCRIPTION,  
              "Type=password",  
              "Name=PASSWORD",  
              ACTION,  
              "SetValue=myPlainTextPassword",  
              LAST);
```

Use the following command to store the password in a parameter:

```
lr_save_string(decryptAES("ab855cd354", -1), "prmPassword");
```

Then use the parameter in the script

```
web_edit_field("PASSWORD",  
              "Snapshot=t2.inf",  
              DESCRIPTION,
```

```
        "Type=password",
        "Name=PASSWORD",
        ACTION,
        "SetValue={prmPassword}",
        LAST);
```

2. The following is an example of a script that cannot use functions and requires a password that uses the old VuGen encryption:

```
web_edit_field("PASSWORD",
               "Snapshot=t2.inf",
               DESCRIPTION,
               "Type=password",
               "Name=PASSWORD",
               ACTION,
               " SetEncryptedValue=myEncryptedPassword",
               LAST);
```

Use the following command to convert the password to the required encryption and store it in a parameter:

```
lr_save_string(convertAESPAss2Old ("ab855cd354", -1),
               "prmPassword");
```

Then use the parameter in the script:

```
web_edit_field("PASSWORD",
               "Snapshot=t2.inf",
               DESCRIPTION,
               "Type=password",
               "Name=PASSWORD",
               ACTION,
               " SetEncryptedValue={prmPassword}",
               LAST);
```

Entering Passwords Using the Script Parameterization Feature (integrated in BSM EUM Admin and VuGen):

If you want to enter passwords in a script using the Script Parameters feature which is integrated in BSM and VuGen, you must:

1. Convert the script parameter to a VuGen String object.
2. Decrypt it using one of the two decryption functions.

In the following example, a parameter called **PrmPassword2** is converted to a String object using the **lr_eval_string** function, decrypted using the **decryptAES** function, and then saved as another parameter for later use using the **ls_save_string** function. Finally, the new parameter that includes the decrypted password **PrmPassword** is used in the **web_submit_form** function.

```
lr_save_string(decryptAES(lr_eval_string("{PrmPassword2}"), -1),
               "PrmPassword");
               web_submit_form("login.pl",
                               "Snapshot=t9.inf",
                               ITEMDATA,
```

```
                                "Name=username", "Value=jojo", ENDITEM,  
                                "Name=password", "Value={PrmPassword}",  
ENDITEM,  
  
                                "Name=login.x", "Value=59", ENDITEM,  
                                "Name=login.y", "Value=13", ENDITEM,  
                                LAST);
```

For more information on the script parameterization feature in BSM, refer to the "Script Parameter Management Overview" section in the the BSM User Guide.

For more information on the script parameterization feature in VuGen, refer to the "Parameter Overview" section in the VuGen User guide.

- **Example of Script Using Two Functions:**

The following is an example of the Action section of a script in which the two functions are used:

```
extern char *convertAESPAss2Old(char *, int);  
extern char *decryptAES(char *, int);  
  
Action()  
{  
    lr_load_dll("aes_crypt.dll");  
    lr_message("New 2 Old Pass ='s'", convertAESPAss2Old  
("96862f667ed76e1cd0a7d30fd1124efa", -1));  
    lr_message("decrypt New Pass to plain text='s'", decryptAES  
("96862f667ed76e1cd0a7d30fd1124efa", -1));  
    return 0;  
}
```

- **Example of Script Using Parameters:**

The following is an example of the Action section of a script in which one of the functions uses parameters:

```
extern char *convertAESPAss2Old(char *, int);  
  
Action()  
{  
    lr_load_dll("aes_crypt.dll");  
    lr_save_string(convertAESPAss2Old("d0a7d30fd1124efa ", -1),  
"prmPassword");  
  
    web_edit_field("PASSWORD",  
        "Snapshot=t2.inf",  
        DESCRIPTION,  
        "Type=password",  
        "Name=PASSWORD",  
        ACTION,  
        "SetEncryptedValue={prmPassword}",  
        LAST);  
    return 0;  
}
```

Chapter 17

Workspace Directory and Log Files

The BPM processes can be divided into three main categories:

- Controller
- Agent
- Data server

Each category has one or more log files, all stored under the Workspace directory. There are different types of log files:

- logs that record flow and logics information for events.
- logs that contain resource-related issues, such as memory, communication, threads, and so forth (MDRV logs). These logs only report errors, so an entry indicates a problem in the process.

Each log file has a default memory limit of 5 MB. A new log file is started automatically for a log when the log file reaches its memory limit, or when Business Process Monitor is stopped and restarted.

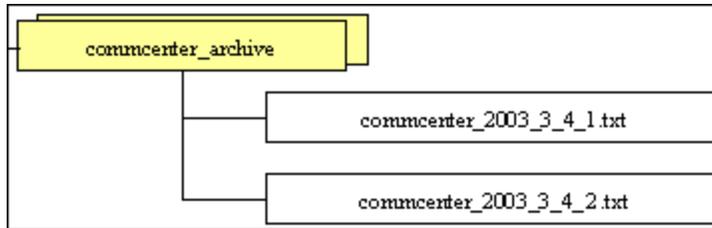
Note that the default values for each log can be edited in the BPM configuration files. For more information, see ["Business Process Monitor Configuration Files" on page 97](#).

This section includes the following topics:

- ["Log Archives" below](#)
- ["Log Entry Format" on next page](#)
- ["Workspace Directory Architecture" on next page](#)
- ["Agent1 Directory" on page 159](#)
- ["Data Directory" on page 160](#)
- ["Site1 Directory" on page 161](#)

Log Archives

Most logs have a corresponding archive. Each archive holds the most recent files for the relevant log (prior to the currently active log file), up to a default maximum of five log files. When a new log file is started, the previous log file is added to the archive and, if the archive already contains the maximum number of files, the oldest file is dropped. The following example shows the archive file structure for the **commcenter_archive** directory, containing two older files for the **commcenter.txt** log.



Log Entry Format

The following are examples of log entries:

```
01/12/2003 20:57:04 FLOW    task 'war_http' (id=52) of application
'AA_Sanity' (id=27) is running
```

```
26/11/2003 16:08:03 ERROR   AgentCtrl: "send configuration" could not
be passed to the agent: Failed to post a message to agent 'Agent1'
(error -1).
```

Each line starts with the date and time, then the level of the message. BPM uses the following log levels for events:

- Fatal
- Error
- Warning
- Flow
- Debug

By default, BPM is set to log only entries of level Flow and higher (meaning that Debug events are not included). You can change the default setting (to show a different level and higher) in the BPM configuration files, as described in ["Parameters in topaz_agent_ctrl.cfg" on page 97](#).

As one BPM can serve more than one BPM instance, some of the messages targeted to a general log (for example, **agent.txt**) are also duplicated to the log for a specific instance (for example, **agent_Site#.txt**). The instance logs for a component are located in the same directory as the component general log (the source log). In the general/source log, each duplicated message ends with **[owner: 'Site#']**. For example:

```
02/12/2003 06:14:01 FLOW    running task 'testik' (id=56) of
application 'bpm_Sanity' (id=57) with timeout of 900 seconds [owner:
'Site3']
```

Workspace Directory Architecture

The Workspace directory contains the following logs and files for BPM:

- **agent1**. The directory for all the logs and files relevant for the agent category. For details, see ["Agent1 Directory" on next page](#).
- **bpm_admin_audit.log (and archive)**. The log for each API call performed through BPM Admin or the BPM SOAP API. This includes tasks such as adding an instance, removing an instance, invoking a task, and so forth.

- **bpm_admin_out.log (and archive)**. The log of the Catalina output. (This file contains the same information printed to the Catalina DOS window, that is hidden by default. If you prefer to view the output in the window, see ["Viewing the Catalina DOS Window" on page 145.](#))
- **commcenter**. The directory for controller logs. The directory contains the following files (and corresponding archives):
 - **commcenter.txt (and archive)**. The commcenter (controller) log, logging events such as registration, and job and time poll intervals.
 - **commcenter_site1.txt (and archive)**. The commcenter (controller) log for a specific BPM instance. Each instance log contains all the entries in the **commcenter.txt** log that are relevant for the instance.
- **manager_task_invoker**. The directory for all output files and logs created for a run of a script, when the script run is invoked using the **Invoke Task** option in BPM Admin.
- **mercwebtrace.log (and archive)**. A log for the mercwebtrace component used with WebTrace in BPM.
- **nanny.log**. The log of the nanny component (responsible for launching the following processes and making sure they are up: tp_bpm_admin, tp_bpm_ctrl, and mercwebtrace).
- **supervisor.txt (and archive)**. This log contains data regarding the launch/failure of the following processes: tp_bpm_admin, tp_bpm_ctrl, and mercwebtrace.
- **topaz_agent_ctrl.log (and archive)**. The MDRV log for the controller category.
- **topaz_agent_manager.log (and archive)**. The log for the TAM's jmdrv. Logs low-level BPM Admin events.
- **webtrace**. The directory for logs relating to the mercwebtrace component, used to handle WebTrace. The directory contains the following files (with corresponding archives, as required):
 - **webtrace.txt**. The log of the management level for WebTrace, logging events such as request handling.
 - **network.txt**. The log of the networking layer in WebTrace.

Agent1 Directory

The agent1 directory contains logs and files that relate to the operation of the agent category.

Note: Site1, Site2, and so forth, are internal names for the BPM instances. You can check which internal name is assigned to each instance in the **<Business Process Monitor application directory>\config\topaz_agent_ctrl.cfg** file.

The agent1 directory contains the following files:

- **agent_Site1.txt (and archive)**. Logs the flow of the agent for a specific BPM instance. Each instance log contains all the entries in the **agent.txt log** that are relevant for the instance.
- **agent.txt (and archive)**. Logs the flow of the agent. Logs events such as processing scripts, running run units (applications or business transaction flows that override their parent application's schedule), downloads, processing errors (for all BPM instances).
- **agent_task_invoker.txt (and archive)**. Logs information regarding invoked tasks (invoked using the **Invoke Now** option in BPM Admin).
- **agent1_drvlog.txt (and archive)**. The MDRV log for the whole agent category.

- **agent1_drvlog_launcher.txt (and archive)**. A log for internal HP use.
- **data**. This directory contains all logs and files relevant for the data server. For details, see "[Data Directory](#)" below.
- **downloads**. A temporary directory for downloads of scripts, without connection to the logs.
- **Site1**. Each "SiteX" directory contains information relating to a specific BPM instance. For details, see "[Site1 Directory](#)" on next page.
- **task_invoker**. This directory contains files regarding the runs of tasks invoked using the **Invoke Now** option in BPM Admin.
- **traceroute**. A directory for traceroute server logs. The directory contains the following file (and corresponding archive):
 - **tracert_drvlog.txt (and archive)**. The MDRV log for the traceroute server component.

Data Directory

The data directory contains the following logs and files relating to the BPM data server:

- **clients**. This directory contains information about the transaction and WebTrace data that is reported to BSM. The information for each finished transaction/WebTrace appears in the client logs at the moment the data is ready to be sent, while the data depot log records what data is actually sent.

The directory contains the following files (and corresponding archives):

- **saved_snapshots**. The directory used to store Snapshot on Error data that is not sent to BSM. For more information on configuring Snapshot on Error, see "[Configuring Snapshot on Error](#)" on page 148.
- **soadata.txt (and archive)**. The log for finished SOA transaction data, including details on the SOA performance and event samples. This log also contains entries for failed SOA calls on which no SOA samples were sent to BSM due to missing data.
- **transdata.txt (and archive)**. The log for finished transaction data. This log also contains entries for transactions that were not run due to problematic scripts, but for which special samples were sent to BSM.
- **wtdata.txt (and archive)**. The log for finished WebTrace data.
- **data_depot.txt (and archive)**. The log for all information relating to reported data, for all BPM instances. For example, this file logs if data reporting was successful or failed, and the number of samples (in a queue) that were included in a report.
- **data_depot_Site1.txt (and archive)**. The log of all information relating to reported data, for a specific BPM instance. Each instance log contains all the entries in the **data_depot.txt** log that are relevant for the instance.
- **datasrv_drvlog.log**. The MDRV log for the whole data server category.
- **queues**. This directory contains the persistency queues for transaction, SOA transaction, and WebTrace reports that have not yet been sent to BSM, or that have not yet been acknowledged by BSM. (If BPM is stopped, the reports are stored in the persistency queues until they can be sent.)

- **snapshots.** This is a temporary directory holding the snapshots (when the Snapshot on Error option is enabled for a script) that are reported by BPM to BSM. For more information on configuring Snapshot on Error, see "[Configuring Snapshot on Error](#)" on page 148.

Site1 Directory

The Site1 (or Site2, Site3, and so forth) directory contains the following logs and files regarding the specific instance's job (when running a script):

- **input_job.xml.** This is the last received .xml file, describing the last job with which the instance dealt (the file may contain only the difference between the last job and the previous one).
- **persistency_job.xml (and archive).** This .xml file stores persistency information for all jobs currently assigned to the instance.
- **<run_unit_id#>.** This directory contains information concerning the run of an application or business transaction flow (run unit), for a specific run unit that the instance is assigned to run. It contains:
 - **<script_id#>.** This directory contains files relating to a script in the run unit:
 - **<script1>.** This directory contains files concerning the run of the script. These files include the script itself, additional files for the script, and the res directory where the output files for the script's run are stored.
 - **<script>.crc.** The .crc file for the script, containing information needed by BPM to run the script, as defined in the database.
 - **<WebTrace_id#>.** This directory is identified by an ID value between 100–199, and is generally empty.

Chapter 18

Planning Business Process Monitor Capacity

This section describes factors that influence a BPM's load and capacity and includes the following topics:

- "Script Loads" below
- "Sizing" on next page
- "Business Process Monitor Configuration Tips" on page 165

Script Loads

The main factors that influence the load you can assign a BPM are:

- The hardware of the BPM machine (in terms of the processor, memory speed, processor L2 cache memory, and so forth).
- The operating system. Since BPM uses services provided by the operating system, differences between operating systems may impact BPM performance.
- The total number of concurrently running scripts on the BPM machine.

For details on hardware and operating system requirements, see "Business Process Monitor System Requirements" in the Business Process Monitor Deployment Guide.

Example of a Simple Configuration with No Concurrent Script Runs

An example of a simple configuration where all the scripts included in the configuration run sequentially is a BPM running a single application that uses the default application schedule of 15 minutes and that includes 15 scripts that each take one minute to complete. In this configuration there will always be a single script running, but no script will run concurrently with another.

Changes to the configuration or its environment may cause scripts to run concurrently. For example, if a script run time lasts longer than one minute due to slow performance.

Automatic Distribution of Concurrent Script Runs

When a BPM has more than one application or business transaction flow configured on it, a special mechanism ensures that the distribution of concurrent running scripts is kept as low as possible.

To allow an even distribution of the BPM's use of resources (such as CPU, memory, and network), the BPM assigns each application or business transaction flow (that has its own schedule) an offset. By using this offset, BPM tries to reduce the number of concurrent script runs by staggering their start time. The offset mechanism is applied whenever a new configuration is assigned to the BPM.

Factors Causing Concurrent Script Runs

Some of the main factors that may cause scripts to run concurrently are:

- The work load assigned to the BPM. This includes:
 - The number of instances configured for the BPM.
 - The number of applications and business transaction flows (run units) per instance.
 - The number of scripts per run unit.
 - The number of transactions per script.
- The scheduled interval configured for run units.
- The average time it takes for a script or run unit to finish a single run.
- The availability and performance of monitored applications. Unavailable or slow applications result in slower script runs.
- The type of the scripts. Some protocols may take a longer time to finish than others (for example, if there is a need to work with FAT client that needs to be initialized).
- The unit run modes (classic, sequential, and so forth). Some modes (such as the stepped mode with a step value of zero) enable you to run scripts concurrently. For details on run modes, "[Run Modes](#)" on page 92.

Note: Changing the default unit run mode overrides the automatic mechanism that distributes script runs. This reduces the load that can be assigned to a BPM. It is strongly recommend that you do not change the default offset in high volume environments.

Sizing

Since there are a number of factors that affect the load on a BPM, and therefore the required configuration, there are a large number of different possible configuration combinations. The following tables list some of the load and system configurations that have been used:

- "[Load Configuration](#)" below
- "[System Configurations](#)" on next page

Note: Changing any one of the parameters may impact the load you can run on a Business Process Monitor.

Load Configuration

Entity	1 Instance	2 Instances	16 Instances
Run units per instance	250	250	30
Scripts per run unit	5	5	5
Transaction per script	4	4	4

Entity	1 Instance	2 Instances	16 Instances
WebTraces per run unit	1	1	1
Total run units	250	500	480
Total scripts	1,250	2,500	2,400
Total transactions	5,000	10,000	9,600
Total WebTraces	250	500	480

Note the following in conjunction with the listed configurations:

- All specifications are related to http web protocols only. Using scripts from other protocols may impact the load that a BPM can run.
- The average script run time is 30 seconds.
- Scheduling is set to 15 minutes for all run units (this is the default schedule).

All other run unit attributes are assigned default values.

System Configurations

The following tables show the processor and memory configurations used for Windows Server 2003 and 2008:

- ["Windows Server 2003 Configuration Details"](#) below
- ["Windows Server 2008 Configuration Details"](#) on next page

Windows Server 2003 Configuration Details

The following settings apply to the processor in the system:

Setting	Value
Name	Intel(R) Core(TM)2 CPU 6600 @ 2.40GHz
Address Width	32
Description	x86 Family 6 Model 15 Stepping 6
Data Width	32
Ext Clock	1066 MHz
L2 Cache Size	4096 Kilobytes
Max Clock Speed	2400 MHz
Processor Type	3 (Central Processor)

The following settings apply to each of the two memory slots in the machine:

Settings	Value
Capacity	2147483648 bytes
DataWidth	64 bits
FormFactor	8 (DIMM)
Speed	667 nanoseconds

Windows Server 2008 Configuration Details

The following settings apply to the processor in the system:

Setting	Value
Name	Intel(R) Core(TM)2 CPU 6600 @ 2.40GHz
Address Width	64
Description	Intel64 Family 6 Model 15 Stepping 6
Data Width	64
Ext Clock	1066 MHz
L2 Cache Size	4096 Kilobytes
Max Clock Speed	2400 MHz
Processor Type	3 (Central Processor)

The following settings apply to each of the two memory slots in the machine:

Settings	Value
Capacity	2147483648 bytes
DataWidth	64 bits
FormFactor	8 (DIMM)
Speed	667 nanoseconds

Business Process Monitor Configuration Tips

This section describes tips and recommendations for configuring BPM:

- BPM must run on a dedicated machine.
- Use the default run unit mode
- If you do not use one of the tried configuration sizes, use the following method to check your BPM capacity.

To check Business Process Monitor capacity for a new configuration:

1. Load the BPM with the new configuration using a rump up method (cycles). In each cycle, assign only a part of the configuration and check that the BPM's capacity is not breached (that is, a very high usage of system resources).
2. Once a BPM is assigned a new configuration, it needs to readjust its scheduling mechanism to the new work load. This readjustment phase (during which the BPM still runs the existing configuration) may take a few minutes, depending on the work load of the existing configuration and the amount of new work required by the new configuration. During the readjustment phase, the BPM's CPU consumption may increase, but should return to normal once the readjustment is complete.

Note: When changing a configuration, there may be a delay in transaction reports and in some cases, transaction runs may be skipped. This applies to currently running scripts.

3. Wait until the readjustment phase stabilizes before applying additional parts of the new configuration.