



Nastel Navigator

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Chapter 1: Introduction

Welcome to the *Nastel Workgroup Server Expert Installation Guide*. This guide describes installation, configuration, and deployment. Please review this guide carefully before installing and using the product.

The Workgroup Server Expert (WSE) is a Java plug-in to the AutoPilot (AP) M6 Complex Event Processor (CEP), combining the functionality of the Nastel Navigator Workgroup Server (WGS) and an AutoPilot M6 expert. The WGS discovers the objects of your IBM MQ, IIB/ACE, TIBCO EMS and Kafka networks, stores that information in a database, and makes it available to client applications, such as the Nastel Navigator (formerly, the APWMQ Explorer). In addition, the expert component optionally publishes the object information as facts, which are visible in the Enterprise Manager console and can be used in the formation of AP policies and business views.

1.1 How this Guide is Organized

[Chapter 1:](#) Introductory information as well as support and reference information.

[Chapter 2:](#) An overview of Nastel Navigator and its components.

[Chapter 3:](#) Provides installation and licensing requirements, as well as information for the development of management plans.

[Chapter 4:](#) The installation/upgrade steps.

[Chapter 5:](#) Provides database configuration information.

[Chapter 6:](#) Provides instructions for deploying the WGS Expert.

[Chapter 7:](#) Installation of the web applications integrated with Nastel Navigator.

[Chapter 8:](#) Provides installation instructions for Nastel Navigator's Scheduler.

[Chapter 9:](#) Information on Rest API.

[Chapter 10:](#) Information on how to reassign viewlets to different workgroup servers.

[Chapter 11:](#) Troubleshooting topics.

[Appendix A:](#) A list of reference material and documents.

[Appendix B:](#) Information on executing user-defined scripts.

[Appendix C:](#) A listing of Nastel Navigator objects and IBM MQ objects used by Nastel Navigator.

[Appendix D:](#) A listing of IBM MQ agent run-time messages.

[Appendix E:](#) A listing of workgroup server run-time messages.

[Appendix F:](#) Information on IBM MQ agent z/OS error codes and messages.

[Appendix G:](#) Exit codes when Nastel Navigator runs as a service on Windows.

[Appendix H:](#) Discusses fact publishing and behavior.

[Appendix I:](#) Explains and illustrates Workgroup Server Communication to Nastel's IBM MQ Agent

1.2 History of this Document

Table 1-1. Document History			
Release Date	Doc Number	Version	Summary
January 2020	NAV/WGS 101.012	10	Change "APMW" to "Nastel Navigator." Update year and doc number format.
March 2020	NAV/WGS 101.013	10	Update hyperlinks, section 2.2 and Appendix A.
April 2020	NAV/WGS 101.014	10	Update MQ object refresh interval and add screenshot of "Other Options" tab in Chapter 7.
June 2020	NAV/WGS 101.015	10	Job scheduler updates in Chapter 6. Add Chapter 8, Rest API.
June 2020	NAV/WGS 101.016	10	Updates to sections: 6.1, 6.2 (step #2), 6.3 and 6.3.1. Add section 6.4. In section 4.2: remove option 0 and add information on running nsqjdbcmk manually.
June 2020	NAV/WGS 101.017	10	Update figures 6-3, 6-4 and 7-4.
June 2020	NAV/WGS 101.018	10	Add chapter 9: Web Application Installation.
July 2020	NAV/WGS 101.019	10	Update intro to Chapter 8, Rest API.
July 2020	NAV/WGS 101.020	10	Update nastel_permv3 information in section 4.1.
August 2020	NAV/WGS 101.021	10	Update section 3.3. Add chapters 2 and 3 and update proceeding chapter numbers accordingly.
August 2020	NAV/WGS 101.022	10	Updates to section 1.4.
September 2020	NAV/WGS 101.023	10	Updates to section 1.7.
September 2020	NAV/WGS 101.024	10	Update Figure 1-1.

Table 1-1. Document History

Release Date	Doc Number	Version	Summary
October 2020	NAV/WGS 101.025	10	Updated step #8 in section 5.1. Appendix E, changed “nsqsqlmk” to “nsqjdbcmk.”
December 2020	NAV/WGS 101.026	10	Change version 10.1.1.x to 10.x in sections 5.1 and 5.2.
December 2020	NAV/WGS 101.027	10	Add section 7.4.4, Connecting to the Network, and chapter on Reassigning Viewlets. Update section 4.3, remove word commands for nsqjdbcmk in section 5.2, move 4.1 – 4.2.2 to Chapter 3, rearrange and update Chapter 5, move location of Web Application Installation chapter from 10 to 7 (and reorder proceeding chapters and sections), create an appendix for “Understanding WGS 10 Fact Publishing”, update figure 5-1. Update screenshots in Chapter 6. Update section 1.4.1.
February 2021	NAV/WGS 101.028	10	Add section 4.4.
March 2021	NAV/WGS 101.029	10	Update Figure 9-1.
April 2021	NAV/WGS 101.030	10	Updates to Chapter 9, Rest API. Add information on ACE/IIB. Add information on nsqjdbcmk’s option 9 to section 5.3.
May 2021	NAV/WGS 101.031	10	Updates throughout Chapter 9 (Rest API). Add information on auditing and deleting connection definitions in section 7.2.2.
May 2021	NAV/WGS 101.032	10	Update section 1.4.1 (What’s new in Version 10.2).
June 2021	NAV/WGS 101.033	10	Update Figure 1-1 (Nastel AutoPilot M6 for Nastel Navigator Installation Support)
August 2021	NAV/WGS 101.034	10	Update to Chapter 8 section 1 (Requirements) to add DB2 to list of supported databases for Job Scheduler Setup. Updated AP60_SU28.6.pkg to AP60_SU31.pkg.
November 2021	NAV/WGS 101.035	10	Adding 4.4 (Firewall Administration) and Appendix I: Workgroup Server Communication to Nastel's IBM MQ Agent. Updated definition, Table 6 -1.
March 2022	NAV/WGS 101.036	10	Added option 11 and exit codes to section 5.3.

1.3 Related Documents

Related and referenced documents can be found in [Appendix A](#).

1.4 Release Notes

Refer to the text files on your installation media or Workgroup Server Expert installation directory. Release notes and updates are also available through the Nastel Resource Center at: <http://customers.nastel.com>.

1.4.1 What's New in Version 10.4

The following are new functions in version 10.4:

- Solace support
- Transfer dashboard ownership from inactive users
- Streaming queues
- Select which columns to filter by when using viewlet filter
- Select columns to freeze (at left of viewlet)
- Force refresh mode for quick consecutive forced updates
- Kafka schema, schema subject, and schema subject version viewlets

1.5 Intended Audience

- This document is intended for personnel installing, configuring, and using Workgroup Server Expert.

1.5.1 User Feedback

Nastel encourages all users of Workgroup Server Expert to submit comments, suggestions, corrections, and recommendations for improvement of this documentation. Please send comments via email to: support@nastel.com. You will receive a response, along with status of any proposed change, update, or correction.

1.6 Technical Support

If you need additional technical support, you can contact Nastel by telephone or by email. 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. You can also contact Nastel support via the support website. To access online web-based Nastel automated support system (user ID/Password required), go to: <http://support.nastel.com/>.

1.7 Nastel AutoPilot M6 for Nastel Navigator Installation Support

See Figure 1-1 below for Nastel AutoPilot M6 for Nastel Navigator installation support. This platform is for the workgroup server and databases supported. Agents may be available for other versions of operating systems and middleware versions. You should contact your support representatives if your platform is not listed.

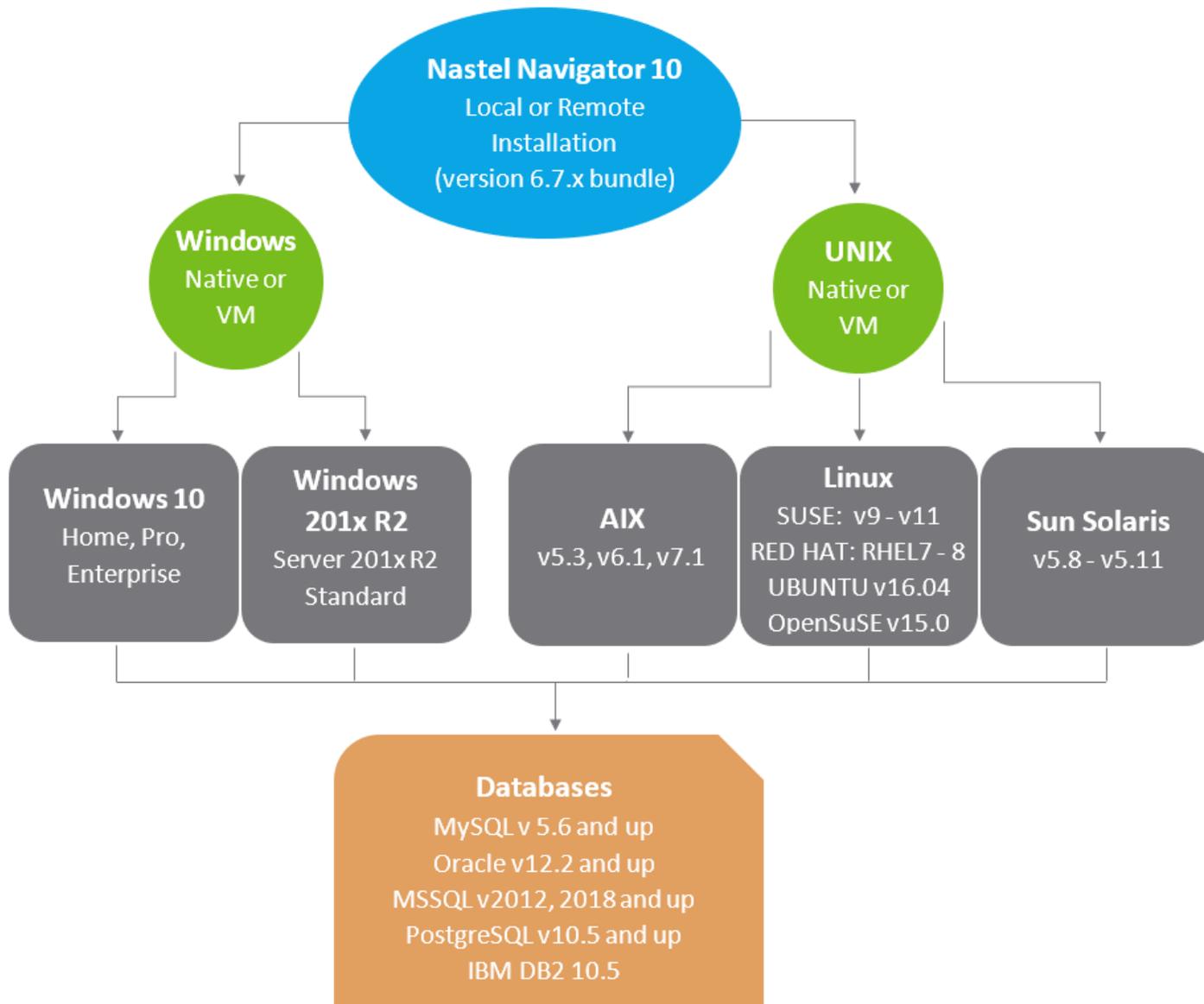


Figure 1-1. Nastel AutoPilot M6 for Nastel Navigator Installation Support

Chapter 2: About Nastel Navigator

This chapter provides an overview of Nastel Navigator and its components.

2.1 Nastel Navigator Functionality

Nastel Navigator enables users to identify and resolve the problems associated with managing middleware.

2.1.1 Management Needs of Middleware

When administrators deploy a middleware network, they need a management tool that:

- Ensures uninterrupted operation of each middleware component
- Discovers and corrects middleware system failures
- Prevents performance bottlenecks and conflicts that might affect business applications.

2.1.2 Management Tasks Performed by Nastel Navigator

To meet the management needs of middleware, Nastel Navigator does the following:

- Collects management data, statistics, and events (including performance and fault events) through intelligent agents.
- Takes corrective actions when middleware problems are identified.

2.2 Nastel Navigator System Components

Nastel Navigator has multi-tier client/server architecture, consisting of the following components:

- Workgroup servers
- IBM MQ Agents, Message Servers, and Event Publish-Subscribers
- Front-end administration applications (Web-based and console)

IBM MQ Experts monitor data and updates, even with the command server down. The Universal Agent, on the other hand, uses PCF commands and will not update with the command server down. Nastel Navigator system architecture is shown in the figure below.

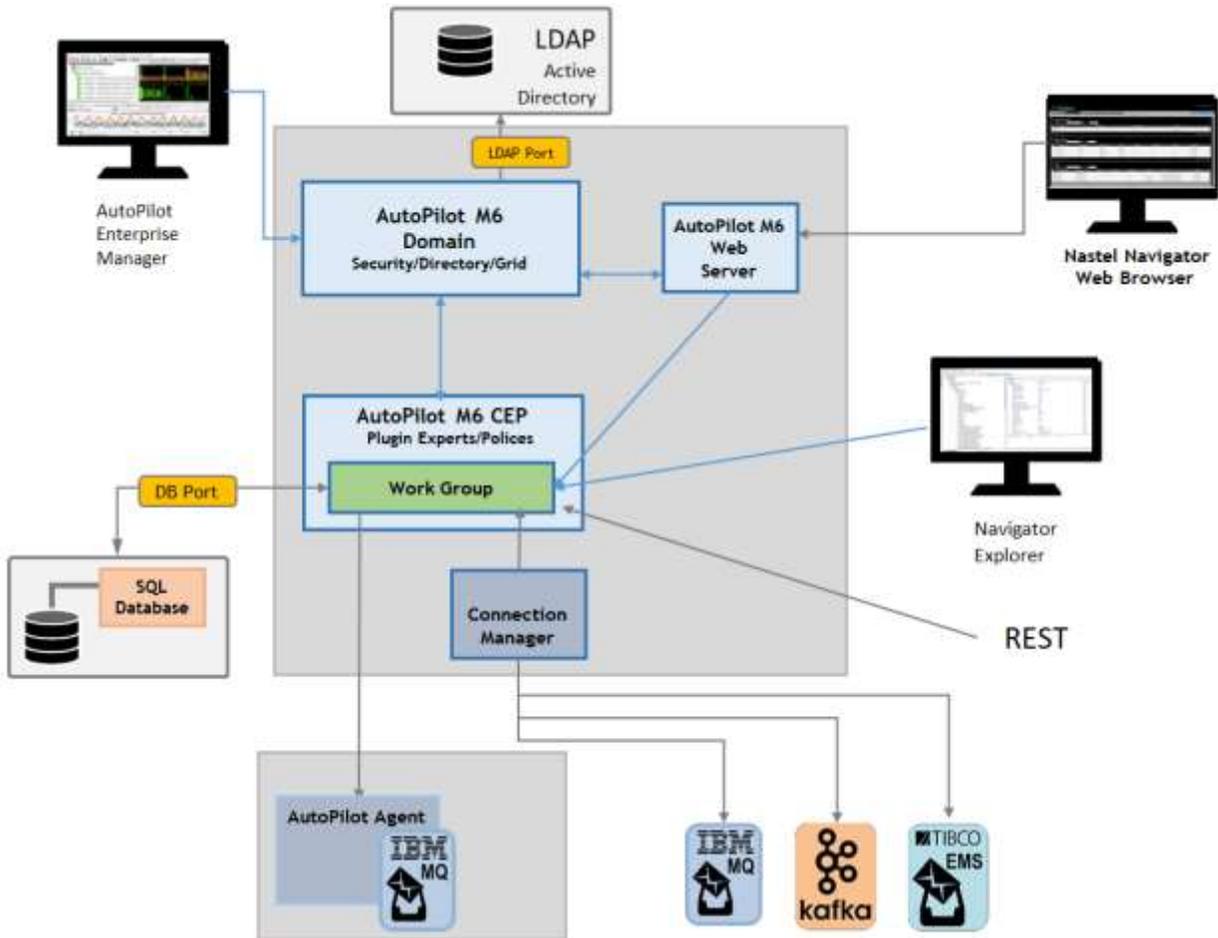


Figure 2-1. Nastel Navigator System Architecture

2.2.1 Workgroup Server

Nastel Navigator places IBM MQ nodes into groups. A workgroup server (also referred to as WGS) oversees a group of IBM MQ nodes. A workgroup server consists of two agents, (M6 managed node/CEP server with M6 SU6 or higher) and workgroup. The workgroup server collects information about a group of registered IBM MQ nodes and stores it in its database. This server makes it readily available for management applications. It can be used with or without local agents. The workgroup server is used to issue IBM MQ commands (PCF/MQSCs) remotely, without setting up IBM MQ channels. It can carry out instructions at any level of organization, including:

- Workgroup
- Node
- Queue manager
- Queue, channel, process, listener, namelist, authentication information, service, etc.



NOTE

A single workgroup server can manage up to 2048 IBM MQ nodes, with a maximum of 2048 queue managers on each node.

Recording IBM MQ System Metrics and publishing them as facts is supported when using workgroup server v10 and an agent running 6.5.8 or later against an IBM MQ V9 or later queue manager. In the figure below you see **QM_VER9** and below it is a **METRICS** folder, which is further divided into **CPU** and **DISK**, where the system metrics are published.

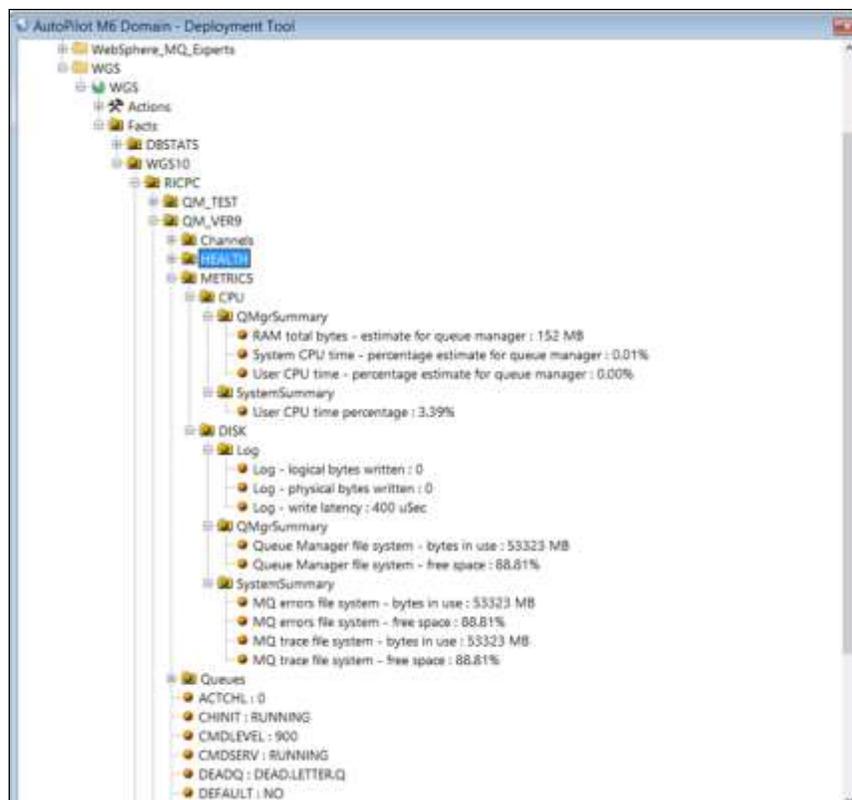


Figure 2-2. MQ System Metrics

2.2.2 Nastel AutoPilot M6 Complex Event Processor (CEP Server)

The Nastel AutoPilot M6 Complex Event Processor provides Nastel Navigator monitoring experts, automation policies, and business views. It is installed for every workgroup server and monitors only one workgroup.

2.2.3 Automation Policies

Policies use proactive automation rules and procedures to perform actions on one or more management services:

- Perform actions on one or more management services
- Policies are capable of writing information to database, log files, and other data stores
- Policies subscribe to facts and act on fact changes, time events, or other conditions
- Usually specific to monitored applications
- Managers manage policies. (Example: Scheduling Manager, IBM MQ Manager, etc.). Any number of relevant policies can be assigned to a manager (example: Alert or execute an action based on a condition/event).

2.2.4 Business Views

- Collection of rules (also known as sensors) that define a desired state of an eBusiness environment. The business views can be tailored to present the information in the form that best suits your needs.
- Proactive user-defined policies that:
 - Correlate facts/events
 - Automate and alert
 - Generate user-defined events
 - Collect historical data for future analysis
- Defined using domain console
- Deployable as policies within any defined network of managers (running in the background)
- Once deployed, available for remote viewing

2.2.5 Agents

The *IBM MQ* agent is an intelligent agent that runs on an IBM MQ node. It executes management commands on one or more queue managers within a local node. Every managed IBM MQ node must have its own IBM Agent unless agent-less monitoring is preferred. In the IBM MQ hierarchy, events occurring at the IBM MQ Agent level are directed back up to the workgroup server, and then distributed among client applications.

The *Publish Subscriber for IBM MQ* server is an agent that distributes IBM MQ events among subscribers. It is installed once on IBM MQ node, and once activated monitors events from all queue managers on this node. Also, the *Publish Subscriber for IBM MQ* monitors dead letter queues and generates events if message arrived on the dead letter queue.

The *Message Server for IBM MQ* provides message management of IBM MQ queue managers. It is also installed once per IBM MQ node but could be activated per queue manager. It allows copy, move, delete, find, and edit of individual or group of messages.

The *Connection Manager for IBM MQ* allows you to connect to queue managers running on remote IBM MQ nodes without installing agents on the nodes. It uses Server-Conn channels to connect and issue administration commands and receive replies and events. While the Server-Conn channel is available, you will be able to perform most of the IBM MQ administration functions except a few, like starting/stopping queue managers, browsing logs, etc.

Connection Manager for TIBCO EMS, also referred to as "CM for EMS," is a jar file called, `nsqcmems.jar`. All EMS connection information is passed from the workgroup server and is entered/modified either locally in the `nsqcmems.properties` EMS connection manager file or directly in the Nastel Navigator GUI.

The *Connection Manager for Kafka* passes all Kafka cluster connection information from the workgroup server and is entered/modified either locally in the `KafkaNode` `nsqcmkafka.properties` file or directly in the Nastel Navigator GUI.

The *Connection Manager for IBM IIB/ACE* passes all connection information from the workgroup server and is entered/modified either locally in the `nsqcmace.properties` file or directly in the Nastel Navigator GUI.

2.2.6 Components by Platform

The table below lists all Nastel Navigator components currently available and indicates the associated platforms.

Table 2-1. Nastel Navigator Components by Platform						
	z/OS	OS/400	AIX	Linux	SunOS	Windows
CEP Server			*	*	*	*
Workgroup Server			*	*	*	*
IBM MQ Agent	*	*	*	*	*	*
Event Publish-Subscriber	*	*	*	*	*	*
Message Server	*	*	*	*	*	*
Connection Manager for IBM MQ				*		*
Connection Manager for TIBCO			*	*	*	*
Connection Manager for Kafka			*	*	*	*
Connection Manager for IIB/ACE			*	*	*	*
Log Adapter (Tivoli, HP-OV)			*	*	*	*
Nastel Navigator Explorer						*
Message Explorer						*

* Available

Chapter 3: Prerequisites

This section contains general information related to the preparation for and installation of the Workgroup Server Expert. Refer to the text file included in the installation package for pertinent information.

3.1 Installation Requirements

To install the workgroup server, the following requirements must be met:

- You must have the following products. Contact Nastel Support for assistance if you do not already have these installed:
 - Nastel AutoPilot M6 (checkout [Nastel AutoPilot M6 Installation Guide](#) for additional information)
 - Nastel AutoPilot M6 CEP Server
- Hardware requirements:
 - Minimum must be met:
 - 1 GHz or higher CPU
 - 2 G RAM
 - 1 G free disk space
 - Recommended:
 - 2 CPUs 8 core each
 - 8 G RAM
 - 10 G free disk space
- A database connection. Workgroup Server Expert supports the databases in [Figure 1-1](#). A database connection is needed.



SQL database should be highly available.

3.2 Workgroup Server Expert Installation Materials

Click on the following link to download the installation packages:

<http://data.nastel.com/ap/AutoPilot-M6> (credentials required)

Download the most recent `Nav_Server_10.x.x.zip` file. It contains the following components:

- `Nav_Server_10.x.x.txt`: the readme
- `bin`: M6-WMQ binary files

- `webapps`: Navigator war and jar files
- `nsqcmems.jar`: Tibco EMS Agent
- `nsqcmems.properties`: EMS Agent properties
- `nsqcmkafka.jar`: Kafka Agent
- `nsqcmkafka.properties`: Kafka Agent properties
- `nsqcmace.properties`: IIB/ACE Agent properties
- `WGS_10.x.x.x.pkg`: Workgroup Server 10 Expert, includes `lib\wgsexpert.jar`, `lib\nsqjdbcmk.jar` and `sql\scripts\nsqjdbcmk\{various sql scripts}.sql`.
- `WGS_REST_10.x.x.x.pkg`: Workgroup Server 10 REST Pack
- `WGSRP-10.x.x.x.pkg`: Workgroup Server 10 Resource Pack
- `AP_IBMMQ-10.x.x.x.pkg`: MQ plugin for WorkGroup Server 10
- `AP_IBMMQRP-10.x.x.x.pkg`: MQ plugin for WorkGroup Server 10 Resource Pack

3.3 Workgroup Server Expert License

To obtain a license file, contact licensing@nastel.com or your Nastel Support representative.

After obtaining a CPU-based license file, it will need to be installed on each system on which a workgroup server will run (see next section for instructions). The CPU count is pre-allocated and subject to change. Contact your Nastel Support representative for further information pertaining to trial license properties.

A workgroup server license is a digitally signed text file that contains identification and license entitlement information for your Workgroup Server Expert installation. Each time the workgroup server is started, it checks the license file for your licensing and configuration information.

To obtain a license file, contact licensing@nastel.com or your Nastel Support representative.



1. The workgroup server will not run without a correctly configured license file.
2. A new license is required for Version 10.1.0.1 and above. It is required for users of Nastel Navigator and users running agents on z/OS.

3.3.1 Installing the Workgroup Server Expert License File

When you receive your license file, back it up in a safe place in case you ever need to reinstall Workgroup Server Expert. For the system that will run the workgroup server identified in the license file, we recommend you copy the license file to the directory:

```
[AUTOPILOT_HOME]\localhost
```

where:

```
[AUTOPILOT_HOME] is the directory path where AutoPilot is installed.
```

After the Workgroup Server Expert is deployed, you must enter the full path location name of the license file in the expert's properties dialog box. (See [Create Workgroup Server Expert – General Tab.](#))



The name of the license file must be AutoPilotWMQ_xyz.lic, where xyz is the name of the workgroup.

You can check the license file information by starting your Workgroup Server Expert and checking the AutoPilot logs ([*AUTOPILOT_HOME*]\logs\log4j\hostname.log4j).

The workgroup server will return the licensing information, similar to the following example:

```
LICENSING INFORMATION:
SOURCE (C:\nastel\AutoPilotM6\localhost\AutoPilotWMQ_MQM.lic)
WORKGROUP (MQM)
FEATURES (SQLDB)
EXPERT (YES)
WORKGROUP_HOSTS (host)
CPU_COUNT (14)
USER_COUNT (10)
AGENTLESS_CONNECTION_COUNT (250)
APOD_WMQ_USERS (100)
MIPS (0)
EXPIRATION_DATE (Fri Jun 10 00.00.00 2016)
```

where:

SOURCE is the full path location name of the license file.

WORKGROUP name of the workgroup authorized for this license.

FEATURES is a list of licensable features (Kerberos, SQLDB, TopologyView) that the user is authorized to use.

EXPERT yes indicates a license is for Workgroup Server Expert.

WORKGROUP_HOSTS is a list of network hosts that the workgroup server is licensed to run on.

CPU_COUNT is the maximum number of system processors that can be simultaneously managed by a single workgroup server.

USER_COUNT is the maximum number of client users that can simultaneously connect to a single workgroup server via the Navigator Explorer, Message Server, and/or Nastel AutoPilot M6.

AGENTLESS_CONNECTION_COUNT is the maximum number of concurrent queue manager connections allowed by Connection Manager.

APOD_WMQ_USERS number of users that can simultaneously use the web-based Navigator (formerly AutoPilot On-Demand for WMQ).

MIPS (millions of instructions per second) number of MIPS for which z/OS nodes can be

managed.

EXPIRATION_DATE is the date on which the license expires and a new license will have to be obtained.

3.4 Installing Agents, Connection Manager for IBM MQ, or Utilities

This book does not contain instructions for installing agents, the connection manager for IBM MQ, or utilities. To install these, go to the [Nastel Navigator Components Installation Guide](#) and perform the installation steps described.

Chapter 4: Installation / Upgrade Steps

Perform the following steps to install or upgrade your Workgroup Server Expert software.

4.1 Step 1: Install the Latest E-fix File

Perform the following steps to install workgroup server components.

1. Stop all services and processes.
2. If upgrading, back up the %APWMQ_HOME% directory and existing database tables.
3. Open the latest e-fix zip file, Nav_Server_10.x.x.zip.
4. Copy all the files and paste them in to the Nastel directory, for example: c:\nastel\apwmq. If upgrading an existing install, replace any same named elements.

4.2 Install v10.x Workgroup Server Expert

1. Copy the package file to [AUTOPILOT_HOME]/updates on the server where AutoPilot M6 is installed.
2. Run package manager to install the workgroup server expert. For example:
 - [AUTOPILOT_HOME]/bin/pkgman [AUTOPILOT_HOME]/updates/WGS_<version>.pkg
 - OR-
 - Alternatively, on a Windows system, run the package manager GUI by going to **Start > Nastel AutoPilot M6 > M6 Product Maintenance**. Click **Install**, select the package in the **Updates** folder, and click **Open**.

If you get an indicator that you do not have the prerequisite service update, you must download and install the required packages, namely, all packages AP60_SUnn.pkg, where “nn” is 1 greater than the current SU version shown in your package manager display.

4.3 Step 3: Install Additional Packages

If this is a new install use the following packages to install the IBM MQ, IIB/ACE, TIBCO EMS, Kafka experts, REST API, or the scheduler feature (see [Job Scheduler Setup](#) for more information).

Table 5-1. Packages	
Package	Package Name
EMS, Kafka, IIB/ACE	WGSRP-10.x.x.pkg (see note)
IBM MQ	AP_IBMMQRP-10.x.x.pkg (see note)
REST	WGS_REST_10.x.x.x.pkg

Table 5-1. Packages	
Package	Package Name
Scheduler	JOB_SCHEDULER-x.x.x.pkg



The workgroup server needs to be installed as an AutoPilot Expert. The resource pack will install and configure an Expert which can then be tailored to your needs. If you are setting up a new environment using IBM MQ, use the AP_IBMMQRP resource pack. For EMS or Kafka only, or when migrating an existing WGS 6 environment and using existing experts, use the WGSRP package.

4.4 Firewall Administration

Firewall administrators must allow UDP and TCP connection requests for workgroup server port 4010 and agent port 5010 (or whichever ports are used) to be opened bidirectionally.

See appendix I, [Appendix I: Workgroup Server Communication to Nastel's IBM MQ Agent](#).

4.5 Next Steps

Your Workgroup Server Expert software is now installed/upgraded. Continue to the next chapters to complete your install or upgrade.

Chapter 5: Database Configuration

This section discusses database configuration for new Workgroup Server Expert installations and upgrades from version 10.x.

**IMPORTANT!**

If migrating from Workgroup Server Expert v6 to v10, please contact Nistel Support for assistance.

Installing the WGS package will install the new database utility, **nsqjdbcmk**, which can be found under `[AUTOPILOT_HOME]/sql-scripts/nsqjdbcmk`. The utility will be used to create the WGS database or to upgrade an existing installation.

The utility will create or upgrade Navigator database objects and Permits database objects, define additional workgroups in the Navigator database, and add default Navigator records.

5.1 Preparation

Perform the followings steps before running **nsqjdbcmk**:

1. Using your database administrator tool, such as MySQL Workbench, create a Nistel Navigator database schema, for example 'nistel_apwmq' or 'nistel_apwmq10'.
2. If you will be using Nistel Navigator command authorization, create a permits database schema, for example 'nistel_permv3' or 'nistel_permv310'.
3. Define the environment variable `APWMQ_HOME` using a command line if it's not already defined. If Nistel Navigator is installed on the local Auto Pilot M6 server, the variable is already defined. Otherwise, you can create directory `[AUTOPILOT_HOME]/config/groups` and set `APWMQ_HOME` to that directory and create an empty file **mqgroup.ini** in the directory. Utility **nsqjdbcmk** will write workgroup information to the file, to be used by any Nistel Navigator clients that will run on this server.

5.2 Step 2: Configure the Properties File

To run the utility, you will run the **nsqjdbcmk** script file, but first you will want to open the **nsqjdbcmk.properties** file, shown below, and configure it.

```
nsqjdbcmk.apwmq.name = MQM
#Navigator primary connection settings, uncomment and change to override
#nsqjdbcmk.permits.wgsConn.name=Primary Connection
#nsqjdbcmk.permits.wgsConn.serversList=127.0.0.1
#nsqjdbcmk.permits.wgsConn.port=4010

#JDBC url datasource for APWMQ
nsqjdbcmk.apwmq.data_source =
jdbc:mysql://localhost:3306/nistel_apwmq?user=root&password=root
```

```
#APWMQ database schema
nsqjdbcmk.apwmq.schema = nastel_apwmq
#APWMQ database user
nsqjdbcmk.apwmq.user = root
#APWMQ database password
nsqjdbcmk.apwmq.password = root
# Class name of the JDBC driver
nsqjdbcmk.apwmq.driver_class = com.mysql.jdbc.Driver

#following are optional and have default values
#nsqjdbcmk.apwmq.port = 4010
#nsqjdbcmk.apwmq.eventLogSize=1000
#nsqjdbcmk.apwmq.acctLogSize=5000
#nsqjdbcmk.apwmq.statLogSize=5000
#nsqjdbcmk.apwmq.maxMsgCount=10000
#nsqjdbcmk.apwmq.discAuthRec=false;
#nsqjdbcmk.apwmq.agentNetwork=0.0.0.0
#nsqjdbcmk.apwmq.agentPort=5010

#JDBC url datasource for PERMITS
nsqjdbcmk.permits.data_source =
jdbc:mysql://localhost:3306/nastel_permv3?user=root&password=root
#Permits database schema
nsqjdbcmk.permits.schema = nastel_permv3
#PERMITS database user
nsqjdbcmk.permits.user = root
#PERMITS database password
nsqjdbcmk.permits.password = root
# Class name of the JDBC driver
nsqjdbcmk.permits.driver_class = com.mysql.jdbc.Driver
```

An explanation of the parameters is in the table below.

Table 5-2. nsqjdbcmk.properties Explained	
Parameter	Description
nsqjdbcmk.apwmq permits.schema	This maps to the schemas you created in the previous steps.
nsqjdbcmk.apwmq permits.data_source	The connection URL string required by the database that you are using. See the

Table 5-2. nsqjdbcmk.properties Explained	
Parameter	Description
	appropriate product documentation for your database.
nsqjdbcmk.apwmq permits.driver_class	The JDBC driver class that you are using the for the database.
nsqjdbcmk.apwmq.*	Additional settings stored in the apwmq schema such as the port number.
nsqjdbcmk.permits.*	Additional settings for permits schema such as the primary workgroup server connection (see Connecting to the Network).

The values that are commented out can be overridden if you remove the hash sign comment character '#' on each line that you want to change. For example, if you want a different default port you would change:

```
#nsqjdbcmk.apwmq.port = 4010
to
nsqjdbcmk.apwmq.port = 4011
```

5.3 Step 3: Run the Database Utility

Run **nsqjdbcmk.bat** (or **.sh**) by changing the directory to [AUTOPILLOT_HOME]/sql-scripts/nsqjdbcmk then running **nsqjdbcmk.bat** on a command prompt. You will see the **nsqjdbcmk** options listed below.

```
NASTEL DATABASE DEFINITIONS
=====
1. Create M6-WMQ Database Objects
2. Upgrade M6-WMQ Database Objects
3. Create PERMITS Database Objects
4. Upgrade PERMITS Database Objects
5. Define additional workgroups in M6-WMQ Database
8. Add default M6-WMQ records, NOT to be used with option 1
   (When creating the M6-WMQ tables manually, this is needed)
9. Add/Update WGS Connection Definition
10. Quit
11. Run provided SQL script file
```

If performing a new install, select options 1 and 3.

If performing an upgrade from v10.x, select options 2 and 4.

If adding an additional workgroup server to an existing schema, select option 5.

If the schema was created separately by a DBA and you need to populate the default entries, select option 8.

If you need to add a new WGS connection or update an existing one, select option 9. This is useful for when you cannot access the Nastel Navigator GUI. You will be presented with a list of existing connections (each associated with a number option), or an option to add a new connection. To update an existing connection, simply enter the connection's number and update the connection name, host IP and/or port.



You can run **nsqjdbcmk** using a command line instead of a script. There are both numeric and word command line options. Change the directory to: `[AUTOPILOT_HOME]/sql-scripts/` and run one of the following commands to view the command line options.

For Windows: `nsqjdbcmk.bat -?`

For Unix: `nsqjdbcmk.sh -?`

After the utility completes, file `[APWMQ_HOME]\config\groups\mqgroup.ini` has been created or updated with the group information extracted from **nsqjdbcmk.properties**.

For example:

```
Group::MQEVENT=MQM
```

```
Group::MQM=MQM
```

```
MQM::Node=127.0.0.1
```

```
MQM::Service=4011
```

Please review this file for possible manual editing.

If you need to run an SQL script file, select option 11. You can also run a script from a command-line interface (CLI). See [“Running a script from a command-line interface \(CLI\)”](#) below.

```

NAstel DATABASE DEFINITIONS
=====
 1. Create M6-WMQ Database Objects
 2. Upgrade M6-WMQ Database Objects
 3. Create PERMITS Database Objects
 4. Upgrade PERMITS Database Objects
 5. Define additional workgroups in M6-WMQ Database
 8. Add default M6-WMQ records, NOT to be used with option 1
   (When creating the M6-WMQ tables manually, this is needed)
 9. Add/Update WGS Connection Definition
10. Quit
11. Run provided SQL script file

Please select an option: 11

Enter DB URL: jdbc:mysql://localhost:3306/nastel_apwmq?user=root&password=mypass
Enter DB schema [nastel_apwmq]:
Enter DB user name [root]:
Enter DB user password [mypass]:
Enter DB driver class [com.mysql.cj.jdbc.Driver]:
Enter SQL script file path: D:\JAVA\PROJECTS\Nastel\docker\docker_navigator\images\cep-wgs\scheduler\config\db\upgrades\upgrade-0.1.12-mysql.sql
Enter SQL statements delimiter [%]:

DB URL      : jdbc:mysql://localhost:3306/nastel_apwmq?user=root&password=mypass
DB user     : root
DB pass     : mypass
DB schema   : nastel_apwmq
DB driver class : com.mysql.cj.jdbc.Driver
SQL script file : D:\JAVA\PROJECTS\Nastel\docker\docker_navigator\images\cep-wgs\scheduler\config\db\upgrades\upgrade-0.1.12-mysql.sql
SQL statements delimiter :

Is it OK [y/n]: y

```

Figure 5-1. Option 11: SQL Script Example

When you select option 11, nsqjdbcmk initiates a questionnaire wizard. You are prompted for the following values:

Table 5-3. SQL Script Values	
Name	Value
DB URL	(Required.) DB connection URL. This may contain the schema as well as user and password definitions. For example: jdbc:mysql://localhost:3306/nastel_apwmq?user=root&password=mypass
DB schema	Database or schema name. If applicable, the value resolved from the DB URL is provided in brackets as a suggested DB schema value.
DB user name	Database user name. If applicable, the value resolved from the DB URL is provided in brackets as a suggested DB user name value.
DB user password	Database user password. If applicable, the value resolved from the DB URL is provided in brackets as a suggested DB user password value.
DB driver class	(Optional.) If applicable, the value resolved from the DB URL is provided in brackets as a suggested DB driver class value.
SQL script file path	(Required.) SQL script file path
SQL statements delimiter	SQL script statements delimiter. By default, nsqjdbcmk uses '%' and SQL uses ';'. If the SQL script file defines its own DELIMITER value, then that value is used.

When the questionnaire is completed, the values you provided are listed in a form. You are prompted to indicate whether the values presented are acceptable:

Is it OK [y/n]

Choose one of the following:

- To confirm the accuracy of the values, enter 'y'. The provided SQL script is executed.
- To restart the questionnaire, enter 'n'. (Any other value aside from 'y' is also treated as 'n'.)

Running a script from a command-line interface (CLI)

To execute an SQL script file from a CLI, use this pattern, described in the table below:

```
nsqjdbcmk.sh -d <DELIMITER> -runsql <DB_URL> <SQL_SCRIPT_FILE_PATH>
<DB_DRIVER_CLASS_NAME>
```

Table 5-4. SQL Script Values (CLI)	
Name	Value
nsqjdbcmk.sh	Executable nsqjdbcmk shell script file. The extension varies by operating system: For Windows: nsqjdbcmk.bat For Unix: nsqjdbcmk.sh
-d	nsqjdbcmk key argument setting SQL statements delimiter. This is optional if the SQL script file defines its own DELIMITER value.
<DELIMITER>	SQL statements delimiter value
<DB_URL>	(Required.) Database URL containing schema and user credentials
<SQL_FILE>	(Required.) SQL script file path
<DB_DRIVER_CLASS_NAME>	(Optional.) Database driver class name. Nsqjdbcmk resolves a suitable driver class name from the provided URL. But in some cases when classpath contains multiple suitable driver classes, it may be useful to set particular one. Examples of such cases are when there are both MySQL and MariaDB drivers available in classpath, or when different versions of same driver have different package names (like MySQL 5 and MySQL 8).

Example:

```
nsqjdbcmk.sh "-d" ";" "-runsql"
"jdbc:mysql://localhost:3306/nastel_apwmq?user=root&password=mypass"
"/opt/nastel/AutoPilotM6/scheduler/config/db/ap-sched-mysql.sql"
"com.mysql.cj.jdbc.Driver"
```

5.3.1 Exit Codes

The following application exit codes may be produced by nsqjdbcmk:

Table 5-3. SQL Script Values	
Name	Value
0	Success
1	Critical exception, other than those listed below
2	SQL execution exception.

Table 5-3. SQL Script Values

Name	Value
	Examples include bad SQL syntax, wrong DB state, missing DB objects, missing permissions to execute statement
3	Java runtime exception. Examples include null pointer, illegal argument, or illegal access.
5	DB connection failure. Examples include wrong URL, user credentials, permissions, or connection timeout.

Chapter 6: Deploying the Expert and Configuring Expert Properties

This section discusses how to setup your environment.

When you used the resource pack from the section, [Install Additional Packages](#), it installed a sample installation, and you need to review the following section which covers settings you may need to change such as the data URL and passwords.



Only one instance of the Workgroup Server Expert can be deployed to a CEP Server. If you want to run two instances of the Workgroup Server Expert, then you need to run two different instances of the AutoPilot CEP Server, each with one instance of Workgroup Server Expert.

1. Restart the Nastel AutoPilot M6 services: Domain Server, Web Server, and CEP Server. Start the Nastel AutoPilot M6 Enterprise Manager.
2. If you used the Resource pack to deploy the expert, select the WGS instance then **Properties**.



Figure 6-1. Deploy Expert Menu > Properties

Otherwise, to deploy it manually, right-click on the AP M6 server icon and select **Deploy Expert**.

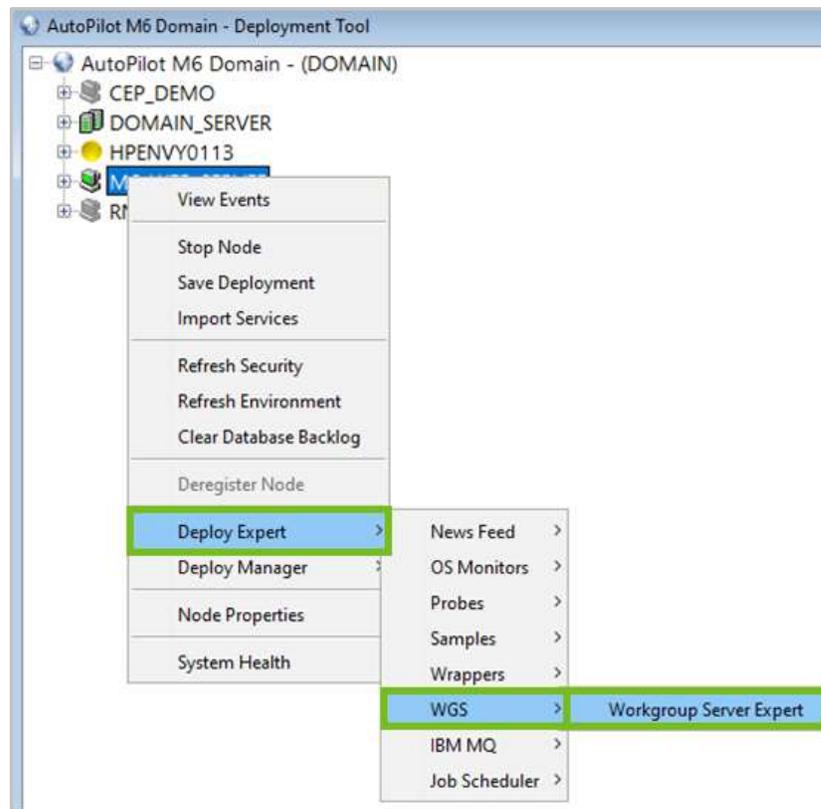


Figure 6-2. Deploy Expert Menu > WGS > Workgroup Server Expert

3. The *General* dialog box is displayed. Edit properties described in the table below, as required.

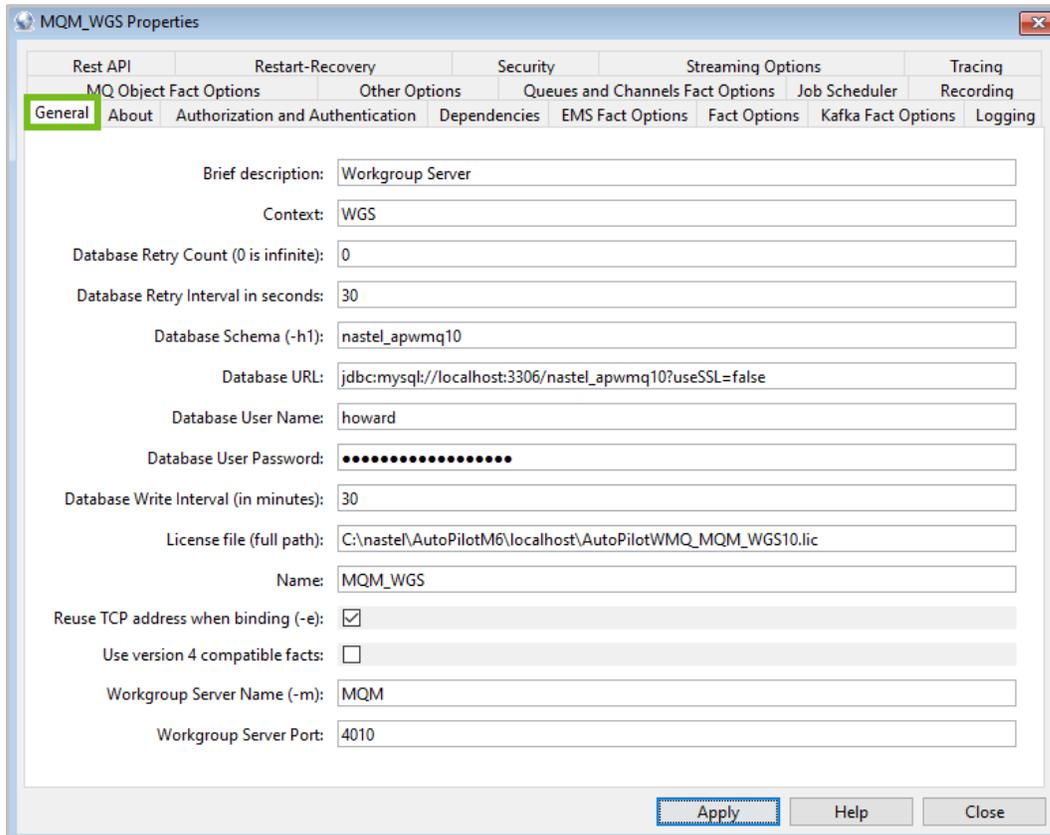


Figure 6-3. Create Workgroup Server Expert – General Tab

4. Enter data using the table below.

Table 6-1. WGS Expert Properties – General

Property	Description
Brief description	Description of the expert
Context	Context name of the expert within the CEP tree
Database Retry Count (0 is infinite)	The number of times the expert tries to connect to the database at startup to load the data. A value of 0 means the expert will keep trying to connect to the database.
Database Retry Interval in seconds	The number of seconds to wait before attempting to connect to the database after an error at startup.
Database Schema (-h1)	Schema name of the WGS database, if one exists.
Database URL	JDBC connection URL for the WGS database. Below is a list of supported database JDBC connection URLs. MYSQL:

Table 6-1. WGS Expert Properties – General

Property	Description
	<p>jdbc:mysql://<host-name or IP>:3306/nastel_apwmq</p> <p>ORACLE:</p> <p>jdbc:oracle:thin:@<host-name or IP>:1521:<SID></p> <p>jdbc:oracle:thin://<host-name or IP>:1521/<SERVICENAME></p> <p>DB2:</p> <p>jdbc:db2://<host-name or IP>:50000/M6WMQ</p> <p>MSSQL:</p> <p>jdbc:sqlserver://<host-name or IP>:1455;databaseName=nastel_apwmq</p> <p>POSTGRE:</p> <p>jdbc:postgresql://<host-name or IP>:5432/nastel_m6wmq?searchpath=nastel_m6wmq</p>
Database User Name	WGS database username
Database User Password	WGS database user password
Database Write Interval (in minutes)	How often the runtime data is written to the WGS database in minutes. Will also be written to database at shutdown.
License file (full path)	If not local host, must be full path.
Name	Name of this instance
Use version 4 compatible facts	Indicates if you want version 4 or version 6 compatible fact names/values.
Workgroup Server Name (-m)	Name of the workgroup server instance that must also be in your license file.
Workgroup Server Port	The default is port 4010. Change as required.

5. Select the *About* tab. These properties are for information only and cannot be edited.

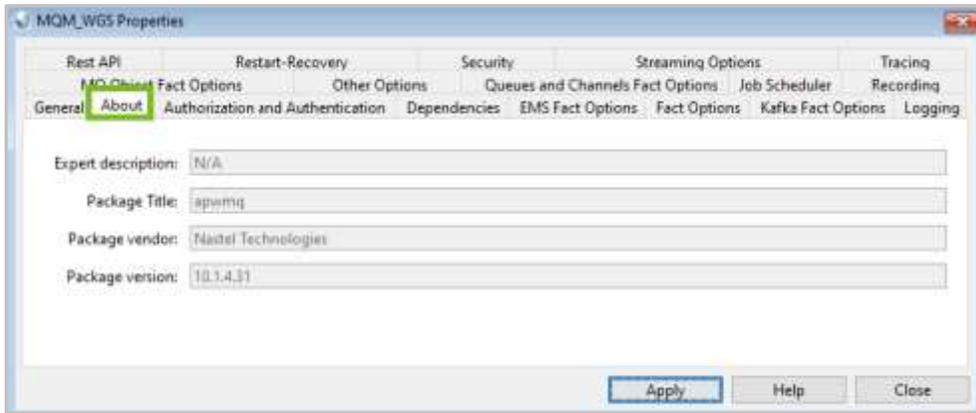


Figure 6-4. Create Workgroup Server Expert – About Tab

Table 6-2. WGS Expert Properties – 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. Select the *Authorization and Authentication* tab and edit properties described in the table below, as required.

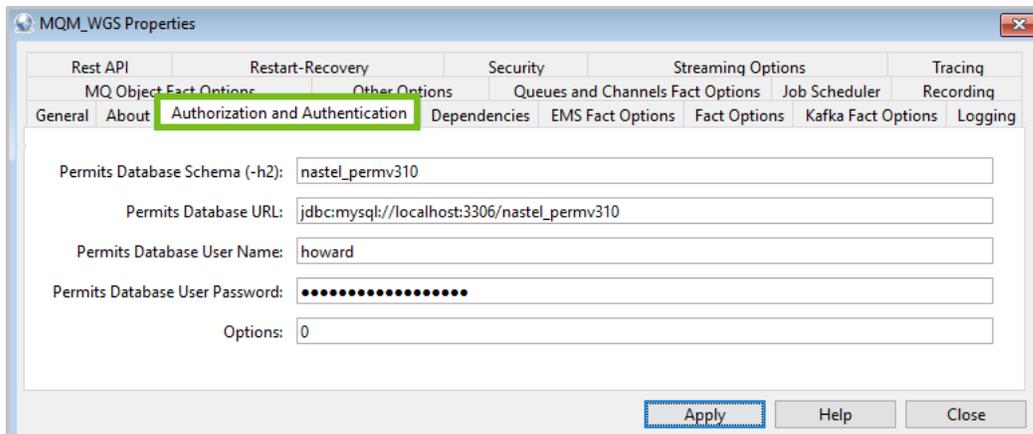


Figure 6-5. Create Workgroup Server Expert – Authorization and Authentication Tab

Table 6-3. WGS Expert Properties – Authorization and Authentication

Property	Description
Permits Database Schema (-h2)	Schema name of the Permits database, if one exists.
Permits Database URL	JDBC URL of the Permits database. Below is a list of supported permit database JDBC connection URLs. MYSQL: jdbc:mysql://<host-name or IP>:3306/nastel_permv3

Table 6-3. WGS Expert Properties – Authorization and Authentication

Property	Description
	ORACLE: jdbc:oracle:thin:@<host-name or IP>:1521:<SID> jdbc:oracle:thin://<host-name or IP>:1521/<SERVICENAME> DB2: jdbc:db2://<host-name or IP>:50000/PERMV3 MSSQL: jdbc:sqlserver://<host-name or IP>:1455;databaseName=nastel_permv3 POSTGRE: jdbc:postgresql://<host-name or IP>:5432/nastel_permv3?searchpath=nastel_permv3
Permits Database User Name	Permits database user name.
Permits Database User Password	Permits database user password.
Options	Select one as described below:
Enable Authentication (+a2)	Enable user authentication through Nastel AutoPilot M6.
Enable Permits (+u3)	Enable Permits Version 3.
Import user groups from AP (+au)	Enable user authentication through Nastel AutoPilot M6 and import Permits.

7. Select the *MQ Object Fact Options* tab. Edit properties described in the table below, as required.

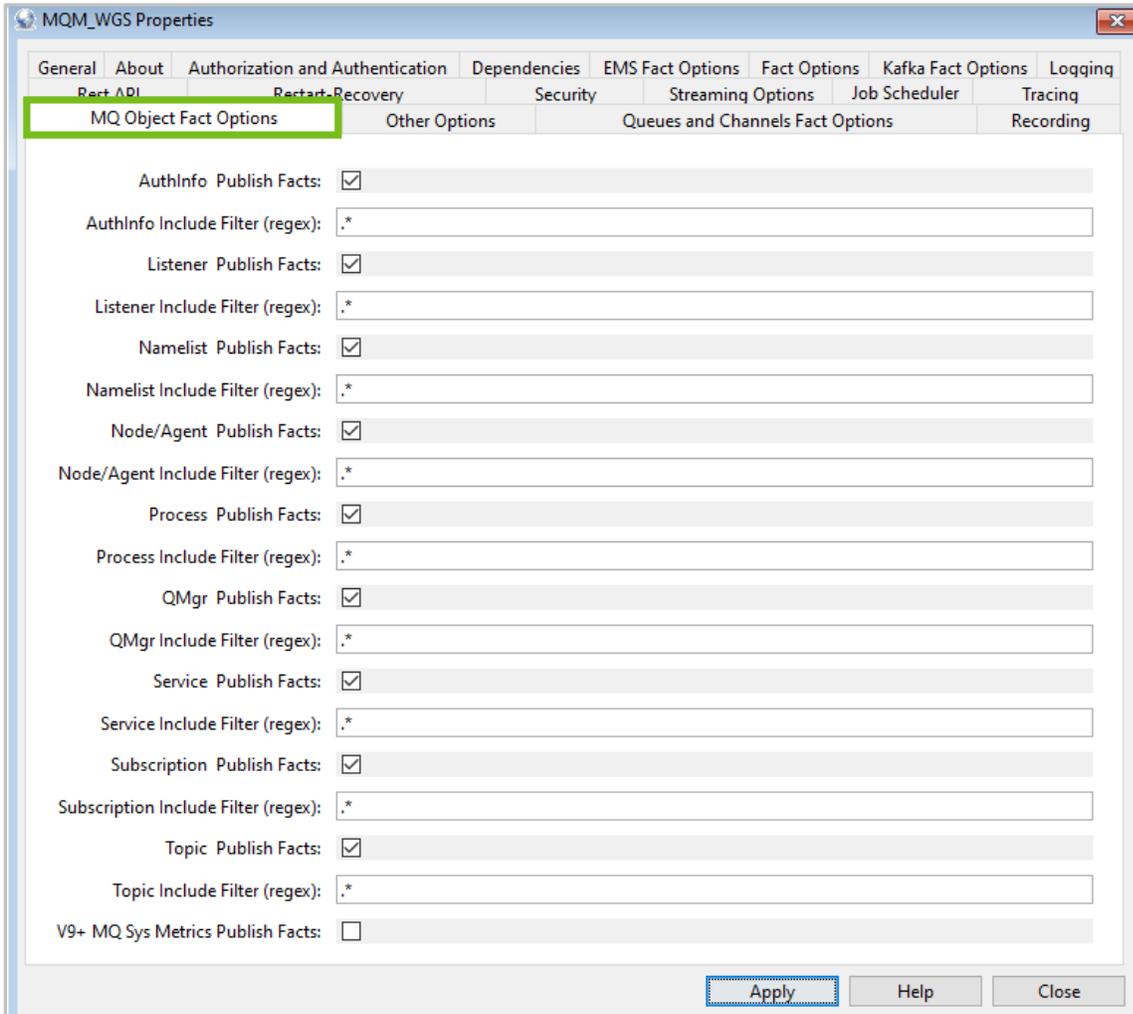


Figure 6-6. Create Workgroup Server Expert – MQ Object Fact Options Tab

Table 6-4. WGS Expert Properties – MQ Object Fact Options

Property	Description
AuthInfo Publish Facts	Enable publishing of AuthInfo facts
AuthInfo Include Filter (regex)	Regex expression of what AuthInfos to publish
Listener Publish Facts	Enable publishing of Listener facts
Listener Include Filter (regex)	Regex expression of what Listeners to publish
Namelist Publish Facts	Enable publishing of Namelist facts
Namelist Include Filter (regex)	Regex expression of what Namelists to publish
Node/Agent Publish Facts	Enable publishing of Node/Agent facts
Node/Agent Include Filter (regex)	Regex expression of what Node/Agent to publish

Table 6-4. WGS Expert Properties – MQ Object Fact Options

Property	Description
Process Publish Facts	Enable publishing of Process facts
Process Include Filter (regex)	Regex expression of what Processes to publish
QMgr Publish Facts	Enable publishing of Queue Manager facts
QMgr Include Filter (regex)	Regex expression of what Queue Manager to publish
Service Publish Facts	Enable publishing of Service facts
Service Include Filter (regex)	Regex expression of what Services to publish
Subscription Publish Facts	Enable publishing of Subscription facts
Subscription Include Filter (regex)	Regex expression of what Subscriptions to publish
Topic Publish Facts	Enable publishing of Topic facts
Topic Include Filter (regex)	Regex expression of what Topics to publish
V9+ MQ Sys Metrics Publish Facts	Enable publishing of MQ V9 system metrics

8. Select the *Queues and Channels Fact Options* tab. Edit properties described in the table below, as required.

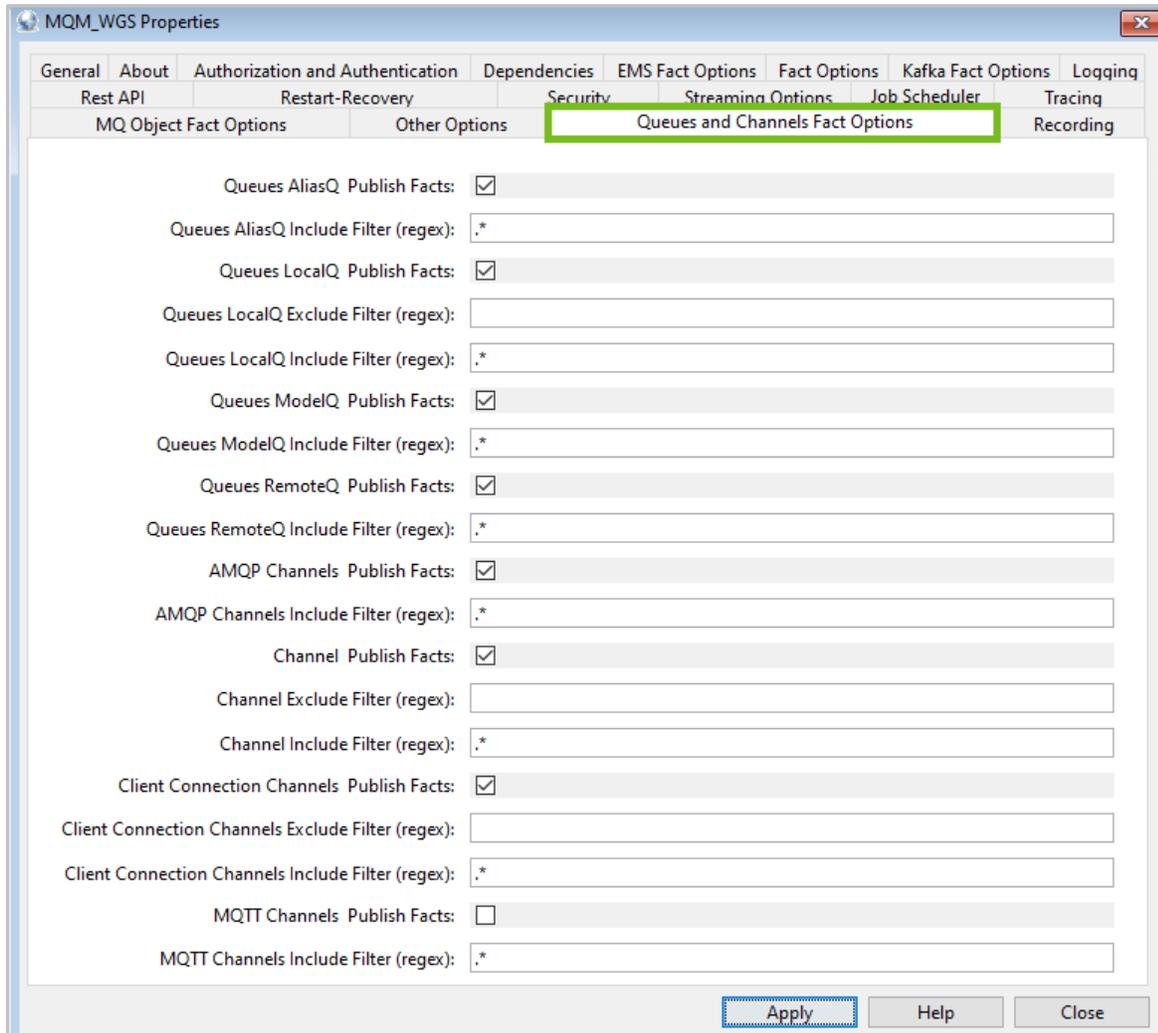


Figure 6-7. Create Workgroup Server Expert – Queues and Channels Fact Options Tab

Table 6-5. WGS Expert Properties – Queues and Channels Fact Options

Property	Description
Queues AliasQ Publish Facts	Enable publishing of AliasQ facts
Queues AliasQ Include Filter (regex)	Regex expression of what AliasQs to publish
Queues LocalQ Publish Facts	Enable publishing of LocalQ facts
Queues LocalQ Include Filter (regex)	Regex expression of what LocalsQs to publish
Queues ModelQ Publish Facts	Enable publishing of ModelQ facts
Queues ModelQ Include Filter (regex)	Regex expression of what ModelQs to publish
Queues RemoteQ Publish Facts	Enable publishing of RemoteQ facts
Queues RemoteQ Include Filter (regex)	Regex expression of what RemoteQs to publish
Channel Publish Facts	Enable publishing of Channel facts

Table 6-5. WGS Expert Properties – Queues and Channels Fact Options	
Property	Description
Channel Include Filter (regex)	Regex expression of what Channels to publish
Client Connection Channel Publish Facts	Enable publishing of Client Connection facts
Client Connection Channel Include Filter (regex)	Regex expression of what Client Connections to publish
MQTT Channels Publish Facts	Enable publishing of MQTT facts
MQTT Channel Include Filter (regex)	Regex expression of what MQTTS to publish

9. Select the *Tracing* tab. Edit properties described in the table below, as required.

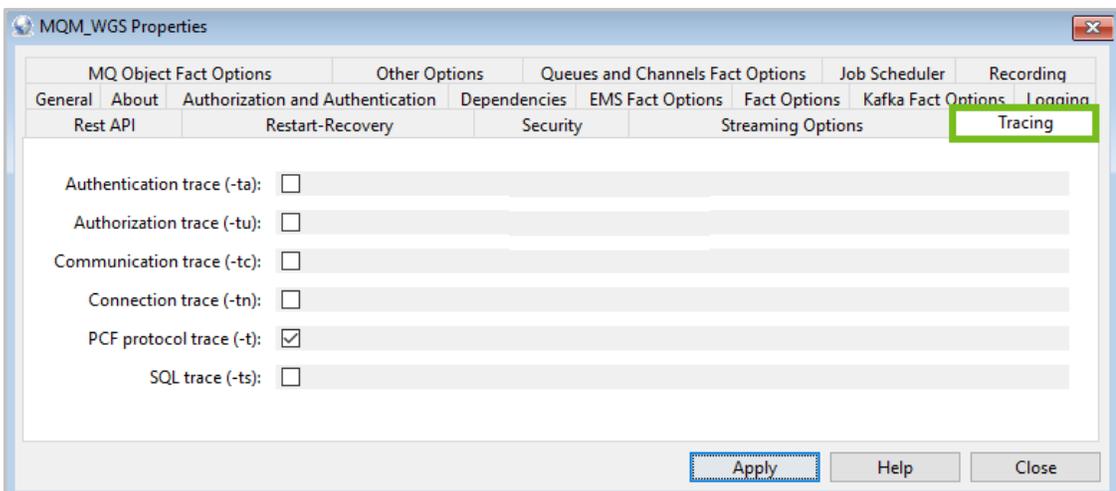


Figure 6-8. Create Workgroup Server Expert - Tracing Tab

Table 6-6. WGS Expert Properties – Tracing	
Property	Description
Authentication trace (-ta)	Enable/disable authentication trace.
Authorization trace (-tu)	Enable/disable authorization trace.
Communication trace (-tc)	Enable/disable communication trace.
Connection trace (-tn)	Enable/disable connection trace.
PCF protocol trace (-t)	Enable/disable PCF protocol trace.
SQL trace (-ts)	Enable/disable SQL trace.

10. To make WGS 10 log viewing easier, on the *Logging* tab, change the default **Log name** field from **services** to something like **wgs10_service_log**, to make the log name more recognizable. This log will contain only log messages for the WGS 10 service, excluding log messages for other services (experts).

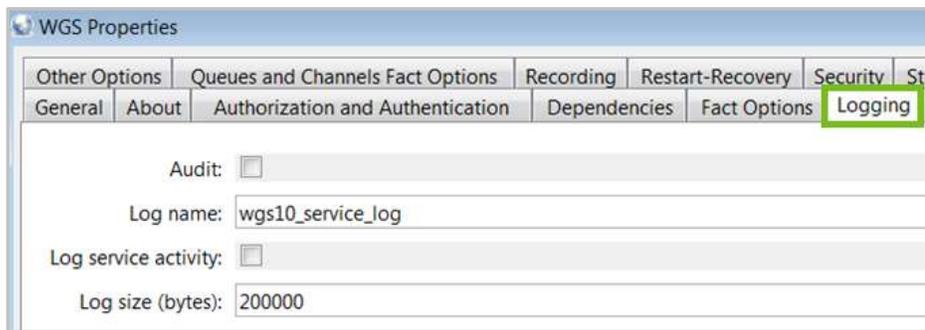


Figure 6-9. Logging

If you right click on **WGS > View Events**, the Event Viewer window opens. Click **Menu > cep_server_Logs** and observe that **wgs10_service_log** is one of the selectable choices.

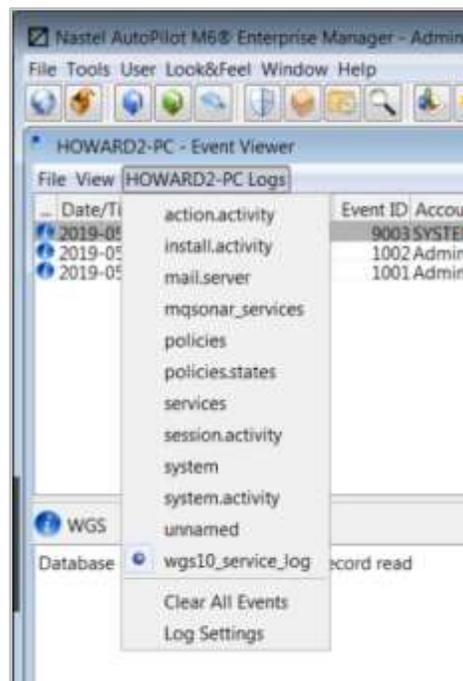


Figure 6-10. Event Viewer Menu

Select **wgs10_service_log** and you will see the WGS 10 log messages.

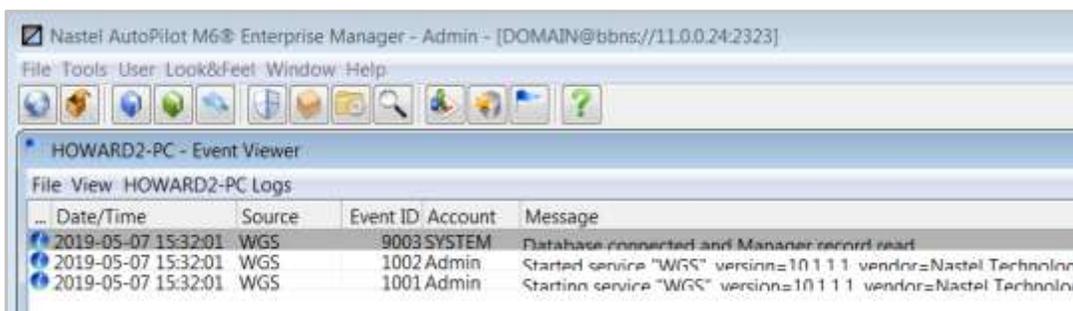


Figure 6-11. Event Viewer – WGS 10 Log Messages

11. Click **Apply**. A confirmation dialog box opens. Click **Yes** to apply and **No** to cancel. Click **Close**.

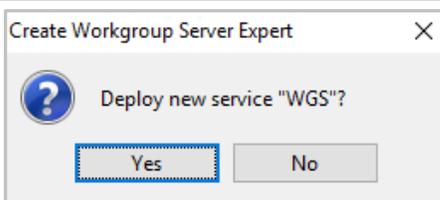


Figure 6-12. Deployment Confirmation

NOTE The following AutoPilot tabs are not used to configure the Workgroup Server Expert: Dependencies, Fact Options, Recording, Restart-Recovery, Security, Streaming.

6.1 Workgroup Server Verification

The following figures show examples of the Workgroup Server Expert facts that will be visible in the Enterprise Management console if you configured the Workgroup Server Expert properly. DBSTATS is the most important as it shows the connections to the databases. License shows license information, WGSTATS will show operational metrics about the WGS and under the WGS name (MQM) will be facts published about the environment based on options selected.

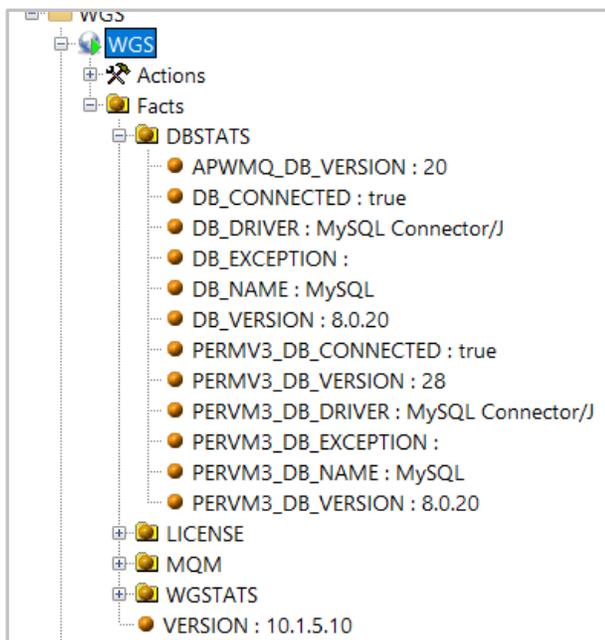


Figure 6-13. Facts for the Database and Workgroup Nodes

Chapter 7: Web Application Installation

The following sections cover installation of the web applications integrated with Nastel Navigator:

- Nastel Navigator Security Manager provides a user interface for defining authorization rules for Nastel Navigator. It allows you to manage authority records and preserve them in the SQL database.
- Nastel Navigator provides the ability to view objects and manage messages for IBM MQ, IIB/ACE, Kafka and TIBCO EMS.

7.1 Install in Tomcat

The following steps are common to both Nastel Navigator and Security Manager. When finished with these steps, perform the instructions in the section, [Setup Users and Roles](#), for Nastel Navigator Security Manager.



In the following installation steps, `<tomcat_install>` string denotes directory where Tomcat is installed on your system, such as `/nastel/AutoPilotM6/apache-tomcat`.

To install web applications, assuming you are installing in the same apache-tomcat as shipped with Nastel AutoPilotM6, do the following:

1. Stop all M6 Web Services
2. From webapps, copy the **navigator.war**, **navigator-server.war** and **apodwmq.war** files into the `<tomcat_install>/webapps` directory.
3. Navigate to `<tomcat_install>/conf/` and open the file **server.xml**.
If not already there, insert the content of **APWMQ_HOME/webapps/config/tomcat/DataSource_Snippet_<DATABASE>.xml** within the `<GlobalNamingResources>...</GlobalNamingResources>` block and update the fields indicated according to the database configuration of your machine.
4. Replicate the existing global resource for **nastel_permv3_db_ds** changing the name to **nastel_apwmq_db_ds** and changing the database instance to point to the apwmq database. See example below.
5. Copy the appropriate JDBC connectors into `<tomcat_install>/lib` by copying the respective jdbc jar from **AUTOPILOT_HOME/lib**.
6. or by downloading the required jdbc driver from the vendor website.
7. Restart all M6 Web Services.

Example:

```
<GlobalNamingResources>
.
.
.
<Resource name="jdbc/nastel_permv3_db_ds"
          scope="Shareable"
```

```

        type="javax.sql.DataSource"
        maxWait="5000"
        maxActive="100"
        maxIdle="100"
        username="user"
        password="pwd"

url="jdbc:mysql://localhost:3306/nastel_permv3?autoReconnect=true"
    driverClassName="com.mysql.jdbc.Driver"
    auth="Container"/>
<Resource name="jdbc/nastel_apwmq_db_ds"
    scope="Shareable"
        type="javax.sql.DataSource"
        maxWait="5000"
        maxActive="100"
        maxIdle="100"
        username="user"
        password="user"

url="jdbc:mysql://localhost:3306/nastel_apwmq?autoReconnect=true"
    driverClassName="com.mysql.jdbc.Driver"
    auth="Container"/>
. . .
</GlobalNamingResources>'

```

7.1.1 Setup Users and Roles

To access the Nastel Navigator Security Manager, users must set up an m6admin role.

1. Navigate to `[CATALINA_HOME]/conf/` and open the file **tomcat-users.xml**.
2. Add m6admin role and create/modify users to assign role as m6admin as follows:

```

<role rolename="m6admin"/>
<user username="<YOUR-USERNAME>" password="<YOUR-PASSWORD>" fullName=""
roles="m6admin"/>

```

For Example:

```

<?xml version='1.0' encoding='utf-8'?>
<tomcat-users>
    <role rolename="tomcat"/>
    <role rolename="manager"/>
    <role rolename="m6admin"/>
    <user          username="admin"          password="<YOUR-PASSWORD>"
    roles="m6admin,manager"/>
</tomcat-users>

```

All users who have been assigned an m6admin role can now access the Nastel Navigator Security Manager.

7.2 Nastel Navigator Initial Setup

7.2.1 Licensing Information

Nastel Navigator is a standard component of AutoPilot M6 for middleware. The number of users that can use this interface is limited by the terms of your license.

7.2.2 Connecting to the Network

As part of creating an initial database or upgrading from previous releases, a set of WGS connections was created. You may need to modify these for your environment. Adding and editing workgroup servers can only be performed by administrators with the **Configure Connections** permission enabled (set in Nastel Navigator Security Manager).

Click the **Manage Workgroup Servers** button in the *Workgroup Servers* viewlet located on the *WorkSpace* dashboard to add a new workgroup server connection or to edit an existing one.



Figure 7-1. Add/Edit Workgroup Servers

The *Work Group Server Connections* window opens displaying all workgroup server connection names and their servers on the left side of the window (this list is global to all administrators). Select a workgroup server to display its details on the right side of the window.



If you are upgrading, you might want to delete miscellaneous workgroup server connections that are not used. The **Viewlet Count** field on the below screen will help you determine which workgroup servers are no longer needed. This field displays how many viewlets a workgroup server contains. Before deleting a workgroup server, you can reassign its viewlets to a different workgroup server (see [Reassigning Viewlets](#) for more information). After moving the viewlets to a new workgroup server, you can then delete the old workgroup server.

Work Group Server Connections ? x

Filter by:

#	<input type="checkbox"/>	Connection Name	Server(s)
1	<input type="checkbox"/>	GENERATED_110_1.1.1.10_	1.1.1.10
2	<input type="checkbox"/>	GENERATED_1212_123.1231.231.1_	123.1231.231.1
3	<input type="checkbox"/>	GENERATED_4040_127.0.0.1_	127.0.0.1
4	<input type="checkbox"/>	GENERATED_4041_172.16.6.25_6-025.singleton-labs.It	172.16.6.25

Attribute Name	Attribute Value
Connection Name	GENERATED_4040_127.0.0.1_
WGS name	
Server(s)	127.0.0.1
Port	4040
Viewlet Count	32
Favorite Viewlet Count	1
Search Viewlet Count	31

Figure 7-2. Work Group Server Connections

Use the **Add**, **Modify** and **Delete** buttons to update the workgroup server connections. These actions are all audited in the Nastel Navigator Security Manager under **Administration > Audit Report**. You can view who performed the action, when, and the changes made.

When deleting workgroup server connections, all associated viewlets (both visible and invisible) are deleted. Before permanently deleting a connection, you can preserve its viewlets by moving them to a different workgroup server. See [Reassigning Viewlets](#) for more information. Before workgroup server connections are deleted, a prompt will appear confirming the delete action. Please note, you will not be able to delete all connections; at least one connection must remain.

The connection names, servers list and port numbers of workgroup servers must be specified when creating a new workgroup server connection.

The connection name is a custom name to represent the workgroup server connection. Enter a simple name that will be easy for users to recognize as this name will be displayed in Nastel Navigator.



If you are upgrading, you will need to modify the Connection Names to be something more useful, as these fields were automatically populated after upgrading.

Please note, the **Server(s)** list can contain any valid IP or hostname and they must be separated by a comma, for example: 127.0.0.1, 172.16.6.25, NODESERVER1, 172.16.6.44



Figure 7-3. Change Work Group Server Connection

The **Viewlet Count** field located on the right side of the window represents all valid viewlets belonging to that connection, it is the total "Favorite Viewlet Count" + "Search Viewlet Count."

7.3 Updating AutoPilot Web Security Manager and Nastel Navigator

If a fix contains the web applications, these must be copied to the application server. The process to do this is dependent on the application server. For example, to use the Apache version supplied with AutoPilot, do the following:

1. Stop the application server (M6-Web-Server).
2. Copy the war files from the apwmq/webapps folder to the
AutoPilotM6/apache-tomcat/webapps folder.
3. Remove the existing navigator, navigator-server, apodwsm and apodwmq folders from AutoPilotM6/apache-tomcat/webapps.
4. Remove the existing navigator, navigator-server, apodwsm and apodwmq folders from AutoPilotM6/apache-tomcat/work/Catalina/localhost.

Chapter 8: Job Scheduler Setup

The following steps are not required. Only perform the below if you plan on utilizing Nastel Navigator Scheduler, as this is an optional feature.

The scheduler allows tasks or jobs to be scheduled for execution by a client, such as WGS Expert, at some time in the future. These jobs can be anything that can be performed with PCF commands, such as putting a batch of end-of-market related messages on a transmit queue to be sent to a securities dealer at end of day; or defining a new channel, starting it, and then deleting it.

8.1 Requirements

- **AP60_SU31.pkg** or higher, available from the same media or web site from where you obtained the WGS Expert.
- Java 1.8
- A supported database: MySQL, PostgreSQL, Oracle, MS SQL, or DB2

8.2 Installation Steps

1. Install **JOB_SCHEDULER-x.x.x.pkg**. This package is available from the same media or web site from where you obtained the WGS Expert.
 - a. Stop WGS Expert if running and CEP Server.
 - b. Copy the package file to `[AUTOPILOT_HOME]/updates` on the server where AP M6 is installed
 - c. Install using pkgman:

```
[AUTOPILOT_HOME]/bin/pkgman [AUTOPILOT_HOME]/updates/JOB_SCHEDULER-version.pkg
```

Alternatively, on a Windows system, run the package manager GUI by going to **Start > Nastel AutoPilot M6 > M6 Product Maintenance**. Click **Install**, select the package in the **Updates** folder, and click **Open**.
2. Run the following SQL file found within the directory, `AutoPilotM6/scheduler/config/db`. Run these files from the command client or your database Admin tool. Use database schema **nastel_apwmq** (or the similar name that you defined):
 - a. **ap-sched-<db>.sql**
 - b. **quartz_<db>.sql**
3. Restart CEP Server.
4. Deploy an instance of Job Scheduler to the same node where WGS10 expert is installed.

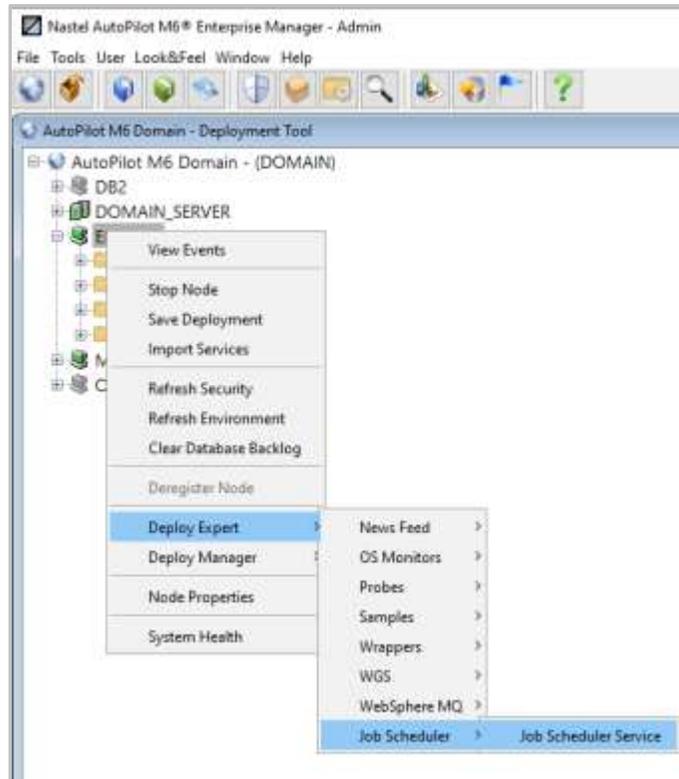


Figure 8-1. Deploy Expert Menu

- a. Configure Job Scheduler database property page to use the database schema where the new tables in step 2 were created.
- b. For the database selected include the name of the JDBC driver
- c. Make sure not to leave spaces when copying DB information into the DB fields: JDBC Driver, DB Logon ID, DB Password, DB Connection URL. Use the same DB properties as used when configuring the WGS Expert properties. See [Figure 6-2](#).

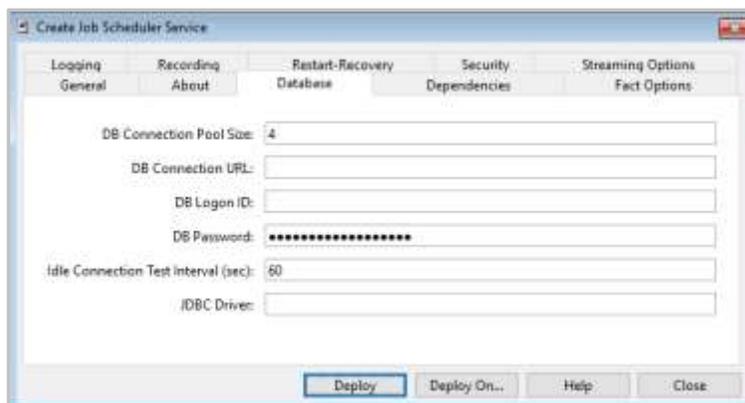


Figure 8-2. Database Tab in Job Scheduler Properties

- 5. Start Job Scheduler Expert
- 6. Start WGS10 Expert

8.3 ServiceNow Service

Nastel Navigator connects to ServiceNow to allow you to correlate change requests and scheduled actions. This an optional setup that allows you to see what changes have been approved and how they correlate to changes being made. In addition, these changes can be set for approval before being implemented which can be triggered from a ServiceNow action.

8.3.1 ServiceNow Setup

Go to the **Other Options** tab of the *WGS Properties* window and populate the **ServiceNow URL**, **ServiceNow User Name** and **ServiceNow User Password** fields.

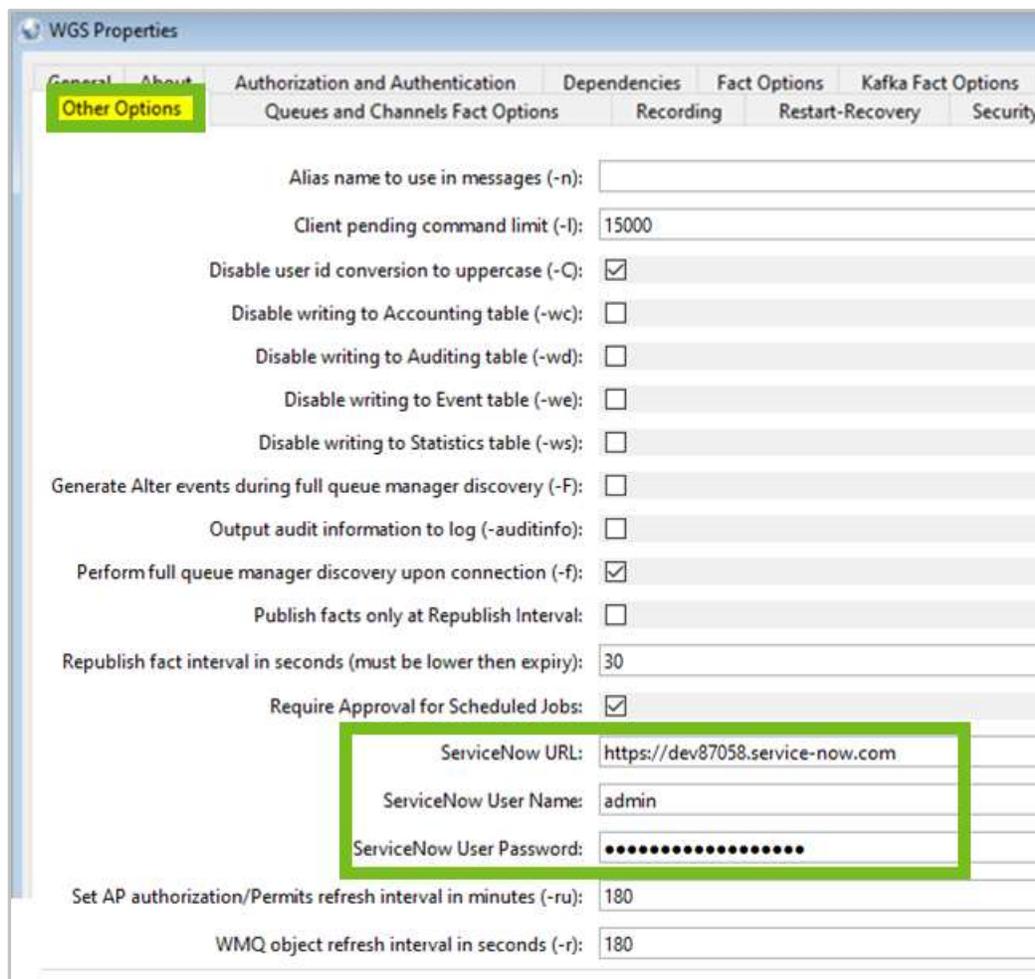


Figure 8-3. WGS Properties – ServiceNow Fields

8.4 Approving Scheduled Actions

Scheduled actions can be configured to require approval either manually using the Nastel Navigator GUI, or via commands. The process is as follows:

1. Within the workgroup server, specify that approval is required. Do this by going to the **Other Options** tab of the *WGS Properties* window and enabling the **Require Approval for Scheduled Jobs** option.

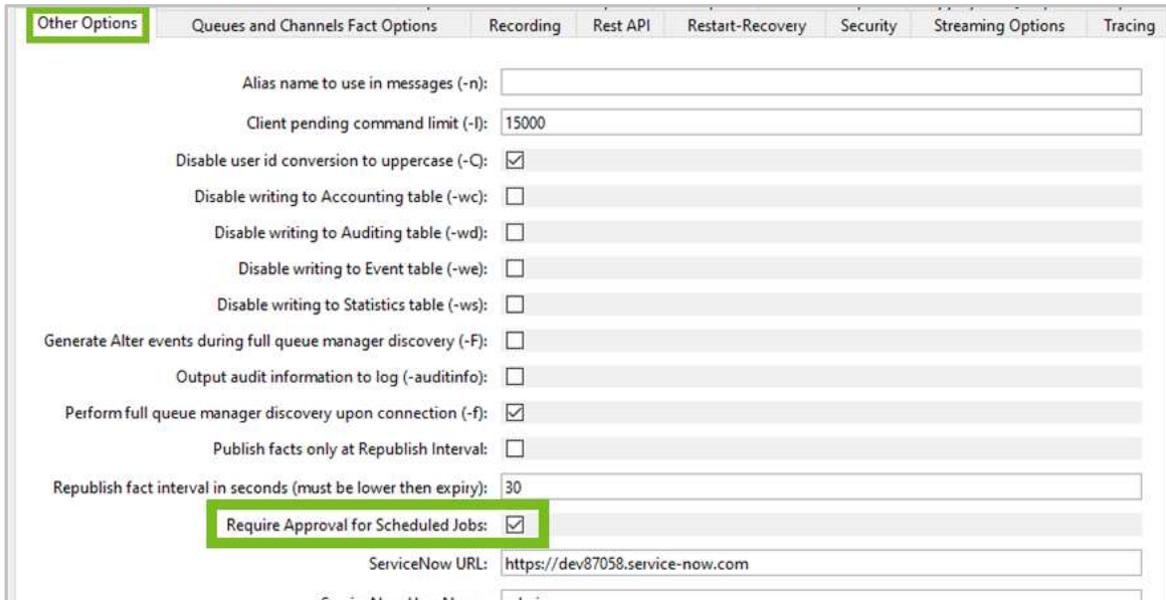


Figure 8-4. Require Approval Option

2. Within Nastel Navigator, a scheduled action is created or updated. The scheduled action will have a status of approval pending.
3. The scheduled action will need to be approved. This is done either using the Nastel Navigator GUI or command actions:
 - a. Via the Nastel Navigator GUI: Click the **Approve** button for each scheduled action, or the **Approve All** button to approve all scheduled actions.

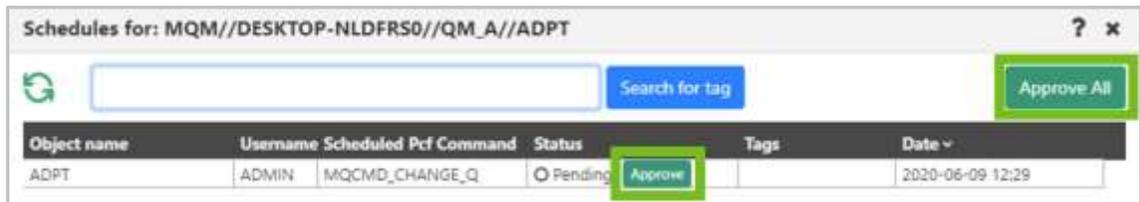


Figure 8-5. Approve Button

- b. Via command actions: Use one of the following commands:
 - i. `approveJobTag(String jobTag)`
 - or-
 - ii. `approveJobUserTag(String username, String jobTag)`
4. If approved, the actions will activate at the scheduled times. If not approved, the actions will fail.

Chapter 9: Rest API

9.1 Installation

Install the Rest package which installs all the required libraries used by the Rest API. The name of the package is WGS_REST_10.x.x.x.pkg.

9.2 Configuration

Configure the following settings on the **Rest API** tab of the *WGS Properties* window.

- **Basic Authentication Enabled:** Enable/disable basic authentication.
- **HTTP REST Listener Enabled:** Enable/disable Rest API HTTP listener (start Jetty server).
- **HTTP REST Listening Port:** Change Rest API port.
- **OAuth2 Authentication enabled:** Enable/disable OAuth2 authentication.
- **OAuth2 Access Token Valid Time(s):** Valid time of OAuth2 access token in seconds.
- **OAuth2 Client ID:** OAuth2 client ID used for authentication. This field must not be empty when OAuth2 Authentication is enabled.
- **OAuth2 Client Secure:** The OAuth2 client secure key used for authentication. This field must not be empty when OAuth2 Authentication is enabled.
- **OAuth2 JWT token secret key:** The OAuth2 client JWT token key used for access and refresh token key sign and validate. This field must be not empty when OAuth2 Authentication is enabled.
- **OAuth2 Refresh Token Valid Time(s):** Valid time of OAuth2 refresh token in seconds.
- **SSL(HTTPS) Enabled:** Enable/disable SSL (starts Jetty on HTTPS mode).
- **SSL(HTTPS) Key Store Path:** SSL key store path.
- **SSL(HTTPS) Key Store Password:** SSL key store password.
- **SSL(HTTPS) Key Manager Password:** SSL key manager password.
- **WSM access granted to user groups:** User groups that can access Nastel Navigator Security Manager Rest API functionality. User group names are comma separated.

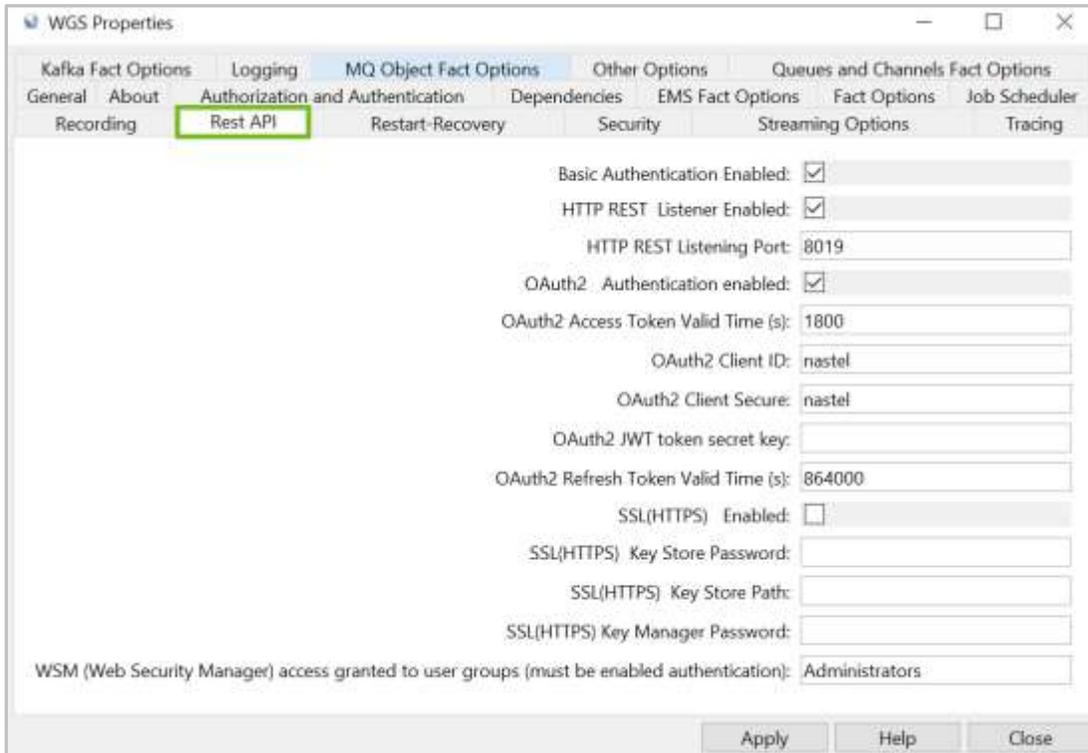


Figure 9-1. WGS Properties - Rest API tab

9.3 Rest API Usage

9.3.1 OAuth2 authentication

OAuth2 authentication must be enabled/configured via the Nastel Autopilot M6 Enterprise Manager.

OAuth2 authentication is available on the Rest API server via HTTP POST endpoint `http[s]://{host:port}/auth/token`, for example:

```
curl -k -X POST "https://192.168.1.220:8019/auth/token" -H "accept: */*"
-H "Content-Type: application/json" -d
"{\"client_id\": \"client_test\", \"client_secret\": \"client_test_secure\",
, \"grant_type\": \"password\", \
\"username\": \"Admin\", \"password\": \"admin\"}"
```

OAuth2 request parameters:

- **client_id:** authorize OAuth2 client ID from WGS configuration, required
- **client_secret:** authorize OAuth2 client secret from WGS configuration, required
- **scope:** the scope that the user will be authorized
- **grant_type:** can be password or refresh_token, required
- **username:** authentication WGS username, required when **grant_type** is password

- **password:** authentication WGS user password, required when **grant_type** is password
- **access_token:** access token, required when **grant_type** is refresh_token
- **refresh_token:** refresh token, required when **grant_type** is refresh_token

OAuth2 response parameters:

- **scope:** the scope that the user will be authorized
- **token_type:** always will be Bearer, how the Authorization token is sent
- **expires_in:** access token expiration in seconds
- **access_token:** access token used for authentication Rest API resources
- **refresh_token:** refresh token used for regenerate access token (username and password is not sent for access token refreshing)

9.3.2 Rest API Resources

Rest API resources are accessible via endpoint:

- WGS objects: `http[s]://{host:port}/rest/v1/`
- WSM (Nastel Navigator Security Manger functionality): `http[s]://{host:port}/wsm/v1/`

Rest API for workgroup server objects resources documentation is accessible via endpoint `http[s]://{host:port}/rest/v1/services`, for example:

`http://192.168.88.233:8019/rest/v1/services`

- WADL description: `http[s]://{host:port}/rest/v1/?_wadl`, for example `http://192.168.88.233:8019/rest/v1/?_wadl`
- OpenAPI description: `http[s]://{host:port}/rest/v1/openapi.json`, for example `http://192.168.88.233:8019/rest/v1/openapi.json`
- SwaggerUI OpenAPI documentation: `http[s]://{host:port}/rest/v1/api-docs?url=/rest/v1/openapi.json`, for example `http://192.168.88.233:8019/rest/v1/api-docs?url=/rest/v1/openapi.json`

Rest API for Nastel Navigator Security Manager resources documentation is accessible via endpoint `http[s]://{host:port}/wsm/v1/services`, for example:

`http://192.168.88.233:8019/wsm/v1/services`

- WADL description: `http[s]://{host:port}/wsm/v1/?_wadl`, for example `http://192.168.88.233:8019/wsm/v1/?_wadl`
- OpenAPI description: `http[s]://{host:port}/wsm/v1/openapi.json`, for example `http://192.168.88.233:8019/wsm/v1/openapi.json`
- SwaggerUI OpenAPI documentation: `http[s]://{host:port}/wsm/v1/api-docs?url=/rest/v1/openapi.json`, for example `http://192.168.88.233:8019/wsm/v1/api-docs?url=/wsm/v1/openapi.json`

Rest API for OAuth2 resources documentation is accessible via endpoint `http[s]://{host:port}/auth/services`, for example:
`http://192.168.88.233:8019/auth/services`

- WADL description: `http[s]://{host:port}/auth/?_wadl`, for example `http://192.168.88.233:8019/auth/?_wadl`
- OpenAPI description: `http[s]://{host:port}/auth/openapi.json`, for example `http://192.168.88.233:8019/auth/openapi.json`
- SwaggerUI OpenAPI documentation: `http[s]://{host:port}/auth/api-docs?url=/rest/v1/openapi.json`, for example `http://192.168.88.233:8019/auth/api-docs?url=/auth/openapi.json`

To access Rest API resources the Authorization header must be included, it can be:

- Authorization: Basic {Base64(username:password)}
- Authorization: Bearer {access_token}

9.3.3 Rest API Responses

Table 9-1. Rest API Responses

Code	Name	Description
200	Success	Returns success with body
201	Created	Object created
204	Empty	Returns success without body
304	Not changed	Object not changed
400	Bad Request	Wrong request parameters, returns error object for more information
401	Unauthorized	Operation is unauthorized, returns error object for more information
403	Forbidden	Operation is forbidden, returns error object for more information
404	Not Found	Object not found, returns error object for more information
409	Conflict	Conflicts with object status, returns error object for more information

Table 9-1. Rest API Responses		
Code	Name	Description
500	Internal Server Exception	Something is wrong on the server side, returns error object for more information

Rest API error object parameters:

- Type: error type, can be:
 - rest - error on Rest side
 - pcf- error on PCF communication side
 - java - internal java error
- messageId: error identifier: WGS0001, WGS0002, ...
- message: error message
- explanation: error explanation
- action: how the user can avoid error
- code: if it was a PCF return code
- exception: if it was an internal exception message

9.4 Rest API Workgroup Server Object Searches

All workgroup server object searches contain the following parameters:

- attributes by which select objects, depends on object type, for example: name, type, nodeName, ...
- filter - filter by attribute. Structure is {attribute}:{eq|ne|lt|le|gt|ge|co|nc}:{value}:
 - {attribute} - attribute name
 - {eq|ne|lt|le|gt|ge|co|nc} - operation type:
 - eq - equals to value, for types: Boolean, Integer, Long, Double, String, Date, String Selector
 - ne - not equals to value, for types: Boolean, Integer, Long, Double, String, Date, String Selector
 - lt - less than value, for types: Integer, Long, Double, Date
 - le - less than or equals to value, for types: Integer, Long, Double, Date
 - gt - greater than value, for types: Integer, Long, Double, Date

- ge - greater than or equals to value, for types: Integer, Long, Double, Date
- co - contains value, for types: String, String Selector, Object arrays, Object maps
- nc - not contains value, for types: String, String Selector, Object arrays, Object maps
 - {value} - check value
- order - order by attributes. Structure is {attribute}:[asc | desc],{attribute}:[asc | desc] comma separated attributes ordering:
 - {attribute} - attribute name
 - [asc | desc] - order type:
 - asc – ascending
 - desc – descending
- limit - limit of return objects
- attributes - a comma-separated list of attributes or attribute sections to retrieve.
 - * - select all attributes
 - general.* - select section general all attributes
 - general.description - select exact attribute description of section general (must be full path section and attribute name)
 - name, type, general.*, status.lastUpdate - combined attributes selection is separated by comma ','

9.5 Rest API Tasks

1. Add Rest API objects that have not been implemented and missing operations.
2. Add CORS filter.
3. Analyze which data must be validated and add:
 - a. Rest API configuration via Nastel Autopilot M6 Enterprise Manager (enable/disable listener, port, Basic Auth, OAuth2, SSL)
 - b. Rest API Basic Authentication (username/password via Authorization header Basic)
 - c. Rest API OAuth2 Authentication (key Authorization header Bearer)
 - i. For OAuth2 authentication use endpoint: /auth/token
 - d. Rest API documentation generate:
 - i. Rest services: /rest/v1/services
 - ii. WADL: /rest/v1/?_wadl
 - iii. OpenAPI: /rest/v1/openapi.json
 - iv. Swagger UI: /rest/v1/api-docs?url=/rest/v1/openapi.json

e. See tables immediately below for main object Rest API resources

Table 9-2. Manager operations (/rest/v1/manager)					
Operation	Endpoint	Path Parameters	Query Parameters	Body	Response body if ok
Read	HTTP GET /rest/v1/manager		attributes: comma-separated list of attributes, or attribute sections to retrieve (Example: *, state.*, state.status)		manager JSON object

Table 9-3. Nodes operations (/rest/v1/nodes)					
Operation	Endpoint	Path Parameters	Query Parameters	Body	Response body if ok
Search	HTTP GET /rest/v1/nodes		attributes: comma-separated list of attributes or attribute sections to retrieve (Example: *, state.*, state.status) nodeName: wildcard name to search		node JSON objects array
Read by name	HTTP GET /rest/v1/nodes/{nodeName}	nodeName: node name	attributes: comma-separated list of attributes or attribute sections to retrieve (Example: *, state.*, state.status)		node JSON object

Table 9-3. Nodes operations (/rest/v1/nodes)

Operation	Endpoint	Path Parameters	Query Parameters	Body	Response body if ok
Create	HTTP POST /rest/v1/nodes			node JSON object	
Delete by name	DELETE /rest/v1/nodes/{nodeName}	nodeName: node name			
Manage/Unmanage by name	HTTP PATCH /rest/v1/nodes/{nodeName}/manage	nodeName: node name		node manage JSON object	

Table 9-4. Queue managers on specific node operations (/rest/v1/nodes/{nodeName}/qmgrs)

Operation	Endpoint	Path Parameters	Query Parameters	Body	Response body if ok
Search	HTTP GET /rest/v1/nodes/{nodeName}/qmgrs	nodeName: node name	attributes: comma-separated list of attributes or attribute sections to retrieve (Example: *, state.*, state.status) qmgrName: wildcard name to search		queue manger JSON objects array
Read by name	HTTP GET /rest/v1/nodes/{nodeName}/qmgrs/{qmgrName}	nodeName: node name qmgrName: queue manager name	attributes: comma-separated list of attributes or attribute sections to retrieve (Example: *, state.*, state.status)		queue manger JSON object

Table 9-5. Remote queue managers operations (/rest/v1/remote-qmgrs)

Operation	Endpoint	Path Parameters	Query Parameters	Body	Response body if ok
Search	HTTP GET /rest/v1/remote-qmgrs		attributes: comma-separated list of attributes or attribute sections to retrieve (Example: *, state.*, state.status) nodeName: wildcard name to search qmgrName - wildcard name to search		remote queue manager JSON objects array
Read by name	HTTP GET /rest/v1/remote-qmgrs/{nodeName}/{qmgrName}	nodeName: node name qmgrName: queue manager name	attributes: comma-separated list of attributes or attribute sections to retrieve (Example: *, state.*, state.status)		remote queue manager JSON object
Create	HTTP POST /rest/v1/remote-qmgrs			remote queue manager JSON object	
Change by name	HTTP PATCH /rest/v1/remote-qmgrs/{nodeName}/{qmgrName}	nodeName: node name qmgrName: queue		remote queue manager JSON object	

Table 9-5. Remote queue managers operations (/rest/v1/remote-qmgrs)

Operation	Endpoint	Path Parameters	Query Parameters	Body	Response body if ok
		manager name			
Delete by name	DELETE /rest/v1/remote-qmgrs/{nodeName}/{qmgrName}	nodeName: node name qmgrName: queue manager name			

9.6 Examples

Table 9-6. IBM MQ REST API Examples

Object	Command
List nodes	<code>curl -i -u Admin:admin -X GET "http://172.16.31.20:8019/rest/v1/nodes"</code>
List remote queue managers	<code>curl -i -u Admin:admin -X GET "http://172.16.31.20:8019/rest/v1/remote-qmgrs"</code>
Add a remote queue manager	<code>curl -i -u Admin:admin -X POST "http://172.16.31.20:8019/rest/v1/remote-qmgrs" -H "Content-Type: application/json" -d '{"managerName":"MQM","nodeName":"DOCKER","qmgrName":"TQM53","general":{"connectUser":"nastel","connectPassword":"Nastel@12345678"},"communication":{"connectionName":"172.16.31.121(1434)","cmdQName":"SYSTEM.ADMIN.COMMAND.QUEUE","channelName":"NAVIGATOR.SVRCONN","cmdConvert":"No"}}'</code>
Delete remote queue manager	<code>curl -i -u Admin:admin -X DELETE "http://172.16.31.20:8019/rest/v1/remote-qmgrs/DOCKER/TQM2"</code>
Display attributes of a queue	<code>curl -X GET "http://172.16.31.20:8019/rest/v1/ibmmq/queues?attributes=%2A&nodeName=RDQM-1&qmgrName=STYX&type=Local&queueName=STYX.TEST.QL" -H "accept: application/json" -H "Authorization: Basic QWRtaW46YWRtaW4="</code>

Table 9-6. IBM MQ REST API Examples	
Object	Command
Display a specific attribute of a queue	curl -X GET "http://172.16.31.20:8019/rest/v1/ibmmq/queues?attributes=state.curQDepth&nodeName=RDQM-1&qmgrName=STYX&type=Local&queueName=STYX.TEST.QL" -H "accept: application/json" -H "Authorization: Basic QWRtaW46YWRTaW4="
Display multiple attributes of a queue	curl -X GET "http://172.16.31.20:8019/rest/v1/ibmmq/queues/RDQM-1/STYX/Local/STYX.TEST.QL?attributes=general.usage%2Cstate.curQDepth%2Cextended.maxDepth" -H "accept: application/json" -H "Authorization: Basic QWRtaW46YWRTaW4="

Table 9-7. Kafka REST API Examples	
Object	Command
List Kafka remote managers	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/kafka/remote-mgrs"
List Kafka topics	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/kafka/topics"
Get Kafka topic xxx on node CMKafka and cluster localhost:9095 all attributes	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/kafka/topics/CMKafka/localhost:9095/xxx?attributes=%2A"
List Kafka connects	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/kafka/connects"
Get Kafka connect TestConnect on node CMKafka, cluster localhost:9095 and connect instance Connector1 general and state sections attributes	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/kafka/connects/CMKafka/localhost:9095/Connector1/TestConnect?attributes=general.*,state.*"

Table 9-8. TIBCO EMS REST API Examples	
Object	Command
List EMS remote managers	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ems/remote-mgrs"
List EMS managers	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ems/managers"
Get EMS manager tcp://127.0.0.1:7222 on node EMS-SERVER ACLs	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ems/managers/EMS-SERVER/tcp:%2F%2F127.0.0.1:7222/acls"
List EMS queues on node EMS-SERVER and manager tcp://127.0.0.1:7222	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ems/queues?nodeName=EMS-SERVER&managerName=tcp:%2F%2F127.0.0.1:7222"
Get EMS queue sample on node EMS-SERVER and manager tcp://127.0.0.1:7222 all attributes	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ems/queues/EMS-SERVER/tcp:%2F%2F127.0.0.1:7222/sample?attributes=%2A"

Table 9-9. IBM IIB REST API Examples	
Object	Command
List IIB remote managers	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/aceiib/remote-mgrs"
List IIB servers	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/iib/servers"
Get IIB applications on node CMACE, manager	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/iib/applications?wgsNodeName=CMACE&wgsMgrName=NodeIIB&serverName=Server1"

Table 9-9. IBM IIB REST API Examples

Object	Command
NodeIIB and server Server1	
Get IIB application App on node CMACE, manager NodeIIB and server Server1 all attributes	<pre>curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/iib/applications/CMACE/NodeIIB/Server1/App?attributes=%2A"</pre>

Table 9-10. IBM ACE REST API Examples

Object	Command
List IBM ACE remote managers	<pre>curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/aceiib/remote-mgrs"</pre>
List ACE servers	<pre>curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ace/servers"</pre>
Get ACE applications on node CMACE, manager NodeACE and server Server1	<pre>curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ace/applications?wgsNodeName=CMACE&wgsMgrName=NodeACE&serverName=Server1"</pre>
Get ACE application App on node CMACE, manager NodeACE and server Server1 active, descriptive, and state sections attributes	<pre>curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/rest/v1/ace/applications/CMACE/NodeACE/Server1/App?attributes=active.*,descriptive.*,state.*"</pre>

Table 9-11. Nastel Navigator Security Manager REST API Examples

Object	Command
List server groups	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/server-groups"
List object groups	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/object-groups"
List object types	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/object-types"
List features	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/features"
List roles	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/roles"
List user groups	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/user-groups"
List users	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/users"
Read user full information by ID	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/users/5"
Create new user Tom with group Developers:	curl -i -u Admin:admin -X POST "http://192.168.88.233:8019/wsm/v1/users" -H "accept: application/json" -H "Content-Type: application/json" -d '{"userName\":\"tom\",\"description\":\"Tom Developer\",\"locked\":false,\"disabled\":false,\"userGroupNames\":[\"Developers\"]}'
Delete user by ID:	curl -i -u Admin:admin -X DELETE "http://192.168.88.233:8019/wsm/v1/users/8"
List audit levels	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/audit-levels"
List configured audits	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/audits"
List configured trusts	curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/trusts"

Table 9-11. Nastel Navigator Security Manager REST API Examples

Object	Command
List last WSM audit records with limit 10:	<pre>curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/wsm-audits?limit=10"</pre>
List last WGS audit records with limit 10:	<pre>curl -i -u Admin:admin -X GET "http://192.168.88.233:8019/wsm/v1/wgs-audits?limit=10"</pre>

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Chapter 10: Reassigning Viewlets

When a workgroup server is deleted, all its viewlets will also be deleted. To prevent losing viewlets, use the reassigning viewlets feature to move viewlets to a different workgroup server. Please note, only administrators with the **Configure Connections** permission enabled (set in Nastel Navigator Security Manager) can reassign viewlets.

**TIP**

Before deleting workgroup servers, take a look at the **Viewlet Count** field (as seen in Figure 10-2 below) which displays how many viewlets a workgroup server contains.

Perform the following to reassign viewlets:

1. Click the **Manage Workgroup Servers** button in the *Workgroup Servers* viewlet located on the *WorkSpace* dashboard.

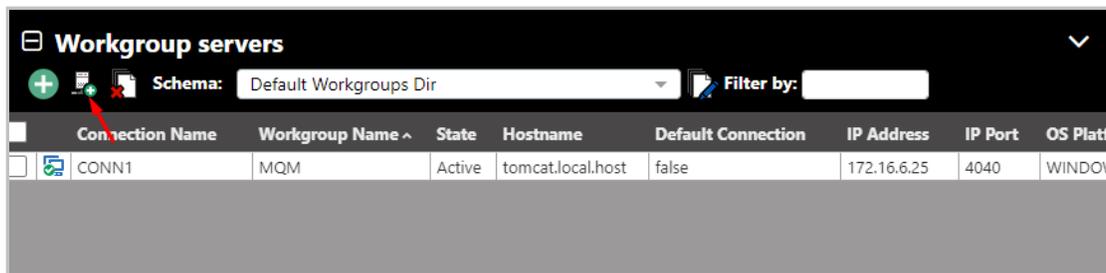


Figure 10-1. Manage Workgroup Servers

2. The *Workgroup Server Connections* window opens. Click the **Re-Assign Viewlets** button.

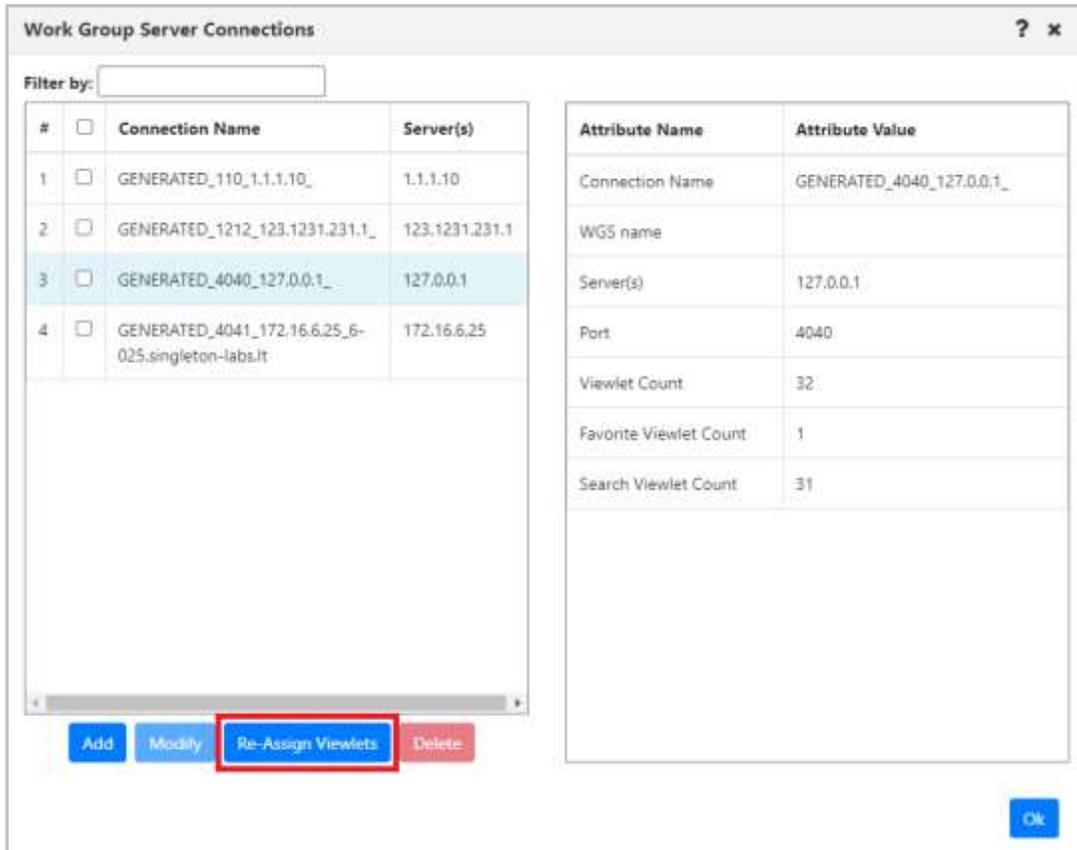


Figure 10-2. Re-Assign Viewlets Button

3. The *Viewlet Reassignment location picker* window opens. Select the **Connection From** (the viewlets' originating workgroup server) and **Connection To** (the new workgroup server for the viewlets).



Figure 10-3. Viewlet Reassignment Location Picker Window

4. The Viewlet Reassignment window opens where you can move viewlets from one connection to the other. Do this by selecting viewlet(s) and using the blue buttons located in the middle of the two connections. To quickly select multiple viewlets use the **Ctrl** and **Shift** keys, or **Ctrl** and mouse click. If the connection names are longer than 30 characters, the name will be truncated to 30 characters but can be fully

viewed by hovering your mouse over the name.

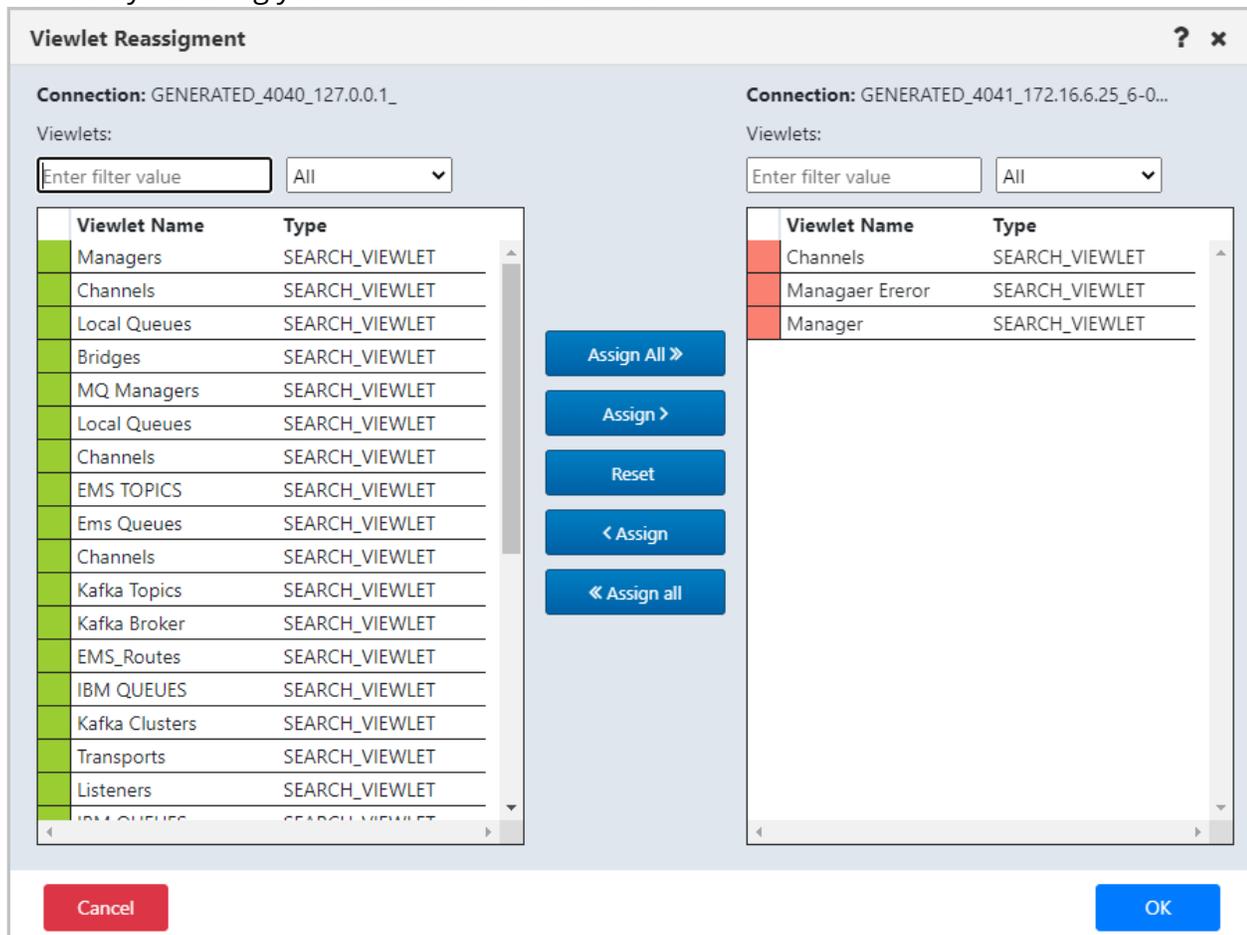


Figure 10-4. Viewlet Reassignment Window

The red or green color displayed immediately to the left of a viewlet’s name represents the viewlet’s originating connection. Viewlets originating from the connection located on the left side of the screen will have green, and viewlets originating from the connection located on the right side of the screen will have red. You can also hover your mouse over the viewlet to display the originating connection.

To undo all your updates and move the viewlets back to their originating connections, simply click the **Reset** button.

5. Click **OK** when finished.

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Chapter 11: Troubleshooting

WGS Expert DBStatus shows DB_Exception: Access denied for user xxx@localhost (using password: YES)

➤ Check/modify the WGS Expert properties, the **Database User Name** and **Password** fields on the **General** and **Authorization and Authentication** tabs. Click **Apply**, click **Yes** for the **Deploy to WGS** prompt box, and click **Close**.

Restart WGS Expert if it is stopped. Facts should now appear under fact categories DBStats and *workgroup_name*.

CEP Server log (or ATPNODES console) shows repeating SSL related error message

➤ This error message appears repeatedly approximately every 30 seconds:

```
2019-05-06 18:32:36,815 ERROR[nastel.console] - Mon May 06 18:32:36 EDT 2019
WARN: Establishing SSL connection without server's identity verification is not
recommended. According to MySQL 5.5.45+, 5.6.26+ and 5.7.6+ requirements SSL
connection must be established by default if explicit option isn't set. For
compliance with existing applications not using SSL the verifyServerCertificate
property is set to 'false'. You need either to explicitly disable SSL by
setting useSSL=false, or set useSSL=true and provide truststore for server
certificate verification.
```

In this scenario, perform the following:

a) Modify the WGS Expert properties. In the Database URL fields on the **General** and **Authorization and Authentication** tabs, append the URL parameter string **?useSSL=false**. Click **Apply**, click **Yes** for the **Deploy to WGS** prompt box, and click **Close**. Restart WGS Expert if it is stopped.

b) Disable use of SSL in MySQL 8:

Stop the CEP Server (atpnode process). In MySQL Workbench, select **Menu > Database > Manage Connections**. Select the connection being used in the MySQL Connections panel, select tab **Connection > SSL**. Change field **Use SSL** to **No**. Click **Test Connection** and you should see a popup showing "Successfully made the MySQL connection" and "SSL: not enabled". Click **Close** on the **Connection** tab. Restart the CEP Server (atpnode).

WGS Expert fails to manage nodes due to license problem

➤ Messages such as these might appear in the

```
[AUTOPILOT_HOME]\logs\log4j\cep_server_name.log4j:
```

```
2019-05-06 22:24:00,422 ERROR[WGSExpert][WsExpertThread] - Error starting
scheduling. That component might not work
```

```
2019-05-06 22:24:00,449 ERROR[WGSExpert][ConnectionPool_for_SUNFIRE] - Failed
to get license for node 'SUNFIRE' with 2 CPU & 0 MIPS
```

Check the CPU Count in your license file

```
[AUTOPILOT_HOME]\localhost\AutoPilotWMQ_MQM.lic
```

- a) If the CPU Count is less than the total core count for all your managed MQ and EMS nodes, you will not be able to manage those nodes whose core counts cause the license limit to be exceeded.
- b) If you installed **WGSRP-10.1.1.pkg**, an AutoPilot license with CPU Count: 0 was installed. No MQ or EMS nodes can be managed with this license.

Request a license file from [Nastel support](#) that has a valid user count.

Appendix A: References

This appendix contains a list of reference material and documents relevant to Nastel Navigator. The documents can be found in the [Resource Center](#).

A.1 Nastel Documentation

Table A-1. Nastel Documentation	
Document Number (or higher)	Title
NN10.019	<i>Nastel Navigator User's Guide</i>
NAV/COMP 101.017	<i>Nastel Navigator Components Installation Guide</i>
NAV-SM 667.007	<i>Nastel Navigator Security Manager V6 – User's Guide</i>
M6/MQ 600.005	<i>AutoPilot® M6 Plug-in for IBM MQ</i>
APM6/INS 625.002	<i>AutoPilot M6 Installation Guide</i>
APM6/USR 625.003	<i>AutoPilot M6 User's Guide</i>

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Appendix B: Executing User-Defined Scripts

Nastel Navigator provides a method for executing user-supplied scripts or programs when a given event occurs. A simple script-naming convention associates a script with a specific event. When the event occurs, all event-dependent parameters are passed to the script on the command line that invoked the script.

Scripts can be executed on the IBM MQ node where the event occurs, or at the level of the workgroup server(s) that are managing the node. They are invoked by the IBM MQ Agent on the node where the event actually occurs, or by any workgroup server to which the event is sent. A script for an event may be placed on the IBM MQ Agent node, the workgroup server level, or both.

B.1 Script Naming Conventions

Scripts must be named after the events to which they are associated. Each script must have the name:

<CATID>_<EVENTID>

where:

<CATID> is a PCF event category ID, given as one of the integers in the table below.

Table B-1. PCF Categories Integer Values	
Event Category	Integer
MQCMD_Q_MGR_EVENT	44
MQCMD_PERFM_EVENT	45
MQCMD_CHANNEL_EVENT	46

<EVENTID> is a PCF event ID number, given as one of the integers in the *Integer Values for PCF Events* tables. For example, if association of a script with a channel-stopped event (MQRC_CHANNEL_STOPPED) is required, name the script 46_2283. If the script is a Windows batch script, its full name would be 46_2283.bat.

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)			
PCF Event	Integer Value	Integer Value	Integer Value
MQRC_ALIAS_BASE_Q_TYPE_ERROR	2001L	MQRC_ALREADY_CONNECTED	2002L
MQRC_BACKED_OUT	2003L	MQRC_BUFFER_ERROR	2004L
MQRC_BUFFER_LENGTH_ERROR	2005L	MQRC_CHAR_ATTR_LENGTH_ERROR	2006L
MQRC_CHAR_ATTRS_ERROR	2007L	MQRC_CHAR_ATTRS_TOO_SHORT	2008L

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_CONNECTION_BROKEN	2009L	MQRC_DATA_LENGTH_ERROR	2010L
MQRC_DYNAMIC_Q_NAME_ERROR	2011L	MQRC_ENVIRONMENT_ERROR	2012L
MQRC_EXPIRY_ERROR	2013L	MQRC_FEEDBACK_ERROR	2014L
MQRC_GET_INHIBITED	2016L	MQRC_HANDLE_NOT_AVAILABLE	2017L
MQRC_HCONN_ERROR	2018L	MQRC_HOBJ_ERROR	2019L
MQRC_INHIBIT_VALUE_ERROR	2020L	MQRC_INT_ATTR_COUNT_ERROR	2021L
MQRC_INT_ATTR_COUNT_TOO_SMALL	2022L	MQRC_INT_ATTRS_ARRAY_ERROR	2023L
MQRC_SYNCPOINT_LIMIT_REACHED	2024L	MQRC_MAX_CONNS_LIMIT_REACHED	2025L
MQRC_MD_ERROR	2026L	MQRC_MISSING_REPLY_TO_Q	2027L
MQRC_MSG_TYPE_ERROR	2029L	MQRC_MSG_TOO_BIG_FOR_Q	2030L
MQRC_MSG_TOO_BIG_FOR_Queue_MGR	2031L	MQRC_NO_MSG_AVAILABLE	2033L
MQRC_NO_MSG_UNDER_CURSOR	2034L	MQRC_NOT_AUTHORIZED	2035L
MQRC_NOT_OPEN_FOR_BROWSE	2036L	MQRC_NOT_OPEN_FOR_INPUT	2037L
MQRC_NOT_OPEN_FOR_INQUIRE	2038L	MQRC_NOT_OPEN_FOR_OUTPUT	2039L
MQRC_NOT_OPEN_FOR_SET	2040L	MQRC_OBJECT_CHANGED	2041L
MQRC_OBJECT_IN_USE	2042L	MQRC_OBJECT_TYPE_ERROR	2043L
MQRC_OD_ERROR	2044L	MQRC_OPTION_NOT_VALID_FORTYPE	2045L
MQRC_OPTIONS_ERROR	2046L	MQRC_PERSISTENCE_ERROR	2047L
MQRC_PERSISTENT_NOT_ALLOWED	2048L	MQRC_PRIORITY_EXCEEDS_MAXIMUM	2049L
MQRC_PRIORITY_ERROR	2050L	MQRC_PUT_INHIBITED	2051L
MQRC_Q_DELETED	2052L	MQRC_Q_FULL	2053L
MQRC_Q_NOT_EMPTY	2055L	MQRC_Q_SPACE_NOT_AVAILABLE	2056L
MQRC_Q_TYPE_ERROR	2057L	MQRC_Q_MGR_NAME_ERROR	2058L
MQRC_Q_MGR_NOT_AVAILABLE	2059L	MQRC_REPORT_OPTIONS_ERROR	2061L
MQRC_SECOND_MARK_NOT_ALLOWED	2062L	MQRC_SECURITY_ERROR	2063L
MQRC_SELECTOR_COUNT_ERROR	2065L	MQRC_SELECTOR_LIMIT_EXCEEDED	2066L
MQRC_SELECTOR_ERROR	2067L	MQRC_SELECTOR_NOT_FOR_TYPE	2068L
MQRC_SIGNAL_OUTSTANDING	2069L	MQRC_SIGNAL_REQUEST_ACCEPTED	2070L

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_STORAGE_NOT_AVAILABLE	2071L	MQRC_SYNCPOINT_NOT_AVAILABLE	2072L
MQRC_TRIGGER_CONTROL_ERROR	2075L	MQRC_TRIGGER_DEPTH_ERROR	2076L
MQRC_TRIGGER_MSG_PRIORITY_ERR	2077L	MQRC_TRIGGER_TYPE_ERROR	2078L
MQRC_TRUNCATED_MSG_ACCEPTED	2079L	MQRC_TRUNCATED_MSG_FAILED	2080L
MQRC_UNKNOWN_ALIAS_BASE_Q	2082L	MQRC_UNKNOWN_OBJECT_NAME	2085L
MQRC_UNKNOWN_OBJECT_Q_MGR	2086L	MQRC_UNKNOWN_REMOTE_Q_MGR	2087L
MQRC_WAIT_INTERVAL_ERROR	2090L	MQRC_XMIT_Q_TYPE_ERROR	2091L
MQRC_XMIT_Q_USAGE_ERROR	2092L	MQRC_NOT_OPEN_FOR_PASS_ALL	2093L
MQRC_NOT_OPEN_FOR_PASS_IDENT	2094L	MQRC_NOT_OPEN_FOR_SET_ALL	2095L
MQRC_NOT_OPEN_FOR_SET_IDENT	2096L	MQRC_CONTEXT_HANDLE_ERROR	2097L
MQRC_CONTEXT_NOT_AVAILABLE	2098L	MQRC_SIGNAL1_ERROR	2099L
MQRC_OBJECT_ALREADY_EXISTS	2100L	MQRC_OBJECT_DAMAGED	2101L
MQRC_RESOURCE_PROBLEM	2102L	MQRC_ANOTHER_Q_MGR_CONNECTED	2103L
MQRC_UNKNOWN_REPORT_OPTION	2104L	MQRC_STORAGE_CLASS_ERROR	2105L
MQRC_COD_NOT_VALID_FOR_XCF_Q	2106L	MQRC_XWAIT_CANCELED	2107L
MQRC_XWAIT_ERROR	2108L	MQRC_SUPPRESSED_BY_EXIT	2109L
MQRC_FORMAT_ERROR	2110L	MQRC_SOURCE_CCSID_ERROR	2111L
MQRC_SOURCE_INTEGER_ENC_ERROR	2112L	MQRC_SOURCE_DECIMAL_ENC_ERROR	2113L
MQRC_SOURCE_FLOAT_ENC_ERROR	2114L	MQRC_TARGET_CCSID_ERROR	2115L
MQRC_TARGET_INTEGER_ENC_ERROR	2116L	MQRC_TARGET_DECIMAL_ENC_ERROR	2117L
MQRC_TARGET_FLOAT_ENC_ERROR	2118L	MQRC_NOT_CONVERTED	2119L
MQRC_CONVERTED_MSG_TOO_BIG	2120L	MQRC_TRUNCATED	2120L
MQRC_NO_EXTERNAL_PARTICIPANTS	2121L	MQRC_PARTICIPANT_NOT_AVAILABLE	2122L
MQRC_OUTCOME_MIXED	2123L	MQRC_OUTCOME_PENDING	2124L
MQRC_BRIDGE_STARTED	2125L	MQRC_BRIDGE_STOPPED	2126L
MQRC_ADAPTER_STORAGE_SHORTAGE	2127L	MQRC_UOW_IN_PROGRESS	2128L
MQRC_ADAPTER_CONN_LOAD_ERROR	2129L	MQRC_ADAPTER_SERV_LOAD_ERROR	2130L
MQRC_ADAPTER_CONV_LOAD_ERROR	2133L	MQRC_BO_ERROR	2134L

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_DH_ERROR	2135L	MQRC_MULTIPLE_REASONS	2136L
MQRC_OPEN_FAILED	2137L	MQRC_ADAPTER_DISC_LOAD_ERROR	2138L
MQRC_CNO_ERROR	2139L	MQRC_CICS_WAIT_FAILED	2140L
MQRC_DLH_ERROR	2141L	MQRC_HEADER_ERROR	2142L
MQRC_SOURCE_LENGTH_ERROR	2143L	MQRC_TARGET_LENGTH_ERROR	2144L
MQRC_SOURCE_BUFFER_ERROR	2145L	MQRC_TARGET_BUFFER_ERROR	2146L
MQRC_IIH_ERROR	2148L	MQRC_PCF_ERROR	2149L
MQRC_DBCS_ERROR	2150L	MQRC_OBJECT_NAME_ERROR	2152L
MQRC_OBJECT_Q_MGR_NAME_ERROR	2153L	MQRC_RECS_PRESENT_ERROR	2154L
MQRC_OBJECT_RECORDS_ERROR	2155L	MQRC_RESPONSE_RECORDS_ERROR	2156L
MQRC_ASID_MISMATCH	2157L	MQRC_PMO_RECORD_FLAGS_ERROR	2158L
MQRC_PUT_MSG_RECORDS_ERROR	2159L	MQRC_CONN_ID_IN_USE	2160L
MQRC_Q_MGR QUIESCING	2161L	MQRC_Q_MGR_STOPPING	2162L
MQRC_DUPLICATE_RECOV_COORD	2163L	MQRC_PMO_ERROR	2173L
MQRC_API_EXIT_NOT_FOUND	2182L	MQRC_API_EXIT_LOAD_ERROR	2183L
MQRC_REMOTE_Q_NAME_ERROR	2184L	MQRC_INCONSISTENT_PERSISTENCE	2185L
MQRC_GMO_ERROR	2186L	MQRC_TMC_ERROR	2191L
MQRC_PAGESET_FULL	2192L	MQRC_PAGESET_ERROR	2193L
MQRC_NAME_NOT_VALID_FOR_TYPE	2194L	MQRC_UNEXPECTED_ERROR	2195L
MQRC_UNKNOWN_XMIT_Q	2196L	MQRC_UNKNOWN_DEF_XMIT_Q	2197L
MQRC_DEF_XMIT_Q_TYPE_ERROR	2198L	MQRC_DEF_XMIT_Q_USAGE_ERROR	2199L
MQRC_NAME_IN_USE	2201L	MQRC_CONNECTION QUIESCING	2202L
MQRC_CONNECTION_STOPPING	2203L	MQRC_ADAPTER_NOT_AVAILABLE	2204L
MQRC_MSG_ID_ERROR	2206L	MQRC_CORREL_ID_ERROR	2207L
MQRC_FILE_SYSTEM_ERROR	2208L	MQRC_NO_MSG_LOCKED	2209L
MQRC_SOAP_DOTNET_ERROR	2210L	MQRC_SOAP_AXIS_ERROR	2211L
MQRC_SOAP_URL_ERROR	2212L	MQRC_FILE_NOT_AUDITED	2216L
MQRC_CONNECTION_NOT_AUTHORIZED	2217L	MQRC_MSG_TOO_BIG_FOR_CHANNEL	2218L

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_CALL_IN_PROGRESS	2219L	MQRC_RMH_ERROR	2220L
MQRC_Q_MGR_ACTIVE	2222L	MQRC_Q_MGR_NOT_ACTIVE	2223L
MQRC_Q_DEPTH_HIGH	2224L	MQRC_Q_DEPTH_LOW	2225L
MQRC_Q_SERVICE_INTERVAL_HIGH	2226L		
MQRC_Q_SERVICE_INTERVAL_OK	2227L	MQRC_CHANNEL_AUTO_DEF_OK	2233L
MQRC_CHANNEL_AUTO_DEF_ERROR	2234L	MQRC_CFH_ERROR	2235L
MQRC_CFIL_ERROR	2236L	MQRC_CFIN_ERROR	2237L
MQRC_CFSL_ERROR	2238L	MQRC_CFST_ERROR	2239L
MQRC_INCOMPLETE_GROUP	2238L	MQRC_INCOMPLETE_MSG	2242L
MQRC_INCONSISTENT_CCSDS	2243L	MQRC_INCONSISTENT_ENCODINGS	2244L
MQRC_INCONSISTENT_UOW	2245L	MQRC_INVALID_MSG_UNDER_CURSOR	2246L
MQRC_MATCH_OPTIONS_ERROR	2247L	MQRC_MDE_ERROR	2248L
MQRC_MSG_FLAGS_ERROR	2249L	MQRC_MSG_SEQ_NUMBER_ERROR	2250L
MQRC_OFFSET_ERROR	2251L	MQRC_ORIGINAL_LENGTH_ERROR	2252L
MQRC_SEGMENT_LENGTH_ZERO	2253L	MQRC_UOW_NOT_AVAILABLE	2255L
MQRC_WRONG_GMO_VERSION	2256L	MQRC_WRONG_MD_VERSION	2257L
MQRC_GROUP_ID_ERROR	2258L	MQRC_INCONSISTENT_BROWSE	2259L
MQRC_XQH_ERROR	2260L	MQRC_SRC_ENV_ERROR	2261L
MQRC_SRC_NAME_ERROR	2262L	MQRC_DEST_ENV_ERROR	2263L
MQRC_DEST_NAME_ERROR	2264L	MQRC_TM_ERROR	2265L
MQRC_HCONFIG_ERROR	2280L	MQRC_FUNCTION_ERROR	2281L
MQRC_CHANNEL_STARTED	2282L	MQRC_CHANNEL_STOPPED	2283L
MQRC_CHANNEL_CONV_ERROR	2284L	MQRC_SERVICE_NOT_AVAILABLE	2285L
MQRC_INITIALIZATION_FAILED	2286L	MQRC_TERMINATION_FAILED	2287L
MQRC_UNKNOWN_Q_NAME	2288L	MQRC_SERVICE_ERROR	2289L
MQRC_Q_ALREADY_EXISTS	2290L	MQRC_USER_ID_NOT_AVAILABLE	2291L
MQRC_UNKNOWN_ENTITY	2292L	MQRC_UNKNOWN_AUTH_ENTITY	2293L
MQRC_UNKNOWN_REF_OBJECT	2294L	MQRC_CHANNEL_ACTIVATED	2295L

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_CHANNEL_NOT_ACTIVATED	2296L	MQRC_UOW_CANCELED	2297L
MQRC_FUNCTION_NOT_SUPPORTED	2298L	MQRC_SELECTOR_TYPE_ERROR	2299L
MQRC_COMMAND_TYPE_ERROR	2300	MQRC_MULTIPLE_INSTANCE_ERROR	2301
MQRC_SYSTEM_ITEM_NOT_ALTERABLE	2302	MQRC_BAG_CONVERSION_ERROR	2303
MQRC_SELECTOR_OUT_OF_RANGE	2304	MQRC_SELECTOR_NOT_UNIQUE	2305
MQRC_INDEX_NOT_PRESENT	2306	MQRC_STRING_ERROR	2307
MQRC_ENCODING_NOT_SUPPORTED	2308	MQRC_SELECTOR_NOT_PRESENT	2309
MQRC_OUT_SELECTOR_ERROR	2310	MQRC_STRING_TRUNCATED	2311
MQRC_SELECTOR_WRONG_TYPE	2312	MQRC_INCONSISTENT_ITEM_TYPE	2313
MQRC_INDEX_ERROR	2314	MQRC_SYSTEM_BAG_NOT_ALTERABLE	2315
MQRC_ITEM_COUNT_ERROR	2316	MQRC_FORMAT_NOT_SUPPORTED	2317
MQRC_SELECTOR_NOT_SUPPORTED	2318	MQRC_ITEM_VALUE_ERROR	2319
MQRC_HBAG_ERROR	2320	MQRC_PARAMETER_MISSING	2321
MQRC_CMD_SERVER_NOT_AVAILABLE	2322	MQRC_STRING_LENGTH_ERROR	2323
MQRC_INQUIRY_COMMAND_ERROR	2324	MQRC_NESTED_BAG_NOT_SUPPORTED	2325
MQRC_BAG_WRONG_TYPE	2326	MQRC_ITEM_TYPE_ERROR	2327
MQRC_SYSTEM_BAG_NOT_DELETABLE	2328	MQRC_SYSTEM_ITEM_NOT_DELETABLE	2329
MQRC_CODED_CHAR_SET_ID_ERROR	2330	MQRC_MSG_TOKEN_ERROR	2331
MQRC_MISSING_WIH	2332	MQRC_WIH_ERROR	2333
MQRC_RFH_ERROR	2334	MQRC_RFH_STRING_ERROR	2335
MQRC_RFH_COMMAND_ERROR	2336	MQRC_RFH_PARM_ERROR	2337
MQRC_RFH_DUPLICATE_PARM	2338	MQRC_RFH_PARM_MISSING	2339
MQRC_CHAR_CONVERSION_ERROR	2340	MQRC_UCS2_CONVERSION_ERROR	2341
MQRC_DB2_NOT_AVAILABLE	2342	MQRC_OBJECT_NOT_UNIQUE	2343
MQRC_CONN_TAG_NOT_RELEASED	2344	MQRC_CF_NOT_AVAILABLE	2345
MQRC_CF_STRUC_IN_USE	2346	MQRC_CF_STRUC_LIST_HDR_IN_USE	2347
MQRC_CF_STRUC_AUTH_FAILED	2348	MQRC_CF_STRUC_ERROR	2349
MQRC_CONN_TAG_NOT_USABLE	2350	MQRC_GLOBAL_UOW_CONFLICT	2351

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_LOCAL_UOW_CONFLICT	2352	MQRC_HANDLE_IN_USE_FOR_UOW	2353
MQRC_UOW_ENLISTMENT_ERROR	2354	MQRC_UOW_MIX_NOT_SUPPORTED	2355
MQRC_WXP_ERROR	2356	MQRC_CURRENT_RECORD_ERROR	2357
MQRC_NEXT_OFFSET_ERROR	2358	MQRC_NO_RECORD_AVAILABLE	2359
MQRC_OBJECT_LEVEL_INCOMPATIBLE	2360	MQRC_NEXT_RECORD_ERROR	2361
MQRC_BACKOUT_THRESHOLD_REACHED	2362	MQRC_MSG_NOT_MATCHED	2363
MQRC_JMS_FORMAT_ERROR	2364	MQRC_SEGMENTS_NOT_SUPPORTED	2365
MQRC_WRONG_CF_LEVEL	2366	MQRC_CONFIG_CREATE_OBJECT	2367
MQRC_CONFIG_CHANGE_OBJECT	2368	MQRC_CONFIG_DELETE_OBJECT	2369
MQRC_CONFIG_REFRESH_OBJECT	2370	MQRC_CHANNEL_SSL_ERROR	2371
MQRC_CF_STRUC_FAILED	2373	MQRC_API_EXIT_ERROR	2374
MQRC_API_EXIT_INIT_ERROR	2375	MQRC_API_EXIT_TERM_ERROR	2376
MQRC_EXIT_REASON_ERROR	2377	MQRC_RESERVED_VALUE_ERROR	2378
MQRC_NO_DATA_AVAILABLE	2379	MQRC_SCO_ERROR	2380
MQRC_KEY_REPOSITORY_ERROR	2381	MQRC_CRYPTO_HARDWARE_ERROR	2382
MQRC_AUTH_INFO_REC_COUNT_ERROR	2383	MQRC_AUTH_INFO_REC_ERROR	2384
MQRC_AIR_ERROR	2385	MQRC_AUTH_INFO_TYPE_ERROR	2386
MQRC_AUTH_INFO_CONN_NAME_ERROR	2387	MQRC_LDAP_USER_NAME_ERROR	2388
MQRC_LDAP_USER_NAME_LENGTH_ERR	2389	MQRC_LDAP_PASSWORD_ERROR	2390
MQRC_SSL_ALREADY_INITIALIZED	2391	MQRC_SSL_CONFIG_ERROR	2392
MQRC_SSL_INITIALIZATION_ERROR	2393	MQRC_Q_INDEX_TYPE_ERROR	2394
MQRC_CFBS_ERROR	2395	MQRC_SSL_NOT_ALLOWED	2396
MQRC_JSSE_ERROR	2397	MQRC_SSL_PEER_NAME_MISMATCH	2398
MQRC_SSL_PEER_NAME_ERROR	2399	MQRC_UNSUPPORTED_CIPHER_SUITE	2400
MQRC_SSL_CERTIFICATE_REVOKED	2401	MQRC_SSL_CERT_STORE_ERROR	2402
MQRC_CLIENT_EXIT_LOAD_ERROR	2406	MQRC_CLIENT_EXIT_ERROR	2407
MQRC_SSL_KEY_RESET_ERROR	2409	MQRC_UNKNOWN_COMPONENT_NAME	2410
MQRC_LOGGER_STATUS	2411	MQRC_COMMAND_MQSC	2412

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_COMMAND_PCF	2413	MQRC_CFIF_ERROR	2414
MQRC_CFSF_ERROR	2415	MQRC_CFGR_ERROR	2416
MQRC_MSG_NOT_ALLOWED_IN_GROUP	2417	MQRC_FILTER_OPERATOR_ERROR	2418
MQRC_NESTED_SELECTOR_ERROR	2419	MQRC_EPH_ERROR	2420
MQRC_RFH_FORMAT_ERROR	2421	MQRC_CFBF_ERROR	2422
MQRC_CLIENT_CHANNEL_CONFLICT	2423	MQRC_SD_ERROR	2424
MQRC_TOPIC_STRING_ERROR	2425	MQRC_STS_ERROR	2426
MQRC_NO_SUBSCRIPTION	2428	MQRC_SUBSCRIPTION_IN_USE	2429
MQRC_STAT_TYPE_ERROR	2430	MQRC_SUB_USER_DATA_ERROR	2431
MQRC_SUB_ALREADY_EXISTS	2432	MQRC_IDENTITY_MISMATCH	2434
MQRC_ALTER_SUB_ERROR	2435	MQRC_DURABILITY_NOT_ALLOWED	2436
MQRC_NO_RETAINED_MSG	2437	MQRC_SRO_ERROR	2438
MQRC_SUB_NAME_ERROR	2440	MQRC_OBJECT_STRING_ERROR	2441
MQRC_PROPERTY_NAME_ERROR	2442	MQRC_SEGMENTATION_NOT_ALLOWED	2443
MQRC_CBD_ERROR	2444	MQRC_CTLO_ERROR	2445
MQRC_NO_CALLBACKS_ACTIVE	2446	MQRC_CALLBACK_NOT_REGISTERED	2448
MQRC_OPTIONS_CHANGED	2457	MQRC_READ_AHEAD_MSGS	2458
MQRC_SELECTOR_SYNTAX_ERROR	2459	MQRC_HMSG_ERROR	2460
MQRC_CMHO_ERROR	2461	MQRC_DMHO_ERROR	2462
MQRC_SMPO_ERROR	2463	MQRC_IMPO_ERROR	2464
MQRC_PROPERTY_NAME_TOO_BIG	2465	MQRC_PROP_VALUE_NOT_CONVERTED	2466
MQRC_PROP_TYPE_NOT_SUPPORTED	2467	MQRC_PROPERTY_VALUE_TOO_BIG	2469
MQRC_PROP_CONV_NOT_SUPPORTED	2470	MQRC_PROPERTY_NOT_AVAILABLE	2471
MQRC_PROP_NUMBER_FORMAT_ERROR	2472	MQRC_PROPERTY_TYPE_ERROR	2473
MQRC_PROPERTIES_TOO_BIG	2478	MQRC_PUT_NOT_RETAINED	2479
MQRC_ALIAS_TARGTYPE_CHANGED	2480	MQRC_DMPO_ERROR	2481
MQRC_PD_ERROR	2482	MQRC_CALLBACK_TYPE_ERROR	2483
MQRC_CBD_OPTIONS_ERROR	2484	MQRC_MAX_MSG_LENGTH_ERROR	2485

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_CALLBACK_ROUTINE_ERROR	2486	MQRC_CALLBACK_LINK_ERROR	2487
MQRC_OPERATION_ERROR	2488	MQRC_BMHO_ERROR	2489
MQRC_UNSUPPORTED_PROPERTY	2490	MQRC_PROP_NAME_NOT_CONVERTED	2492
MQRC_GET_ENABLED	2494	MQRC_MODULE_NOT_FOUND	2495
MQRC_MODULE_INVALID	2496	MQRC_MODULE_ENTRY_NOT_FOUND	2497
MQRC_MIXED_CONTENT_NOT_ALLOWED	2498	MQRC_MSG_HANDLE_IN_USE	2499
MQRC_HCONN_ASYNC_ACTIVE	2500	MQRC_MHBO_ERROR	2501
MQRC_PUBLICATION_FAILURE	2502	MQRC_SUB_INHIBITED	2503
MQRC_SELECTOR_ALWAYS_FALSE	2504	MQRC_XEPO_ERROR	2507
MQRC_DURABILITY_NOT_ALTERABLE	2509	MQRC_TOPIC_NOT_ALTERABLE	2510
MQRC_SUBLEVEL_NOT_ALTERABLE	2512	MQRC_PROPERTY_NAME_LENGTH_ERR	2513
MQRC_DUPLICATE_GROUP_SUB	2514	MQRC_GROUPING_NOT_ALTERABLE	2515
MQRC_SELECTOR_INVALID_FOR_TYPE	2516	MQRC_HOBJ QUIESCED	2517
MQRC_HOBJ QUIESCED_NO_MSGS	2518	MQRC_SELECTION_STRING_ERROR	2519
MQRC_RES_OBJECT_STRING_ERROR	2520	MQRC_CONNECTION_SUSPENDED	2521
MQRC_INVALID_DESTINATION	2522	MQRC_INVALID_SUBSCRIPTION	2523
MQRC_SELECTOR_NOT_ALTERABLE	2524	MQRC_RETAINED_MSG_Q_ERROR	2525
MQRC_RETAINED_NOT_DELIVERED	2526	MQRC_RFH_RESTRICTED_FORMAT_ERR	2527
MQRC_CONNECTION_STOPPED	2528	MQRC_ASYNC_UOW_CONFLICT	2529
MQRC_ASYNC_XA_CONFLICT	2530	MQRC_PUBSUB_INHIBITED	2531
MQRC_MSG_HANDLE_COPY_FAILURE	2532	MQRC_DEST_CLASS_NOT_ALTERABLE	2533
MQRC_OPERATION_NOT_ALLOWED	2534	MQRC_ACTION_ERROR	2535
MQRC_CHANNEL_NOT_AVAILABLE	2537	MQRC_HOST_NOT_AVAILABLE	2538
MQRC_CHANNEL_CONFIG_ERROR	2539	MQRC_UNKNOWN_CHANNEL_NAME	2540
MQRC_LOOPING_PUBLICATION	2541	MQRC_ALREADY_JOINED	2542
MQRC_STANDBY_Q_MGR	2543	MQRC_RECONNECTING	2544
MQRC_RECONNECTED	2545	MQRC_RECONNECT_QMID_MISMATCH	2546
MQRC_RECONNECT_INCOMPATIBLE	2547	MQRC_RECONNECT_FAILED	2548

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRC_CALL_INTERRUPTED	2549	MQRC_NO_SUBS_MATCHED	2550
MQRC_SELECTION_NOT_AVAILABLE	2551	MQRC_CHANNEL_SSL_WARNING	2552
MQRC_OCSP_URL_ERROR	2553	MQRC_CONTENT_ERROR	2554
MQRC_RECONNECT_Q_MGR_REQD	2555	MQRC_RECONNECT_TIMED_OUT	2556
MQRC_PUBLISH_EXIT_ERROR	2557	MQRCCF_CFH_TYPE_ERROR	3001
MQRCCF_CFH_LENGTH_ERROR	3002	MQRCCF_CFH_VERSION_ERROR	3003
MQRCCF_CFH_MSG_SEQ_NUMBER_ERR	3004	MQRCCF_CFH_CONTROL_ERROR	3005
MQRCCF_CFH_PARM_COUNT_ERROR	3006	MQRCCF_CFH_COMMAND_ERROR	3007
MQRCCF_COMMAND_FAILED	3008	MQRCCF_CFIN_LENGTH_ERROR	3009
MQRCCF_CFST_LENGTH_ERROR	3010	MQRCCF_CFST_STRING_LENGTH_ERROR	3011
MQRCCF_FORCE_VALUE_ERROR	3012	MQRCCF_STRUCTURE_TYPE_ERROR	3013
MQRCCF_CFIN_PARM_ID_ERROR	3014	MQRCCF_CFST_PARM_ID_ERROR	3015
MQRCCF_MSG_LENGTH_ERROR	3016	MQRCCF_CFIN_DUPLICATE_PARM	3017
MQRCCF_CFST_DUPLICATE_PARM	3018	MQRCCF_PARM_COUNT_TOO_SMALL	3019
MQRCCF_PARM_COUNT_TOO_BIG	3020	MQRCCF_Q_ALREADY_IN_CELL	3021
MQRCCF_Q_TYPE_ERROR	3022	MQRCCF_MD_FORMAT_ERROR	3023
MQRCCF_CFSL_LENGTH_ERROR	3024	MQRCCF_REPLACE_VALUE_ERROR	3025
MQRCCF_CFIL_DUPLICATE_VALUE	3026	MQRCCF_CFIL_COUNT_ERROR	3027
MQRCCF_CFIL_LENGTH_ERROR	3028	MQRCCF_QUIESCE_VALUE_ERROR	3029
MQRCCF_MSG_SEQ_NUMBER_ERROR	3030	MQRCCF_PING_DATA_COUNT_ERROR	3031
MQRCCF_PING_DATA_COMPARE_ERROR	3032	MQRCCF_CFSL_PARM_ID_ERROR	3033
MQRCCF_CHANNEL_TYPE_ERROR	3034	MQRCCF_PARM_SEQUENCE_ERROR	3035
MQRCCF_XMIT_PROTOCOL_TYPE_ERR	3036	MQRCCF_BATCH_SIZE_ERROR	3037
MQRCCF_DISC_INT_ERROR	3038	MQRCCF_SHORT_RETRY_ERROR	3039
MQRCCF_SHORT_TIMER_ERROR	3040	MQRCCF_LONG_RETRY_ERROR	3041
MQRCCF_LONG_TIMER_ERROR	3042	MQRCCF_SEQ_NUMBER_WRAP_ERROR	3043
MQRCCF_MAX_MSG_LENGTH_ERROR	3044	MQRCCF_PUT_AUTH_ERROR	3045
MQRCCF_PURGE_VALUE_ERROR	3046	MQRCCF_CFIL_PARM_ID_ERROR	3047

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRCCF_MSG_TRUNCATED	3048	MQRCCF_CCSD_ERROR	3049
MQRCCF_ENCODING_ERROR	3050	MQRCCF_QUEUES_VALUE_ERROR	3051
MQRCCF_DATA_CONV_VALUE_ERROR	3052	MQRCCF_INDOUBT_VALUE_ERROR	3053
MQRCCF_ESCAPE_TYPE_ERROR	3054	MQRCCF_REPOS_VALUE_ERROR	3055
MQRCCF_CHANNEL_TABLE_ERROR	3062	MQRCCF_MCA_TYPE_ERROR	3063
MQRCCF_CHL_INST_TYPE_ERROR	3064	MQRCCF_CHL_STATUS_NOT_FOUND	3065
MQRCCF_CFSL_DUPLICATE_PARM	3066	MQRCCF_CFSL_TOTAL_LENGTH_ERROR	3067
MQRCCF_CFSL_COUNT_ERROR	3068	MQRCCF_CFSL_STRING_LENGTH_ERR	3069
MQRCCF_BROKER_DELETED	3070	MQRCCF_STREAM_ERROR	3071
MQRCCF_TOPIC_ERROR	3072	MQRCCF_NOT_REGISTERED	3073
MQRCCF_Q_MGR_NAME_ERROR	3074	MQRCCF_INCORRECT_STREAM	3075
MQRCCF_Q_NAME_ERROR	3076	MQRCCF_NO_RETAINED_MSG	3077
MQRCCF_DUPLICATE_IDENTITY	3078	MQRCCF_INCORRECT_Q	3079
MQRCCF_CORREL_ID_ERROR	3080	MQRCCF_NOT_AUTHORIZED	3081
MQRCCF_UNKNOWN_STREAM	3082	MQRCCF_REG_OPTIONS_ERROR	3083
MQRCCF_PUB_OPTIONS_ERROR	3084	MQRCCF_UNKNOWN_BROKER	3085
MQRCCF_Q_MGR_CCSD_ERROR	3086	MQRCCF_DEL_OPTIONS_ERROR	3087
MQRCCF_CLUSTER_NAME_CONFLICT	3088	MQRCCF_REPOS_NAME_CONFLICT	3089
MQRCCF_CLUSTER_Q_USAGE_ERROR	3090	MQRCCF_ACTION_VALUE_ERROR	3091
MQRCCF_COMMS_LIBRARY_ERROR	3092	MQRCCF_NETBIOS_NAME_ERROR	3093
MQRCCF_BROKER_COMMAND_FAILED	3094	MQRCCF_CFST_CONFLICTING_PARM	3095
MQRCCF_PATH_NOT_VALID	3096	MQRCCF_PARM_SYNTAX_ERROR	3097
MQRCCF_PWD_LENGTH_ERROR	3098	MQRCCF_FILTER_ERROR	3150
MQRCCF_WRONG_USER	3151	MQRCCF_DUPLICATE_SUBSCRIPTION	3152
MQRCCF_SUB_NAME_ERROR	3153	MQRCCF_SUB_IDENTITY_ERROR	3154
MQRCCF_SUBSCRIPTION_IN_USE	3155	MQRCCF_SUBSCRIPTION_LOCKED	3156
MQRCCF_ALREADY_JOINED	3157	MQRCCF_OBJECT_IN_USE	3160
MQRCCF_UNKNOWN_FILE_NAME	3161	MQRCCF_FILE_NOT_AVAILABLE	3162

Table B-2. Integer Values for PCF Events/Reason Codes (from header file cmqc.h)

PCF Event	Integer Value	Integer Value	Integer Value
MQRCCF_DISC_RETRY_ERROR	3163	MQRCCF_ALLOC_RETRY_ERROR	3164
MQRCCF_ALLOC_SLOW_TIMER_ERROR	3165	MQRCCF_ALLOC_FAST_TIMER_ERROR	3166
MQRCCF_PORT_NUMBER_ERROR	3167	MQRCCF_CHL_SYSTEM_NOT_ACTIVE	3168
MQRCCF_ENTITY_NAME_MISSING	3169	MQRCCF_PROFILE_NAME_ERROR	3170
MQRCCF_AUTH_VALUE_ERROR	3171	MQRCCF_AUTH_VALUE_MISSING	3172
MQRCCF_OBJECT_TYPE_MISSING	3173	MQRCCF_CONNECTION_ID_ERROR	3174
MQRCCF_LOG_TYPE_ERROR	3175	MQRCCF_PROGRAM_NOT_AVAILABLE	3176
MQRCCF_PROGRAM_AUTH_FAILED	3177	MQRC_REOPEN_EXCL_INPUT_ERROR	6100
MQRC_REOPEN_INQUIRE_ERROR	6101	MQRC_REOPEN_SAVED_CONTEXT_ERR	6102
MQRC_REOPEN_TEMPORARY_Q_ERROR	6103	MQRC_ATTRIBUTE_LOCKED	6104
MQRC_CURSOR_NOT_VALID	6105	MQRC_ENCODING_ERROR	6106
MQRC_STRUC_ID_ERROR	6107	MQRC_NULL_POINTER	6108
MQRC_NO_CONNECTION_REFERENCE	6109	MQRC_NO_BUFFER	6110
MQRC_BINARY_DATA_LENGTH_ERROR	6111	MQRC_BUFFER_NOT_AUTOMATIC	6112
MQRC_INSUFFICIENT_BUFFER	6113	MQRC_INSUFFICIENT_DATA	6114
MQRC_DATA_TRUNCATED	6115	MQRC_ZERO_LENGTH	6116
MQRC_NEGATIVE_LENGTH	6117	MQRC_NEGATIVE_OFFSET	6118
MQRC_INCONSISTENT_FORMAT	6119	MQRC_INCONSISTENT_OBJECT_STATE	6120
MQRC_CONTEXT_OBJECT_NOT_VALID	6121	MQRC_CONTEXT_OPEN_ERROR	6122
MQRC_STRUC_LENGTH_ERROR	6123	MQRC_NOT_CONNECTED	6124
MQRC_NOT_OPEN	6125	MQRC_DISTRIBUTION_LIST_EMPTY	6126
MQRC_INCONSISTENT_OPEN_OPTIONS	6127	MQRC_WRONG_VERSION	6128
MQRC_REFERENCE_ERROR	6129		

Table B-3. Integer Values for Extended PCF Events/Reason Codes

EPCF Event	Integer Value	EPCF Event	Integer Value
EXRC_EVENT_BASE	20000	EXRC_OBJECT_NEW	20001
EXRC_OBJECT_CHANGE	20002	EXRC_OBJECT_DELETED	20003
EXRC_Q_MGR_DELETED	20004	EXRC_EXISTING_REGISTRATION	20005
EXRC_NEW_REGISTRATION	20006	EXRC_USER_ACTION	20007
EXRC_SYSTEM_ACTION	20008	EXRC_LIMIT_OVERFLOW	20009
EXRC_DISCOVERY_ERROR	20010	EXRC_DISCOVERY_STARTED	20011
EXRC_CMD_SERVER_DOWN	20012	EXRC_MSG_Q_SERVER_DOWN	20013
EXRC_PROCESS_NOT_EXEC	20014	EXRC_STATE_CHANGE	20015
EXRC_DEAD_LETTER_MESSAGE	20016	EXRC_DISCOVERY_STOPPED	20017
EXRC_PUBLISHER_DOWN	20018	EXRC_CHANNEL_RESET	20019
EXRC_CHANNEL_RESOLVE	20020	EXRC_CHANNEL_START	20021
EXRC_CHANNEL_STOP	20022	EXRC_LISTENER_START	20023
EXRC_LISTENER_STOP	20024	EXRC_SERVICE_START	20025
EXRC_SERVICE_STOP	20026	EXRC_DISCOVERY_IN_PROGRESS	20027
EXRC_LIMIT_REACHED	20028	EXRC_MCA_STARTED	8014
EXRC_MCA_STOPPED	8015	EXRC_MQNODE_COMMAND_FAILED	20100
EXRC_MQNODE_CONNECTED	20101	EXRC_MQNODE_DISCONNECTED	20102
EXRC_CLIENT_CONNECTED	20103	EXRC_CLIENT_DISCONNECTED	20104
EXRC_CLIENT_COMMAND_FAILED	20105	EXRC_MQDB_ERROR	20106
EXRC_CMD_IN_PROGRESS	20107	EXRC_MQNODE_UNREACHABLE	20301
EXRC_NO_HEART_BEAT	20302	EXRC_DELAYED_HEART_BEAT	20303
EXRC_OBJECT_NOT_MANAGED	20304	EXRC_Q_MGR_PROXY	20305
EXRC_MANAGER_DOWN	20306	EXRC_COMMAND_TIMEOUT	20307
EXRC_Q_MGR_NON_PCF	20308	EXRC_MANAGER_NOT_AVAILABLE	20309
EXRC_CUSTOM_EVENT	20310	EXRC_LA_HEARTBEAT	20311
EXRC_DEF_Q_MGR_INCONSISTENT	20501	EXRC_LOG_LOCATION_ERROR	20502
EXRC_LOG_SIZE_ERROR	20503	EXRC_Q_MGR_CREATING	20504
EXRC_NO_Q_MGRS_DEFINED	20505	EXRC_NOT_LICENSED	20506
EXRC_CLIENT_NOT_TRUSTED	20507	EXRC_DB_BACKUP_OK	20600
EXRC_DB_BACKUP_FAILED	20601	EXRC_DB_RESTORE_OK	20602
EXRC_DB_RESTORE_FAILED	20603	EXRC_SQLDB_ERROR	20700
EXRC_SQLDB_RECOVERED	20701	EXRC_MEMALLOC_ERROR	9000
EXRC MCA PROCESS CREATE FAILED	9001	EXRC AUTH NOT REQUIRED	1000
EXRC ACCOUNT PASSWORD EXPIRED	1001	EXRC ACCOUNT DISABLED	1002
EXRC ACCOUNT LOCKED	1003	EXRC ACCOUNT UNKNOWN	1004
EXRC ACCOUNT NOT LICENSED	1005	EXRC ACCOUNT ILLEGAL USAGE	1006
EXRC ACCOUNT ACCESS DENIED	1007	EXRC INVALID SIGNATURE	1008
EXRC WRONG SIGNATURE	1009	EXRC INVALID SESSION TOKEN	1010
EXRC EXPIRED SESSION TOKEN	1011	EXRC INVALID PASSWORD	1012
EXRC KERBEROS AUTH REQUIRED	1050	EXRC KERBEROS AUTH FAILED	1051
EXRC CMD NOT ALLOWED	1098	EXRC AUTH CLEAR PASSWORD	1099
EXRC INVALID ARGUMENT	2001	EXRC UNEXPECTED ERROR	2002

Table B-3. Integer Values for Extended PCF Events/Reason Codes

EPCF Event	Integer Value	EPCF Event	Integer Value
EXRC UNSUPPORTED COMMAND	2003	EXRC AUTHORIZATION UPDATED	10508
EXRC WRONG SIGNATURE	1009	EXRC INVALID SESSION TOKEN	1010
EXRC EXPIRED SESSION TOKEN	1011	EXRC INVALID PASSWORD	1012
EXRC KERBEROS AUTH REQUIRED	1050	EXRC KERBEROS AUTH FAILED	1051
EXRC CMD NOT ALLOWED	1098	EXRC AUTH CLEAR PASSWORD	1099
EXRC INVALID ARGUMENT	2001	EXRC UNEXPECTED ERROR	2002
EXRC UNSUPPORTED COMMAND	2003	EXRC AUTHORIZATION UPDATED	10508

B.2 Locations and Scripts

All IBM MQ agent scripts must be located in `[APWMQ_HOME]\scripts`, and all workgroup server scripts must be located in `[APWMQ_HOME]\groups\[GroupName]\scripts`, where `[APWMQ_HOME]` is your IBM MQ installation directory and `[GroupName]` is the name of your workgroup server.

By default, the workgroup server and WMQ AIBM MQ agent script directories are created when you install Nasted Navigator. The script files in the directory have the extension `.sam`. To activate the scripts, rename them to `.bat` on Windows, or remove the extension in UNIX.

The following are sample scripts:

45_2224.sam: Adjust queue low threshold when queue low event is received (calls `nsqqw`). **45_2225.sam:** Adjust queue high threshold when queue high event is received (calls `nsqqw`). **46_2226.sam:** Restart a channel after channel stop event is received.

The following executables are associated with the above script samples:

nsqqw: Program to adjust reporting threshold levels for queue high/low events.

nstrig: Program to format trigger messages for a queue.

pcfparm: Program to parse PCF parameters in the script command line

pcfval: Program to parse PCF value in the script command line

On Windows, the executables are already in the `[APWMQ_HOME]\bin` directory.

On UNIX, the executables must be copied from one of the scripts directories to `$APWMQ/bin`

See the README.txt file in the scripts directory for additional details.

B.3 How Scripts are Invoked

Scripts are invoked by the IBM MQ agent at the node where the event occurred, or at the workgroup server(s) that is managing the node. The script (or executable) must parse the command line to obtain the event parameters. The parameters associated with the event are then passed to the script in the following format:

```
script_name pcfid1=p1 pcfid2=p2 ... pcfidn=pn
```

where:

- `script_name` is the script name (following the script naming convention)
- `pcfidi` is an integer identifying the name of an event parameter
- `pi` is the actual event parameter

Scripts that are invoked by the workgroup server have three additional arguments added to their command line:

`EXCA_MANAGER_NAME (20006)`

Name of the Workgroup server executing the script.

For example, `20006=MQM`

`EXCA_MQNODE_NAME (20007)`

Name of the WMQ Agent on which the event occurred.

For example, `20007=LS1`

`MQCA_Q_MGR_NAME (2015)`

Name of the queue manager for which the event occurred.

For example, `2015=MY.QMGR`

For example, the IBM MQ agent script associated with a channel-stopped event might be invoked as follows:

```
46_2283 3501=MY.CHANNEL
```

The integer 3501 represents the event parameter `MQCACH_CHANNEL_NAME`; its value is `MY.CHANNEL` (note that, in reality, there would be several PCF event parameters associated with this event). The same script executed by a workgroup server would be invoked as:

```
46_2283 20007=LS1 20006=MQM 2015=MY.QMGR 3501=MY.CHANNEL
```

B.4 Script Examples

The examples below demonstrate:

- A UNIX shell script, `46_2283`, used to process a channel-stopped event
- The C programs, `pcfarm.c` and `pcfval.c`, used to retrieve the PCF ID (`pcfarm`) and its value (`pcfval`)
- The deletion of a queue manager from the database.

The `nsqmqsc` program (executed near the end of the script) *must* run in detached mode (or else the Workgroup server may hang waiting for `nsqmqsc` to finish). This requires the `nsqmqsc` command line to start with 'start' on Windows systems or end with the ampersand character '&' on UNIX systems.

Example of UNIX Script to Restart a Channel:

```
#!/bin/ksh
# 46_2283 Script to restart a channel after receiving channel stop event

# Comment out or set next line to null if you don't want script echo lines
OUT=$AUTOPILOT/WMQ/script.out

echo ----- Channel Stop script starting ----- >>$OUT
echo `date` >>$OUT

STOPPED_OK=7
STOPPED_ERROR=8
STOPPED_RETRY=9
STOPPED_DISABLED=10

while (($# > 0))
do
  PCFPARM=$(pcfparm
  $1)
  PCFVAL=$(pcfval $1)
  case $PCFPARM in
    20006)
      echo "-- Workgroup server=$PCFVAL" >>$OUT
      GS=$PCFVAL
      ;;
    20007)
      echo "-- Node=$PCFVAL" >>$OUT
      NN=$PCFVAL
      ;;
    2015)
      echo "-- Queue Manager=$PCFVAL" >>$OUT
      QM=$PCFVAL
      ;;
    1013)
      echo "-- AMQ Msg Error Identifier=$PCFVAL" >>$OUT
      EI=$PCFVAL
      ;;
    1020)
      echo "-- Reason Qualifier: $PCFVAL" >>$OUT
      RC=$PCFVAL
      ;;
    3501)
      echo "-- Channel Name: $PCFVAL" >>$OUT
      CH=$PCFVAL
      ;;
    3505)
      echo "-- Transmit Queue: $PCFVAL" >>$OUT
      TQ=$PCFVAL
      ;;
    3506)
      echo "-- Connection Name: $PCFVAL" >>$OUT
      CO=$PCFVAL
      ;;
    3507)
      echo "-- Message Channel Agent: $PCFVAL" >>$OUT
      MA=$PCFVAL
  esac
  shift
done
```

```

echo "Reason Code RC = $RC" >>$OUT

# Do not restart channel if closed with either a zero return code or
# a warning return code
if [ $RC -eq $STOPPED_OK ]
then
echo "Bypass channel restart due to rc STOPPED_OK" >>$OUT
exit 0
fi

# Restart sndr or rcvr channel which had some error
if [ $RC -eq $STOPPED_ERROR ]
then
echo "Restarting channel due to rc STOPPED_ERROR" >>$OUT
fi

# Do not restart channel since it's in retry state
if [ $RC -eq $STOPPED_RETRY ]
then
echo "Bypass channel restart due to rc STOPPED_RETRY" >>$OUT
exit 0
fi

# Do not restart channel if in stopped state (it was manually stopped)
if [ $RC -eq $STOPPED_DISABLED ]
then
echo "Bypass channel restart due to rc STOPPED_DISABLED" >>$OUT exit 0
fi

echo "Executing nsqmqsc start channel command: " >>$OUT
echo "$APWMQ_HOME/bin/nsqmqsc -m$GS -n$NN -q$QM" >>$OUT

echo "start channel ($CH)" > $CH.tst
$APWMQ_HOME/bin/nsqmqsc -m$GS -n$NN -q$QM < $CH.tst > $CH.out &
exit 0

```

pcfparm.c/* C-program to get PCF parameter; returns a numeric string*/

```

#include <stdio.h>
#include <strings.h>
#ifdef TRUE
#define TRUE 1
#endif

void main (int argc, char* argv[]) {
int ok;
int len, i;
char buf[256];
    if(argc < 2) {
        return;
    }
}

```

```

    strcpy(buf, argv[1]);
    len = strlen(buf);
    for(i=0; i < len; i++) {
        if(buf[i] == '=') {
            ok = TRUE;
            buf[i] = 0;
            break;
        }
    }
    if(ok)
    printf(buf);
    return;
}

```

pcfval.c /* C-program to get PCF value following the '=' sign; returns a character string*/

```

#include <stdio.h>
#include <strings.h>
#ifdef TRUE
#define TRUE 1
#endif
void main (int argc, char* argv[]) {
int ok;int len, i;
char buf[256];
if(argc < 2) {
return;
}
strcpy(buf, argv[1]);
len = strlen(buf);
for(i=0; i < len; i++) {
if(buf[i] == '=') {
ok = TRUE;
break;
}
}
if(ok)
printf(&buf[i+1]);
return;
return;
}

```

Example 1: UNIX Script Output:

In this example, a sender channel was manually stopped. A sender channel stop event was generated, indicating the stop reason. The output shows that channel is not restarted because the user stopped the channel intentionally.

```

----- Channel Stop script starting -----
Mon Dec 13 13:04:40 CUT 1999
-- Queue Manager=JPC

```

```
-- Channel Name: TO_AIXQM
-- Workgroup server=MQM
-- Node=AIXIS
-- Queue Manager=JPC
-- Channel Name: TO_AIXQM
-- Reason Qualifier: 10
-- AMQ Msg Error Identifier=0
Reason Code RC = 10
Bypass channel restart due to rc STOPPED_DISABLED
```

Example 2: UNIX Script Output:

In this example, the sender channel TO_AIXQM was started on node AIXIS by a runmqchl command and then the process was killed. A receiver channel stop event was generated and the receiver channel was restarted.

```
----- Channel Stop script starting -----
Mon Dec 13 13:34:51 CUT 1999
-- Queue Manager=AIX_QM
-- Channel Name: TO_AIXQM
-- Workgroup server=MQM
-- Node=AIXIS
-- Queue Manager=AIX_QM
-- Channel Name: TO_AIXQM
-- Connection Name: 11.0.0.73
-- Reason Qualifier: 8
-- AMQ Msg Error Identifier=9208
Reason Code RC = 8
Restarting channel due to STOPPED_ERROR
Executing nsqmqsc start channel command:
/opt/nastel/apwmq/bin/nsqmqsc -mMQM -nAIXIS -qAIX_QM
```

Queue Manager Deletion from Database:

Use the following script to delete the object from the database and the actual queue manager from the system.

```
/opt/mqm/bin/endmqm -i $QMGRNAME
/opt/mqm/bin/endmqmqlsr -m $QMGRNAME & sleep 5
/opt/mqm/bin/dltmqm $QMGRNAME sleep 10
# Delete the queue manager via Nastel's nsqmqsc utility
echo "CD .." > Nastel.TEMP.txt
echo "UNMANAGE GAMEIPT" >> Nastel.TEMP.txt
echo "CD GAMEIPT" >> Nastel.TEMP.txt
echo "DELETE $QMGRNAME" >> Nastel.TEMP.txt
echo "CD .." >> Nastel.TEMP.txt
echo "MANAGE GAMEIPT" >> Nastel.TEMP.txt
echo "EXIT" >> Nastel.TEMP.txt
/opt/nastel/apwmq/bin/nsqmqsc -mMQM -nGAMEIPT < Nastel.TEMP.txt
```

Appendix C: IBM MQ Objects

The tables below list objects that are created by the following Nistel Navigator components: workgroup servers, IBM MQ agents, Event Publisher for IBM MQ, MMF Server and z/OS PCF Command Server.

Table C-1 lists when and by which Nistel Navigator component an object is created, the object's type, platforms that utilize the object and which Nistel Navigator components access the object.

Table C-2 lists IBM MQ objects used by Nistel Navigator components.

Table C-1. Nistel Navigator Objects and Descriptions				
Nistel Navigator Object	Platform	Created By/When	Attribute	Comments
NASTEL.ADMIN.AUDIT.QUEUE	All	Created during MMF installation (mmf.tst MQSC script).	Permanent, local, persistent	For future use by MMF.
NASTEL.MMF.ADMIN.COMMAND.QUEUE	All	Created during MMF installation (mmf.tst MQSC script).	Permanent, local, non-persistent	MMF Server uses this queue to receive Message Explorer commands. Messages are received and put there by the IBM MQ Agent.
NASTEL.EVENT.DEFAULT date_time_hash** For non- z/OS platforms, the date_time string yyyymmddhhmmsshh is attached as a suffix for a dynamic queue. For z/OS, a hash number is attached.	All	Created by IBM MQ Agent before subscribing to the Publisher. Occurs when Workgroup server sends EXCMD_OPEN_EVENT command to IBM MQ Agent.	Temporary dynamic, local, non-persistent	Publisher puts IBM MQ instrumentation events requested during subscription and DLQ events on the specified temporary.
NASTEL.PUBSUB.EVENT.QUEUE	All	Created during Publisher installation (pubsub.tst MQSC script).	Permanent, local, non-persistent	Publisher uses this queue to: Get QMGR instrumentation event messages Get Nistel Navigator command message (open/close subscription, shutdown Publisher) Put DLQ event message.

Table C-1. Nastel Navigator Objects and Descriptions

Nastel Navigator Object	Platform	Created By/When	Attribute	Comments
NASTEL.REPLY. ClientName_Date_Time_hash <i>where</i> ClientName is name of connecting client application. Example: NSQMGR for WGS or NSQCL for the nsqcl test pgm	All	Created by IBM MQ Agent when connects and sends command EXCMD_MQ_OPENqmgr_name to connect to the queue manager.	Temporary dynamic, local, non-persistent	IBM MQ Agent thread uses this queue as a ReplyTo queue for responses from the IBM MQ PCF or MQSC command server.
NASTEL.REPLY. NAstel.PCF.MQhash	z/OS	Created by MMF Server when it starts up.	Temporary dynamic, local, non-persistent	MMF Server uses this as ReplyTo queue to obtain responses for commands it submits to IBM MQ command server.
NASTEL.REPLY. NAstel.MSG. Redate_Time_hash	All	Created by MMF Server when it starts up.	Temporary dynamic, local, non-persistent	MMF Server uses this as ReplyTo queue to obtain responses for commands it submits to IBM MQ command server.
NAstel.EVENT.QUEUE	All	Created during Nastel Navigator installation (by NASTEL.tst MQSC script).	Permanent, local, non-persistent	IBM MQ Agent gets IBM MQ instrumentation event messages from queue when Publisher is not configured.

Table C-2. IBM MQ Objects Used by Nastel Navigator Components

Nastel Navigator Object	Platform	Created By/When	Attribute	Comments
SYSTEM.ADMIN.COMMAND.QUEUE	Non-z/OS	Created during QMGR creation	Permanent, local, non-persistent	IBM MQ Agent puts PCF commands on this queue for the IBM MQ PCF Server.

Table C-2. IBM MQ Objects Used by Nastel Navigator Components

Nastel Navigator Object	Platform	Created By/When	Attribute	Comments
	z/OS	Created during Nastel Navigator installation	Permanent, local, non-persistent	z/OS PCF Command Server gets commands from this queue, converts them to MQSC commands and submits them to MQSC command server.
SYSTEM.COMMAND.INPUT	z/OS	Created during QMGR creation	Permanent, local, non-persistent	z/OS PCF Command Server puts converted PCF commands onto this queue. IBM MQ Command Server gets commands from this queue.
SYSTEM.ADMIN.CHANNEL.EVENT SYSTEM.ADMIN.PERFM.EVENT SYSTEM.ADMIN.QMGR.EVENT SYSTEM.ADMIN.CONFIG.EVENT SYSTEM.ADMIN.COMMAND.EVENT	All	Created during QMGR creation as local queues. Modified during Nastel Navigator and Publisher installation (MQSC scripts NASTEL.tst, pubsub.tst)	Permanent, local, non-persistent	Nastel Navigator installation script NASTEL.tst converts from local queue to alias queue with target queue set to NASTEL.EVENT.QUEUE Publisher installation script pubsub.tst redefines the alias queue with target queue set to NASTEL.PUBSUB.EVENT.QUEUE
SYSTEM.DEAD.LETTER.QUEUE	All	Created during QMGR creation.	Temporary, dynamic, local, non-persistent	Publisher monitors this queue and creates an event when appropriate.
SYSTEM.ADMIN.ACCOUNTING.QUEUE	Non-z/OS	Created during QMGR creation as local queues. Modified during Nastel Navigator and Publisher installation (MQSC scripts NASTEL.tst, pubsub.tst)	Permanent, local, non-persistent	Nastel Navigator installation script NASTEL.tst converts from local queue to alias queue with target queue set to NASTEL.EVENT.QUEUE. Publisher installation script pubsub.tst redefines the alias queue with target queue set to

Table C-2. IBM MQ Objects Used by Nastel Navigator Components

Nastel Navigator Object	Platform	Created By/When	Attribute	Comments
				NASTEL.PUBSUB.EVENT.QUEUE
SYSTEM.ADMIN.STATISTICS.QUEUE	Non-z/OS	Created during QMGR creation as local queues. Modified during Nastel Navigator and Publisher installation (MQSC scripts NASTEL.tst, pubsub.tst)	Permanent, local, non-persistent	Nastel Navigator installation script NASTEL.tst converts from local queue to alias queue with target queue set to NASTEL.EVENT.QUEUE. Publisher installation script pubsub.tst redefines the alias queue with target queue set to NASTEL.PUBSUB.EVENT.QUEUE

Appendix D: IBM MQ Agent Run-Time Messages

This appendix lists run-time messages returned by the IBM MQ Agent.

Table D-1. Run-Time Messages Returned by IBM MQ Agents		
Msg Id	IBM MQ Agent Message/Meaning	Corrective Action
IMI0000	(NodeName, GroupName, port_number): IBM MQ Agent version RC(process_id.) Specifies version of the	None
IMI0001	(NodeName, GroupName, port_number): Usage: NSQMQL [- console] - mGroupName -sport_number -t. Process specified was started with improper	Use correct command line arguments. Check value of environment variable
IMI0002	(NodeName, GroupName, port_number): Initialization completed. IBM MQ Agent initialized its internal	None
IMI0003	(NodeName, GroupName, port_number): Successfully terminated RC(0). IBM MQ Agent terminated due to	None
IMI0004	(NodeName, GroupName, port_number): Received signal indication RC (signal). IBM MQ Agent received an OS signal whose id is signal. All OS signals cause	If the process terminates without explicit user request, contact your
IMI0005	(NodeName, GroupName, port_number): Executing signal indication RC (signal). IBM MQ Agent received an OS signal whose id is signal, which is executing	If the process terminates without explicit user request, contact your
IMI0007	(NodeName, GroupName, port_number): Group registration completed ok! RC(0). IBM MQ Agent	None
IMI0008	(NodeName, GroupName, port_number): Client has disconnected! RC(system error). IBM MQ Agent detected that a connected client disconnected from the IBM MQ Agent with the system reason code specified in the RC() field.	Consult your OS guide for system error code to determine cause of disconnection. When a client drops connection
IMI0009	(NodeName, GroupName, port_number): IBM MQ Agent node bound successfully! RC(Port). IBM MQ Agent bound to TCP/IP port number Port. This port is used by the IBM MQ Agent to accept new clients. The	None
IMI0010	(NodeName, GroupName, port_number): IBM MQ Agent node bound successfully! RC(Port). IBM MQ Agent bound to UDP port number Port. This port is used by the IBM MQ Agent to accept new clients. The	None
IMI0011	(NodeName, GroupName, port_number): Terminating due to signal RC(signal). IBM MQ Agent received an	None
IMI0012	(NodeName, GroupName, port_number): Successfully terminated (RC(0). IBM MQ Agent completed its	None

Table D-1. Run-Time Messages Returned by IBM MQ Agents		
Msg Id	IBM MQ Agent Message/Meaning	Corrective Action
IMI0014	(NodeName, GroupName, port_number): Registration sent to WORKGROUP(GroupName) at IPAddress(Port). IBM MQ Agent sends a registration request to the specified workgroup server	None.
IMI0015	(NodeName, GroupName, port_number): Registration confirmation received from WORKGROUP(GroupName) at IPAddress(Port). IBM MQ Agent received the registration confirmation from the specified workgroup server at the	None
IMI0016	(NodeName, GroupName, QmgrName): Connected to queue manager RC(MQRC_). IBM MQ Agent established a connection	None
IMI0017	(NodeName, GroupName, QmgrName): Reconnected to queue manager RC(MQRC_). IBM MQ Agent reestablished a	None
IMI0018	(NodeName, GroupName, QmgrName): Terminating due to command RC(Command). IBM MQ Agent received the	None
IMI0019	(NodeName, GroupName, QmgrName): Terminating due to command IBM MQ Agent is terminating because it has	None
IME0001	(NodeName, GroupName, port_number): Failed to create TC/IP server: RC(system_error). IBM MQ Agent was unable to establish a TCP/IP listening port due to one of these system errors:1000 - timeout occurred1001 - invalid socket identifier (call customer support)1002 - invalid service name specified. The -sservice parameter is not valid because service is not defined in the SERVICES file.1003 - invalid host name. The local host name is not defined or unknown. Ensure the local host	Follow the steps outlined.
IME0002	(NodeName, GroupName, port_number): Failed to accept new client RC(system_error) IBM MQ Agent was unable to accept a new client connection because either no more threads can be allocated to service the client, or system_error occurred	None
IME0004	(NodeName, GroupName, port_number): Out of memory RC(0). IBM MQ Agent cannot allocate memory and cannot	Close applications or allocate enough resources
IME0005	(NodeName, GroupName, port_number): Unable to open queue manager RC(MQRC_). IBM MQ Agent cannot open a	To get a description for MQRC_ code in the RC() field,
IME0007	(NodeName, GroupName, port_number): Invalid PCF command received RC(MQRC_). IBM MQ Agent received an EPCF command that does not conform to all EPCF standards.	To get a description for MQRC_, invoke nsqcode MQRC_. Ensure that all client applications use strict
IME0008	(NodeName, GroupName, port_number): Unable to process PCF command RC(MQRC_). IBM MQ Agent received an EPCF command that cannot be processed due to the reason specified in the RC() field.	To get an MQRC_ description, invoke nsqcode MQRC_. Ensure that all client applications use a

Table D-1. Run-Time Messages Returned by IBM MQ Agents		
Msg Id	IBM MQ Agent Message/Meaning	Corrective Action
IME0009	(NodeName, GroupName, port_number): Unable to read client commands RC(system_error). IBM MQ Agent was unable to read EPCF commands from a client due to a system error.	Consult the OS system guide for an error description.
IME0010	(NodeName, GroupName, port_number): Unable to install signal handlers RC(system_error). IBM MQ Agent was unable to register required signal handlers with the OS.	Consult the OS system guide for an error description
IME0011	(NodeName, GroupName, port_number): Unable to read from event queue RC(MQRC_). IBM MQ Agent failed to read a message from the queue manager's event queue.	To get an MQRC_ description, invoke nsqcode MQRC_.
IME0012	(NodeName, GroupName, port_number): Unable to register under group RC(MQRC_ system). IBM MQ Agent was unable to contact the workgroup server due to one of these errors:1000 - timeout occurred1001 - invalid socket identifier (call customer support)1002 - invalid service name specified. The -sservice parameter is not valid because service is not defined in SERVICES file.1003 - invalid host name. The local host name is not defined or unknown. Ensure the local host name is defined in HOSTS, DNS, etc.1004 - connection reset by TCP/IP stack (call customer support). MQRC_ (2000+ codes) - use nsqcodes to retrieve MQRC_ values. Other errors - consult the OS system guide for system description. IBM MQ Agent will continue to work normally; however, Workgroup server may not be aware of IBM MQ Agent's existence until the next discovery period.	Follow the steps outlined.
IME0013	(NodeName, GroupName, port number): Failed to initialize: unable to continue RC(Reason). IBM MQ Agent was unable to continue due to a previous error.	Refer to the previous error reported by the IBM MQ Agent.
IME0014	(NodeName, GroupName, port number): Failed to create UDP server RC(system_error). Nastel Navigator failed to create socket to receive requests on.	Consult the OS system guide for an error description
IME0015	(NodeName, GroupName, port number): Failed to obtain digital signature. Nastel Navigator failed to create digital signature for encryption, usually due to lack of memory.	Contact your customer support representative.
IME0016	(NodeName, GroupName, port number): Invalid UDP/PCF command received from IPAddress(Port)! IBM MQ Agent received an invalid or corrupted command message structure.	Verify messages sent by all clients.
IME0017	(NodeName, GroupName, QmgrName): Unable to read from reply queue RC(MQRC_). IBM MQ Agent failed to read a	To get an MQRC_ description, invoke nsqcode

	message from the queue manager's reply queue.	MQRC_.
IME0018	(NodeName, GroupName, port number): Serious late IO PID (IBM MQ Agent Process ID). IBM MQ Agent is unable to respond to requests in a timely fashion.	Contact your customer support representative.
IME0019	(NodeName, GroupName, port number): Registration failed Nastel Navigator Agent failed to register with the Workgroup Server.	Contact Nastel Support

Appendix E: Workgroup Server Run-Time Messages

This appendix lists run-time messages returned by the workgroup servers.

Table E-1. Run-Time Messages Returned by Workgroup Server		
Message Id	Workgroup Server Message/Meaning	Corrective Action
IGE0001	Unable to open Nastel Navigator Group (Group) RC (MQRC_). Workgroup server was unable to open group database, which must be located in the install\groups directory.	Start workgroup server with a correct group name, or make a desired group using the nsqjdbcmk utility.
IGE0002	Could not locate Nastel Navigator install directory. Workgroup server cannot locate the Nastel Navigator installation directory. On UNIX the default, installation directory is opt/nastel/M6-WMQ. On other OS, the default installation directory is set through the Nastel Navigator environment variable.	Refer to the Installation Guide to configure the workgroup server.
IGE0003	Group group does not exist. Workgroup server cannot find the group record in the group database specified on a command line (-mgroup).	Try re-indexing the database using the nsqfix utility, or remake the database using the nsqjdbcmk utility.
IGE0004	Group group is in use by another application! Workgroup server cannot start since some other application is using the group database. There already may be a workgroup server servicing this group.	Stop all applications that are using the group, and restart the workgroup server.
	(NodeName, GroupName, port_number): Received signal indication RC (signal). IBM MQ Agent received an OS signal whose id is signal. All OS signals cause IBM MQ Agent to terminate. Signals usually originate from a user.	If the process terminates without explicit user request, contact your customer support representative.
IGE0005	Group database is corrupted. Workgroup server detected that its database has been corrupted. It will attempt to repair the database and continue. Warning: During database repair, data loss is possible. Lost data is usually rediscovered automatically when the workgroup server starts.	None

Table E-1. Run-Time Messages Returned by Workgroup Server

Message Id	Workgroup Server Message/Meaning	Corrective Action
IGE0006	Still unable to open Nastel Navigator Group (group) RC (MQRC_xxx). Workgroup server was still unable to open the group database even after the repair process.	The database must be rebuilt using the nsqjdbcmk utility. All data will be lost during this operation. Use nsqcode to get the MQRC_code.
IGE0007	Node (group.node) not found in MQDB RC (DBRC_). Workgroup server cannot locate a referenced node in its database due to one of these DBRC_codes: D_NF=1 Record not found D_PRIOR=2 No prior record for this request D_EOF=3 End of file D_BOF=4 Beginning of file D_DUPL=5 Primary key already exists D_OM=6 Out of memory D_INDXC=7 Index corrupted D_IOERR=8 I/O error D_LOCK=9 Database locked	Stop the workgroup server and re-index the database using the nsqfix utility.
IGE0008	Unable to establish [TCP/IP UDP] server:Host = host Service = service, Reason = system_error. Workgroup server was unable to start because it cannot establish a listening TCP/IP/UDP socket. Either a system error occurred, or the port/service is in use by some other application. Refer to the OS system guide for a description of system_error.	Ensure that TCP/IP stack is available, then remake databases using a different port number using the command: nsqjdbcmk -mgroup [-sport] Another application is using the port. Close that application and retry.
IGE0009	Unable to load Group (group). Workgroup server was unable to load the group properties.	Follow the applicable corrective action in one of the following error messages.
IGE0010	Record for Workgroup <group> not found. Workgroup server cannot locate the group record in the group database.	Try re-indexing the database using the nsqfix utility, or remake the nsqjdbcmk utility.

Table E-1. Run-Time Messages Returned by Workgroup Server		
Message Id	Workgroup Server Message/Meaning	Corrective Action
IGE0011	<p>-MANAGER (<group>) -MQNODE (<node>) -APPLNM (<appl_name>) -STATUS (WRITE_FAILED) RC (<system_error>). Workgroup server was unable to send commands to an IBM MQ Agent due to a communication error specified by the RC () field.</p>	<p>Refer to the OS system guide for details on the system_error code. System Action: Workgroup server will drop the connection. The connection will be retried in the next discovery period.</p>
IGE0012	<p>-MANAGER (<group>) -MQNODE (<node>) -APPLNM (<appl_name>) -STATUS (READ_FAILED) RC (<system_error>) Workgroup server was unable to read responses from an IBM MQ Agent due to a communication error specified by the RC () field.</p>	<p>Refer to the OS system guide for a description of system_error. System Action: Workgroup server will drop the connection. The connection will be retried in the next discovery period.</p>
IGE0013	<p>-MANAGER (<group>) -MQNODE (<node>) -APPLNM (<appl_name>) -STATUS (TIMEOUT) RC(<system_error>). Workgroup server was unable to read responses from an IBM MQ Agent due to a timeout.</p>	<p>Increase the group Cmd Timeout interval using Nastel Navigator Explorer or some other utility. IBM MQ Agent may be hanging. Refer to the OS system guide for a description of system_error. System Action: Workgroup server will drop the connection. The connection will be retried in the next discovery period.</p>
IGE0014	<p>Initialization failed, unable to proceed. workgroup server was unable to continue due to a previous error.</p>	<p>See previous error(s) reported by workgroup server. System Action: Workgroup server will terminate.</p>
IGE0015	<p>Workgroup "<group>", Unable to initiate 'Node Discovery'.</p>	<p>None.</p>

Table E-1. Run-Time Messages Returned by Workgroup Server

Message Id	Workgroup Server Message/Meaning	Corrective Action
	Workgroup server was unable to complete node discovery due to one of the following: No nodes have been defined or registered under the group. This is a normal condition. All IBM MQ Agents are either inaccessible or not running. This does not indicate a problem with a workgroup server but may mean a problem with connectivity or availability of IBM MQ Agents.	Ensure that all IBM MQ Agents are running and connectivity is available. System Action: Workgroup server stops the discovery process until the next discovery period (see the Discovery Timer property of the Workgroup server).
IGE0016	Workgroup "<group>", Unable to SyncPoint database, RC (<MQRC_ DBRC_>). Workgroup server was unable to commit the group database (normally done after every discovery cycle). This process failed due to one of the following DBRC_ or MQRC_ error codes: D_NF=1record not found D_PRIOR=2no prior record for this request D_EOF=3end of file D_BOF=4Beginning of file D_DUPL=5primary key already exists D_OM=6out of memory D_INDXC=7index corrupted D_IOERR=8I/O error D_LOCK=9database lockedMQRC_ codes. Use the utility nsqcode to get the MQRC_ code description.	Ensure that the workgroup server has read/write permission for all group database files. Verify that there is enough disk storage. After correcting the problem, restart the workgroup server. System Action: Workgroup server will terminate.
IGE0017	Discovery message could not be sent RC (<SystemCode>). Workgroup server could not send a discovery message to IBM MQ Agents due to an error.	Look up the SystemCode for your platform, or call technical support.
IGE0018	Starting with the following system limits: MAX_GROUP_CLIENTS MaxClients MAX_QMGR_THREADS =MaxQMGrThreads MAX_MANAGED_NODES =MaxManagedNodes MAX_TOTAL_CONNS =MaxTotalConns MAX_Q_MGRS_PER_NODE =MaxQMgrsPerNode MAX_OBJ_INSTANCES =MaxObjectInstances. Workgroup server reports its operating limits, which are different in the group properties.	None
IGE0019	Workgroup server group is ready!	None

Table E-1. Run-Time Messages Returned by Workgroup Server		
Message Id	Workgroup Server Message/Meaning	Corrective Action
	Workgroup server group is ready for operation and management of IBM MQ.	
IGE0020	Could not allocate memory! Workgroup server is unable to claim memory and cannot continue.	Close some programs to free up resources.
IGE0021	Broadcasting discovery to IBM MQ Agents on <IPAddress>(<Port>). Workgroup server is trying to discover all IBM MQ Nodes that run IBM MQ Agents on a specified port. IBM MQ Agents will respond only if they run within a given subnet, listen on a given port, and belong to the broadcasting group.	None
IGE0022	Workgroup server "<group>" is terminating due to signal(sig)! Workgroup server received a termination signal from a user or OS.	None System Action: Workgroup server will terminate.
IGE0023	Client (host IP IP service proto) requested Workgroup server "<group>" to shutdown! A client from a specified location (host IP IP_service proto) requested workgroup server to terminate.	None System Action: Workgroup server will terminate based upon a user request.
IGE0024	Workgroup server "<group>" is terminating in <time> (sec). Workgroup server will terminate in the given number of seconds. This message is generated due to a user shutdown request (EXCMD_MANAGER_SHUTDOWN).	None System Action: Workgroup server will terminate no earlier than time seconds after the issue of this message
IGE0025	Workgroup server "<group>" terminated successfully! Workgroup server instance was terminated by user request, or by an OS signal, and is no longer an active process. Refer to previous messages for more details.	None
IGE0026	workgroup server "<workgroup>" is terminating due to signal WM_CLOSE!! Specified workgroup received a Windows WM_CLOSE signal and will terminate.	None System Action: Workgroup server will terminate as soon as possible.

Table E-1. Run-Time Messages Returned by Workgroup Server

Message Id	Workgroup Server Message/Meaning	Corrective Action
IGE0027	<p>Could not load license from "<lic_file>", <system error>, RC (Reason) Workgroup server could not load a license file from the [AutoPilot-WMQ]\config\groupsdirectory due to one of the following: SysRc - an OS specific reason code (example: file not found, or a security problem).Reason - one of these licensing reason codes:</p> <p>LR_NO_ERROR 0no error in the license format LR_CHECKSUM_ERROR -1license file is corrupted LR_LICENSE_FILE_ERROR -2general failure (refer to SysRc)</p>	<p>Inspect the reason code and perform the appropriate action: Install a license file. Give the Workgroup server access to the license file. Restore the license file if it was corrupted.</p> <p>System Action: Workgroup server will terminate.</p>
IGE0028 (Node-based licensing only.)	<p>Workgroup "<workgroup>" is not licensed on HOST("<hostname>")</p> <p>Specified workgroup is not licensed on the local machine hostname. The license file installed on the local machine does not allow group to run locally.</p>	<p>Verify that the workgroup server license file "<workgroup>.lic" exists in [APWMQ_HOME]/groups/config and that this is the proper license file for this workgroup server. Contact your sales representative and obtain the license file for your group name.</p> <p>System Action: Workgroup server will terminate.</p>
IGE0028 (CPU-based licensing only.)	<p>Workgroup "<workgroup>" is not licensed on HOST("<hostname>") The workgroup server is not licensed to run on the specified host.</p>	<p>Verify that the workgroup server has been installed on the proper host and that the license file AutoPilotWMQ.lic contains the required host name.</p> <p>System Action: Workgroup server will terminate.</p>
IGE0029 (Node-based licensing only.)	<p>Host "<hostname>", resolving to IP address...</p> <p>Workgroup server is trying to determine the IP address for the local machine specified in the <host> parameter to verify licensing information.</p>	<p>None.</p> <p>System Action: Workgroup server will resolve the host name either through the local HOSTS file, or DNS, whichever is configured.</p>

Table E-1. Run-Time Messages Returned by Workgroup Server		
Message Id	Workgroup Server Message/Meaning	Corrective Action
		This operation may take some time if DNS is down or is not reachable. If host name is unresolved (and license unverified), local machine will be shut down.
IGE0030 (Node-based licensing only.)	Host "<hostname>", resolved to IP address <IPAddress>. Workgroup server completed IP address resolution. If address is blank, the resolution process failed, and licensing verification may not be completed.	None System Action: None
IGE0031 (Node-based licensing only.)	Host "<hostname>(<IPAddress>)", incorrect license "<lic_hostname>(<lic_IPAddress>)" Local host is not licensed to run any of the Workgroup servers.	Obtain a license file for the host. System Action: Workgroup server will terminate.
IGE0032 (CPU-based licensing only.)	Software license has expired on <date>. Workgroup server reports that the license has expired.	Obtain a license file from your sales representative. System Action: Workgroup server will terminate.
IGE0032 (Node-based licensing only.)	Host "<hostname>(<IPAddress>)", Software license has expired on <date>. Workgroup server reports that the license has expired.	Obtain a license file from your sales representative. System Action: Workgroup server will terminate.
IGE0033	Failure in SET_BUFFER_SIZE(<Hostname> <IPAddress>, <size> (Bytes))! Workgroup Server failed to allocate a message buffer of the indicated size.	Contact your customer support representative.
IGE0034	Unrecoverable error while processing <method>(Node#<node id>)! Workgroup Server encountered an internal processing error from which it cannot recover	Contact your customer support representative. System Action: Workgroup server will terminate.

Table E-1. Run-Time Messages Returned by Workgroup Server

Message Id	Workgroup Server Message/Meaning	Corrective Action
IGE0035	Workgroup database "<GroupName>", backup completed, RC(<system error>). Workgroup Server completed backup of database for specified workgroup.	If RC is non-zero, database backup failed. In this case, look up the SystemCode for your platform, or call technical support.
IGE0036	Workgroup database "<GroupName>" is corrupted. Attempting to use backup... The database for the specified workgroup is corrupted and cannot be used. Workgroup Server is attempting to restore the latest backup.	None
IGE0037	Workgroup database "<GroupName>" has been restored. Workgroup Server successfully restored the latest database backup for the specified workgroup.	None
IGE0038	Unable to open Workgroup backup database "<GroupName>", RC(<system>). Workgroup server could not access database backup for specified group.	Look up the SystemCode for your platform, or call technical support.
IGE0039	Workgroup database "<GroupName>", failed to restore, (<system error>). Workgroup Server was unable to restore the database backup.	None System Action: Workgroup server will attempt to repair the database
IGE0040	Workgroup database "<GroupName>", creating backup... Workgroup Server is creating a backup of the database for the specified workgroup.	None
IGE0041	Could not open %s log, RC(<system error>). Workgroup Server could not open the indicated log type/file.	Look up the SystemCode for your platform, or call technical support.
IGE0042	Workgroup backup database is corrupted. Attempting to repair... The database backup for the specified workgroup is corrupted and cannot be used. Workgroup Server is attempting to repair the corrupted database	None
IGE0043	Unable to obtain digital signature!	Contact your customer support representative.

Table E-1. Run-Time Messages Returned by Workgroup Server		
Message Id	Workgroup Server Message/Meaning	Corrective Action
	Workgroup Server failed to create digital signature for encryption, usually due to lack of memory.	
IGE0044	Workgroup database "<GroupName>" is not loaded. Workgroup server could not load record for specified workgroup database.	Verify that workgroup database has been created successfully and contains a definition for the specified workgroup.
IGE0045	Workgroup database "<GroupName>" could not connect RC(<system/db-server error>). Workgroup server could not connect to database for specified workgroup.	If using Nastel database, look up the SystemCode for your platform, or call technical support. If using SQL database, look up the system code for your database server type.
IGE0046	"Workgroup '<GroupName>' is not licensed! No license was found for this workgroup. System Action: Workgroup server will terminate.	Verify that the license file AutoPilotWMQ_<GroupNa me>.lic exists in [APWMQ_HOME]\config\gro ups and that the file is readable, contains the proper format, and is for the specified workgroup.
IGE0047 (CPU-based licensing only.)	"Unable to load CPU-based license: <reason> Workgroup server failed to load the CPU-based licensing information. System Action: Workgroup server will terminate.	Verify that the license file AutoPilotWMQ_<GroupNa me>.lic exists in [APWMQ_HOME]\config\gro ups, where <GroupName> is the workgroup being processed by Workgroup server, and that the file is readable and contains the proper format.

Table E-1. Run-Time Messages Returned by Workgroup Server

Message Id	Workgroup Server Message/Meaning	Corrective Action
IGE0048	Workgroup '<GroupName>' is not licensed to use Kerberos Authentication! System Action: Workgroup server will terminate.	Verify that the license file AutoPilotWMQ_<GroupNa me>.lic exists in [APWMQ_HOME]\config\gro ups and that the file is readable, contains the proper format, and has an entry for feature 'Kerberos'.
IGE0049	Workgroup '<GroupName>' is not licensed to use SQL Database feature! Workgroup server failed to validate the use of SQL database support. System Action: Workgroup server will terminate.	Verify that the license file AutoPilotWMQ_<GroupNa me>.lic exists in [APWMQ_HOME]\config\gro ups and that the file is readable, contains the proper format, and has an entry for feature 'SQLDB'.
IGE0050	Creating link to Security Server <IPAddress-Port>. Workgroup Server is establishing connection to AutoPilot M6 Security Server.	None
IGE0051	Workgroup Server "<GroupName>" failed to send challenge command to Security Server, RC(<system error>)! Workgroup Server failed to initiate user authentication with AutoPilot M6 Security Server.	Look up the SystemCode for your platform, or call technical support.
IGE0052	Workgroup Server "<GroupName>" failed to receive challenge response from Security Server, RC(<system error>)! Workgroup Server failed to read user authentication response from AutoPilot M6 Security Server.	Look up the SystemCode for your platform, or call technical support.
IGE0053	Workgroup Server "<GroupName>" failed to send login command to Security Server, RC(<system error>)! Workgroup Server failed to send user authentication login request to AutoPilot M6 Security Server.	Look up the SystemCode for your platform, or call technical support.

Table E-1. Run-Time Messages Returned by Workgroup Server		
Message Id	Workgroup Server Message/Meaning	Corrective Action
IGE0054	Workgroup Server "<GroupName>" failed to receive challenge response from Security Server, RC(<system error>)! Workgroup Server failed to read user authentication login response from AutoPilot M6 Security Server.	Look up the SystemCode for your platform, or call technical support.
IGE0055	Workgroup Server "<GroupName>" failed to establish connection with Security Server, RC(<system error>)! Workgroup Server failed to establish a connection to AutoPilot M6 Security Server.	Look up the SystemCode for your platform, or call technical support.
IGE0056	Deleting link to Security Server <IPAddress-Port>. Workgroup Server is closing the connection to AutoPilot M6 Security Server.	None
IGE0061	SQL DB(DBType) - <DataSource>(USER:<DBUserName>) - connected. Workgroup Server successfully connected to the specified type of database using the indicated Data Source Name and Database User.	None
IGE0062	SQL DB(DB Type) - <Data Source>(USER:<DB User Name>) - connection failed. <DB-specific diagnostic message> Workgroup Server failed to connect to the specified type of database using the indicated Data Source Name and Database User.	Verify state of database server. See Database specific diagnostic message and consult documentation from database vendor for further information.
IGE0063	Command '<SQL statement>' - failed. <DB-specific diagnostic message> Workgroup Server encountered an error executing the specified SQL statement.	Verify state of database server. See Database specific diagnostic message and consult documentation from database vendor for further information.
IGE0064	SQL DB <DataSource> disconnected. Workgroup Server disconnected from the specified Data Source Name.	None

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Appendix F: IBM MQ Agent z/OS Error Codes and Messages

Table F-1. IBM MQ Agent z/OS Error Codes and Messages

Msgid	Message Text	Explanation	User Action
NSQ0100W	CreateMQManager: Unable to create event queue qmgr:queue RC(reason)	qmgr: Queue Manager queue: Event Queue reason: IBM MQ reason code.	Review IBM MQ reason code to determine the cause of the error and correct the problem. If necessary, contact Nastel Support.
NSQ0101W	CreateMQManager: Unable to create reply queue qmgr:queue RC(reason)	qmgr: Queue Manager queue: Reply Queue reason: IBM MQ reason code	Review IBM MQ reason code to determine the cause of the error and correct the problem. If necessary, contact Nastel Support.
NSQ0102W	qmOpen: Open Reply Queue failed, ReplyQ qmgr:queue REASON (reason) UserID(user) AltID(altuser)	qmgr: Queue Manager queue: Reply Queue reason: IBM MQ reason code user: Original user altuser: Alternate user	Review IBM MQ reason code to determine the cause of the error and correct the problem. If necessary, contact Nastel Support.
NSQ0103E	qmOpen: Command Queue and/or Reply Queue not specified in qmgr	qmgr: Queue Manager	Use MQSC to specify the command and/or reply queues for the specified queue manager. If necessary, contact Nastel Support.
NSQ1104E	Unable to create reply queue on QMGR (qmgr)	The PCF translator was unable to create a reply queue for a command that requires a response. qmgr: Queue Manager	Check job log and sysout for associated error messages and correct any indicated problems. Review region size and increase, if necessary. If problem persists, contact Nastel Support.

NSQ0104W	Could not open \\\"ini\\\" RC(errno)	ini: ddname for ini file. errno: Error code after fopen() call.	Review errno reason code to determine the cause of the error and correct the problem. Also, inspect joblog for IECxxx error messages. Most likely cause will be missing ddname. If necessary, contact Nastel Support.
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Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ0105E	Assertion failed in file at line no: message	An internal error has been detected. file: Source file name line: line number message: Further information about error	If necessary, contact Nastel Support.
NSQ0106W	Timeout received, possible unreachable host	The attempt to contact the host timed out; the request will be retried.	If message is seen frequently or contact is not successfully made check TCP/IP routing, DNS server and firewall issues. If necessary, contact Nastel Support.
NSQ0107W	qmOpen: Clear Reply Queue failed, ReplyQ qmgr:queue REASON (reason) UserID (user) AltID (altuer)	qmgr: Queue Manager queue: Reply Queue reason: IBM MQ reason code user: Original user altuser: Alternate user	Review IBM MQ reason code for possible problems, for example security issues. If necessary, contact Nastel Support.
NSQ0108A	Unable to read filename file	The +u option was specified but filename could not be read. (All authorization requests will be failed; successful execution is unlikely.)	Ensure that the specified file is available and can be read, then retry the function. If necessary, contact Nastel Support.
NSQ1001I	WMQ Agent started Version	version: Version of IBM MQ Agent in format vv.rr.mmmm, for example 04.05.0001.	None.
NSQ1003I	Nastel Navigator PCF Command Server started Vversion	version: Version of PCF Command Server in format vv.rr.mmm, for example 04.05.0001.	None.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ1101E	Unable to read ReplyQ qmgr:queue REASON (reason)	qmgr: Queue Managerqueue: Reply Queue	Retry function; if problem persists, contact Nastel Support.
NSQ1102W	MQSC/PCF conversion failed for MQSC (mqsc) PCFID (pcfid) COUNT (count) COMPCODE (comPCODE) REASON (reason) QUAL (qualifier)	mqsc: MQSC text pcfid: PCF code count: Position of failing code. comPCODE: Completion code. qualifier: Further information.	If you are using the Nastel Navigator SDK to send PCF messages, review for possible problems and correct your error. Otherwise, this is an internal error. In the latter case, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ1103E	qmgr failed to reply to QUEUE (queue) REASON (reason)	qmgr: Queue Manager queue: Queue name reason: IBM MQ reason code	Retry function; if problem persists, contact Nastel Support.
NSQ1104E	Unable to create reply queue on QMGR (qmgr)	The PCF translator was unable to create a reply queue for a command that requires a response. qmgr: Queue Manager	Check job log and sysout for associated error messages and correct any indicated problems. Review region size and increase if necessary. If problem persists, contact Nastel Support.
NSQ1108E	DoExcmd OpenEvent: qqOpen failed, EventQ qmgr:queue REASON (reason)	qmgr: Queue Manager queue: Event Queue reason: IBM MQ reason code	Retry function; if problem persists, contact Nastel Support.
NSQ1109W	Discovery cannot start, EventQ qmgr:queue not open for input	Because the specified queue could not be opened, discovery of IBM MQ objects will not be done. qmgr: Queue Manager queue: Event Queue	Review for possible problems and correct. If necessary, contact Nastel Support.
NSQ1110W	GetPcfEvent: MQINQ (value) failed RC(reason)	value: Object in error reason: IBM MQ reason code	Retry function; if problem persists, contact Nastel Support.
NSQ1111W	Failed to open input file file	file: ddname of file that failed to open.	Review for possible problems, for example missing ddname. If necessary, contact Nastel Support.
NSQ1111W	Failed to open input file file	file: ddname of file that failed to open.	Review for possible problems, for example missing ddname. If necessary, contact Nastel Support.

NSQ1112W	errno (errno) message	errno: C library error code message: Informative message text	Review for possible problems. Check for further messages in stdout. If necessary, contact Nastel Support.
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Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ1113 W	Failed to write to input file file	file: ddname of failing file	Review for possible problems and any information in message NSQ1112W. If necessary, contact Nastel Support.
NSQ1114 W	Failed to create output file file	file: ddname of failing file	Review for possible problems and any information in message NSQ1112W. If necessary, contact Nastel Support.
NSQ1115 W	Failed to open output file file to read	file: ddname of failing file	Review for possible problems and any information in message NSQ1112W. If necessary, contact Nastel Support.
NSQ1116 W	Response from client not legal, ignored	Malformed client response has been dropped.	Retry function; if problem persists, contact Nastel Support.
NSQ1117 W	SRVTASK: RC(reason) from get_conn()	reason: MTF failure code	Review MTF reason code for possible problems. If necessary, contact Nastel Support.
NSQ1118 W	QueueManager (qmgr): Command Server is stopped or not responding.	qmgr: Queue Manager	Attempt to restart the command server; inspect job log of queue manager for problems starting the command server. If necessary, contact Nastel Support.
NSQ1119 W	QueueManager (qmgr): Command Server is not running.	qmgr: Queue Manager	Attempt to restart the command server; inspect job log of queue manager for problems starting the command server. If necessary, contact Nastel Support.
NSQ1120 W	QueueManager (qmgr): is not running.	qmgr: Queue Manager	Attempt to restart the queue manager. Review z/OS console log for possible problems. Remove unused queue managers from MQSINI file. If necessary, contact Nastel Support.

NSQ1121 W	QueueManager (qmgr): defined but does not exist.	qmgr: Queue Manager	Attempt to restart the queue manager. Review z/OS console log for possible problems. Remove unused queue managers from MQSINI file. If necessary, contact Nastel Support.
NSQ1122 W	No queue managers have been found on your system.	The IBM MQ Agent did not find any valid Queue Managers to monitor.	Review for possible problems. If queue managers exist on this system, review previous error messages and stdout for further diagnostic information. If necessary, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages

Msgid	Message Text	Explanation	User Action
NSQ1123A	If queue manager(s) exist, refer to the Installation Guide to configure	A previous message (NSQ1122W) has been issued which indicates no queue managers exist; for Nastel Navigator to function it must identify at least one valid queue manager.	See message NSQ1122W.
NSQ1124T	Fatal error while initializing MTF, tinit RC (reason)	reason: MTF error code	If reason code is -7, try adding the proper EDCMTF dd statement. Contact Nastel Support.
NSQ1134E	Unable to connect to Queue Manager qmgr REASON (reason), will retry every interval seconds	qmgr: Queue Manager reason: IBM MQ reason code interval: Retry interval	Ensure queue manager is running. Review IBM MQ reason code. If problem persists, contact Nastel Support.
NSQ1136I	Successfully connected to Queue Manager qmgr	qmgr: Queue Manager	None.
NSQ1137W	QueueManager (qmgr): PASSED verification test.	qmgr: Queue Manager	None.

NSQ1138W	QueueManager (qmgr): FAILED verification test with RC (reason).	qmgr: Queue Manager reason: IBM MQ reason code	Review IBM MQ reason code for possible problems. If necessary, contact Nastel Support.
NSQ1139E	Queue manager qmgr not available, will retry every interval seconds	qmgr: Queue Manager interval: Retry interval	Ensure queue manager is running. Review IBM MQ reason code. If problem persists, contact Nastel Support.
NSQ1141E	Unable to open Queue qmgr:queue REASON (reason); will retry every interval seconds	qmgr: Queue Manager queue: Queue Name reason: IBM MQ Reason code interval: retry interval	Review IBM MQ reason code and correct any problems. Retry function; if problem persists, contact Nastel Support.
NSQ1142E	Queue manager qmgr not available, will retry every interval seconds	qmgr: Queue Manager interval: Retry interval	Ensure queue manager is running. Review IBM MQ reason code. If problem persists, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ1143I	Successfully opened input PCF CmdQ qmgr:queue	qmgr: Queue Manager queue: PCF	None.
NSQ1144E	Unable to read from queue qmgr:queue REASON (reason)	qmgr: Queue Manager queue: Queue Name reason: IBM MQ Reason code	Review IBM MQ reason code and correct any problems. Retry function; if problem persists, contact Nistel Support.
NSQ1145E	Queue manager qmgr not available; will retry every	qmgr: Queue Manager interval: Retry interval	Ensure queue manager is running. Review IBM MQ reason code. If problem
NSQ1146E	Unable to convert PCFID(pcfid) USER(user) to MQSC, COMPCODE (compcode) REASON (reason)	pcfid: PCF code count: Position of failing code.comp code: Completion code. qualifier: Further	If you are using the Nistel Navigator SDK to send PCF messages, review for possible problems and correct your error. Otherwise, this is an internal error. In the latter case, contact Nistel Support.
NSQ1147E	Unable to write to queue qmgr:queue USER(user) REASON (reason)	qmgr: Queue Manager queue: Queue Name user: Original User reason: IBM MQ	Review IBM MQ reason code and correct any problems. Retry function; if problem persists, contact Nistel Support.
NSQ1148E	Queue manager qmgr not available; will retry every	qmgr : Queue Manager interval: Retry interval	Ensure queue manager is running. Review IBM MQ reason code. If problem
NSQ1149E	Unable to send reply to qmgr: queue USER(user) REASON (reason)	qmgr : Queue Manager queue: Queue Name user: Original User reason: IBM MQ	Review IBM MQ reason code and correct any problems. Retry function; if problem persists, contact Nistel Support.
NSQ1150E	Queue manager qmgr not available; will retry every	qmgr : Queue Manager interval: Retry interval	Ensure queue manager is running. Review IBM MQ reason code. If problem
NSQ1152E	Problem in PCF Command Server	A PCF command server function failed.	Review job log for previous error messages and correct any problems. Retry function; if problem persists, contact

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ1153 E	No resources available for Queue Manager qmgr	qmgr : Queue Manager	Use REGION JCL parameter to increase storage available and restart IBM MQ Agent. If problem persists, contact Nastel Support.
NSQ1154 A	Queue Manager (qmgr): should be deleted or re-created.	qmgr : Queue Manager	Perform indicated action; if necessary, contact Nastel Support.
NSQ1155 I	Successfully opened MQSC CmdQ qmgr:queue	qmgr : Queue Manager queue: MQSC Command Queue Name	None.
NSQ1156 I	Successfully opened MQSC ReplyQ qmgr:queue	qmgr: Queue Manager queue: MQSC Reply Queue Name	None.
NSQ1157 I	Program waiting for TCP/IP to become active.	The indicated program was unable to initiate TCP/IP communications. It will retry at intervals until TCP/IP becomes available. program: Program name. This problem can be caused by a missing or invalid SYSTCPD dd statement.	Ensure TCP/IP is running and retry function; consult with your TCP/IP administrator for SYSTCPD requirements. If problem persists, contact Nastel Support.
NSQ1158 I	TCP/IP now active, initialization will proceed for program.	After retrying a failing TCP/IP communications connection, a successful connection was made. program: Program name	None.

NSQ1160 E	Unable to open MQSC CmdQ and/or ReplyQ for Queue Manager qmgr REASON (reason); will retry every interval seconds	qmgr: Queue Manager reason: IBM MQ reason code interval: Retry interval	Review IBM MQ reason code and correct any problems. Retry function; if problem persists, contact Nastel Support.
NSQ1161 E	CmdQ qmgr:queue	qmgr:Queue Manager queue: Command Queue Name	Refer to previous error message in job log.
NSQ1162 E	ReplyQ qmgr:queue	qmgr: Queue Manager queue: Command Queue Name	Refer to previous error message in job log.
NSQ1200 I	NSQTACON <vers.rel.patch> started	The NSQTACON task is running.	None.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ1299I	stop issued, NSQTACON terminating	The NSQTACON task is stopped.	None.
NSQ1990T	Internal segmentation violation.	An internal error has occurred.	Contact Nastel Support.
NSQ1991I	Shutdown request of all WMQ Agent processes rcvd from ipaddr (service)	ipaddr: IP Address where request originated service: Service number of request	None.
NSQ1992T	Enqueue failed for WMQ Agent Queue Manager (qmgr)	Another IBM MQ Agent is already active for the indicated queue manager qmgr.	Ensure the two IBM MQ Agents are using different MQSINI files. Remove the qmgr entry from one of the MQSINI parameter files. Contact Nastel Support if this message is produced in error.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ1997I	Nastel Navigator PCF Command Server Vversion terminated with RC (reason)	version: PCF Command server version reason: Shutdown reason code, usually zero.	None.
NSQ1998I	Shutdown indicator was received from WMQ Agent	A request to shut down the IBM MQ Agent has been received	None.
NSQ1999I	z/OS STOP issued, NSQMQ terminating	Use of the ""P/STOP NSQMQ"" OS/390 command has been detected.	None.
NSQ2001I	Nastel Navigator Publish/Subscribe Server has started version	version: Version of Publish/Subscribe Server in format vv.rr.mmm, for example 04.05.0001	None.
NSQ2100I	An event was detected which was found in the SEVERITY file. event:: Event number	severity: Severity value from SEVERITY file	None.
NSQ2101W	Cannot write into event queue RC (reason)	reason: IBM MQ reason code.	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nastel Support.
NSQ2102I	QMGR (qmgr) no longer exists, thread is terminating	qmgr: Queue Manager	None.
NSQ2104W	Unable to connect to QMGR (qmgr) RC (reason)	qmgr: Queue Manager reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ2105I	QMGR(qmgr)is deleted, thread is terminating	qmgr: Queue Manager	None.
NSQ2106W	Unable to get DLQ name QMGR(qmgr)	qmgr: Queue Manager	Either specify a DLQ for the queue manager or restart the publisher without DLQ monitoring. If necessary, contact Nastel Support.
NSQ2107A	DLQ name not configured in qmgr, please edit QMGR(qmgr) properties	qmgr: Queue Manager	Perform indicated action (but see NSQ2106W); if necessary, contact Nastel Support.
NSQ2108W	Unable to open qmgr DLQ(queue) RC(reason)	qmgr: Queue Manager queue: Dead Letter Queue Name reason: IBM MQ reason code	Review for possible problems and correct. If necessary, contact Nastel Support.
NSQ2109W	MQINQ DLQ failed QMGR(qmgr) RC(reason)	qmgr: Queue Manager reason: IBM MQ reason code	Review for possible problems and correct. If necessary, contact Nastel Support.
NSQ2110I.	Cannot read from input queue DLQ (queue) QMGR (qmgr) RC (reason)	queue: Dead Letter Queue qmgr: Queue Manager reason: IBM MQ reason code	Review for possible problems and correct. If necessary, contact Nastel Support.
NSQ2120E	Insufficient memory available to monitor QMGR (qmgr)	qmgr: Queue Manager	Increase REGION parameter and retry function; if problem persists, contact Nastel Support.
NSQ2121I	QMGR (qmgr) is deleted, thread is terminating	qmgr: Queue Manager	None.

NSQ2122I	DLQ thread for QMGR (qmgr) started.	qmgr: Queue Manager	None.
NSQ2123I	QMGR (qmgr) is deleted, thread is terminating	qmgr: Queue Manager	None.
NSQ2124W	Unable to get DLQ name QMGR (qmgr)	qmgr: Queue Manager Review for possible problems.	If necessary, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ2125W	Cannot read from input queue DLQ (queue) QMGR (qmgr) RC (reason)	queue: Dead Letter Queue qmgr: Queue Manager reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nastel Support.
NSQ2126W	Cannot get SHUTDOWN message under browse cursor DLQ(queue) QMGR(qmgr) RC(reason)	queue: Dead Letter Queue qmgr: Queue Manager reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nastel Support.
NSQ2127I	DLQ thread for QMGR (qmgr) has terminated	qmgr: Queue Manager	None.
NSQ2130T	Cannot get authentication signature	The Nastel Navigator Event Publisher has been started with the -a parameter but this function has failed.	Contact Nastel Support.
NSQ2132T	Cannot create MQ node	An internal failure has occurred.	Contact Nastel Support.
NSQ2133T	Cannot open connections with MQNote	An internal failure has occurred.	Contact Nastel Support.
NSQ2134T	Cannot write SHUTDOWN message	An internal failure has occurred during shutdown.	Contact Nastel Support.
NSQ2135W	RawToPcf failed	An internal failure has occurred.	Contact Nastel Support.
NSQ2137E	Error for tsched () RC (reason)	reason: MTF error code	Retry function; if problem persists, contact Nastel Support.
NSQ2139E	Error for tsched () RC (reason)	reason: MTF error code	Retry function; if problem persists, contact Nastel Support.

NSQ2141E	Unable to connect to QMGR (qmgr) RC (reason)	qmgr: Queue Manager reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. Retry function; if problem persists, contact Nastel Support.
NSQ2143E	Unable to write to qmgr EventQ(queue) RC(reason)	qmgr: Queue Manager queue: Event Queue reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. Retry function; if problem persists, contact Nastel Support.
NSQ2145E	Unable to connect to QMGR (qmgr) RC (reason)	qmgr: Queue Manager reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. Retry function; if problem persists, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages

Msgid	Message Text	Explanation	User Action
NSQ2147E	Unable to write to qmgr DLQ (queue) RC (reason)	qmgr: Queue Manager queue: Event Queue reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. Retry function; if problem persists, contact Nastel Support.
NSQ2149T	Max number of subtasks (ntasks) is greater than MAXTASK (maxtasks)	ntasks: Number of MTF tasks requested maxtasks: Number of tasks MTF will allow	Reduce number of tasks requested and restart. If problem persists, contact Nastel Support.
NSQ2150E	Error on tinit() RC(reason)	reason: MTF error code	Retry function; if problem persists, contact Nastel Support.
NSQ2151W	Cannot create UDP MQ node, port (port) REASON (reason) message, will try next port	port: TCP/IP UDP port number reason: TCP/IP error code	Review TCP/IP error code and message text for possible problems and correct. If necessary, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
		message: Further information	
NSQ2153T	Cannot create UDP MQ node	All attempts to create a UDP node failed, unable to start the Nastel Navigator MQ Event Publisher.	Check that ports are not otherwise in use; if so, use a different port. If problem persists, contact Nastel Support.
NSQ2154E	Error for tterm() RC(reason)	reason: MTF error code	Retry function; if problem persists, contact Nastel Support.
NSQ2155T	Cannot open connections with the UDP MQNode	A possible TCP/IP error is preventing connection. Examine stdout for other error messages.	Contact Nastel Support.
NSQ2156E	Error for tterm() RC(reason)	reason: MTF error code	Retry function; if problem persists, contact Nastel Support.
NSQ2157W	Number of QMGRs is greater than max QMGRs parameter (-bmaxqmgrs)	maxqmgrs: Maximum number of queue managers that can be handled by the Publish/Subscribe Server.	Increase the max queue managers value (-b) and retry. If problem persists, contact Nastel Support.
NSQ2158W	Error on ThreadLstnr EvQ()RC (reason)	reason: Error code.	Retry function; if problem persists, contact Nastel Support.
NSQ2159W	Error on ThreadLstnr DLQ()RC (reason)	reason: Error code	Retry function; if problem persists, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ2160E	Error from GetPcfStrListAttrValue() RC(reason)	reason: Error code.	Retry function; if problem persists, contact Nastel Support.
NSQ2162I	SHUTDOWN message received		None.
NSQ2163W	Error on mnRead() of UDP/PCF message RC(reason)	reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nastel Support.
NSQ2164T	Loop detected on UDP read error	An unrecoverable state was reached handling UDP errors.	Contact Nastel Support.
NSQ2165W	Error for tterm() RC (reason)	reason: MTF error code.	Review for possible problems and retry. If necessary, contact Nastel Support.
NSQ2167W	MQINQ (function) failed with RC (reason)	function: Function attempted reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nastel Support.
NSQ2168I	Unable to open temporary subscriber file QMGR (qmgr) FILE(file) RC(reason) message	qmgr: Queue Managerfile: ddname of temp subscriber file reason: C library error code from open failure message: Informative error message	If using this function, review error and correct. Otherwise, none.
NSQ2170W	Unable to open permanent subscriber file FILE(file) RC(reason) message	file: ddname of temp subscriber file reason: C library error code from open failure message: Informative error message	If using this function, review error and correct. Otherwise, none.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ2171I	Unable to open temporary subscriber file, QMGR(qmgr) QUEUE (queue)	qmgr: Queue Manager queue: Queue Name	None.
NSQ2172I	Unable to open subscriber file, QMGR (qmgr) QUEUE (queue)	qmgr: Queue Manager queue: Queue Name	None.
NSQ2173I	QMGR (qmgr) no longer exists, thread is terminating	qmgr: Queue Manager	None.
NSQ2174I	QMGR (qmgr) no longer exists, thread is terminating	qmgr: Queue Manager	None.
NSQ2175W	Unable to connect to QMGR (qmgr) RC(reason)	qmgr: Queue Manager	Review for possible problems. If necessary, contact Nastel Support.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ2176I	QMGR (qmgr) is deleted, thread is terminating	qmgr: Queue Manager	None.
NSQ2177W	Unable to open qmgr EventQ (queue) RC(reason)	qmgr: Queue Manager queue: Queue Name reason: IBM MQ reason code	Review IBM MQ reason code for possible problems. If necessary, contact Nistel Support.
NSQ2179W	QMGR (qmgr) is deleted, thread is terminating	qmgr: Queue Manager	None.
NSQ2182W	Can not read from input QUEUE (queue) QMGR (qmgr) RC (reason)	qmgr: Queue Manager queue: Queue Name reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nistel Support.
NSQ2183W	Unable to write to subscriber QMGR (qmgr) Queue (queue) RC (reason)	qmgr: Queue Manager queue: Queue Name reason: IBM MQ reason code	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nistel Support.
NSQ2184W	Subscriber EventQ (queue) was not created QMGR (qmgr)	qmgr: Queue Manager	Review IBM MQ reason code for possible problems and correct. If necessary, contact Nistel Support.
NSQ2185I	Publisher thread for QMGR (qmgr) had terminated	qmgr: Queue Manager	None.
NSQ2187I	Publisher thread for QMGR (qmgr) started	qmgr: Queue Manager	None.
NSQ2990T	Signal sig received, terminating	An internal error has occurred sig: Signal code	Contact Nistel Support.

NSQ2992T	Enqueue failed for PUBSUB QueueManager (qmgr).	Another Publisher is already active for the indicated queue manager.	Ensure the two Publishers are using different MQSINI files. Remove the qmgr entry from one of the MQSINI parameter files. Contact Nastel Support if this message is produced in error.
NSQ2999I	z/OS STOP issued, NSQPUB terminating	Use of the ""P/STOP NSQMQ"" OS/390 command has been detected.	None.
NSQ3001I	Nastel Navigator Message Server NSQMSG has started Version.	version: Version of IBM MQ Agent in format vv.rr.mmm, for example 04.05.0001.	None.

Table F-1. IBM MQ Agent z/OS Error Codes and Messages			
Msgid	Message Text	Explanation	User Action
NSQ3101E	Error for tsched (reason) in NSQMSG	reason: MTF error code	Retry function; if problem persists, contact Nastel Support.
NSQ3990T	Internal segmentation violation.	An internal error has occurred.	Contact Nastel Support.
NSQ3992T	Enqueue failed for MMF Queue Manager \\"qmgr\".	Only one MMF Server per queue manager can be started on an z/OS system image. qmgr: Queue Manager	Do not try to start a second MMF Server for a queue manager. If this message is issued in error, contact Nastel Support.
NSQ3999I	z/OS STOP issued, NSQMSG terminating	Use of the \"P/STOP NSQMQ\" OS/390 command has been detected.	None.

Appendix G: Exit Codes When Nastel Navigator Runs as Service on Windows

When running Nastel Navigator applications as services on Windows, the following exit codes are returned if the service fails to run. In the case of the workgroup server, the workgroup log file is located in `[APWMQ_HOME]/groups/<workgroup>/<workgroup>.log`, where `<workgroup>` is the name of the workgroup.

Table G-1. Exit Codes when Nastel Navigator Applications Run as Services on Windows

Application	Exit Code	Description
Workgroup Server	43	WGS uses "43" only in a case of license check failure. It writes to the log file the following messages: "IGE0043: Unable to obtain digital signature!" "IGE0014: Initialization failed, unable to proceed." If the workgroup server is a windows service, it sets the status code to
	21010	Service could not locate workgroup database record.
	21101	Service encountered an error initializing internal variables.
	21027	Service could not load node-based licensing information.
	21028	Host is not licensed to run Workgroup Server.
	21031	Node-based licensing information is invalid or corrupt.
	21032	Workgroup license has expired.
	21046	Specified workgroup is not licensed.
	21047	Service could not load CPU-based licensing information.
	21048	Service is not licensed to use Kerberos authentication.
	21049	Service is not licensed to use SQL database.
Nastel Navigator Agent and Connection Manager	21100	Service was started with invalid argument(s).
	21101	Service encountered an error initializing internal variables.
	21110	Service encountered a memory access violation.
	21111	Service received a signal indicating that it should terminate.
Event Adapter	21113	Service failed to initialize.
	21100	Service was started with invalid argument(s).
	21101	Service encountered an error initializing internal variables.
	21102	Service could not resolve workgroup name to a valid host and/or port
	21110	Service encountered a memory access violation.
Log Adapter	21111	Service received a signal indicating that it should terminate.
	21100	Service was started with invalid argument(s).
	21101	Service encountered an error initializing internal variables.
	21102	Service could not open log file.

Table G-1. Exit Codes when Nastel Navigator Applications Run as Services on Windows

Application	Exit Code	Description
	21120	Service could not determine appropriate log file or specific platform.
Message Server and Event Publisher	21110	Service encountered a memory access violation.
	21111	Service received a signal indicating that it should terminate.

Appendix H: Understanding WGS 10 Fact Publishing

When publishing IBM MQ facts with Workgroup Server 10, the first thing to consider is which facts you are publishing. If you do not have sensors that use a specific object, such as namelists, do not activate facts for it. See section below, [Controlling Facts Published in WGS 10](#), for additional discussion on that topic.

Fact Publishing Concepts

The next thing to consider is the fact publishing activity. The data published by the WGS has two main types. The first type of data to consider is status metrics which change frequently, such as queue depth, input and output open counts, channel status, sequence number, etc. These need to be frequently collected and published. The other type of data is configuration data which change infrequently or may never change. Because these two types of data behave so differently, there are two individual intervals defined and the facts they produce updated at those times. These settings can be found on the **Other Options** property tab for the WGS.

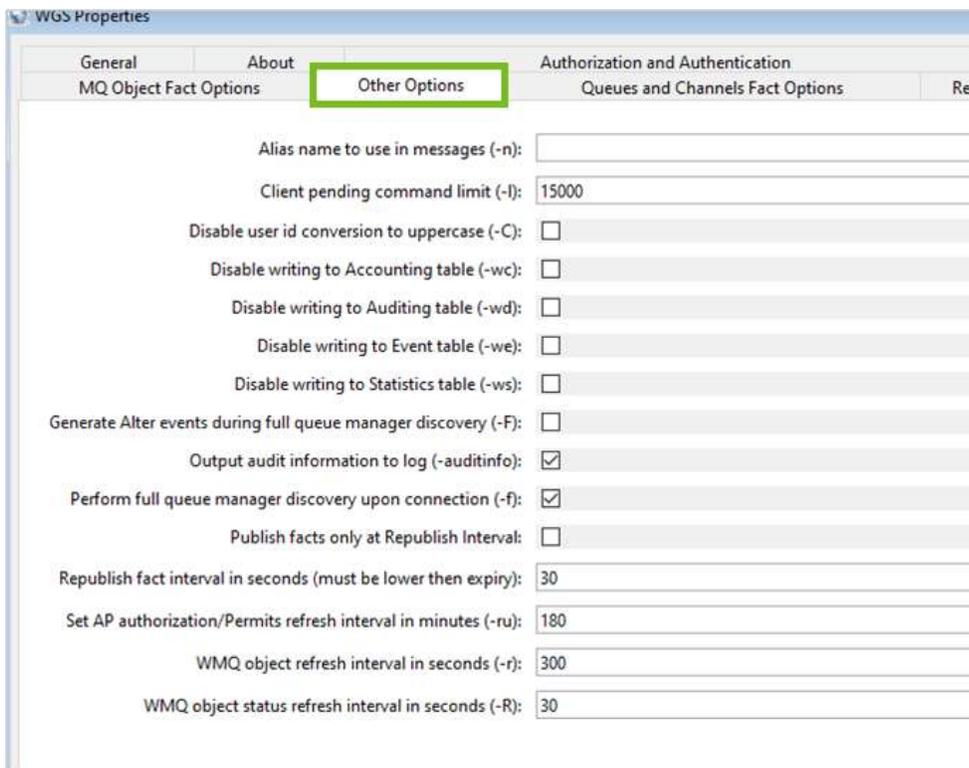


Figure H-1. Other Options Tab

MQ Status object refresh interval controls the first, and defaults to every 30 seconds. Thus, every 30 seconds, the current status of objects will be refreshed. Thirty seconds is a good frequency for this data to ensure that updates like queue depth are up to date. There are other factors, such as events or user queries that can cause individual objects to update on demand.

MQ object refresh interval controls the second type of data and defaults to every 600 seconds. When requesting this data, the WGS sends a request to MQ asking for changes since the last interval. The default of 600 seconds is a good value to start but depends largely on how dynamic the environment is, the maximum time you are willing to wait before a change is reported, and whether changes are being made using Nastel Navigator or external tooling. Increasing the value decreases load on the MQ Server as that is the primary cost in identifying these changes. For stable environments, even once an hour may be sufficient. Actions, such as creating a queue, that are triggered by Nastel components are immediately recognized. This incremental discovery can be triggered manually if needed.

A third interval on this tab, the **fact republish rate** controls a periodic update of facts the WGS has collected. This works with the **expiry interval** to make sure that facts that are no longer available are removed. For example, if an object has been deleted, since there are no facts to publish, it will no longer be updated. As another example, if a queue manager or node is stopped, no facts other than the queue manager status are maintained in the WGS, these facts are no longer published. By default, this interval is 30 seconds, which means that for active objects, the most recent data will be published at least every 30 seconds. The fact expiry interval controls how quickly objects are removed from the published facts. The default for the expiration is 90 seconds. As an example, if a queue were deleted at time 0, its facts would stop publishing since it no longer exists, and it would be removed 90 seconds later. Ninety seconds allows for delays in update times due to system load.

Understanding Your Fact Publishing Behavior

The total number of facts published and the publishing rate are available in the CEP system metrics. To locate these facts, expand the SYSTEM folder under the CEP Server hosting the WGS.

cep-server_Facts > Facts > Services > WGS_expert_name. A number of different metrics are published in every 30 second interval. These are several of the key metrics:

- **fact_publish_rate_per_sec**: rate of fact publishing during the interval (number of facts/interval time)
- **facts_current**: number of active facts
- **facts_published**: number of facts published during the interval
- **facts_updated**: number of published facts that were updated during the interval
- **facts_created**: number of new facts created during the interval
- **facts_cleared**: number of facts that expired during the interval

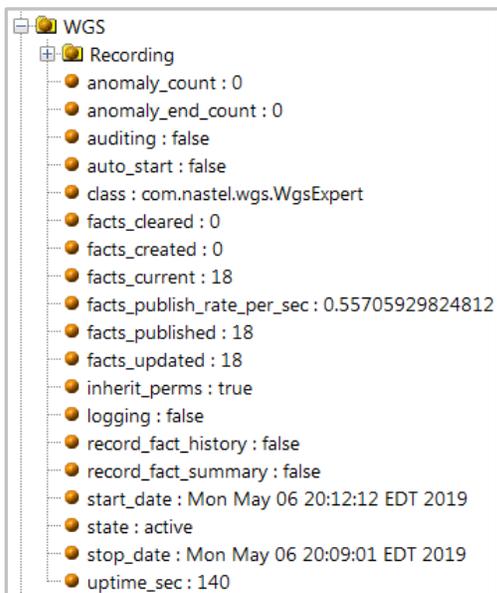


Figure H-2. WGS Expert Metrics Facts

In addition to the current value, the derived properties can be useful to understand the behavior. To see these, left click on any fact and then move the mouse to the white space, right click and select Show Properties. This shows quite a few statistics, but the key ones for this scenario are the maximum, minimum and average values. Many of the facts are counters. The Property counter is the total number for that counter since the WGS was started. It is not required to close the properties window to select a different fact; simply click on it.

Property	Value
Actions	[Toggle-Ignore-Status, Update-Fact, Reset-Fac
Anomaly-Avg-Duration	0
Anomaly-Count	0
Anomaly-End-Count	0
Anomaly-Last-Duration	0
Anomaly-Total-Duration	0
Change-Age	65139640
Change-Latency	65132174
Changes	1
Class	java.lang.Integer
Created	2019-11-21 14:06:06
Deleted	false
Description	NA
Expired	false
Expiry	0
History-Lock	false
History-Locked	false
History-Max-Size	0
History-Max-Time	0
History-Size	0
History-Time-Sec	0
Ignored	false
Last-Changed	2019-11-21 14:06:06
Last-Updated	2019-11-22 08:11:39
Length	4
Location	HPENVY0113
MAvg	8899.0
Max	8899
Min	8899
Previous-Value	8899
Reset-Age	65139640
Resets	0
resourceHandle	WGS
resourcePath	com/nastel/nfc/net/boards/images/
type	FactProxy
uniquename	COUNT
Update-Age	7466
Update-Latency	30001
Update-Velocity	0.0
Updates	2172
Value	8899

Figure H-3. Show Properties Example

H.1 Controlling Facts Published in WGS10

If you are seeing too many facts in WGS 10, they be reduced as explained below. There is no impact on viewing the data; only facts not typically needed are removed.

On the WGS properties, turn off any publishing for data that are not evaluated in any of your policies. If using the default policies, the following are not needed:

Authinfo, Namelist, Process, Subscriptions, Topics, ModelQ, Client Connection Channels, MQTT Channels

Appendix I: Workgroup Server Communication to Nastel's IBM MQ Agent

Firewall administrators must allow incoming TCP connection requests on port 5010 for Nastel's IBM MQ agent.

Nastel's IBM MQ agent ("the agent") is started and creates TCP and UDP listeners on the specified port. Connectivity from agent to workgroup server is outlined here and graphically in Figure 1.

1. The agent reads the local workgroup server configuration file (mqgroup.ini).
2. The agent sends a UDP registration request to the workgroup server. The default port is 4010 and is configurable.
3. The workgroup server responds to the registration request and sends a UDP confirmation to the agent.
4. The workgroup server sends a command to the agent to inquire queue manager names (EXCMD_INQUIRE_Q_MGR_NAMES).
5. The agent responds with a list of the queue manager names found in IBM MQ file mqs.ini.
6. The workgroup server sends sequential commands (EXCMD_MQ_OPEN) to connect to each of the queue managers.
7. The agent starts a new thread for each queue manager.
8. The agent thread attempts to connect to a queue manager and responds, one per queue manager. The TCP/IP service allocates a new local port number for each thread; this is transparent to the user and handled automatically by the firewall.

If the connection between agent and workgroup server is broken, the workgroup server tries to reestablish the connection. If unsuccessful, it sends a TCP request every 10 minutes (default can be changed for each node) to reestablish connection.

The node (agent) can alternatively be manually added to the workgroup server configuration and the workgroup server will establish connection to the agent when the node is managed. The connectivity is outlined in Figure 2.

The workgroup server also sends UDP broadcasts on the preconfigured port (5010) to request registrations from any new agents every 1440 minutes, once per day by default, but both port and time interval are configurable.

Firewall administrators must allow UDP and TCP connection requests for workgroup server port 4010 and agent port 5010 (i.e., whatever the configured ports are) to be opened bidirectionally.

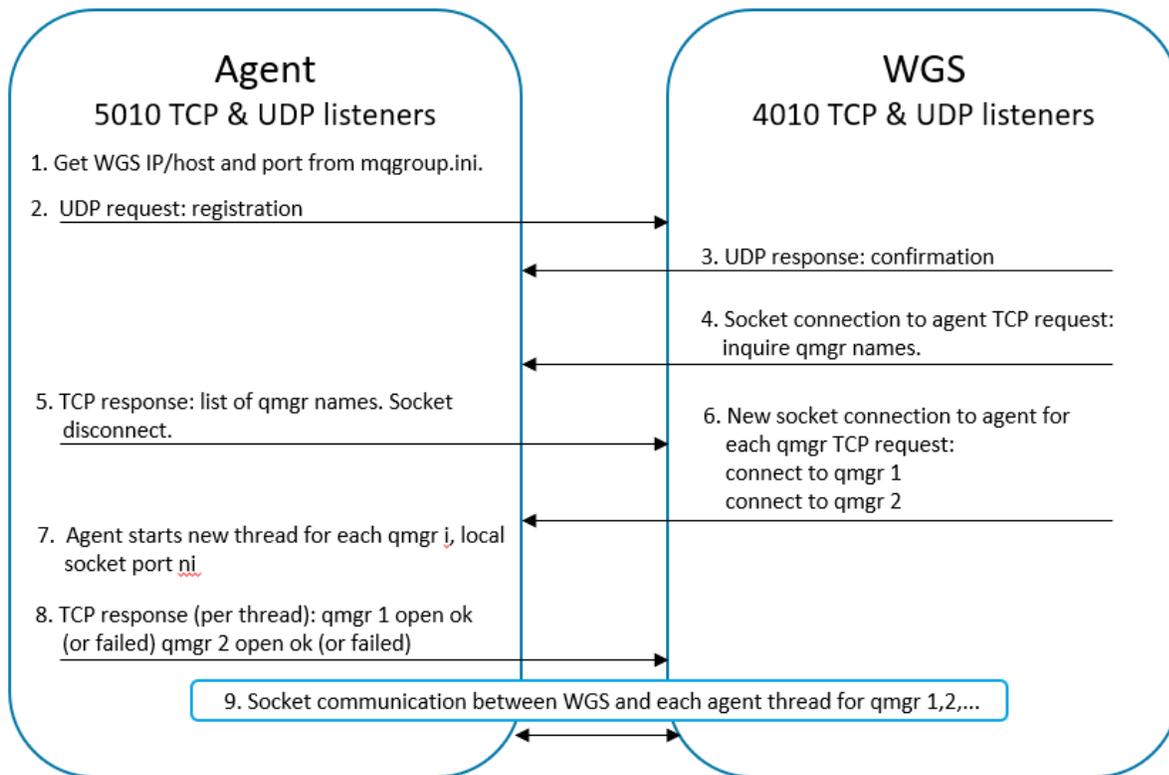


Figure I-1. Agent establishes connection to WGS

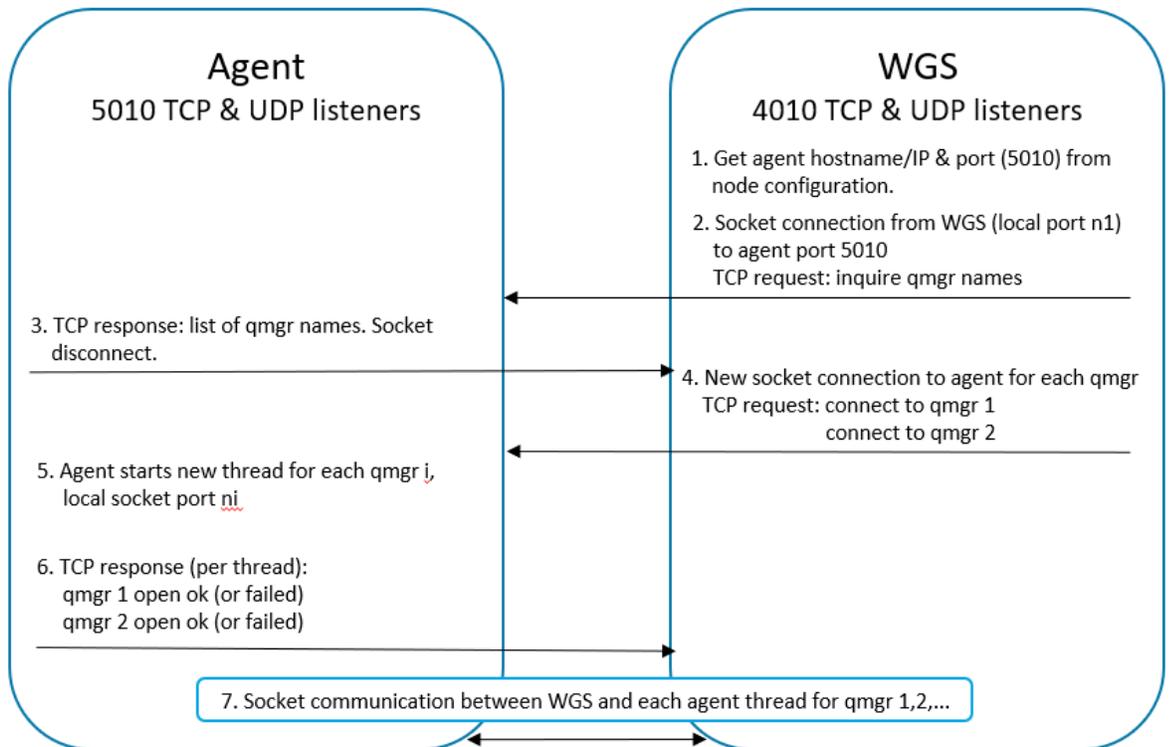


Figure I-2. WGS establishes connection to agent