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AP/TEMS 110.004.1

AutoPilot® M6 Plug-in for TIBCO EMS Installation and User's Guide

Version 1.1

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Chapter 1: Introduction

Welcome to the *AutoPilot/TIBCO Enterprise Message Service Plug-in Guide*. This guide describes installation and uses of the plug-in. Please review this guide carefully before installing the product.

1.1 How This Guide is Organized

Chapter 1: Identifies the users and history of the document, as well as additional and alternate documents. System requirements are outlined in addition to supplying support and reference information.

Chapter 2: Contains a brief functional description of AutoPilot/TIBCO EMS Plug-in.

Chapter 3: Provides instructions for new installations of the TIBCO EMS Plug-in AutoPilot/M6.

Chapter 4: Provides post-installation set-up and configuration instructions.

Chapter 5: Defines the TIBCO EMS metrics.

Chapter 6: Outlines the TIBCO EMS business view and its configuration.

Appendix A: Provides a detailed list of all reference information required for the installation of AutoPilot.

Appendix B: Contains conventions used in this document.

Glossary: Contains a listing of unique and common acronyms and words and their definition.

1.2 History of This Document

Table 1-1. Document History

Release Date:	Document Number	For AutoPilot Versions:	Summary
July 2004	AP/TEMS 100.001	4.0 and higher	Version 1.0
Sept 2004	AP/TEMS 110.001	4.0 and higher	Version 1.1
December 2010	AP/TEMS 110.002	6.0 and higher	Errata
May 2013	AP/TEMS 110.003	6.0 and higher	Mantis 8198
September 2017	AP/TEMS 110.004	6.0 and higher	Update Nastel's phone numbers and street address
May 2022	AP/TEMS 110.004.1	6.0 and higher	Change title to *AutoPilot M6 Plug-in for TIBCO EMS Installation and User's Guide*

1.2.1 User Feedback

Nastel encourages all users and administrators of AutoPilot to submit comments, suggestions, corrections and recommendations for improvement for all AutoPilot documentation. Please send your comments via post/mail, or by *e*-mail. Send messages to: support@nastel.com. You will receive a response, along with status of any proposed change, update, or correction.

1.3 Related Documents

The complete listing of related and referenced documents is listed in Appendix A of this guide.

1.4 Release Notes

See README.HTM files on installation CD or AutoPilot installation directory. Release notes and updates are also available through the Nastel Resource Center

1.5 Intended Audience

This document is intended for personnel installing and customizing AutoPilot M6. The installer should be familiar with:

- TIBCO EMS 4.0 and 3.1.2
- Java Run Time Environment 1.4.1 (JRE 1.4.1) or higher (included in AutoPilot M6 for Solaris, AIX, HP-UX and Linux).
- Target operating system environment.
- The installer may need administrative privileges for the target platform.
- Procedures for installing software on the target platform such as Windows, UNIX, Mac OS etc.

1.6 System Requirements

- TIBCO Enterprise Message Server (EMS 4.0) or Enterprise for JMS (E4JMS 3.x.x)
- At least one AutoPilot managed node must be installed on the machine where TIBCO EMS Server will be monitored.
- The AutoPilot/TIBCO EMS plug-in can be installed on a separate AutoPilot managed node, but will require manual copying of the JAR files.
- The AutoPilot/TIBCO EMS plug-in installation requires approximately 1M of disk space.

	**NOTE:**	AutoPilot/Web has been tested with Internet Explorer 5.5 ServicePack1, Netscape 4.0 and Java browser plug-in 1.4.1 on Windows environments. Other browser configurations may work as well, however, Nastel Technologies, Inc. recommends using IE 5.5 or higher.

1.7 Terms and Abbreviations

A list of terms and abbreviation used in this document is located in the Glossary.

1.8 Technical Support

If you need technical support, you can contact Nastel Technologies by telephone or by e-mail. To contact Nastel technical support by telephone, call **800-963-9822 ext. 1**, if you are calling from outside the United States dial **001-516-801-2100**. To contact Nastel technical support by e-mail, send a message to support@nastel.com. To access the Nastel automated support system (user ID and password required), go to: http://support.nastel.com/. Contact your local AutoPilot administrator for further information.

1.9 Conventions

Refer to Appendix B for typographical and naming conventions used in all AutoPilot documentation.

Chapter 2: About AutoPilot/TIBCO EMS Plug-in

TIBCO Enterprise Message Service™ (TIBCO EMS) software is a high-performance and robust implementation of JMS. TIBCO's messaging software powers the communications infrastructure for the world's top financial institutions.

TIBCO EMS employs a store-and-forward architecture, and supports both queue-based and publish/subscribe messaging, local messaging transactions and, message selectors.

This chapter describes Nastel's AutoPilot/TIBCO EMS Plug-in and its application with AutoPilot.

2.1 Functional Description

The AutoPilot/TIBCO EMS Plug-in can retrieve information about the TIBCO EMS server and its components such as queues, topics, consumers, producers, etc. The collected information available is based on TIBCO EMS implementation of the Java Message Service (JMS) API, which provides a common way to create, send, receive, and read an enterprise messaging system's messages.

The TIBCO EMS Plug-in experts communicate with the TIBCO EMS Server administering object, *TibjmsAdmin*. The AutoPilot TIBCO EMS experts periodically collect information about TIBCO EMS servers and their components via TibjmsAdmin, based on user defined intervals. AutoPilot then translates them into AutoPilot facts. The facts are published to the facts board on an AutoPilot managed node where they are made available to managers and console users. The facts are then available for use in business views.

In TIBCO EMS user management, only admin users and members of the *$admin group* have permissions to perform all server actions, including viewing monitor topics. All other users must be individually granted permission to view system monitor topics. AutoPilot/TIBCO EMS expert's accessibility to EMS is based on the TIBCO EMS user management. Only the *$admin* group members or specified users with privileges to view system monitor topics can deploy the event experts.

AutoPilot/TIBCO EMS experts can monitor TIBCO EMS 3.1.2, 4.0, and 6.1. TIBCO EMS Plug-in experts are modularized based on the EMS servers and its components, for example, queue expert, topic expert, consumer and producer experts. User requirements for performance monitoring activities will determine how the experts are deployed; they can be deployed individually or in any combination of multiple deployments.

One of the key features of TIBCO EMS Plug-in is the *event expert* which can monitor and publish facts for several system events, such as a user is attempting to make a connection, administrator creating a topic or queue or an administrator setting a user's password. System event facts contain detail about the event stored in properties of the message. Each system event has different properties. All system event facts names begin with `TIBCO Expert\Facts\Events\$sys.monitor.*`. The remainder of the name is the event class followed by the event.

The AutoPilot/TIBCO EMS Plug-in can monitor any EMS server, with or without a managed node installed on that machine. Installing a managed node on the same machine as the EMS server is the most efficient method to monitor the server, but it is not required.

New in Version 1.1

An additional expert was developed to support group monitoring. The TIBCO EMS Server Group expert can be used to monitor multiple EMS Servers as a group. Once deployed on a managed node, the expert can dynamically add and delete EMS server(s) that are to be monitored.

When monitoring a relatively small number of TIBCO EMS servers we recommend deploying multiple single server monitors. When monitoring a larger number, use the groups to monitor the servers.

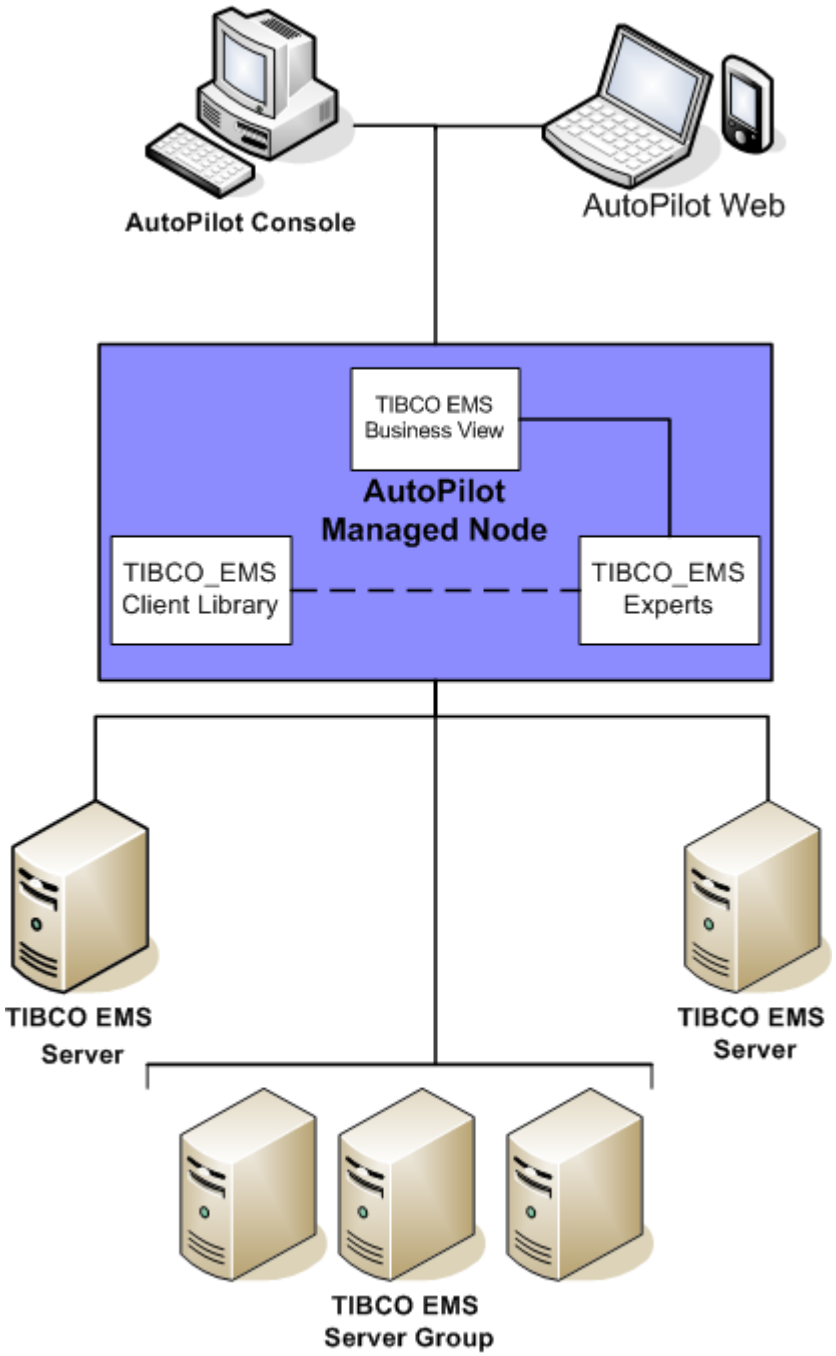

Figure 2-1. Typical AutoPilot/TIBCO EMS Plug-in Deployment

Chapter 3: AutoPilot/TIBCO EMS Installation

This chapter covers the installation and setup requirements for the AutoPilot/TIBCO-EMS Plug-in.

3.1 Before Installation

3.1.1 Technical Documents

Prior to installation you should review all text files and installation procedures on the installation CD or files provided. You should print all of the installation related materials to give yourself quick access to any required information during any installation or migration procedures.

Additional sets of printed documents are available from your Nastel representative or Nastel Support.

3.1.2 Installation Recommendations

Nastel recommends that you observe the following update sequence when updating AutoPilot with patches, updates, and service packs:

- Machines running the Domain Server
- Machines running the managed nodes

3.1.3 Download the TIBCO EMS Plug-in

Download the TIBCO EMS Plug-in from the Nastel Resource Center, or copy from your installation CD.

3.2 Installing the Plug-in

1. Save your work and logoff AutoPilot M6 or AutoPilot/WMQ.

	NOTE:	There are no specific logoff procedures required to exit AutoPilot M6 Console.

2. Stop the managed nodes and/or Domain Servers that will be updated as specified in the *AutoPilot M6 User's Guide*.
3. Copy TIBCO_EMS.pkg into the `[AUTOPILOT_HOME]\updates directory`.
4. At the command prompt run:
   `[AUTOPILOT_HOME]/bin/pkgman ..\updates\TIBCO_EMS.pkg`
5. The *Input* screen will be displayed. Enter the file path to the TIBCO EMS client library (`[TIBCO_EMS_HOME]/clients/java`). If the file path is not input the installation will not continue.

   Example: `C:/TibcoEMS/clients/java.`

   The `jms.jar, tibjms.jar, tibcrypt.jar, jnet.jar, jcert.jar, jsse.jar, tibcoemsplugin.jar` and `tibjmsadmin.jar` are copied into `[AutoPilot_Home]/lib.`

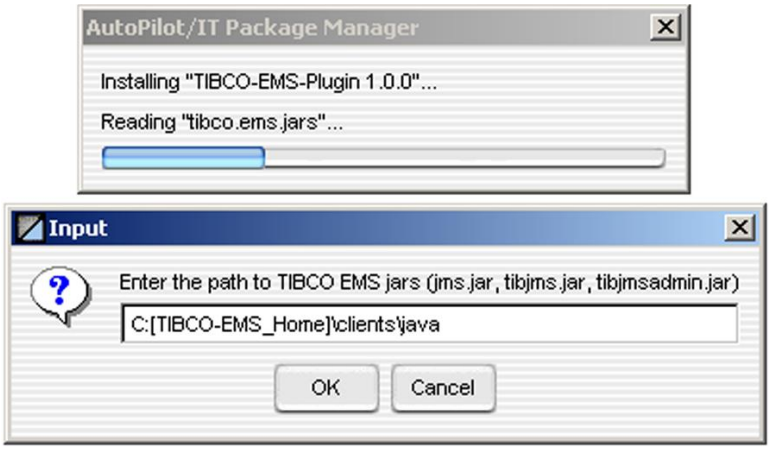

Figure 3-1. TIBCO EMS File Path Input Screen

6. Verify plug-in installation:

   a. Verify the plug-in installation:
   List the installed packages: [*AUTOPILOT_HOME*]\bin\pkgman –info

   Example:

```
C:\nastel\AutoPilotM6\localhost>..\bin\pkgman  -info AutoPilot M6 Package
Manager Package
                            Version          Z-Size(KB) Time
-------------------------------- ---------------- ----------
--------------------
AutoPilot M6 Base (NA)     4.0-JR1.4              NA         2004-11-03  06:55
ServicePack(AP40_CSP11.pkg)      1.1              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU1.pkg)      1.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU2.pkg)      2.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU3.pkg)      3.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU4.pkg)      4.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU5.pkg)      5.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU6.pkg)      6.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU7.pkg)      7.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU8.pkg)      8.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU9.pkg)      9.0              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU91.pkg)     9.1              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU92.pkg)     9.2              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU93.pkg)     9.3              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU94.pkg)     9.4              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU95.pkg)     9.5              NA         2004-10-20 14:47:00
ServiceUpdate(AP40_SU97.pkg)     9.7              NA         2004-10-20 14:47:00
APTM-Plugin(APTM_TA41.pkg)       4.1.001_240      140        2004-11-12 12:24:31
TIBCO-EMS-Plugin(TIBCO_EMS.pkg)  1.1.0            128        2005-02-22 12:55:29
```


b. Using the exact TIBCO package name, verify the required jar and xml files have been installed. If there is a problem, uninstall the plug-in and install again. If still a problem, contact Nastel.

Example:

```
C:\nastel\AutoPilotM6\localhost>..\bin\pkgman  -verify TIBCO-EMS-Plugin
AutoPilot M6 Package Manager

Verifying "TIBCO-EMS-Plugin 1.1.0"…
Verifying "TIBCO-EMS-Plugin 1.1.0" prerequisites…
Verifying "localhost/import/TIBCO_EMS/EMS_SERVER.bsv"…
Error: File created during installation of "TIBCO-EMS-Plugin 1.1.0" not
found: "localhost/import/TIBCO_EMS/EMS_SERVER.bsv"
Verifying "localhost/import/TIBCO_EMS/EMS_MONITOR.bsv"…
Error: File created during installation of "TIBCO-EMS-Plugin 1.1.0" not
found: "localhost/import/TIBCO_EMS/EMS_MONITOR.bsv"
Verifying "localhost/import/TIBCO_EMS"…
Verifying "localhost/import/tibcoemsreg.xml"…
Error: File created during installation of "TIBCO-EMS-Plugin 1.1.0" not
found: "localhost/import/tibcoemsreg.xml"
Verifying "lib/jsse.jar"…
Verifying "lib/jcert.jar"…
Verifying "lib/jnet.jar"…
Verifying "lib/tibcrypt.jar"…
Verifying "lib/tibjmsadmin.jar"…
Verifying "lib/tibjms.jar"…
Verifying "lib/jms.jar"…
Verifying "localhost/plugin.properties"…
Verifying "lib/tibcoemsplugin.jar"…
Error: "TIBCO-EMS-Plugin 1.1.0" failed verification.
```

	**NOTE:**	The file errors in this example occurred because the verify command was done after the managed node component was started, which caused the merging and renaming of those files.

c. Verify the library: `[AUTOPILOT_HOME]\bin\pkgman -infolib`. The details of the library are listed. Verify that the following files have been copied into the lib directory:

- `jms.jar`
- `tibjms.jar`
- `tibjmsadmin.jar`
- `tibcrypt.jar`
- `jnet.jar`
- `jcert.jar`
- `jsse.jar`
- `tibcoemsplugin.jar`

	**NOTE:**	Make sure there are no errors posted at the bottom of the screen.

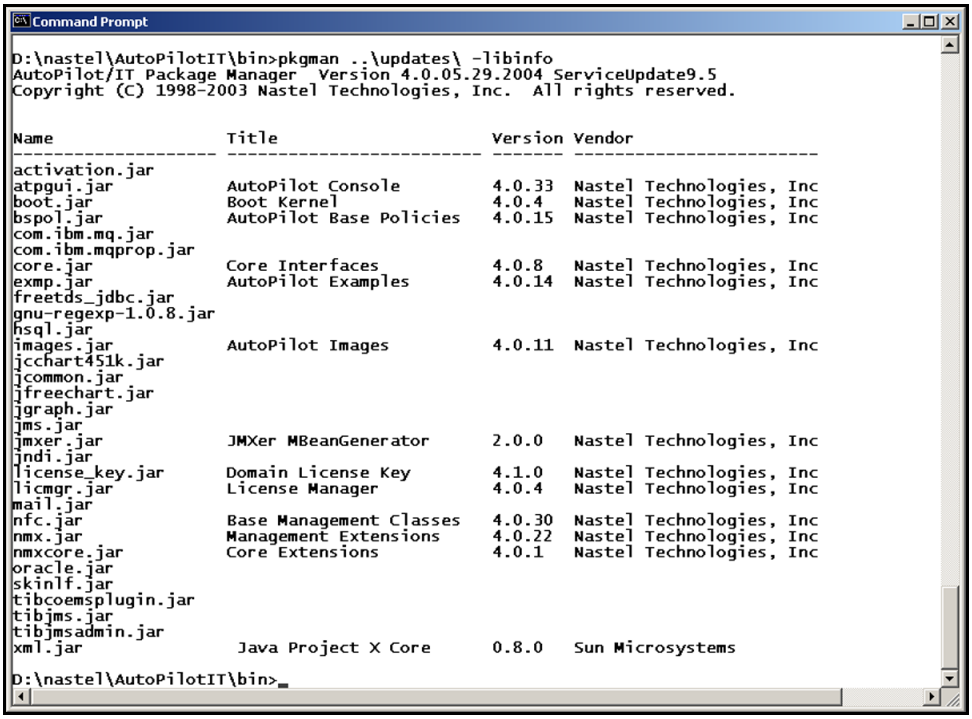

Figure 3-2. Detail of Installed Library List

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Chapter 4: Using AutoPilot/TIBCO EMS

4.1 Deploying TIBCO EMS Experts

The following procedure is used to configure the TIBCO EMS expert within the AP managed node.

1. Open your AutoPilot Console.
2. Right-click on the managed node that has AutoPilot/TIBCO_EMS agent installed.
3. Click **Deploy Expert > TIBCO Ems > TibcoEmsServerGroup**. (All TIBCO EMS, experts use the same properties with one exception; TibcoEMS Server Group has two additional properties under the General category). The experts displayed in the figure (menu) below are described in detail in Chapter 5.

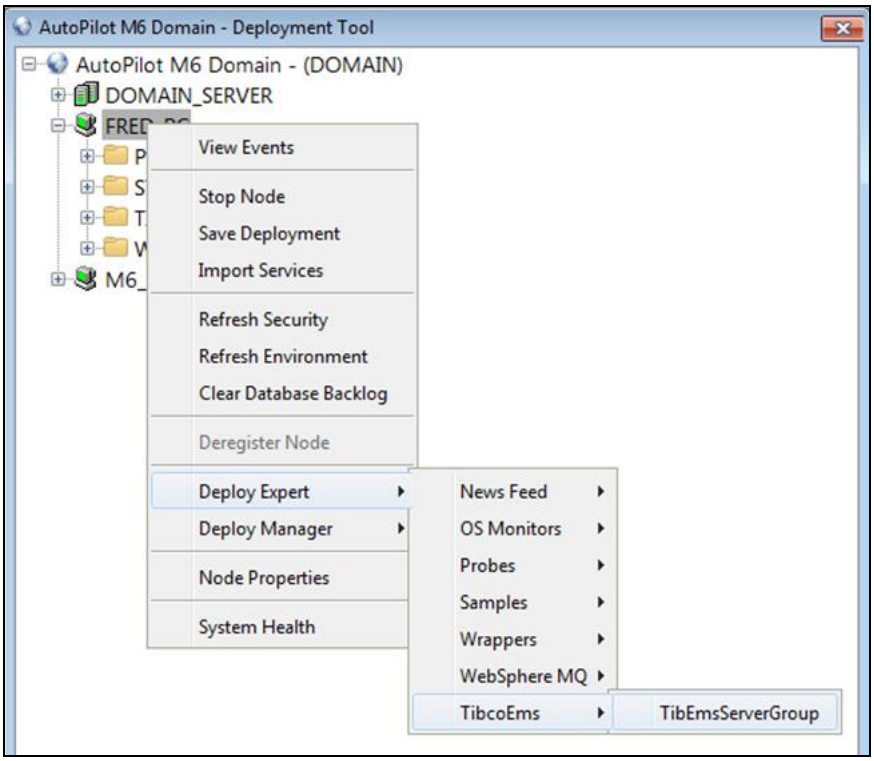

Figure 4-1. Deploy TIBCO EMS Expert

4. It is recommended that you update all three general properties to define your expert. At a minimum apply a definitive name to your agent.

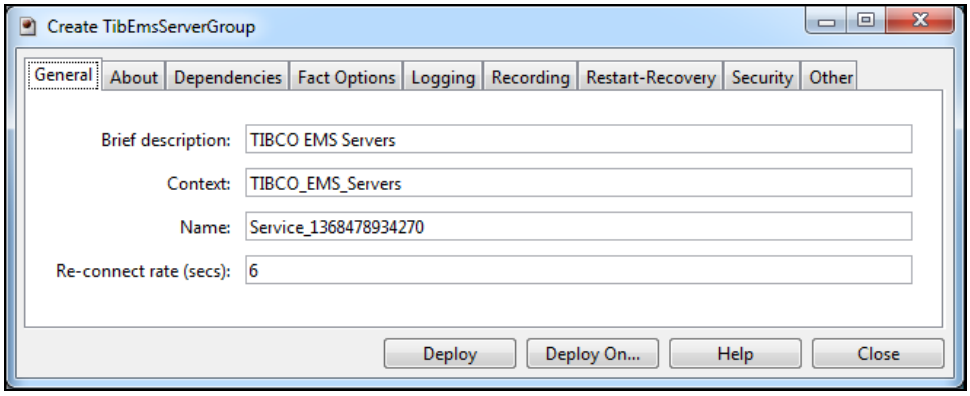

Figure 4-2. TIBCO EMS (Group) Expert: General

Table 4-1. TIBCO EMS Expert: General	
Property	**Description**
Brief Description	A short, user defined description of the service. The default is the subject expert name (example: TibcoServerInfo).
Context	A user defined category that will be registered with the domain server. The default is: TIBCO_EMS_Servers.
Name	Name that uniquely identifies the service in the domain. The default name is system assigned with the word service and twelve random digits (example: Service_123456789012). You can change the name to anything that suites your needs.
Re-connect rate (secs)	Rate at which the expert will attempt to reconnect to the target server, in seconds if connection failed. The default is 6 seconds.

5. Click the *About* tab. These parameters are common to all experts and cannot be edited.

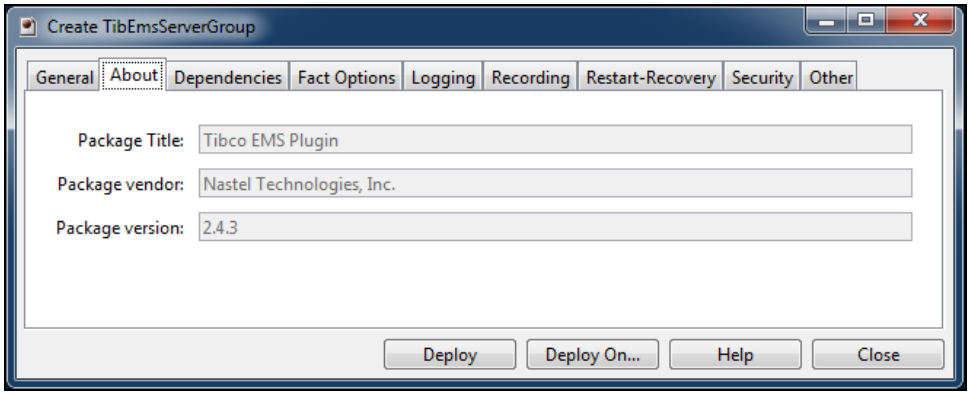

Figure 4-3. TIBCO EMS (Group) Expert: About

Table 4-2. TIBCO EMS Expert: About	
Property	**Description**
Package Title	Implementation title of the source package.
Package Vendor	Name of implementation vendor.
Package version	Package version as assigned by the vendor.

6. Click the *Dependencies* tab if required, identify, and format dependencies as defined in the table. These parameters are common to all experts.

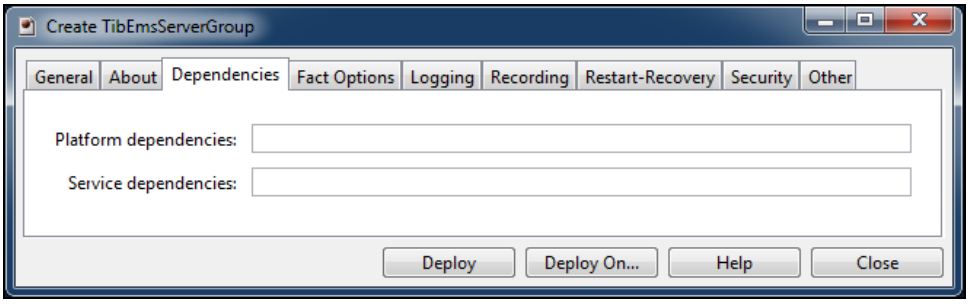

Figure 4-4. TIBCO EMS Expert: Dependencies

Table 4-3. Common Properties: Dependencies	
Property	**Description**
Platform Dependencies	Dependencies on OS platforms, comma separated list.
Service Dependencies	Dependencies on other services, comma separated list.

7. Click the *Fact Options* tab. Edit properties described in the table below, as required. These parameters are common to all experts.

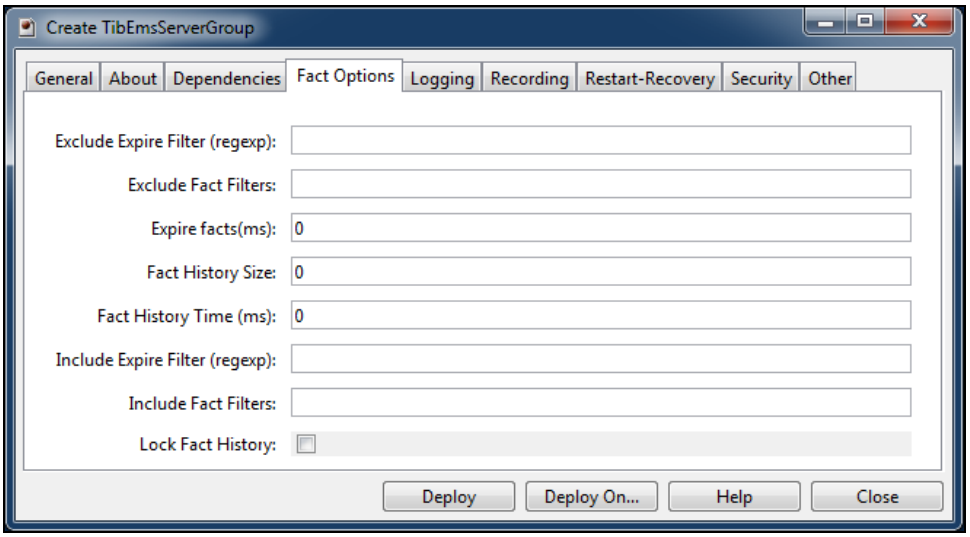

Figure 4-5. TIBCO EMS Expert: Fact Options

Table 4-4. Common Properties: Fact Options	
Property	**Description**
Exclude Expire Filter (regexp)	Facts that match the specified regular expression are not expired.
Exclude Fact Filters	Comma separated list of fact paths to exclude during publishing. For example: *SYSTEM*, *FactName*
Expire facts(ms)	User-defined time in which facts that have not been updated within a specific time automatically expire (in milliseconds). 0 means never expire. *Expire facts* must be less than *Statistics reset rate* value (in seconds), under the *Statistics* tab, or the facts will continue to reset and never expire.
Fact History Size	Automatically maintain the specified number of samples for each published fact in memory. 0 means there is no limit.

Table 4-4. Common Properties: Fact Options	
Property	**Description**
Fact History Time (ms)	Automatically maintain fact history not exceeding specified time in milliseconds.
Include Expire Filter (regexp)	Facts that match the specified regular expression are expired.
Include Fact Filters	Comma separated list of fact paths to include during publishing. For example: *SYSTEM*, *FactName*
Lock Fact History	Enables/disables history collection after accumulating the first history batch up to **Fact History Time** or **Fact History Size** which ever limit is reached first. If disabled newer history samples replace older on a rolling basis.

8. Click the *Logging* tab if required, identify, and format logging requirements as defined in the table. These parameters are common to all experts.

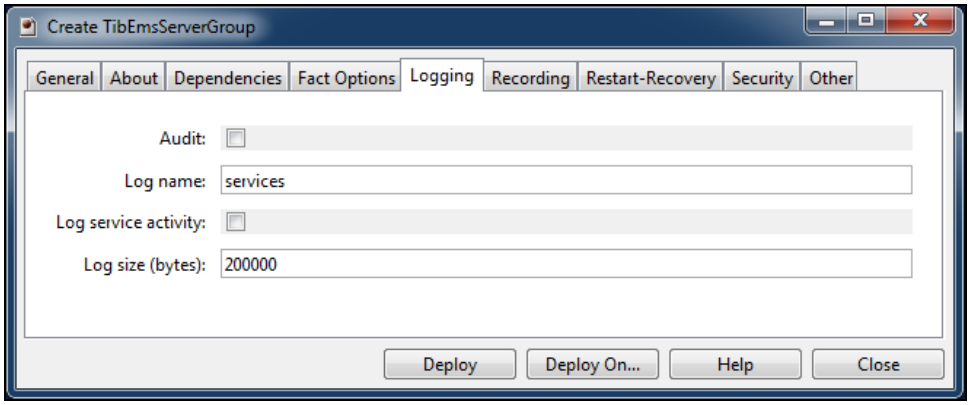

Figure 4-6. TIBCO EMS Expert: Logging

Table 4-5. TIBCO EMS Expert: Logging	
Property	**Description**
Audit	Check to enable service audit trace.
Log name	Log name associated with the service.
Log service activity	Check to enable service activity trace.
Log size (bytes)	Enter log file size if the activity is enabled. Default value: 200000.

9. Click the *Recording* tab if required, identify, and format recording requirements as defined in the table. These parameters are common to all experts.

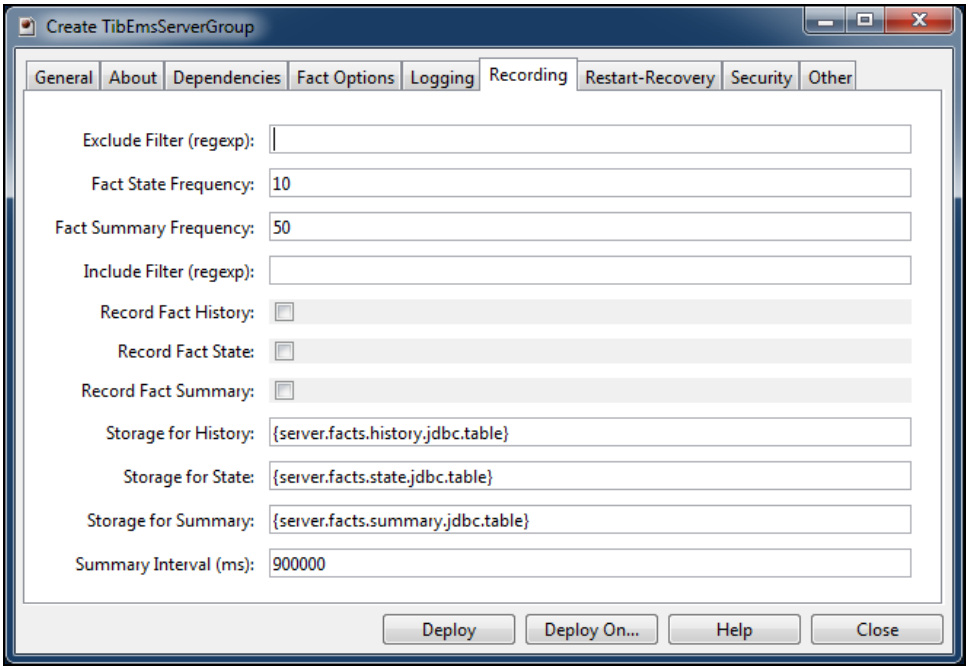

Figure 4-7. TIBCO EMS Expert: Recording

Table 4-6. TIBCO EMS Expert: Recording

Property	Description
Exclude Filter (regexp)	A regular expression filter to exclude certain facts from being written to the database. Facts have the format `expert\class\instance\leaf=value` such as in the example `Servers\Linux\Serv7\processes=40`.
Fact State Frequency	If **Record Fact State** is enabled, the value entered here specifies how often the Fact State is updated.
Fact Summary Frequency	If **Record Fact Summary** is enabled, used to write an intermediate summary record every X th update to the fact during the Summary Interval. In this example, every 50th update to the fact an intermediate summary record is recorded. This is done to avoid waiting 15 minutes for a summary record to appear in the summary table.
Include Filter (regexp)	A regular expression filter to include certain facts being written to the database. Same format as described for the exclude filter.
Record Fact History	If enabled, records every fact change into the History database. The exclude/include filters are respected. To define database tables and set AutoPilot options, refer to *AutoPilot M6 User's Guide*, section 4.5.4.1.
Record Fact State	If enabled, records the last value published (current state) into the state database and restores that value when the CEP Server is stopped and restarted. The exclude/include filters are respected. To define database tables and set AutoPilot options, refer to *AutoPilot M6 User's Guide*, section 4.5.4.1.
Record Fact Summary	If enabled, records summary record at the interval designated in the Summary Interval (ms) field into the Summary database. The exclude/include filters are respected. To define database tables and set AutoPilot options, refer to *AutoPilot M6 User's Guide*, section 4.5.4.1.
Storage for History	Database table where the Fact History data is stored.
Storage for State	Database table where the Fact State data is stored.

Table 4-6. TIBCO EMS Expert: Recording	
Property	**Description**
Storage for Summary	Database table where the Fact Summary data is stored.
Summary Interval (ms)	If **Record Fact Summary** is enabled, designates the interval of time in ms for which baseline numbers for each numeric fact are computed. Summary Interval is only in affect when CEP instance is running in record mode (ATPNODE –record). Default 900000 is 15 minutes, which means maintain a baseline of statistics for each numeric fact for a period of 15 minutes and write a record to the database. At the end of interval fact statistics is reset and the baseline collection starts again.

10. Click the *Restart-Recovery* tab if required, check to enable requirements as defined in the table. These parameters are common to all experts.

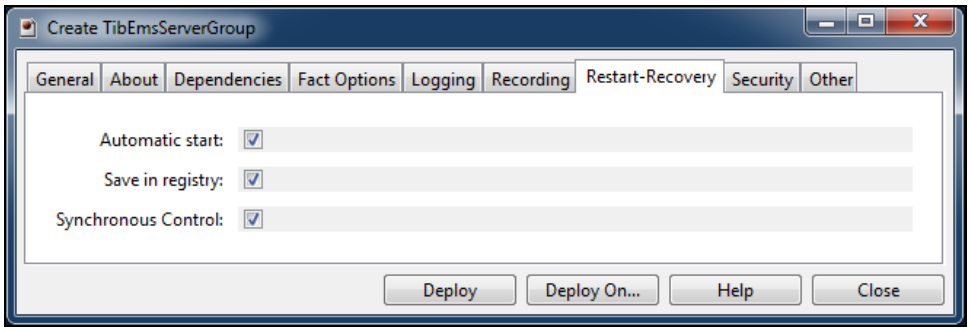

Figure 4-8. TIBCO EMS Expert: Restart-Recovery

Table 4-7. TIBCO EMS Expert: Restart-Recovery	
Property	**Description**
Automatic Start	Check to enable automatic start.
Save in registry	Check to enable saving persistent services in registry .xml file.
Synchronous Control	Check to enable synchronous service initiation.

11. Click the *Security* tab, enter, or enable requirements as defined in the table below. These parameters are common to all experts.

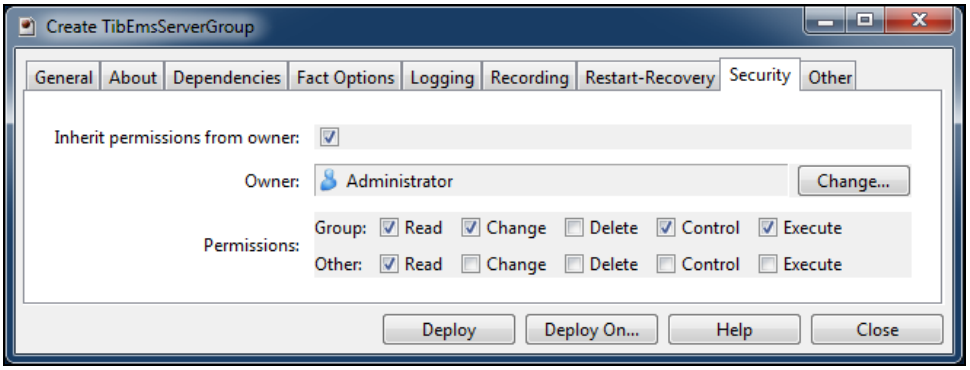

Figure 4-9. TIBCO EMS Expert: Security

Table 4-8. TIBCO EMS Expert: Security

Property	Description	
Inherit Permission from Owner	Enable/disable inherit permission from owner's permission masks.	
Owner	User that owns the object.	
Permissions:	Permissions for users in the same group and users in other groups. Enable/disable as required.	
	Group:	**Others Users:**
Read	Group members may read/view attributes of an object.	Others may read/view attributes of an object.
Change	Group members may change the attributes of an object.	Others may change the attributes of an object.
Delete	Group members may delete the object.	Others may delete the object.
Control	Group members may execute control actions such as start, stop, and disable.	Others may execute control actions such as start, stop, and disable.
Execute	Group members may execute operational commands on the object.	Others may execute operational commands on the object.

12. Click the TIBCO-EMS *Other* tab. Change the **sampleRate** if required.

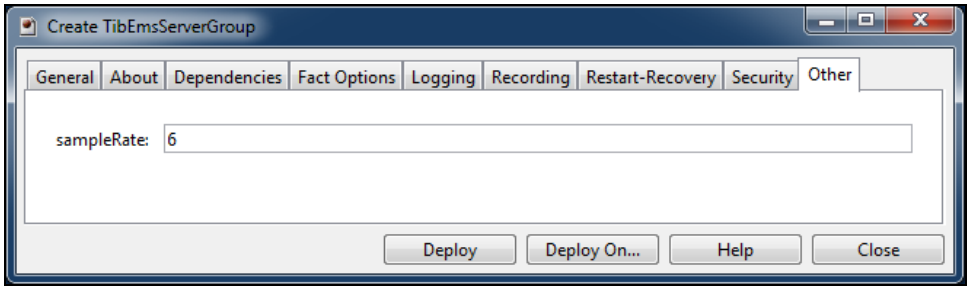

Figure 4-10. TIBCO EMS Expert: Other

Table 4-9. TIBCO-EMS Expert: Other	
Property	**Description**
sampleRate	Rate of fact samplings interval in seconds. The default is 6 seconds.

13. Click **Deploy**. The deployment message will confirm the name of the expert. Click **Yes**.

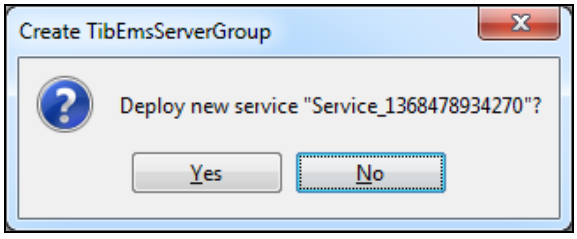

Figure 4-11. Service Deployment Message

14. Deployment confirmation message is displayed. Click **OK** to close the message box.

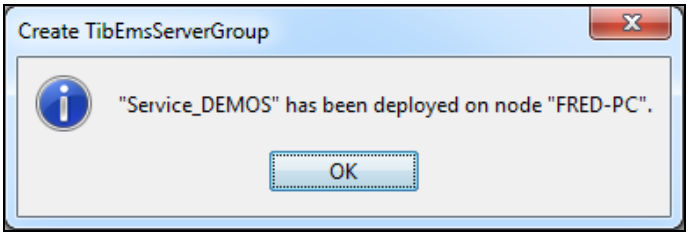

Figure 4-12. Service Deployment Confirmation

15. The deployed expert(s) will be displayed under the node they were deployed on, as in the sample below. The facts produced by each expert are defined in: Chapter 5: AutoPilot/TIBCO EMS Metrics.

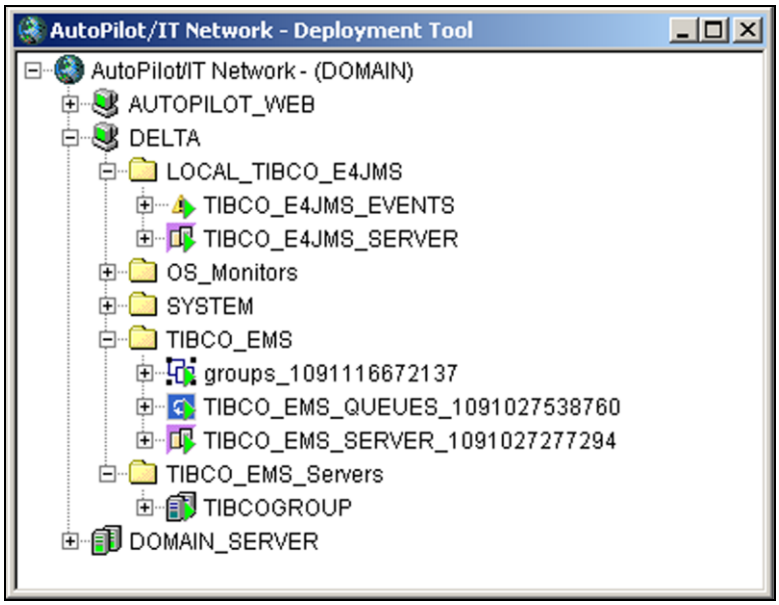

Figure 4-13. Deployed Experts

4.2 Adding TIBCO EMS Server Group Experts

Once deployed then context of the expert can be found in the TIBCO_EMS_Servers folder. The expert is not fully functional at this point. The servers to be monitored must be registered (or deregistered) individually before facts are collected (or not collected).

- **TIBCOGROUP:** Contains deployed server group experts. Any number of experts can be deployed to support the required groups.
- **Facts:** The facts collected by the expert. Complete listings of facts are defined in Chapter 5.
- **Server Registry:** A folder used to register TIBCO EMS servers to the group. The default settings for one server are shown in Figure 4-14.

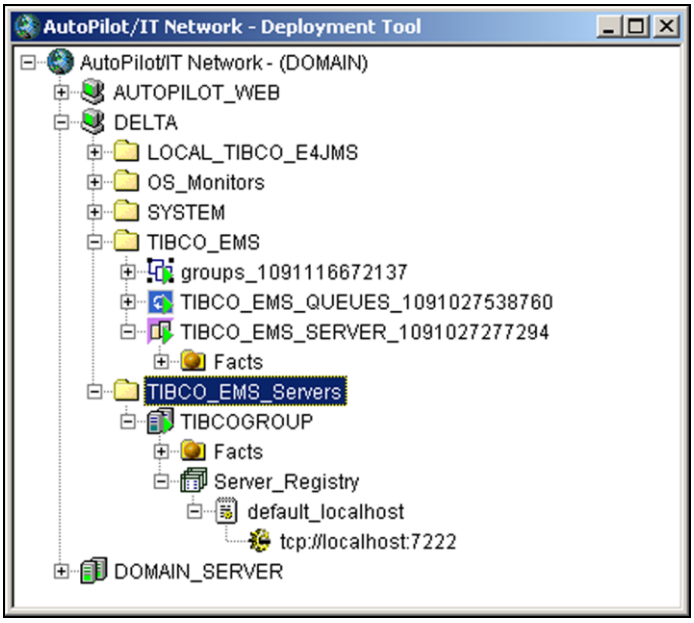

Figure 4-14. TIBCO EMS Servers Default Installation

4.2.1 Adding TIBCO EMS Servers

1. Right-click on the **Server Registry** > **Add Daemon**, the *Tibco EMS daemon profile* is displayed.

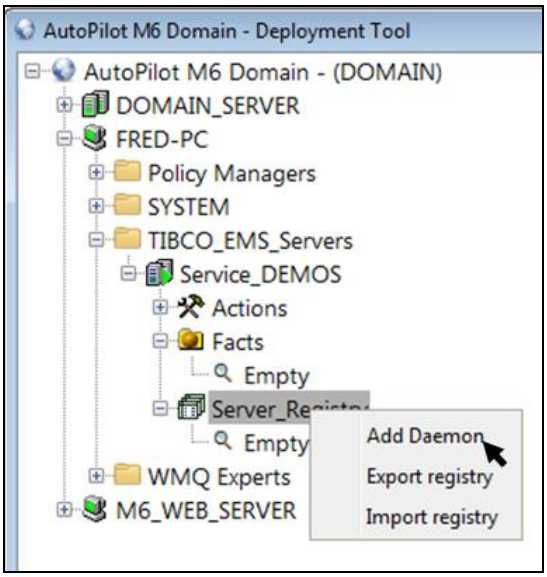

Figure 4-15. Adding TIBCO EMS Servers

2. Configure the profile properties and select the monitors, as defined in Table 4-10, to be deployed for the server(s) in the group.

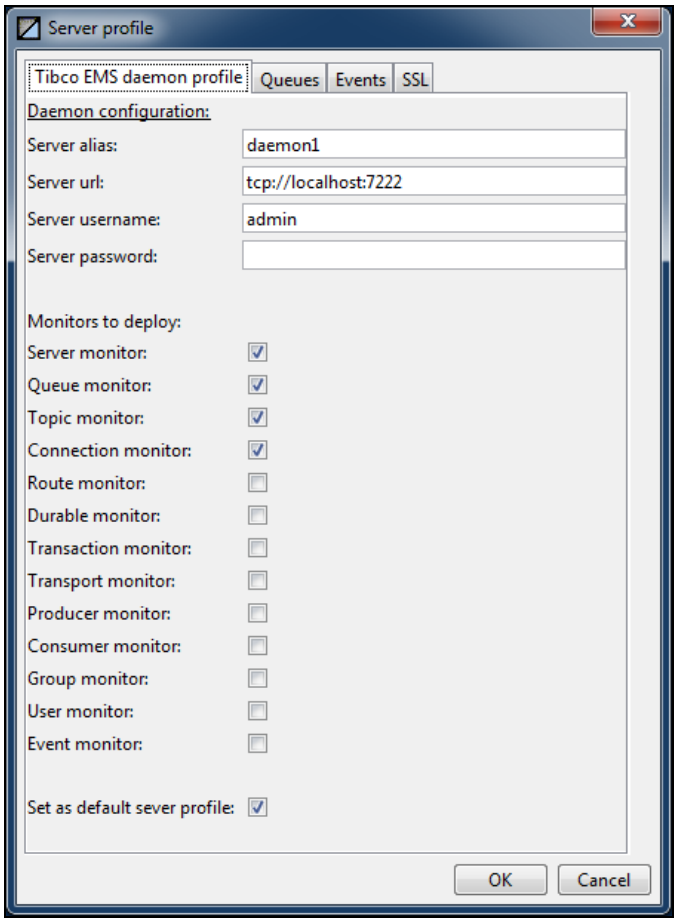

Figure 4-16. TIBCO EMS Server Profile

Table 4-10. TIBCO EMS Daemon Profile	
Daemon configuration	
Property	**Description**
Server alias	The alias for EMS Server profile configuration. It should be unique within an instance of TIBCO EMS Group expert.
Server URL	The URL of TIBCO EMS server. The default value is tcp://localhost:7222. Enter the EMS Server IP if the server is on a different machine.
Server user name	User ID used to connect to machine running the TIBCO EMS server. The user name is your EMS admin group user name.
Server user password	Password used to connect to the machine running TIBCO EMS server. The password for the EMS server is the EMS Server admin group user password.
Monitors to deploy	
Monitor	**Deployed Expert**
Server monitor	TIBCO EMS Server Expert
Queue monitor	TIBCO EMS Queues Expert
Topic monitor	TIBCO EMS Topics Expert
Connection monitor	TIBCO EMS Connection Expert
Route monitor	TIBCO EMS Routes Expert
Durable monitor	TIBCO EMS Durables Expert
Transaction monitor	TIBCO EMS Transaction Expert
Transport monitor	TIBCO EMS Transport Expert
Producer monitor	TIBCO EMS Producers Expert
Consumer monitor	TIBCO EMS Consumers Expert
Group monitor	TIBCO EMS Groups Expert
User monitor	TIBCO EMS Users Expert
Event monitor	TIBCO EMS Event Expert

3. Configuration is only required if the **Queue monitor** was checked in step 2. Click the *Queues* tab to display queue properties profile. Configure the queue monitor properties identified in Table 4-11.

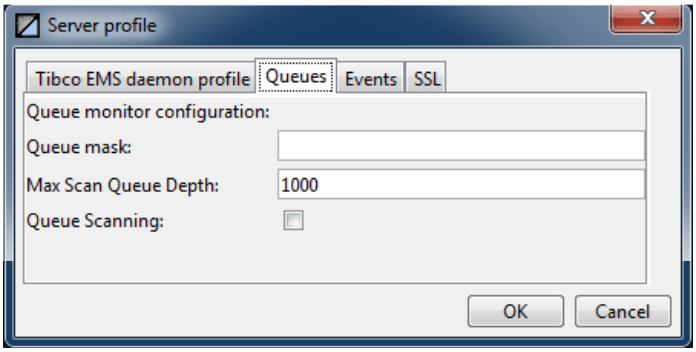

Figure 4-17. TIBCO EMS Server Profile Queues

Table 4-11. TIBCO EMS Daemon Profile – Queues	
Property	**Description**
Queue mask	Queue mask.
Max Scan Queue Depth	User defined queue depth to scan. Default is 1000 (applies to TIBCO EMS Queues Expert only). Used to determine the age of the oldest message in the queue.
Queue Scanning	Enable/disable queue scanning (applies to TIBCO EMS Queues Expert only).

4. Configuration is only required if the **Event monitor** was checked in step 2. Click the **Event** tab. Check the alerts needed to monitor specific alerts within the system. See Table 5-13 for events metrics.

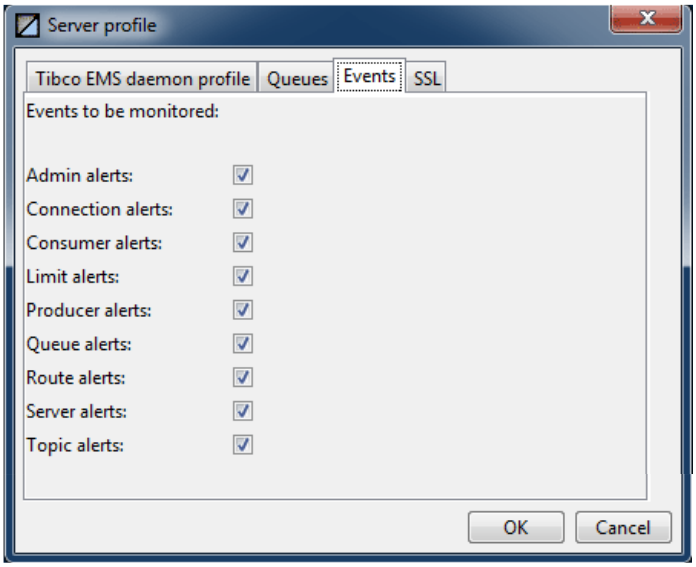

Figure 4-18. TIBCO EMS Server Profile Events

5. Click **SSL**. Configure properties as needed. See Table 4-12.

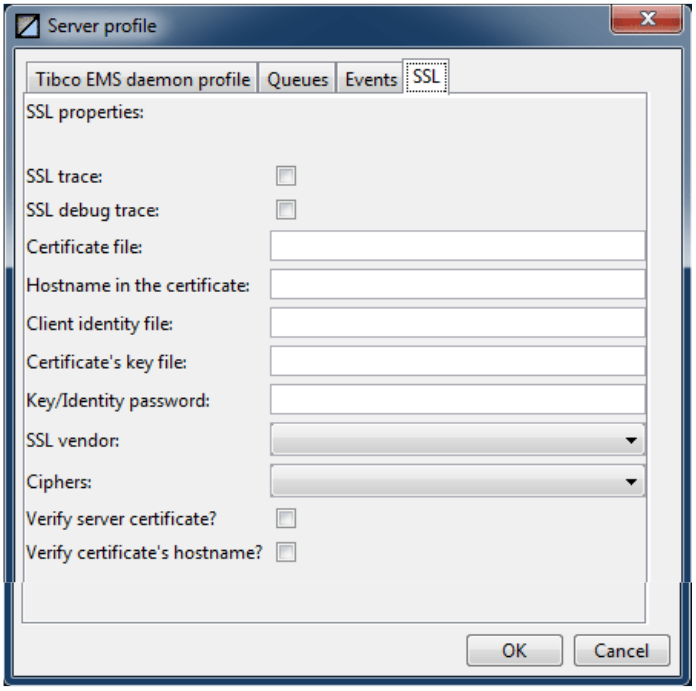

Figure 4-19. TIBCO EMS Server Profile – SSL

Table 4-12. TIBCO EMS Daemon Profile – SSL

Property	Description
SSL trace	Enable/disable SSL trace.
SSL debug trace	Enable/disable SSL debugging.
Certificate file	Name of certificate file.
Hostname in the certificate	Host name in the certificate.
Client identity file	Name of identity file.
Certificate's key file	Name of key file.
Key/Identity password	Password.
SSL vendor	Select from the drop-down list.
Ciphers	Select from the drop-down list. Select ALL if using SSL with any cipher.
Verify server certificate?	Enable/disable server certificate verification.
Verify certificate's hostname?	Enable/disable certificate hostname verification.

4.2.2 After EMS Server Registration

Editing / Removing Existing Server Instance.

1. Expand the **Server_Registry** folder.
2. Right-click the EMS server alias to be edited or removed.
3. To remove, click **Remove Server Profile**. The confirmation dialog box will be displayed.

   To edit, click **TIBCO EMS Server Profile**. The configuration screen will be displayed. Configure according to section 4.2.1, Adding TIBCO EMS Servers.

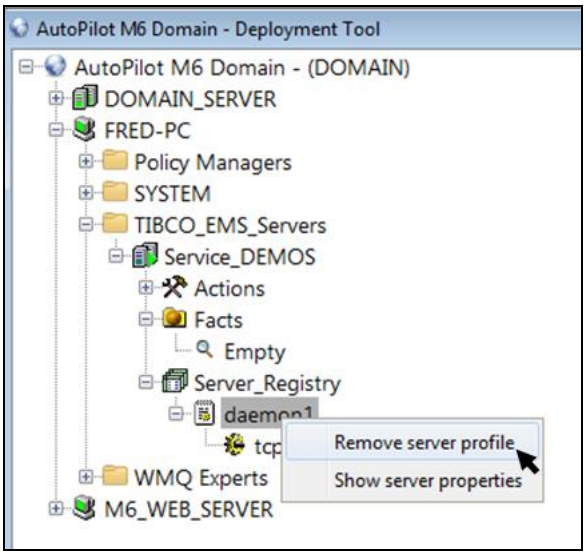

Figure 4-20. Removing Registered Server Profile

4. Click **Yes** to remove the selected server alias profile, or **No** to cancel the deletion.

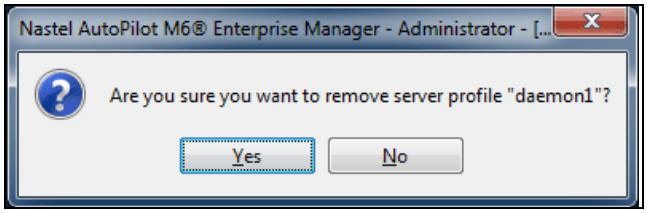

Figure 4-21. Confirm Removal

5. Collapse and expand **Server_Registry** to refresh the server listing.

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Chapter 5: AutoPilot/TIBCO EMS Metrics

This section describes the TIBCO EMS metrics collected by the AutoPilot experts. They are published as facts and are available under each expert as shown below:

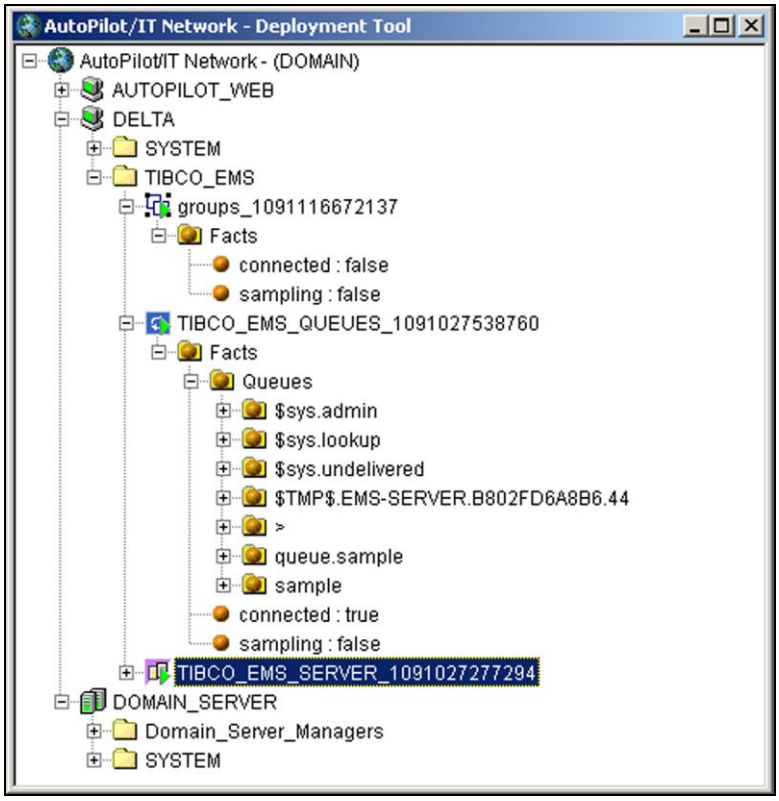

Figure 5-1. TIBCO EMS Metrics Collected by AutoPilot's TIBCO EMS Experts

Once published, these facts can be included in one or more business views for validation, automation, notifications, logging and alerts.

5.1 AutoPilot/TIBCO EMS Metrics Tables

The *TibcoEMSExpert* gets the performance data from the TIBCO EMS Server and publishes them to the AutoPilot facts board for use in business views for validation, automation, notifications, logging and alerts etc.

There is no preset limit to the number of TIBCO EMS servers you can monitor. However, performance issues will arise if a single managed node monitors too many servers. To ensure maximum efficiency distribute the monitoring load across multiple managed nodes.

5.1.1 TIBCO EMS Experts

The following experts are available in the TIBCO EMS plug-in:

- TIBCO EMS Server
- TIBCO EMS Queues
- TIBCO EMS Routes
- TIBCO EMS Topics
- TIBCO EMS Consumer
- TIBCO EMS Producers
- TIBCO EMS Groups
- TIBCO EMS Users
- TIBCO EMS Connections
- TIBCO EMS Transports
- TIBCO EMS Events.

5.2 AutoPilot/TIBCO EMS Metrics Tables

AutoPilot/TIBCO EMS experts publish the following metrics:

Table 5-1. Facts Published by TIBCO EMS Server Expert

Metric	Data Type	Description
async_db_size	long	Current size of the asynchronous message store.
backup_server_name	string	Server name and host name of the backup server connected to this server.
connection_count	integer	Number of connections to the server.
durable_count	integer	Number of durable subscribers in the server.
fault_tolerant_url	string	URL of the fault-tolerant server for this server.
inbound_bytes_rate	long	Volume of inbound messages per second for this server.
inbound_message_count	long	Number of inbound messages for this server.
inbound_message_rate	long	Number of inbound messages per second for this server as a whole.
outbound_bytes_rate	long	Volume of outbound messages per second for this server as a whole.
outbound_message_count	long	Number of outbound messages for this server.
outbound_message_rate	long	Number of outbound messages per second for this server as a whole.
pending_message_count	long	Total number of pending messages for this server.
pending_message_size	long	Total size of pending messages for this server.
log_file_max_ssize	long	Maximum allowed size of the log file.
log_file_size	long	Total size of the log file.
log_file_name	string	Long file name.
max_message_memory	long	Average response time on all methods of the remote Interface.
max_statistics_memory	long	Maximum amount of memory that will be allocated to collecting statistics.
queue_count	integer	Number of queues in the server.
rate_interval	long	Statistics rate interval in milliseconds.
server_rate_interval	long	Server statistics rate interval in milliseconds.
start_time	date	Server start time.
sever_state	integer	Current state of the server. 2 = Standby, 4 = Active, else Unknown.
satistics_cleanup_interval	long	Statistics cleanup interval in milliseconds.
store_directory	string	Directory in which the server is storing its store files.
sync_db_size	long	Current size of the synchronous message store.
store_async_minumum_size	long	Minimum size of the server's asynchronous store file.
store_sync_minumum_size	long	Minimum size of the server's synchronous store file.
topic_count	integer	Number of topics in the server.
up_time	long	Server uptime in milliseconds.
url	string	URL that should be used to contact this server.
authorization_enabled	boolean	Indicates whether or not authorization of user credentials and permissions is enabled.
message_swapping_enabled	boolean	Indicates whether or not server message swapping is enabled.
routing_enabled	boolean	Indicates whether or not routing of messages between servers is enabled.

Table 5-1. Facts Published by TIBCO EMS Server Expert		
Metric	**Data Type**	**Description**
statistics_enabled	boolean	Indicates whether or not statistics is enabled.
store_crc_enabled	boolean	Indicates whether or not the server uses CRC verification when reading data from the store files.
store_truncate_enabled	boolean	Indicates whether or not the server will attempt to truncate the store files when possible.
track_correlation_ids	boolean	Indicates whether or not tracking messages by correlation ID is enabled.
is_track_message_ids	boolean	Indicates whether or not tracking messages by message ID is enabled.
build_info	integer	Build number.
major_version_info	integer	Major version number.
minor_version_info	integer	Minor version number.
update_info	integer	Update number.
admin_connection_accept	boolean	Indicates whether or not admin connections are accepted by EMS Server
queue_connection_accept	boolean	Indicates whether or not queue connections are accepted by EMS Server
topic_connection_accept	Boolean	Indicates whether or not topic connections are accepted by EMS Server

Table 5-2. Facts Published by TIBCO EMS Connections Expert		
Name	**Data Type**	**Description**
client_id	string	ClientID for this connection.
consumer_count	integer	Server name and host name of the backup server connected to this server.
host	string	Host for this connection.
producer_count	integer	Number of producers for this connection.
session_count	integer	Number of sessions for this connection.
start_time	long	Creation time, in milliseconds, for this connection.
up_time	long	Server uptime in millisecond.
url	string	URL that should be used to contact this server.

Table 5-3. Facts Published by TIBCO EMS Queues Expert		
Name	**Data Type**	**Description**
consumer_count	integer	Number of consumers for this destination.
queue_description	string	Description of this destination.
max_bytes	long	Maximum number of message bytes that the server will store for pending messages bound for this destination.
queue_name	string	Name of this destination
pending_message_count	long	Total number of pending messages for this destination
pending_message_size	long	Total size for all pending messages for this destination.
is_fail_safe	boolean	Indicates if this destination is failsafe.
is_global	boolean	Indicates if this destination is global.
is_secure	boolean	Indicates if this destination is secure.
is_static	boolean	Indicates if this destination is static.
is_temporary	boolean	Indicates if this destination is temporary.
prefetch	integer	The number of messages prefetched by the EMS client from the server to improve efficiency.
receiver_count	integer	Get the number of active receivers on this queue.
is_ exclusive	boolean	Determine if this queue is exclusive.
is_route_connected	boolean	Determine if the route for this queue is connected.
outbound_byte_rate	long	The rate of outbound bytes per second for this queue.
outbound_message_rate	long	The number of outbound messages per second for this queue.
outbound_total_bytes	long	The total size of outbound message for this queue.
outbound_total_messages	long	The total number of outbound message for this queue.
inbound_byte_rate	long	The rate of inbound bytes per second for this queue.
inbound_message_rate	long	The number of inbound messages per second for this queue.
inbound_total_bytes	long	The number of inbound messages per second for this queue.
inbound_total_messages	long	The total size of inbound messages for this queue.
has_sender_name	boolean	Indicates whether or not the sender_name property is set on this destination.
sender_nameenforced	boolean	Indicates whether or not the sender_name_enforced property is set on this destination.
max_redelivery	integer	The maximum number of times the server will redeliver a given message from this queue to the queue receivers.
flow_control_max_bytes	long	The volume of pending messages (in bytes) at which flow control is enabled for this destination.
delivered_message_count	long	The total number of messages that have been delivered to consumer applications but have not yet been acknowledged. (EMS 4.0 only)
intransit_message_count	long	The total number of messages that have been delivered to the queue owner but have not yet been acknowledged. (EMS 4.0 only)
oldest_message_age	long	Age of the oldest message in queue. It is calculated based on filter option in TIBCO_Filters Tab of Queues Properties. By default, it publishes the age of the first message in the queue. Otherwise, the expert will scan through the queue until the user specified queue depth to scan. (Milliseconds) (Also see Figure 4-8.)

Table 5-4. Facts Published by TIBCO EMS Routes Expert		
Name	**Data Type**	**Description**
name	string	Name of the remote server in this route.
url	string	URL that should be used to contact this server.
outbound_byte_rate	long	The number of outbound bytes per second for this route.
outbound_message_rate	long	The number of outbound messages per second for this route.
outbound_total_bytes	long	The total number of outbound bytes for this route.
outbound_total_messages	long	The total number of outbound messages for this route.
inbound_byte_rate	long	The number of inbound bytes per second for this route.
inbound_message_rate	long	The number of inbound messages per second for this route.
is_connected	boolean	Indicates whether or not the route is connected.
is_configured	boolean	Indicates whether or not the route is defined in the server configuration.
inbound_total_bytes	long	The total number of inbound bytes per second for this route.
inbound_total_messages	long	The total number of inbound messages for this route.

Table 5-5. Facts Published by TIBCO EMS Topics Expert		
Name	**Data Type**	**Description**
consumer_count	int	Number of consumers for this destination.
topic_description	string	Description of this destination.
max_bytes	long	Maximum number of message bytes that the server will store for pending messages bound for this destination.
topic_name	string	Name of this destination.
pending_message_count	long	Total number of pending messages for this destination.
pending_message_size	long	Total size for all pending messages for this destination.
is_fail_safe	boolean	Indicates if this destination is failsafe.
is_global	boolean	Indicates if this destination is global.
is_secure	boolean	Indicates if this destination is secure.
is_static	boolean	Indicates if this destination is static.
is_temporary	boolean	Indicates if this destination is temporary.
prefetch	int	The number of messages prefetched by the EMS client from the server to improve efficiency.
receiver_count	int	The number of active receivers on this queue.
is_ exclusive	boolean	Indicates if this queue is exclusive.
is_route_connected	boolean	Indicates if the route for this queue is connected.
outbound_byte_rate	long	The rate of outbound bytes per second for this destination.
outbound_message_rate	long	The number of outbound messages per second for this destination.
outbound_total_bytes	long	The total number of outbound bytes for this destination.
outbound_total_messages	long	The total number of outbound messages for this destination.
inbound_byte_rate	long	The rate of inbound bytes per second for this destination.
inbound_message_rate	long	The number of inbound messages per second for this destination.
inbound_total_bytes	long	The number of inbound messages per second for this destination.
inbound_total_messages	long	The total number of inbound messages for this destination.
has_sender_name	boolean	Indicates whether or not the sender_name property is set on this destination.
sender_nameenforced	boolean	Indicates whether or not the sender_name_enforced property is set on this destination.
flow_control_max_bytes	long	The volume of pending messages (in bytes) at which flow control is enabled for this destination.

Table 5-6. Facts Published by TIBCO EMS Groups Expert		
Name	**Data Type**	**Description**
group_name	string	Existing user group in server.
group_description	string	Group description.
user_name	string	User name.
user_description	string	User description.

Table 5-7. Facts Published by TIBCO EMS Consumers Expert		
Name	**Data Type**	**Description**
connection_id	long	Consumer's connection ID.
create_time	date	Consumer's creation time.
destination_name	string	Consumer’s destination name.
destination_type	string	Consumer's destination type.
id	long	Consumer ID.
session_id	long	Consumer's session ID.
user_name	string	Consumer’s user name.
byte_rate	long	The number of bytes per second.
message_rate	long	The number of messages per second.
total_bytes	long	The total number of bytes.
total_messages	long	The total number of messages.
user_description	string	Consumer user description.

Table 5-8. Facts Published by TIBCO EMS Producers Expert		
Name	**Data Type**	**Description**
producer_count	int	Total number of producers on the EMS Server.
connection_id	long	Producer's connection identification.
create_time	date	Producer's creation time in milliseconds.
destination_name	string	Producer's destination name.
destination_type	string	Producer's destination type.
id	long	Producer's identification.
session_id	long	Producer's session identification.
user_name	string	Producer's user name.
byte_rate	long	The number of bytes per second.
message_rate	long	The number of messages per second.
total_bytes	long	The total number of bytes.
total_messages	long	The total number of messages.
user_description	string	User description.

Table 5-9. Facts Published by TIBCO EMS Transports Expert		
Name	**Data Type**	**Description**
transport_name	string	Name of the transport.
export_headers	boolean	Indicates whether or not JMS header information is included in messages export on this transport.
transport_type	string	Type of transport.
topic_import_delivery_mode	string	Delivery mode for messages imported from this transport to a topic.
queue_import_delivery_mode	long	Delivery mode for messages imported from this transport to a queue.

Table 5-10. Facts Published by TIBCO EMS Durables Expert		
Name	**Data Type**	**Description**
client_id	long	Client ID associated with this durable.
consumer_id	string	Consumer ID associated with this durable.
name	string	Name of this durable.
topic_name	string	Topic name that this durable subscribes to.
user_name	string	Name of the authenticated user whose connection this durable subscriber is currently using.
pending_message_size	long	Total size, in bytes, of messages waiting to be delivered to this durable subscription.
pending_message_count	long	Number of messages waiting to be delivered to this durable subscription.

Table 5-11. Facts Published by TIBCO EMS Transactions Expert		
Name	**Data Type**	**Description**
transaction_state	string	State of the transaction (Active, Prepared, Rollback only, Ended and Unknown).
global_transaction_id	string	Global transaction identification of the transaction.
transaction_format_id	integer	Format identification of the transaction.
branch_qualifier	string	The branch qualifier of the transaction.

Table 5-12. Facts Published by TIBCO EMS Users Expert		
Name	**Data Type**	**Description**
user_name	long	User name.
user_description	string	User description.

Table 5-13. Facts Published by TIBCO EMS Events Expert	
Event	**Description**
$sys.monitor.connection.connect	User attempted to connect to the server.
$sys.monitor.connection.disconnect	User connection is disconnected.
$sys.monitor.admin.change	Administrator has made a change to the configuration.
$sys.monitor.connection.error	Error occurred on a user connection.
$sys.monitor.consumer.create	A consumer was created.
$sys.monitor.consumer.destroy	A consumer was destroyed.
$sys.monitor.limits.connection	Maximum number of hosts or connections was reached.
$sys.monitor.limits.queue	Maximum bytes for queue storage were reached.
$sys.monitor.limits.server	Server memory limit was reached.
$sys.monitor.limits.topic	Maximum bytes for durable subscriptions were reached.
$sys.monitor.producer.create	A producer was created.
$sys.monitor.producer.destroy	A producer was destroyed.
$sys.monitor.queue.create	A dynamic queue wais created.
$sys.monitor.route.connect	A route connection was attempted.
$sys.monitor.route.disconnect	A route connection was disconnected.
$sys.monitor.route.error	An error occurred on a route connection.
$sys.monitor.route.interest	A change in registered interest occurred on the route.
$sys.monitor.server.info	The server sent information about an event. (Example: a log file is rotated)
$sys.monitor.server.state	The server state changed.
$sys.monitor.server.warning	The server sent a warning message.
$sys.monitor.topic.create	A dynamic topic was created.

** For a list of descriptions for the event message properties, see TIBCO's documentation.

Chapter 6: Business Views

The TIBCO EMS plug-in comes with a business view that can be user customized. The TIBCO EMS business view is located in directory:
`[AUTOPILOT_HOME]\AutoPilotM6\Naming\Policies\TIBCO_EMS`

Table 6-1. Default Business Views

Business View	Filename	Description
TIBCO_EMS_HEALTH	EMS_MONITOR.bsv	Generic business view that monitors TIBCO EMS server health status and server alerts.

This business view can be found in the *Business View Explorer* at `ds:/TIBCO_EMS/EMS_MONITOR.bsv`. Business views are configured based on Server Expert and Event Expert settings.

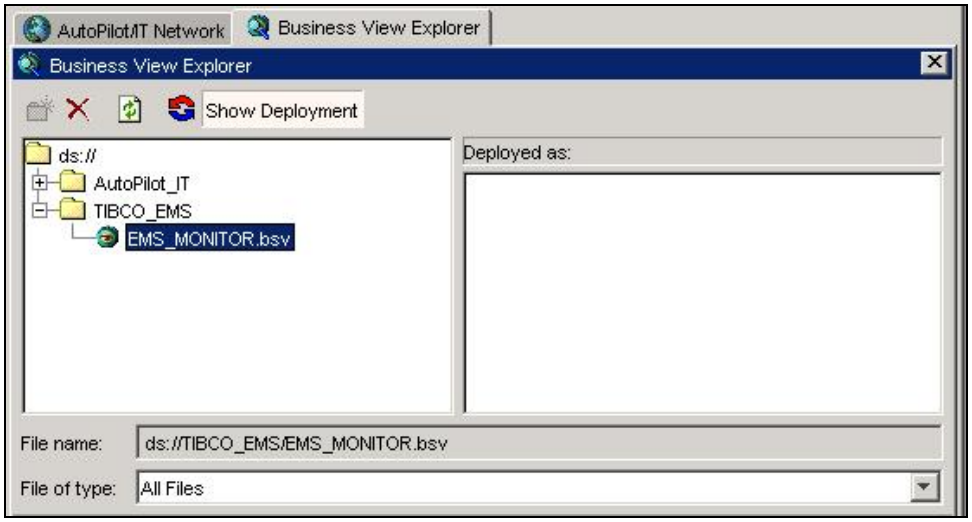

Figure 6-1. Business View Explorer

EMS Server setting for corresponding experts should be changed and re-configured according to current deployment environments. The user can deploy this business view to any AP managed node or domain server. Like all business views, it can be copied, customized, and named to best serve your business needs.

6.1 Default EMS Server Settings

The following TIBCO EMS server settings are used by the EMS_Monitor business view.

Table 6-2. TIBCO EMS Server Default Settings

Property	Value
Sampling:	60000
Server Host Name:	localhost
Server Password:	admin
Server Port:	7222
Server Protocol:	-tcp
Server User Name:	admin
Server Version	3.1.X

6.2 TIBCO EMS HEALTH Monitor

The TIBCO EMS HEALTH Monitor monitors the health of the TIBCO EMS Server environment.

Below is a sample of a running TIBCO EMS HEALTH business view, which:

- Monitors EMS Server health state
- Detects number of connections which are connected to EMS Server
- Detects number of queues created on the EMS Server
- Detects EMS Server uptime in milliseconds
- Detects connection acceptance at EMS Server
- Monitors and displays route creation events at EMS Server
- Monitors and displays queue creation events at EMS Server
- Monitors and displays topic creation events at EMS Server
- Monitors and displays unauthorized access attempts at EMS Server
- Monitors and displays connection errors/events at EMS Server

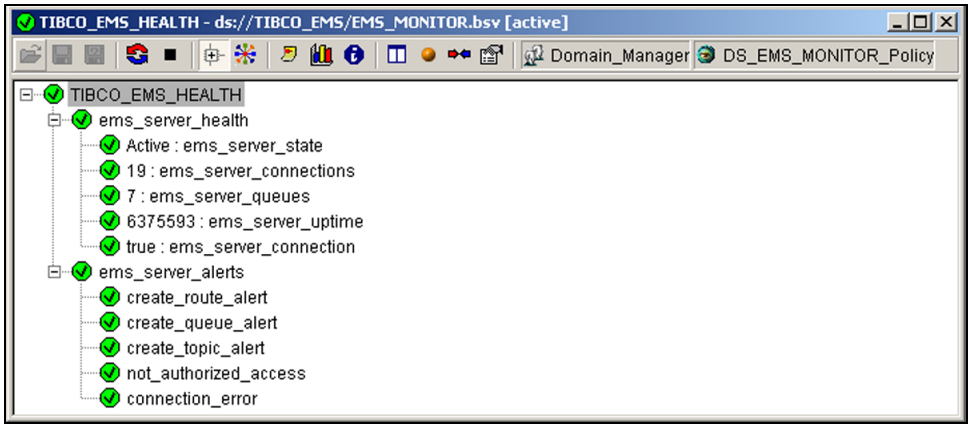

Figure 6-2. Sample TIBCO EMS HEALTH Business View

The TIBCO EMS business view can be deployed in the same way as all business views. See the *AutoPilot M6 User's Guide*, Chapter 4 for details about customizing and deploying business views.

Appendix A: References

A.1 Nastel Documentation

Table A-1. Nastel Documentation

Document Number (or higher)	Title
AP/TPz 600.001	*AutoPilot M6/Transaction Monitor Probe for WebSphere MQ (z/OS) Installation and User Guide*
APM6/INS 600.007	*Nastel AutoPilot M6 Installation Guide*
APM6/USR 650.001	*Nastel AutoPilot M6 User's Guide*
M6/DSB 600.001	*Nastel AutoPilot M6 Business Dashboard*
M6WMQ/ADM 650.001	*Nastel AutoPilot M6 for WebSphere MQ Administrator's Guide*
M6WMQ/INS 650.001	*Nastel AutoPilot M6 for WebSphere MQ Installation Guide*
M6WMQ/SM 650.001	*Nastel AutoPilot M6 for WebSphere MQ Security Manager User's Guide*
WMQ/M6 600.001	*WebSphere MQ Plug-in for AutoPilot M6*
TWORKS/E 650.002	*AutoPilot TransactionWorks Explorer Installation and User's Guide*
TWORKS/P 650.001	*AutoPilot TransactionWorks Java Probes Installation and User's Guide*
TWORKS/TA 650.001	*AutoPilot TransactionWorks Transaction Analyzer Installation and User's Guide*
TWORKS/TP 650.001	*AutoPilot TransactionWorks Probe for WebSphere MQ (Distributed) Installation, Configuration and User's Guide*
TWORKS/WSz 650.001	*AutoPilot TransactionWorks Probes for z/OS Installation and User's Guide*

A.2 TIBCO Enterprise Message Service™ Documentation

TIBCO Enterprise Message Service™ User's Guide

TIBCO Enterprise Message Service™ Installation Guide

TIBCO Enterprise Message Service™ Application Integration Guide

TIBCO Enterprise Message Service™ Release Notes

TIBCO Enterprise Message Service™ C API Reference

	**NOTE:**	The TIBCO documentation is usually supplied in PDF format with the installation CDs.

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Appendix B: Conventions

B.1 Typographical Conventions

Table B-1. Typographical Conventions

Convention	Description
Blue/Underlined	Used to identify links to referenced material or websites. Example: support@nastel.com
Bold Print	Used to identify topical headings, glossary entries, and to identify toggle or buttons used in procedural steps. Example: Click **EXIT**.
Italic Print	Used to identify a title, menu, screen name, user inputs, or other categories.
`monospaced bold`	Used identify keystrokes/data entries, file names, directory name etc.
`Monospaced italic`	Used to identify variables in an address location. Example: `[C:\AutoPilot_Home]\documents`, where the portion of the address within the brackets [ ] are variable.
`monospaced text`	Used to identify addresses, commands, script etc.
Normal Text	Typically used for general text throughout the document.
Table Text	Table text is generally a smaller size to conserve space. 10, 9, and 8 point type is used in tables through the AutoPilot product family documents

B.2 Naming Conventions

Naming conventions have been adjusted to accommodate IBM's re-naming of MQSeries products to WebSphere MQ.

Nastel has adapted AutoPilot products to reflect IBM's product naming changes. In the redesign of AutoPilot, we have also better defined many elements within the AutoPilot product line.

Table B-2. AutoPilot Related Naming Conventions

Old Name	New Name
AutoPilot/MQSI	**AutoPilot for WebSphere WBI**
MQSeries Plug-in for AutoPilot	**WebSphere MQ Plug-in for AutoPilot**
MQControl	**AutoPilot for WebSphere MQ (AP/WMQ or AutoPilot/WMQ)**
MQSeries	**WebSphere MQ (IBM)**

Glossary

AutoPilot M6: Nastel Technologies' Enterprise Application Management Platform. AutoPilot M6 is designed to monitor and control distributed IT services such as application servers, middleware, user applications, workflow engines, brokers, Service Oriented Architecture (SOA) and Enterprise Service Bus (ESB) based applications and their impact on business services.

AutoPilot M6 for WMQ: Nastel Technologies' WebSphere MQ management solution. Re-designated as M6 for WMQ with release 6.0, prior releases retain the AP-WMQ or MQControl trademark.

AutoPilot/Transaction Monitor (AP/TM): Nastel's AutoPilot/Transaction Monitor plug-in that enables AutoPilot to intercept message exits and forward the statistical data to an AutoPilot expert.

AutoPilot M6 Web: AutoPilot M6 Web is a browser-based interface that provides monitoring and operational control over managed resources and applications. It allows users to monitor health, recover from a failure, view historical performance graphs and visualize impacts of a failure.

AutoPilot/WebSphere (AP/WS): AutoPilot/WebSphere plug-into enables AutoPilot to monitor and manage *e*Business applications for continuous operations in addition to its standard features.

AutoPilot/WebSphere Message Queue Integrator (AP/WMQI): Formerly AP/MQSI

BSV: *see* Business Views

Business View (BSV): A collection of rules that define a desired state of an *e*Business environment. Business Views can be tailored to presents information in the form most suited to a given user, as defined by the user.

Client: Any programming component that uses the AutoPilot infrastructure; for example, the AutoPilot Console.

Common Object Request Broker Architecture (CORBA): A Common Object Request Broker Architecture (CORBA) object can be invoked from a Web browser using CGI scripts or applets.

Console: The console acts as the graphical interface for AutoPilot.

Contacts: A subordinate to a given Manager or Expert.

CORBA: *See* Common Object Request Broker Architecture.

Data Source Name: A Data Source Name (DSN) is the logical name that is used by Open Database Connectivity (ODBC) to refer to the drive and other information that is required to access data. The name is use by Internet Information Services (IIS) for a connection to an ODBC data source, (Example: Microsoft SQL Server database). The ODBC tool in Control Panel is used to set the DSN. When ODBC DSN entries are used to store the connection string values externally, you simplify the information that is needed in the connection string. This makes changes to the data source completely transparent to the code itself.

Decision Support System (DSS): An AutoPilot-based service designed to monitor, store, and display any event information generated by AutoPilot enabled middleware and applications.

Deploy: To put to use, to position for use or action.

Domain Server: The domain server is a specialized managed node that maintains the directory of managed nodes, experts etc. The domain server is also capable of hosting experts, managers etc

DSN: *See* Data Source Name

DSS: *See* Decision Support System

EVT: Event Log file extension (e.g.: `sample.evt`),

Event: An *Event* is something that happens to an object. Events are logged by AutoPilot and are available for use by AutoPilot Policies or the user.

Expert: Services that monitor specific applications such as an applications server, web-server or specific components within the applications. (Example channels in MQSeries. Experts generate facts.)

Fact: Facts are single pieces of data that has a unique name and value. One or more facts are used to determine the health of the object, application or server

Graphic User Interface (GUI): A type of environment that represents programs, files, and options by means of icons, menus, and dialog boxes on the screen. The user can select and activate these options by pointing and clicking with a mouse or, often, with the keyboard. Because the graphical user interface provides standard software routines to handle these elements and report the user's actions (such as a mouse click on a particular icon or at a particular location in text, or a key press); applications call these routines with specific parameters rather than attempting to reproduce them from scratch.

GUI: *see* Graphic User Interface.

HAQS: *see* High Availability Queuing Service

High Availability Queuing Service (HAQS): HAQS is a component of AutoPilot consisting of two policies that provide automatic queue fail-over for WebSphere MQ applications, provide high availability of WebSphere MQ resources such as queues and channels, and ensure automatic recovery of WebSphere MQ channels

IIS: *See* Internet Information Services

Internet Information Services: Microsoft's brand of Web server software, utilizing HTTP to deliver World Wide Web documents. It incorporates various functions for security, allows CGI programs, and also provides for Gopher and FTP services

Java: A platform-independent, object-oriented programming language developed and made available by Sun Microsystems.

Java Developer's Kit (JDK): A set of software tools developed by Sun Microsystems, Inc., for writing Java applets or applications. The kit, which is distributed free, includes a Java compiler, interpreter, debugger, viewer for applets, and documentation.

JDBC: *See* Java Database Connectivity.

Java Database Connectivity (JDBC): The JDBC API provides universal data access from the Java programming language. Using the JDBC 2.0 API, you can access virtually any data source, from relational databases to spreadsheets and flat files. JDBC technology also provides a common base on which tools and alternate interfaces can be built. The JDBC *Test Tool* that was developed by Merant and Sun Microsystems may be used to test drivers, to demonstrate executing queries and getting results, and to teach programmers about the JDBC API.

Java Management Extensions (JMX): The Java Management Extensions (JMX) technology is an open technology for management and monitoring that can be deployed wherever management and monitoring are needed. By design, this standard is suitable for adapting legacy systems, implementing new management and monitoring solutions and plugging into those of the future.

Java Server Pages (JSP): JSP technology enables rapid development of web-based applications that are platform independent. Java Server Pages technology separates the user interface from content generation enabling designers to change the overall page layout without altering the underlying dynamic content. Java Server Pages technology is an extension of the Java Servlet technology.

Java Virtual Machine (JVM): The "virtual" operating system that JAVA-written programs run. The JVM is a hardware- and operating system-independent abstract computing machine and execution environment. Java programs execute in the JVM where they are protected from malicious programs and have a small compiled footprint.

JDK: *See* Java Developer's Kit.

JMX: *See* Java Management Extensions.

JRE: JAVA Run-time Environment. The minimum core JAVA required to run JAVA Programs.

JSP: *See* Java Server Pages.

JVM: *See* JAVA Virtual Machine.

Manager: Managers are the home or container for policies. All business views must reside on managers, and manager must be deployed prior to deploying a business view or policy.

Message Queue Interface: The Message Queue Interface (MQI) is part of IBM's Networking Blueprint. It is a method of program-to-program communication suitable for connecting independent and potentially non-concurrent distributed applications.

MOM: *see* Message-Oriented Middleware.

MQControl: Nastel Technologies' MQSeries management product. Re-designated as AutoPilot/MQ with release 4.0, prior releases retain the MQControl trademark.

MQI: *See* Message Queue Interface

MQSeries: IBM's message queuing product. Renamed by IBM as WebSphere MQ.

Naming Service: A common server records "names" of objects and associates them with references, locations and properties.

Managed Node: Managed nodes are containers that are capable of hosting any number of AutoPilot services, such as experts, managers, policies etc.

ORB: Object Request Broker.

Orbix: CORBA product distributed by IONA Technologies.

Package Manager: The command line utility that allows users to list, install, uninstall, verify, and update AutoPilot installation on any Managed Node.

PKGMAN: *see* Package Manager Utility included in AutoPilot products.

Policy/Business Views: Business views are a collection of one or more sensors. Business views are used to visually present the health and status of the different systems as well as automatically issue remedial actions.

Sensor: A rule that is used to determine the health of an object or application based on one or more facts. Actions can then be issued, based on the health.

Simple Mail Transfer Protocol (SMTP): A TCP/IP protocol for sending messages from one computer to another on a network. This protocol is used on the Internet to route e-mail. *See also* communications protocol, TCP/IP. *Compare* CCITT X series, Post Office Protocol.

SMTP: *See* Simple Mail Transfer Protocol.

TCP/IP: *See* Transmission Control Protocol/Internet Protocol.

Transmission Control Protocol/Internet Protocol (TCP/IP): A protocol developed by the Department of Defense for communications between computers. It is built into the UNIX system and has become the de facto standard for data transmission over networks, including the Internet.

Virtual Machine: Software that mimics the performance of a hardware device, such as a program that allows applications written for an Intel processor to be run on a Motorola chip. *Also see* Java Virtual Machine.

WebSphere MQ: IBM's message queuing product. Formerly known as IBM MQSeries

WebSphere MQ Manager: A specialized AutoPilot manager capable of hosting one or more MQSeries specific policies, apart from the regular policies.

Wireless Application Protocol (WAP): An open global specification that is used by most mobile telephone manufacturers. WAP determines how wireless devices utilize Internet content and other services. WAP enables devices to link diverse systems contents and controls.

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