AP/RAB 610.001.1

AutoPilot® M6 Plug-In for RabbitMQ
Installation and User's Guide

Version 6.1.0

Table of Contents

Chapter 1: Introduction

Welcome to the Nastel AutoPilot M6 Plug-In for RabbitMQ Installation and User's Guide. Installation and use of the AutoPilot RabbitMQ Expert will be described. The expert is compatible with RabbitMQ and is designed to work with AutoPilot, its components, and other plug-ins, and run simultaneously without interference or performance degradation.

1.1 How this Guide is Organized

Chapter 1:   Document information and system requirements

Chapter 2:   Contains a brief description of the AutoPilot RabbitMQ Expert

Chapter 3:   Information for installing the AutoPilot RabbitMQ Expert software

Chapter 4:   Autopilot integration

Chapter 5:   Metrics collected by the AutoPilot RabbitMQ Expert

Chapter 6:   Out-of-the-box policies provided by the Rabbit MQ plugin

1.2 History of this Document

<table>
<tr><td colspan="3" align="center">**Table 1-1. Document History**</td></tr>
<tr><td align="center">**Release Date**</td><td align="center">**Document Number**</td><td align="center">**Summary**</td></tr>
<tr><td>June 2019</td><td>AP/RAB 610.001</td><td>Initial release</td></tr>
<tr><td>May 2022</td><td>AP/RAB 610.001.1</td><td>Changed title to *AutoPilot M6 Plug-in for RabbitMQ Installation and User's Guide*</td></tr>
</table>

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 email to: support@nastel.com. You will receive a written response, along with the 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 Intended Audience

The Nastel AutoPilot RabbitMQ Expert Guide is intended for use by administrators of Nastel's AutoPilot RabbitMQ Expert with RabbitMQ and its related software components.

1.5 System Requirements

This section defines system and platform prerequisite support requirements for AutoPilot RabbitMQ Expert.

1.5.1 Platforms

AutoPilot RabbitMQ Expert is compatible with the following platforms:

- Windows NT/2000 or later/XP

- Unix (Solaris, AIX, HP-UX, Linux)

1.5.2 Other Requirements

RabbitMQ Expert requires the following conditions:

- AutoPilot 6.0 or higher
- Java Run Time Environment 1.7.x (JRE 1.6.x) or higher
- RabbitMQ
- Erlang
- Target operating system environment
- Installer may need administrative privileges for the target platform

1.6 Technical Support

If you need additional 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 email, send a message to support@nastel.com.

To access the Nastel automated support system, go to http://support.nastel.com/

A user name and password are required. Contact your local AutoPilot Administrator for further information.

1.7 Conventions

Refer to Appendix B for conventions used in this guide.

Chapter 2: About AutoPilot RabbitMQ Expert

AutoPilot RabbitMQ Expert is designed to monitor the RabbitMQ messaging platform. Monitoring information is processed by the AutoPilot RabbitMQ Expert and integrated into the AutoPilot infrastructure. Communication with the RabbitMQ Broker takes place either locally or remotely across a network.

Information includes:

- Channel status, channels per connection
- Channel send /receive rate
- Connections
- Exchanges
- Consumers
- Publish In / Out rates
- Memory usage
- Available sockets
- Disk usage
- Queues with / without consumers
- Pending messages, messages delivered, messages ready for delivery
- Queue idle time
- Queue memory

This information can be combined with information provided by AutoPilot for other components, such as the operating system or log files to get further insight into the performance and operation of the RabbitMQ environment.

Chapter 3: Installation & Configuration

This section contains general information for installing the AutoPilot RabbitMQ Expert software.

3.1 Installation Preparation

This section contains general information for installing the AutoPilot RabbitMQ Expert software.

3.1.1 Installation Materials

Installation can be performed from installation media or by download through the Nastel Resource Center.

Prior to installation, review all text files and installation procedures provided on the Nastel Resource Center. It is recommended that all installation related materials are printed to allow the installer to review them prior to installation, and better to follow the detailed instructions within.

3.1.2 Licensing Information

A copy of the standard Licensing Agreement is imbedded in the installation software and is provided on the Resource Center. The formal licensing agreement has been furnished in the purchase agreement package.

3.2 Installation

This section provides instructions for installing AutoPilot RabbitMQ Expert on the compatible platforms. Review all installation-related materials prior to commencing installation procedures. Reviewing materials will allow installers to pre-determine installation options and familiarize themselves with associated requirements.

3.2.1 Before Installing AutoPilot RabbitMQ Expert

The AutoPilot RabbitMQ Expert uses a java archive file (rabbitmq_metrics_multiserver.jar) and a configuration file.

The AutoPilot RabbitMQ ResourcePack contains a series of AutoPilot Business Views (monitoring dashboards).

You can install AutoPilot RabbitMQ Expert and the AutoPilot RabbitMQ ResourcePack using the AutoPilot package manager. Then transfer the java archive file to a folder on the server(s) where RabbitMQ is to be managed from, if different than the AutoPilot server. Additional steps on configuring these services is outlined below.

3.2.2 AutoPilot RabbitMQ Expert Installation

Following installation of AutoPilot RabbitMQ Expert (i.e. the package AP_RABBITMQ), the following files are placed in the AutoPilot Home directory (e.g. /opt/nastel/AutoPilotM6):

- AP_RABBITMQ_readme.txt

- rabbitmq_metrics_multiserver.jar

- File.properties

Create a folder on your system (e.g. /opt/nastel/rabbitmq_plugin) to host these files, and move the files to the target folder.

Review the AP_RABBITMQ_readme.txt file for general configuration instructions.

3.2.3 Installing the AutoPilot RabbitMQ Expert from the Nastel Delivery Center

1. Download the AutoPilot RabbitMQ Expert Plug-in from the Nastel Delivery Center

    (http://data.nastel.com/ap/).

    A user name and password are required.

2. Stop the Nodes and/or Domain Servers that will be updated as specified in the AutoPilot User's Guide.

3. Copy the installation package AP_RabbitMQ_version.pkg into the

    [AUTOPILOT_HOME]\updates directory.

4. At the command prompt run:

    [AUTOPILOT_HOME]\bin\pkgman ..\updates\AP_RabbitMQ-version.pkg

5. Verify the plug-in installation by running:

    [AUTOPILOT_HOME]\bin\pkgman –info

6. Verify AP_RabbitMQ-Plugin (AP_RabbitMQ-<version_number>.pkg) is listed.

7. Restart the AutoPilot services and login to the Enterprise Manager. The RabbitMQ Expert and Policy Manager can now be configured.
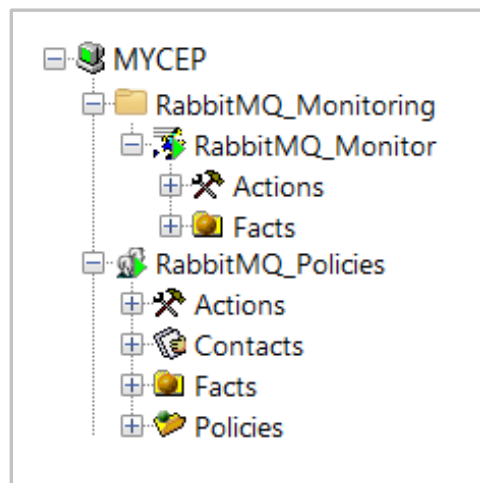
3.3 Configuration

3.3.1 Configure RabbitMQ Monitoring

The AutoPilot RabbitMQ data collector is the executable:

*   rabbitmq_metrics_multiserver.jar

3.3.2 Configuration File

The AutoPilot RabbitMQ data collector uses the configuration file:

- File.properties

An example of the configuration file is shown below:

```
 1  #PLEASE PROVIDE READTIME IN MILLSECONDS 60000
 2  READTIME = 10000
 3
 4  #RabbitMQ Server PROPERTIES
 5  #SERVERIP = apmdw
 6  #SERVERPORT = 15672
 7  #USERNAME = guest
 8  #PASSWORD = guest ;localhost,15673,guest,guest;localhost,15673,guest,guest
 9  #MqServerinfo = 192.168.1.56,15672,Admin,admin;192.168.1.46,15672,Admin,admin;192.168.1.43,15672,Admin,admin
10  MqServerinfo = apmdw,15672,Admin,admin;
11
12  #M6PUBLISH PROPERTIES
13  M6SERVERIP = localhost
14  M6SERVERPORT = 6071
15  M6PROTOCOL = tcp
```

Table 3-1. RabbitMQ Data Collector – Properties	
Property	**Description**
READTIME	Read time in milliseconds.
SERVERIP	IP Address of RabbitMQ broker.
SERVERPORT	RappitMQ Admin interface port number.
USERNAME	Admin user name.
PASSWORD	Admin user password.
MqServerinfo	RabbitMQ server name, admin port #, admin user name and admin user password.
M6SERVERIP	IP Address or hostname of AutoPilot CEP server that hosts the AutoPilot RabbitMQ Expert.
M6SERVERPORT	Listener port number of the AutoPilot RabbitMQ Expert.
M6PROTOCOL	Protocol of the AutoPilot RabbitMQ Expert. Valid values are tcp or udp.

3.3.3 Connecting RabbitMQ Data Collector to Rabbit MQ

The following sample shell script shows an example of how to connect the AutoPilot RabbitMQ Data Collector to a RabbitMQ broker.

Unix/Linux Example (bash)

```
#! /bin/bash

RABBITMQ_PLUGIN_DIR=/opt/nastel/rabbitmq_plugin/
RABBITMQ_PLUGIN_LOG=/opt/nastel/rabbitmq_plugin/log
```

```
cd $RABBITMQ_PLUGIN_DIR

# With log file …
#nohup java -jar RabbitMq_Metrics_Multiserver_v1.4.jar >
$RABBITMQ_PLUGIN_LOG/rabbitmq_plugin.log 2>&1 &

# Without log file …
nohup java -jar RabbitMq_Metrics_Multiserver_v1.4.jar > /dev/null 2>&1
&

exit
```

Chapter 4: AutoPilot Integration

During installation, a RabbitMQ monitoring service and a policy manager with a set of policies were configured automatically. As such, only minor configuration changes should be required.

If needed, you can edit the monitor properties as follows:

1. Open the AutoPilot Console.

2. Click the Deployment Tool to display Directory Viewer (if not already displayed).

3. Right-click RabbitMQ_Monitor and select Properties.
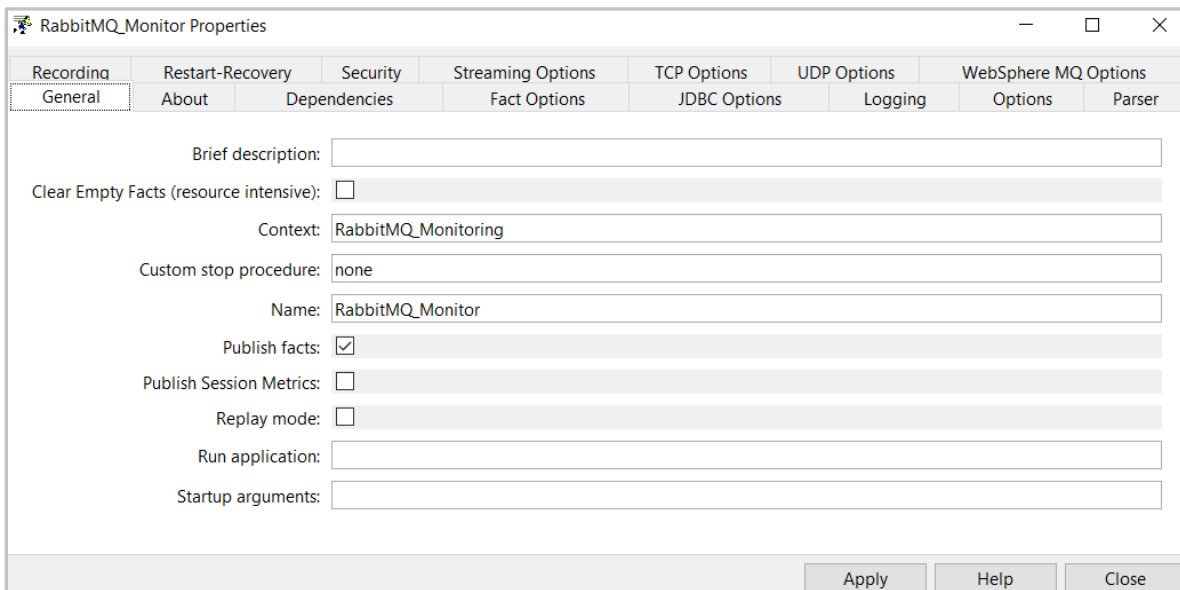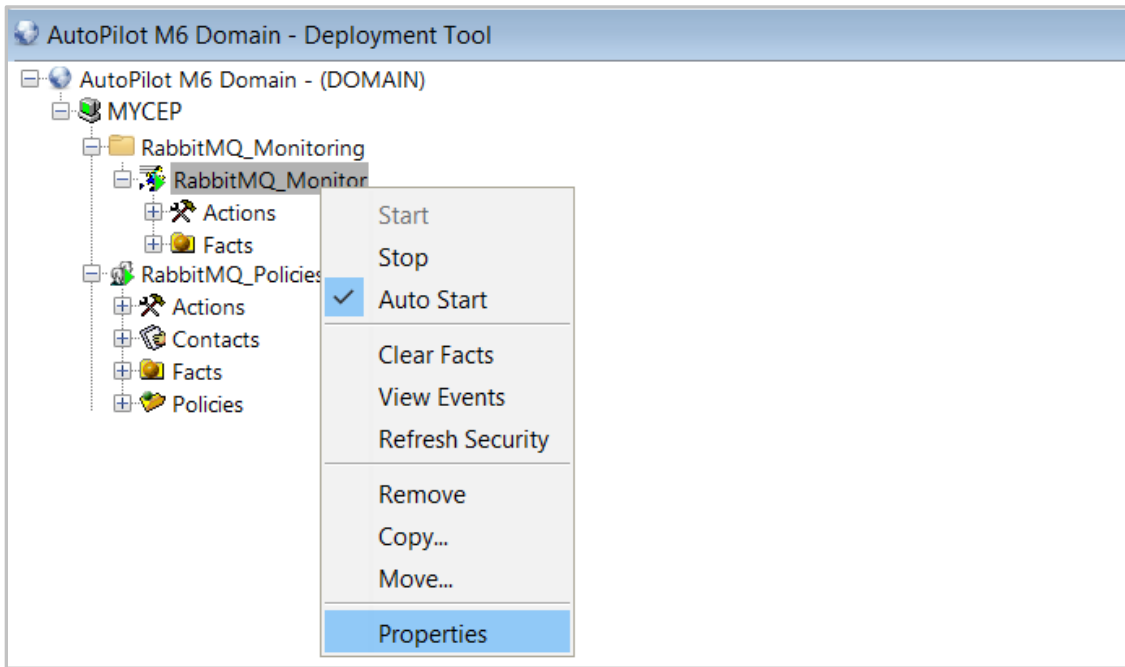
On the General tab, the following fields could be changed as required. Other parameters are not applicable to RabbitMQ monitoring.

<p style="text-align:center">Table 4-1. RabbitMQ Monitor – General Properties</p>

Property	Description
Brief description	Short description of the service.
Context	User-defined category that will be registered in the Domain Server. Context is displayed as a folder icon under each Managed Node.
Name	Name that uniquely identifies the service in the Domain Server. Enter or modify the Service Name as required, or in accordance with local guidelines. Variations of names are used when deploying services on multiple Nodes. No spaces or blanks are recommended in Service Name formats. For example, RabbitMQ_Monitor.

The following properties are available for the RabbitMQ expert. Review (if updating existing expert) or configure data elements as follows.
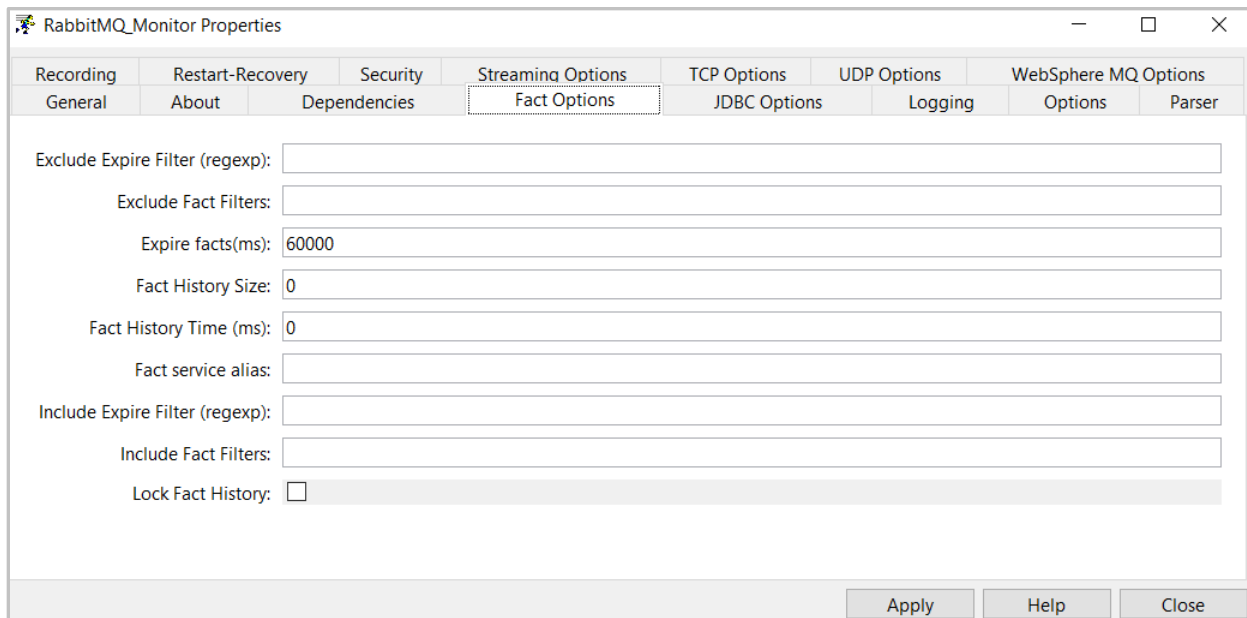

<p style="text-align:center">Table 4-2. RabbitMQ Monitor – Fact Options Properties</p>

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). The default is 0, which means never expire.

Table 4-2. RabbitMQ Monitor – Fact Options Properties

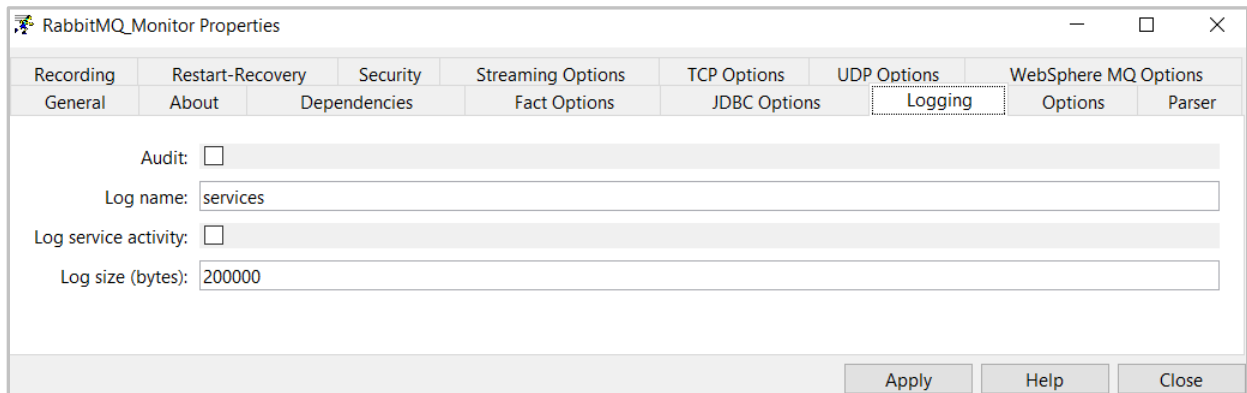| Property	Description
	However, in most applications, 0 should not be used. In cases where certain data is no longer published, if 0 is used, these facts will never expire. It is recommended that this value be 50% larger than the sample rate.
Fact History Size	Automatically maintains the specified number of samples for each published fact in memory.
Fact History Time	Automatically maintain fact history not exceeding specified time in milliseconds.
Include Fact Filters	Comma separated list of fact paths to include during publishing. For example: *SYSTEM*, *FactName*
Fact service alias	If supported by the expert, specifies the alternative service name that the expert will publish its facts under.
Include Expire Filter (regexp)	Facts that match the specified regular expression are expired.
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.

Table 4-3. RabbitMQ Monitor – Logging Properties

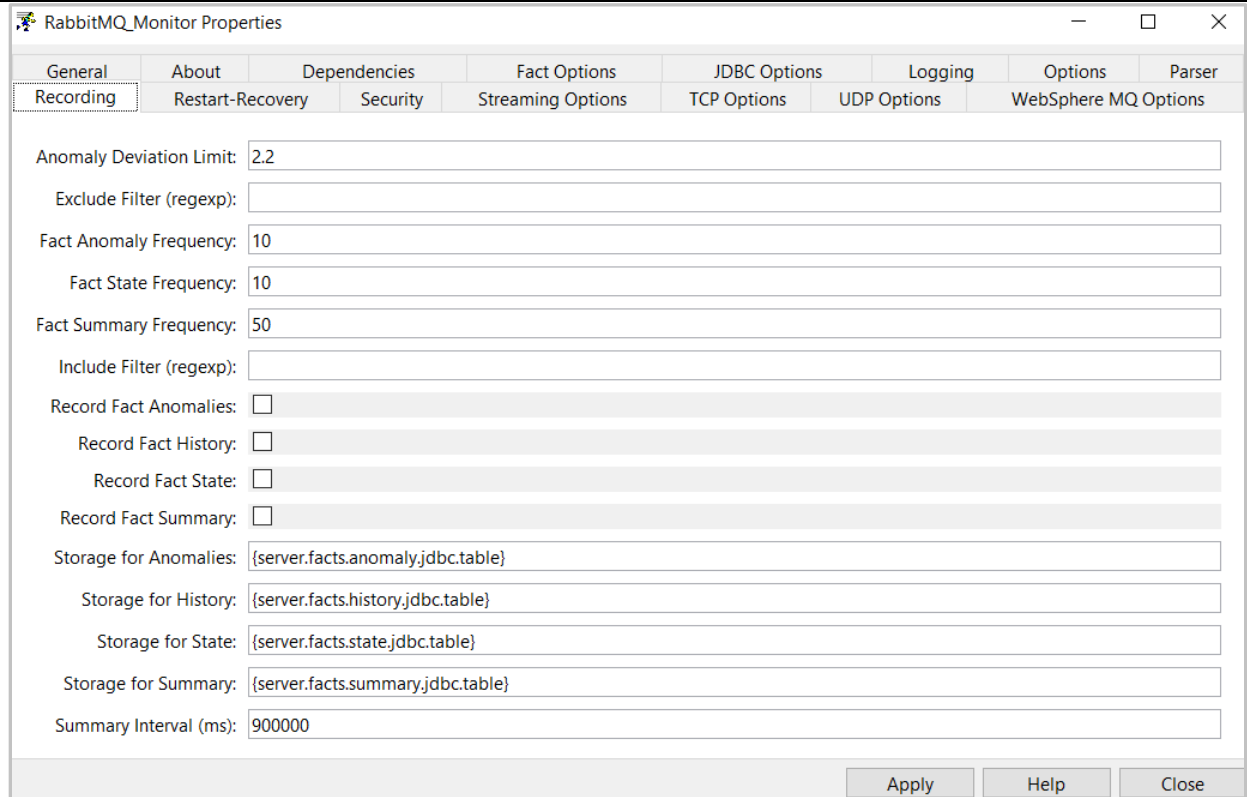| Property	Description
Audit	Enable/Disable service audit trace. Default is disabled.
Log name	Log name associated with the service. The default name is Services, but may be changed as required.
Log service activity	Enable/Disable service activity trace. Default is disabled.
Log size (bytes)	Log size in bytes. Real log size is the maximum value of the server.log.size and logsize.

RabbitMQ_Monitor Properties — □ ✕

| General | About | Dependencies | Fact Options | JDBC Options | Logging | Options | Parser |
| Recording | Restart-Recovery | Security | Streaming Options | TCP Options | UDP Options | WebSphere MQ Options |

Anomaly Deviation Limit: `2.2`

Exclude Filter (regexp): ` `

Fact Anomaly Frequency: `10`

Fact State Frequency: `10`

Fact Summary Frequency: `50`

Include Filter (regexp): ` `

Record Fact Anomalies: ☐

Record Fact History: ☐

Record Fact State: ☐

Record Fact Summary: ☐

Storage for Anomalies: `{server.facts.anomaly.jdbc.table}`

Storage for History: `{server.facts.history.jdbc.table}`

Storage for State: `{server.facts.state.jdbc.table}`

Storage for Summary: `{server.facts.summary.jdbc.table}`

Summary Interval (ms): `900000`

Apply   Help   Close

Table 4-4. RabbitMQ Monitor – Recording Properties	
Property	**Description**
Anomaly Deviation Limit	The number of standard deviations from the mean at which the value is considered an anomaly. For example, a value of 2.2 is 2.2 standard deviations. Requires fact recording to be configured (although not actually recording).
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 Anomaly Frequency	The frequency of fact updates at which anomaly calculation is done. A value of 10 indicates every 10th sample. A value of 1 would analyze every fact update to determine if it was an anomaly.
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, ~~it is used to write~~ an intermediate summary record is written every Xth 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.

<div align="center">

Table 4-4. RabbitMQ Monitor – Recording Properties

</div>

Property	Description
Record Fact Anomalies	If enabled, records every fact anomaly into the Anomaly database. The exclude/include filters are respected. Requires fact recording to be configured (although not actually recording).
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 records 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 Anomalies	Database table where the Fact Anomalies data is stored.
Storage for History	Database table where the Fact History data is stored.
Storage for State	Database table where the Fact State data is stored.
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.
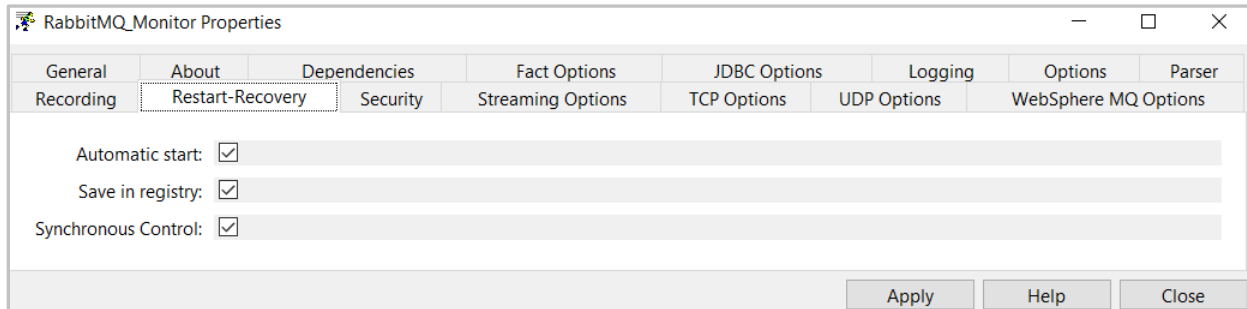
Table 4-5. RabbitMQ Monitor – Restart-Recovery Properties

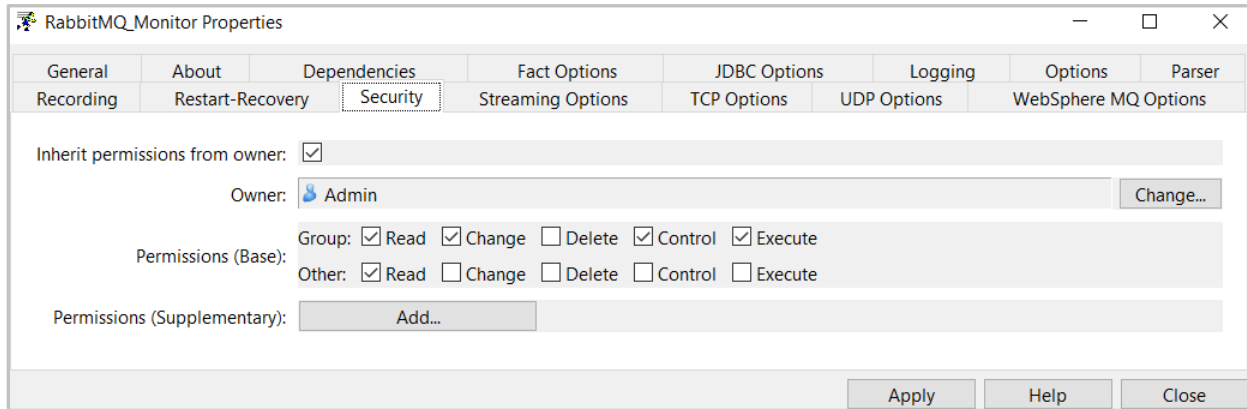| Property	Description
Automatic start	Enable/disable automatic start.
Save in registry	Persistent services are saved in the `Registry.xml` file. Default is enabled.
Synchronous Control	Enable/Disable synchronous service initiation.

Table 4-6. RabbitMQ Monitor – Security Properties

Property	Description	
Inherit permissions from owner	Enable/disable inherit permission from owner's permission masks. Default is enabled.	
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:
Read	Group members may read/view attributes of an object.	Other users may read/view attributes of an object.
Change	Group members may change the attributes of an object.	Other users may change the attributes of an object.
Delete	Group members may delete the object.	Other users may delete the object.
Control	Group members may execute control actions such as start, stop, and disable.	Other users may execute control actions such as start, stop, and disable.
Execute	Group members may execute operational commands on the object.	Other users may execute operational commands on the object.
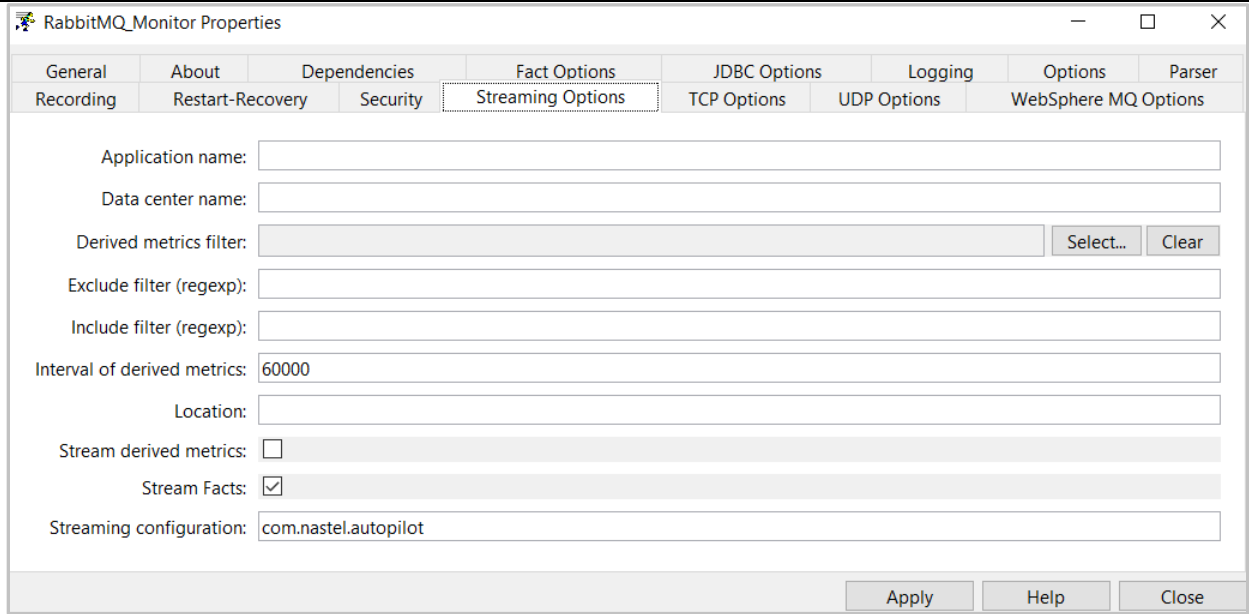
Table 4-7. RabbitMQ Monitor – Streaming Options Properties

Application name	Sets application name if different from the default set in the tnt4j.properties file.
Data center name	Sets data center name if different from the default set in the tnt4j.properties file.
Exclude filter (regexp)	Ignore facts that match specified regular expression; that is, do not stream facts that match the regexp.
Include filter (regexp)	Only stream the facts that match specified regular expression.
Location	Sets server location if different from the default set in the tnt4j.properties file.
Stream Facts	Enable/disable fact streaming (requires TNT4J streaming framework).
Streaming configuration	Indicates where the data streams. This value must match a stanza in the tnt4j.properties file. The default is com.nastel.autopilot.
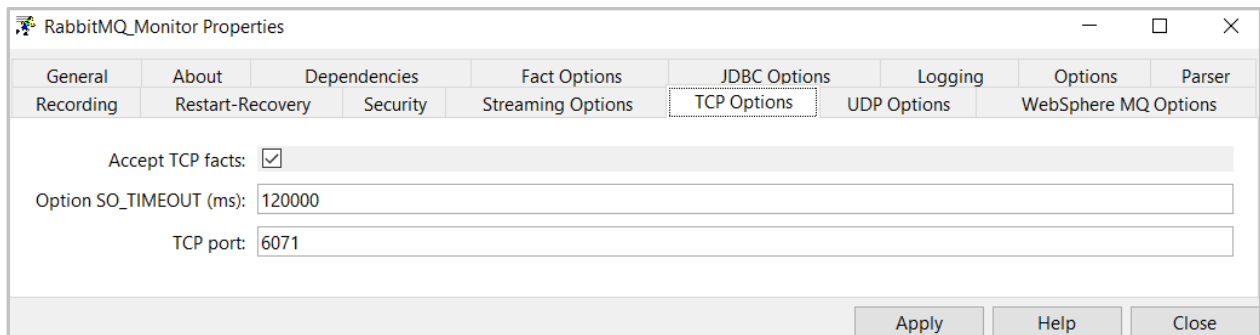
TCP is a reliable data connection to ensure facts will be published, but there is a slight performance hit due to the extra networking overhead required.

- Click TCP Options tab, to enable an M6 Process Wrapper to receive TCP data.

- Check Accept TCP Facts checkbox, and then enter a port. The port will also have to be specified in the application sending the fact data.
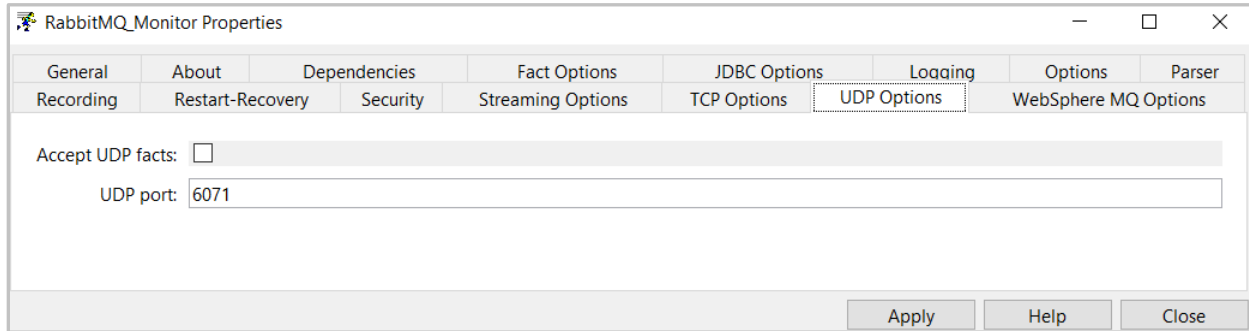
UDP is a less reliable data connection used mainly for speed and application-to-application decoupling. While this is the fastest protocol with the least amount of network overhead, there is potential that data could be lost since there is no acknowledgment/hand shaking between the sender and receiver.

- Click UDP Options tab to enable an M6 process wrapper to receive UDP data.
- Check Accept UDP Facts checkbox and then enter a port. The port will also have to be specified in the application sending the fact data.

Chapter 5: AutoPilot RabbitMQ Expert Metrics

This section describes some of the metrics collected by the AutoPilot RabbitMQ Expert.

The level or detail of the data presented can be modified as discussed in the configuration section above. The facts shown in these screen captures are samples only.
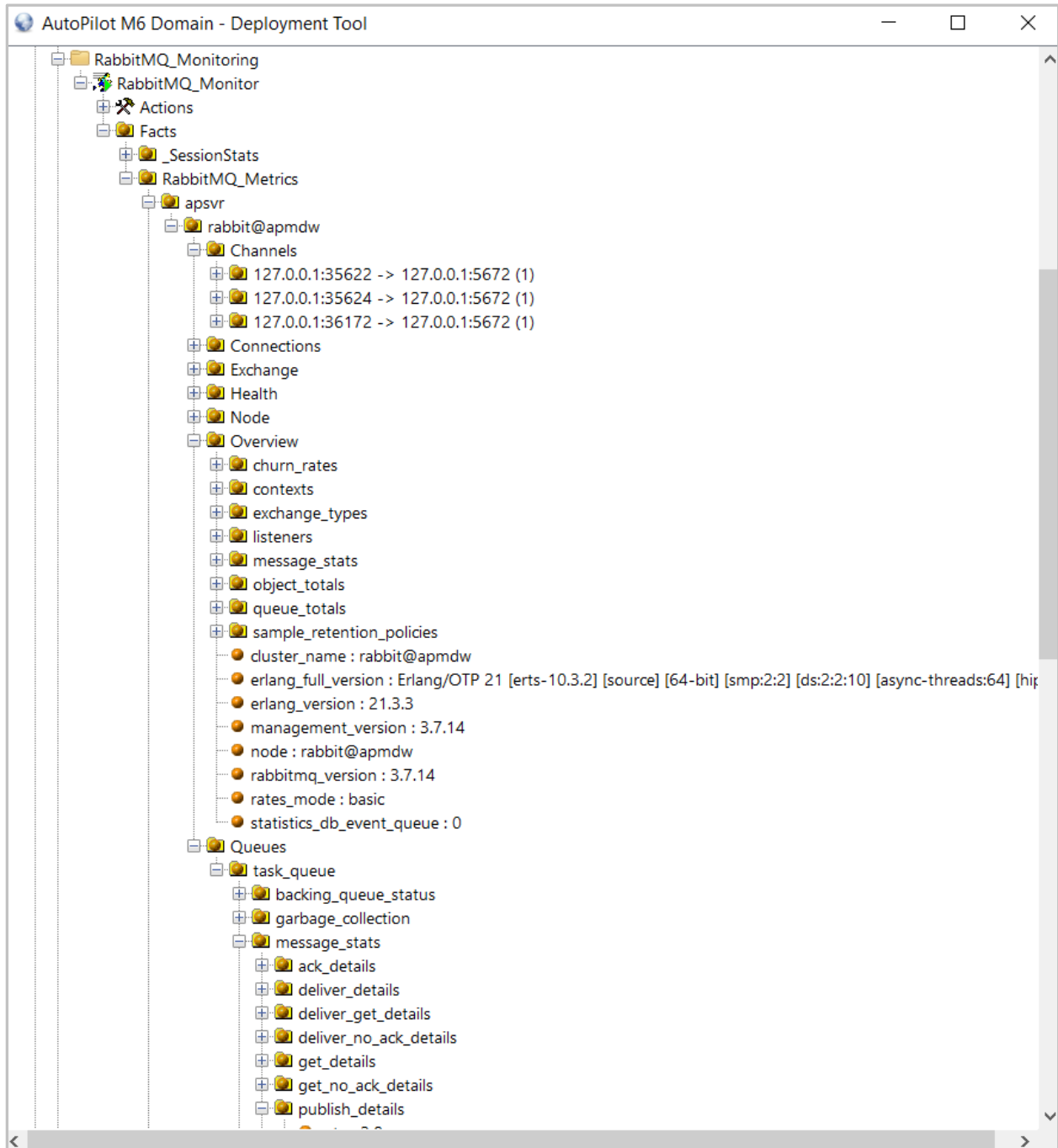
5.1 Rabbit MQ Channels

Provides highly granular information about channel activity: message publish and confirm rates, rates at which messages are delivered and acknowledged by consumers, etc.
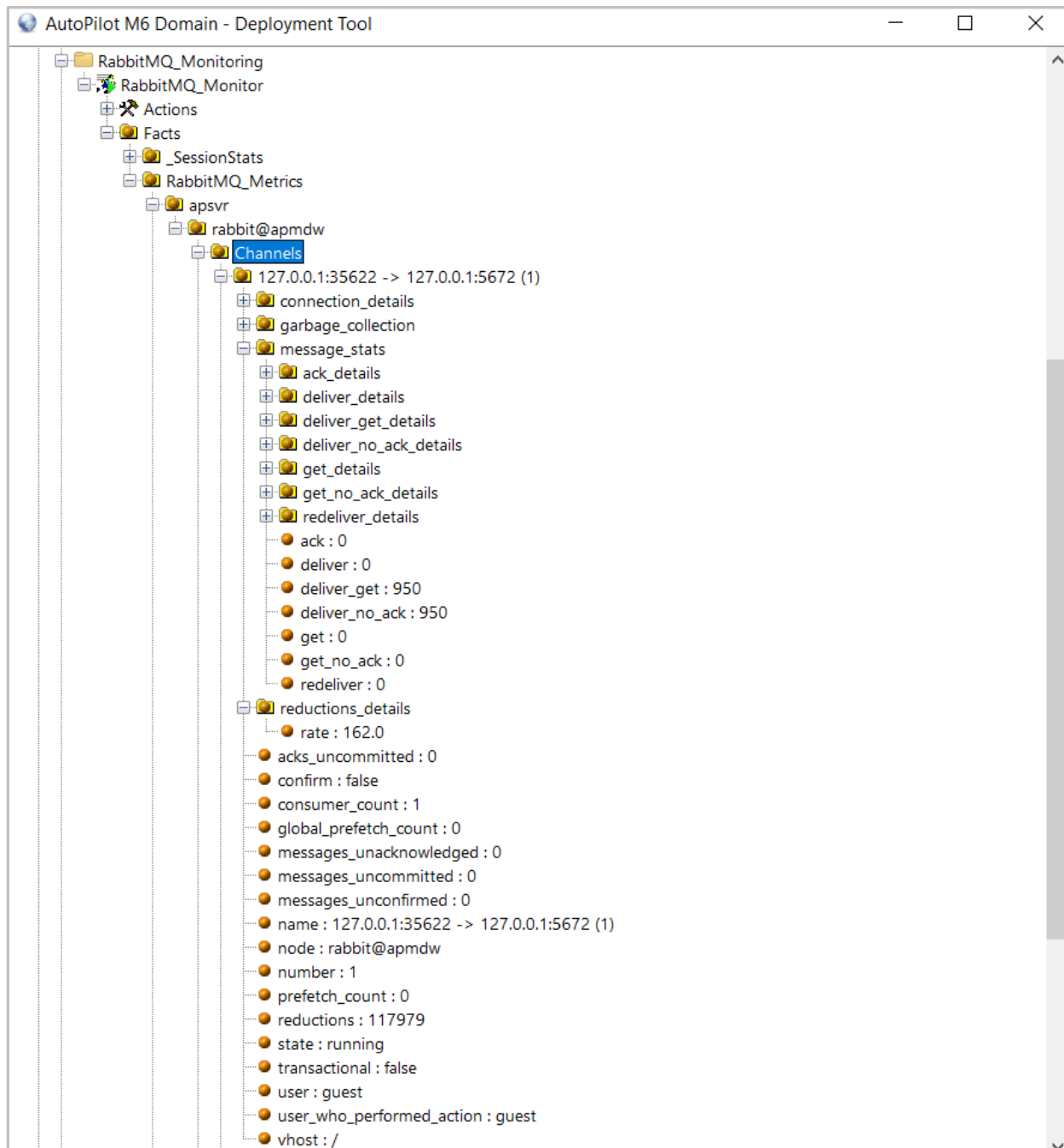
5.2 Rabbit MQ Connections

These metrics provide information about Connections: protocol, state, client properties, reductions rates and other details.

5.3 Rabbit MQ Exchange

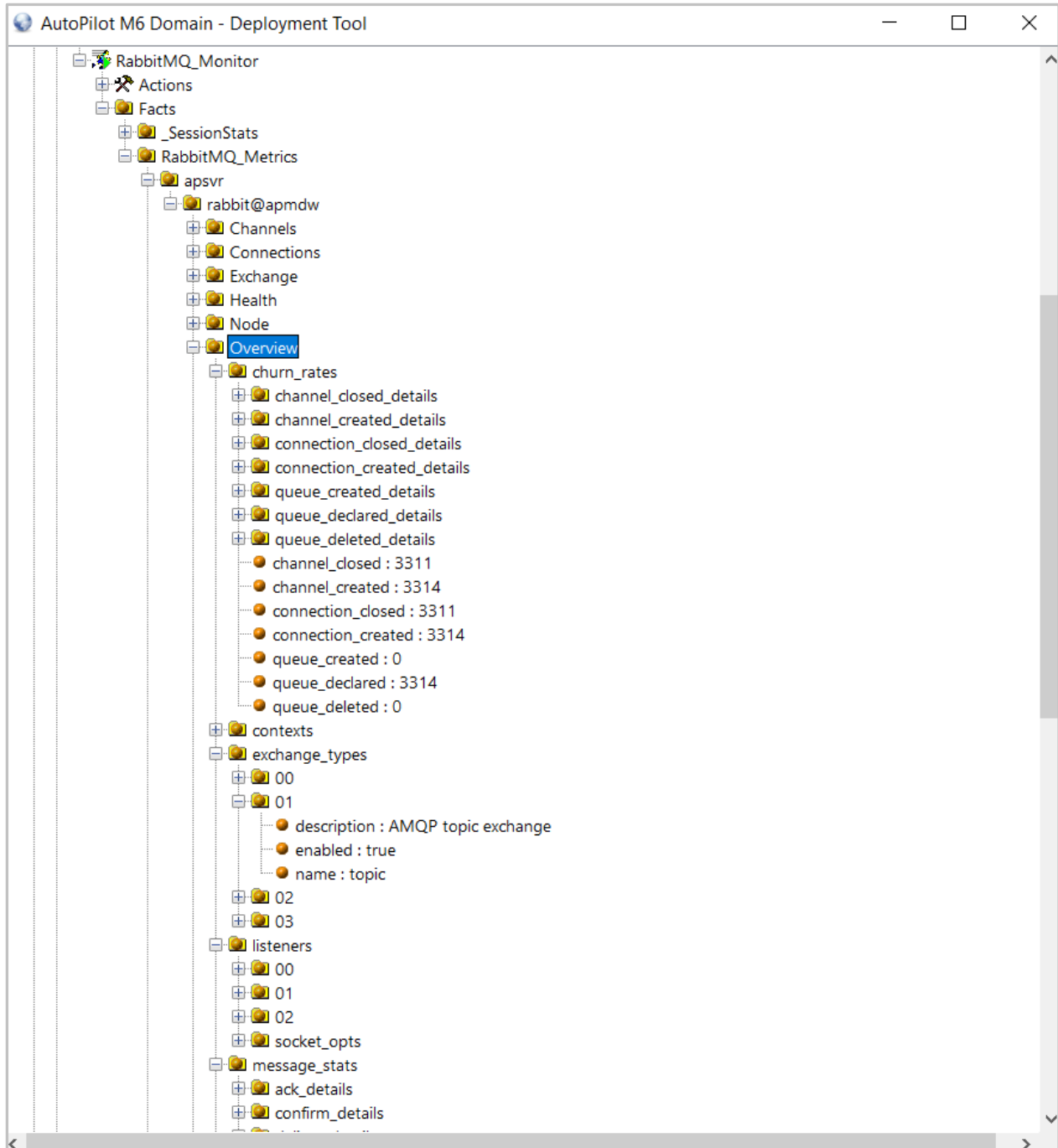These metrics provide information about RabbitMQ Exchanges, including publish in /out rates.
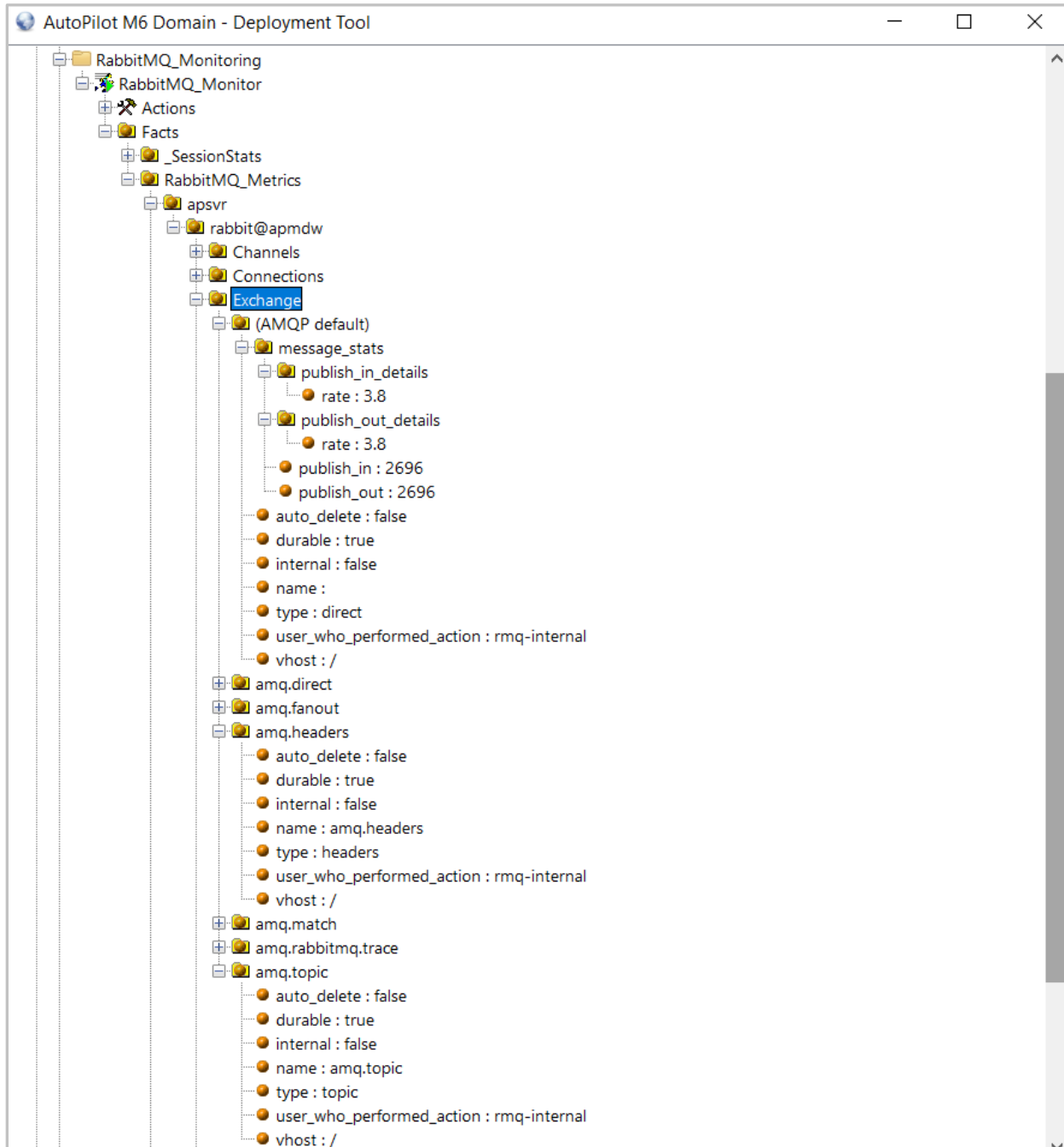
5.4 Rabbit MQ Node

These metrics provide a wealth of operational statistics on messaging operations performed by the RabbitMQ broker.
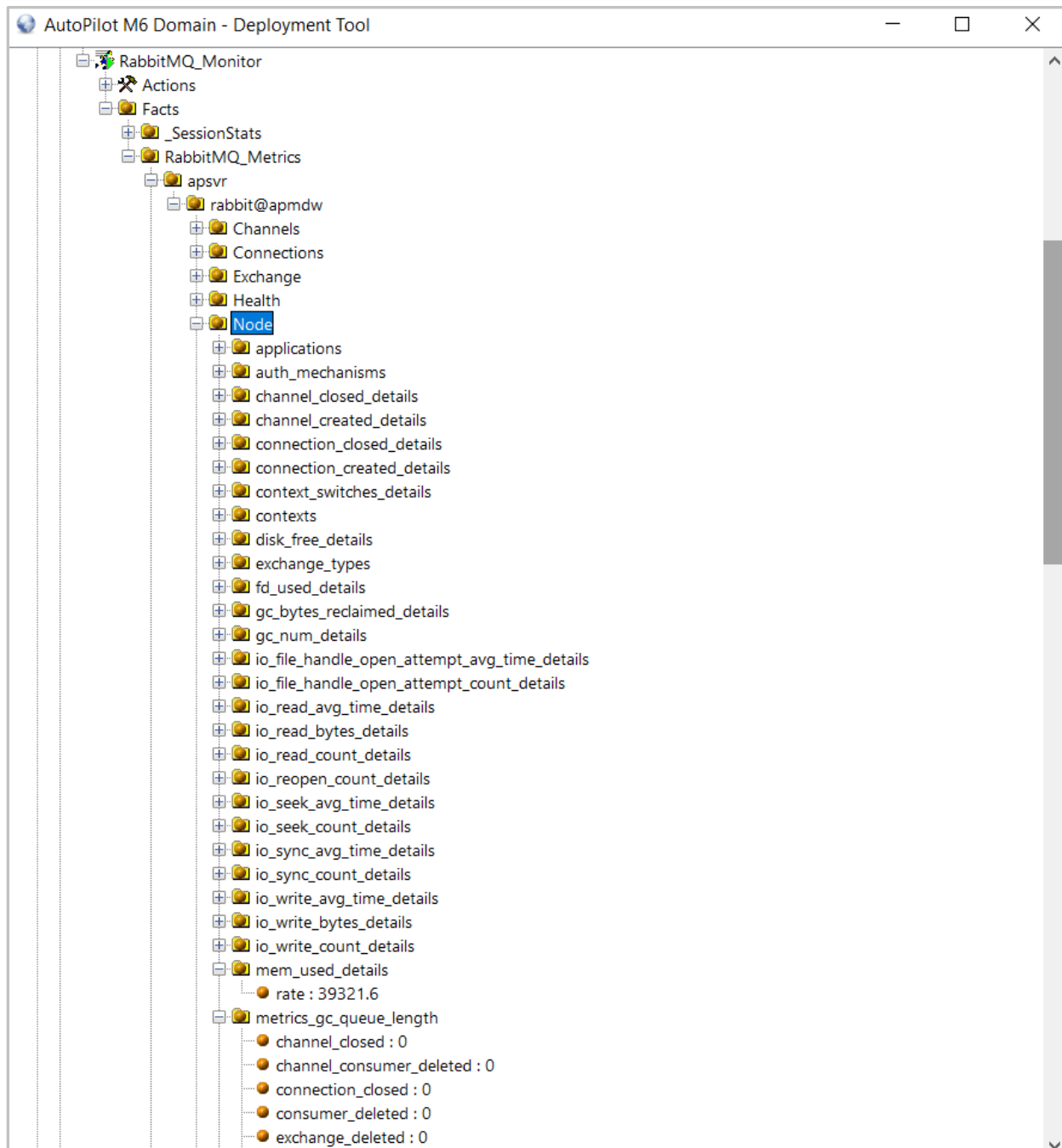
5.5 Rabbit MQ Overview

These metrics provide an overview of the RabbitMQ environment, including details about connections, channel operations, queue operations, churn statistics, memory consumption, broker definitions and other useful information.

5.6 Rabbit MQ Queues

These metrics provide detailed information about RabbitMQ message queues, including publish and delivery rates, message sizes, memory used by queue processes, consumer utilizations and many other vital statistics.

Chapter 6: AutoPilot RabbitMQ Sample Policies

The RabbitMQ plugin provides a set of out-of-the-box policies which analyze the data collected by the RabbitMQ Monitor.

This section outlines the key policies and use cases for these policies. Additional out of the box policies are included.
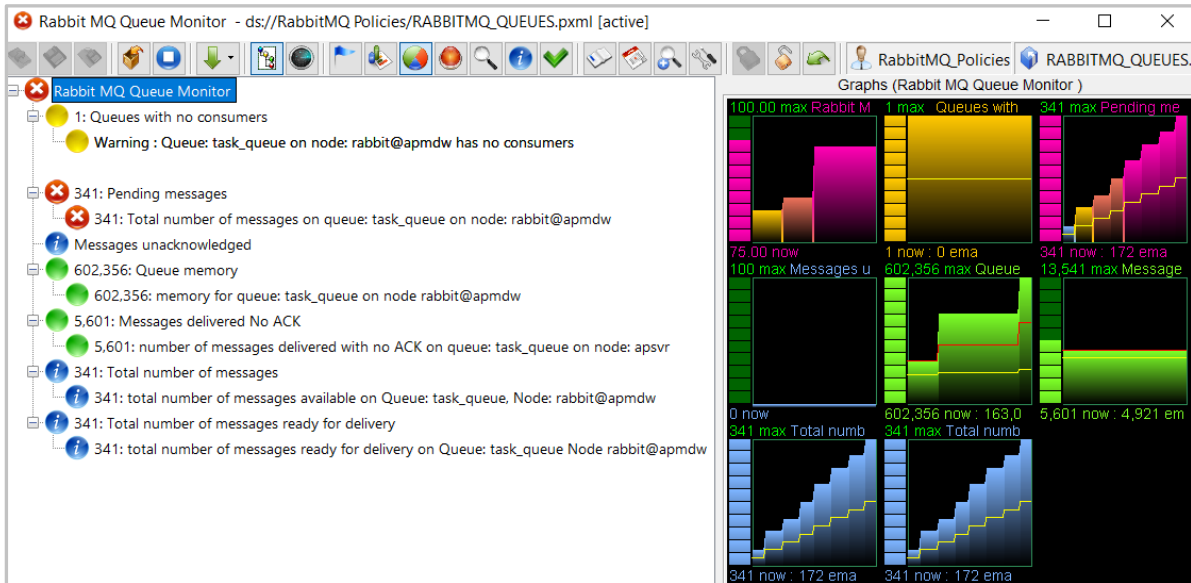
6.1 RabbitMQ Dashboard

This dashboard provides insight into the overall health of RabbitMQ.
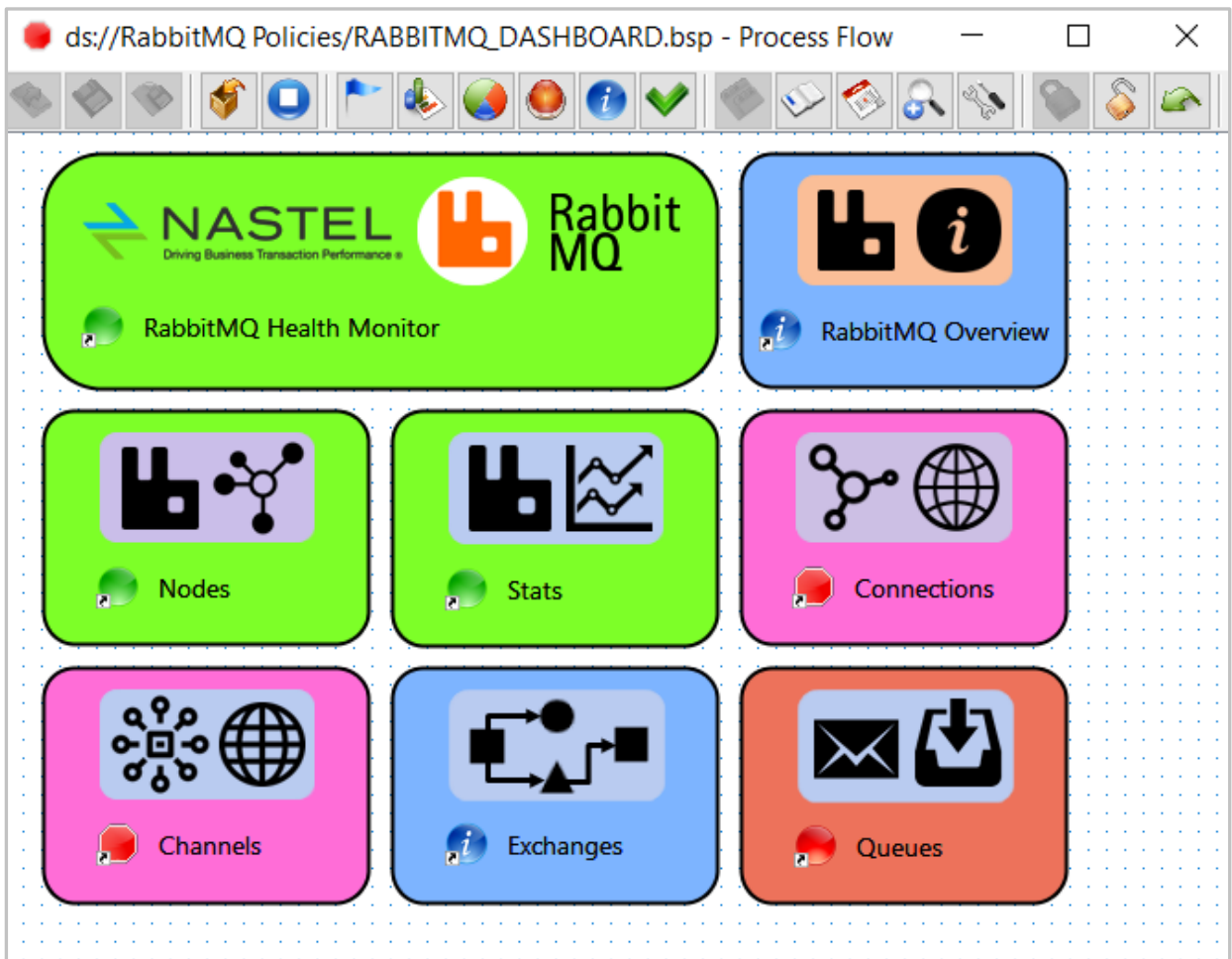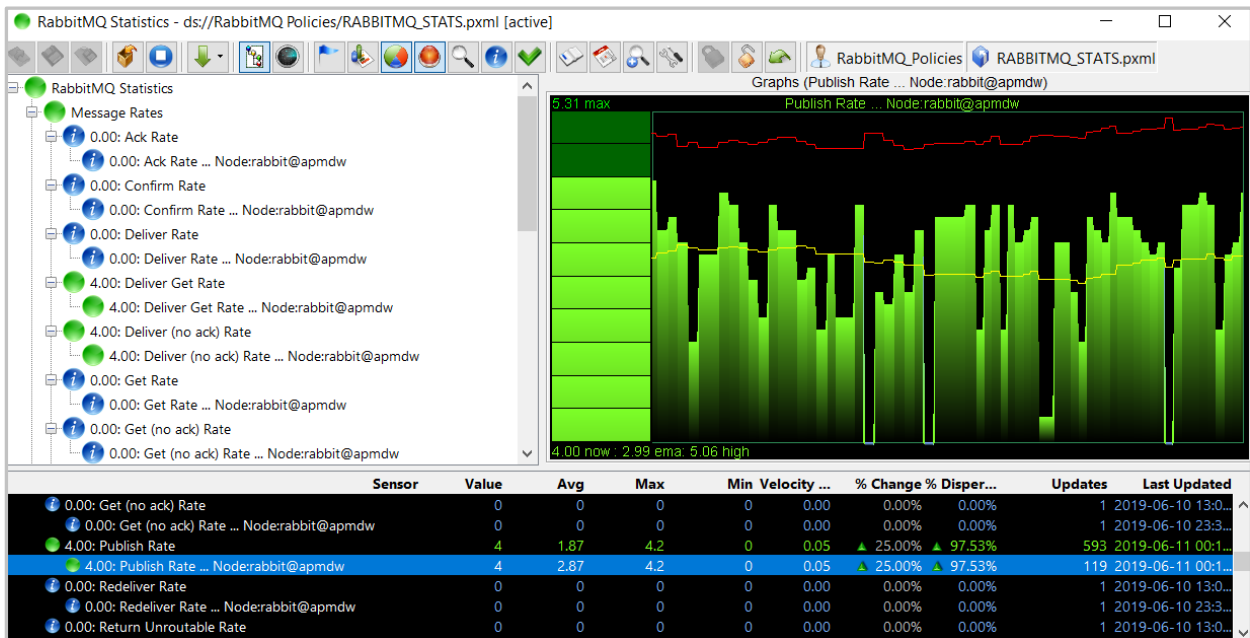
6.2 Rabbit MQ Queue Monitor

This dashboard provides real-time monitoring of RabbitMQ message queues.

6.3 Rabbit MQ Stats Monitor

This dashboard provides real-time monitoring of vital statistics for RabbitMQ Brokers.

Appendix A: Related Documents

This appendix contains a list of reference material and documents relevant to APMW. The documents can be found in the Resource Center.

<table>
<tr><td colspan="2" align="center">**Table A-1. Nastel Documentation**</td></tr>
<tr><td align="center">**Document Number (or higher)**</td><td align="center">**Title**</td></tr>
<tr><td>M6MW-ADM 660.002</td><td>*Nastel AutoPilot M6 for Middleware V6.6 - Administrator's Guide*</td></tr>
<tr><td>M6MW-INS 664.003</td><td>*Nastel AutoPilot M6 for Middleware V6.6 - Installation Guide*</td></tr>
<tr><td>M6MW/SM 660.001</td><td>*Nastel AutoPilot for Middleware Security Manager V6.6 - User's Guide*</td></tr>
<tr><td>M6WMQ-WMM 661.002</td><td>*Nastel Navigator Classic (apodwmq) V6.6 - User's Guide*</td></tr>
<tr><td>M6/MQ 600.005</td><td>*AutoPilot® M6 Plug-in for IBM MQ*</td></tr>
<tr><td>APM6/INS 625.002</td><td>*AutoPilot M6 Installation Guide*</td></tr>
<tr><td>APM6/USR 625.003</td><td>*AutoPilot M6 User's Guide*</td></tr>
</table>

Appendix B: Conventions

Table B-1. Typographical Conventions	
Convention	**Description**
<u>Blue/Underlined</u>	Used to identify links to referenced material or websites. Example: <u>support@nastel.com</u>
Bold Print	Used to identify topical headings, glossary entries, and toggles or buttons used in procedural steps. Example: Click **EXIT**.
Italic Print:	Used to place emphasis on titles, menus, screen names, or other categories.
Monospaced Bold	Used to identify keystrokes/data entries, file names, directory names, etc.
Monospaced Italic	Used to identify variables in a directory path or a command line. Example: `[AUTOPILOT_HOME]\documents.` Where the portion of the address in the brackets [ ] is 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 throughout AutoPilot M6 product family of documents.