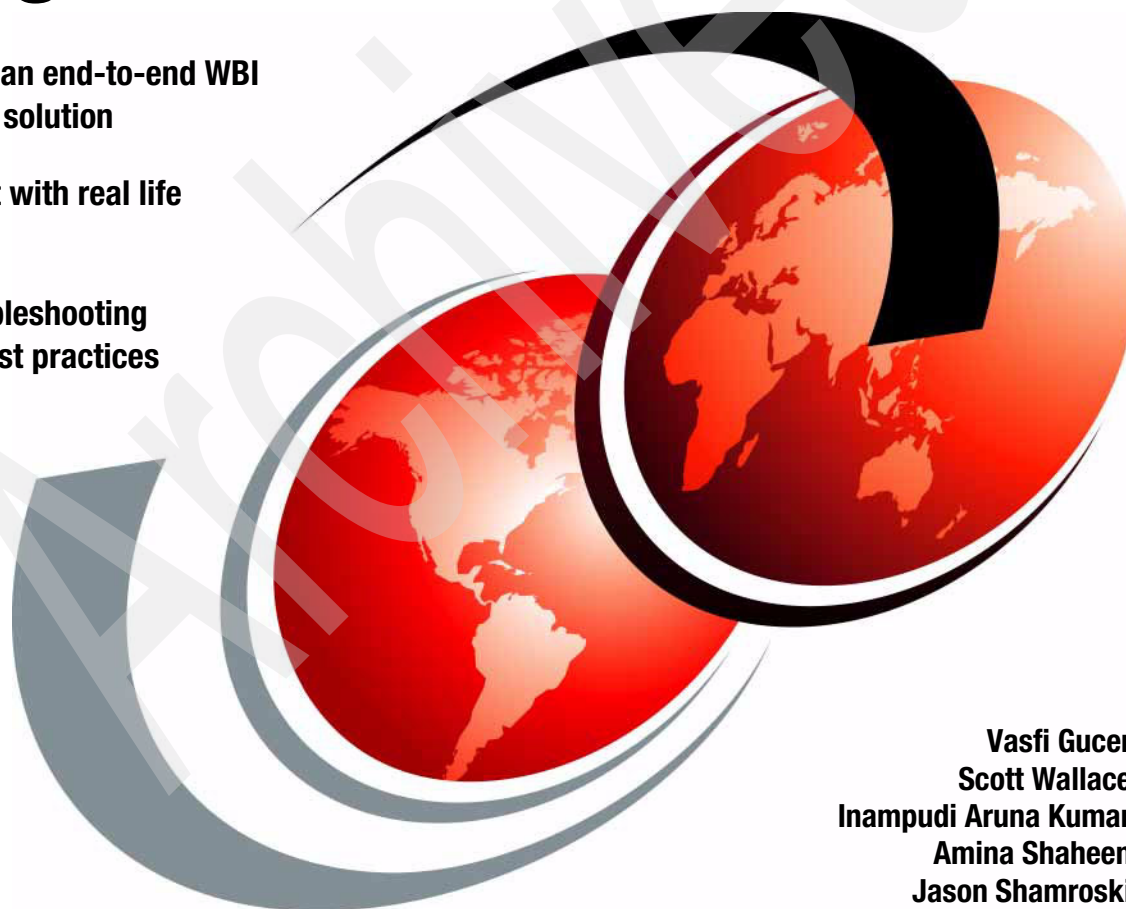


Implementing IBM Tivoli OMEGAMON XE for WebSphere Business Integration V1.1

Implement an end-to-end WBI
monitoring solution

Experiment with real life
scenarios

Learn troubleshooting
tips and best practices



Vasfi Gucer
Scott Wallace
Inampudi Aruna Kumar
Amina Shaheen
Jason Shamroski



International Technical Support Organization

**Implementing IBM Tivoli OMEGAMON XE for
WebSphere Business Integration V1.1**

July 2005

Archived

Note: Before using this information and the product it supports, read the information in “Notices” on page xv.

First Edition (July 2005)

This edition applies to OMEGAMON XE for WebSphere Business Integration V1.1.

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Preface

IBM® Tivoli® OMEGAMON® XE for WebSphere® Business Integration is a new product in Tivoli portfolio that manages WebSphere MQ, Message Broker, and InterChange Server environments from a single console. IBM Tivoli OMEGAMON XE for WebSphere Business Integration supports distributed and mainframe systems and provides an end-to-end view across all systems. It analyzes application performance and identifies slowdowns and monitors message rates, brokers, message flows, and sub-flows.

This IBM redbook covers the installation, configuration, and troubleshooting of IBM Tivoli OMEGAMON XE for WebSphere Business Integration on Windows®, AIX®, Linux®, and z/OS® platforms, with real life scenarios. OMEGAMON Framework architecture is also covered with typical deployment scenarios, best practices, and scalability considerations.

This redbook is an essential reading for IT Specialists who will implement IBM Tivoli OMEGAMON XE for WebSphere Business Integration, or in general OMEGAMON Framework in a customer environment.

The team that wrote this redbook

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Introduction

In this chapter, we first provide a high-level technical overview of the WebSphere Message Queuing (WMQ), WebSphere Business Integration Message Broker (WBI), WebSphere InterChange Server (WICS), and IBM Tivoli OMEGAMON XE for WebSphere Business Integration (also referred as OMEGAMON XE for WBI) products. Next, we discuss the benefits of managing your WMQ environment. Finally, we cover IBM Tivoli OMEGAMON XE for WebSphere Business Integration's relationship to ITIL.

This chapter discusses the following:

- ▶ 1.1, "WebSphere MQ overview" on page 2
- ▶ 1.2, "WebSphere Business Integration Message Broker overview" on page 6
- ▶ 1.3, "WebSphere InterChange Server overview" on page 9
- ▶ 1.4, "Why do I need to manage my middleware?" on page 10
- ▶ 1.5, "OMEGAMON XE for WBI overview" on page 13
- ▶ 1.6, "OMEGAMON XE for WBI and ITIL" on page 13
- ▶ 1.7, "Our lab environment for the redbook" on page 17

1.1 WebSphere MQ overview

WebSphere MQ (MQ) is essentially a transport mechanism. It is a courier service for inter-application messages that does not require the communicating applications to be running at the same time, does not require them to be aware of each other's operating environment, and is communication protocol neutral.¹

Consider this analogy: An e-mail system allows two people to send and receive messages between different systems without the need for each person to be sitting at their computer waiting for the message. It differs from a phone call (or IM) in that it is *asynchronous*; it uses a *store and forward* mechanism, as shown in Figure 1-1.

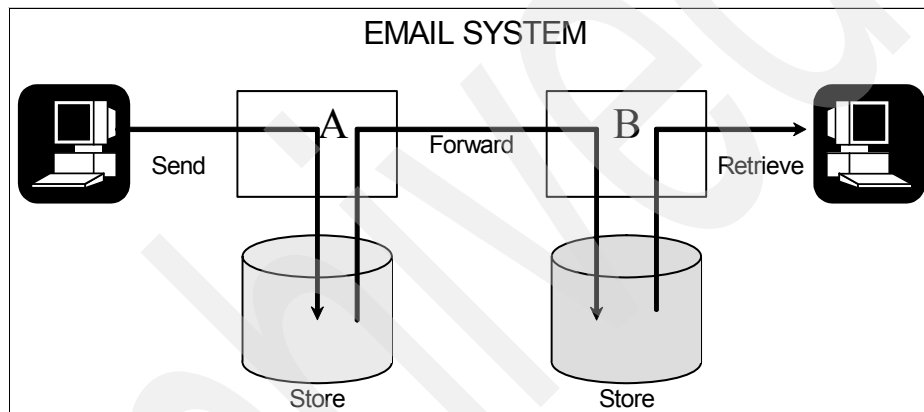


Figure 1-1 E-mail as an analogy of MQ

In Figure 1-1, the person using the e-mail client attached to system A sends a message that is stored by the e-mail server on their local system until it can establish communication with the e-mail server on system B. Then the message is forwarded and stored by the e-mail server on system B. When the user running the e-mail client attached to system B requests the message, it is retrieved from the storage on system B.

1.1.1 Queue managers and queues

Unlike point-to-point, application-to-application communication mechanisms (such as the Advanced Program to Program Communication Interface (APPC)), MQ uses *queues* to store messages temporarily as they are being passed from one place to another. Each system that supports MQ has a *queue manager*

¹ Some of the material in this chapter is based on a white paper called "IBM Tivoli OMEGAMON XE for WebSphere Business Integration", written by Robin Wiley, and an OMEGAMON XE for WBI presentation created by Mark Verplaetse.

running, which handles the interface to the application program as well as the interface with other queue managers in order to propagate messages successfully. It is possible to have a network of several queue managers all communicating with each other and passing messages, from one to another, that are destined for delivery to applications attached to other queue managers elsewhere in the network. Figure 1-2 illustrates this concept.

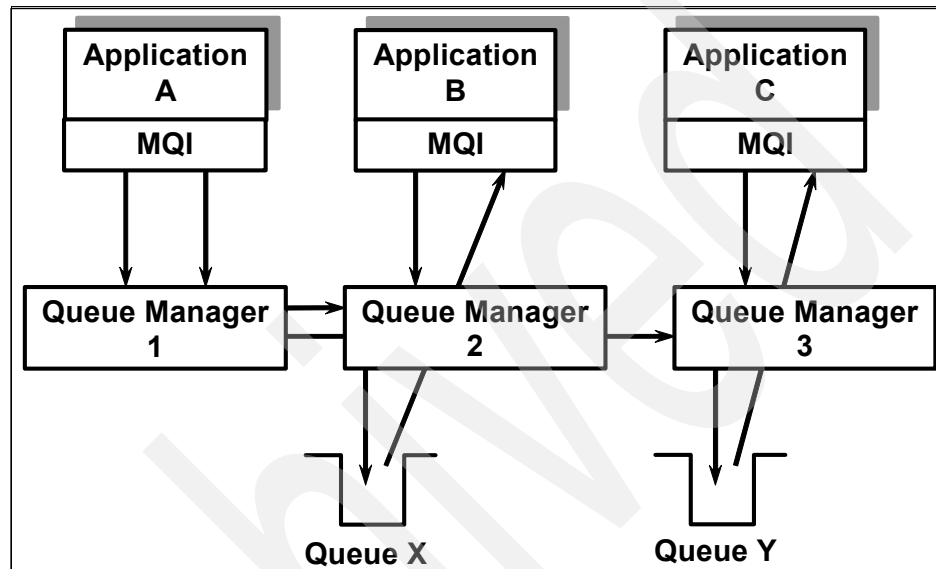


Figure 1-2 MQ application to queue manager interface and message handling

In Figure 1-2, application A sends two messages: the first to queue X, and the other to queue Y. It does this by communicating with the queue manager on its local system (Queue Manager 1) using a mechanism called the *Message Queue Interface* (MQI). There are MQI stubs available for most programming languages on most operating environments.

In this example, Queue Manager 1 passes both messages to Queue Manager 2, who recognizes the first message as being addressed to queue X, which is under its control and stores it there. Queue Manager 2 then resolves the address of the second message and routes it to Queue Manager 3, which stores it on queue Y.

Sometime later, applications B and C ask their respective queue managers to retrieve the messages from queues X and Y. In any MQ environment, the phrase *sometime later* could mean milliseconds, minutes, hours, or days.

Note: MQ delivers messages to destination queues promptly, but the application may pick up the message whenever it is ready to do so.

1.1.2 Channels

The way the queue managers communicate with each other is via *channels*, which are uni-directional communication links between systems. This is illustrated in Figure 1-3.

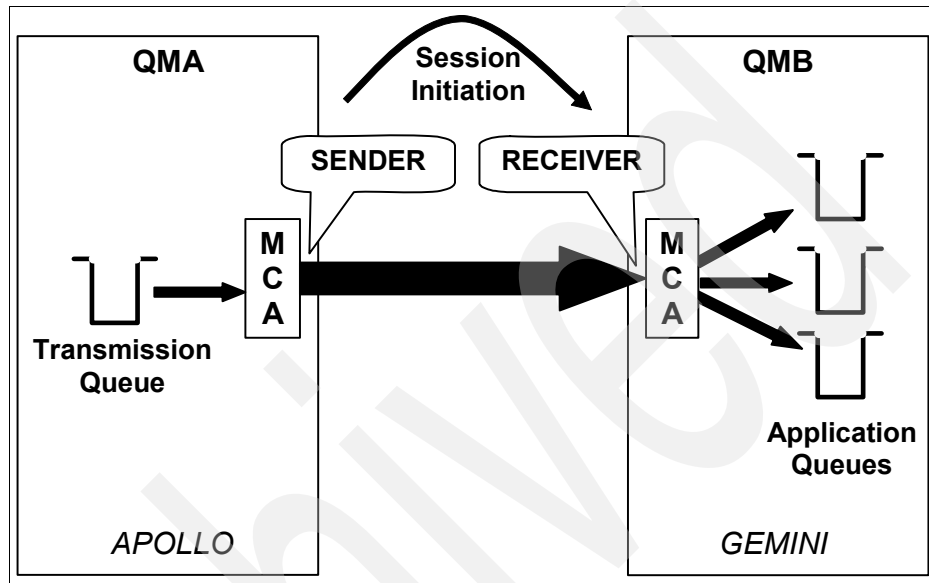


Figure 1-3 MQ channels

In Figure 1-3, queue manager QMA has some messages it has stored that is ready to send to queue manager QMB. These messages are stored in a special queue called a *Transmission Queue*. A dedicated application called a Sender Message Channel Agent (MCA) monitors the Transmission Queue and, when it finds messages ready to be sent, initiates a communication session with a partner Receiver MCA on the destination system.

Once the communication link is established, the Sender MCA reads the messages from the Transmission Queue and sends them via the communication link to the Receiver MCA, which stores the messages on the appropriate application queues and are ready for the receiving applications to get and process them.

1.1.3 Dead Letter Queue

In the above illustration, if the Receiver MCA was unable to successfully deliver the message to the nominated application queue, it would place the message instead into a *Dead Letter Queue* (DLQ). A DLQ is a special local queue set

aside to receive undeliverable messages. The reasons why a message may not be delivered include: The queue name is spelled incorrectly, the queue is full, the message is too big for queue, and so on.

1.1.4 Triggering

Within MQ, there is a mechanism that allows an application to be triggered when a message arrives on a nominated queue. The mechanism is illustrated in Figure 1-4.

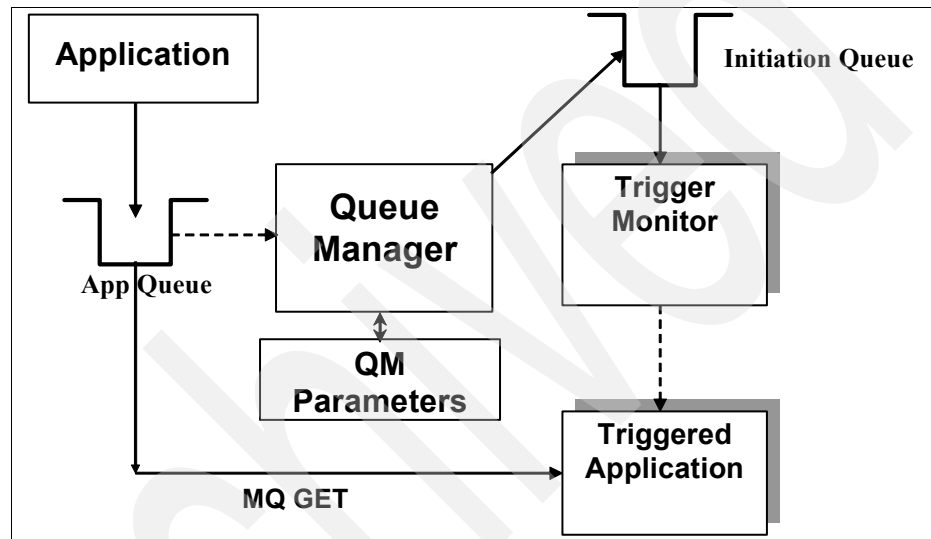


Figure 1-4 MQ triggering

A sending application places a message onto a specific application queue that has been defined as having trigger parameters. When this happens, the queue manager constructs a separate trigger message that is placed on a separate, dedicated *Initiation Queue*. A dedicated system application called a *Trigger Monitor* is watching the Initiation Queue and reads the Trigger Message, which contains the name of the application to be triggered, along with some parameters to be passed to the triggered application. The Trigger Monitor starts the triggered application running, which in turn opens the original application queue and reads the message from it that caused the trigger to occur.

Note: For more information on WebSphere MQ, you can refer to *MQSeries Primer*, REDP-0021.

1.2 WebSphere Business Integration Message Broker overview

At its simplest level, WebSphere Business Integration Message Broker processes messages on MQ queues and provides the following functions:

- ▶ **Message transformation:** This is the main purpose for which most people use WebSphere Business Integration Message Broker. It can restructure a message from practically any format to any other. For example, you may have a COBOL application that sends messages with fixed-length fields and have WebSphere Business Integration Message Broker reformat it into XML that will be processed by a Java™ application.
- ▶ **Content-based message routing:** This feature allows WebSphere Business Integration Message Broker to examine the contents of messages and make decisions as to which queues to send them to.

Message transformation and content-based message routing functions are described in Figure 1-5.

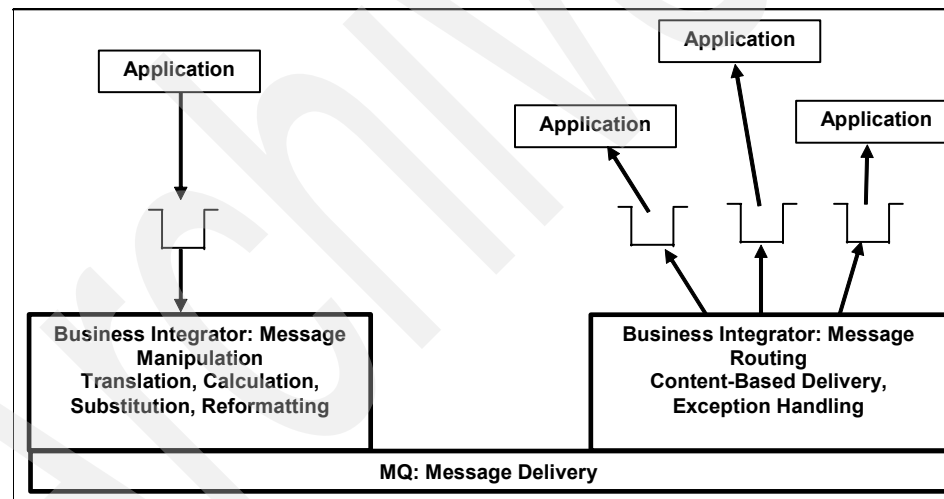


Figure 1-5 WBI message handling

- ▶ **Publish and subscribe:** This is a message distribution architecture that uncouples the sending and receiving applications. Essentially, *Publisher applications* send messages with an attached *Topic* to WebSphere Business Integration Message Broker, which then automatically distributes them to *Subscriber applications*, which have previously advertised their interest in certain topics. The publish and subscribe mechanism is described in Figure 1-6 on page 7.

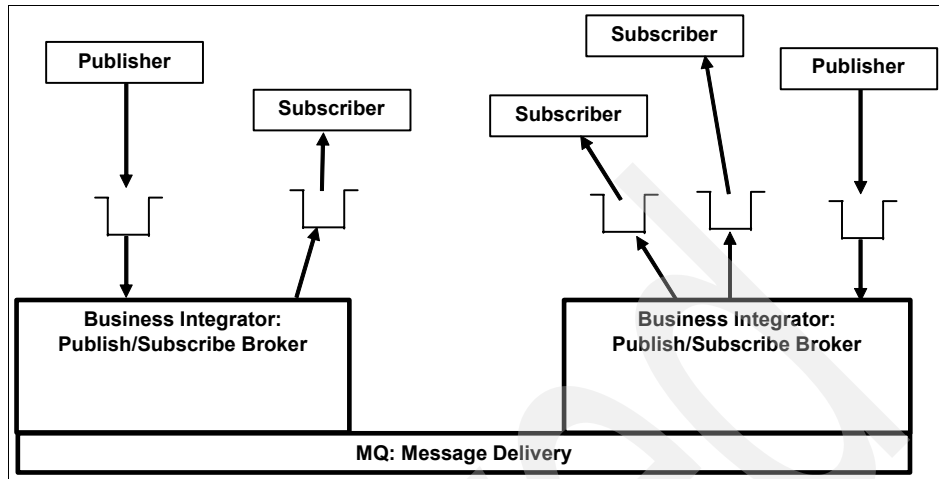


Figure 1-6 WBI publish and subscribe

The WebSphere Business Integration Message Broker system is implemented as a series of Message Brokers running on different platforms. A group of related Message Brokers are collectively called a *Domain* and are controlled by a single *Configuration Manager*, which maintains parameters and configuration status for all Brokers under its control. End users and administrators interface with the Configuration Manager via a desktop Toolkit provided by Eclipse running on a Windows PC, as shown in Figure 1-7 on page 8.

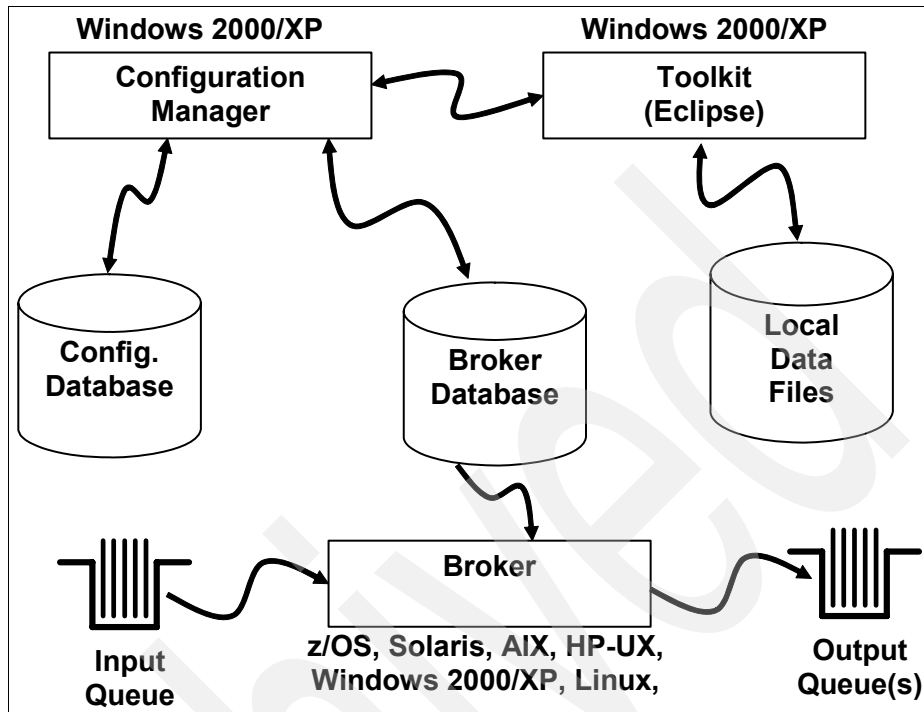


Figure 1-7 Relationship between WBI components

Functions to be performed by the Broker are coded as *Message Flows* by developers using the Eclipse Toolkit, then transferred to the Configuration Manager, which in turn downloads the parameters to the Broker for execution. Message Flows are assigned to an Execution Group, which controls the allocation of resources to each Message Flow. The Broker interfaces with MQ to get and put messages from and to queues as required by the Message Flows. This is illustrated in Figure 1-8 on page 9.

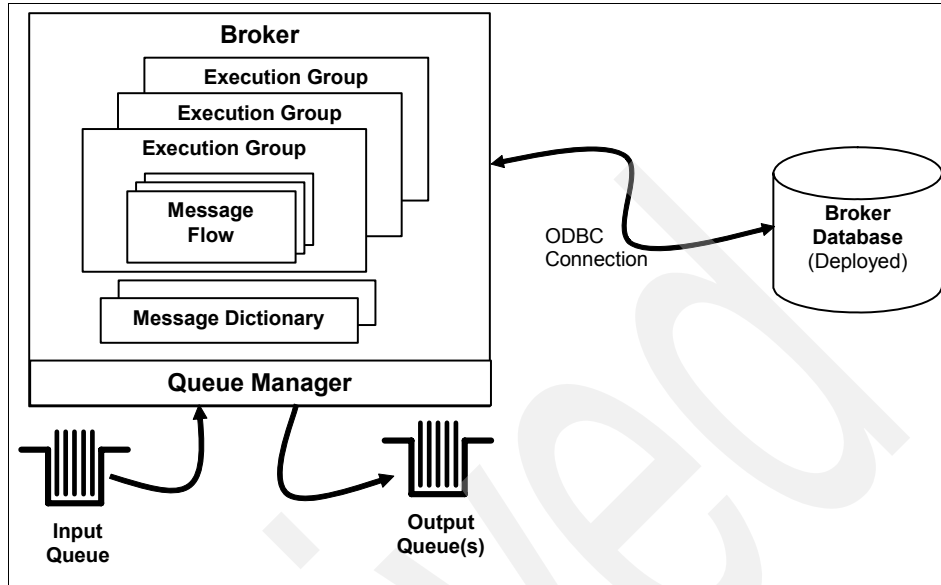


Figure 1-8 Message Broker components

1.3 WebSphere InterChange Server overview

InterChange Server provides a distributed infrastructure for solving cross-application problems, including the capability to:

- ▶ Move business information among diverse sources to perform business exchanges across the Internet
- ▶ Process and route business information among disparate applications in the enterprise environment

The IBM WebSphere InterChange Server system uses a central infrastructure (InterChange Server) and modular components in a hub-and-spoke design, as follows:

- ▶ Business-process logic resides in InterChange Server *collaborations* at the hub. InterChange Server collaborations are software modules that contain logic that describes a distributed business process. There are different collaborations for different fundamental business processes, for example, a ContactManager collaboration or an InventoryMovement collaboration. Collaborations coordinate the functionality of business processes for disparate applications and enable data exchange between them. Collaborations are the hub; through them, data is exchanged in the form of business objects.

- ▶ Data is exchanged between the hub and the spokes in the form of *business objects*. Business objects are the messages used by the IBM WebSphere InterChange Server system for exchanging data. *Data handlers* are used to transform serial application data into business objects, and maps are used between a business object that is structured for the data model of a specific application and a business object that is generically structured for use by collaborations at the hub.
- ▶ Application and technology *connectors* supply connectivity to applications (or to Web servers or other programmatic entities) at the spokes. Connectors can be configured to interact either within a network, or across the Internet and beyond firewalls. Each connector consists of two parts: the *connector controller* and the *connector agent*. The connector controller interacts directly with WebSphere InterChange Server collaboration objects and resides on a server that has implemented the IBM WebSphere InterChange Server system (the hub in a hub-and-spoke relationship). The connector agent interacts directly with an application, and can reside with that application on any server. A *remote agent technology* can be used to implement communication between a connector controller at a hub site and an agent that resides at another site across the Internet. Some connectors are designed to interact with specific applications. Other connectors (such as the XML connector) are designed for interactions that conform to specific technology standards.
- ▶ The Server Access Interface makes it possible for remote spoke sites that do not implement WebSphere InterChange Server to use access clients, which make calls over the Internet to a hub site that does have InterChange Server. The Server Access Interface is a CORBA-compliant API that accepts synchronous data transfers from either internally networked or external sources. The data is then transformed into business objects that can be manipulated by a collaboration. The Server Access Interface makes it possible to receive calls from external entities, for example, from Web browsers at remote customer sites, that do not come through connector agents, but instead come through Web servlets into the Server Access Interface.

1.4 Why do I need to manage my middleware?

Given the increased complexity of e-business infrastructures, intelligent performance and availability management tools are essential for proactive identification and resolution of IT problems before they impact business performance. These tools enable companies to cost effectively monitor individual resource performance while simultaneously ensuring availability across heterogeneous operating environments. Ensuring peak performance and availability helps companies meet and exceed both internal and external service level agreements and reduce total cost of ownership.

Business processes are increasingly dependent on multi-tier *composite applications* that use business logic and data from multiple resources: Web servers, J2EE application servers, integration middleware, and existing systems. As we build new applications and connect to existing applications, transport and mediation across multiple systems must be monitored, configured, and managed to ensure the best possible performing applications. These must be actively managed to support the On Demand Business. Using traditional tools, these problems are often not even identified until a customer complains.

As transactions move from the synchronous nature of the customer facing application to the asynchronous world of messaging and workflow, tracking business transactions across these composite applications and managing them become even more difficult.

IBM Tivoli Intelligent Management software has simple goals to provide software that runs your IT infrastructure so you have more time to run your business, deliver optimal ROI, and generate revenue. With Tivoli Software, IT expenses become IT investment.

We shall examine a simple scenario on how Tivoli Monitoring tools help in managing your middleware. Consider Table 1-1 a business infrastructure you are managing, and problem management with and without Tivoli Monitoring tools.

Table 1-1 *Proactive management offered by Tivoli Monitoring tools*

Process step	How it typically works	IT organization	What Tivoli monitoring solutions enable a client to do
Sense	The help desk is bombarded with calls that purchased items are not shipped after 30 days. IT staff members are paged and emergency meetings are called.	Help Desk	Monitoring tools proactively identify the middleware hitches or slowdown in message flow, and route the problem to the correct support person.
Isolate	In a meeting, the available representatives from the different silos work to determine which assets are causing the problem	IT operations team	The support person uses resource and transaction-level tools to identify the asset where the problem is occurring.

Process step	How it typically works	IT organization	What Tivoli monitoring solutions enable a client to do
Diagnose	The appropriate silo experts test the specific assets that cause the problem to determine which silo is responsible, (if the problem falls in between silos, this step becomes more difficult.). The “isolate” and “diagnose” steps are repeated until the root cause is found	Network operations center Database administrators Application server administrator Application development team	Using interoperable tools and detailed analysis capabilities, the support person drills down seamlessly to pinpoint the root cause.
Take action	The responsible silo expert determines, plans, and implements a course of action to resolve the problem	Application development team Server administrator	Still using the same console, the support person triggers another seamlessly integrated tool to take an automated, best practice action. Changes might include creating more threads or provisioning, configuring, and deploying more server capacity. If the support person lacks the skills to resolve the problem, tools route the problem to a domain expert and enable that expert to work on the problem in the exact context where the support person left off.
Evaluate	If the problem does not go away or if a new problem arises, the whole process must be repeated.	IT operations team	Integrated monitoring tools allow the domain expert to instantly see how well the results of the change support the company’s business priorities. The expert can also immediately drill down into and resolve other problems that arise.

The proactive management of your business infrastructure helps in:

- ▶ Minimizing down time of your business services
- ▶ Efficient utilization of resources
- ▶ Capacity planning for the on demand business environments, and the inventory of your business infrastructure.
- ▶ Problem determination and isolation in a short amount of time
- ▶ Develop, test, and deploy your middleware infrastructure

- Monitoring and alerting options that can be customized to suite your needs

Do not forget that you cannot manage what you do not measure.

1.5 OMEGAMON XE for WBI overview

IBM Tivoli OMEGAMON XE for WebSphere Business Integration helps you to manage and configure your WebSphere MQ, Message Broker, and InterChange Server environments. These solutions provide the most comprehensive suite of tools to manage the performance, connectivity, and configuration of your environment. This allows you to gain an understanding of your environment and determine when your applications are not performing properly. You will then be able to take corrective action to alleviate these problems.

IBM Tivoli Performance and Availability Management products provide the central nervous system for complicated business landscapes: they constantly gather information on hardware, software, and network devices, and, in many cases, cure problems before they actually occur. IBM Tivoli availability products monitor business at the component, business system, and enterprise levels. This technology identifies critical problems as well as misleading symptoms, and then either notifies support staff with the appropriate response, or automatically cures the problems, which decreases operating costs and improves staff efficiency.

IBM Tivoli OMEGAMON XE for Business Integration monitors and manages the WebSphere MQ, WebSphere MQ Message Broker, and WebSphere InterChange Server environments. The out-of-the box capabilities of this product provide auto-discovery and monitoring of these complex environments, providing customers with rapid time to value, ease of use, and improved product quality. Additionally, it identifies common problems and automates corrective actions by monitoring key WebSphere MQ, WebSphere MQ Message Broker, and WebSphere InterChange Server metrics. It sends event notification and provides data collection for real-time and historical data analysis, thus reducing administration costs and maximizing return on investment with increased efficiency of the IT staff.

1.6 OMEGAMON XE for WBI and ITIL

ITIL (IT Infrastructure Library) is the only comprehensive, non-proprietary source of service management best practices that is publicly available. It was originally created by the UK Government, but has rapidly been adopted across the world as the guidelines for best practices in the provision of IT Service.

The main focus of IT Service Management is divided into two main areas, Service Support and Service Delivery, and contains an integrated set of well-documented processes including, among others:

- ▶ Service Support
 - Service Desk
 - Incident Management
 - Problem Management
 - Change Management
 - Release Management
 - Configuration Management
- ▶ Service Delivery
 - Service Level Management
 - Availability Management
 - Capacity Management
 - Financial Management for IT Services
 - IT Service Continuity Management

Note: Service Desk is considered a function, not a process, in ITIL.

Figure 1-9 on page 15 shows the ITIL architecture.

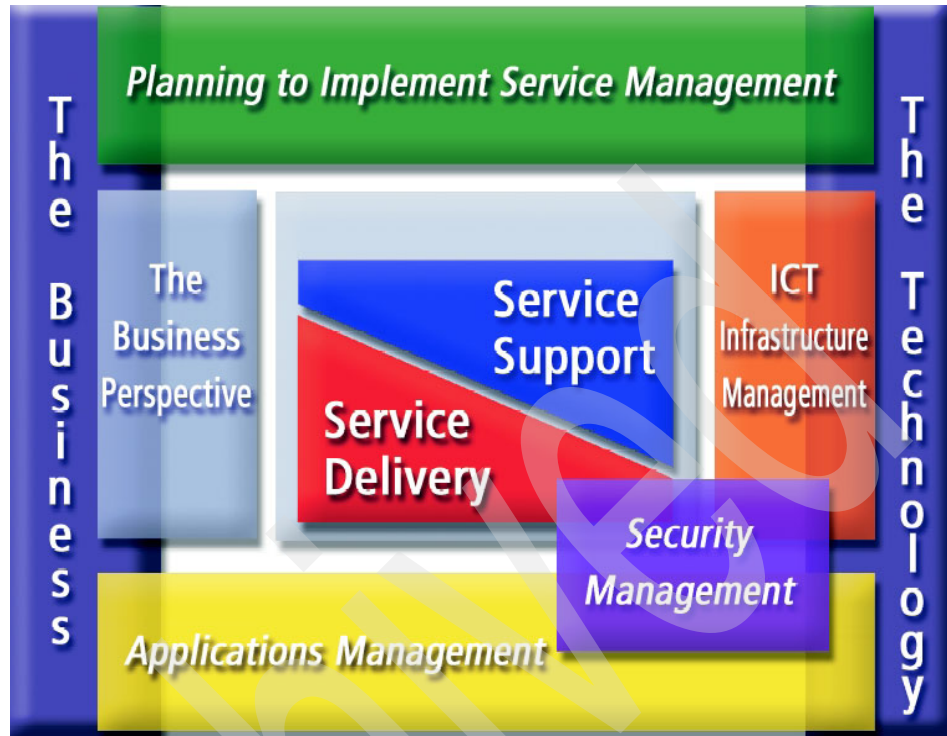


Figure 1-9 ITIL architecture

In recent years, it has become increasingly recognized that information is the most important strategic resource that any organization has to manage. Key to the collection, analysis, production, and distribution of information within an organization is the quality of the Information Communication Technology (ICT) systems and IT services provided to the business. It is essential that we recognize that ICT systems are crucial, strategic, and organizational assets and therefore organizations must invest appropriate levels of resources into the support, delivery, and management of these critical IT services and the ICT systems that underpin them. However, these aspects of IT are often overlooked or only superficially addressed within many organizations. The key issues facing many of today's senior Business Managers and IT Managers are:

- ▶ IT and business strategic planning
- ▶ Integrating and aligning IT and business goals
- ▶ Acquiring and retaining the right resources and skill sets
- ▶ Implementing continuous improvement
- ▶ Measuring IT organization effectiveness and efficiency

- ▶ Reducing costs and the Total Cost of Ownership (TCO)
- ▶ Achieving and demonstrating Value For Money (VFM) and Return on Investment (ROI)
- ▶ Demonstrating the business value of IT
- ▶ Developing business and IT partnerships and relationships
- ▶ Improving project delivery success
- ▶ Outsourcing, insourcing, and smart sourcing
- ▶ Using IT to gain competitive advantage
- ▶ Delivering the required, business justified IT services (that is, delivering what is required, when required, and at an agreed cost)
- ▶ Managing constant business and IT change
- ▶ Following the sun and offshore operations
- ▶ Demonstrating appropriate IT governance

The challenges for IT managers are to co-ordinate and work in partnership with the business to deliver high quality IT services. This has to be achieved while reducing the overall TCO and often increasing the frequency, complexity, and volume of change. The main method of realizing this goal is the operation of effective processes and the provision of appropriate, value for money services. To achieve this, the correct processes need to be developed and implemented with in-built assessment and improvement mechanisms.

Tivoli OMEGAMON XE for WBI addresses specific areas in Service Management. OMEGAMON for WBI address ITIL Services Management areas to help align IT with the business requirements, as shown in the following sections.

Services Support

Tivoli OMEGAMON XE for WBI addresses can be used in the following ITIL Services Support processes:

- ▶ Problem Management: OMEGAMON for WBI provides for problem isolation in order to turn incidents into known errors. The ability of OMEGAMON for WBI to provide the capabilities of high level monitoring and alerting, the ability to deep dive into specific WBI resources in order to understand where WMQ and the Message Broker have problems, and the ability to automate responses to fix issues before they become problems lead to effective resolution of problems.
- ▶ Release Management: The WebSphere MQ Configuration tool that is part of OMEGAMON for WBI will help define and deploy WebSphere MQ configurations. The WMQ Configuration database will be able to make

changes to the Queue manager configuration, verify them, and then stage them for deployment. The database will be backed up in case a restoration is necessary.

- ▶ **Configuration Management:** While not necessarily a component of Configuration Management, OMEGAMON for WBI can provide input to the Configuration Management Database (CMDB) to inventory the Queue Managers and the objects associated with the Queue Managers, should this level of detail be required. This information will help feed information Change Management.

Service Delivery

Tivoli OMEGAMON XE for WBI addresses or can be used in the following ITIL Services Delivery processes:

- ▶ **Service Level Management:** It is important to retrieve information from OMEGAMON for WBI as input into the Service Level Agreement (SLA). Information here will determine a baseline for response times and message throughput to help draw up the SLA.
- ▶ **Availability Management:** It is important to understand the availability of messaging components and message brokers. OMEGAMON for WBI constantly monitors the availability of these components that will feed into the Availability Management function.
- ▶ **Capacity Management:** When monitoring messaging components, it is important to understand the throughput of individual messaging components. This will help us to draw baselines for normal operations and then help plan for peak periods. Trending these results and planning growth based on this input will help determine capacity for the future, and plan for this capacity to be available.
- ▶ **IT Service Continuity Management:** OMEGAMON for WBI provides input into the disaster planning process by creating a centrally located backup of the WMQ configuration of any Queue Manager in the enterprise. This will facilitate in restoring service for applications affected by service outages.

1.7 Our lab environment for the redbook

For the purposes of this redbook, we installed the following products to manage through OMEGAMON XE for WBI:

- ▶ **On Windows:**
 - WebSphere MQ
 - WebSphere Business Integration Message Broker

- WebSphere InterChange Server
- ▶ On AIX:
 - WebSphere MQ
 - WebSphere Business Integration Message Broker
- ▶ On Linux:
 - WebSphere MQ
 - WebSphere Business Integration Message Broker
- ▶ On z/OS:
 - WebSphere MQ

Our OMEGAMON XE for WBI environment consist of a CMS server on a Windows 2003 system, a CNP server on a Windows 2000 system, and several agents on Windows, AIX, Linux, and z/OS platforms. Figure 1-10 on page 19 shows our environment and various product components installed in this environment.

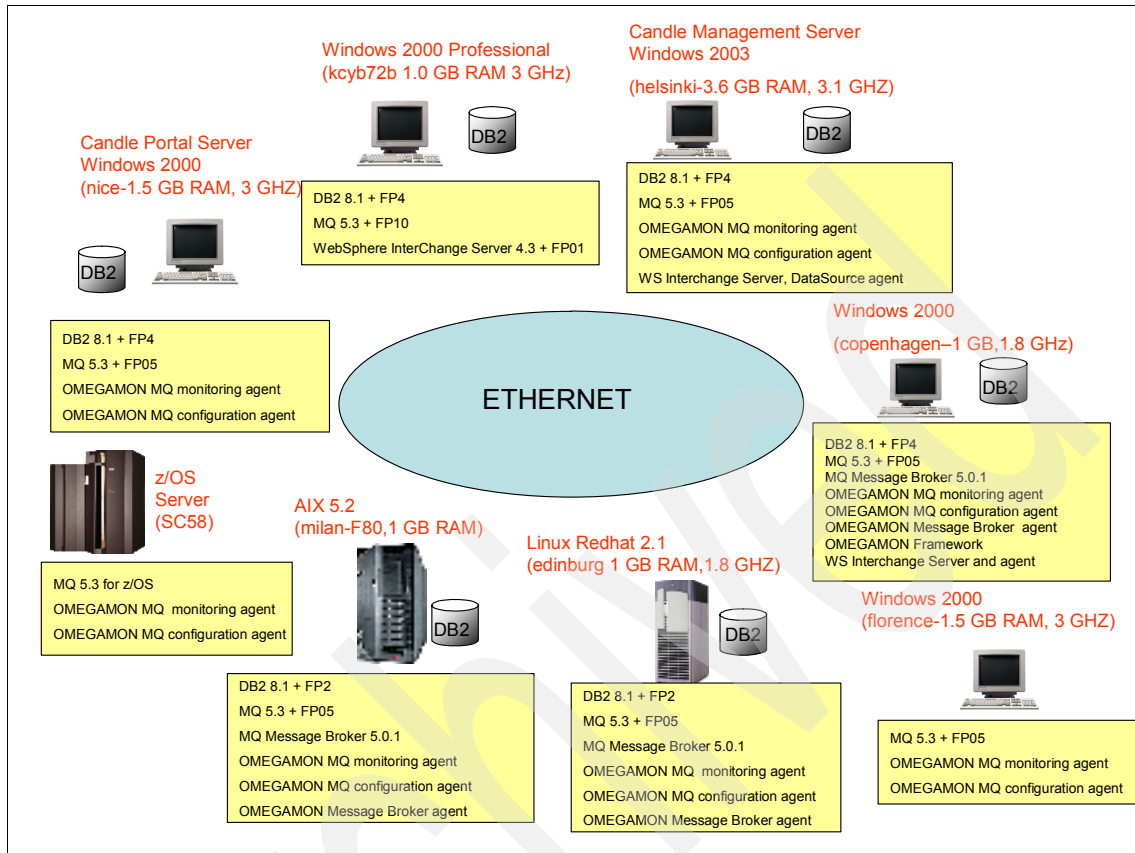


Figure 1-10 Our lab environment

In this redbook, we will not cover the installation of WebSphere MQ, WebSphere Business Integration Message Broker, and WebSphere InterChange Server products, since we assume that readers are familiar with these products.

Refer to the following sections of the book for installation and configuration of the various OMEGAMON XE for WBI components shown in Figure 1-10:

- ▶ Chapter 3, “Installation of the OMEGAMON infrastructure” on page 31 for the OMEGAMON Framework components.
- ▶ 4.1, “WebSphere MQ Agent installation and configuration” on page 60 for the OMEGAMON XE for WBI MQ Agents (both Monitoring and Configuration Agents).
- ▶ 7.3, “Installing the WebSphere Integration Brokers Monitoring Agent” on page 200 for the OMEGAMON XE for WBI Message Broker Agents.

- ▶ 8.2, “WebSphere InterChange Server configuration for monitoring” on page 261 for the WebSphere InterChange Server Monitoring and SNMP Agents.

Also, Chapter 2, “OMEGAMON XE/DE Distributed Architecture” on page 21 provides architecture and scalability information for the OMEGAMON Framework.

OMEGAMON XE/DE

Distributed Architecture

This chapter discusses the deployment of an OMEGAMON XE/DE architecture in a Distributed Computing environment. It is important to know the best practices for deploying an OMEGAMON XE/DE architecture to successfully implement a IBM Tivoli OMEGAMON XE for WebSphere Business Integration V1.1 solution in your environment.

The following are covered in this chapter:

- ▶ 2.1, “Overview” on page 22.
- ▶ 2.2, “Terminology” on page 23
- ▶ 2.3, “Communications” on page 24
- ▶ 2.4, “Deployment scenarios” on page 25
- ▶ 2.5, “Scalability” on page 29

2.1 Overview

While this redbook focuses on OMEGAMON for WebSphere Business Integration, we felt it necessary to include an overview of the OMEGAMON architecture. This chapter will discuss the deployment of an OMEGAMON XE/DE architecture in Distributed Computing environment. We will discuss the installation and placement of the Candle® Management Server® (CMS), Candle Net Portal, database integration, Candle's built-in Web server, and how to manage devices in DMZs through corporate firewalls.

Let us clarify one thing at this time: the OMEGAMON designations of XE and DE are simple. The OMEGAMON XE product is the base product that everyone starts with when they install a Candle Management Server. The OMEGAMON DE allows the defining of Business views rather than just Physical views as given in XE. It also allows more combination and linking of data provided by totally different components monitored by different types of agents.

More specifically, the OMEGAMON DE extends the capabilities of OMEGAMON XE to include:

- ▶ Enterprise-specific Navigator views

The Navigator physical view shows the hierarchy of your managed enterprise by operating platform and type of IBM Tivoli OMEGAMON XE agent. The Navigator business view offered by IBM Tivoli OMEGAMON DE shows the hierarchy of any managed objects. You can also define Navigator views for any logical grouping, such as a business process or a departmental hierarchy.

- ▶ Views of data from different types of monitoring agents in one workspace

In a single workspace, you can build a table or chart with data from one type of monitoring agent, and another table or chart with data from a different agent. Within that workspace, you can show views from as many different agent types as are included on that branch of the Navigator.

- ▶ Linking application workspaces

You can define a link from a workspace associated with one type of monitoring agent to a workspace associated with another type of agent.

You will understand these additional capabilities better as you follow the example scenarios given throughout this book.

2.2 Terminology

The following sections describe the OMEGAMON terminology:

- ▶ **Candle Management Server (CMS):** CMS gathers data from the OMEGAMON XE agents and acts as a collection and control point for alerts received from the agents. The CMS sends the data it receives from the agents to CandleNet® Portal® clients, where it is displayed in tabular or graphic views in a set of predefined or customized workspaces. The CMS also accepts requests for information or action from CandleNet Portal clients and distributes them to the agents for execution.
- ▶ **Hub Candle Management Server (Hub CMS):** In scalability solutions, Hub CMS communicates with agents and Remote CMSs, the CNPS, and Warehouse Agent.
- ▶ **Remote Management Server (RMS) (also called Remote CMS):** In large environments to improve scalability it may be necessary to balance the network loads and configure some agents to connect to RMSs rather than directly to a primary CMS. Too many agents directly connecting to the primary CMS may cause network traffic congestion.
- ▶ **CandleNet Portal (CNP):** CNP is the Java-based interface to the data monitoring and management resources of OMEGAMON Platform. Depending on how it is installed, CandleNet Portal can be used as either a desktop or browser-based client. CandleNet Portal has its own server, the CandleNet Portal Server. The CandleNet Portal Server performs common CandleNet Portal functions and serves to lighten the CandleNet Portal client.
- ▶ **Candle Management Workstation® (CMW):** CMW is an older Windows based interface for CMS users. It is now replaced by CandleNet Portal client.

Note: CMW still offers some features not otherwise available, such as the Universal Message Console and the Policy Microscope. It was previously referred to as the Candle Command Center® (CCC) interface.

- ▶ **Agent:** Agents are the processes that collect data on a managed device and return it to the CMS or RMS for processing.
- ▶ **Situation:** A logical expression involving one or more system conditions used to monitor the condition of systems in your network. You can manage situations from CandleNet Portal by using the Situation Editor.
- ▶ **Event:** Also called an alert. An event is a notification to a console for either manual or automatic actions. Note that in the case of situation firing you also get an event, but this is for detection only, not for any action.

- ▶ Warehouse Agent - The Warehouse Agent or Warehouse Agent Proxy takes data from the CMS and inserts it into a Data Warehouse. Supported databases for the Warehouse are SQL Server, Oracle, and IBM DB2®. Specific versions of each database vary by version of the OMEGAMON Warehouse Agent Proxy; check the *IBM Tivoli OMEGAMON XE for WebSphere Application Server Business Integration Release Notes*, GI11-4058 to get exact versions. Check <http://www-306.ibm.com/software/tivoli/features/ccr2/ccr2-2003-10/techtip-warehouse.html> for more information on the configuration of the Warehouse Agent.

Notes:

- ▶ Use of the term "OMEGAMON" refers to both the XE and DE versions in this book.
- ▶ The CMS must be installed on z/OS, UNIX®, Windows XP Professional Edition, Windows 2000, or Windows 2003 Server. CandleNet Portal must be installed on Windows XP Professional Edition, Windows 2000, or Windows 2003 Server. The CMW must be installed on Windows XP Professional Edition or Windows 2000. Additional operating systems are slated to be supported sometime after the next version is released, which will be IBM Tivoli Monitoring V6.1.
- ▶ We would never recommend using Windows XP as a production platform, but we have found it useful for simple testing or small scale proof of concepts.

2.3 Communications

Communications between components in the OMEGAMON infrastructure can use several different methods. The terminology is a little off from normal, so here is a mapping:

- ▶ TCP communications uses the UDP protocol. When UDP is used, RPC requests and responses flow as payload in user datagrams. UDP is generally favored for LANs because it is "lighter weight".
- ▶ IP Pipe communications uses full blown TCP/IP. Using TCP, RPC requests and responses stream between a point-to-point session. All concurrent RPC requests and responses for that instance of the product are multiplexed across this single link.
- ▶ SNA communications uses SNA.

Note: Agent communication ports are configurable; by default, CMS listens to agent communication on port 1918. The CNPS by default listens on port 1920.

2.4 Deployment scenarios

In this section, we will investigate three different deployment scenarios:

- ▶ Simple deployment with no firewall
- ▶ Simple deployment with a firewall
- ▶ Complex deployment: CMS, RMS, and a firewall

2.4.1 Simple deployment with no firewall

In a simple deployment of OMEGAMON, there is only one Candle Management Server and Agents installed on monitored servers. This scenario assumes all systems have name lookup capability with no port restrictions or firewalls.

A typical deployment would look something like Figure 2-1 on page 26.

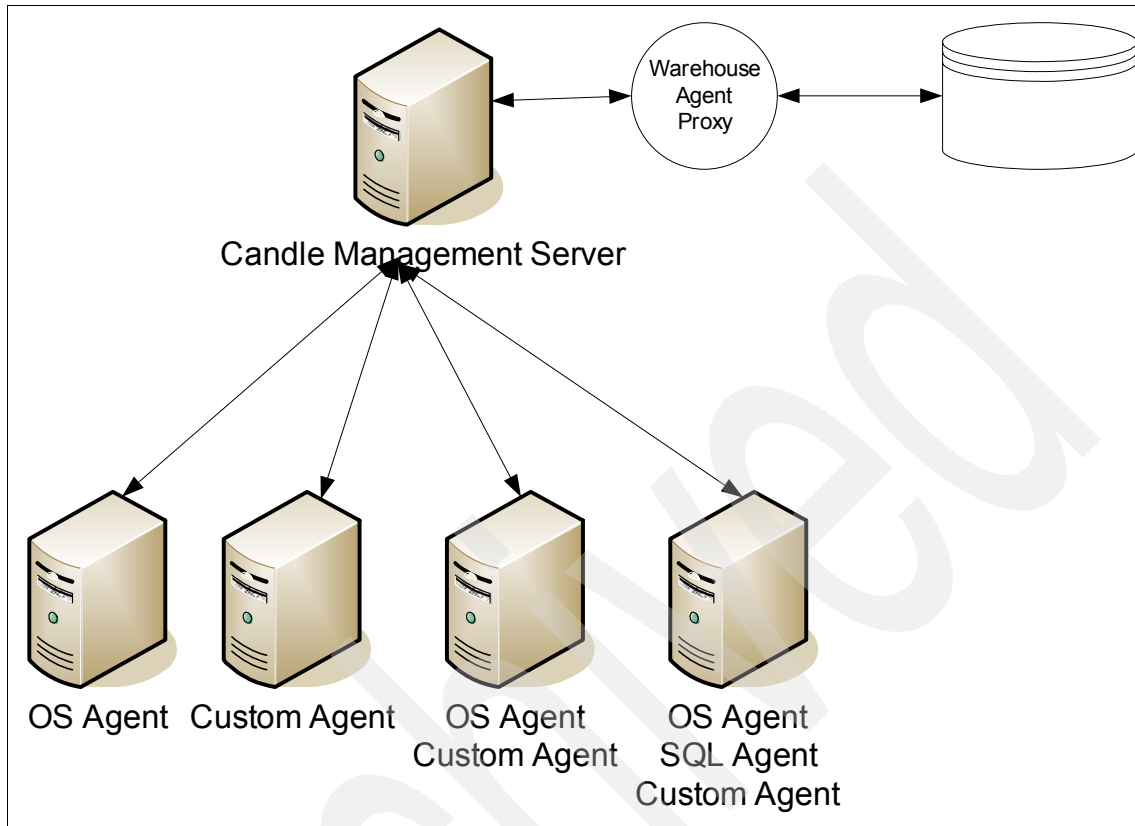


Figure 2-1 Simple deployment with no firewall

As we can see in Figure 2-1, the Agents communicate directly with the Candle Management Server. The CMS in this scenario communicates with the Warehouse Agent Proxy to store data historically in a SQL database. This is a very simple deployment that can support approximately 400 agents, which could support small businesses just fine.

A typical Candle Net Portal will support approximately 50 users before performance begins to degrade. Keep this in mind when you give out login IDs to the CNP.

2.4.2 Simple deployment with firewall

A slightly more complex implementation involves a firewall (Figure 2-2 on page 27). The firewall will require us to use IP Pipe to perform port consolidation. Using TCP, RPC requests and responses stream between a point-to-point

session. All concurrent RPC requests and responses for that instance of the product are multiplexed across this single link.

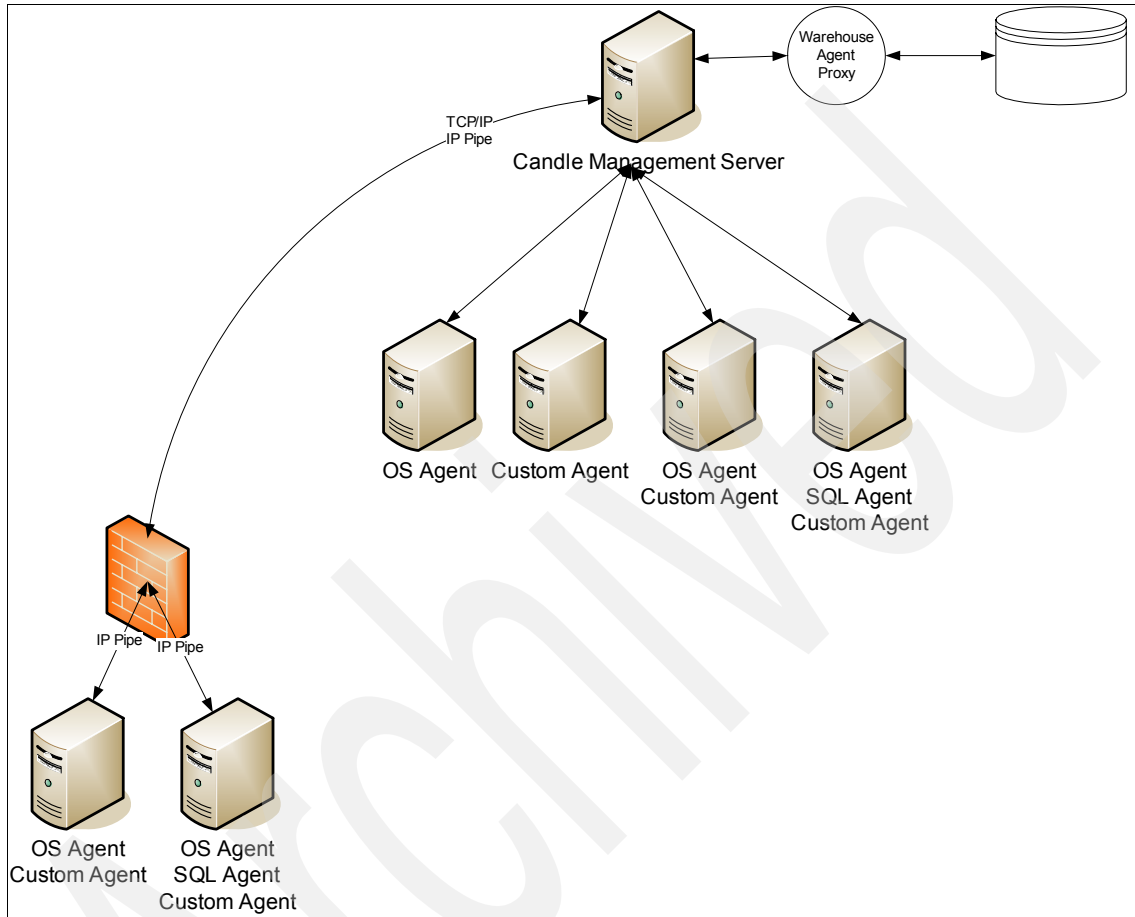


Figure 2-2 Simple deployment with firewall

2.4.3 Complex deployment: CMS, RMS, and a firewall

In order to truly scale OMEGAMON, we must use several Remote Management Servers. Each RMS has agents communicating with it, and then the RMS inputs data to the CMS. Only the CMS can communicate with the Warehouse Agent Proxy, so presentation needs to occur from the CMS so that all RMSs can be represented. This setup is described in Figure 2-3 on page 28.

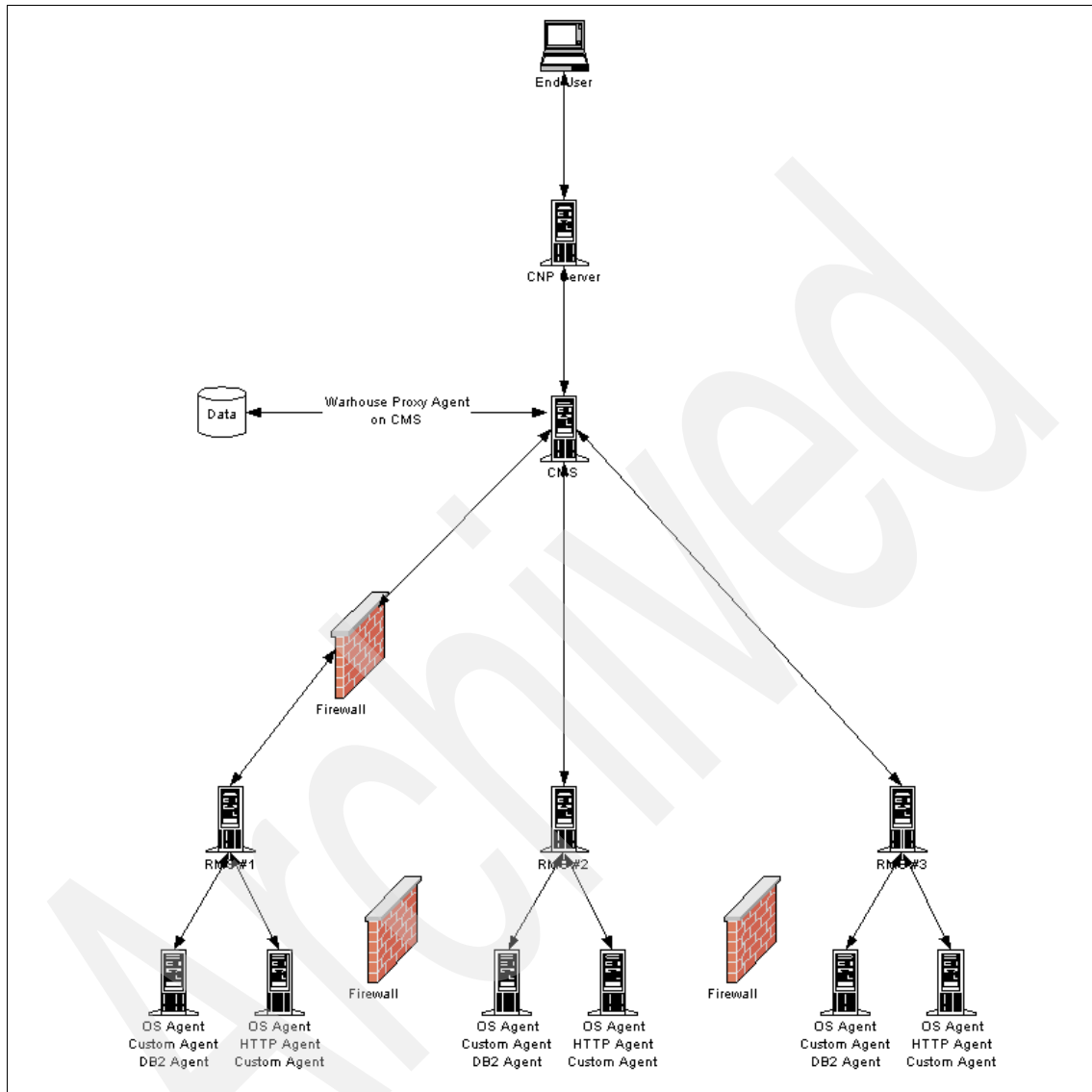


Figure 2-3 Complex deployment: CMS, RMS and firewall

2.5 Scalability

Current architectures support monitoring of approximately 2000 agents. To support 2000 agents, the environment includes several RMSs connecting to the CMS and frequent aggregating of data in the Data Warehouse. These limits were not tested during the writing of this redbook, but were conveyed to us by the OMEGAMON support and development staff.

In testing, we could find no designed break points. Like any systems management product, the true scale depends on the frequency at which you data collection, automated responses, notifications, and cross situation correlation occurs.

Collecting data every minute and performing an action like running a script is more intensive than doing it every five minutes. However, in certain circumstances, you are required to monitor at such frequent intervals. Put some thought into your monitors, situations, and automated action routines. Here are some key elements for consideration:

- ▶ Always make certain your monitor is necessary: Many monitors have been deployed for the sake of having a monitor, not because it is needed or makes sense. What are you going to do with the data? If you cannot determine what you will use the data from a monitor for, ask yourself, “Do I need this monitor?”
- ▶ Do not monitor too often. If you are monitoring a resource every five minutes, but that resource has 48 hours to be fixed if it is broken, you could reduce your monitoring by hours.
- ▶ Finally, do not keep data just to keep it. Just because you can warehouse all of the data you collect does not mean you should. Every stored data element needs to be managed for presentation and retention; make sure that you have the ability to manage data before storing large amounts.

The Warehouse Agent Proxy is generally not the bottleneck when it comes to data insertion to the warehouse. The agent itself is capable of writing 200 records per second; make certain your database is tuned accordingly for maximum insert performance.

Average record sizes for data captured during testing ranged from 128 bytes to 500 bytes per record. Use these figures to estimate database sizes. These record sizes are only representative of the OMEGAMON for WebSphere Business Integration MQ data. Each agent can produce data for warehousing and should be tested for size separately.

Installation of the OMEGAMON infrastructure

The IBM Tivoli OMEGAMON infrastructure provides a robust set of tools for monitoring and managing an IT infrastructure and business systems. This chapter provides details on the installation and configuration of the OMEGAMON platform components.

The following sections are covered:

- ▶ 3.1, “Planning for the installation” on page 32
- ▶ 3.2, “Candle Management Server” on page 37
- ▶ 3.3, “IBM Tivoli OMEGAMON DE” on page 54
- ▶ 3.4, “Verifying the installation” on page 56

3.1 Planning for the installation

The successful installation of an enterprise monitoring system takes careful planning. This section provides the steps necessary to plan this installation. There are multiple factors that need to be considered before you begin the installation of the OMEGAMON infrastructure.

These steps include:

- ▶ Business requirements
- ▶ Hardware requirements
- ▶ Software requirements
- ▶ Network requirements

3.1.1 Business requirements

The requirements of the business are of major importance, since these are the components that drive the decision making process. By business requirements, we mean the demands placed on the system management infrastructure to ensure that the target applications are managed to the satisfaction of the customer. Business requirements need to be balanced with other areas, such as system impact.

Some of the topics to consider are:

- ▶ Cycle time
- ▶ Number of resources being monitored
- ▶ Amount of time the data is needed (life of the data)

3.1.2 Hardware requirements

The hardware requirements will vary based on the component being installed. Each section will provide details about the hardware requirements for the individual components. Some items to consider when planning the hardware for the infrastructure server components are the number of managed systems, number of users accessing the system, amount of available storage, longevity of the data, number of processors, and frequency of monitoring activity.

3.1.3 Software requirements

The software requirements provided in Table 3-1 on page 33 are the operating system and Java components. The network software requirements are detailed in 3.1.4, “Network requirements” on page 33.

Table 3-1 Supported operating systems and software

Component	Software
CMS	<ul style="list-style-type: none"> ▶ AIX 5L™ V5.1 or 5.2 (32-bit or 64-bit) ▶ HP-UX V11.x, including V11i (32-bit or 64-bit) ▶ Solaris™ <ul style="list-style-type: none"> – V2.6 – V7, V8, or V9 (32-bit or 64-bit) ▶ Windows XP Professional, 2000, or 2003 Server ▶ z/OS
CNPS	<ul style="list-style-type: none"> ▶ Windows (only) <ul style="list-style-type: none"> – XP Professional with Service Pack 1 or higher – 2000 with Service Pack 3 or higher – 2003 Server ▶ Java Runtime Environment V1.3.1_04 to 1.4.2 ▶ DB2 UDB V8.1

3.1.4 Network requirements

While networking can be considered a hardware component, it does require some attention. The OMEGAMON infrastructure uses three communication protocols: TCP/IP, IP.PIPE, and SNA. These protocols have different requirements in order to properly work with the infrastructure components.

Table 3-2 on page 34 lists the network requirements for the infrastructure server components.

Table 3-2 Communication protocol requirements

Component	Protocol
CMS	<ul style="list-style-type: none"> ▶ TCP/IP <ul style="list-style-type: none"> – Windows <ul style="list-style-type: none"> • Microsoft® Winsock V1.1 or higher. • Microsoft TCP/IP protocol stack. ▶ IP.PIPE <ul style="list-style-type: none"> – HP-UX V11.00 32-bit <ul style="list-style-type: none"> • Apply patch PHNE_21767 cumulative ARPA Transport Patch. – HP-UX V11.00 64-bit <ul style="list-style-type: none"> • PHCO_22021, PHKL_22208, PHSS_21950, PHKL_22031, PHCO_19656, PHKL_21349, PHKL_22030, PHKL_20151 ▶ SNA <ul style="list-style-type: none"> – Windows <ul style="list-style-type: none"> • Microsoft SNA Server V3.0 or higher. Service Pac 1 is required for SNA Server v4.0. • IBM Communications Server V5.0 or 5.2 (fixes JR10466 and JR10368 are required for V5.0).

Component	Protocol
CNPS	<ul style="list-style-type: none"> ▶ TCP/IP (required) <ul style="list-style-type: none"> – Windows <ul style="list-style-type: none"> • Microsoft Winsock V1.1 or higher. • Microsoft TCP/IP protocol stack. ▶ IP.PIPE ▶ SNA <ul style="list-style-type: none"> – Windows (optional) <ul style="list-style-type: none"> • Microsoft SNA Server V3.0 or higher. Service Pack 1 is required for SNA Server v4.0. • IBM Communications Server v5.0 or 5.2 (fixes JR10466 and JR10368 are required for v5.0).

Component	Protocol
Candle Management Agent Framework	<ul style="list-style-type: none"> ▶ TCP/IP <ul style="list-style-type: none"> – Windows <ul style="list-style-type: none"> • Microsoft Winsock V1.1 or higher. • Microsoft TCP/IP protocol stack. ▶ IP.PIPE ▶ SNA <ul style="list-style-type: none"> – Windows: 32-bit version of one of the following: <ul style="list-style-type: none"> • IBM PCOMM V4.11 or higher (Fix IC19970 is required on Windows 2000 Server or Workstation). • IBM Communications Server V5.0 or higher (Fixes JR10466 and JR10368 are required for SNA Server V5.0). • Microsoft SNA Server v3 or higher (Service Pack 1 is required for SNA Server V4.0). • Attachmate EXTRA! V6.2, 6.3, or 6.4 (Fix for case number 1221139 is required for Versions 6.2 and 6.3; a fix for case number 1274151 is required for Version 6.4). • Walldata RUMBA V5.1 or higher (Walldata PTF OPK52002 is required for RUMBA versions less than 5.2A).

3.2 Candle Management Server

The Candle Management Server (CMS) is the focal point for the reception of alerts, collection of performance and availability data, and acts as a repository for historical data generated by OMEGAMON agents.

The CMS is supported on the following operating system platforms:

- ▶ AIX
- ▶ HP-UX
- ▶ Solaris
- ▶ Windows XP, 2000, or 2003 Server
- ▶ z/OS

3.2.1 Candle Management Server installation

This section provides details on installing the CMS server on Windows and on UNIX.

Installing on Windows

Run the InstallShield on Windows to install the CMS components:

1. Log on to the system with a user ID that has Administrator rights.
2. Load the installation image (choose one of the following):
 - a. Insert the IBM Tivoli OMEGAMON XE Platform CD into the system's CD drive.
 - b. Access the installation image on a network share.
 - c. Copy the installation image to a local disk drive.
3. Change directories to the WINDOWS directory on the image and run setup.exe.

Note: Depending on the setup of the Windows system, the installation may start automatically.

4. The Welcome screen appears as in Figure 3-1 on page 38. Click **Next** to continue.

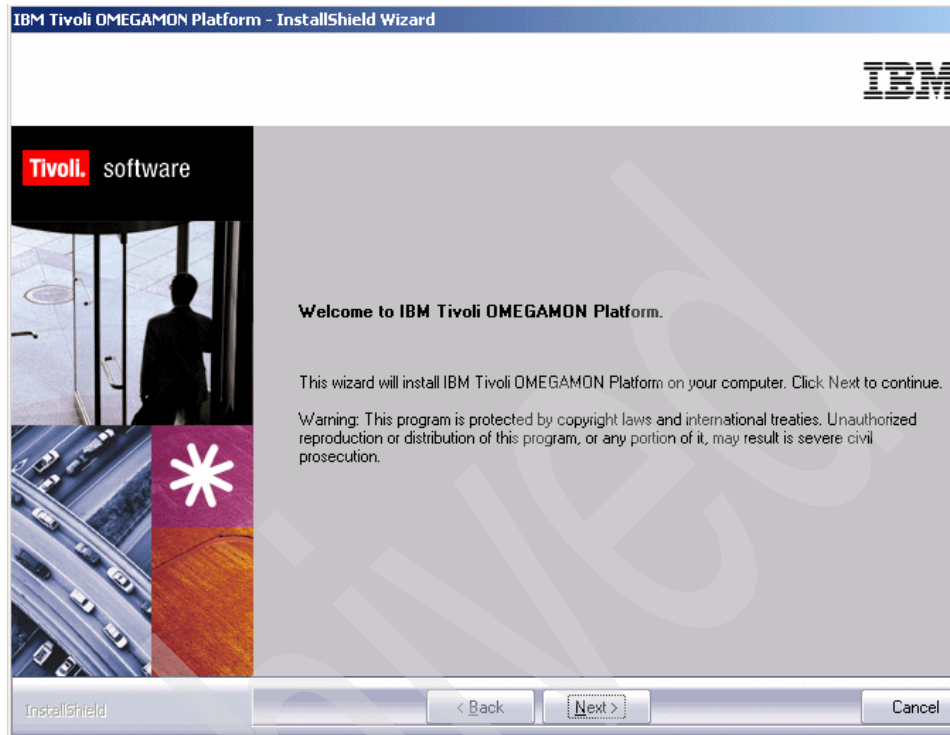


Figure 3-1 CMS Welcome screen

5. Read the software license agreement and click **Accept**.
6. If the prerequisite dialog appears, read the information and click **Next**.
7. If the location menu appears (see Figure 3-2 on page 39), select the target drive and directory for the software (the default is C:\Candle).

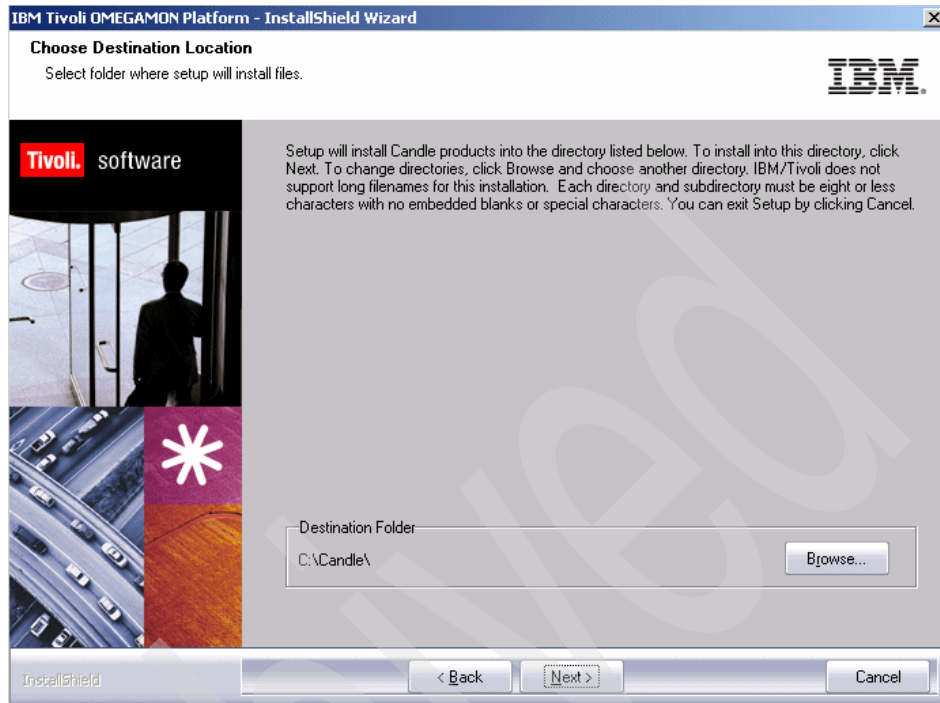


Figure 3-2 Location menu

8. On the Select Features menu (Figure 3-3 on page 40), choose the components to install, in this case, select the **Agent Support** and the **Candle Management Server**. Click the + sign to expand the section and see all the available options. Clicking the box next to the main feature will select all of the sub-features.

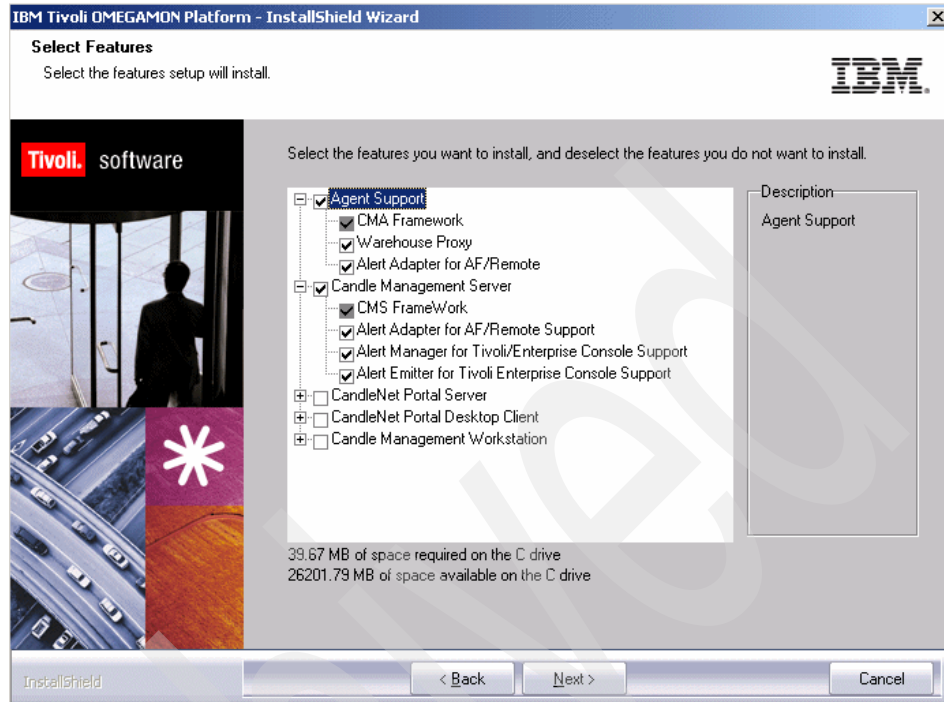


Figure 3-3 Select features menu

9. Once you have selected the components to install, click **Next** to continue.
10. The Select Program Folder menu appears; either take the defaults or make changes and click **Next**.
11. Review the settings in the Confirmation Installation menu that appears (Figure 3-4 on page 41). If these appear correct, click **Next**; if you wish to make changes, click **Back** and make changes.

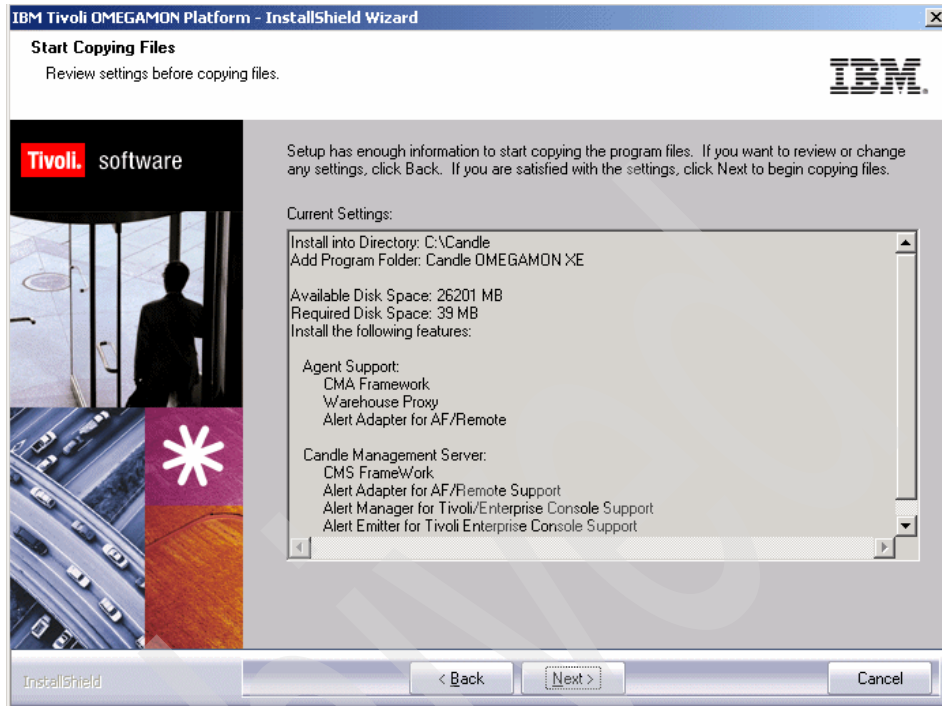


Figure 3-4 Confirm installation menu

12. The InstallShield Wizard copies the files and makes updates to complete the installation of the CMS. Once this is complete, the Setup Type menu is displayed (Figure 3-5 on page 42).

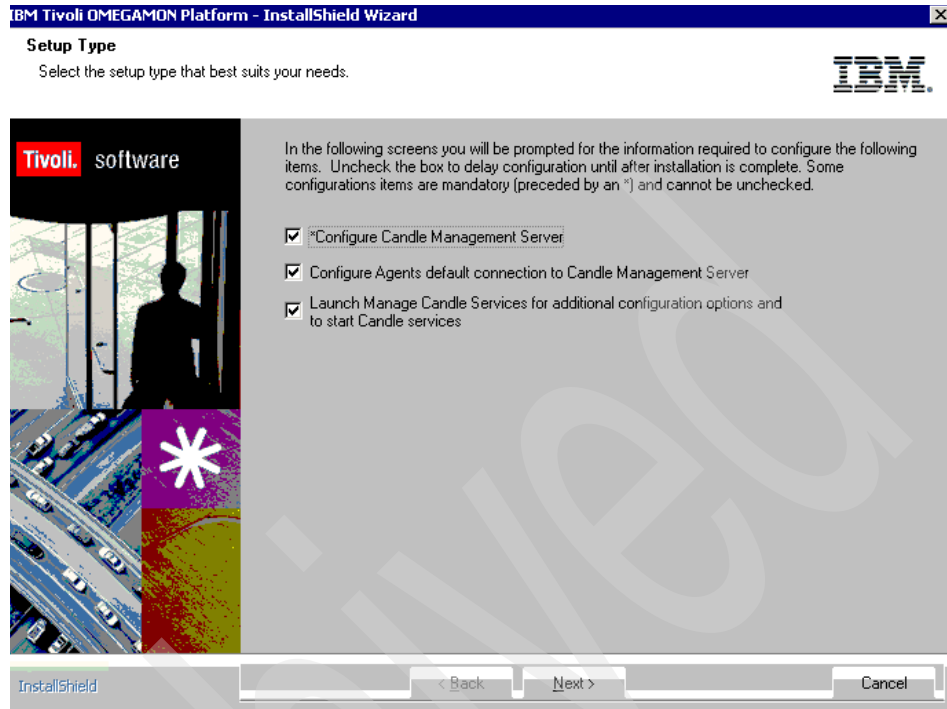
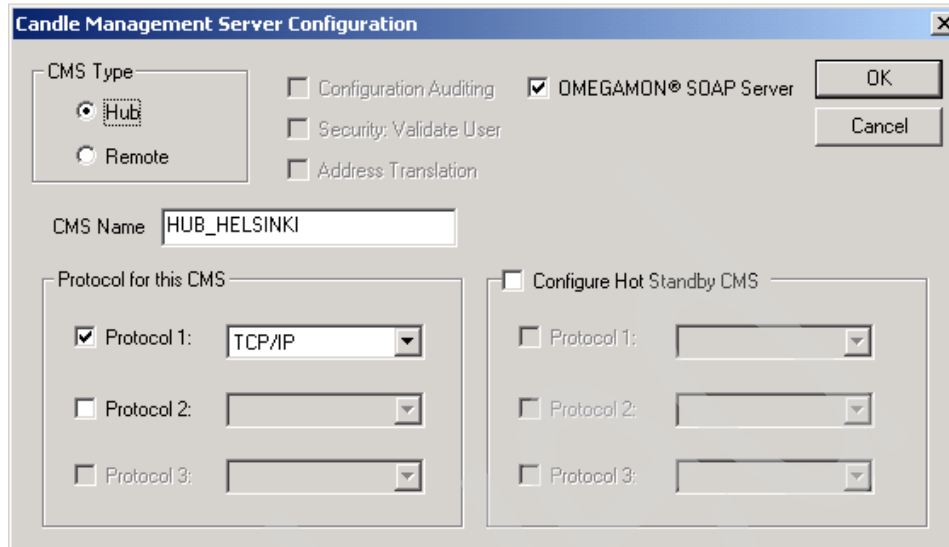


Figure 3-5 Setup Types menu

13. In the Setup Types menu, select which components to configure. The options in this menu are controlled by what components were installed. Configure Candle Management Server is not optional and we have also taken the default setting, which is all options selected. Once you make the selections, click **Next** to continue.
14. The Candle Management Server Configuration menu is displayed (Figure 3-6 on page 43). In this menu, select **CMS Type, Hub**, or **Remote**; enter a name for the CMS and select one or more protocols. We have selected **Hub** and chosen **TCP/IP** as the communication protocol.



Candle Management Server Configuration

CMS Type

☒ Hub
☐ Remote

☐ Configuration Auditing ☒ OMEGAMON® SOAP Server

☐ Security: Validate User

☐ Address Translation

OK Cancel

CMS Name: HUB_HELSINKI

Protocol for this CMS

☒ Protocol 1: TCP/IP

☐ Protocol 2:

☐ Protocol 3:

☐ Configure Hot Standby CMS

☐ Protocol 1:

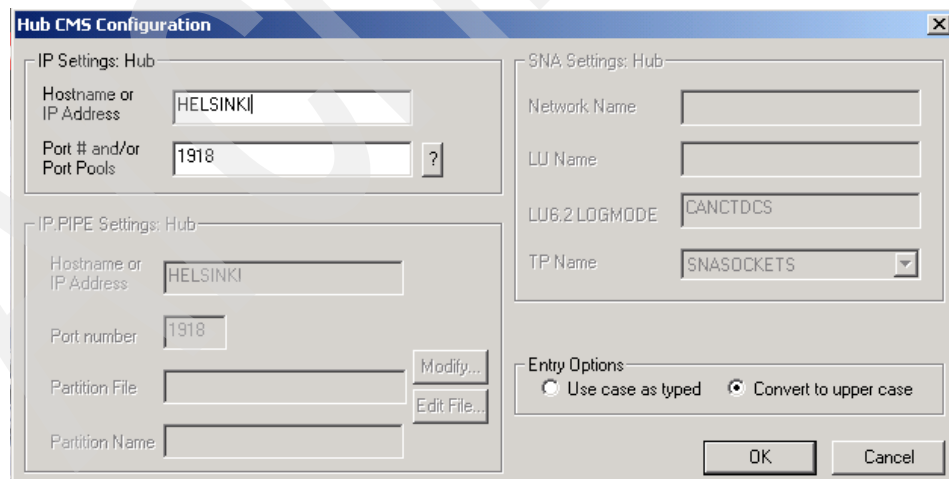
☐ Protocol 2:

☐ Protocol 3:

Figure 3-6 Configure CMS menu

15. Once complete, click **OK** to continue.

16. The Hub CMS Configuration menu appears (see Figure 3-7). Enter the host name or IP address of the CMS and the port number or port pools to be used by the CMS.



Hub CMS Configuration

IP Settings: Hub

Hostname or IP Address: HELSINKI

Port # and/or Port Pools: 1918 ?

IP/PIPE Settings: Hub

Hostname or IP Address: HELSINKI

Port number: 1918

Partition File: Modify...

Partition Name: Edit File...

SNA Settings: Hub

Network Name:

LU Name:

LU6.2 LOGMODE: CANCTDCS

TP Name: SNASOCKETS

Entry Options

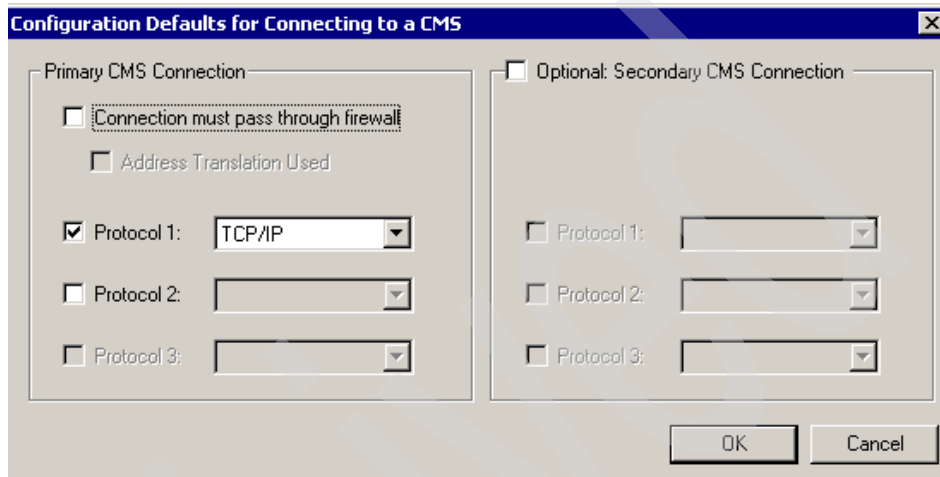
☐ Use case as typed ☒ Convert to upper case

OK Cancel

Figure 3-7 Configure CMS communication menu

17. Once the information is complete, click **OK** to continue. The installer will make the configuration updates to the CMS.

18. If Configure Agent Defaults was selected, then the Configuration Defaults for Connecting to a CMS menu will appear (see Figure 3-8). This allows you to set the default configuration for communication between agents and this CMS. We have selected one protocol and chosen **TCP/IP**. Once the selections are made, click **OK**.



The dialog box is titled "Configuration Defaults for Connecting to a CMS". It contains two main sections: "Primary CMS Connection" and "Optional: Secondary CMS Connection".

Primary CMS Connection:

- ☐ Connection must pass through firewall
- ☐ Address Translation Used
- ☒ Protocol 1: TCP/IP (dropdown menu)
- ☐ Protocol 2: (dropdown menu)
- ☐ Protocol 3: (dropdown menu)

Optional: Secondary CMS Connection:

- ☐ Protocol 1: (dropdown menu)
- ☐ Protocol 2: (dropdown menu)
- ☐ Protocol 3: (dropdown menu)

At the bottom right, there are "OK" and "Cancel" buttons.

Figure 3-8 Configuration Defaults for Connecting to a CMS

19. The Configuration Defaults for Connecting to a CMS menu is displayed in Figure 3-9 on page 45. Enter the CMS host name or IP address and the port number or port pools. Click **OK** to continue.

Configuration Defaults for Connecting to a CMS

Configure Primary CMS

IP Settings

Hostname or IP Address: HELSINKI

Port # and/or Port Pools: 1918

IP.PIPE Settings

Hostname or IP Address: NTHAMACHI

Port number: 1918

Partition Name:

For Warehouse Proxy Only

Partition File: [] [Modify] [Edit File]

SNA Settings

Primary CMS

Network Name:

LU Name:

LU6.2 LOGMODE: CANCTDCS

TP Name: SNASOCKETS

Local LU Alias (not required if using defined default):

Entry Options

☐ Use case as typed ☒ Convert to upper case

OK Cancel

Figure 3-9 Configuration Defaults for Connecting to a CMS menu

20. Once the defaults are configured, the InstallShield Wizard Complete menu appears. This will give you the chance to display the README file. Click **Finish** to complete the installation.
21. If you launched the Manage Candle Services in Figure 3-5 on page 42, then the Manage Candle Services interface will appear on the screen, allowing you to start the CMS (see Figure 3-10 on page 46). Right-click the **Candle Management Server** and select **Start**. The installation of the CMS is now complete.

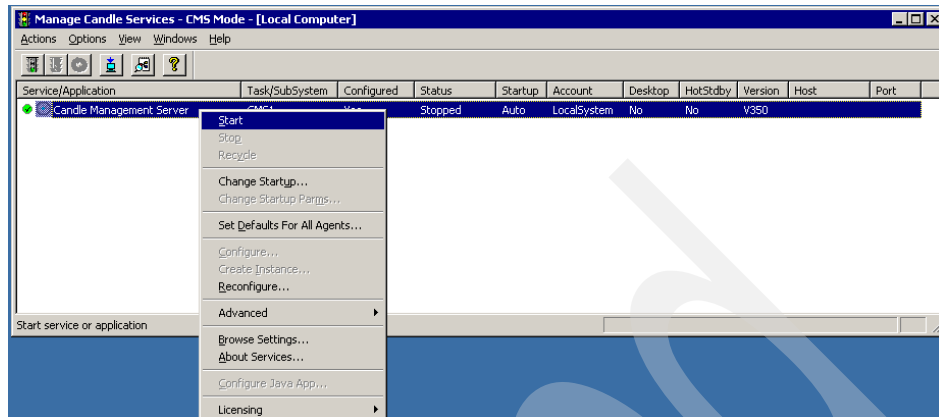


Figure 3-10 Manage Candle Services

Once the CMS has been successfully installed, the other components can be installed and configured.

3.2.2 CandleNet Portal

CandleNet Portal is the interface for your OMEGAMON XE products. You use CandleNet Portal to get a high level overview of your network environment. One section of the window displays the Navigator, a tree-like view of your monitored network, from the top level (ENTERPRISE) down to individual groupings of information collected by OMEGAMON monitoring agents. The rest of the window is filled with views pertinent to the chosen item in the Navigator tree. From the top level or from your home workspace, you can navigate to specific locations to check activity and investigate problems.

In summary, the characteristics of CandleNet Portal include:

- ▶ A Navigator view of your enterprise. When a condition you are monitoring exceeds thresholds you define, an alert appears within the physical navigator view to let you know.
- ▶ Workspaces that contain various types of information whose format and content you can customize.
- ▶ Attributes you can use to create situations that monitor areas of particular interest and issue alerts when specified conditions are met.
- ▶ Predefined situations you can either use as is to begin monitoring immediately, or you can copy then modify them to monitor your specific environment.

3.2.3 Modes of operation

There are two modes of operation for the CandleNet Portal:

- ▶ Desktop mode, in which the CandleNet Portal client is installed on your machine and runs as a desktop application.
- ▶ Browser mode, in which the thin client software is downloaded from the CandleNet Portal Server to your machine the first time you log on to CandleNet Portal from your browser, and thereafter when there are software updates. When using CandleNet Portal in browser mode, you can start it from any machine by entering the URL for the Web server where the CNP Server is installed. CandleNet Portal requires TCP/IP. IBM Tivoli products do not require a Domain Name Server (DNS). If your Windows systems are running without DNS, make sure the `\etc\hosts\` file of the local machine is up to date.

3.2.4 Supported operating systems

All CandleNet Portal components are supported on the following Windows operating systems:

- ▶ Windows XP Professional Edition with Service Pack 1 or higher
- ▶ Windows 2000 with Service Pack 3 or higher
- ▶ Windows 2003 Server

Note: Windows operating systems listed are for Intel®-based (x86) CPUs and compatible CPUs only.

3.2.5 Product prerequisites

- ▶ Java Runtime Environment. The CandleNet Portal Server, desktop client, and browser client run Java-based software. Each of these components must have a version of the Sun™ Microsystems™ JRE installed: any version from 1.3.1_04 to 1.4.2. The following steps are required only if you do not have the required JRE installed locally:
 - a. Go to Sun's Java 2 Platform Standard Edition (J2SE™) Web page to download the latest supported version at the following URL:
<http://java.sun.com/j2se/downloads/index.html>
 - b. Follow the downloaded instructions on the site.
- ▶ The CandleNet Portal Server requires prior installation of one of the following
 - a. DB2 UDB V8.1
(The installation package includes DB2 UDB, which IBM encourages its clients to use as the CandleNet Portal Server database.)

b. Microsoft SQL Server Version 7.0 or 2000

- The CandleNet Portal browser client is automatically installed with CandleNet Portal on the same system as your CandleNet Portal Server. The browser client software is downloaded from here the first time a user enters the URL to start the CandleNet Portal browser mode. The CandleNet Portal browser mode requires Microsoft Internet Explorer® 5.5 or above.

Table 3-3 lists the minimum and recommended hardware requirements for CandleNet Portal Server and desktop client.

Table 3-3 Hardware requirements for CandleNet Portal Server

Minimum requirements	Recommended requirements
1 GHz or higher processor	1 GHz or higher processor
512 MB RAM	1 GB RAM
300 MB or more of available hard drive space	300 MB or more of available hard drive space
150 MB or more of virtual memory in addition to operating system or other application requirements	150 MB or more of virtual memory in addition to operating system or other application requirements
Video card supporting 64 K color and 1024 by 768 resolution (Super VGA)	Video card supporting 64K colors and 1024 by 768 resolution or higher

3.2.6 Starting the InstallShield Wizard

In this step, you will start the InstallShield Wizard and specify the target directory for the OMEGAMON Platform and CandleNet Portal software. Perform the following steps:

1. Log on to Windows using an ID with Administrator authority and close any running applications.
2. Insert the OMEGAMON Platform and CandleNet Portal product CD into your CDROM drive. Installation begins automatically and the InstallShield Wizard displays.

Note: If the installer does not start, go to the WINDOWS CD-ROM directory and run setup.exe. If the setup.exe initialization fails, you do not have enough disk space to decompress the setup files.

3. Read the text that welcomes you to the installation and click **Next** to continue.
4. The Software License Agreement dialog box will appear. Read the software license agreement and click **Accept**.

5. The Choose Destination Location dialog box will appear. Specify the target drive and directory where you want to download the OMEGAMON Platform and CandleNet Portal software. The recommended default is C:\Candle.
6. Click **Next** to continue.
7. In this step, you will choose the component products and support for CandleNet Portal that you want to install locally (Figure 3-11). Click **Next** to continue.

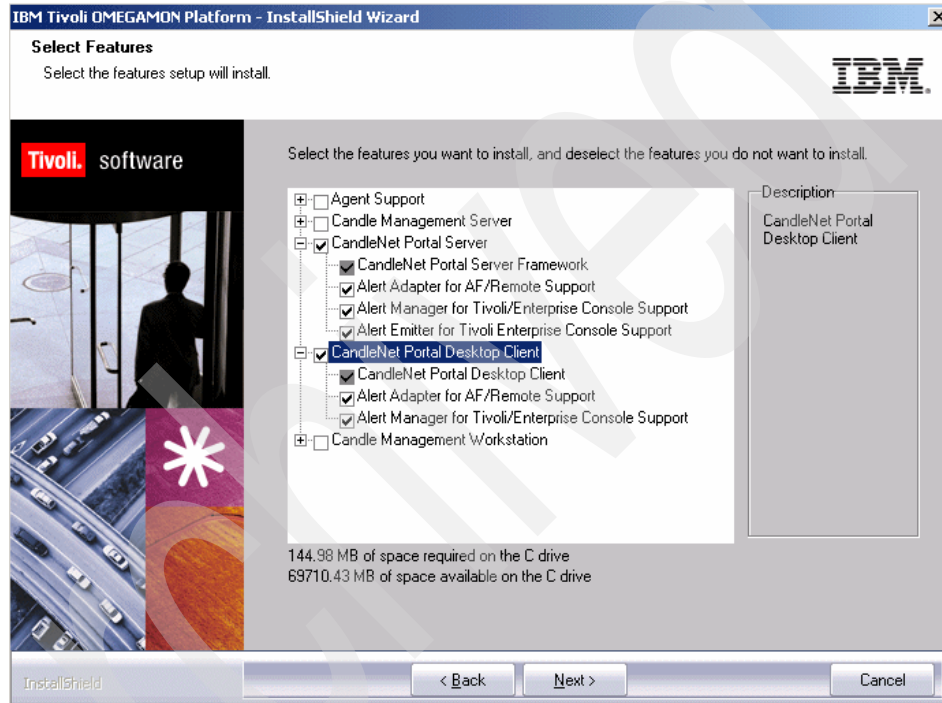


Figure 3-11 CandleNet Portal Component Installation

8. To determine the folder in which the files will be installed, accept the folder name that appears in the Program Folder text box, type in a new name, or select one of the existing folders in the list below. IBM recommends that you use the default Program Folder name shown. Click **Next** to continue.
9. The Start Copying Files screen will appear. This screen shows the destination directory and program folder information you supplied in the previous steps, and lists the modules you chose to install.
10. Review the settings and click **Back** if you want to go back and change them. If you want to start copying files with the settings that are listed, click **Next**. The Setup Status screen will appear and the InstallShield Wizard will begin.

configuring the installation and copying files needed to complete the installation. Then the Setup Type dialog box will appear.

11. Leave selected (checked) the items that you want to configure before completion of the installation. Deselect (uncheck) the items for which you want to delay configuration until after completion of the installation (Figure 3-12).

Note: Some configuration items are mandatory (preceded by an *) and cannot be unchecked.



Figure 3-12 Configure the installed products

Click **Next** to continue

12. The next window (Figure 3-13 on page 51) will ask you define the CNP Host information.

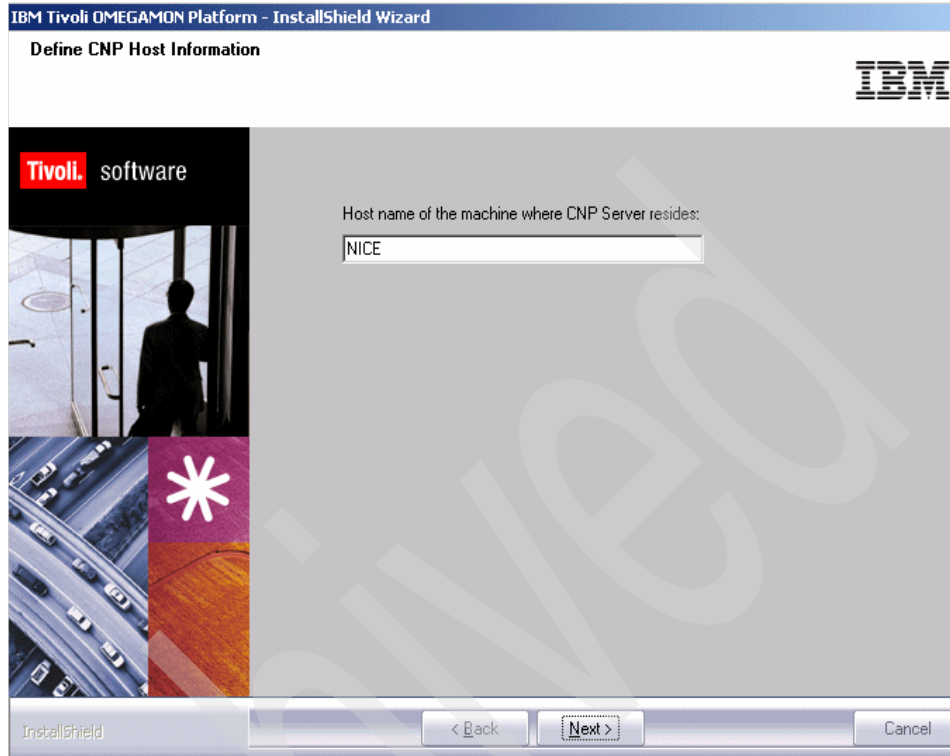


Figure 3-13 CNP host information

Click **Next** to continue.

13. The next window (Figure 3-14 on page 52) will be the CNPS Data Source Config Parameters. You will be prompted to enter your Database Administrator ID and password and will be asked to accept the CNPS database user ID and password. You can change the default CNPS password.

Figure 3-14 CNPS data source configuration

Click **OK**.

14. The next window (Figure 3-15 on page 53) will be the CNP connection to the Hub CMS configuration. Do one of the following:

- a. If the CandleNet Portal Server will access the CMS through a firewall, perform the following procedure:
 - i. The **Connection must pass through firewall** option must be selected. The IP.PIPE protocol is automatically selected for Protocol 1. You must use IP.PIPE if the CandleNet Portal Server resides outside a firewall. The remaining two Protocol fields are disabled; only IP.PIPE may be used.
 - ii. If your site uses Network Address Translation (NAT) between the CandleNet Portal Server and the CMS, select **Address Translation Used** option.
- b. If the CandleNet Portal Server will not communicate with the CMS across a firewall, select up to three of the following communications protocols:
 - i. TCP/IP
 - ii. SNA
 - iii. IP.PIPE

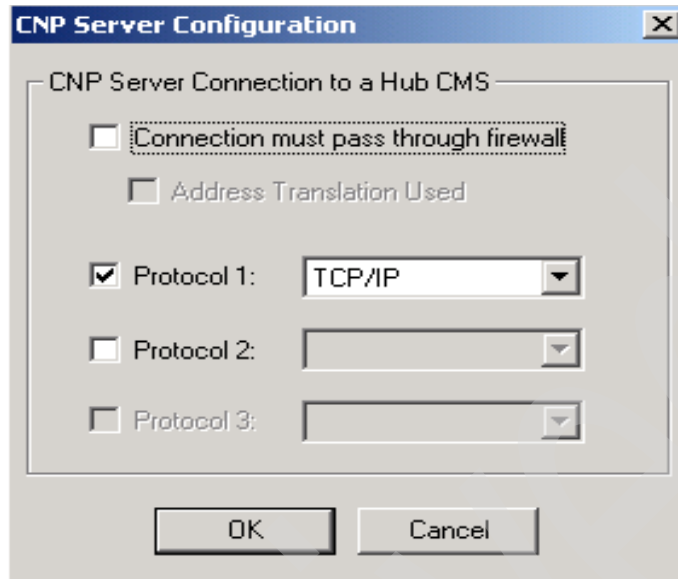


Figure 3-15 CNP server configuration

We have selected TCP/IP (Protocol 1), because we do not have any firewalls between the CandleNet Portal Server and the Hub CMS. Click **OK**.

15. The second CNP Server Configuration dialog box will appear (Figure 3-16 on page 54).
 - a. Enter your HUB CMS host name or IP. The CMS listening port for the agent that IBM recommends is 1918; however, if you must change it, enter the new port number (IBM recommends numbers 1025 to 65535).
 - b. If you are configuring SNA communication, enter the following under SNA Settings of the CMS:
 - i. Network Name: Your site's SNA network identifier.
 - ii. LU Name: The LU name for this agent. This LU name corresponds to the Local LU Alias in your SNA communications software.
 - iii. LU6.2 LOGMODE: The name of the LU6.2 logmode. IBM recommends that you use the default name shown (CANCTDCS).
 - iv. TP Name: The Transaction Program name for this agent.
 - c. If you are configuring IP.PIPE communication, enter the Partition Name (required only by sites using address translation). This is the name of the partition that the CandleNet Portal Server uses, up to 32 letters and numbers. This name will be stored in the CandleNet Portal Server

KFWENV file and corresponds to the partition name entry in the Hub CMS partition file.

The image shows a 'CNP Server Configuration' dialog box with the following sections:

- IP Settings of the CMS:**
 - Hostname or IP Address:
 - Port # and/or Port Pools: ?
- IP.PIPE Settings of the CMS:**
 - Hostname or IP Address:
 - Port number:
 - Partition Name:
 - Partition File: Modify... Edit File...
- SNA Settings of the CMS:**
 - Network Name:
 - LU Name:
 - LU6.2 LOGMODE:
 - TP Name: ▼
 - Local LU Alias (not required if using defined default):
- Entry Options:**
 - ☐ Use case as typed
 - ☒ Convert to upper case

Buttons at the bottom: OK Cancel

Figure 3-16 Second CNP server configuration dialog box

IBM recommends that you retain the default settings. Click **OK** to confirm the CandleNet Portal Server configuration you have supplied.

3.3 IBM Tivoli OMEGAMON DE

IBM Tivoli OMEGAMON DE offers a dashboard view of your enterprise. It gives you a single point of control for managing the resources that your business-critical applications rely on, including a range of operating systems, servers, databases, mainframes, and Web components. For example, a typical IT network might have a Web server running on Windows, an application server running on UNIX, a database on z/OS, and a transaction processor on CICS® on the mainframe. IBM Tivoli OMEGAMON DE brings all these views together in a single window, so you can see when any component is not working as expected.

3.3.1 Installing IBM Tivoli OMEGAMON DE

Perform the following procedure to install the IBM Tivoli OMEGAMON DE:

1. Insert the IBM Tivoli OMEGAMON DE product CD into your CDROM drive. Installation begins automatically. (If the installer does not start, go to the CD-ROM directory and run setup.exe. If setup.exe initialization fails, you do

not have enough disk space to decompress the setup files.) The InstallShield Wizard opens.

2. Read the text that welcomes you to the installation and click **Next** to continue.
3. Read the software license agreement and click **Accept**.
4. IBM Tivoli OMEGAMON DE will be installed, and the InstallShield Wizard Complete dialog box displays. If you want the Manage Candle Services window to open when the installation is finished, make sure **Manage Candle Services will be launched to complete configuration and start services** check box is selected (Figure 3-17).

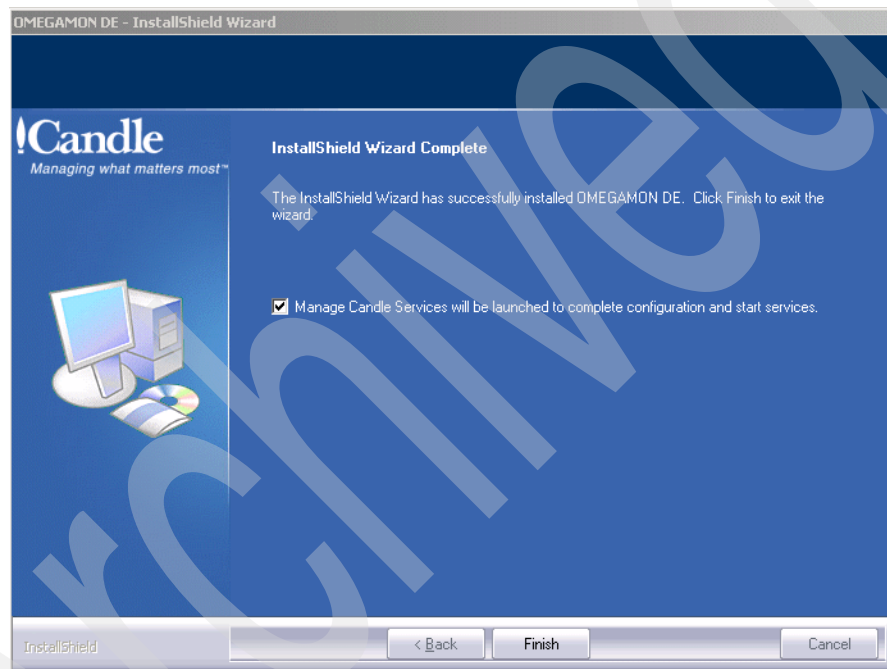


Figure 3-17 Installing IBM Tivoli OMEGAMON DE

5. Click **Finish**.

3.4 Verifying the installation

The installation can be verified in several ways.

- ▶ The installation logs can be checked to verify the outcome of the install process.
 - Windows: The installation log is located in CANDLEHOME\INSTALL and it is named “IBM Tivoli OMEGAMON Platform <date> <time>.log”. Example 3-1 contains a sample from the log. Note that the log will vary based on selected components.

Example 3-1 The installation log: Windows

```
5-19-2005 16:35:51 Features to be installed:
5-19-2005 16:35:51 CandleNet Portal Browser Client: CNP Browser Client
Framework
5-19-2005 16:35:51 Agent Support: CMA Framework
5-19-2005 16:35:51 Candle Management Server: CMS Framework
5-19-2005 16:35:51 CandleNet Portal Server: CandleNet Portal Server Framework
5-19-2005 16:35:51 CandleNet Portal Desktop Client: CandleNet Portal Desktop
Client
5-19-2005 16:35:51 Candle Management Workstation: CMW Framework
.....
.....
5-19-2005 16:44:54 Installation Complete.
```

- UNIX: The installation log is located in CANDLEHOME\logs and it is named candle_installation.log. Example 3-2 contains a sample from the UNIX log.

Example 3-2 The installation log: UNIX

```
You selected "AIX R5.2 (32 bit)"
You selected the following products:
    Candle Management Server V350R260
.....
.....
Installation step complete.
```

- ▶ The Manage Candle Services application will allow you to start the CMS and CNPS if the installation was successful.
- ▶ On UNIX, you can use the **cinfo** command to view the installed products, as shown in Example 3-3 on page 57.

Example 3-3 cinfo command

```
cd CANDLEHOME/bin
./cinfo -i (sample details below)
ax      Candle Shared Libraries
        aix433  Version: 350 Rel: 260
ms      Candle Management Server
        aix433  Version: 350 Rel: 260
```

Now that the ITM Tivoli OMEGAMON platform components are installed and configured, the next step is to install and configure the IBM Tivoli OMEGAMON XE for WebSphere Business Integration agents to monitor the target applications.

Installation and configuration of WebSphere MQ Agents

After installing the OMEGAMON Framework, the next step is to install and configure the OMEGAMON XE for WBI Agents. In this chapter, we discuss the installation and configuration steps for WebSphere MQ Configuration and WebSphere MQ Monitoring Agents. In Chapter 7, “WebSphere Integration Brokers Monitoring” on page 193, we will talk about the installation and configuration of the WebSphere Integration Brokers Monitoring Agent. Also, the WebSphere Interchange Server Monitoring Agent will be covered in Chapter 8, “WebSphere Interchange Server Monitoring” on page 255.

The following are covered in this chapter:

- ▶ 4.1.1, “Installing the WebSphere MQ Agent on z/OS” on page 60
- ▶ 4.1.2, “Installing the WebSphere MQ Agent on UNIX” on page 80
- ▶ 4.1.3, “Installing OMEGAMON WebSphere MQ Agent on Windows” on page 86
- ▶ 4.1.4, “Create additional instances of the agent” on page 96
- ▶ 4.2, “WebSphere MQ Configuration Agent configuration” on page 98

4.1 WebSphere MQ Agent installation and configuration

In this section, we will discuss how to install and configure WebSphere MQ Agent on different platforms. Note that although OMEGAMON XE for WebSphere MQ Configuration and OMEGAMON XE for WebSphere MQ Monitoring are two separate components, there is no separate installation for them, except for the z/OS platform. On the z/OS platform, you can install WebSphere MQ Configuration Agent and WebSphere MQ Monitoring Agent separately, but on all the other supported platforms, both of these agents are installed when you install the WebSphere MQ Agent.

4.1.1 Installing the WebSphere MQ Agent on z/OS

We will start with the installation of the WebSphere MQ Agent on z/OS. There are couple of differences in the installation of WebSphere MQ Agent on z/OS and the distributed platforms.

First of all, the installation on z/OS does not use the installation wizard used for the distributed platforms. Instead, two separate tools are used. The installation step is performed using the System Modification Program/Extended (SMP/E) tool, and the configuration is done using the Candle Installation and Configuration Assistant (CICAT) tool.

SMP/E is a tool designed to manage the installation of software products on z/OS systems and to track the modifications made to those products. SMP/E allows you to test new versions of a software or apply maintenance to an existing version on a production system while the old version is being used by the production applications simultaneously. Note that SMP/E is not specific to OMEGAMON products; most of the products on the z/OS platform use SMP/E services.

The CICAT tool, on the other hand, is a customization tool shipped with OMEGAMON products on z/OS to facilitate customization of the OMEGAMON products on this platform.

Another difference between the installation and configuration of agents on z/OS and distributed platforms is that on the distributed platforms, installation and configuration is usually done by the same person, while on z/OS, the SMP/E process is usually performed by the systems administrator and CICAT is done by the OMEGAMON XE for WBI product specialist.

Finally, as mentioned in the previous section, you can install OMEGAMON XE for WebSphere MQ Configuration and OMEGAMON XE for WebSphere MQ Monitoring on z/OS separately.

Prerequisites for configuring the component product

Below are the prerequisites for configuring the WebSphere MQ Agent on z/OS.

If you have not already done so, verify the following for the component product you want to configure:

- ▶ You have the required DASD space.
- ▶ You must have installed the component product using the System Modification Program/Extended (SMP/E) tool.
- ▶ You must have completed the configuration for a Candle Management Server (CMS).

In addition, the following manuals will help you during the installation:

- ▶ *IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring on z/OS V4.0 Program Directory*, GI11-4061.
- ▶ *Installation and Configuration of Candle Products on OS/390 and z/OS*, GC32-9214
- ▶ *IBM Tivoli OMEGAMON XE for WebSphere MQ on z/OS Configuration and Customization Guide*, GC32-9329

Notes:

- ▶ The OMEGAMON XE for WebSphere MQ on z/OS Program Directory, along with other Tivoli Program Directories, can be found by following links to the product from the support Web site listed below:

<http://www-3.ibm.com/software/sysmgmt/products/support/>

- ▶ The OMEGAMON XE for WebSphere MQ on z/OS product manuals and all other Tivoli product manuals can be found at the Tivoli Information Center URL listed below:

<http://publib.boulder.ibm.com/tividd/td/tdprodlist.html>

Setting up the configuration environment

Do the following to set up the configuration environment:

1. After installing the component product tape that contains the FMID (HKCI310), read the overview described in *IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring on z/OS V4.0 Program Directory*, GI11-4061, which says that you must copy the contents from one of the target libraries into the appropriate Candle Installation and Configuration Assistant (CICAT) tool work library. This applies to products installed into either an existing consolidated software inventory (CSI) or into a new CSI.

2. In our test environment, we have installed components to a new CSI, as shown in Figure 4-1. The attributes for the new dataset are shown in the picture.

Note: Since this was the first OMEGAMON product installed on our test system, we used INSTLIB. If there were other OMEGAMON products installed on our test system, we would use INSTLIBW.

Menu	RefList	Utilities	Help
Command ==> Allocate New Data Set Command is not a			
Data Set Name	:	OMWBI.INSTLIB	
Management class	:	-	(Blank for default management class)
Storage class	:		(Blank for default storage class)
Volume serial	:	TAROM1	(Blank for system default volume) *
Device type	:		(Generic unit or device address) **
Data class	:		(Blank for default data class)
Space units	:	BLOCK	(BLKS, TRKS, CYLS, KB, MB, BYTES or RECORDS)
Average record unit	:		(M, K, or U)
Primary quantity	:	516	(In above units)
Secondary quantity	:	247	(In above units)
Directory blocks	:	132	(Zero for sequential data set) *
Record format	:	FB	
Record length	:	80	
Block size	:	8880	
Data set name type	:	PDS	(LIBRARY, HFS, PDS, or blank) *
Expiration date	:		(YY/MM/DD, YYYY/MM/DD YY.DDD, YYYY.DDD in Julian form DDDD for retention period in days or blank)
Enter "/" to select option			
Allocate Multiple Volumes			
(* Specifying LIBRARY may override zero directory block)			
(** Only one of these fields may be specified)			
F1=Help F3=Exit F10=Actions F12=Cancel			

Figure 4-1 Creating a new dataset

3. Copy the contents of the OMEGAXE.TKCIINST library into the OMWBI.INSTLIB library. You can use the JCL in Example 4-1 for this purpose.

Example 4-1 JCL used for the copy operation

```
//COPY EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//IN DD DSN=OMEGAXE.TKCIINST,DISP=SHR
//OUT DD DSN=OMWBI.INSTLIB,DISP=SHR
//SYSIN DD *
C 0=OUT,I=((IN,R))
```

Note: We used following high-level qualifiers for our installation:

- OMEGAXE: For the target library for SMP/E
- OMWBI: For the runtime library

Alternatively, you can perform the copy operation through ISPF panels, as shown in Figure 4-2.

The screenshot shows the ISPF Copy panel with the following content:

```
Menu  RefList  Utilities  Help
COPY      From OMEGAXE.TKCIINST(*)
Command ==>
Specify "To" Data Set Below

To ISPF Library:                                Options:
Project . . . EP0                                Enter "/" to select option
Group . . . ISPF41                               Replace like-named members
Type . . . PROFILE                             / Process member aliases

To Other Partitioned or Sequential Data Set:
Data Set Name . . . 'OMWBI.INSTLIB'
Volume Serial . . . (If not cataloged)
Data Set Password . . . (If password protected)

To Data Set Options:
Sequential Disposition          Pack Option          SCLM Setting
1 1. Mod                        3 1. Yes          3 1. SCLM
2 2. Old                        2. No           2. Non-SCLM
                               3. Default      3. As is

F1=Help  F3=Exit  F10=Actions  F12=Cancel
```

Figure 4-2 Copy the datasets via ISPF

4. Start the Configuration tool, and do the following:
 - a. Log on to a TSO session.
 - b. Invoke ISPF.
 - c. Go to a TSO command line. (In most cases, this is done by entering 6 on the ISPF Primary Option Menu.)
 - d. Enter the following command:
EX 'OMWBI.INSTLIB'
where the variable OMWBI is the SMP/E dataset high-level qualifier.

5. From the Main Menu, select “Set up work environment” (Figure 4-3).

```
----- MAIN MENU -----
OPTION ==> _
Enter the number to select an option:
  1  Set up work environment
  2  Install products or maintenance
  3  Configure products
  I  Installation information          <=== Revised
  S  Services and utilities

      Installation and Configuration Assistance Tool Version 310
      (C) Copyright IBM Corp. 1992-2004
      Licensed Material - Program Property of IBM

F1=Help  F3=Back

F1=HELP  F2=SPLIT  F3=END  F4=RETURN  F5=RFIND  F6=
F7=UP    F8=DOWN   F9=SWAP  F10=LEFT  F11=RIGHT  F12=
```

Figure 4-3 Main menu

6. In the Set Up Work Environment menu (Figure 4-4 on page 65), do the following:
 - a. Select “Specify options” to specify allocation and processing values that will be used to create the work data sets that are needed by the Configuration tool.
 - b. Select “Allocate work libraries” to allocate the Configuration tool work libraries.

```

----- SET UP WORK ENVIRONMENT -----
OPTION ==> _
Enter the number to select an option:
1 Specify options
2 Allocate work libraries

Last selected
Date      Time

Note: Once you create and submit the "Allocate work libraries" job,
you must exit the installer and allow the job to run before
restarting the installer.

F1=Help  F3=Back

F1=HELP  F2=SPLIT  F3=END  F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP    F8=DOWN   F9=SWAP F10=LEFT  F11=RIGHT F12=RETRIEVE

```

Figure 4-4 Set Up Work Environment menu

Important: Once you create and submit the Allocate work libraries job, you must exit the Configuration tool and allow the job to run before starting the Configuration tool again.

Creating a new runtime environment

Creating a runtime environment includes adding, building, configuring, and loading. Follow the steps in the next sections to create a new runtime environment.

Adding a new runtime environment

Perform the following steps to add a new runtime environment:

1. On the Runtime Environments panel, enter A (Add RTE) in the Action field of the first (blank) row in the list (Figure 4-5 on page 66).

Note: In our test environment, we added an RTE called sc58 as FULL type and not SHARING, as this is not a sysplex environment.

```

----- RUNTIME ENVIRONMENTS (RTEs) --- Enter required field
COMMAND ==>

Actions: A Add RTE, B Build libraries, C Configure,
        L Load all product libraries after SMP/E,
        D Delete, U Update, V View values, Z Utilities

Action Name      Type      Sharing      Description
A SC58          FULL      Full RTE for SC58
F1=Help F3=Back  (No RTEs defined, use Action A to Add)

F1=HELP      F2=SPLIT      F3=END      F4=RETURN      F5=RFIND      F6=RCHANGE
F7=UP        F8=DOWN       F9=SWAP     F10=LEFT       F11=RIGHT     F12=RETRIEVE

```

Figure 4-5 Adding the runtime environment

The runtime environment types are as follows:

- ▶ **FULL:** Allocates both private and base libraries. Use this if only one runtime environment will be defined for the environment, or if you add an runtime environment for a unique set of component products.
- ▶ **BASE:** Allocates base libraries only, and does not execute alone. Use this only in conjunction with **SHARING** runtime environments populated with the same component products.
- ▶ **SHARING:** Allocates private libraries only. This type can share base libraries with a **BASE** or **FULL** runtime environment populated with the same component products, or use SMP/E target libraries for its base libraries. Define one **SHARING** runtime environment for each z/OS image if you have multiple images.

For **SHARING** runtime environments only: Enter the name of the **BASE** or **FULL** runtime environment from which this runtime environment will obtain its base library information. If SMP/E target libraries are to be shared, enter **SMP**.

2. After specifying all required values on the runtime environments panel, press Enter.

Building a new runtime environment

To build the runtime environment, perform the following steps:

1. On the Runtime Environments panel, enter B (Build libraries) in the Action field of the runtime environment you are configuring (Figure 4-6).

```
----- RUNTIME ENVIRONMENTS (RTes) ----- ENTRY ADDED
COMMAND ==>

Actions: A Add RTE, B Build libraries, C Configure,
        L Load all product libraries after SMP/E,
        D Delete, U Update, V View values, Z Utilities

Action Name      Type      Sharing      Description
-----
D SC58           FULL      (No RTEs defined, use Action A to Add)

F1=HELP F3=Back F2=SPLIT F8=DOWN F3=END F9=SWAP F4=RETURN F10=LEFT F5=RFIND F11=RIGHT F6=RCHANGE F12=RETRIEVE
```

Figure 4-6 Building the runtime environment

2. Review the JCL and submit the job, or if you want to edit the values in this JCL, make the changes and then submit the job.
3. Verify that the job completes successfully. All return codes should be 0.

Configure a new runtime environment

To configure the runtime environment, perform the following steps:

Perform the following procedure to register the component product with a local CMS.

1. On the Runtime Environments panel, enter C (Configure) in the Action field of the runtime environment you are configuring (Figure 4-7 on page 68).

```
----- RUNTIME ENVIRONMENTS (RTEs) -----
COMMAND ==>
Actions: A Add RTE, B Build libraries, C Configure,
        L Load all product libraries after SMP/E,
        D Delete, U Update, V View values, Z Utilities

Action Name      Type      Sharing      Description
-----
C SC58          FULL      Full RTE for SC58
Enter=Next F1=Help F3=Back F7=Up F8=Down

F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=RCHANGE
F7=UP   F8=DOWN F9=SWAP F10=LEFT  F11=RIGHT F12=RETRIEVE
```

Figure 4-7 Configuring the runtime environment

- 2. Select the component product you want to configure.

In our test scenario, we are configuring the MQ Monitoring Agent, so we selected option 3 in the PRODUCT COMPONENT SELECTION COMPONENT menu, as shown in Figure 4-8 on page 69.

```
----- PRODUCT COMPONENT SELECTION MENU -----
COMMAND ==> 3

The following list of components requires configuration to make the product
operational. Refer to the appropriate configuration documentation if you
require additional information to complete the configuration.

To configure the desired component, enter the selection number on the command
line. You should configure the components in the order they are listed.

COMPONENT TITLE
1 Candle Management Server
2 IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration
3 IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring
4 IBM Tivoli OMEGAMON XE for WebSphere Integration Broker

F1=HELP      F2=SPLIT    F3=END      F4=RETURN   F5=RFIND    F6=RCHANGE
F7=UP        F8=DOWN     F9=SWAP     F10=LEFT    F11=RIGHT   F12=RETRIEVE
```

Figure 4-8 Selecting the product component to configure

Note: In our scenario we are configuring the monitoring agent to a seed data to a remote CMS.

3. You will see the window in Figure 4-9 on page 70. Select “Specify Agent address space parameters”.

```

----- CONFIGURE OMEGAMON XE FOR WEBSphere MQ MONITORING / RTE: SC58 -----
OPTION ==> _

Perform the appropriate configuration steps in order:
If you have defined a CMS in this RTE that this Agent
will communicate with, select option 1.
1 Register with local CMS

If defining an Agent, select option 2, then select the appropriate
section(s) below to configure the desired address space.
2 Specify configuration parameters

    To run in an Agent address space: (Recommended)
    3 Specify Agent address space parameters
    4 Create runtime members
    5 Configure persistent datastore

    To run in the CMS address space: (Alternative)
    6 Install Agent into local CMS
    7 Configure persistent datastore
    8 Complete the configuration
F1=Help F3=Back

F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=RCHANGE
F7=UP F8=DOWN F9=SWAP F10=LEFT F11=RIGHT F12=RETRIEVE

```

Figure 4-9 Creating the runtime members

4. In the next window, specify the communication protocols in priority sequence.
5. Select F10 from the next panel.
6. Select F5 and you will be prompted to enter the CMS information, as shown in Figure 4-10 on page 71.

```

----- SPECIFY AGENT PRIMARY CMS VALUE      Enter required field
COMMAND ==>
CMS name (case sensitive)      ==> HUB_HELSINKI
Complete this section if the primary CMS requires SNA support:
  LU6.2 logmode                ==>
  Logmode table name           ==>
  Local location broker applid ==>
  Network ID                   ==> USIBMSC_
Complete this section if the primary CMS requires TCP support:
  Hostname                     ==> HELSINKI.ITSC.AUSTIN.IBM.COM
  Address                      ==> 9.3.5.52
  Network interface card (NIC) ==>
  IP port number               ==> 1918
  IP.PIPE port number          ==>
  Address translation           ==> N      (Y, N)
  Partition name               ==>
Enter=Next  F1=Help  F3=Back

F1=HELP      F2=SPLIT  F3=END      F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP        F8=DOWN   F9=SWAP    F10=LEFT   F11=RIGHT F12=RETRIEVE

```

Figure 4-10 Specify the agent address space parameters

7. Specify the TCP communication values for the Agent and, if required, the Network interface card (NIC), as shown in Figure 4-11 on page 72.

```

----- SPECIFY AGENT IP CONFIGURATION V "LEFT" is not active
COMMAND ==>

Specify the TCP communication values for this Agent:
Hostname      ==> WTSC58.ITS0.IBM.COM
Address       ==> 9.12.6.96
Started task  ==> TCPIP

If applicable
Network interface card (NIC) ==> OSA2C00
Interlink subsystem          ==>
IUCV interface in use?      ==> N      (Y, N)

-

Enter=Next  F1=Help  F3=Back

F1=HELP      F2=SPLIT  F3=END      F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP        F8=DOWN   F9=SWAP   F10=LEFT  F11=RIGHT F12=RETRIEVE

```

Figure 4-11 Specify TCP and NIC parameters

8. Go back to the CONFIGURE OMEGAMON XE FOR WEBSphere MQ MONITORING/RTE screen and select "Create runtime members", as shown in Figure 4-12 on page 73.

```

----- CONFIGURE OMEGAMON XE FOR WEBSPPHERE MQ MONITORING / RTE: SC58 -----
OPTION ==> _

Perform the appropriate configuration steps in order:
Last selected
Date         Time

If you have defined a CMS in this RTE that this Agent
will communicate with, select option 1.
1 Register with local CMS

If defining an Agent, select option 2, then select the appropriate
section(s) below to configure the desired address space.
2 Specify configuration parameters

To run in an Agent address space: (Recommended)
3 Specify Agent address space parameters
4 Create runtime members
5 Configure persistent datastore

To run in the CMS address space: (Alternative)
6 Install Agent into local CMS
7 Configure persistent datastore
8 Complete the configuration
F1=Help F3=Back

F1=HELP    F2=SPLIT    F3=END      F4=RETURN   F5=RFIND    F6=RCHANGE
F7=UP      F8=DOWN     F9=SWAP    F10=LEFT   F11=RIGHT   F12=RETRIEVE

```

Figure 4-12 Creating the runtime members

9. Review the Job Control Language (JCL) and submit the job, or, if you want to edit the values in this JCL, make the modifications and then submit the job.
10. Verify that the job completes successfully. All return codes should be 0.
11. Go to the CONFIGURE OMEGAMON XE FOR WEBSPPHERE MQ MONITORING/RTE screen and select "Complete the configuration". Follow the steps on the Completion Panel, as shown in Figure 4-13 on page 74. Do not start the WebSphere MQ Agent at this point.

```

----- COMPLETE THE CONFIGURATION -----
COMMAND ==> _                                SCROLL ==> CSR

..                COMPLETE THE CONFIGURATION

After configuring this product, you must perform the following
procedures outside of the Configuration tool to finalize
installation and configuration.

Perform the following steps for each of the items listed below,
if applicable:

The following steps only apply if the agent is running in its own
address space. If the agent is sharing the address space with other
agents, then the address space owner is required to do these steps:

Step 1 - Copy procedures to PROCLIB.

The Configuration tool created started task procedures in RKANSAM
which you must copy to your procedure library. Update your started
task library as follows:

    a) If you have configured an agent address space, copy the agent
       started task (CANSMC) from RKANSAM to PROCLIB.

Step 2 - APF-authorize libraries (if applicable).

Add the following runtime load libraries to your list of APF-
authorized libraries.

Load library name:
- OMWBI.SC58.RKANMOD
- OMWBI.SC58.RKANMODL

Note: Any runtime libraries concatenated in the STEPLIB DDNAME and
in the RKANMODL DDNAME of the CANSMC started task must be
APF-authorized.

Step 3 - Verify installation and configuration (if applicable).
F1=HELP      F2=SPLIT      F3=END      F4=RETURN      F5=RFIND      F6=RCHANGE
F7=UP        F8=DOWN      F9=SWAP      F10=LEFT      F11=RIGHT      F12=RETRIEVE
. . . . .

```

Figure 4-13 Configuration completion

12. Go back to the RUNTIME ENVIRONMENTS screen and enter L (Load all product libraries after SMP/E) in the Action field of the runtime environment you are configuring (Figure 4-14 on page 75).


```

----- RUNTIME ENVIRONMENTS (RTEs) -----
COMMAND ==>
Actions: A Add RTE, B Build libraries, C Configure,
         L Load all product libraries after SMP/E,
         D Delete, U Update, V View values, Z Utilities

Action Name      Type      Sharing      Description
-----
I SC58           FULL      FULL      Full RTE for SC58
VBD              FULL      FULL      VBD Full
Enter=Next      F1=Help  F3=Back  F7=Up    F8=Down

F1=HELP      F2=SPLIT  F3=END    F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP        F8=DOWN   F9=SWAP   F10=LEFT   F11=RIGHT F12=RETRIEVE

```

Figure 4-14 *RUNTIME ENVIRONMENTS* panel

- Review the JCL and submit the job or, if you want to edit the values in this JCL, make the changes and then submit the job.
- Verify that the job completes successfully. All return codes should be 0.
- After loading all the product libraries, start the MQ Monitoring Agent started task by running:
S CANSMQ

Note: If you want to store and report on the MQ monitoring data, you need to perform an additional step: Configure Persistent Datastore (see step 5 in Figure 4-12 on page 73). Refer to *IBM Tivoli OMEGAMON XE for WebSphere MQ on z/OS Configuration and Customization Guide*, GC32-9329 for details on configuring the Persistent Datastore. This step is not necessary for the Configuration Agent, but might be used for the Monitoring Agent.

CandleNet Portal Support for z/OS

You will need to install the IBM Tivoli OMEGAMON XE for WebSphere Business Integration z/OS support component on the CandleNet Portal server:

Note: We had previously installed the CandleNet Portal Server. We are now installing the OMEGAMON XE for WebSphere Business Integration z/OS Support component.

1. Log on to Windows using an ID with Administrator authority and close any running applications.
2. Insert the IBM Tivoli OMEGAMON XE for WebSphere Business Integration z/OS support product CD into your CD-ROM drive. Installation begins automatically. (If the installer does not start, go to CD-ROM directory WINDOWS and run setup.exe. If setup.exe initialization fails, you do not have enough disk space to decompress the setup files.) The InstallShield Wizard displays.
3. Read the text that welcomes you to the installation and click **Next** to continue.
4. The Software License Agreement dialog box will appear. Read the software license agreement and click **Accept**.
5. The Choose Destination Location dialog box will appear. Specify the target drive and directory where you want to download the Tivoli OMEGAMON XE for WebSphere Business Integration z/OS support product. The recommended default is C:\Candle. Click **Next** to continue.

Note: If you are upgrading from a previous release CandleNet Portal, the software will be loaded to your existing IBM Tivoli directory. Do not create a new directory.

6. Click the + sign next to expand the tree. Select **OMEGAMON XE for WebSphere Business Integration Support**. Click **Next** to continue (Figure 4-15 on page 77).

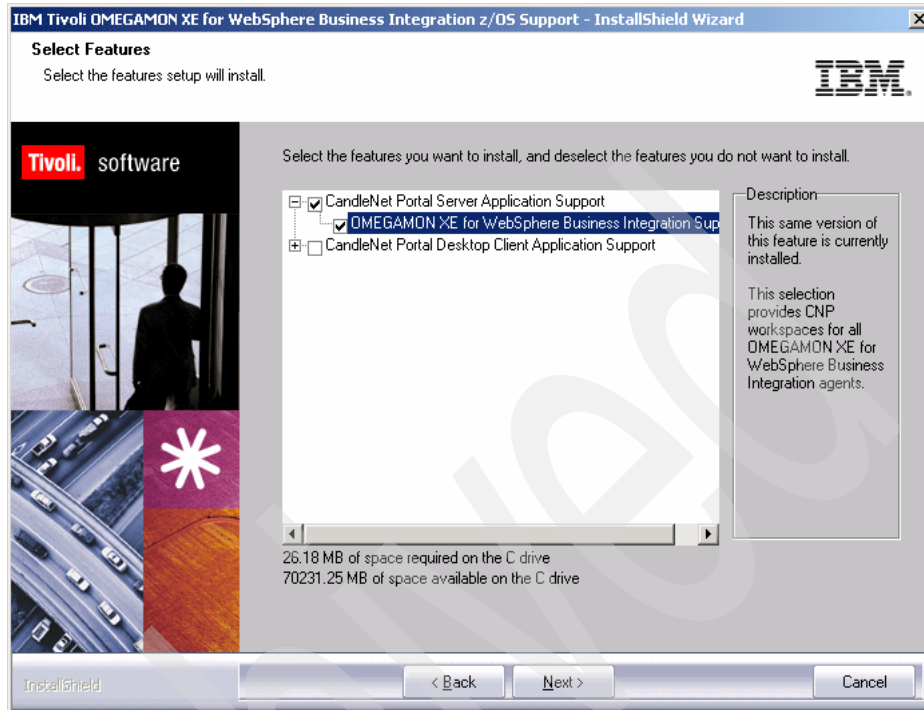


Figure 4-15 OMEGAMON XE WBI component

7. To determine the folder in which the files will be installed, accept the folder name that appears in the Program Folder text box, type in a new name, or select one of the existing folders in the list below. IBM recommends that you use the default Program Folder name shown. Click **Next** to continue.
8. The Start Copying Files screen will appear. This screen shows the destination directory and program folder information you supplied in the previous steps, and lists the modules you chose to install. Review the settings and click **Back** if you want to go back and change them. If you want to start copying files with the settings that are listed, click **Next**.
9. The Setup Status screen will appear and the InstallShield Wizard will begin configuring the installation and copying files needed to complete the installation. Then the Setup Type dialog box will appear as shown in Figure 2-15 on page 24. Leave selected (checked) the items that you want to configure before completion of the installation. Deselect (uncheck) the items for which you want to delay configuration until after completion of the installation. Click **Next** to continue. The software is copied to disk.

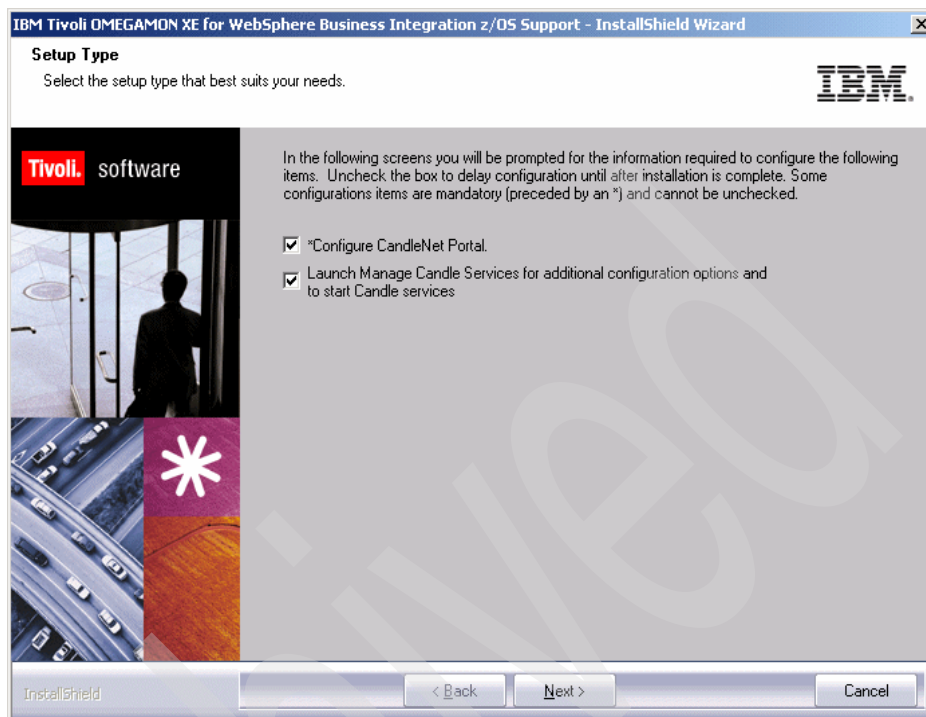


Figure 4-16 Configuration setup

10. The next panel will ask you to enter the CNP host name. Click **Next** to continue (Figure 4-17 on page 79).

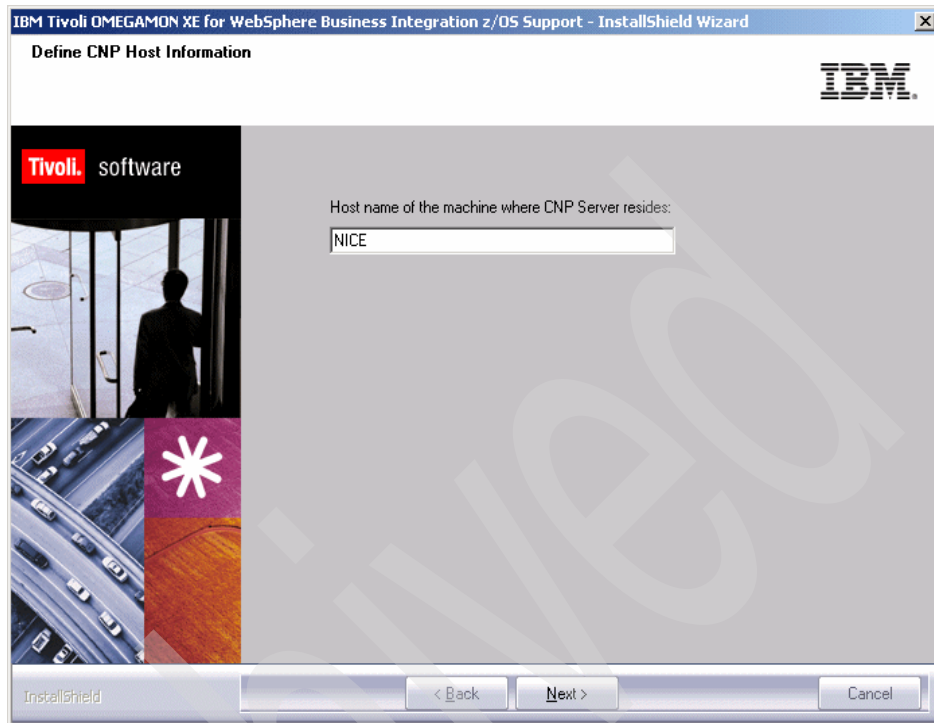


Figure 4-17 CNP host information

11. In the next window, select **Display the README file** if you would like to read the file. Click **Finish** to complete the setup (Figure 4-18 on page 80).

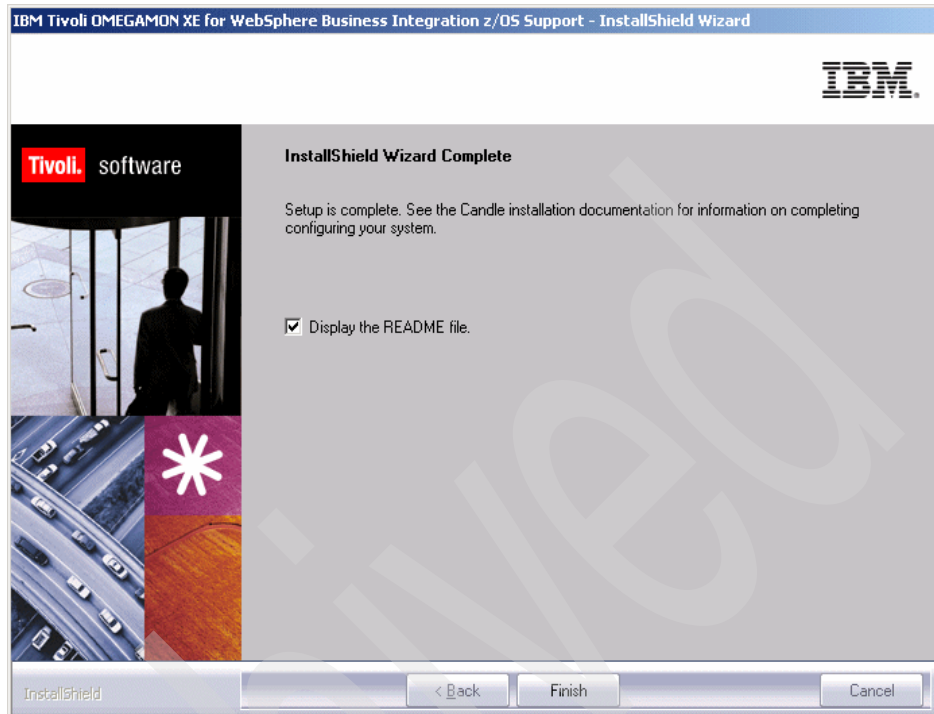


Figure 4-18 Setup completion

4.1.2 Installing the WebSphere MQ Agent on UNIX

The CMA Framework is installed automatically with the WebSphere MQ Agent on UNIX. This section lists the hardware and software requirements for the CMA Framework. Unless otherwise stated, the CMA Framework requires the same hardware as the operating systems under which they execute. In addition, you will need the following:

- ▶ Ethernet or token ring LAN capability.
- ▶ CD-ROM drive.
- ▶ Native X-Term monitor for UNIX or Hummingbird® Exceed X-Windows emulators for PCs only.
- ▶ On Solaris, X11 is required.
- ▶ 8 MB of disk space.

Running the installation program

In this step, you run the `install.sh` installation program through a shell script to install the WebSphere MQ Agent. In our environment, we installed it on an AIX platform, but the installation mechanism is same for any UNIX or Linux platforms supported by the OMEGAMON XE for WebSphere Business Integration product.

Follow these steps:

1. Mount the OMEGAMON XE for WebSphere Business Integration product CD at the location you have chosen on the host. Enter the following:

- a. `mount device mount_point`

- b. `cd mount_point`

where the following are the variables:

- `device`: The device driver for the CD-ROM.
- `mount_point`: The directory where the device will be mounted.

2. From the `bin` directory under the root directory of the CD-ROM, execute `install.sh` by entering the following:

```
./install.sh [-h $candlehome] [-d cdrom path] [-v] [-c]
```

Table 4-1 explains the functions of the parameters of the above command.

Table 4-1 `./install.sh` parameters

Variable	Description
-h	(Optional) Used to specify <code>\$candlehome</code> . If you do not include -h, and do not have an environmental variable named <code>\$candlehome</code> present, <code>install.sh</code> prompts you for the installation directory. Also, use this option to take action on a <code>\$candlehome</code> other than the <code>\$candlehome</code> in the current system.
<code>\$candlehome</code>	A home directory created for the installation of the OMEGAMON WebSphere MQ Agent.
-d	(Optional) Used to specify the path to the CD-ROM drive.
<code>cdrom path</code>	The full path to the root of the CD-ROM drive or the full path to the CD-ROM image.
-v	(optional) Used to display the version and release levels of the current installer.

One of the following will occur:

- a. If the directory specified exists already, you will see a prompt that tells you so and asks you if you want to use this as your home directory.
 - b. If the directory specified does not exist, you will see a prompt that tells you so and asks you if you want to create this as your home directory.
3. Enter y and press Enter. The menu in Example 4-2 appears.

Example 4-2 Prompt for installing agent on AIX

Select one of the following:

- 1) Install products via GUI.
- 2) Install products via command line.
- 3) Create remote packages via GUI.
- 4) Create remote packages via command line.
- 5) View readme files
- 6) Exit install.

Please enter a valid number:

Select 2.

4. When you enter 2 in the preceding step, you will see a numbered list of languages in which you may view the Software License Agreement displays. Enter the number of the language.
5. Read the instructions for viewing the Software License Agreement and press Enter. The general terms of the Software License Agreement displays. Press Enter to continue viewing the Software License Agreement until you reach the end of the agreement. Enter 1 to accept the agreement.
6. A numbered list of operating systems on which to install the software displays. Enter the number of the operating system. Enter y.

A numbered list of products to install is shown in Example 4-3. Enter the numbers of the products you want to install. If you enter more than one number, separate the numbers by a comma or a space. Enter 4.

Example 4-3 Numbered list of products

- 1) WebSphere Integration Brokers V130R106
 - 2) WebSphere InterChange Server Data Source V110R110
 - 3) WebSphere InterChange Server V110R109
 - 4) WebSphere MQ V370R108
 - 5) all of the above
-

7. A list of the products that will be installed displays. If the list is correct, enter y.
8. The selected component products are installed. Then you are prompted to enter another operating system or complete the installation. Enter n.

9. Your installation is complete.

Configuring WebSphere MQ Agent on UNIX

To configure an WebSphere MQ Agent, start by changing to the \$candlehome/bin directory. Then execute the following:

```
./CandleConfig -A [-h $candlehome] [-a arch] [-t agent_host_name] pc
```

Table 4-2 explains the functions of the parameters in the above command.

Table 4-2 ./CandleConfig parameters

Variable	Description
-A	Used to configure an agent
-a	(Optional) Specifies the architecture. This flag allows you to configure an agent and a CMS for an architecture other than the one that you are on. For example, if you are on AIX 5L Version 5.1, and want to configure for an HP 10.20 machine, then this option is required. Otherwise, the default is the machine you are on, which in this case is AIX 5L Version 5.1. This allows you to install and configure on any machine.
arch	One of the abbreviations used by IBM Tivoli for the architecture.
-h	(Optional) Used when \$candlehome is not defined in the current environment. Also, use this option to take action on a \$candlehome other than the \$candlehome in the current system.
\$candlehome	A home directory created for the installation of the OMEGAMON WebSphere MQ Agent.
-t (when used for agents)	(Optional) Used for specific agent-to-CMS connectivity. Entering this flag creates a configuration file that is specific for running on the specified host. This option overrides the generic OS configuration file. This option should only be used in those instances where an agent configuration requires different parameters for the host OS on which it will run. Note: When re-configuring an agent that has been configured using this option, you must use this option again to update the existing configuration.
agent_host_name	Host name for the agent.
host_name	Host name of the CMS.
pc	Indicates the product code of the agent you are configuring.

When configuring agents, some or all of the prompts in Table 4-3 may display after executing CandleConfig without optional parameters.

Table 4-3 Prompts in response to CandleConfig execution

Parameters when configuring the CandleAgent on AIX	Our selections
Will this agent connect to a CMS? [YES or NO] (The default is YES.)	YES
CMS Host Name (The default is CANDLE.)	HELSINKI
Will the agent connect through a firewall? [YES or NO] (The default is NO.)	NO
Network Protocol 1 [ip, sna, or ip.pipe] (The default is ip.)	ip
Network Protocol 2 (The default is none.)	
Network Protocol 3 (The default is none.)	
IP Port Number (The default is 1918.)	1918
Net Name (The default is CANDLE.)	
LU Name (The default is LUNAME.)	
Log Mode (The default is LOGMODE.)	
IP.PIPE Port Number (The default is 1918.)	
Enter name of KDC_PARTITION (The default is null.)	
Configure connection for a secondary CMS? [YES or NO] (The default is NO.)	NO
Secondary CMS host name (The default is CMS.)	
Will the agent connect through a firewall? [YES or NO] (The default is NO.)	
Secondary CMS protocol [ip, sna, ip.pipe] (The default is none.)	
Secondary CMS protocol 2 (The default is none.)	
Secondary CMS protocol 3 (The default is none.)	
Secondary CMS IP Port Number (The default is 1918.)	
Secondary CMS Net Name (The default is CANDLE.)	
Secondary CMS LU Name (The default is LUNAME.)	
Secondary CMS Log Mode (The default is LOGMODE.)	

Parameters when configuring the CandleAgent on AIX	Our selections
Secondary CMS IP.PIPE Port Number (The default is 1918.)	
Enter Optional Primary Network Name or "none" (The default is none.)	

After all the questions are answered, a config file is generated for the agent in the \$candlehome/config directory with the format pc.config, where the variable pc is the product code of the agent you are configuring.

Using CandleAgent to start and stop WebSphere MQ Agents

CandleAgent is used to start and stop WebSphere MQ Agents. It must be executed on the architecture for which the agent is installed. Execute the following command:

```
./CandleAgent [-h $candlehome] [-l] [-c] start | stop pc pc pc
```

Table 4-4 explains the functions of the parameters of the above command.

Table 4-4 *CandleAgent command parameters*

Variable	Description
-c	(Optional) Used to <i>not</i> refresh the configuration file used on agent startup. The default is to refresh the configuration file each time the agent is started.
-h	(Optional) Used to specify \$candlehome if it is not the one in which the script is located. Also, use this option to take action on a \$candlehome other than the \$candlehome in the current system.
\$candlehome	A home directory created for the installation of the OMEGAMON WebSphere MQ Agent.
start stop	Specifies whether you want to start or stop the designated agent.
-l	(Optional) Used to delete the log file associated with the agent that is being stopped. The default is to save the log when the agent is stopped normally using CandleAgent stop.
pc	The product code of the agent. You can specify one or more products to start or stop. If multiple products, you must separate the product codes with either a space or comma as illustrated above.

4.1.3 Installing OMEGAMON WebSphere MQ Agent on Windows

Installation of the Candle Management Agent (CMA) Framework is required prior to installation of any of the agents on Windows. This section lists the system software, disk space, and anything else that may be required by the CMA Framework. You may install the CMA Framework on Intel-based (x86) CPUs and compatible CPUs running Windows XP Professional Edition, Windows 2000, or Windows 2003 Server.

Operating systems

The following operating systems are supported:

- ▶ Windows 2000 Professional server or workstation, with Service Pack 3 or above
- ▶ Windows XP Professional Edition, with Service Pack 1 or above.
- ▶ Windows 2003 Server.

TCP/IP communications

The following are required:

- ▶ Microsoft Winsock (Version 1.1 or higher)
- ▶ Microsoft TCP/IP protocol stack

SNA communications

A 32-bit version of one of the following SNA Server or Client products is required:

- ▶ IBM PCOMM (Version 4.11 or higher).
- ▶ Fix IC19970 is required on Windows 2000 Server or Workstation.
- ▶ IBM Communications Server (Version 5.0 or higher).
- ▶ Fixes JR10466 and JR10368 are required for SNA Server (Version 5.0).
- ▶ Microsoft SNA Server (Version 3 or higher).
- ▶ Service Pack 1 is required for SNA Server (Version 4.0).
- ▶ Attachmate EXTRA! (Version 6.2, 6.3, or 6.4). The fix for case number 1221139 is required for Versions 6.2 and 6.3. The fix for case number 1274151 is required for Version 6.4.
- ▶ Walldata RUMBA (Version 5.1 or higher).
- ▶ Walldata PTF OPK52002 is required for RUMBA versions less than 5.2A.

Hardware and other requirements

In addition to the minimum software requirements for the CMA Framework listed in the previous section, the CMA Framework installation requires a minimum of the following:

- ▶ 32 MB RAM
- ▶ 50 MB virtual memory
- ▶ 1 MB disk space
- ▶ At least 6 MB disk space in the location referenced by your TEMP system variable

Installing the Candle Management Agent (CMA) Framework

1. Log on to Windows using an ID with Administrator authority and close any running applications.
2. Insert the IBM Tivoli OMEGAMON XE for WebSphere Business Integration platform product CD into your CD-ROM drive. The installation begins automatically.
3. Read the text that welcomes you to the installation and click **Next** to continue.
4. The Software License Agreement dialog box will appear. Read the software license agreement and click **Accept**.
5. The Choose Destination Location dialog box will appear. Specify the target drive and directory where you want to download the OMEGAMON XE for Business Integration software. The recommended default is C:\Candle. Click **Next** to continue.
6. Select the CMA Framework for installation. Note that by selecting the WebSphere MQ Agent, you are actually installing two agents: MQ Configuration and MQ Monitoring. Click **Next** to continue (Figure 4-19 on page 88).

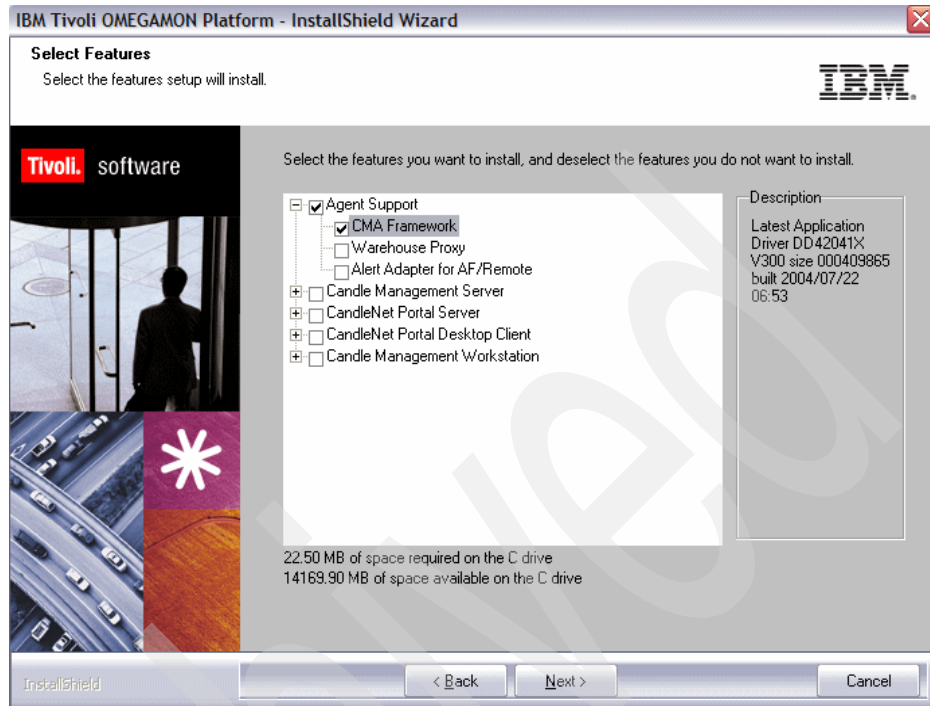


Figure 4-19 Installing CMA Framework

7. To determine the folder in which the files will be installed, accept the folder name that appears in the Program Folder text box, type in a new name, or select one of the existing folders in the list below. IBM recommends that you use the default Program Folder name shown. Click **Next** to continue.
8. The Start Copying Files screen will appear. This screen shows the destination directory and program folder information you supplied in the previous steps, and lists the modules you chose to install. Review the settings and click **Back** if you want to go back and change them. If you want to start copying files with the settings that are listed, click **Next** to continue.
9. The Setup Status screen will appear and the InstallShield Wizard will begin configuring the installation and copying files needed to complete the installation. Then the Setup Type dialog box will appear.
10. Leave selected (checked) the items that you want to configure before completion of the installation. Deselect (uncheck) the items for which you want to delay configuration until after completion of the installation, and click **Next** to continue (Figure 4-20 on page 89).

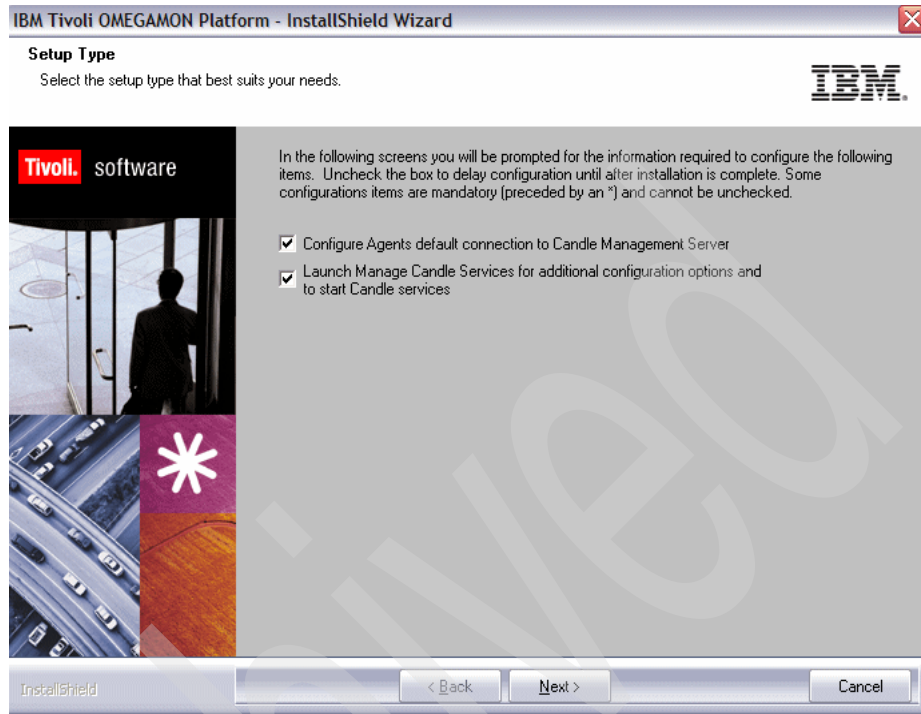


Figure 4-20 CMA Framework Configuration

11. The next window (Figure 4-21 on page 90) will be the CMA connection to the HUB CMS configuration. Select **TCP/IP** for Protocol1. Click **OK** to continue.

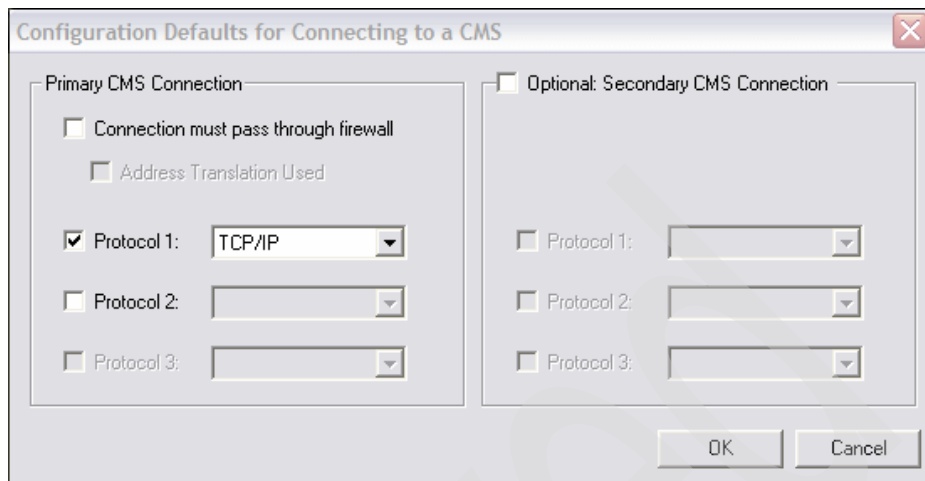


Figure 4-21 Connection to CMS

12. Enter the host name or IP address of the machine where the primary Hub CMS resides (Figure 4-22). Enter the CMS listening port for the agent. IBM recommends you use port number 1918; however if you must change it, enter the new port number (IBM recommends numbers 1025-65535).

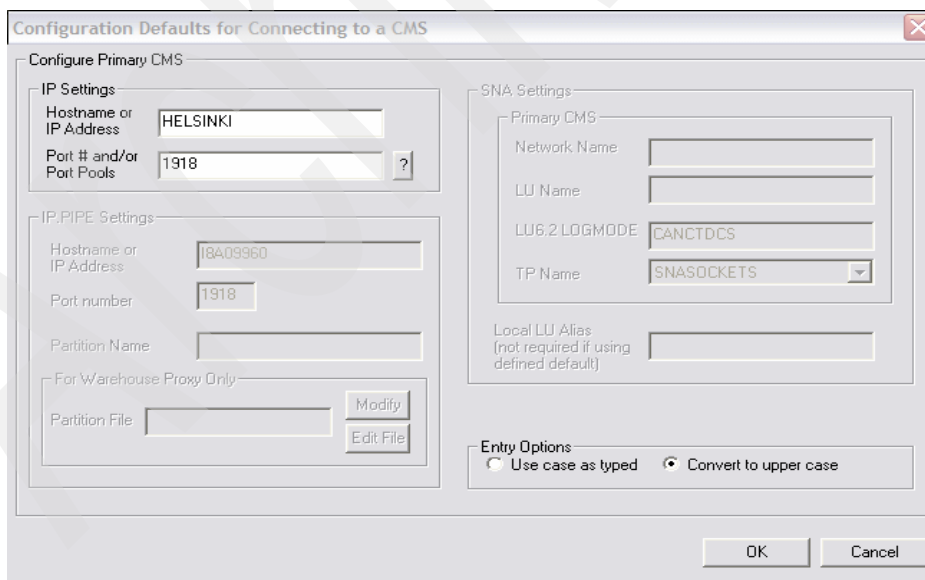


Figure 4-22 Hub CMS connection configuration

13. The next panel will be the completion window. Click **Finish** to complete the CMA Framework installation.



Figure 4-23 Installation completion

After installing the CMA Framework, install the WebSphere MQ Agent next on Windows.

WebSphere MQ Agent Installation

In this step, you will start the InstallShield Wizard and specify the target directory for the IBM Tivoli OMEGAMON XE for WebSphere Business Integration software.

1. Log onto Windows using an ID with Administrator authority and close any running applications.
2. Insert the IBM Tivoli OMEGAMON XE for WebSphere Business Integration product CD into your CD-ROM drive. The installation begins automatically.

Note: If the installer does not start, go to CD-ROM directory WINDOWS and run setup.exe. If setup.exe initialization fails, you do not have enough disk space to decompress the setup files.

3. Read the text that welcomes you to the installation and click **Next** to continue.

4. The Software License Agreement dialog box will appear. Read the software license agreement and click **Accept**.
5. The Choose Destination Location dialog box will appear. Specify the target drive and directory where you want to download the OMEGAMON XE for Business Integration software. The recommended default is C:\Candle. Click **Next** to continue.
6. Select the **WebSphere MQ Agent** for installation. Note that by selecting the the WebSphere MQ Agent you are actually installing two agents: MQ Configuration and MQ Monitoring. Click **Next** to continue (Figure 4-24).

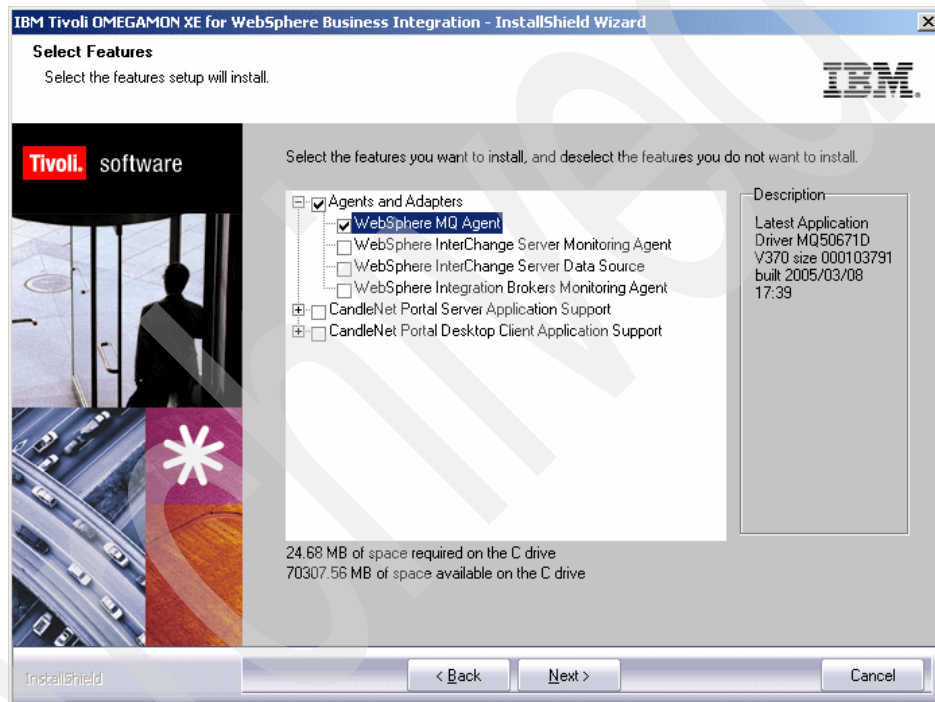


Figure 4-24 WebSphere MQ Agent Installation

7. To determine the folder in which the files will be installed, accept the folder name that appears in the Program Folder text box, type in a new name, or select one of the existing folders in the list below. IBM recommends that you use the default Program Folder name shown. Click **Next** to continue.
8. The Start Copying Files screen will appear. This screen shows the destination directory and program folder information you supplied in the previous steps, and lists the modules you chose to install. Review the settings and click **Back** if you want to go back and change them. If you want to start copying files with the settings that are listed, click **Next** to continue.

9. The Setup Status screen will appear and the InstallShield Wizard will begin configuring the installation and copying files needed to complete the installation. Then the Setup Type dialog box will appear.
10. Leave selected (checked) the items that you want to configure before completion of the installation. Deselect (uncheck) the items for which you want to delay configuration until after completion of the installation, and click **Next** to continue (Figure 4-25).

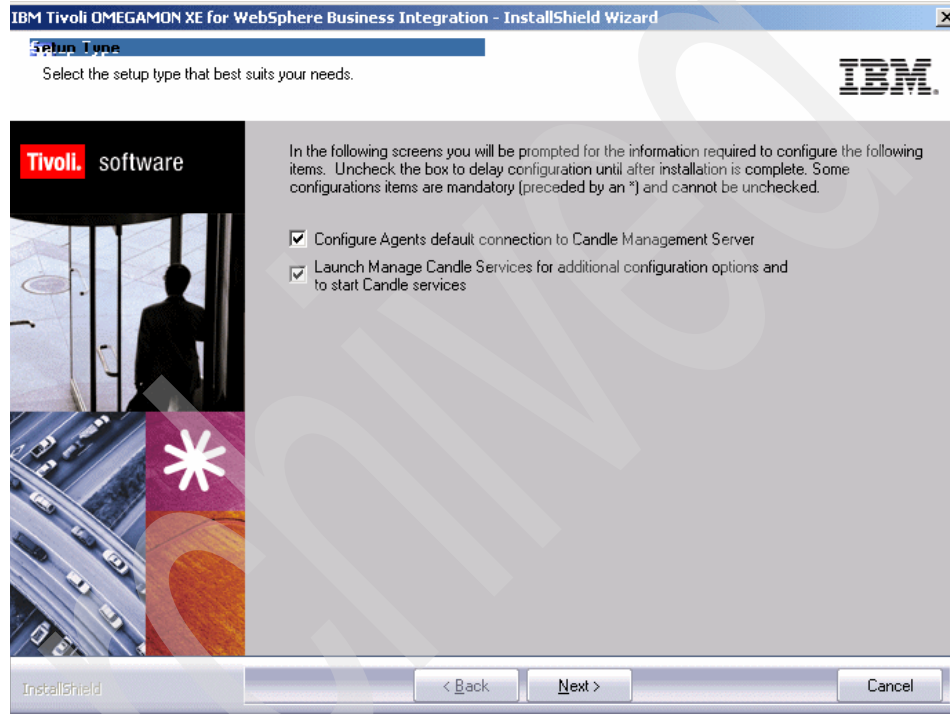


Figure 4-25 Configuration setup

Important: By selecting the **Configuring Agents default connection to Candle Management Server** check box, you are actually asking the wizard to prompt you to configure the agent's connection to CMS (see Figure 4-26 on page 94). *But in this window, this configuration is done only for the MQ Monitoring Agent, not for the MQ Configuration Agent.* The configuration for the Configuration Agent must be done as a separate step (see 4.2, "WebSphere MQ Configuration Agent configuration" on page 98).

If you do not select the **Configuring Agents default connection to Candle Management Server** check box, you will need to configure the connection of the MQ Monitoring Agent to CMS as a separate step after the installation, just like the MQ Configuration Agent.

11. The next window will be the CMA connection to the HUB CMS configuration (Figure 4-26). Select **TCP/IP** for Protocol1. Click **OK** to continue.

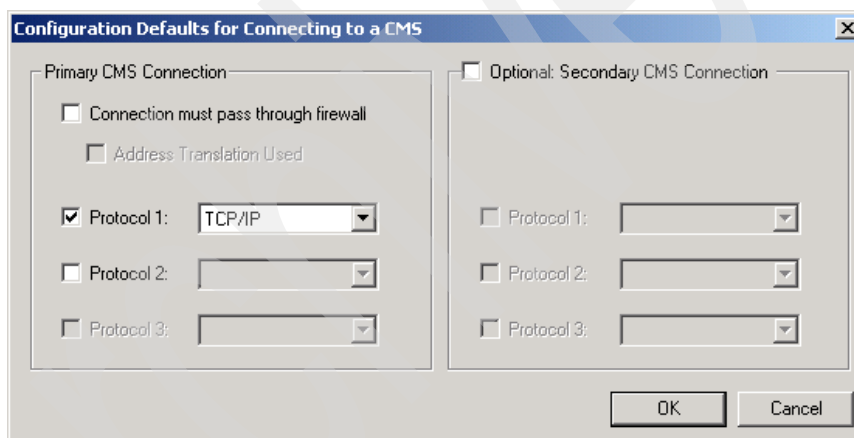
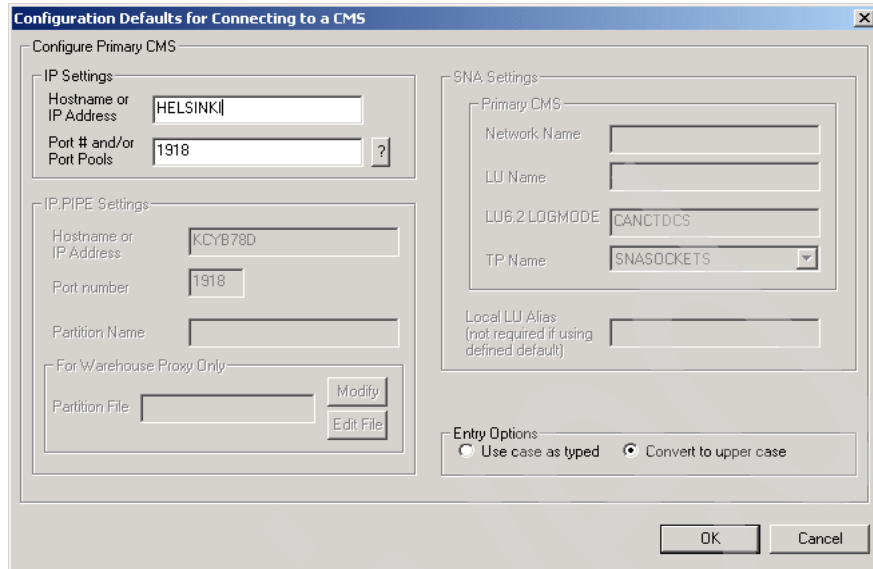


Figure 4-26 Connection to CMS

12. Enter the host name or IP address of the machine where the primary Hub CMS resides (Figure 4-27 on page 95). Enter the CMS listening port for the agent. IBM recommends you use port number 1918; however, if you must change it, enter the new port number (IBM recommends numbers 1025-65535).



Configuration Defaults for Connecting to a CMS

Configure Primary CMS

IP Settings

Hostname or IP Address:

Port # and/or Port Pools: ?

IP.PIPE Settings

Hostname or IP Address:

Port number:

Partition Name:

For Warehouse Proxy Only

Partition File:

SNA Settings

Primary CMS

Network Name:

LU Name:

LU6.2 LOGMODE:

TP Name:

Local LU Alias (not required if using defined default):

Entry Options

☐ Use case as typed ☒ Convert to upper case

Figure 4-27 Hub CMS connection configuration

13. The next panel will be the completion window. Click **Finish** to complete the WebSphere MQ Agent installation (Figure 4-28 on page 96).

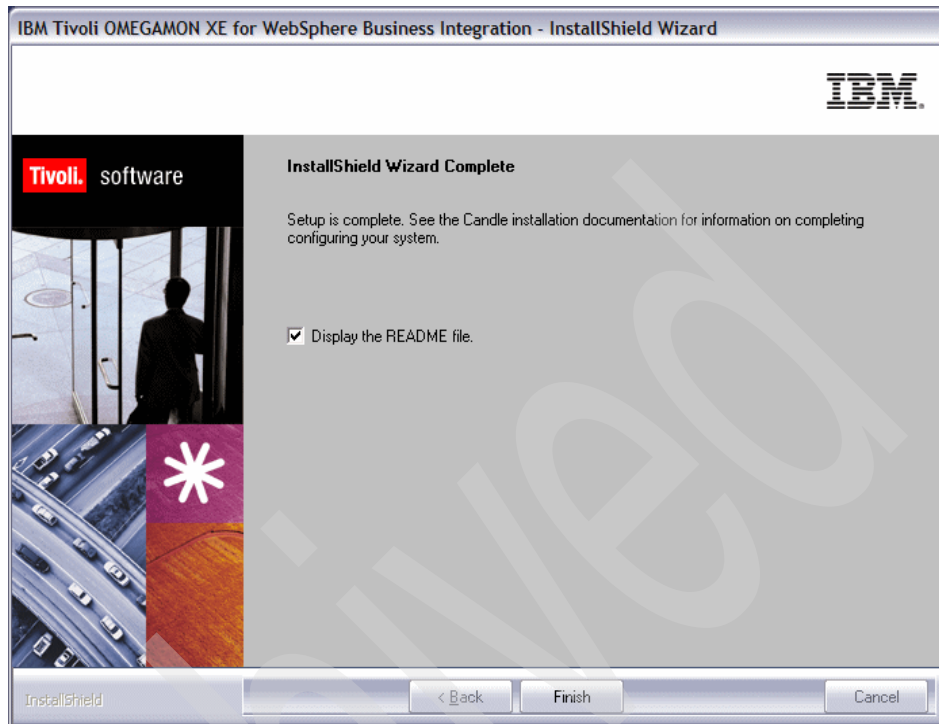


Figure 4-28 Installation completion

Note: You will need to install the IBM Tivoli OMEGAMON XE for WebSphere Business Integration Support component on the CandleNet Portal server for monitoring WebSphere Business Integration. This installation is similar to “CandleNet Portal Support for z/OS” on page 76.

4.1.4 Create additional instances of the agent

The IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring Agent monitors a single WebSphere MQ queue manager. If you want to monitor multiple queue managers, create one instance of the monitoring agent for each queue manager. *One agent instance is needed per queue manager.*

To create an additional instance of the IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring Agent:

1. From Manage Candle Services, right-click **WebSphere MQ Monitoring Agent** (Figure 4-29 on page 97) and select **Create Instance**.

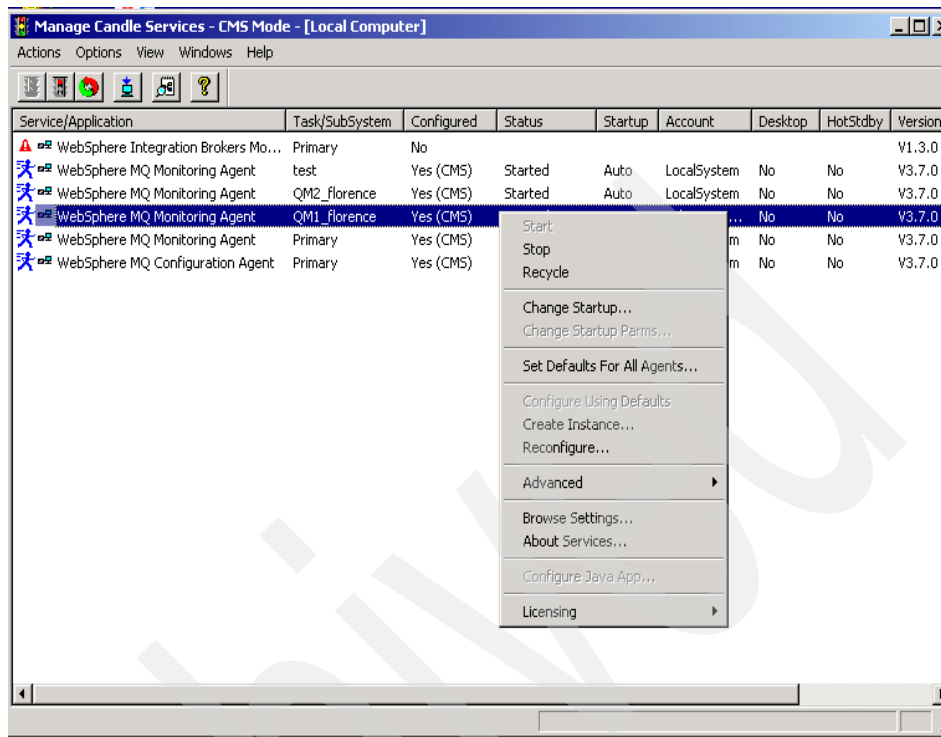


Figure 4-29 Creating a WebSphere MQ Agent instance

2. When prompted, supply a name for the new instance (no blanks are allowed), and then click **OK**.
3. The name you supply appears in the Task/Subsystem column of the Manage Candle Services window.
4. Next, you will need to configure the agent. Right-click the WebSphere MQ Monitoring Agent instance you created and select **Configure using defaults**.
5. To accept existing communications settings, click **OK** on the two configuration dialogs that appear, or make any desired changes on these dialogs, and then click **OK**.
6. You are prompted to edit the agent.s.cfg file. (The Primary agent's file is named mq.cfg.)
 - If your site has a default queue manager specified, the agent's default .cfg file will operate successfully with no modifications. Click **No**. The agent will be configured using defaults. If necessary, you can customize this file later after you have a verified successful installation.

- If your site does not have a default queue manager specified, or if you are configuring this agent to monitor a queue manager other than the default, click **Yes**. A Notepad session opens. Supply the WebSphere MQ queue manager name in the MANAGER NAME() and MGRNAME() parameters of the .cfg file, then save and close the Notepad session. Click **Yes** at the next prompt to continue.
7. You are returned to the Manage Candle Services window. This completes the initial configuration, and the agent is ready to start.

4.2 WebSphere MQ Configuration Agent configuration

After the WebSphere Configuration Agent has been installed, it needs to be configured. This involves configuring Agent-to-CMS communication. Do the following steps to accomplish this configuration:

1. From Manage Candle Services, right-click **WebSphere MQ Configuration Agent** and select **Advanced** → **Configured Advanced** (see Figure 4-30).

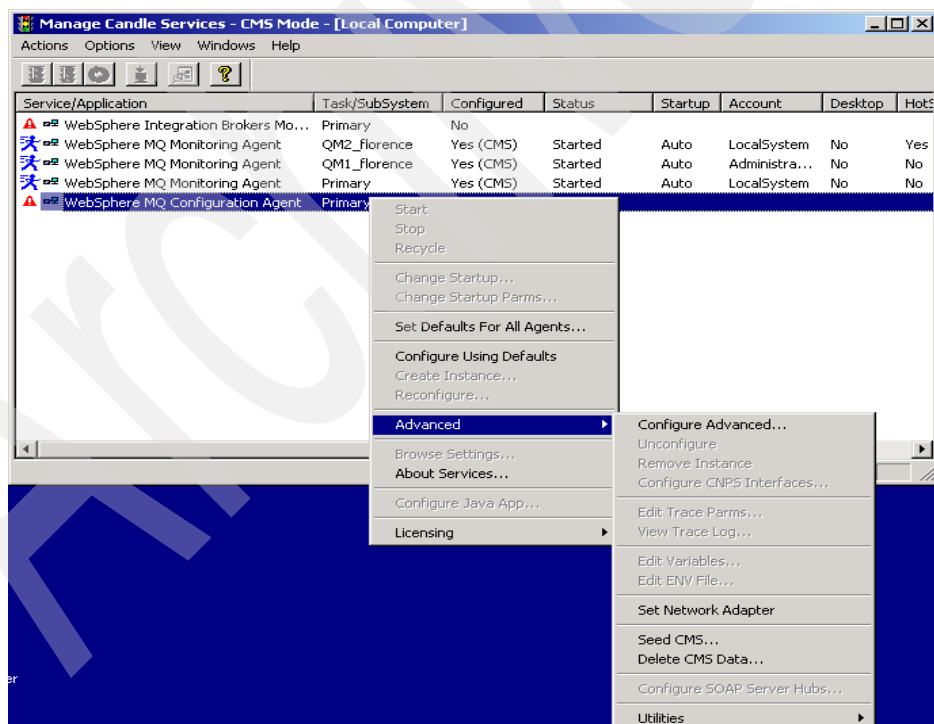


Figure 4-30 WebSphere MQ Configuration Agent

2. Select **TCP/IP** for Protocol1. Click **OK** to continue (Figure 4-31).

Note: The agent we used will not communicate with the CMS across a firewall.

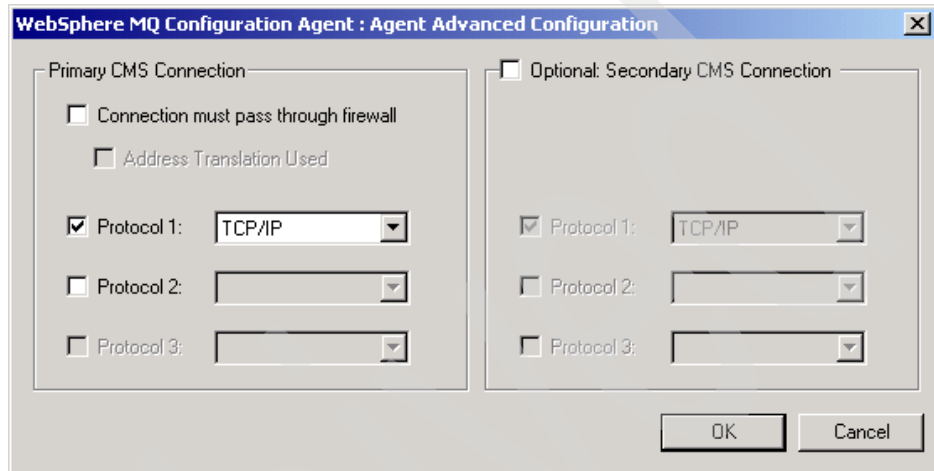


Figure 4-31 WebSphere MQ Configuration Agent-to-CMS communication

3. Enter the host name or IP address of the machine where the primary Hub CMS resides. Enter the CMS listening port for the agent. IBM recommends you use port number 1918; however if you must change it, enter the new port number (IBM recommends numbers 1025-65535). Click **OK** (Figure 4-32 on page 100).

WebSphere MQ Configuration Agent : Agent Advanced Configuration

Configure Primary CMS

IP Settings

Hostname or IP Address: HELSINKI

Port # and/or Port Pools: 1918

SNA Settings

Primary CMS

Network Name:

LU Name:

LU6.2 LOGMODE: CANCTDCS

TP Name: SNASOCKETS

Local LU Alias (not required if using defined default):

IP.PIPE Settings

Hostname or IP Address: FLORENCE

Port number: 1918

Partition Name:

For Warehouse Proxy Only

Partition File:

Modify

Edit File

Entry Options

☒ Use case as typed ☐ Convert to upper case

OK Cancel

Figure 4-32 Hub CMS connection configuration

4. From Manage Candle Services, right-click **WebSphere MQ Configuration Agent** and select **Start** (Figure 4-33 on page 101).

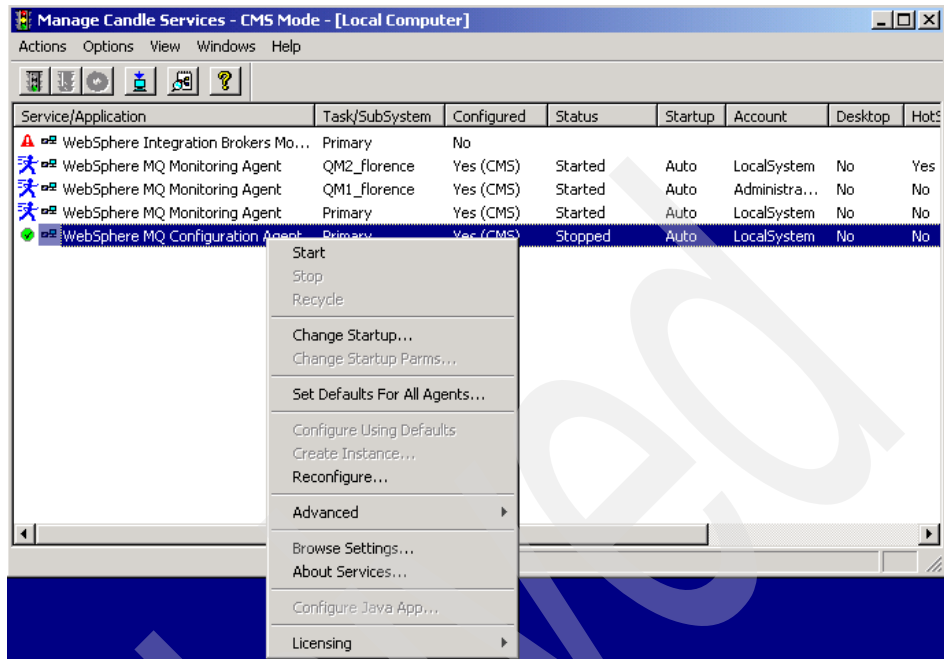


Figure 4-33 Starting WebSphere MQ Configuration Agent

WebSphere MQ Configuration

Building a network for your WebSphere MQ messaging middleware can be a slow and difficult task. As your network grows and queue managers span dozens of systems running on a variety of operating systems, it becomes even more difficult to determine where and how to configure new queue managers and their resources. IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration (OMEGAMON XE for WebSphere MQ Configuration) simplifies the time-consuming and resource-intensive tasks of defining your configuration. You can use IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to:

- ▶ Manage your WebSphere MQ network, including local or remote nodes, from a single point of control
- ▶ See how your WebSphere MQ queue managers and resources are related by viewing a graphical representation of your entire network
- ▶ Manipulate WebSphere MQ objects across one or more networks of queue managers from a single workstation
- ▶ Base configurations on prototype models so you can implement global updates with the click of a mouse
- ▶ Save time and resources by performing many difficult development tasks automatically

- ▶ Group related WebSphere MQ resources together in ways that reflect the business-oriented relationships between them and the logical structure of your enterprise.

The following are covered in this chapter:

- ▶ 5.1, “OMEGAMON XE for WebSphere MQ Configuration overview” on page 105
- ▶ 5.2, “WebSphere MQ Configuration scenario” on page 109
- ▶ 5.3, “Audit Logging feature” on page 130
- ▶ 5.4, “Backing up the configuration database” on page 135

5.1 OMEGAMON XE for WebSphere MQ Configuration overview

OMEGAMON for WebSphere Business Integration provides two components for managing WebSphere MQ: OMEGAMON XE for WebSphere MQ Configuration and OMEGAMON XE for WebSphere MQ Monitoring.

In this chapter, we will introduce OMEGAMON XE for WebSphere MQ Configuration. In the next chapter, Chapter 6, “WebSphere MQ Monitoring” on page 139, we will cover OMEGAMON XE for WebSphere MQ Monitoring. This sequence of chapters will match with the project life cycle, that is, design, develop, test and deploy, maintain, and monitor. So, the reason that we have decided to cover WebSphere MQ Configuration before WebSphere MQ Monitoring is the order these tools are typically used in a real customer environment.

As discussed in Chapter 1, “Introduction” on page 1, “You cannot manage what you do not measure”. Going further, you cannot measure what you do not know about. So in a new WebSphere MQ deployment, the first thing a customer would typically do is to use the OMEGAMON XE for WebSphere MQ Configuration and take stock of what their environment looks like by doing discovery. They would then use the results of this discovery to plan the monitoring of their WebSphere MQ environment. They can use OMEGAMON XE for WebSphere MQ Configuration to set parameters on queues, queue managers, and so on, that would allow them to monitor the relevant WebSphere MQ objects. They would then activate monitoring as required. If the customer is new to WebSphere MQ as well, then they may start by creating WebSphere MQ prototypes and objects first, and then actually push the configuration to their environment.

In the following sections, we will provide a description of the features and tools that IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration offers to help you manage your WebSphere MQ configuration.

5.1.1 Centralized configuration information

In a highly distributed network, WebSphere MQ may run on a wide variety of platforms, which compounds the complexity of configuring and maintaining hundreds or even thousands of nodes. No matter where your resources lie, IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration provides simplification by offering a single repository for all your WebSphere MQ configuration data, called the configuration database.

The configuration database is stored at the Hub CMS and includes a default set of objects to help you start using IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration.

5.1.2 A graphical representation of your configuration

It is difficult to get a sense of your configuration structure when your view of it consists only of configuration definitions. To help you understand the structure of your configuration, IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration provides a representation of your WebSphere MQ configuration called the Defined View. Defined objects in this view represent current or potential WebSphere MQ resources (queue managers, channels, queues, processes, namelists, and so on), all under the management of IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration. Figure 5-1 shows an example of Defined View.

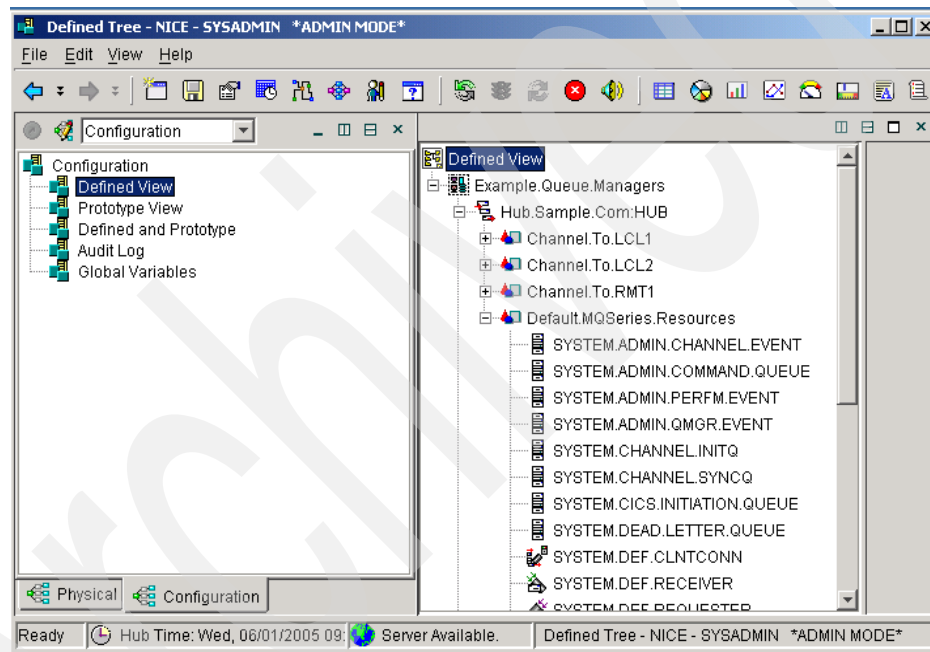


Figure 5-1 Example of Defined View

You can use the Discover feature to quickly and easily build defined objects that represent your actual WebSphere MQ configuration. You can also use the Defined View to safely validate changes to your configuration before applying them to your actual WebSphere MQ configuration.

5.1.3 Common prototype models for creating WebSphere MQ objects

The prototype feature enables you to create blueprints for queue managers, resource groups, and resources that you can use as templates for defining configurations. Once you create a prototype object, you can drag and drop it

from the Prototype View into the Defined View as needed to build or update your configuration.

Any object created from a prototype inherits the characteristics of the prototype unless you specifically override them. If you update a prototype, IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration updates all objects based on that prototype automatically. Using prototypes makes maintaining your WebSphere MQ configuration much easier, because instead of having to update many defined objects, you can update just the prototype on which they are based.

5.1.4 Managing resources from a business perspective

Instead of locking you into a systems perspective of your WebSphere MQ configuration, IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration frees you to organize WebSphere MQ resources into groups according to their business purpose. Configured system groups let you organize queue managers into groups of your own choosing. For example, you can group and manage all resources related to a particular application. This allows you to create a configuration that closely matches the logical structure of your enterprise. At a lower level, Resource groups make it easy to organize queue manager resources (such as channels, queues, processes, namelists, and so on) by the business purpose they serve.

5.1.5 Keeping your actual and defined configurations in sync

Once you develop and test the Defined View, you will want to implement your changes in your actual WebSphere MQ configuration. Or you may want to change your actual configuration manually and update the Defined View accordingly. IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration provides update features that enable you to keep your actual configuration and defined configuration in sync.

It is a good practice to reconcile differences between the Defined View and your actual WebSphere MQ configuration before attempting any type of update operation. The View discrepancies action lets you resolve specific differences either in favor of the configuration database or in favor of the actual configuration.

When you choose “Update actual from defined”, IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration first validates your Defined View to prevent errors from being implemented in your actual configuration, then updates your actual configuration to match the configuration database.

Another way to keep your actual configuration and defined configuration in sync is to choose “Update defined from actual”, which changes the configuration database to match your actual WebSphere MQ configuration.

5.1.6 Scheduling actions

You can either perform the “Update actual from defined”, “Update defined from actual”, or “View discrepancies” actions as you update your configurations, or you can schedule these actions to run at specific intervals.

You have options available for how you perform long-running tasks. Based on how you have the product option set, you can select whether to always run in the foreground, always run in the background, or be prompted each time. Actions that you can perform in the background include:

- ▶ Update defined from actual
- ▶ Update actual from defined
- ▶ View discrepancies
- ▶ Delete (defined, actual, or both actual and defined)
- ▶ Validate
- ▶ Discover new resources
- ▶ Backup configuration database

For example, if you have the product option set to prompt each time, when you select “Update actual from defined”, you are prompted as to whether the update should run in the background. If you reply yes, the product creates an internal scheduled action to perform the update.

5.1.7 Entering WebSphere MQ commands from the Defined View

When you select the Submit MQ Command option (for example, in the Defined View, select a channel, right-click and, from the pop-up menu, select **Action** → **Submit MQ command**). A dialog appears that allows you to enter a free-form WebSphere MQ operator command.

5.2 WebSphere MQ Configuration scenario

This section presents a scenario that may help you understand how the features of IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration work together to help you build your WebSphere MQ network. WebSphere MQ Configuration minimizes the effort involved in the rollout and maintenance of a new application to many sites.

The ABC Company has only recently begun to use WebSphere MQ for application-to-application integration. The company expects their WebSphere MQ configuration to grow rapidly in size and complexity. They will be using the IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to help them manage an increasingly challenging environment. There are two Windows systems that were used for this scenario. One of their first uses of WebSphere MQ is to integrate two applications:

- ▶ An order processing application
- ▶ An order entry application

The order processing system is *copenhagen* and the order entry system is *florence*. They created a queue manager and supporting queues for the order processing application. They had also created queue managers for the order entry application rollout. The order entry queue manager requires four queues.

The ABC company WebSphere MQ environment is shown in Figure 5-2 on page 110.

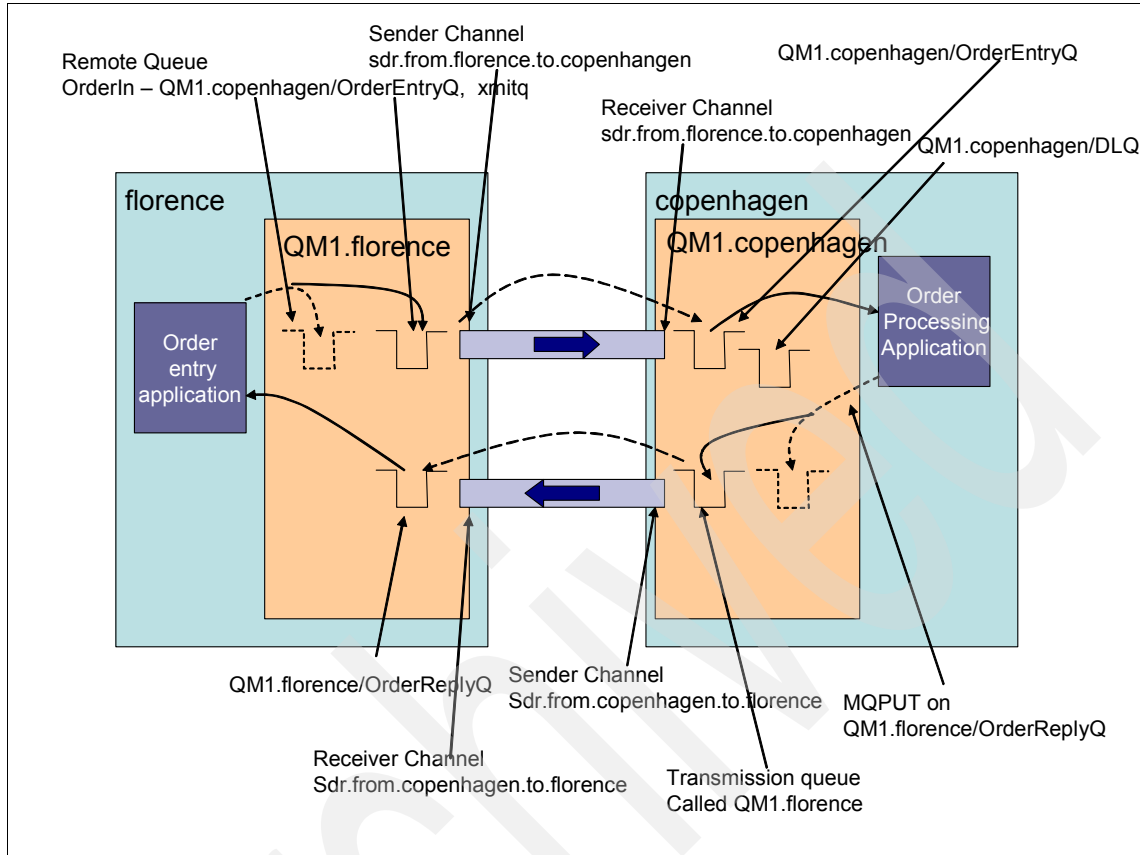


Figure 5-2 ABC company WebSphere MQ environment

Now that you have installed IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration, you want to use its features to minimize the cost of:

- ▶ Designing and testing the planned configuration of the four queues supporting the order entry application.
- ▶ Deploying the planned configuration.
- ▶ Maintaining the configuration of the queues over the life of the application.

After reviewing the goals and the tools provided by IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration, the following strategy for designing, testing, and deploying the planned configuration was planned:

- ▶ The planned configuration consists of four OrderEntryQ's for load balancing purposes. Creating a prototype strategy simplifies the work required to build

the initial configuration on a new store environment when a new order entry system need to be created.

- ▶ Using prototypes also greatly minimizes the effort required to maintain the queues supporting the order entry application. If changes to the application require additional queues or changes to the existing queues, you can change the prototypes directly instead of manually changing each copy.
- ▶ After copying the resource group prototype to a queue manager in the defined view, you use IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to test the defined configuration. Once you are satisfied with the results, use IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to update the actual WebSphere MQ configuration with a few clicks of the mouse.

To implement this strategy, take the following steps:

1. Enter update mode so you can make changes to the configuration database. To enter update mode:
 - a. Ensure you are viewing IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration. In CandleNet Portal's List of available Navigator Views, the Configuration view is selected.
 - b. In the configuration navigator tree, select **Configuration** (the root-level item).
 - c. The "Update mode:" check box displays in the Configuration workspace.
 - d. Select the **Update mode** check box and select **Save**.

Figure 5-3 on page 112 shows the Configuration Update mode.

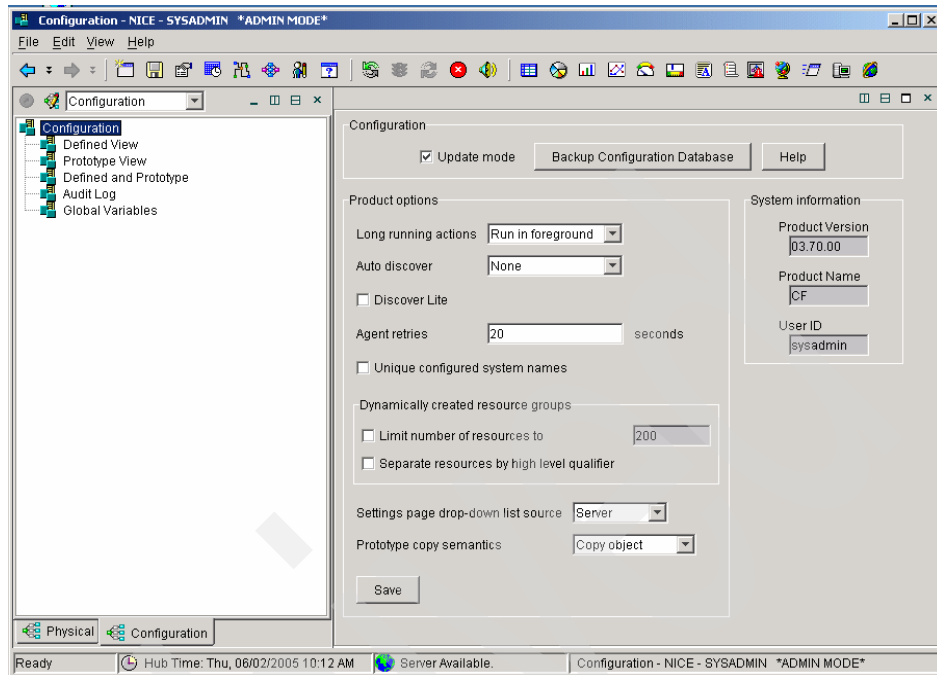


Figure 5-3 Configuration Update mode

2. A configured system group is a unit of organization within IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration that enables you to organize queue managers into groups of your own choosing. A configured system group has no corresponding component in an actual WebSphere MQ configuration; it is simply a collection of queue managers, which in turn contain resource groups. Resource groups contain individual resources (queues, channels, and so on). Configured system groups are the highest unit of organization within IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration. To create a new configured system group:
 - a. Open the Defined View.
 - b. The defined view tree displays on the left side of the Defined View workspace.
 - c. Right-click **Defined View** (the root-level item) and, from the pop-up menu, select **Create new Configured System Group**, as shown in Figure 5-4 on page 113.

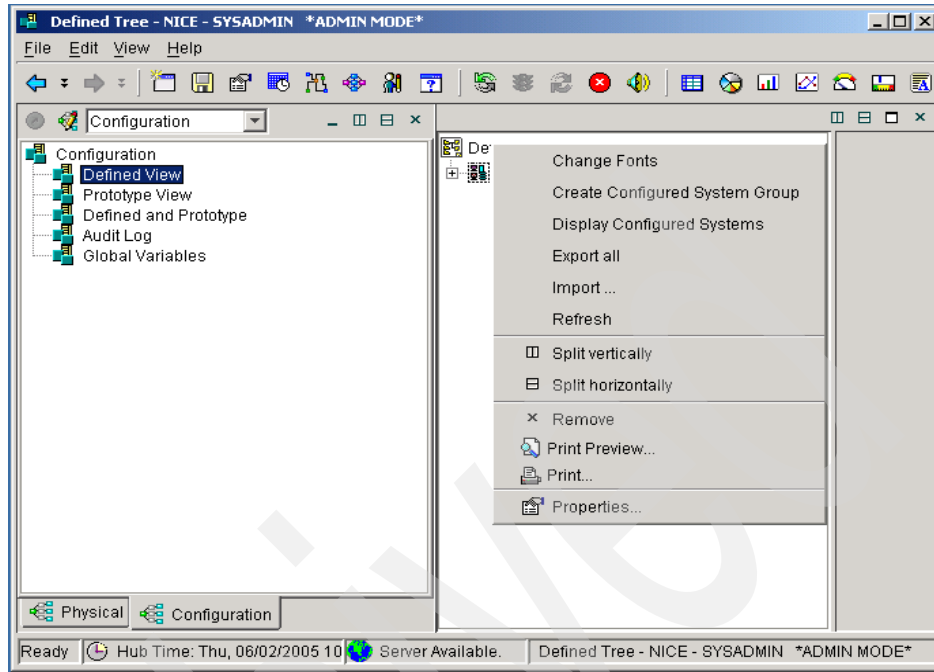


Figure 5-4 Creating new Configured System Group

You will be prompted to supply a name for the new object. Enter an alphanumeric name for the new configured system group. Click **OK**. The new configured system group object is added to the defined view tree.

3. The Discover process populates your Defined View with data from existing queue managers. When you run the Discover process, IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration searches your entire WebSphere MQ network for queue managers not already defined in the configuration database and adds them to the selected configured system group. This feature is only available at the configured system group level.
 - a. Right-click the configured system group to which you want to add the discovered queue managers and, from the pop-up menu, select **Discover** (Figure 5-5 on page 114).

Note: Depending on your WebSphere MQ configuration, this can be a lengthy procedure and it is not interruptible once begun.

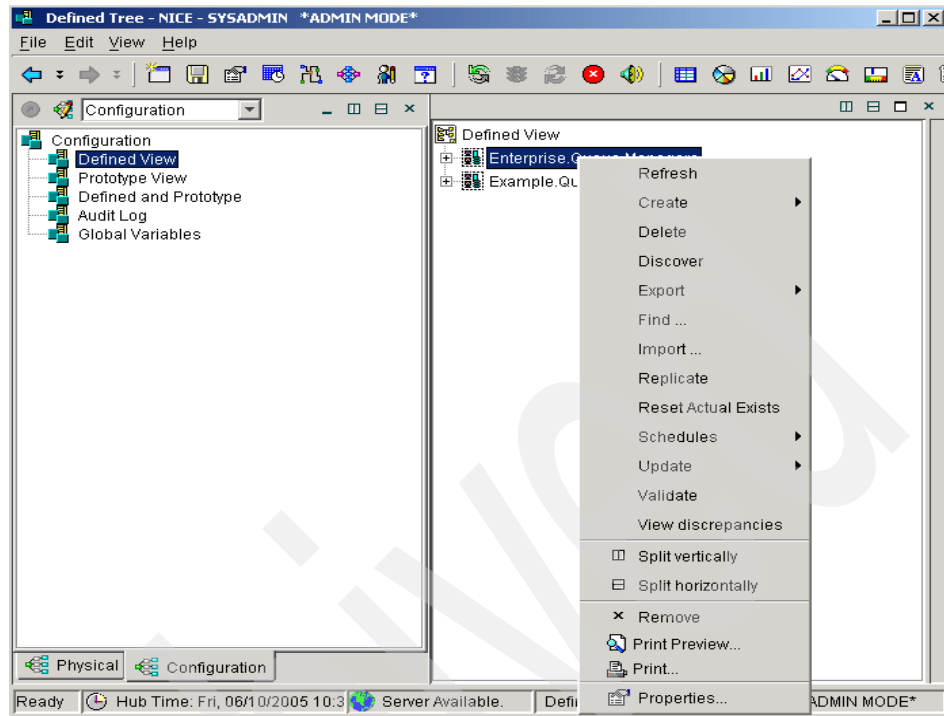


Figure 5-5 Discovering existing queue managers

IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration searches your site's entire WebSphere MQ environment for unknown queue managers and adds them and all their associated resources (queues, channels, and so on) to the configured system group you selected. For each queue manager discovered, this product creates a resource group named \$Default_Group, and the queue manager's resources are added to that resource group.

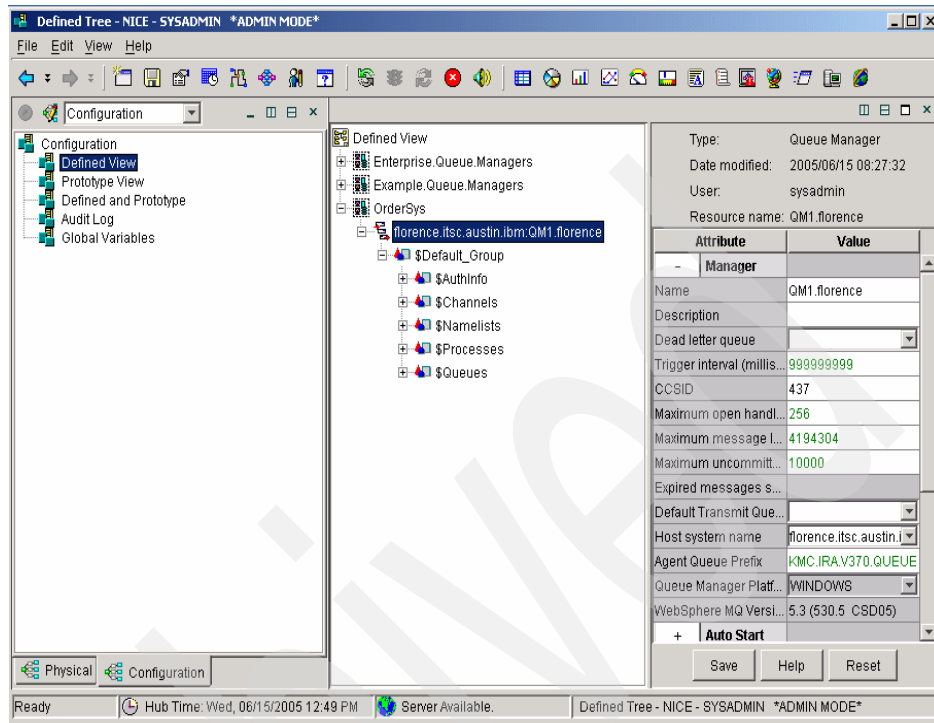


Figure 5-6 Viewing configuration of discovered queue manager

After you use the Discover feature to populate a configured system group, you can see your existing WebSphere MQ configuration in the Defined View. Your configuration is shown graphically in a tree view. In this view, different icons represent each type of object in your configuration (queue managers, queues, channels, processes, namelists, and so on). The left side of the display shows a hierarchical representation of configured systemgroups, configured systems (queue managers), resource groups, and resources. Click the + or - signs to expand or contract the display. The right side of the display shows the settings list of the currently-selected object.

- Next, you create a prototype of each of the four queues that support the order entry application. These prototypes serve as the models for queue objects you will add later to the defined view. Once the queues are added to Windows systems in the defined view, you can change the queues by simply changing the original four prototypes on which they are based. When creating the four queue prototypes, you specify a name for the prototype, ProtoOrderEntryQn, and another name for defined objects based on the prototype, OrderEntryQn on order entry System, where n is a number from 1–4. By using similar names for defined objects and for the prototypes on which they are based, you can

easily keep track of related objects. In the prototype view tree, right click **Resource Prototypes** and, from the pop-up menu, select **Create**, and then select **Queue:Remote**, as shown in Figure 5-7.

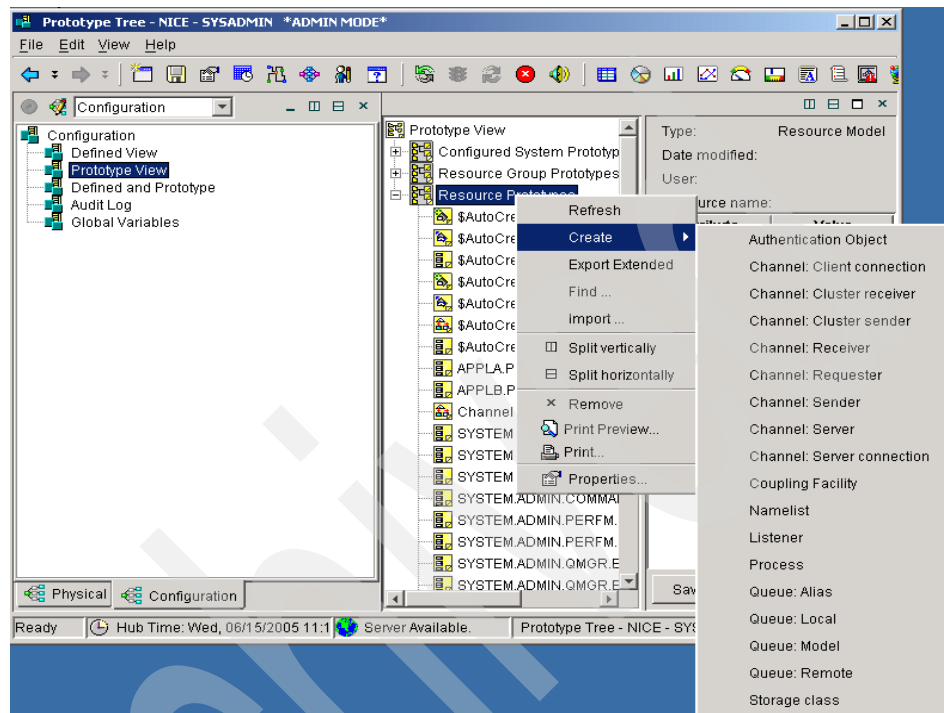


Figure 5-7 Creating prototype for queue

5. Enter a name for the new object and click **OK**. The new prototype object is added to the prototype view tree. In the prototype view tree, select the new prototype. The settings list for the object displays on right side of the Prototype View (Figure 5-8 on page 117).

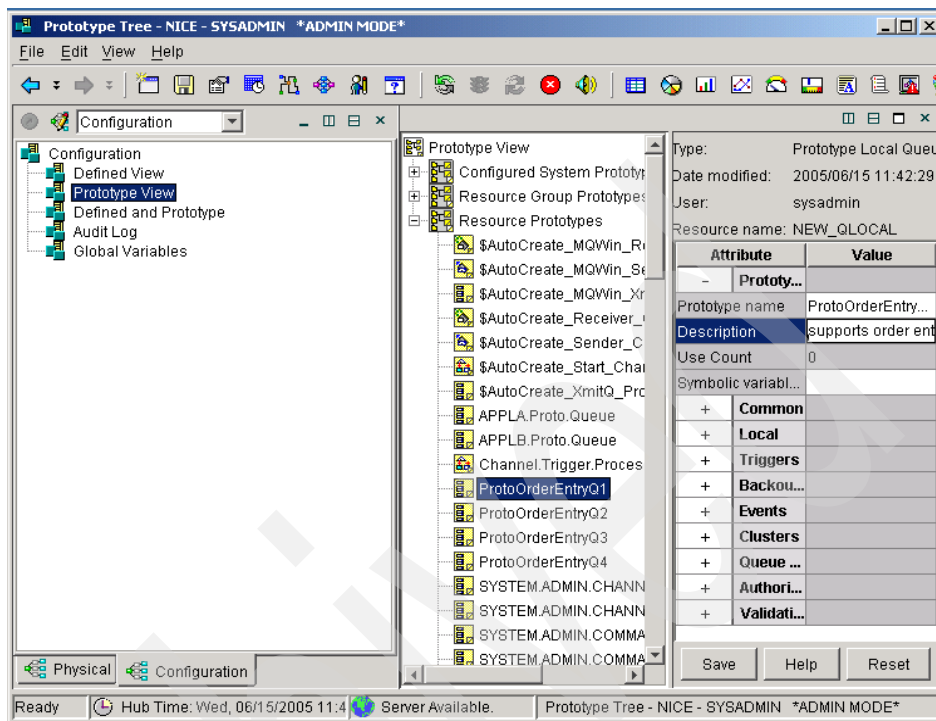


Figure 5-8 Viewing ProtoOrderEntryQ1 prototype

6. You create a resource group prototype to contain the four resources supporting the order entry application. Creating a resource group prototype makes it easy to configure each Windows system for the order entry application as it is rolled out. To create a resource group, right-click **Resource Group Prototype** and select **Create Resource Group**, as shown in Figure 5-9 on page 118.

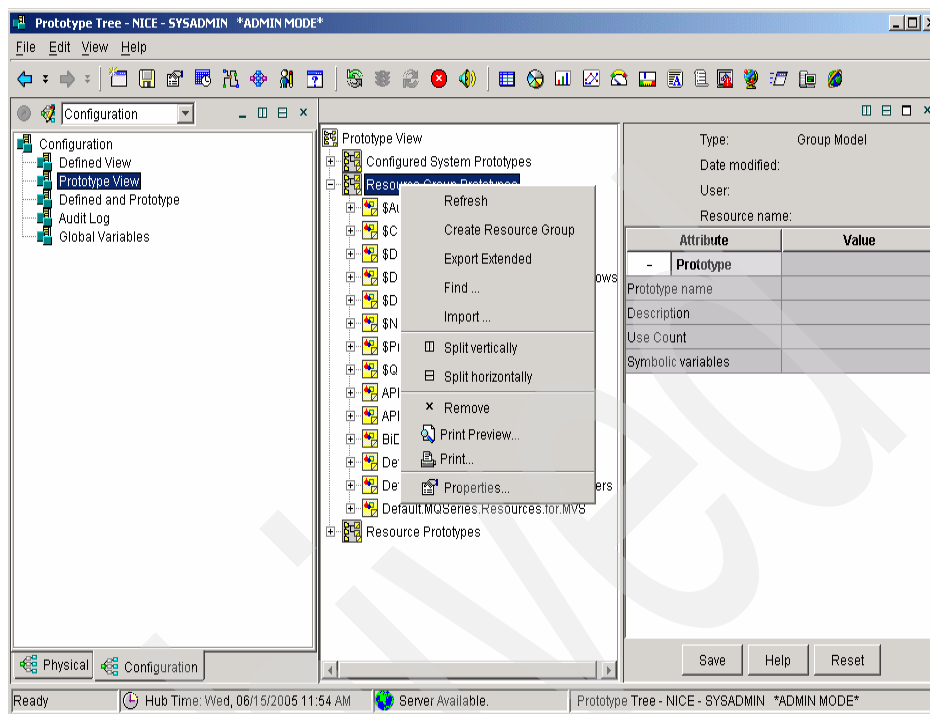


Figure 5-9 Creating Resource Group prototype

7. You will be prompted to supply a name prototype, ProtoOrderEntryGroup, and another name for defined objects that will be based on the prototype, OrderEntryGroup. Again, using similar names for defined objects and for the prototypes on which they are based makes it easier to keep track of related objects. Enter an alphanumeric name for the new configured system group. Click **OK**. The new resource group prototype is added to the prototype view tree.
8. You can drag an instance of the four queue prototypes into the resource group prototype. This creates references to each of the four queue prototypes. These references act as pointers that link the queue prototypes to the resource group prototype. If you make changes to a queue prototype, the change is automatically reflected in the resource group prototype and in each defined object based on these prototypes (see Figure 5-10 on page 119).

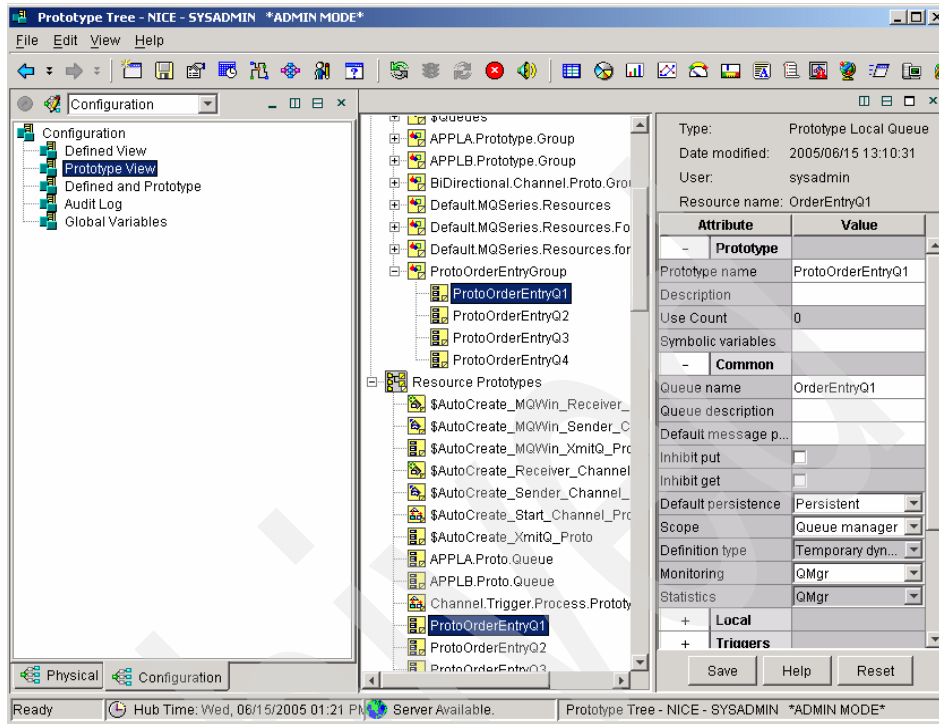


Figure 5-10 Linking queue resource prototypes to the resource group prototype

9. Next, you open the Defined and Prototype view and copy the resource group prototype to the defined queue manager for the first system to support its order entry application (Figure 5-11 on page 120). Dragging an instance of a prototype to the Defined View does not affect your actual WebSphere MQ configuration.

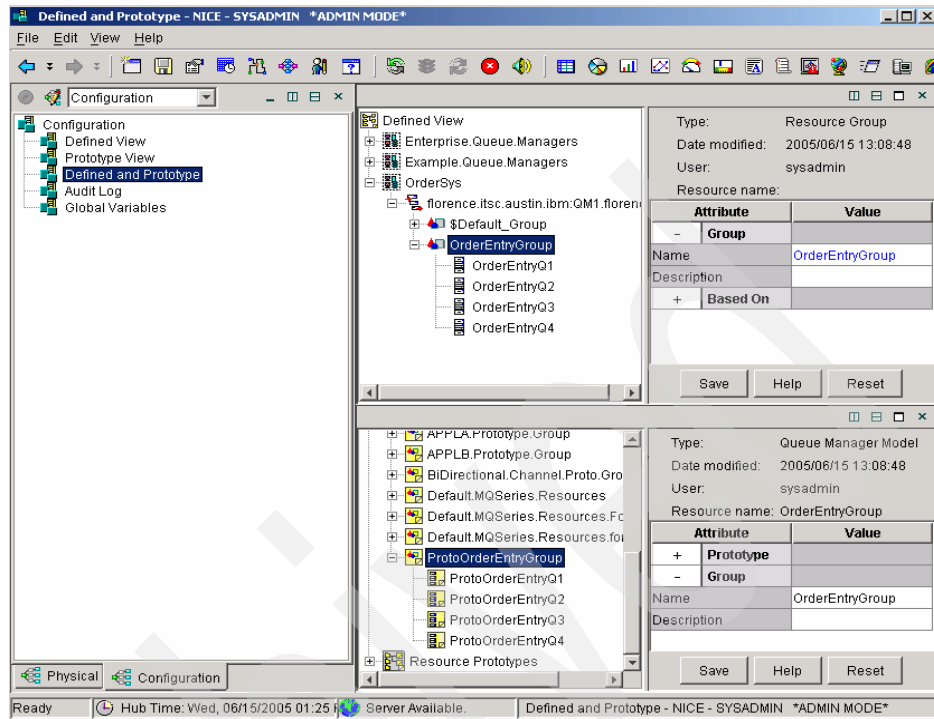


Figure 5-11 Copying the resource group prototype to the defined queue manager

10. To ensure that there are no errors in the queue manager definition or in any of its new, underlying resource definitions, use IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to validate the queue manager with the new resource group. Right-click the queue manager and select **Validate** (Figure 5-12 on page 121).

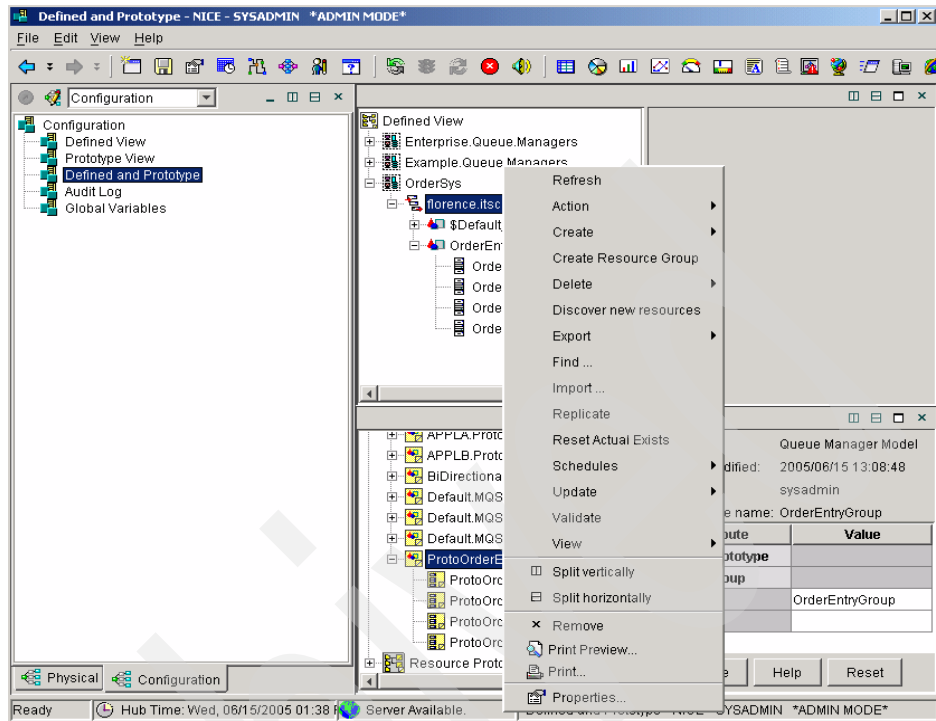


Figure 5-12 Validate the queue manager

If you find any errors in the four new queues, edit the associated prototypes, not the object in the Defined View, then validate the queue manager again.

11. Now that you are confident that the defined view you have created in support of the order entry application is valid, use IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to update the actual WebSphere MQ configuration automatically. Instead of implementing the changes command by command, right-click the queue manager you want to update and, from the pop-up menu, select **Update actual from defined**.

Note: Both the “Update actual from defined” and “Update defined from actual operations” may delete objects from the configuration that is being updated. Thus, it is important to perform “View discrepancies” action before you perform either “Update action” to ensure you know what changes will be implemented.

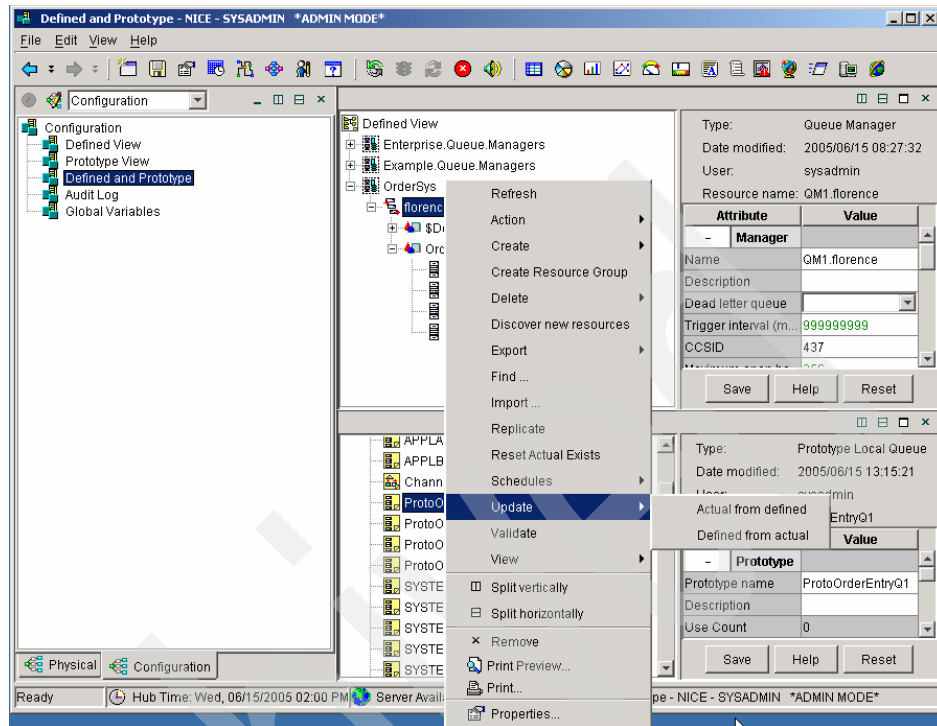


Figure 5-13 Update actual from define

By default, this configuration product validates the defined configuration automatically before adding the four new queues to the queue manager on the actual Windows system.

One year later, an upgrade to the order entry application requires the addition of a fifth queue. Because you used prototypes to build the resource group and original four queues for the application, it is easy and fast to add another queue.

1. You create a fifth prototype in the same manner as you created each of the original four queue prototypes. You use the same naming convention as well: ProtoOrderEntryQ5 for the prototype name and OrderEntryQ5 on the system for the name of defined objects based on the prototype.
2. You add ProtoOrderEntry5 to the resource group prototype ProtoOrderEntryGroup. IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration adds a reference to the fifth queue prototype to the prototype. Now that the resource group prototype has been changed, all the defined resource groups based on ProtoOrderEntryGroup get a fifth defined queue as well.

3. Because this configuration product validates updates to an actual configuration before implementing them, you can run the “Update actual from defined” operation on the entire configured system group without first validating the change you just made to the system or you can also schedule an action for the “Update actual from defined” operation.

The next section describes how you schedule an action.

5.2.1 Scheduling an action

When you make changes to your defined or actual WebSphere MQ environments, you want to update or compare these configurations to keep them in sync. However, performing these actions as configuration changes are made, or during regular business hours, may mean slower response time and a delay in your configuration activities. Additionally, you may be working with configurations in different time zones and want to schedule actions based on the time of day in a particular time zone. Using the action scheduling feature, you can schedule an action to run weekly, daily, hourly, or even on hours in specified time zones. You can also schedule an action to run on demand using an activity program in a policy.

To schedule actions for a target object, use the Scheduled Action settings list. You can create a scheduled action for one object or for a group of objects. To schedule an action:

1. Ensure you are in update mode.
2. In the Defined View, right-click the object for which you want to schedule an action and, from the pop-up menu, select **Schedules** → **Create**, as shown in Figure 5-14 on page 124.

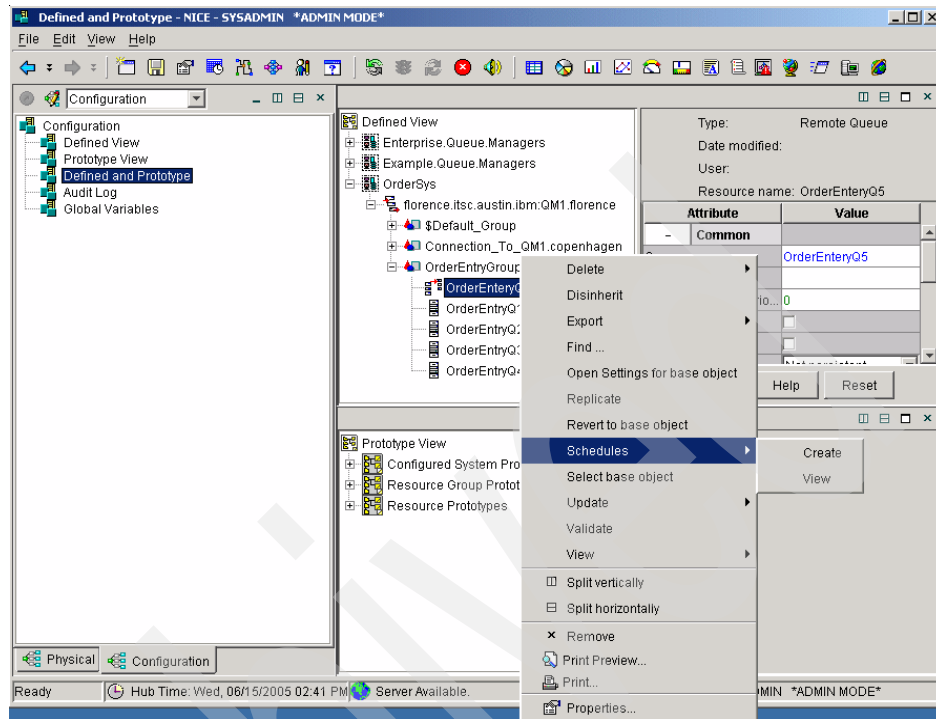


Figure 5-14 Scheduling an action

3. Enter the name of your new scheduled action and click **OK** (Figure 5-15 on page 125).

Attribute	Value
Name	
Name	Order_EntryQ5_schedule
Description	
Creating user	sysadmin
Continue after failure	<input checked="" type="checkbox"/>
Enabled	<input checked="" type="checkbox"/>
Prevent updates if enabled	<input checked="" type="checkbox"/>
Action	Update actual from defined
Backup file	
Time	
Start time	2005/06/15 00:00:00
Last start time	2005/06/17 00:00:00
Time zone	Client
Expires after (days)	5
Run on demand only	<input type="checkbox"/>
Reschedule	None
...every n hours	
Detail	
Target object	OrderEntryQ5
Configured system(s)	florence.itsc.austin.ibm:QM1.florence
Configured system group	OrderSys
Save	
Save output	<input checked="" type="checkbox"/>
Delete after Save	<input type="checkbox"/>
Save format	Delimited
Save level	Summary
Save once	<input type="checkbox"/>
Save file	logstOrder_EntryQ5_schedule.txt

Save Cancel Help

Figure 5-15 Scheduling options

4. Use the Name section to specify:
 - The name and description of the schedule
 - Whether the scheduled action should continue running after a failure on one of the target objects when more than one target object was originally selected
 - whether the schedule is enabled or disabled (to run the scheduled action, the Enabled check box must be selected.)
 - Whether to preserve the integrity of target objects and their descendants or ancestors (This prevents another user from making any updates to target objects or their descendants or ancestors when the scheduled action is Enabled.)
 - The type of action to perform
5. Use the Time section to specify:
 - When the scheduled action should run
 - Whether the times specified are relative to the CandleNet Portal client or the configured system containing the target object or objects

- How often the scheduled action should repeat
 - When the schedule should be purged from the configuration database
 - Whether the defined action should be performed on a specified schedule or executed by a policy
6. Use the Detail section to view the target object or objects as part of its configured system(s) and configured system group.
 7. Use the Save section to specify:
 - Whether to make the scheduled action report data eligible for saving (to Save the scheduled action report output, the Save output check box must be selected. This is not an automatic process; manual steps are required later, from the Scheduled Action Summary Report, if you decide to save the output to a file after the scheduled action runs.)
 - Whether this is a one-time-only scheduled action that should be deleted after the report data is saved
 - The format of the saved report data
 - The level of detail of the saved report data
 - Whether this is a one-time-only save request
 - The file name and location of the saved report data
 8. Click **Save** to save your changes.

5.2.2 Connecting queue managers

You can use IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to quickly and easily create bidirectional links between two queue managers. When you drag and drop queue manager objects within the graphical interface, IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration automatically creates the necessary channels and transmission queues. To automatically create bidirectional links between two queue managers:

1. Ensure you are in update mode.
2. Open the Defined View and expand the defined view tree as necessary.
3. Locate the first queue manager you want to connect.
4. Locate the second queue manager.
5. Click the first queue manager you want to connect.
6. Drag its icon to the queue manager you want to connect to and then release the mouse button.

Figure 5-16 on page 127 shows the connecting queue managers operation.

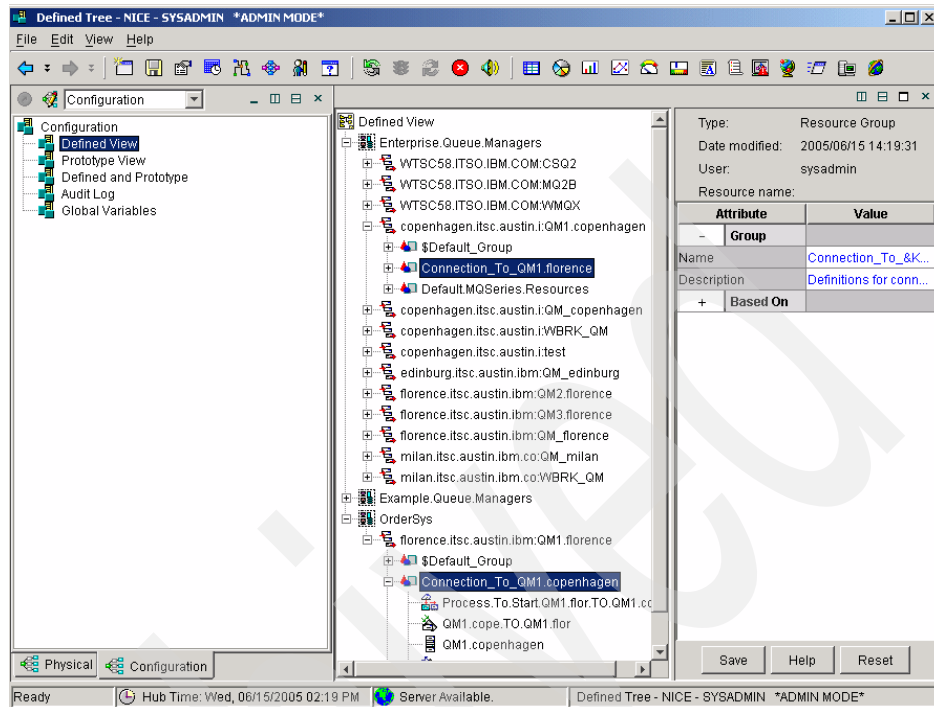


Figure 5-16 Connecting queue managers

A resource group is automatically added to each queue manager. The resource group added is based on the value specified in the Autoconnect prototype resource group field (in the Auto Start section of the Queue Manager settings list). Default “autoconnect” prototype resource groups are shipped with IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration.

IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration creates the necessary transmission queues and channels to link the two queue managers. They are added to the first resource group for each queue manager. If a queue manager has no resource groups, one named \$Default_Group is created.

5.2.3 Creating resources

You can use the Defined View’s menu options to create and define new resources within an existing resource group. The types of resources you can define are:

- ▶ Alias queue
- ▶ Authentication Information object

- ▶ Client connection channel
- ▶ Cluster receiver channel
- ▶ Cluster sender channel
- ▶ Coupling facility (z/OS only)
- ▶ Listener
- ▶ Local queue
- ▶ Model queue
- ▶ Namelist
- ▶ Process
- ▶ Receiver channel
- ▶ Remote queue
- ▶ Requester channel
- ▶ Sender channel
- ▶ Server channel
- ▶ Server connection channel
- ▶ Storage class (z/OS only)

Note: New resources created with the method described in this section are not based on a prototype, so you will need to either specify all required parameters or accept the default settings.

Let us say, for example, you need to create a local test queue for some testing purposes temporarily. You can create a new queue resource for a resource group:

1. Ensure you are in update mode.
2. Open the **Defined View**.
3. Right-click the icon of the resource group to which you want to add the new resource and, from the pop-up menu, select **Create** → **Queue:Local** as shown in Figure 5-17 on page 129.

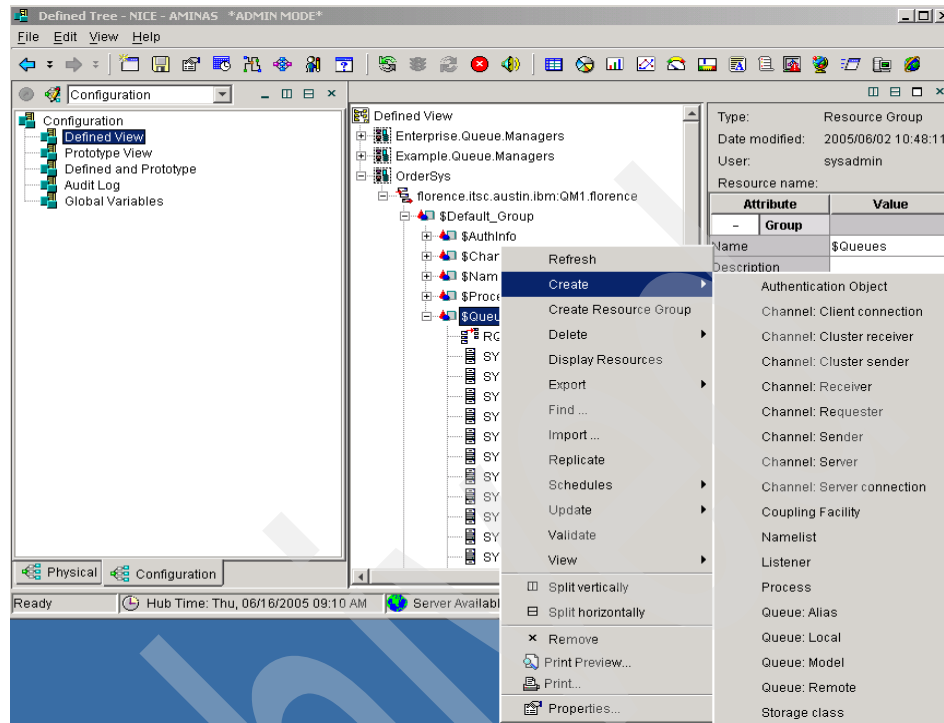


Figure 5-17 Creating local queue

4. Enter an alphanumeric name for the new resource **TEST.LOCAL.QUEUE** and click **OK**. The new resource object is added to the defined view tree.
 - a. If the default settings for the object are acceptable, you are finished creating the new resource.
 - b. If you want to change or view the default settings for the object, continue with the next step in the procedure.
5. In the defined view tree, select the new created resource **TEST.LOCAL.QUEUE**. The settings list for the object displays on the right side of the Defined View (Figure 5-18 on page 130).

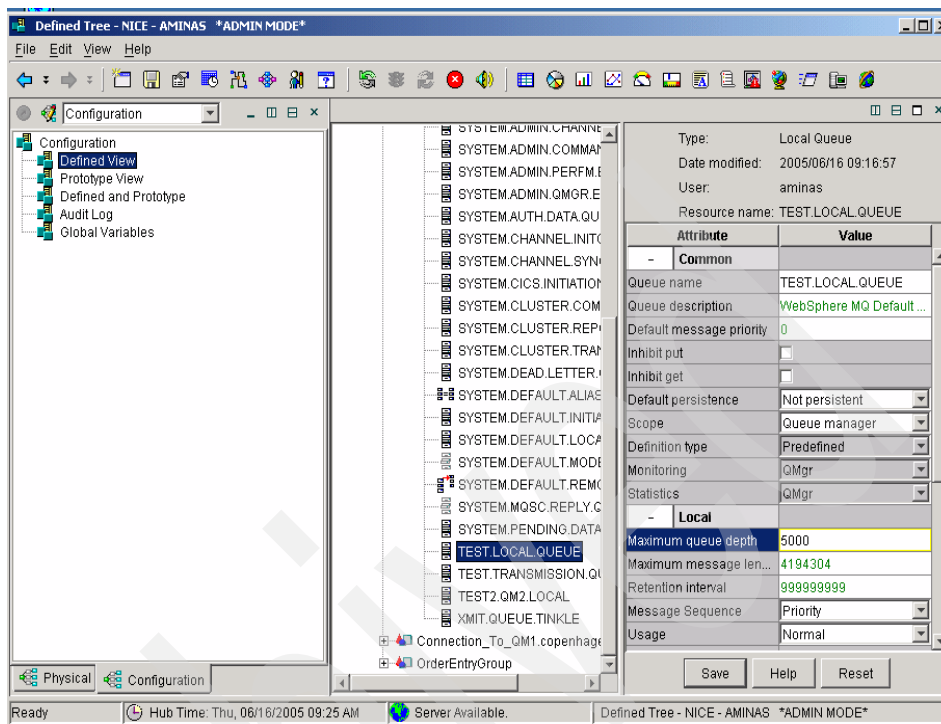


Figure 5-18 Viewing the queue object

6. Complete the settings list as necessary.
7. Click **Save** to save your changes.
8. Before you add defined configuration objects to your actual WebSphere MQ configuration, make sure you validate the definitions to ensure they are defined properly. Once you are completely satisfied, use **Update actual from defined** to add defined objects to the actual WebSphere MQ.

5.3 Audit Logging feature

The Audit Logging feature enables you to view historical records of the changes you make to your defined and actual configurations using IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration. Auditors, WebSphere MQ system administrators, or anyone else interested in determining configuration changes can view this information in easy-to-read report format. The changes reported include:

- Creation of new objects or action schedules

- ▶ Deletion of objects or action schedules
- ▶ Changes to settings
- ▶ Updates to defined or actual objects
- ▶ Actual object discoveries
- ▶ Prototype disinheritance
- ▶ Security violations
- ▶ Changes to product-managed configuration objects made as a result of a change to a managed cluster

5.3.1 Audit Log reports

This report contains information about each change to your defined and actual configurations, including the name of the user who made the changes. Depending on the type of configuration change, you can access additional details reports.

1. Use the Audit Log workspace (Figure 5-19 on page 132) to access the Audit Log report.

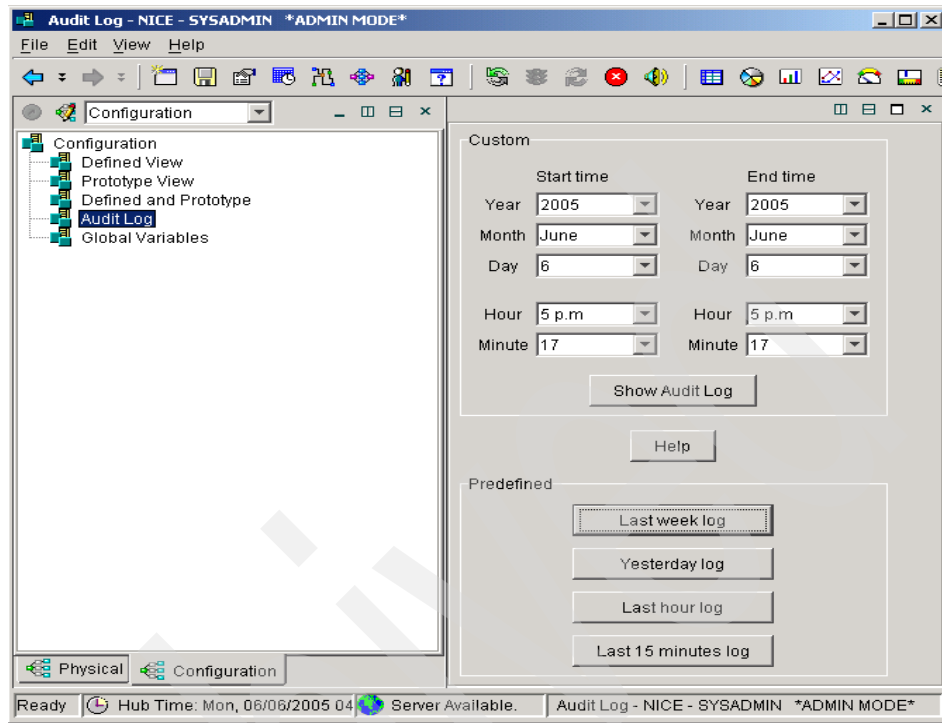


Figure 5-19 Audit Log workspace

2. Specify a custom time period for which you want to view records (using the Start time and End time controls), then click **Show Audit Log**, or you can also click one of the predefined time periods for which you want to view records. The choices are: Last week log, Yesterday log, Last hour log, and Last 15 minutes log (see Figure 5-20 on page 133).

Audit Log for 2005/06/01 17:17:00 to 2005/06/06 17:17:00						
Date/Time	Action	Object name	Object type	Configured s...	Application	Userid
2005/06/02 1...	Create Defined	Florence.Que...	Configured S...			sysadmin
2005/06/02 1...	Discovered	edinburg.itsc...	Queue Mana...	edinburg.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	WTSC58.ITS...	Queue Mana...	WTSC58.ITS...	MQ	sysadmin
2005/06/02 1...	Discovered	copenhagen.i...	Queue Mana...	copenhagen.i...	MQ	sysadmin
2005/06/02 1...	Discovered	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	WTSC58.ITS...	Queue Mana...	WTSC58.ITS...	MQ	sysadmin
2005/06/02 1...	Discovered	copenhagen.i...	Queue Mana...	copenhagen.i...	MQ	sysadmin
2005/06/02 1...	Discovered	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	WTSC58.ITS...	Queue Mana...	WTSC58.ITS...	MQ	sysadmin
2005/06/02 1...	Update Defin...	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Create Defined	SYSTEM.DEF...	Process	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Create Defined	SYSTEM.DEF...	Client Conne...	florence.itsc...	MQ	sysadmin

Open as Details

Figure 5-20 Audit log

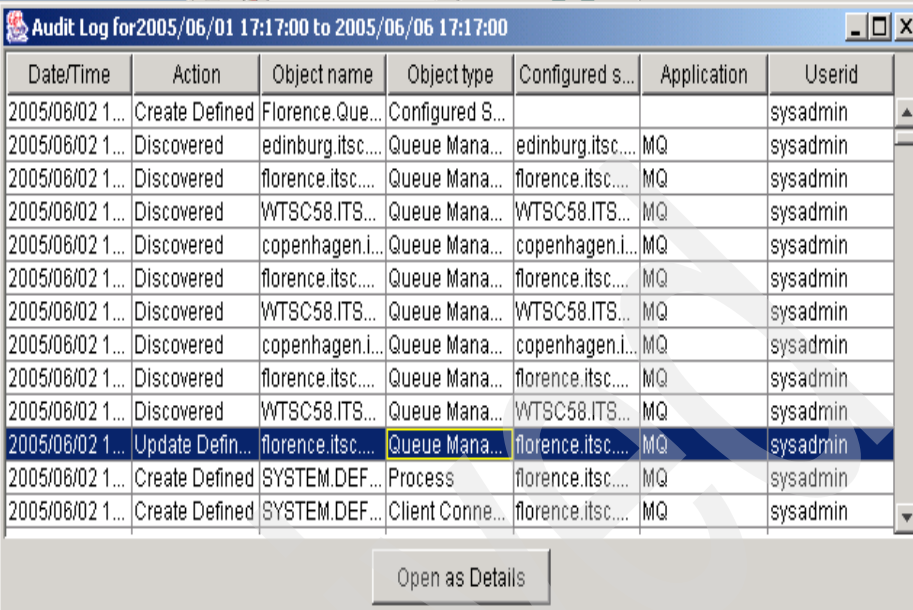
5.3.2 Accessing additional details reports

An additional details report is available for entries in the Audit Log report that represent update and drag/drop actions. The contents of the report vary according to the type of action.

For update actions, a detailed report contains one row for every property that was altered. Every row contains the name of the property and its before and after values.

For drag/drop actions, a detailed report contains the name of the original configured system, the name of the original parent, and the name of the new parent. To get additional information for a particular entry in the Audit Log report:

1. Highlight an entry that contains one of the following actions: DragDrop Copy, Settings Change, and Update Defined, as shown in Figure 5-21 on page 134.

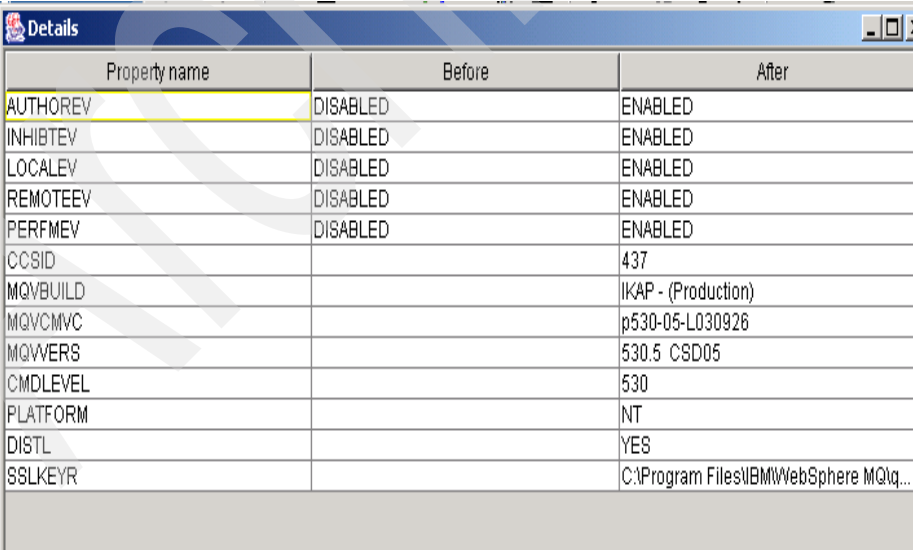


Date/Time	Action	Object name	Object type	Configured s...	Application	Userid
2005/06/02 1...	Create Defined	Florence.Que...	Configured S...			sysadmin
2005/06/02 1...	Discovered	edinburg.itsc...	Queue Mana...	edinburg.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	WTSC58.ITS...	Queue Mana...	WTSC58.ITS...	MQ	sysadmin
2005/06/02 1...	Discovered	copenhagen.i...	Queue Mana...	copenhagen.i...	MQ	sysadmin
2005/06/02 1...	Discovered	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	WTSC58.ITS...	Queue Mana...	WTSC58.ITS...	MQ	sysadmin
2005/06/02 1...	Discovered	copenhagen.i...	Queue Mana...	copenhagen.i...	MQ	sysadmin
2005/06/02 1...	Discovered	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Discovered	WTSC58.ITS...	Queue Mana...	WTSC58.ITS...	MQ	sysadmin
2005/06/02 1...	Update Defn...	florence.itsc...	Queue Mana...	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Create Defined	SYSTEM.DEF...	Process	florence.itsc...	MQ	sysadmin
2005/06/02 1...	Create Defined	SYSTEM.DEF...	Client Conne...	florence.itsc...	MQ	sysadmin

Open as Details

Figure 5-21 Selecting log

2. Click **Open as Details**. The Details report opens (Figure 5-22).



Property name	Before	After
AUTHOREV	DISABLED	ENABLED
INHIBTEV	DISABLED	ENABLED
LOCALEV	DISABLED	ENABLED
REMOTEEV	DISABLED	ENABLED
PERFMEV	DISABLED	ENABLED
CCSID		437
MQVBUILD		IKAP - (Production)
MQVCMVC		p530-05-L030926
MQWERS		530.5 CSD05
CMDLEVEL		530
PLATFORM		NT
DISTL		YES
SSLKEYR		C:\Program Files\IBM\WebSphere MQ\q...

Figure 5-22 Detailed report

5.4 Backing up the configuration database

It is a good practice to regularly back up the configuration database. The backup process is performed using a CandleNet Portal client. The backup process does not interfere with the functioning of the configuration manager, nor does the Candle Management Server need to be disabled in order to execute the backup process.

The backup begins only if there are no outstanding deferred database updates pending; the backup also waits until all database commits have completed. While the backup is running, it is possible to fetch records from the database as required by other transactions; however, any deferred database updates that are created while the backup is running will remain queued until the backup completes. This will not prevent other update transactions from running.

The format of the backup file is platform-independent; therefore, the backup process can be used to migrate the configuration data from one platform to another. If you choose to use FTP to accomplish this, you must specify the ASCII format. Also, if you transfer a backup file to z/OS, the LRECL of the receiving data should be defined as follows:

```
RECFM=FB,LRECL=440,BLKSIZE=<some multiple of 440>
```

There is only one procedure to back up the configuration database file regardless of the type of database (the product-provided Internal type or the DB2 Universal Database™ type) that your site uses for the configuration database. To back up the configuration database to a file:

1. Ensure you are in update mode. The Configuration View displays.
2. In the Configuration View, click **Backup configuration database**. The backup configuration database opens, as in Figure 5-23 on page 136. You will be prompted to supply a file name.

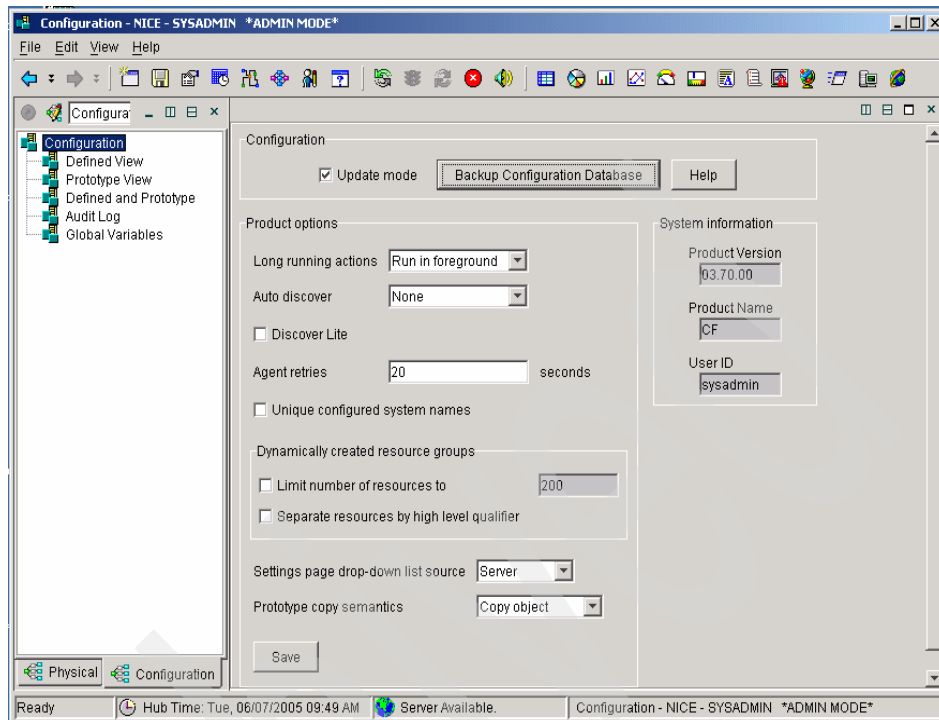


Figure 5-23 Backup configuration database

3. Enter the name of the file, on the Hub CMS machine, where you want the configuration database backed up. The format of the file name is dependant upon the operating system on which the CMS runs:
 - If the CMS is on UNIX, this name identifies a file in the candlehome/tables/CMS_Name directory, where candlehome is the directory into which you installed this Tivoli OMEGAMON XE product package and CMS_Name is the name of your Candle Management Server. If the file does not exist, it is created; if it does exist, its current contents are overwritten.
 - If the CMS is on Windows, this name identifies a file in the current CMS working directory (for example, c:\Candle\CMS). If the file does not exist, it is created; if it does exist, its current contents are overwritten.
 - If the CMS is on z/OS, this name references a predefined sequential dataset. Do not enclose the name in quotes. The DCB information required for this dataset is:

RECFM=FB,LRECL=440,BLKSIZE=<some multiple of 440>

After you have entered the name of the file, click **OK**.

4. Wait for the message that the configuration database was successfully backed up and click **OK**.

Note: In order to restore the configuration database, a previous back up of the configuration database must have been performed.

5.4.1 Restoring the configuration database

The restoration process is performed at the Hub Candle Management Server. The backup file that is needed for restoration must have been previously created. In the event that it is necessary for you to restore the contents of the configuration database from the backup file, use one of the restore utilities listed below. Use the restore utility that is appropriate for the type of configuration database used by your Hub CMS.

1. Product-provided Internal type configuration database restoration options:
 - If the CMS is on UNIX, use the RestoreMQConfig utility located in the candlehome/bin directory where candlehome is the directory into which you installed this Tivoli OMEGAMON XE product package.
 - If the CMS is on Windows, use the KCFCRSTR utility located in the current CMS working directory (for example, c:\Candle\CMS). At the command prompt, you can enter KCFCRST2 with no operands to display usage information for this utility.
 - If the CMS is on z/OS, use the KCFARSM utility. For a sample JCL to run the KCFARSM utility, see the member named KCFCRDBJ that is located in the &RHILEV..TKANSAM library.
2. DB2 Universal Database type configuration database restoration options:
 - If the CMS is on UNIX, use the RestoreMQConfigDB2 utility located in the candlehome/bin directory, where candlehome is the directory into which you installed this Tivoli OMEGAMON XE product package.
 - If the CMS is on Windows, use the KCFCRST2 utility located in the current CMS working directory (for example, c:\Candle\CMS).
 - If the CMS is on z/OS, use the KCFCRST2 utility. For a sample JCL to run the KCFCRST2 utility, see the sample member named KCFRSDDB2 that is located in the &RHILEV..TKANSAM library.

Note: The current contents of the configuration database are completely replaced by the contents of the backup file.

IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration simplifies the time-consuming and resource-intensive tasks of defining your configuration. You

can use IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration to manage your WebSphere MQ network, including local or remote nodes, from a single point of control. You can see how your WebSphere MQ queue managers and resources are related by viewing a graphical representation of your entire network. You can base configurations on prototype models so you can implement global updates with the click of a mouse, saving time and resources by performing many difficult development tasks automatically. You can group related WebSphere MQ resources together in ways that reflect the business-oriented relationships between them and the logical structure of your enterprise.

WebSphere MQ Monitoring

In Chapter 5, “WebSphere MQ Configuration” on page 103, we talked about OMEGAMON XE for WebSphere MQ Configuration. In this chapter we will introduce OMEGAMON XE for WebSphere MQ Monitoring. It is important to remember that although these components are not prerequisite for each other and can be used as stand-alone components, you will get the most benefit by using them together. This will provide you a complete end-to-end WebSphere MQ management.

The following sections are covered in this chapter:

- ▶ 6.1, “OMEGAMON XE for WebSphere MQ Monitoring overview” on page 140
- ▶ 6.2, “WebSphere MQ Monitoring options” on page 140
- ▶ 6.3, “Workspaces” on page 162
- ▶ 6.4, “Monitoring scenarios” on page 166

6.1 OMEGAMON XE for WebSphere MQ Monitoring overview

IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring (OMEGAMON XE for WebSphere MQ Monitoring) lets you easily collect and analyze WebSphere MQ-specific data for all queue managers from a single vantage point. It provides many useful workspaces you can use to track trends and understand and troubleshoot system problems. It provides you with the ability to view information about each WebSphere MQ object you are monitoring. You can use this information to identify system bottlenecks and evaluate tuning decisions, select the most effective threshold values for situations you create, and review status information when a change in the state of a given resource occurs, such as from Informational to Warning or from Warning to Critical.

OMEGAMON XE for WebSphere MQ Monitoring provides these benefits:

- ▶ Increases knowledge with extensive reporting capabilities that provide real-time access to reliable, up-to-the-minute data. Thus, you can make faster, better-informed operating decisions.
- ▶ Enhances system performance by letting you integrate, monitor, and manage your system, environment, console, and mission-critical applications. For example, OMEGAMON XE for WebSphere MQ Monitoring can alert you when conditions in your environment meet or exceed the thresholds you set. These alerts notify your system administrator to limit and control system traffic.
- ▶ Simplifies application and system management by managing applications, platforms, and resources across your system.

6.2 WebSphere MQ Monitoring options

IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring enables you to set a wide range of monitoring options that can be changed to suit the needs of your environment. For example, you can define which queue managers, queues, and channels you want monitored, specify the time interval for collecting WebSphere MQ data, manage the disposal of event messages from an event queue, or specify whether or not you want to collect historical monitoring data and how long you want to have that data available. Monitoring options are set by defining certain commands and parameters in a special command file that we will refer to as the *monitoring file* (the actual name of the file varies slightly by operating system platform). When you start the WebSphere MQ Agent, the commands and parameter values in the monitoring file are read and executed. You do not create the monitoring file; it is supplied with your product and is preconfigured with a set of default commands and parameter values. As supplied, the OMEGAMON

Monitoring Agent® for WebSphere MQ on z/OS monitors all queues and channels for all queue managers and all WebSphere MQ applications. As supplied, the OMEGAMON Monitoring Agent for WebSphere MQ on HP NonStop Kernel (formerly known as Tandem), UNIX, Windows, and OS/400® monitors all queues and channels on a single DEFAULT queue manager. You can change these default options as well as any others. The list of monitoring options available are as follows:

- ▶ The SET GROUP command defines a group of queue managers that have common monitoring characteristics. Within the group, you can override like-named parameters for specific queue managers using the SET MANAGER command. At least one SET GROUP command is required.
- ▶ The SET MANAGER command specifies queue managers to be monitored.
- ▶ The SET QUEUE command specifies the queues to be monitored. IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring always monitors the Dead Letter Queue. To monitor other system or application queues, specify them with the SET QUEUE command.
- ▶ The SET CHANNEL command specifies channels to be monitored.
- ▶ The SET EVENTLOG command specifies the size, location, and other attributes of the event log.
- ▶ The SET EVENTQIN command identifies the queue manager event queue, channel event queue, performance event queue, and configuration event queue for a queue manager or group of queue managers. If no SET EVENTQIN command applies to a queue manager, the following default WebSphere MQ names are used:
 - SYSTEM.ADMIN.QMGR.EVENTS
 - SYSTEM.ADMIN.CHANNEL.EVENTS
 - SYSTEM.ADMIN.PERFM.EVENTS
 - SYSTEM.ADMIN.CONFIG.EVENT (Configuration events are present on WebSphere MQ for z/OS Version 5.3 and above only.)
- ▶ The SET EVENTQOUT command identifies the output queue(s) where queue manager event information, channel event information, performance event information, and configuration event information will be copied. Once IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring has read an event message from an event queue, it deletes the message to ensure that it is processed only once. If another application running at your site requires access to event messages, you can define an output queue where these messages are copied and point the other application to that queue. If no SET EVENTQOUT command applies to a queue manager, the event information is discarded after being processed.

- ▶ The **PERFORM INCLUDE** command points to an external file containing customization commands. To execute the commands in this file, specify **PERFORM INCLUDE** in your startup file.
- ▶ The **PERFORM STARTMON** command initiates monitoring of WebSphere MQ objects, specifies the sampling interval for collecting WebSphere MQ data, and specifies whether or not historical data will be collected.
- ▶ The **SET AGENT** command allows you to specify the middle qualifier used in the managed system name. On distributed platforms, if this value is not specified, no value is used. On z/OS, if this value is not specified, the host name is used. If you specify this value, it is used only in the managed system names of subnodes. For example, to avoid confusion and to allow multiple WebSphere MQ monitoring agents, instead of issuing the default agent startup command **IRAMAN KMQAGENT START** (to start a node named `hostname:MQIRA`) it allows you to issue the modified agent startup command **IRAMAN KMQAGENT START agentid** (to start a node named `agentid:MQIRA`). Here are some reasons to use the **SET AGENT** command:
 - On distributed platforms, if your site has multiple queue managers with the same name, running on different nodes, you would need to specify the node name for each queue manager to uniquely identify them.
 - To group and identify queue manager names by something other than the host name and queue manager name.
 - To allow multiple agents connected to the same CMS to monitor the same queue manager.
- ▶ The **SET APPL (z/OS only)** command identifies the WebSphere MQ-based z/OS applications, CICS transactions, and IMS™ programs that should be monitored for application debugging information and application statistics.
- ▶ The **SET MQIMONITOR (z/OS only)** command is supported on z/OS only. The **SET MQIMONITOR** command activates monitoring for the applications you specified using **SET APPL**. You must specify **SET MQIMONITOR** to turn on monitoring. Use the **SET MQIMONITOR** command together with the **SET APPL** command to activate the application debugging and application statistics features.
- ▶ The **SET QSG (z/OS only)** command specifies which queue-sharing groups the WebSphere MQ Monitoring Agent on z/OS monitors and which queue managers the agent uses to collect queue-sharing group data. At any given time, for a particular queue-sharing group, this monitoring product uses only one queue manager to gather data. If that queue manager becomes unavailable, data gathering will “fail over” to another queue manager. The **SET QSG** command is optional. If not specified, the default behavior of the agent is to monitor all queue-sharing groups that are associated with

monitored queue managers. You might use a SET QSG command to specify such things as:

- That no queue-sharing groups will be monitored
- That a particular queue-sharing group will not be monitored
- That a particular queue manager should not be used to collect queue-sharing group data

6.2.1 Editing WebSphere MQ Monitoring options

On Windows, you can change the OMEGAMON XE for WebSphere MQ Monitoring options by editing the mq.cfg monitoring file. You can customize monitoring options in any or all of these monitoring files.

1. From the Manage Candle Services panel, under Service, select **WebSphere MQ Agent -- instance**, where instance is the name of the agent instance for which you want to change monitoring options.
2. Right-click the **WebSphere MQ Agent** and select **Reconfigure**.
3. Verify settings or change as needed and click **OK**.
4. Click **Yes** when you are prompted to update the mq_instance.file.
5. Click **OK**. A Notepad session opens.
6. Add, delete, or modify monitoring option commands as required for your site. Adhere to the following editing rules:
 - To continue a command onto the next line, end the current line with a hyphen (-).
 - Parameters you set when grouping objects are effective for all the objects in the group.
 - You can override parameters for an object in a group by explicitly defining parameters for that object.
7. Select **File** → **Save** and **Exit** the Notepad.
8. Click **Yes** at the next prompt to continue.
9. Verify that your queue manager and its command server are running.
10. Restart the agent for the changes to take effect.

For more information on this and also details on editing the monitoring options on other platforms, refer to *Using IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring*, SC31-6888.

6.2.2 Install WebSphere MQ Agent on z/OS

We will start with the installation of the WebSphere MQ Agent on z/OS.

Prerequisites for configuring the component product

Below are the prerequisites for configuring the WebSphere MQ Agent on z/OS.

If you have not already done so, verify, for the component product you want to configure, the following:

- ▶ You have the required DASD space.
- ▶ You must have installed the component product using the System Modification Program/Extended (SMP/E) tool.
- ▶ You must have completed the configuration for a Candle Management Server (CMS).

In addition, the following manuals will help you during the installation:

- ▶ *IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring on z/OS V4.0 Program Directory*, GI11-4061.
- ▶ *Installation and Configuration of Candle Products on OS/390 and z/OS*, GC32-9214
- ▶ *IBM Tivoli OMEGAMON XE for WebSphere MQ on z/OS Configuration and Customization Guide*, GC32-9329

Notes:

- ▶ The OMEGAMON XE for WebSphere MQ on z/OS Program Directory, along with other Tivoli Program Directories, can be found by following links to the product from the support Web site listed below:

<http://www-3.ibm.com/software/sysmgmt/products/support/>

- ▶ The OMEGAMON XE for WebSphere MQ on z/OS product manuals and all other Tivoli product manuals can be found at the Tivoli Information Center found at:

<http://publib.boulder.ibm.com/tividd/td/tdprodlist.html>

Setting up the configuration environment

Do the following to set up the configuration environment:

1. After installing the component product tape that contains the FMID (HKCI310), read the overview described in *IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring on z/OS V4.0 Program Directory*, GI11-4061, which says that you must copy the contents from one of the target libraries

into the appropriate Candle Installation and Configuration Assistant (CICAT) tool work library. This applies to products installed into either an existing CSI (consolidated software inventory) or into a new CSI. Note that the CICAT tool is a customization tool, shipped with OMEGAMON products on z/OS to facilitate installation on this platform.

2. In our test environment, we have installed components to a new CSI, as shown in Figure 6-1. The attributes for the new dataset are shown in the picture.

Note: Since this was the first OMEGAMON product installed on our test system, we used INSTLIB. If there were other OMEGAMON products installed on our test system, we would use INSTLIBW.

Menu	RefList	Utilities	Help
Allocate New Data Set			Command is not a
Command ==>			
Data Set Name	OMWBI.INSTLIB		
Management class	- (Blank for default management class)		
Storage class	(Blank for default storage class)		
Volume serial	TAROM1 (Blank for system default volume) *		
Device type	(Generic unit or device address) **		
Data class	(Blank for default data class)		
Space units	BLOCK (BLKS, TRKS, CYLS, KB, MB, BYTES or RECORDS)		
Average record unit	(M, K, or U)		
Primary quantity	516	(In above units)	
Secondary quantity	247	(In above units)	
Directory blocks	132	(Zero for sequential data set) *	
Record format	FB		
Record length	80		
Block size	8880		
Data set name type	PDS	(LIBRARY, HFS, PDS, or blank) *	
Expiration date	(YY/MM/DD, YYYY/MM/DD)		
Enter "/" to select option			
Allocate Multiple Volumes			
(* Specifying LIBRARY may override zero directory block)			
(** Only one of these fields may be specified)			
F1=Help F3=Exit F10=Actions F12=Cancel			

Figure 6-1 Creating a new dataset

3. Copy the contents of the OMEGAXE.TKCIINST library into the OMWBI.INSTLIB library. You can use the JCL Example 6-1 for this purpose.

Example 6-1 JCL used for the copy operation

```
//COPY EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//IN DD DSN=OMEGAXE.TKCIINST,DISP=SHR
//OUT DD DSN=OMWBI.INSTLIB,DISP=SHR
//SYSIN DD *
```

Note: We used following high-level qualifiers for our installation:

- ▶ OMEGAXE for the target library for SMP/E
- ▶ OMWBI for the runtime library

Alternatively, you can perform the copy operation through ISPF panels, as shown in Figure 6-2.

```

Menu  RefList  Utilities  Help
COPY   From OMEGAXE.TKCIINST(*)
Command ==>

Specify "To" Data Set Below

To ISPF Library:
Project . . . EPO
Group . . . ISPF41
Type . . . PROFILE

Options:
Enter "/" to select option
/ Replace like-named members
/ Process member aliases

To Other Partitioned or Sequential Data Set:
Data Set Name . . . 'OMWBI.INSTLIB'
Volume Serial . . . (If not cataloged)

Data Set Password . . . (If password protected)

To Data Set Options:
Sequential Disposition
1 1. Mod
2 2. Old

Pack Option
3 1. Yes
2 2. No
3 3. Default

SCLM Setting
3 1. SCLM
2 2. Non-SCLM
3 3. As is

F1=Help  F3=Exit  F10=Actions  F12=Cancel

```

Figure 6-2 Copy the datasets via ISPF

4. Start the Configuration tool, and do the following:
 - a. Log on to a TSO session.
 - b. Invoke ISPF.
 - c. Go to a TSO command line. (In most cases, this is done by entering 6 on the ISPF Primary Option Menu.)
 - d. Enter the following command:


```
EX 'OMWBI.INSTLIB'
```


where the variable OMWBI is the SMP/E dataset high-level qualifier.

5. From the Main Menu, select “Set up work environment” (Figure 6-3).

```
----- MAIN MENU -----
OPTION ==> _
Enter the number to select an option:
  1  Set up work environment
  2  Install products or maintenance
  3  Configure products
  I  Installation information          <=== Revised
  S  Services and utilities

      Installation and Configuration Assistance Tool Version 310.
      (C) Copyright IBM Corp. 1992-2004
      Licensed Material - Program Property of IBM

F1=Help  F3=Back

F1=HELP  F2=SPLIT  F3=END  F4=RETURN  F5=RFIND  F6=
F7=UP    F8=DOWN   F9=SWAP  F10=LEFT  F11=RIGHT  F12=
```

Figure 6-3 Main menu

6. In the SET UP WORK ENVIRONMENT menu (Figure 6-4 on page 148), do the following:
 - a. Select “Specify options” to specify allocation and processing values that will be used to create the work data sets that are needed by the Configuration tool.
 - b. Select “Allocate work libraries” to allocate the Configuration tool work libraries.

```

----- SET UP WORK ENVIRONMENT -----
OPTION ==> _
Enter the number to select an option:
1 Specify options
2 Allocate work libraries

Last selected
Date      Time

Note: Once you create and submit the "Allocate work libraries" job,
you must exit the installer and allow the job to run before
restarting the installer.

F1=Help  F3=Back

F1=HELP  F2=SPLIT  F3=END  F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP    F8=DOWN   F9=SWAP F10=LEFT  F11=RIGHT F12=RETRIEVE

```

Figure 6-4 SET UP WORK ENVIRONMENT menu

Important: Once you create and submit the Allocate work libraries job, you must exit the Configuration tool and allow the job to run before starting the Configuration tool again.

Creating a new runtime environment

Creating a runtime environment includes adding, building, configuring, and loading. Follow the steps in the following sections to create a new runtime environment.

Adding a new runtime environment

Perform the following steps to add a new runtime environment:

1. On the Runtime Environments panel, enter A (Add RTE) in the Action field of the first (blank) row in the list (Figure 6-5 on page 149).

Note: In our test environment, we added an RTE called sc58 as a FULL type and not SHARING, as this is not a sysplex environment.

```

----- RUNTIME ENVIRONMENTS (RTEs) --- Enter required field
COMMAND ==>

Actions: A Add RTE, B Build libraries, C Configure,
        L Load all product libraries after SMP/E,
        D Delete, U Update, V View values, Z Utilities

Action Name      Type      Sharing      Description
A SC58          FULL      Full RTE for SC58
F1=Help F3=Back  (No RTEs defined, use Action A to Add)

F1=HELP      F2=SPLIT      F3=END      F4=RETURN      F5=RFIND      F6=RCHANGE
F7=UP        F8=DOWN      F9=SWAP     F10=LEFT      F11=RIGHT     F12=RETRIEVE

```

Figure 6-5 Adding the runtime environment

The runtime environment types are as follows:

- ▶ FULL: Allocates both private and base libraries. Use this if only one runtime environment will be defined for the environment, or if you add an runtime environment for a unique set of component products.
- ▶ BASE: Allocates base libraries only, and does not execute alone. Use this only in conjunction with SHARING runtime environments populated with the same component products.
- ▶ SHARING: Allocates private libraries only. This type can share base libraries with a BASE or FULL runtime environment populated with the same component products, or use SMP/E target libraries for its base libraries. Define one SHARING runtime environment for each z/OS image if you have multiple images.

(For SHARING runtime environments only) Enter the name of the BASE or FULL runtime environment from which this runtime environment will obtain its base library information. If SMP/E target libraries are to be shared, enter SMP.

2. After specifying all required values on the runtime environments panel, press Enter.

Building a new runtime environment

To build the runtime environment, perform the following steps:

1. On the Runtime Environments panel, enter B (Build libraries) in the Action field of the runtime environment you are configuring (Figure 6-6).

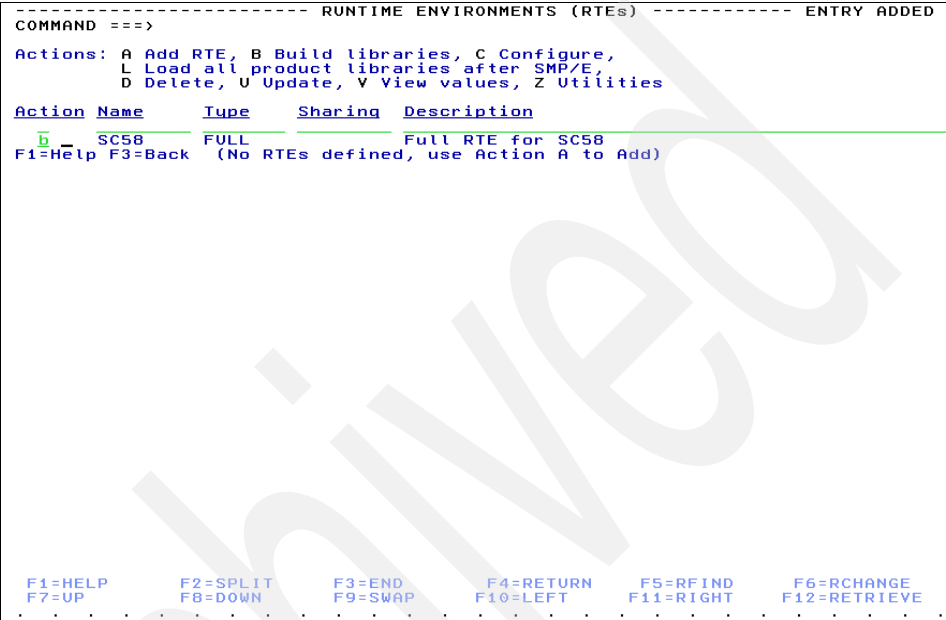


Figure 6-6 Building the runtime environment

2. Review the JCL and submit the job, or if you want to edit the values in this JCL, you can do the following:
 - a. Enter Edit in the command line. The Edit Command Entry panel will display.
 - b. Press F1 to access the online help and follow the instructions there.
 - c. When the JCL contains the preferred values, press Enter and submit the job.
3. Verify that the job completes successfully. All return codes should be 0.

Configure a new runtime environment

To configure the runtime environment, perform the following steps. Perform the following procedure to register the component product with a local CMS:

1. On the Runtime Environments panel, enter C (Configure) in the Action field of the runtime environment you are configuring (Figure 6-7 on page 151).

```
----- RUNTIME ENVIRONMENTS (RTes) -----
COMMAND ==>
Actions: A Add RTE, B Build libraries, C Configure,
        L Load all product libraries after SMP/E,
        D Delete, U Update, V View values, Z Utilities

Action Name      Type      Sharing      Description
-----
C SC58           FULL      Full RTE for SC58
Enter=Next      F1=Help  F3=Back     F7=Up       F8=Down

F1=HELP      F2=SPLIT    F3=END      F4=RETURN   F5=RFIND    F6=RCHANGE
F7=UP        F8=DOWN     F9=SWAP     F10=LEFT    F11=RIGHT   F12=RETRIEVE
```

Figure 6-7 Configuring the runtime environment

2. Select the component product you want to configure.

In our test scenario, we are configuring the MQ Monitoring Agent, so we selected option 3 in the PRODUCT COMPONENT SELECTION COMPONENT menu, as shown in Figure 6-8 on page 152.

Note: As mentioned earlier, you can install OMEGAMON XE for WebSphere MQ Configuration and OMEGAMON XE for WebSphere MQ Monitoring separately on z/OS, but on all other supported platforms, there is no separate installation.

```
----- PRODUCT COMPONENT SELECTION MENU -----
COMMAND ==> 3

The following list of components requires configuration to make the product
operational. Refer to the appropriate configuration documentation if you
require additional information to complete the configuration.

To configure the desired component, enter the selection number on the command
line. You should configure the components in the order they are listed.

COMPONENT TITLE

1  Candle Management Server
2  IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration
3  IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring
4  IBM Tivoli OMEGAMON XE for WebSphere Integration Broker

F1=HELP      F2=SPLIT    F3=END      F4=RETURN   F5=RFIND    F6=RCHANGE
F7=UP        F8=DOWN     F9=SWAP     F10=LEFT    F11=RIGHT   F12=RETRIEVE
```

Figure 6-8 Selecting the product component to configure

Note: In our scenario, we are configuring the monitoring agent to seed data to a remote CMS.

3. In the next panel, select “Specify Agent address space parameters”. Specify the communication protocols in priority sequence.
4. Select F10 from the next panel.
5. Select F5 and you will be prompted to enter the CMS information, as shown in Figure 6-9 on page 153.

```

----- SPECIFY AGENT PRIMARY CMS VALUE          Enter required field
COMMAND ==>
CMS name (case sensitive)          ==> HUB_HELSINKI
Complete this section if the primary CMS requires SNA support:
  LU6.2 logmode                     ==>
  Logmode table name                ==>
  Local location broker applid      ==>
  Network ID                        ==> USIBMSC_
Complete this section if the primary CMS requires TCP support:
  Hostname                         ==> HELSINKI.ITSC.AUSTIN.IBM.COM
  Address                          ==> 9.3.5.52
  Network interface card (NIC)      ==>
  IP port number                    ==> 1918
  IP.PIPE port number               ==>
  Address translation                ==> N      (Y, N)
  Partition name                    ==>
Enter=Next  F1=Help  F3=Back

F1=HELP      F2=SPLIT  F3=END      F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP        F8=DOWN   F9=SWAP     F10=LEFT   F11=RIGHT F12=RETRIEVE

```

Figure 6-9 Specify the agent address space parameters

6. Specify the TCP communication values for the Agent and Network interface card (NIC), as shown in Figure 6-10 on page 154.

```

----- SPECIFY AGENT IF CONFIGURATION V "LEFT" is not active
COMMAND ==>

Specify the TCP communication values for this Agent:
Hostname      ==> WTSC58.ITS0.IBM.COM
Address       ==> 9.12.6.96
Started task  ==> TCPIP

If applicable
Network interface card (NIC) ==> OSA2C00
Interlink subsystem           ==>
IUCV interface in use?       ==> N      (Y, N)

-

Enter=Next  F1=Help  F3=Back

F1=HELP      F2=SPLIT  F3=END      F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP        F8=DOWN   F9=SWAP   F10=LEFT  F11=RIGHT F12=RETRIEVE

```

Figure 6-10 Specify TCP and NIC parameters

7. Go back to the CONFIGURE OMEGAMON XE FOR WEBSphere MQ MONITORING/RTE menu and select "Create runtime members", as shown in Figure 6-11 on page 155.


```

----- CONFIGURE OMEGAMON XE FOR WEBSPPHERE MQ MONITORING / RTE: SC58 -----
OPTION ==> _

Perform the appropriate configuration steps in order:
If you have defined a CMS in this RTE that this Agent
will communicate with, select option 1.
1 Register with local CMS

If defining an Agent, select option 2, then select the appropriate
section(s) below to configure the desired address space.
2 Specify configuration parameters

To run in an Agent address space: (Recommended)
3 Specify Agent address space parameters
4 Create runtime members
5 Configure persistent datastore

To run in the CMS address space: (Alternative)
6 Install Agent into local CMS
7 Configure persistent datastore
8 Complete the configuration
F1=Help F3=Back

Last selected
Date Time

F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=RCHANGE
F7=UP F8=DOWN F9=SWAP F10=LEFT F11=RIGHT F12=RETRIEVE

```

Figure 6-11 Creating the runtime members

8. Review the Job Control Language (JCL) and submit the job, or, if you want to edit the values in this JCL, do the following:
 - a. Enter Edit in the command line. The Edit Command Entry panel will display.
 - b. Press F1 to access the online help and follow the instructions there.
 - c. When the JCL contains the preferred values, press Enter and submit the job.
 - d. Verify that the job completes successfully. All return codes should be 0.
9. Go to the CONFIGURE OMEGAMON XE FOR WEBSPPHERE MQ MONITORING/RTE screen and select "Complete the configuration". Follow the steps on the Completion Panel, as shown on Figure 6-12 on page 156. Do not start the WebSphere MQ Agent at this point.

```

----- COMPLETE THE CONFIGURATION -----
COMMAND ==> _                                SCROLL ==> CSR

..                COMPLETE THE CONFIGURATION

After configuring this product, you must perform the following
procedures outside of the Configuration tool to finalize
installation and configuration.

Perform the following steps for each of the items listed below,
if applicable:

The following steps only apply if the agent is running in its own
address space. If the agent is sharing the address space with other
agents, then the address space owner is required to do these steps:

Step 1 - Copy procedures to PROCLIB.

The Configuration tool created started task procedures in RKANSAM
which you must copy to your procedure library. Update your started
task library as follows:

    a) If you have configured an agent address space, copy the agent
       started task (CANS MC) from RKANSAM to PROCLIB.

Step 2 - APF-authorize libraries (if applicable).

Add the following runtime load libraries to your list of APF-
authorized libraries.

Load library name:
- OMWB1.SC58.RKANMOD
- OMWB1.SC58.RKANMODL

Note: Any runtime libraries concatenated in the STEPLIB DDNAME and
in the RKANMODL DDNAME of the CANS MC started task must be
APF-authorized.

Step 3 - Verify installation and configuration (if applicable).
F1=HELP      F2=SPLIT      F3=END      F4=RETURN      F5=RFIND      F6=RCHANGE
F7=UP        F8=DOWN      F9=SWAP      F10=LEFT      F11=RIGHT      F12=RETRIEVE
. . . . .

```

Figure 6-12 Configuration completion

10. Go back to the Runtime Environments panel and enter L (Load all product libraries after SMP/E) in the Action field of the runtime environment you are configuring (Figure 6-13 on page 157).

```

----- RUNTIME ENVIRONMENTS (RTEs) -----
COMMAND ==>
Actions: A Add RTE, B Build libraries, C Configure,
         L Load all product libraries after SMP/E,
         D Delete, U Update, V View values, Z Utilities

Action Name      Type      Sharing      Description
-----
I SC58           FULL      Full RTE for SC58
VBD              FULL      VBD Full
Enter=Next      F1=Help  F3=Back  F7=Up   F8=Down

F1=HELP      F2=SPLIT  F3=END    F4=RETURN  F5=RFIND  F6=RCHANGE
F7=UP        F8=DOWN   F9=SWAP   F10=LEFT   F11=RIGHT F12=RETRIEVE

```

Figure 6-13 RUNTIME ENVIRONMENTS menu

11. Review the JCL and submit the job or if you want to edit the values in this JCL:
 - a. Enter Edit in the command line. The Edit Command Entry panel will display.
 - b. Press F1 to access the online help and follow the instructions there.
 - c. When the JCL contains the preferred values, press Enter and submit the job.
 - d. Verify that the job completes successfully. All return codes should be 0.
12. After loading all the product libraries, start the MQ Monitoring Agent started task:


```
S CANSMQ
```

CandleNet Portal Support for z/OS

You will need to install the IBM Tivoli OMEGAMON XE for WebSphere Business Integration z/OS support component on the CandleNet Portal server.

Note: We had previously installed the CandleNet Portal Server. We are now installing the OMEGAMON XE for WebSphere Business Integration z/OS Support component.

1. Log onto Windows using an ID with Administrator authority and close any running applications.
2. Insert the IBM Tivoli OMEGAMON XE for WebSphere Business Integration z/OS support product CD into your CD-ROM drive. The installation begins automatically. (If the installer does not start, go to the CD-ROM directory WINDOWS and run setup.exe. If setup.exe initialization fails, you do not have enough disk space to decompress the setup files.) The InstallShield Wizard displays.
3. Read the text that welcomes you to the installation and click **Next** to continue.
4. The Software License Agreement dialog box will appear. Read the software license agreement and click **Accept**.
5. The Choose Destination Location dialog box will appear. Specify the target drive and directory where you want to download the Tivoli OMEGAMON XE for WebSphere Business Integration z/OS support product. The recommended default is C:\Candle. Click **Next** to continue.

Note: If you are upgrading from a previous release CandleNet Portal, the software will be loaded to your existing IBM Tivoli directory. Do not create a new directory.

6. Click the + sign next to expand the tree. Select **OMEGAMON XE for WebSphere Business Integration Support**. Click **Next** to continue (Figure 6-14 on page 159).

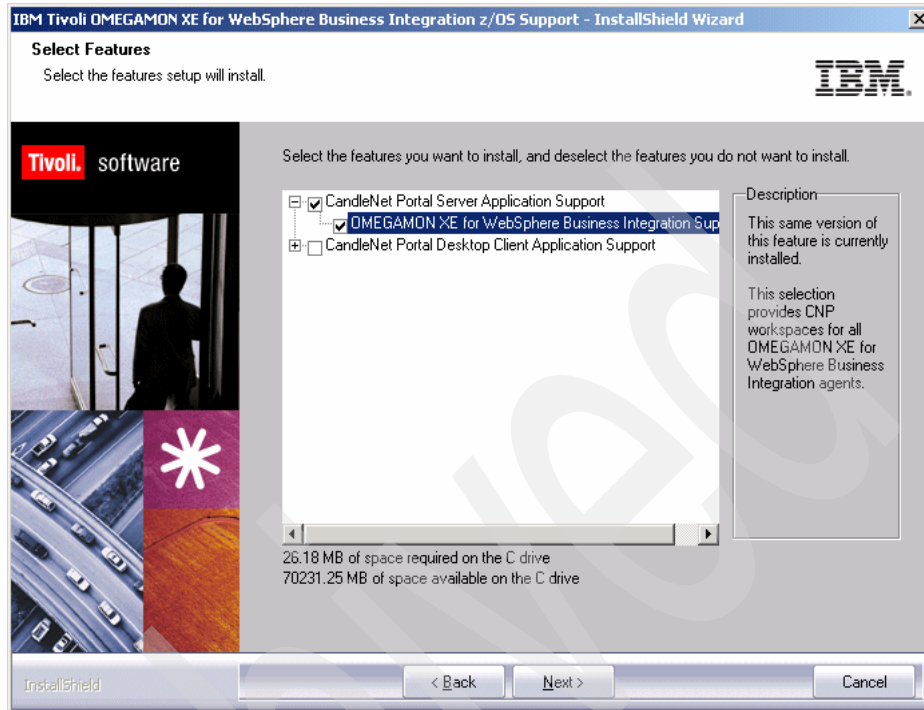


Figure 6-14 OMEGAMON XE WBI component

7. To determine the folder in which the files will be installed, accept the folder name that appears in the Program Folder text box, type in a new name, or select one of the existing folders in the list below. IBM recommends that you use the default Program Folder name shown. Click **Next** to continue.
8. The Start Copying Files screen will appear. This screen shows the destination directory and program folder information you supplied in the previous steps, and lists the modules you chose to install. Review the settings and click **Back** if you want to go back and change them. If you want to start copying files with the settings that are listed, click **Next**.
9. The Setup Status screen will appear and the InstallShield Wizard will begin configuring the installation and copying files needed to complete the installation. Then the Setup Type dialog box will appear, as shown in Figure 2-15 on page 24. Leave selected (checked) the items that you want to configure before completion of the installation. Deselect (uncheck) the items for which you want to delay configuration until after completion of the installation. Click **Next** to continue. The software is copied to disk.

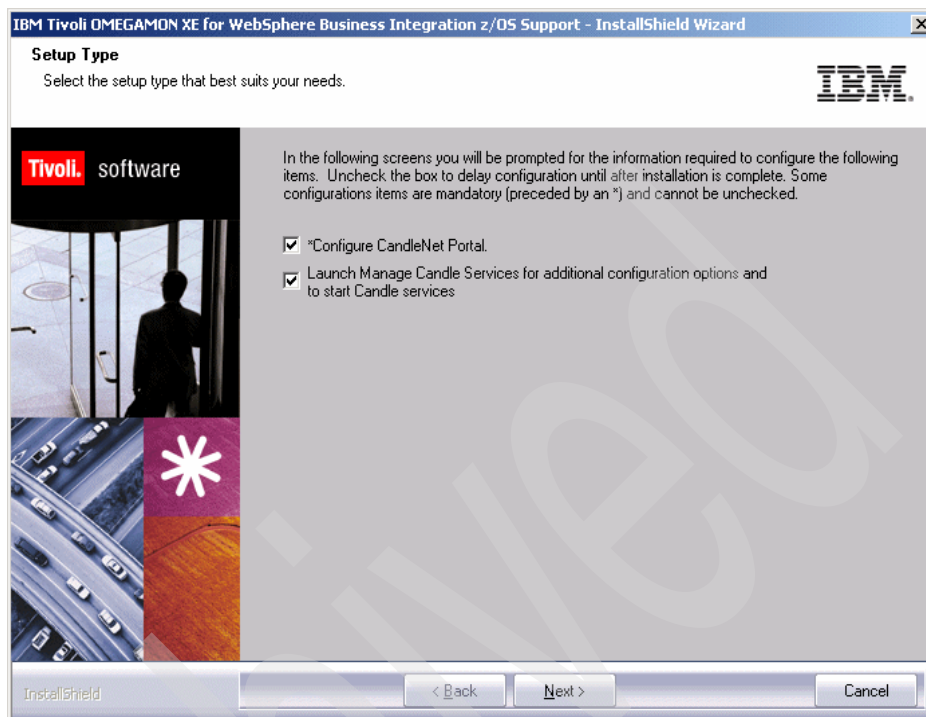


Figure 6-15 Configuration setup

10. The next panel will ask you to enter the CNP host name. Click **Next** to continue (Figure 6-16 on page 161).

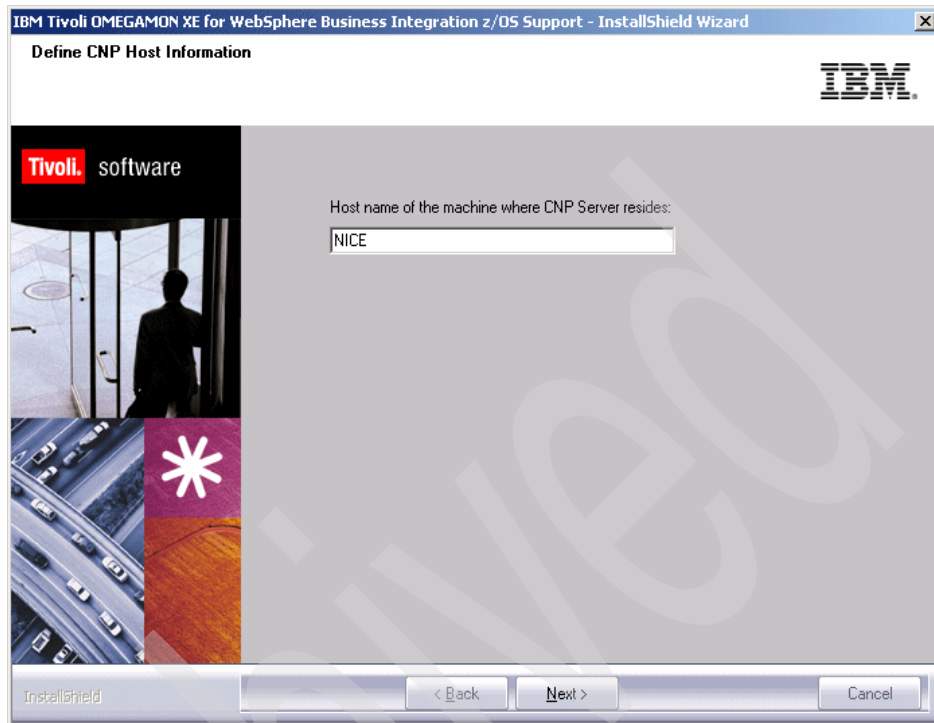


Figure 6-16 CNP host information

11. The next panel will be the setup completed. Select **Display the README file** if you would like to read the file. Click **Finish** to complete the setup (Figure 6-17 on page 162).

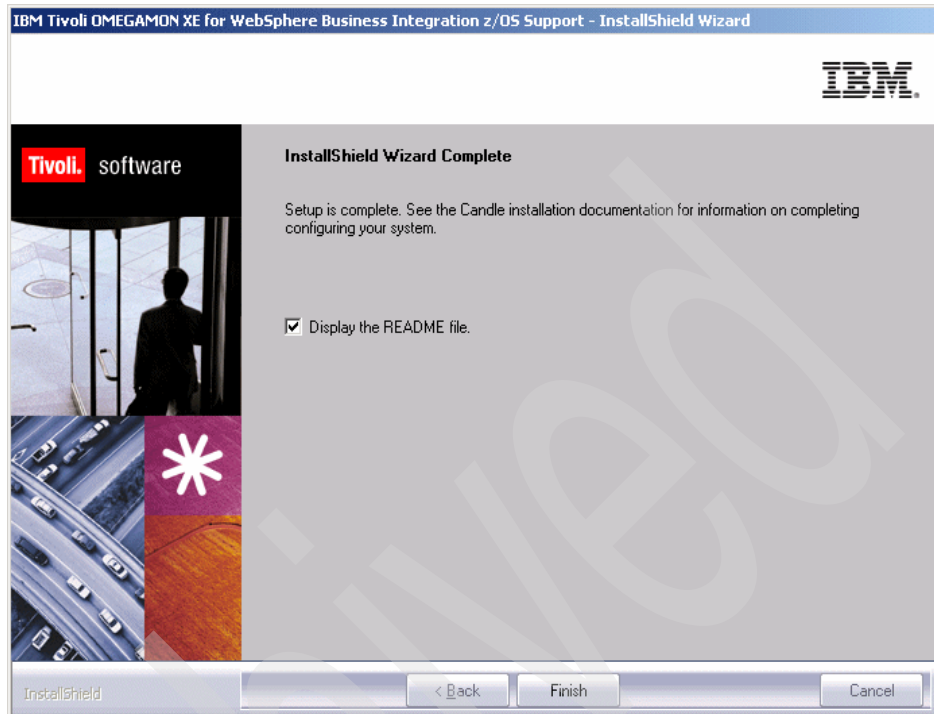


Figure 6-17 Setup completion

6.3 Workspaces

IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring is installed with default views that are displayed in workspaces. Where applicable, links have been provided within the workspace to link from a parent view to a more detailed view about a selected row, or to a related workspace (for example, a workspace containing historical information). The workspaces can be accessed from the Navigator in the CandleNet Portal.

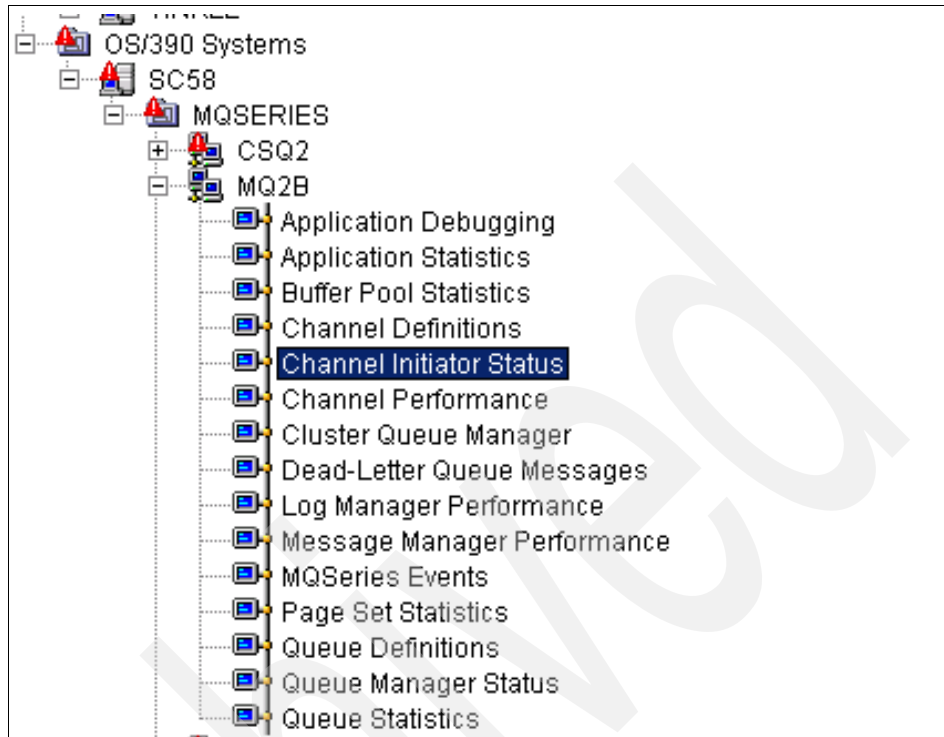


Figure 6-18 WebSphere MQ Agent workspaces within the Navigator

Table 6-1 gives a brief description of the workspaces.

Refer to *Using IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring*, SC31-6888 for more information on workspaces.

Table 6-1 WebSphere MQ workspaces

WorkSpace	Description
Application Debugging	These workspaces apply only to the WebSphere MQ applications that are running on z/OS. These workspaces can help you debug your WebSphere MQ applications by enabling you to view and sort debugging trace data.
Application Statistics	These workspaces provide statistics about WebSphere MQ applications that are running on z/OS only. Data for these workspaces is only available if Application Statistics are being collected on z/OS.

WorkSpace	Description
Buffer Pool Statistics	The Buffer Pool Statistics workspaces can help you ensure that your buffer managers are performing efficiently. These workspaces show current buffer manager performance for all monitored z/OS queue managers. You can also drill down to display information about a specific buffer pool to isolate recent or historical performance trends.
Channel Definitions	The Channel Definitions workspaces provide you with information about the channels your site has defined and is monitoring for each monitored queue manager. Included is the channel type (sender, receiver, server, or requestor).
Channel Initiator Status	These workspaces pertain only to z/OS queue managers. The Channel Initiator status workspaces provide information about: <ul style="list-style-type: none"> ▶ Channel connection states (the number of current, maximum, active, starting, stopping, and retrying) ▶ Whether channel initiator, TCP/IP listener, and LU62 listener are active ▶ The success of adapter subtask and dispatcher activity
Channel Performance	The Channel Performance workspaces provide performance information about the monitored channels on each monitored queue manager. Included is whether or not each channel is in-doubt, current, or inactive, as well as the channel type. The client connection channel definitions do not produce statistics, so they are not listed in any of the Channel Performance workspaces.
Cluster Queue Manager	These workspaces provide information about explicitly and automatically defined cluster channels and the cluster queue manager associated with them.
Dead Letter Queue Messages	These workspaces allow you to list and examine the messages that a queue manager queued to its Dead Letter Queue (DLQ) because they could not be delivered.
Error Log	This workspace allows you to view and monitor WebSphere MQ error log data retrieved from a monitored queue manager (non-z/OS only).

WorkSpace	Description
Log Manager Performance	These workspaces give information about the logging activity (such as I/O levels and the number of times an WebSphere MQ application was delayed because no logging buffers were available) for each monitored z/OS queue manager.
Message Manager Performance	The Message Manager Performance workspaces provide information on how frequently calls to the WebSphere MQ application programming interface (API) are being made against your monitored z/OS queue managers. These rates can help you determine how frequently messages are being passed to and pulled from a particular queue manager.
MQSeries® Events	These workspaces provide information about the following six events for each monitored queue manager: <ul style="list-style-type: none"> ▶ Channel Stopped ▶ Queue Full ▶ Queue Depth High ▶ Queue Service Interval High ▶ Bridge Stopped ▶ Channel Not Activated
Page Set Statistics	These workspaces give information about the usage and allocation of page sets for each monitored z/OS queue manager.
Queue Definitions	The Queue Definitions workspaces provide information about your monitored queues.
Queue Manager Status	These workspaces show the status of the monitored queue managers in your network and give basic descriptive information about each monitored queue manager.
Queue Statistics	The Queue Statistics workspaces provide usage information about the current queue manager queues (such as the number of open queues, how full they are, whether they are get- or put-inhibited, and the number of messages currently on each queue manager's Dead Letter Queue).

6.4 Monitoring scenarios

This section describes which MQ objects and attributes should be monitored, the related alerts to be generated and the appropriate actions, if any, that should be taken to assist in identifying and resolving the problem. In this section we will also discuss some of the OMEGAMON XE WebSphere MQ related workspaces and how you can gather critical information about your monitored MQ network using these workspaces.

6.4.1 WebSphere MQ queue manager monitoring

The OMEGAMON MQ Agent will not function if the queue manager's command server (amqpcsea) is inactive. WebSphere MQ configuration changes also cannot be carried out if this process is inactive.

It is critical to monitor the queue manager status. The Queue Manager Status workspace shows the status of the monitored queue managers in your network and gives basic descriptive information about each monitored queue manager. Use the information in the Queue Manager Status workspaces to compare the status and activity of your queue managers and to look for patterns in resource usage, status, or time of day. Each queue manager's status could be one of the following:

- ▶ Active Queue Manager Not Available
- ▶ Command Server Not Responding
- ▶ Dynamic Queue Allocation Error
- ▶ Cluster Repository Not Available

Let us walk you through an example:

1. If the monitored queue manager goes down, a critical alert will appear in the Enterprise Event Console, as shown in Figure 6-29 on page 178.

Note: We are using OMEGAMON DE and Enterprise Event Console is a feature of the OMEGAMON DE.

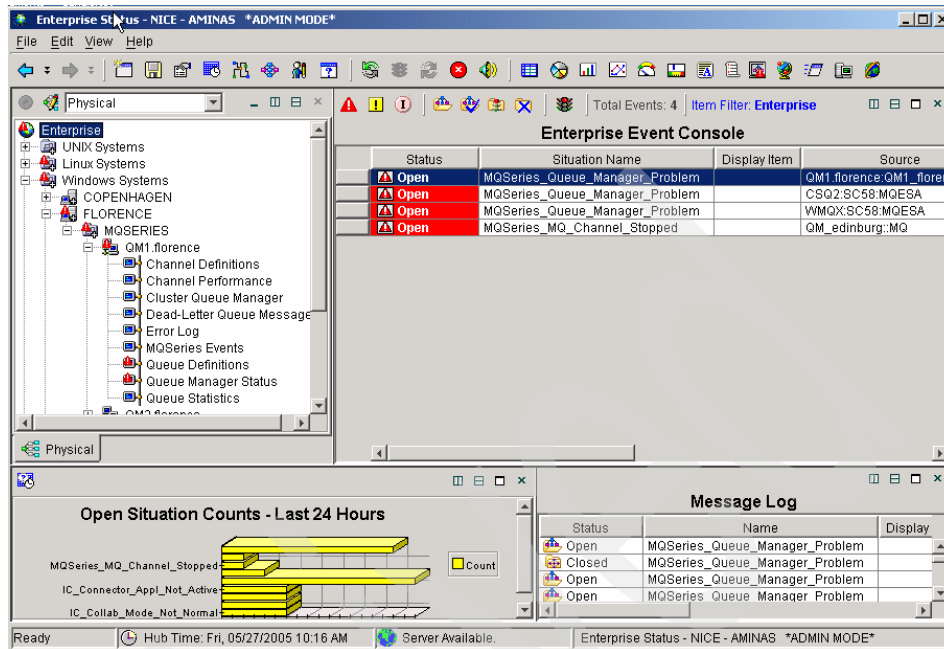
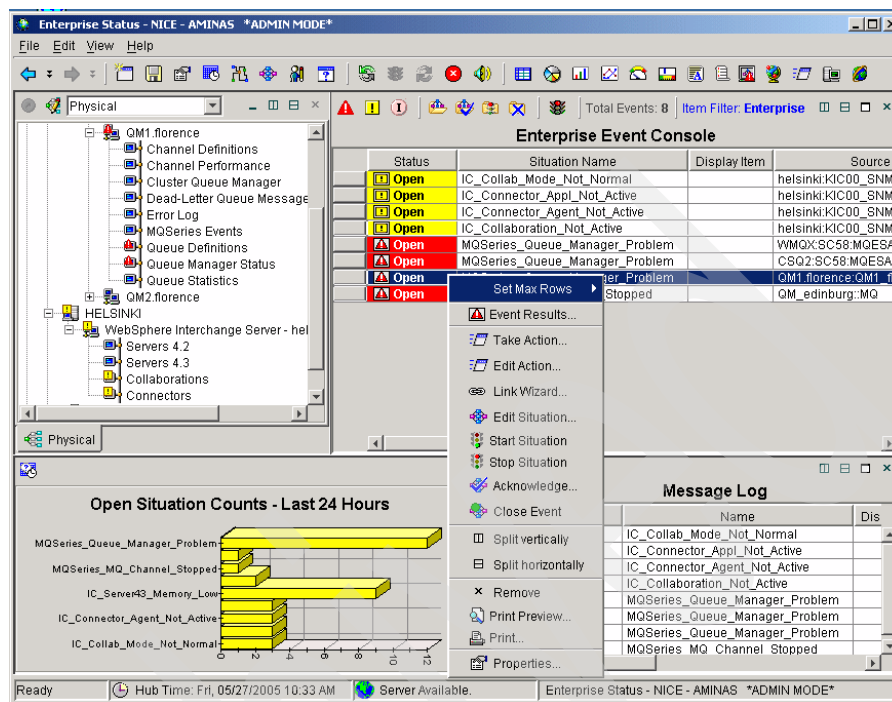


Figure 6-19 WebSphere queue manager problem alert

- When you see an event indicator in the Navigator, you can create an *acknowledgment*. An acknowledgment notifies other users that you have taken ownership of the problem related to the event and are working on it. When you acknowledge an event, a blue checkmark appears next to the situation in the event flyover list and, if you opened the event workspace, over the situation item in the Navigator. If the situation is still true when the acknowledgment expires, the indicator changes accordingly. You can also cancel the acknowledgment before it has expired. This changes the indicator so that users can see that the acknowledgment has been removed even though the situation remains true. Select the event and right click it. Select **Acknowledge** from the drop-down menu, as shown in Figure 6-20 on page 168.



3. In the next panel (Figure 6-21 on page 169), select the **Expiration** time frame for which the alert should be in the acknowledged status. It is a good practice to add a note in the Notes area so the other people will know that you have acknowledged the problem and are working on it. Click **OK**.

Acknowledgement - Create

Acknowledged event

Event: MQSeries_Queue_Manager_Problem - QM1.florence:QM1.florence:MQ
 Event time: Fri, 05/27/2005 01:35 PM

Last Updated:

Owner:
 Ack time:

Created

Owner: AMINAS
 Ack time: Fri, 05/27/2005 02:19 PM

Expiration

☒ Expire at end of Interval

☐ Expire at specific time

☒ 1 Hour ☐ 8 Hours

☐ 2 Hours ☐ 24 Hours ☐ Use Server time

☐ Custom ☐ Never

dd hh mm

Notes

AS - I will be working on this problem.

OK Cancel Remove Help

Current Server time: Fri, 05/27/2005 01:36 PM

Figure 6-21 Setting alert acknowledgement timeframe

4. You will notice that the alert has been changed to the Acknowledged status in the Enterprise Event View, as shown in Figure 6-22 on page 170.

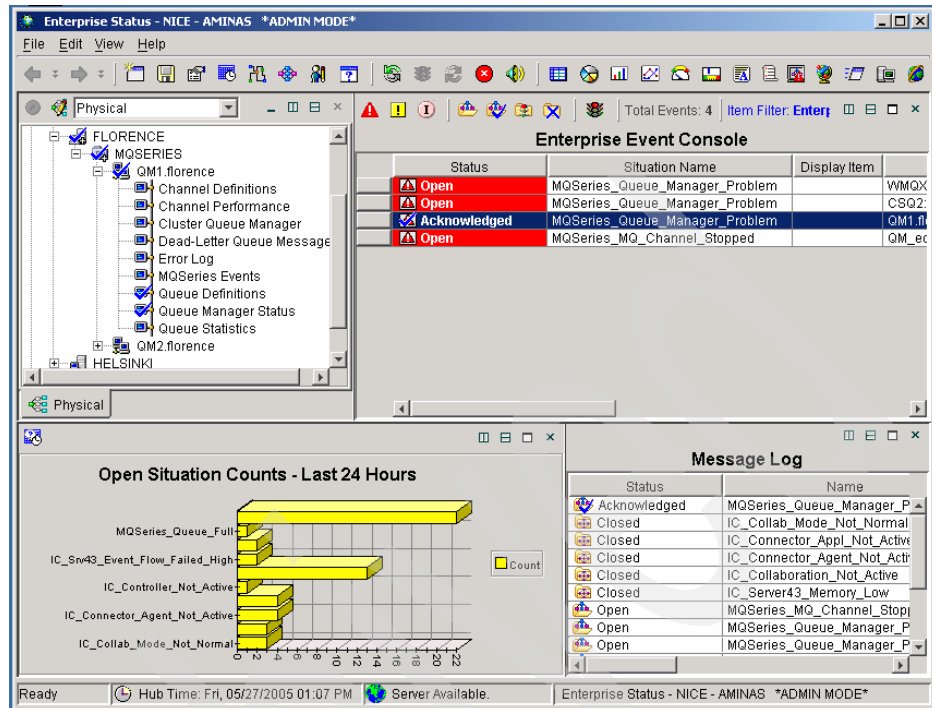


Figure 6-22 Alert in Acknowledged status

- The example given in Figure 6-22 was for a Windows node. You can also acknowledge the WebSphere MQ queue manager alerts on z/OS using the same steps shown above for Windows. Figure 6-23 on page 171 shows a WebSphere MQ Queue Manager alert from a z/OS system. Notice that, regardless of the operating system, the same principals and same type of management is used. This cuts down the training time for your operators that manage WebSphere MQ running on different operating systems.

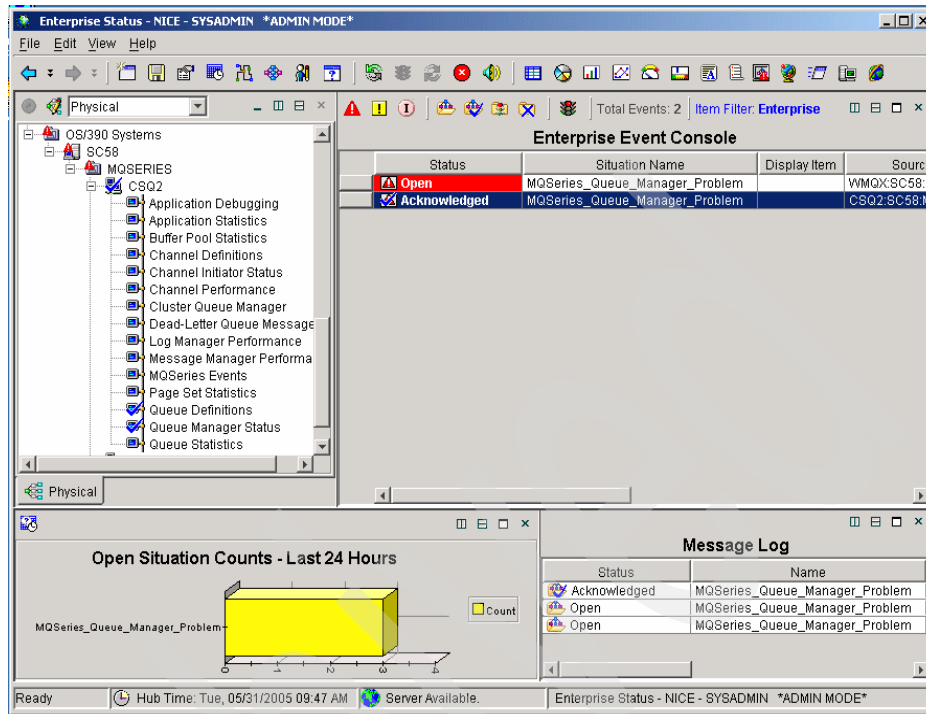


Figure 6-23 Acknowledging z/OS WebSphere MQ queue manager alert

- You can click the **Queue Manager Status** workspace to view the basic descriptive information about each monitored queue manager (Figure 6-24 on page 172). You can use the information in the Queue Manager Status workspaces to compare the status and activity of your queue manager and to look for patterns in resource usage, status, or time of day.

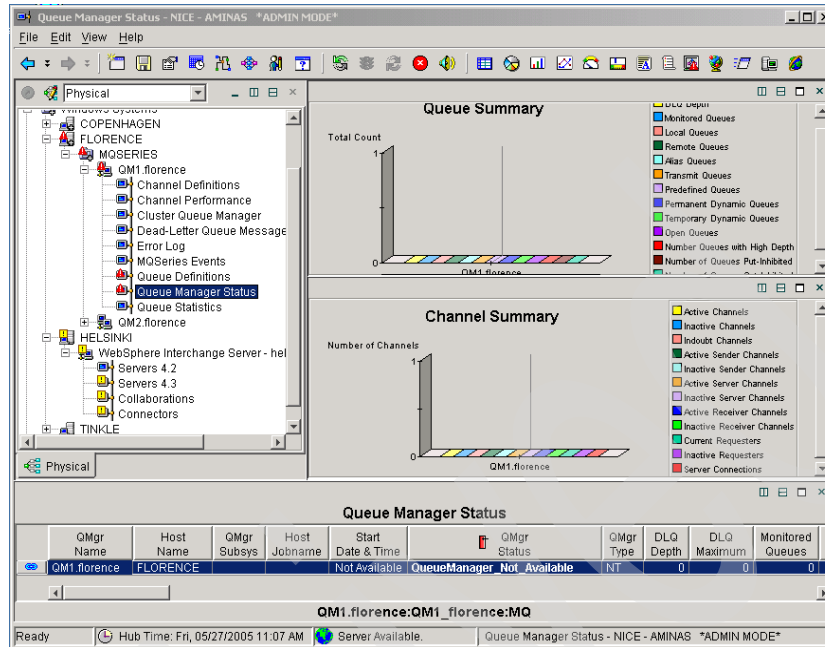


Figure 6-24 Queue Manager Status workspace

From the Queue Manager Status workspace, you can click the link to get the detail information about the monitored queue manager parameters (Figure 6-25 on page 173).

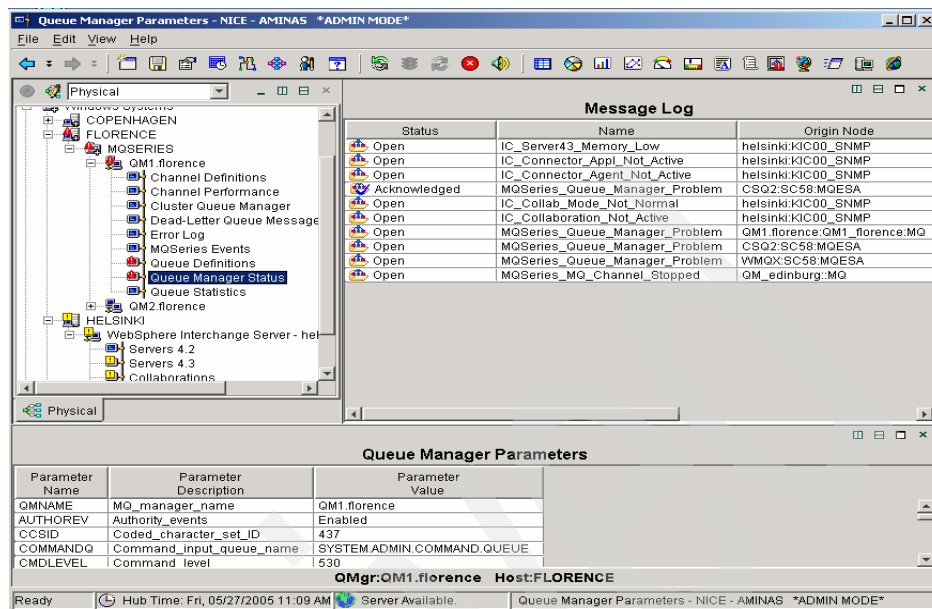


Figure 6-25 Queue Manager parameters

The alert will close automatically after the queue manager problem has been resolved and queue manager is started (Figure 6-26 on page 174).

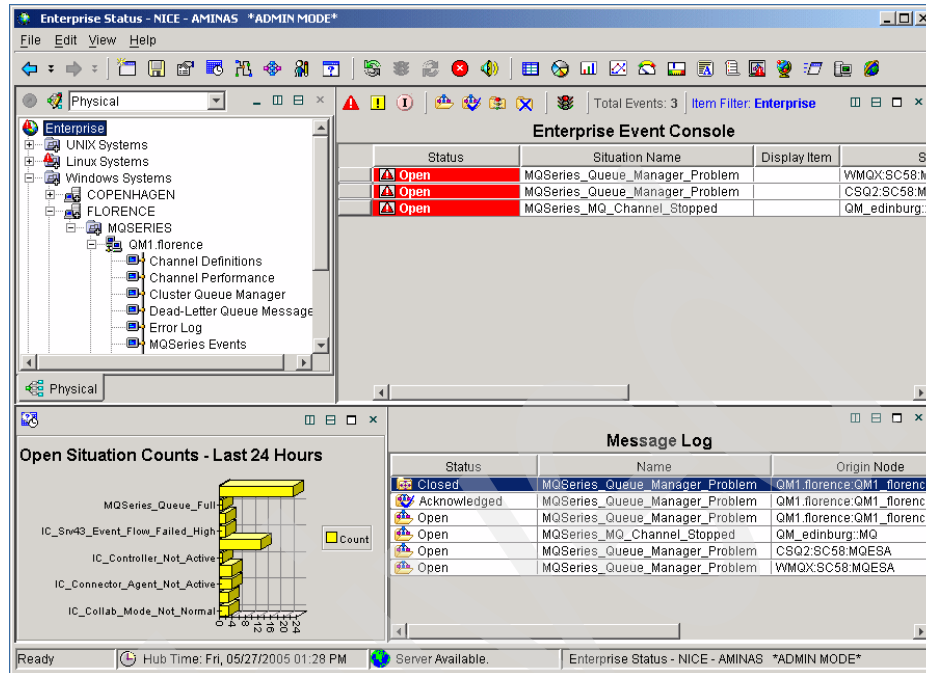


Figure 6-26 Alert in Closed status

6.4.2 WebSphere MQ queue monitoring

This section describes the WebSphere MQ queue monitoring. The Queue Statistics workspace provides usage information about all monitored queues and queue managers (such as the number of open queues, how full they are, whether they are get- or put-inhibited, and the number of messages currently on each queue manager's Dead Letter Queue).

- ▶ The QDEPTHHI queue attribute defines the percentage value (of MAXDEPTH) that indicates a high queue status. The QDPHIEV queue attribute and the queue manager's PERFMEV attributes must be both enabled for a queue depth high event to be generated. The reason for monitoring a queue reaching its maximum depth is to alert the administrator that there may be a potential problem.
- ▶ The queue's MAXDEPTH attribute indicates the maximum number of messages that can be held on a queue. If this number of messages is reached, no additional messages can be placed on the queue, and a QUEUEFULL event is generated by the queue manager.
- ▶ The Dead Letter Queue contains undeliverable messages. If a queue manager cannot find the correct destination for a message, it ends up on the

Dead Letter Queue for manual processing. Monitor the CURDEPTH of the queue manager's Dead Letter Queue. A message on the Dead Letter Queue is considered a critical situation due to the fact that it could indicate a queue full or one that is non-existent.

- ▶ It may be appropriate to monitor how long messages have been resident on designated queues. This may indicate the message consumers are not performing as quickly as was expected, or that some problem is causing the message consumer performance to degrade, or simply that the message load for a single message consumer is too great and additional instances of the message consumer should be started. Note that under normal circumstances the OMEGAMON for MQ monitoring agents do not read the content of messages in queues. One can imagine the extreme overhead of browsing every message in every queue at some frequency. Thus, this facility should be used with discretion and care. It should only be used on critical queues, where it is of paramount importance that *delayed* messages are detected. It would be advisable to use this facility only on queues that have a relatively small CURDEPTH value.
- ▶ For designated queues, the queue's get rate (retrieved messages per second) should be measured against the queue's put rate (inserted messages per second). This will indicate if the queue is filling up faster than messages are being consumed, and may indicate that the queue is heading for a queue full condition.

Again, let us explain this topic with an example:

1. If the monitored queue is full, a critical alert will appear in the Enterprise Event Console indicating that the queue is full, as shown in Figure 6-27 on page 176.

Tip: To generate MQSeries Queue Full event, we have used an MQ sample program called amqspout to put messages on the queue, with the maximum queue depth reduced to three and queue events enabled for maximum queue depth event.

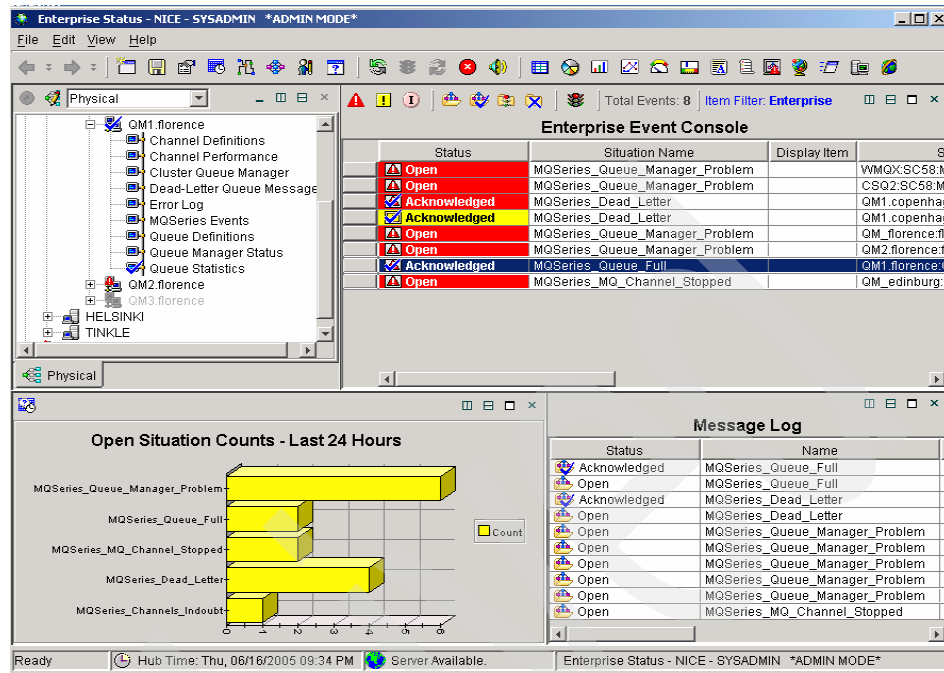


Figure 6-27 WebSphere MQ queue full alert

2. You can acknowledge the alert and take an appropriate action to resolve it.
3. You can view the Queue Statistics workspace (Figure 6-28 on page 177), which provides usage information about all monitored queues for the monitored queue manager (such as the number of open queues, how full they are, whether they are get- or put-inhibited, and the number of messages currently on each queue manager's Dead Letter Queue).

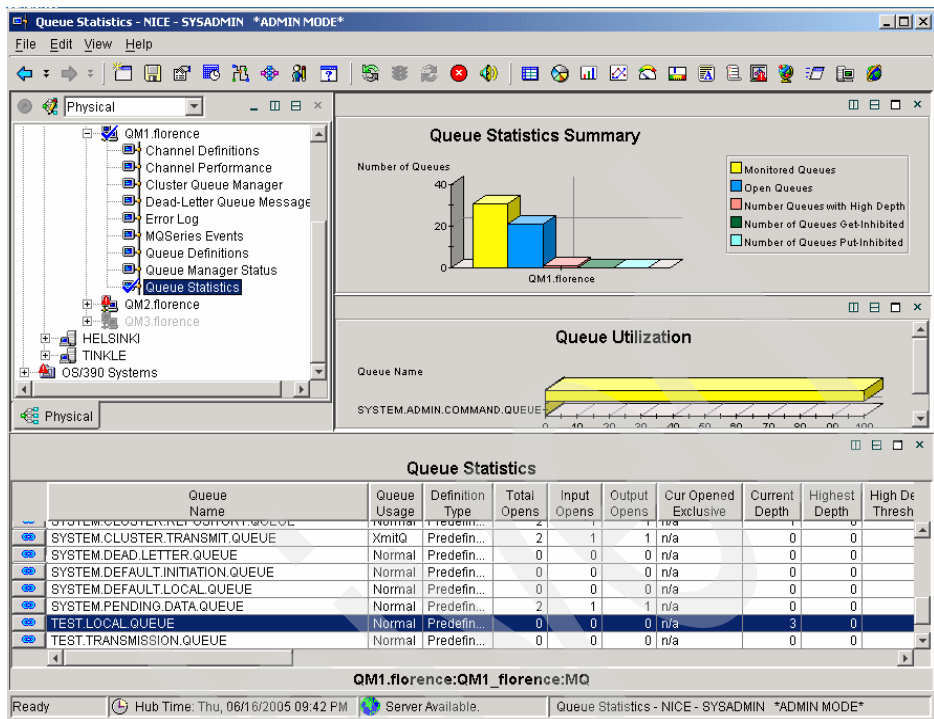


Figure 6-28 Queue Statistics workspace

- From the Queue Manager Statistics workspace, you can click the link to get detailed information about the monitored queue (Figure 6-29 on page 178).

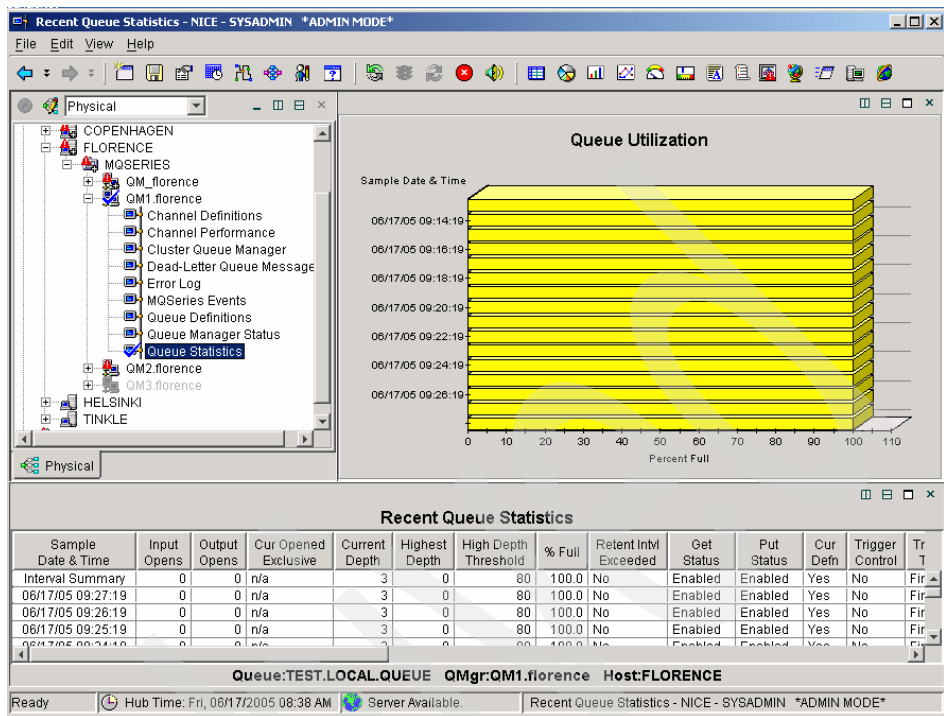


Figure 6-29 Queue Statistics details

5. You can increase the max depth of the queue if needed. To increase the max depth, do the following:
 - a. Go to Queue Statistics Workspace and right-click the queue and select **Configure Queue** (ensure that the queue object already exists in the configuration database), as shown in Figure 6-30 on page 179.

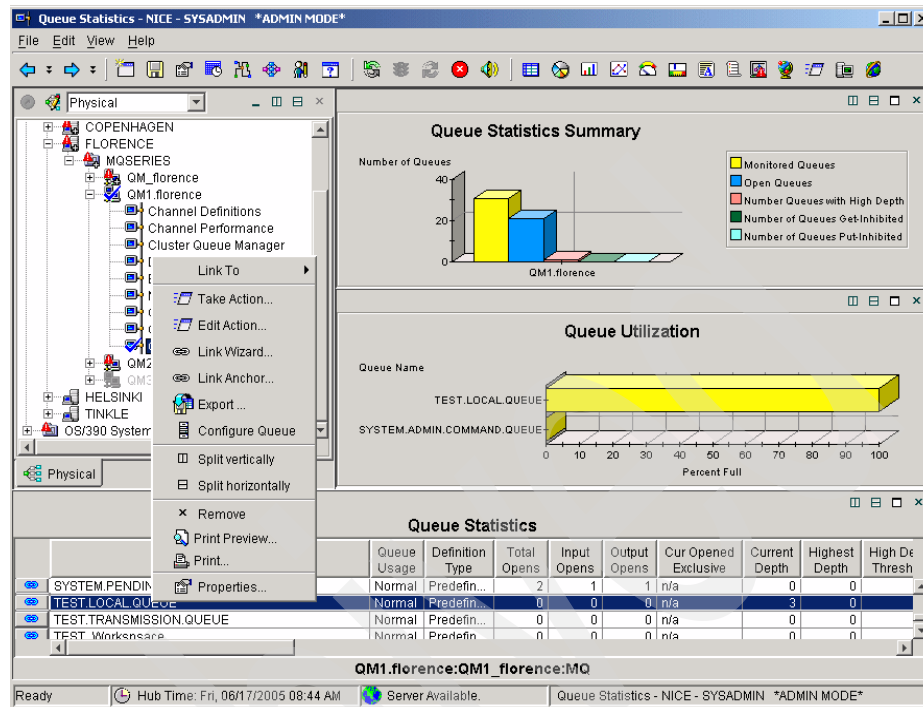


Figure 6-30 Changing object attribute

- b. Change the max depth of the queue as needed and select **Update Actual and Save**. It will update the queue max depth of the actual WebSphere MQ queue (Figure 6-31 on page 180).

Attribute	Value
Common	
Queue name	TEST.LOCAL.QUEUE
Queue description	WebSphere MQ Default Local Queue
Default message priority	0
Inhibit put	<input type="checkbox"/>
Inhibit get	<input type="checkbox"/>
Default persistence	Not persistent
Scope	Queue manager
Definition type	Predefined
Monitoring	QMgr
Statistics	QMgr
Local	
Maximum queue depth	500
Maximum message length	4194304
Retention interval	999999999

Update Actual and Save Cancel

Figure 6-31 Changing queue max depth

6. You can also delete the messages from the queue that are not needed. To delete the messages from the queue:
 - a. Right-click **Queue Statistics** and select **Workspace** → **Queue Messages** (Figure 6-32 on page 181).

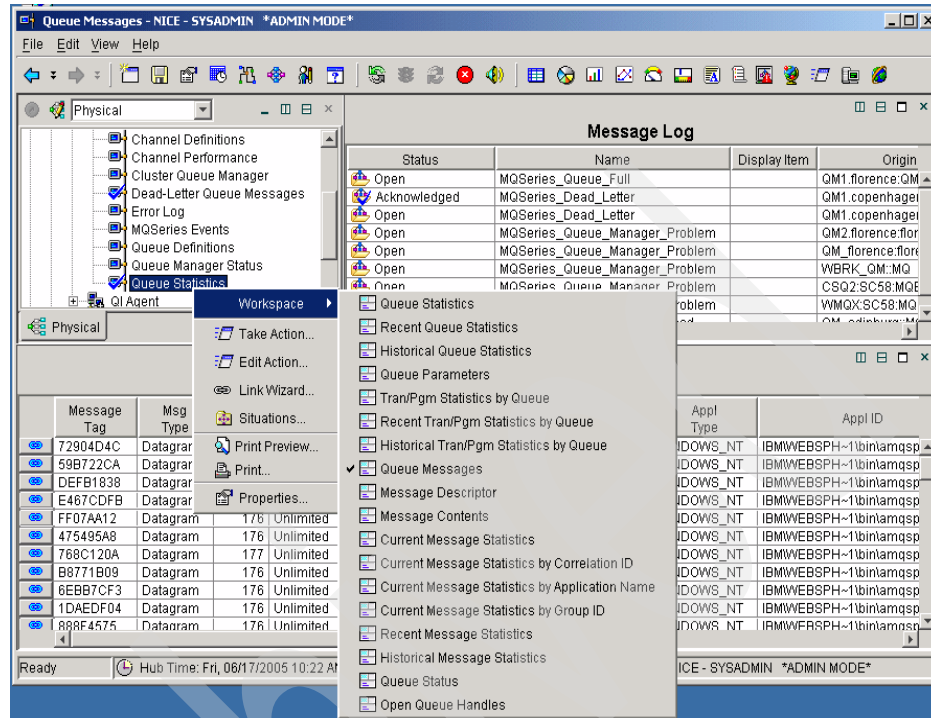


Figure 6-32 Queue Messages workspaces

b. Right-click the message you want to delete (Figure 6-33 on page 182).

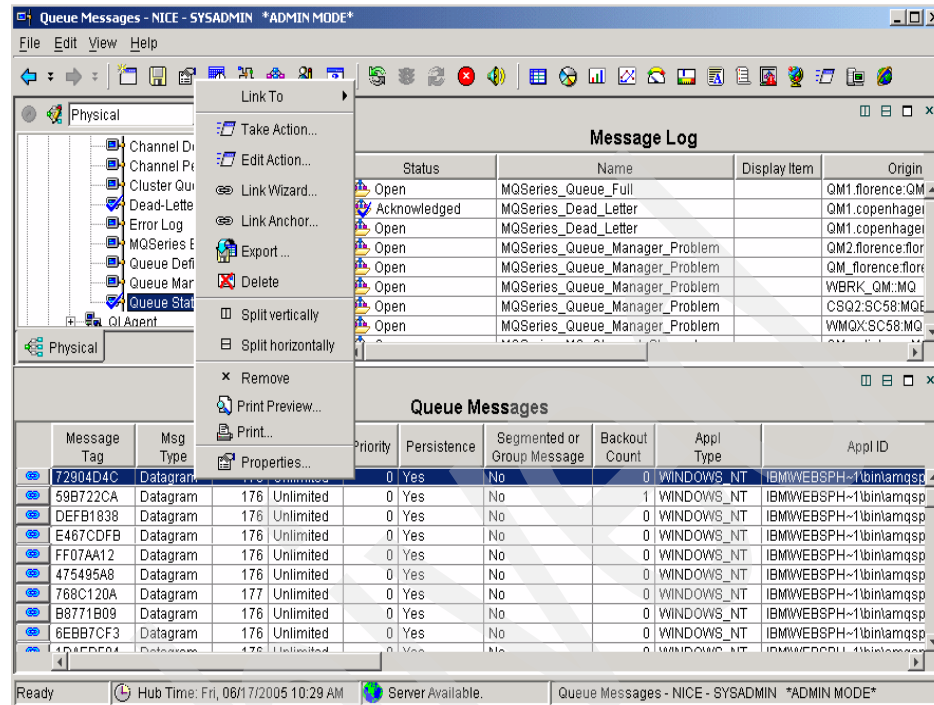


Figure 6-33 Deleting messages from the queue

- c. Next, you will receive a confirmation window. Select **YES** to proceed.
 - d. If the message delivers successfully, you will receive a Command Completed Successful window. Click **OK**.
7. The alert will automatically close once the queue full problem has been resolved and queue is no longer full.

If you receive a queue full alert, check the health of queue, check to see if the max depth of the queue is too low and needs to be increased, consider the load balancing technique and redirect messages to other queues, make sure the consumer application are consuming the messages, and remove the messages that are not needed.

6.4.3 SYSTEM.DEAD.LETTER alert

WebSphere MQ puts a message on the DLQ when it cannot deliver the message to the requested queue. This can occur for various reasons, such as the message is too long, the queue name is invalid, or the queue is full.

For example, if there are messages in the monitored DLQ, a critical alert will be generated. After receiving the `SYSTEM.DEAD.LETTER.QUEUE` alert:

1. It is a good practice to acknowledge the alert (so others will know that you are working on the problem) (see Figure 6-34 for details).

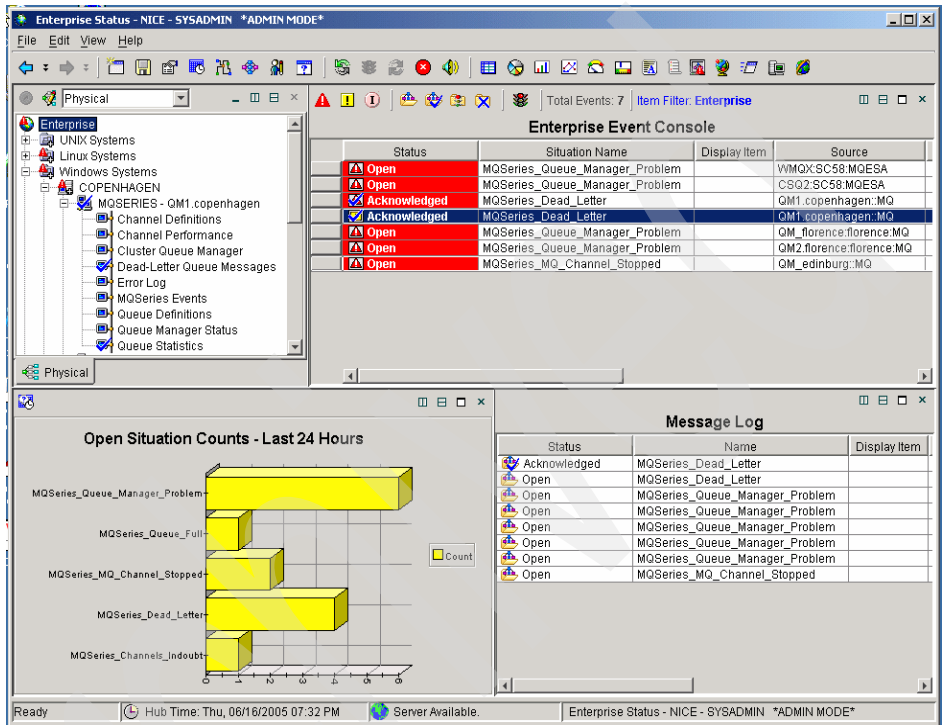


Figure 6-34 Alert acknowledgement

2. Click the **Dead Letter Queue Messages** workspace, which allows you to list and examine the messages that a queue manager queued to its Dead Letter Queue (DLQ) because they could not be delivered (see Figure 6-35 on page 184). This workspace can help you manage your Dead Letter Queues and ensure that you maintain the efficiency and integrity of your business application data. Using this workspace, you can recover important messages or re-send them to their original destinations, delete obsolete messages, and identify problem application. From the Dead Letter Queue Messages workspace, you can select a message to view its header or application data, delete it, or retry its delivery.

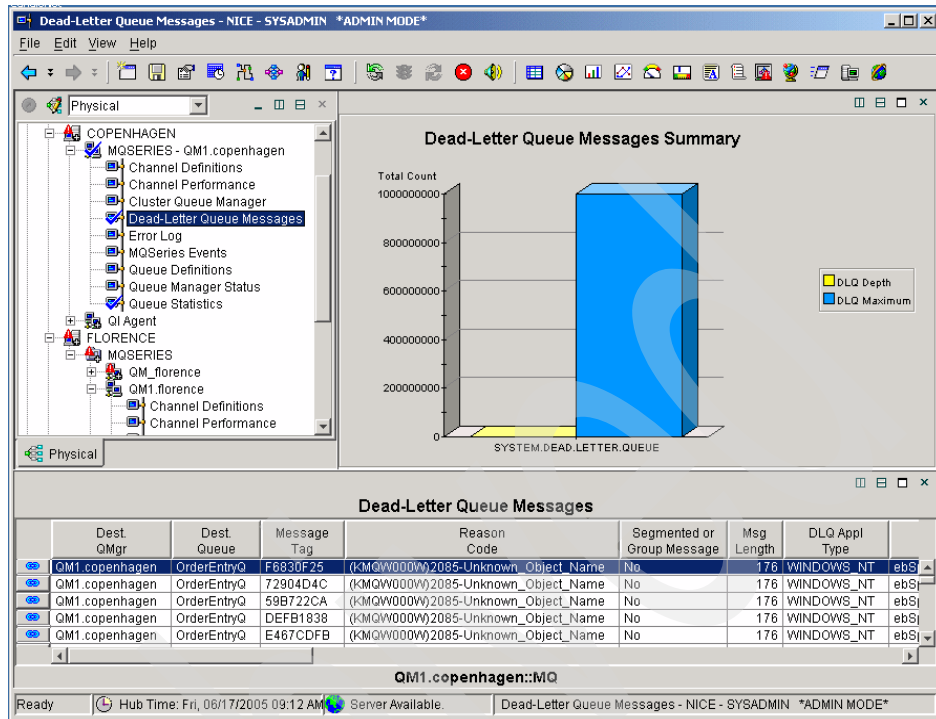


Figure 6-35 Dead Letter Queue Messages workspace

- The reason code in the Dead Letter Queue Messages workspace indicated that the application was trying to send messages to the Unknown_Object_Name. The OrderEntryQ destination queue does not exist. The messages in the DEAD.LETTER.QUEUE will be retried to the correct destination queue.

Important: You need to fix the problem that caused the destination queue name to be incorrect. It could either be an application error, or a configuration error (remote queue definition). Note that this needs to be addressed; otherwise the problem is not fixed permanently and will happen again.

- To retry the message delivery, right-click the message you want to retry and select **MQ Commands** → **Forward** (Figure 6-36 on page 185).

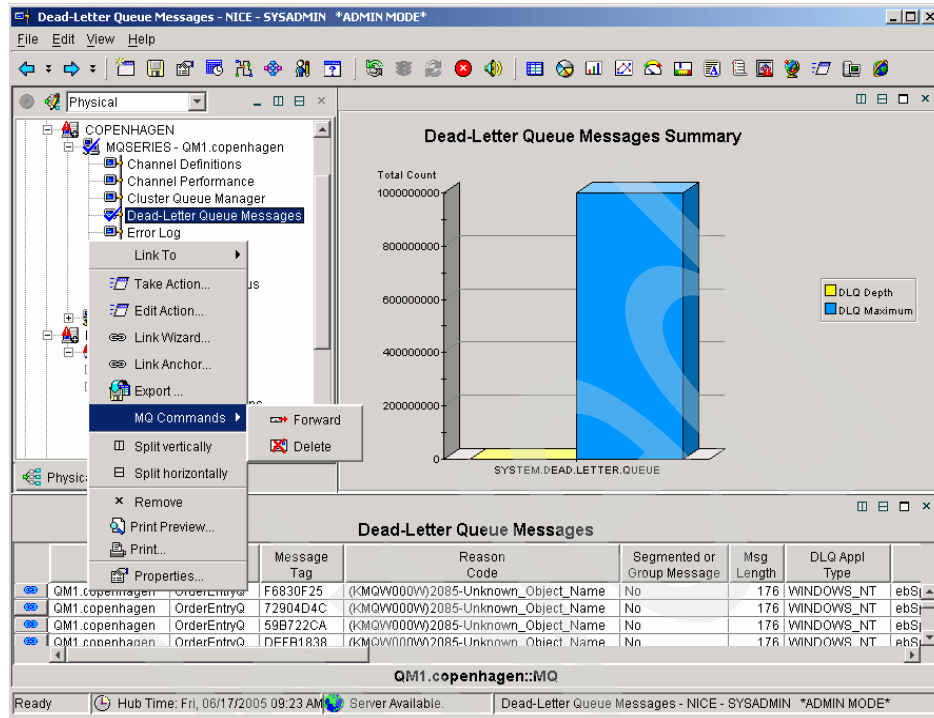


Figure 6-36 Retry message delivery

- Next, you will be prompted to enter the queue and queue manager name (Figure 6-37). Enter the correct names and select **YES**.

Queue: OrderProQ1

Queue manager: QM1.copenhagen

Yes No

Figure 6-37 Queue and queue manager names

- If the message delivers successfully, you will receive a Command Completed Successful window (Figure 6-38 on page 186). Click **OK**.



Figure 6-38 Successful completion message

6.4.4 WebSphere MQ channel monitoring

Here are some highlights of WebSphere MQ channel monitoring:

- ▶ The channel status attribute specifies the current status of a channel. If the channel is retrying, then a previous attempt to establish a connection has failed. The MCA will re-attempt a connection after the specified time interval. If the MCA reaches its limit of retry attempts, then the channel will stop and need to be restarted manually.
- ▶ If the channel is indoubt status, then the sending MCA is waiting for an acknowledgement that a batch of messages, which it has sent, has been successfully received and committed. The detection of an indoubt channel status could indicate network related problems.
- ▶ If the channel is stopped, it is not necessarily a problem with the network, because it may have been manually stopped for a specific reason. Therefore, in addition to checking whether the channel is stopped or not, what also needs to be checked is if the channel stopped because of an error. If this is the case, and the channel is stopped due to an error, then some action needs to be taken to remedy the situation.

Again, let us walk you thorough an example:

1. For example, if the monitored channel is down, a critical alert will appear in the Enterprise Event Console (Figure 6-39 on page 187).

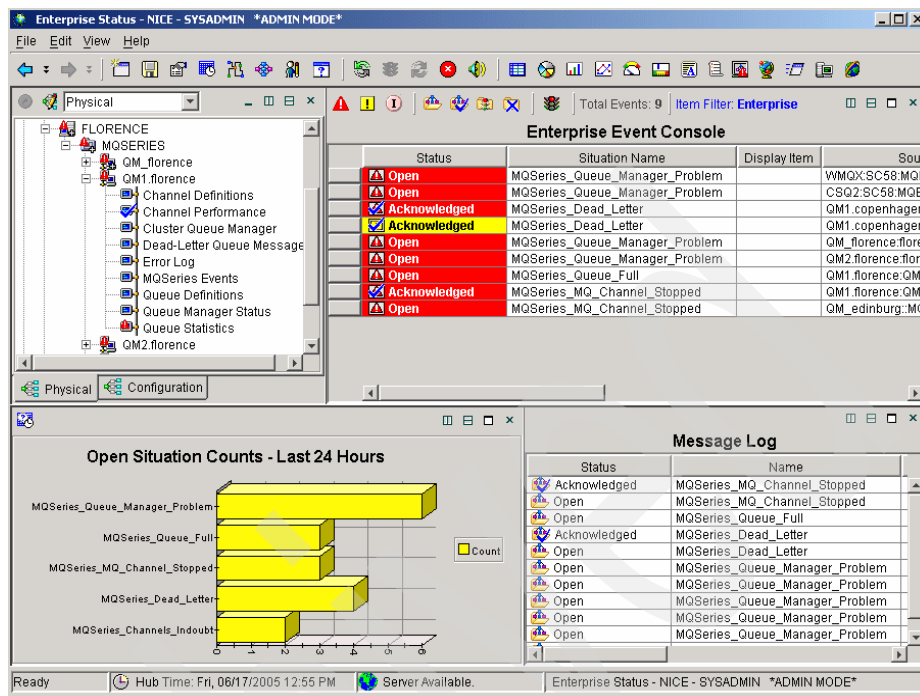


Figure 6-39 WebSphere MQ channel stopped alert

2. It is a good practice to acknowledge the alert first.
3. Select the **Channel Performance** workspace, which provides performance information about the monitored channels on each monitored queue manager, as shown in Figure 6-40 on page 188. Included is whether or not each channel is in-doubt, current, or inactive, as well as the channel type. Use the information in the Channel Performance workspace to examine and compare channel performance among the selected channels. Look for patterns in resource activity, traffic, or time of day.

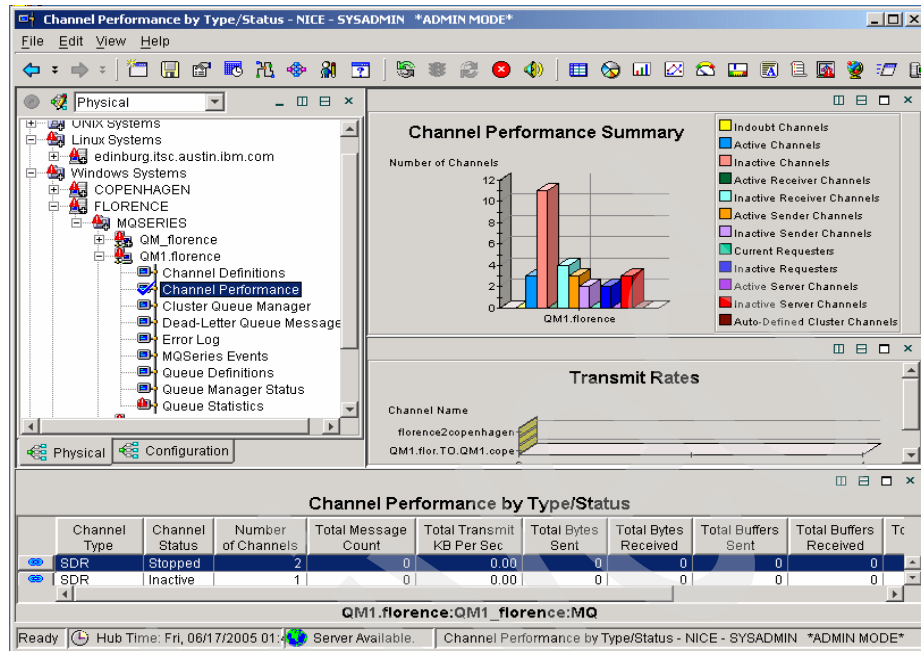


Figure 6-40 Channel Performance workspace

- To view the Recent Channel Performance workspace, right-click the **Channel Performance** workspace and select **Workspace** → **Recent Channel Performance**, as shown in Figure 6-31 on page 180.

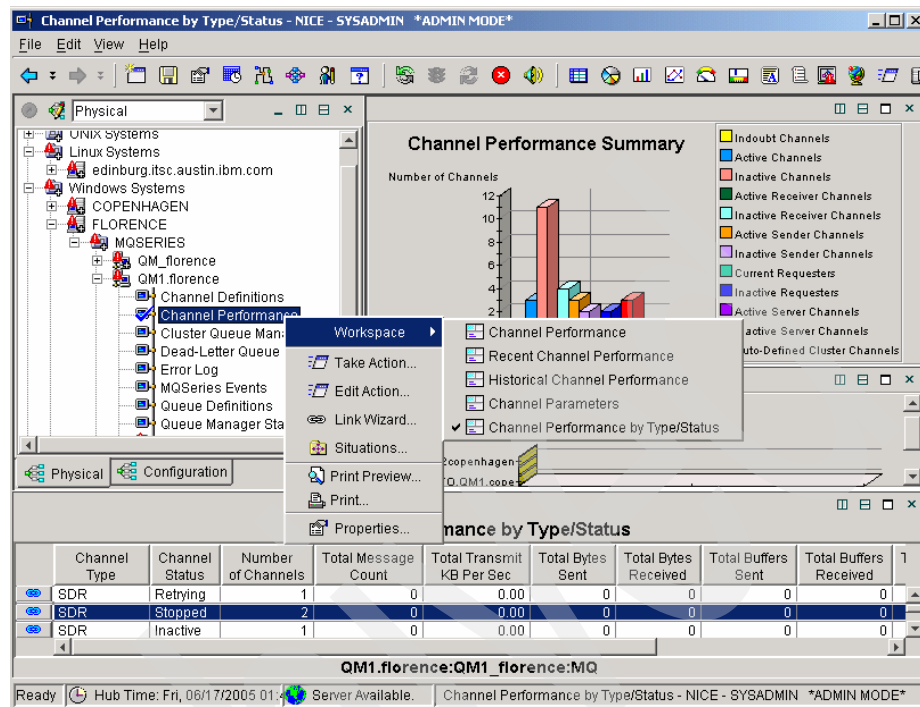



Figure 6-41 Channel Performance workspace

5. Use the information in the Recent Channel Performance workspace to investigate recent trends in the performance of the selected channels. Look for patterns in time of day, channel type, or transmission rate.
6. You can take advantage of Take Action feature. From the Channel Performance workspace, click the  link to Channel Performance workspace. Select the channel you want to start and right click it. Select **Take Action** (Figure 6-42 on page 190).

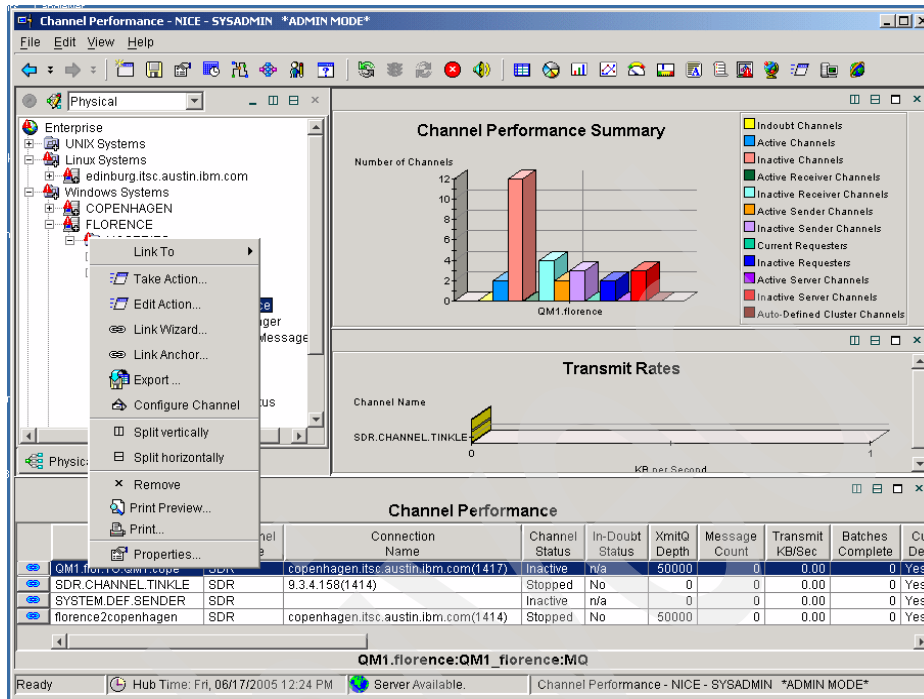


Figure 6-42 Taking actions to restart the channel

7. In the next panel, select **MQ Start Channel** from the drop down Name list, select the **Destination System**, and click **OK** (Figure 6-43).

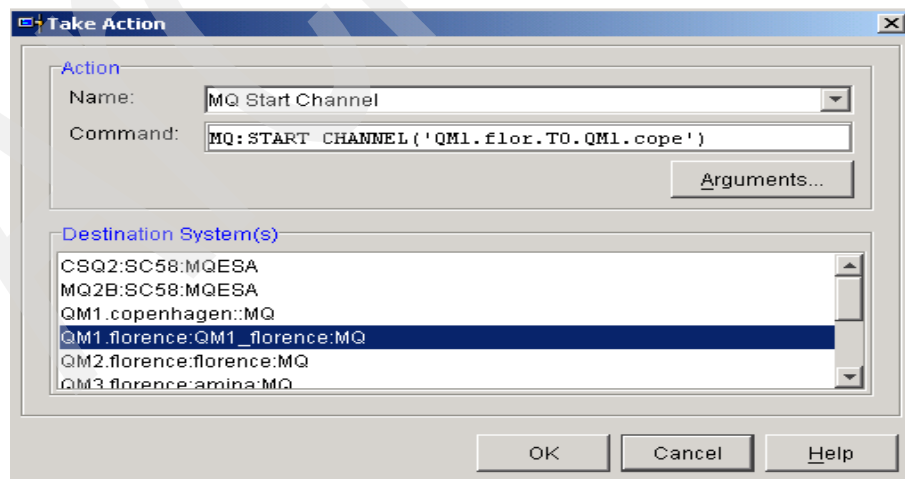


Figure 6-43 Restarting a channel

8. The channel will be started. Once the channel is started, the alert will automatically close from the Enterprise Event Console.

Note: Make sure that the cnp user ID that you are using to Take Action exists on the monitored system and has the proper authorizations needed to issue the MQ commands.

IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring enables you to set a wide range of monitoring options that can be changed to suit the needs of your environment. For example, you can define which queue managers, queues, and channels you want monitored; specify the time interval for collecting WebSphere MQ data, manage the disposal of event messages from an event queue, or specify whether or not you want to collect historical monitoring data and how long you want to have that data available. You can use the Error Log monitoring feature to view and monitor WebSphere MQ error log data retrieved from a monitored queue manager (non-z/OS only). You can manage your WebSphere MQ environment effectively by taking advantage of various WebSphere MQ workspaces. The Take Action feature of CandleNet Portal lets you issue a command to any system in your network where OMEGAMON MQ Monitoring Agents are installed. You can implement commands from the Take Action view, from a situation (when it becomes true), from the Navigator, or from a row in a table view.

WebSphere Integration Brokers Monitoring

This chapter outlines the steps involved to install, configure, and deploy the IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers Monitoring Agent. We describe the information required to successfully deploy the OMEGAMON XE for WebSphere Integration Brokers and additionally cover the details about the product, such as data collection, situations, take actions, events, and reporting.

This chapter provides details on the following:

- ▶ 7.1, “IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers” on page 195
- ▶ 7.2, “Planning for installation of the WebSphere Integration Brokers Monitoring Agent” on page 196
- ▶ 7.3, “Installing the WebSphere Integration Brokers Monitoring Agent” on page 200
- ▶ 7.4, “Installing the seed file on the CMS” on page 210
- ▶ 7.5, “Configuring the WebSphere Integration Brokers Monitoring Agent” on page 214
- ▶ 7.6, “The agent’s configuration file” on page 222
- ▶ 7.7, “Using situations” on page 228

- ▶ 7.8, “Using Take Actions” on page 231s
- ▶ 7.9, “Automating responses” on page 235
- ▶ 7.10, “Workspaces” on page 237
- ▶ 7.11, “Monitoring scenarios” on page 246
- ▶ 7.12, “Other considerations” on page 250

7.1 IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers

The IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers provides insight into the reliability and performance of the WebSphere Business Integration Message Brokers and WebSphere Business Integration Event Brokers (These two products will be referred collectively as WebSphere Business Integration Message Brokers throughout the book). The WebSphere Integration Brokers Monitoring Agent does this by detecting and correcting problems in the environment before they impact availability in production.

7.1.1 What does the agent do?

The WebSphere Integration Brokers Monitoring Agent can do the following:

- ▶ Monitor the status of the broker and its components.
- ▶ Provide views into information and performance statistics for broker topologies at several levels (broker, execution group, message flows, node, terminal and thread level).
- ▶ Issue broker commands remotely through the agent, allowing you to manage the broker environment. These commands can be used as automated responses to events.
- ▶ Receive alerts when thresholds are exceeded or message flow events occur.
- ▶ Maintain data samples in a historical database.

7.1.2 How does the agent work?

WebSphere Business Integration Message Brokers publish event messages that report on the status of the brokers. The WebSphere Integration Brokers Monitoring Agent subscribes to relevant broker topics to receive published event messages. Published events will appear in the Broker Events workspace for the broker. The events include:

- ▶ Configuration changes
- ▶ Operational information
- ▶ Operational warnings

Additional information is obtained when the CandleMonitor Node, an optional customized message flow node, is inserted into message flows. It collects broker message flow performance statistics and allows for generating user defined events within a message flow. These events can be used to isolate abnormalities in the message flow. The CandleMonitor Node is a pass-through node that has

one input terminal and one output terminal and it is situated in a message flow. It is recommended that the placement be immediately after the message flow's first input (see Figure 7-1).

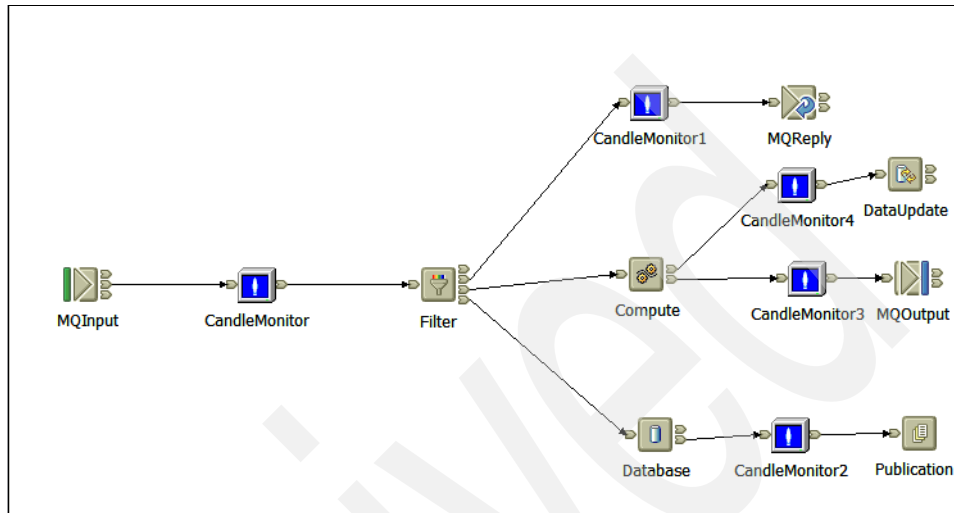


Figure 7-1 CandleMonitor Node

Additional information is also reported if the customer has turned on the "Message Flow Accounting and Statistics" measurement at the broker. The Message Flow Accounting and Statistics data is retrieved by subscription to broker events. This data is not displayed in the Broker Events workspace, because there are whole sets of workspaces dedicated to this data (see Archive Message Flow Accounting and Snapshot Message Flow Accounting in the Navigator pane for this product in Figure 7-21 on page 238.)

7.2 Planning for installation of the WebSphere Integration Brokers Monitoring Agent

This section provides information that should be collected and validated prior to installing the WebSphere Integration Brokers Monitoring Agent.

7.2.1 Prerequisite information

Here are the prerequisites for installing the WebSphere Integration Brokers Monitoring Agent:

- ▶ Identify the target systems.
 - Verify that these systems meet the supported requirements as documented in Table 7-1, which was built using information from *Installing and Setting Up IBM Tivoli OMEGAMON XE for WebSphere Business Integration on Windows and Unix*, SC31-6885.

Table 7-1 Supported operating environment for agent

Component	Operating system	Hardware	Software
Agent	UNIX <ul style="list-style-type: none">▶ AIX 5L V5.1 or higher (32-bit or 64-bit)▶ HP-UX V11.x (32-bit or 64-bit) POSIX threads only▶ Linux on Intel: Red Hat Enterprise Linux AS V2.1, 2.4x kernel▶ Linux on zSeries®: SUSE Linux Enterprise Server V8, 2.4x kernel (31-bit)▶ Solaris V2.7 or higher (32-bit or 64-bit)	<ul style="list-style-type: none">▶ 10 MB of disk space.▶ Additional disk space for historical data, depending on configuration.	<ul style="list-style-type: none">▶ One of the following IBM broker products:<ul style="list-style-type: none">– WebSphere MQIntegrator® V2.1– WebSphere MQIntegrator Broker V2.1– WebSphere MQ Event Broker V2.1– IBM WebSphere Business Integration Event Broker V5– IBM WebSphere Business Integration Message Broker V5– IBM WebSphere Business Integration Message Broker with Rules and Formatter Extension V5▶ The Monitoring Agent must be installed on the same machine as the IBM broker product.▶ On Linux on Intel, the level of IBM WebSphere MQ must be Version 5.3, CSD05 or above.

Component	Operating system	Hardware	Software
	Windows <ul style="list-style-type: none"> ▶ Windows 2003. ▶ Windows XP Professional (Service Pack 1 or higher). ▶ Windows 2000 Professional (Service Pack 3 or higher). 	<ul style="list-style-type: none"> ▶ 32 MB RAM. ▶ 18 MB of disk space. ▶ Additional disk space required based on historical data collection. ▶ 150 MB of virtual memory. 	<ul style="list-style-type: none"> ▶ One of the following IBM broker products: <ul style="list-style-type: none"> – WebSphere MQIntegrator V2.1 – WebSphere MQIntegrator Broker V2.1 – WebSphere MQ Event Broker V2.1 – IBM WebSphere Business Integration Event Broker V5 – IBM WebSphere Business Integration Message Broker V5 – IBM WebSphere Business Integration Message Broker with Rules and Formatter Extension V5 <p>The monitoring agent must be installed on the same machine as the IBM Broker product.</p>

- ▶ Ensure that you have already installed and configured the following components:
 - Candle Management Server (CMS)
 - CandleNet Portal Server
 - CandleNet Portal desktop client
- ▶ Determine the communication protocol between agent and CMS:
 - TCP/IP
 - IP.PIPE
 - SNA
- ▶ Are there any firewalls to be considered?
- ▶ Seed the CMS.

- ▶ Obtain information about the CMS:
 - CMS name
 - Host name
 - IP address
 - Port number
- ▶ Make the installation media available to the target system

7.2.2 Setting up the environment prior to installation

This section covers setting up the environment prior to running the install program on UNIX systems. The installer uses Java for a GUI based install and there are several environment variables that need to be set.

- ▶ Set the DISPLAY variable to a system running an X-server:

For ksh:

```
export DISPLAY=<ip or hostname>:0
```

For csh:

```
setenv DISPLAY <ip or hostname>:0
```

Note: This assumes the screen definition is 0; however, if you are using another screen on the X-server, then change this accordingly.

- ▶ For improved performance in the GUI, set the variable `alternateJRE` to use a different JRE other than the 1.3.x packaged with the product.

For ksh:

```
export alternateJRE=<location of jre>
```

For csh:

```
setenv alternateJRE <location of jre>
```

Notes:

- ▶ The variable should point to the directory where the bin and lib sub-directories exist of the JRE installation.
- ▶ The installer requires the Korn shell. On Linux, this may require that you install the Korn shell interpreter.

7.3 Installing the WebSphere Integration Brokers Monitoring Agent

In this section, we will describe the actual installation process for Windows and UNIX agents.

7.3.1 Running the installer

Once you have set up the environment, the next step is to run the install program. Which version of this program you use depends on the operating system where it is being installed (Windows or UNIX).

Installing on Windows

Note: We assume that CMA Framework is already installed on the Windows system. Remember that on Windows, before installing the agent, you need to install the OMEGAMON Platform CD for the CMA Framework. On UNIX, the CMA Framework is automatically installed when you install the agents.

For instructions on how to install CMA Framework on Windows, refer to “Installing the Candle Management Agent (CMA) Framework” on page 87.

Do the following steps to install the agent on a Windows computer:

1. Log onto the system with a user ID that has Administrator rights.
2. Load the installation image (choose one of the following):
 - Insert the IBM Tivoli OMEGAMON XE for WebSphere Business Integration CD into the system's CD drive.
 - Access the installation image on a network share.
 - Copy the installation image to a local disk drive.
3. Change directories into the WINDOWS directory on the image and run setup.exe.

Note: If you load the CD directly, this may start the installation automatically.

4. The welcome window appears. Click **Next** to continue.

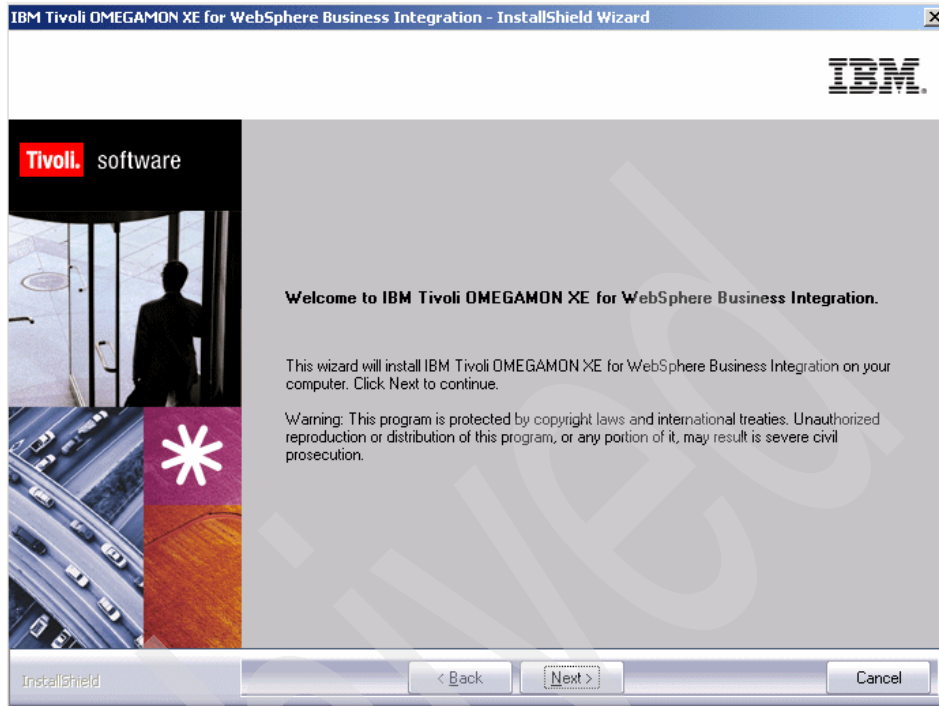


Figure 7-2 Welcome menu

5. Next, the prerequisite information menu is presented (see Figure 7-3 on page 202). Click **Next** to proceed.

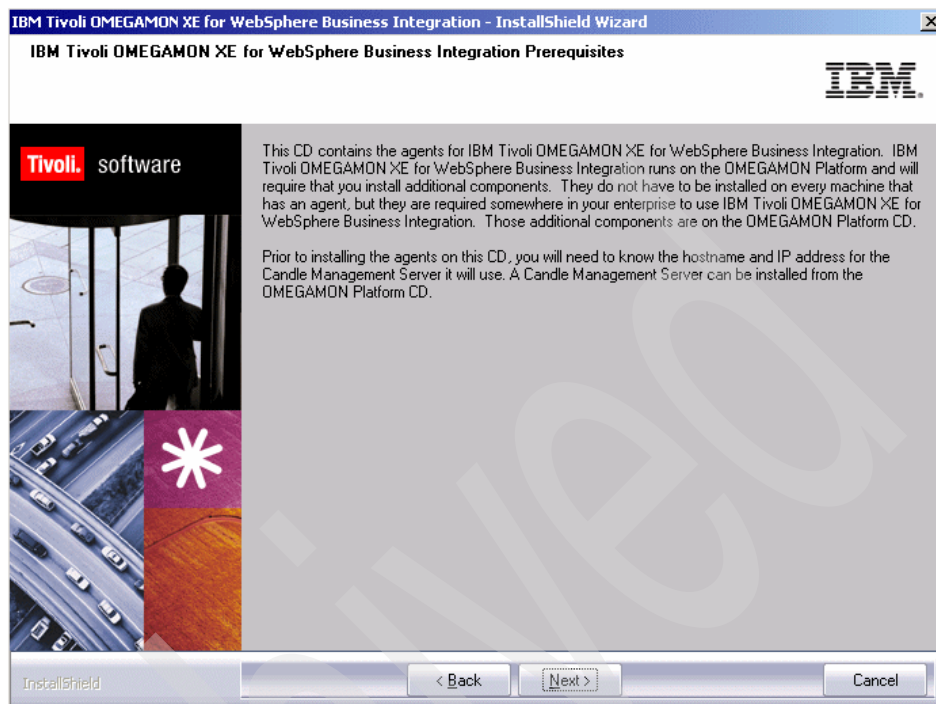


Figure 7-3 Prerequisite information menu

6. Read the license agreement and click **Accept** if you agree to the terms.
7. The installation location menu is displayed (Figure 7-4 on page 203). Either take the default or enter a new location by clicking **Browse**. Once you have the location set, click **Next**.



Figure 7-4 Installation location

8. Next, select the agents to be installed. Click **WebSphere Integration Brokers Monitoring** (see Figure 7-5 on page 204). After selecting the agents to install, click **Next**.

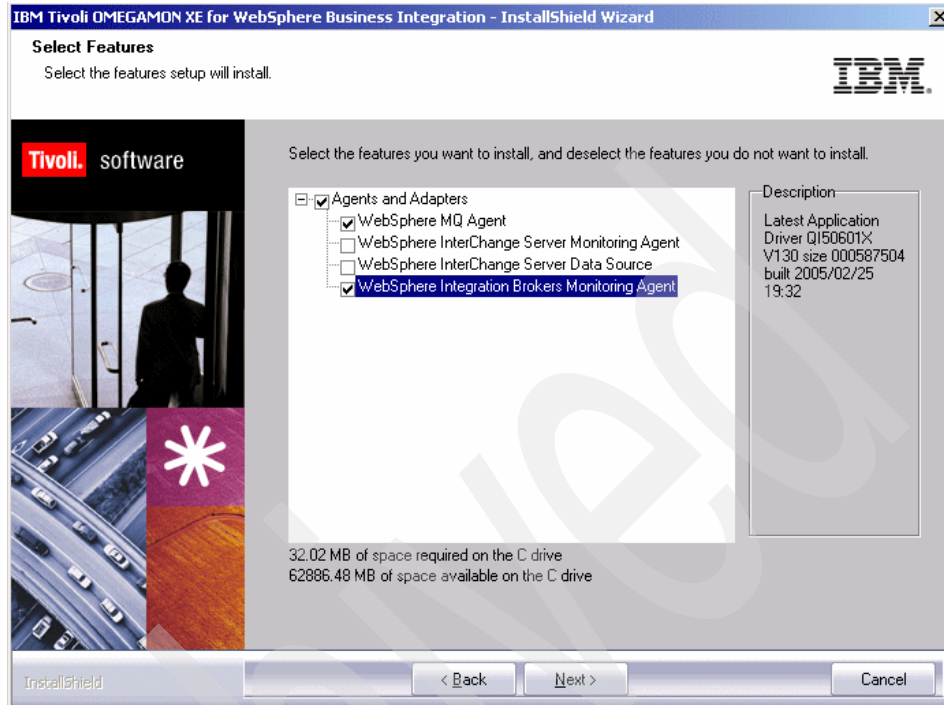


Figure 7-5 Agents to install

9. You are provided with the option to select the program folder where the product icons will be added. Select the default, **Candle OMEGAMON XE**, and click **Next**.
10. The next menu provides a review of the settings. Ensure that these are correct and click **Next**.
11. Next, the install presents the options to configure the agent and start Candle Managed Services (see Figure 7-6 on page 205). These are optional and can be performed at a later time. If you choose not to perform these configuration steps post install, then skip to step 10.

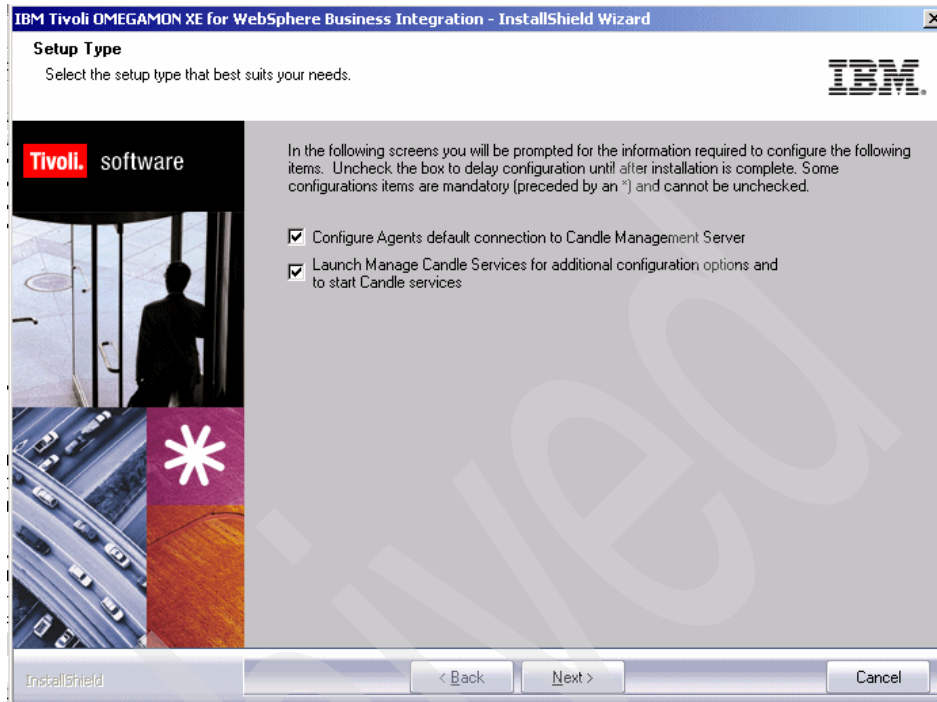


Figure 7-6 Agent configuration options

12. If the option to configure the agent default connection to the CMS is checked, the next menu presented will be Figure 7-7 on page 206.
 - a. Select **Connection must pass through firewall** if the agent must communicate through a firewall.
 - b. Select the communication protocol for connection between the agent and the CMS (TCP/IP, IP.PIPE, or SNA).
 - c. Select **Optional: Secondary CMS Connection** if a secondary connection will be used.

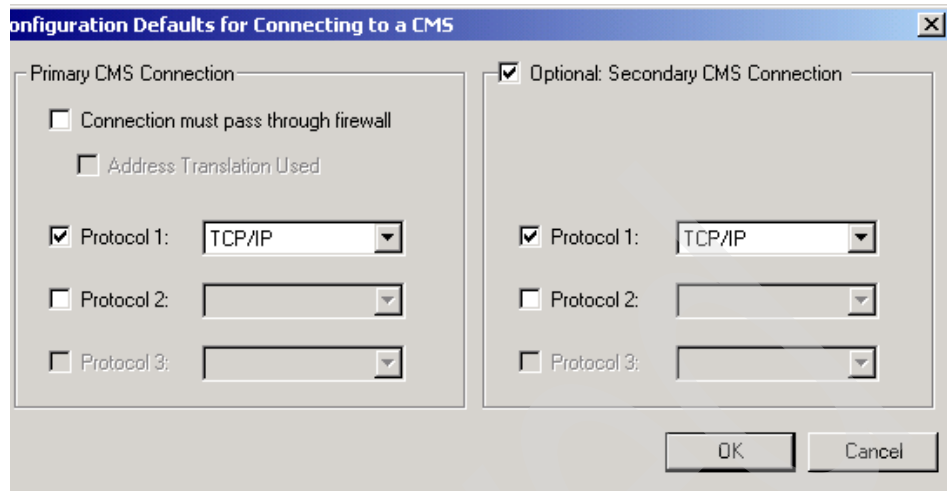
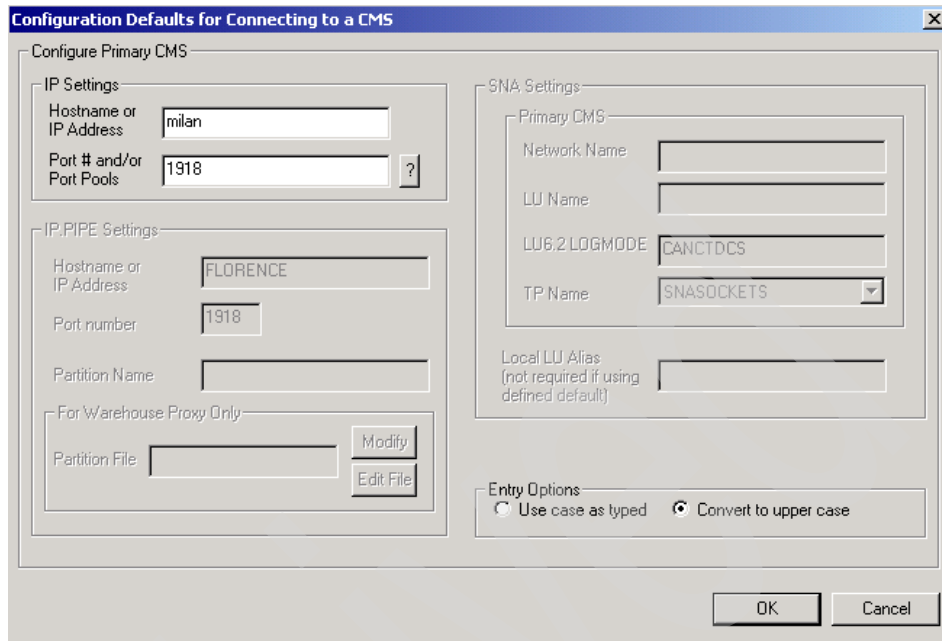


Figure 7-7 Agent connection to CMS

13. The next menu will request information about the CMS (see Figure 7-8 on page 207). Assuming the use of TCP/IP, provide the following information:
- Enter the host name or IP address of the CMS.
 - Enter the port of the CMS.



The dialog box is titled "Configuration Defaults for Connecting to a CMS". It contains several sections for configuring CMS connection settings:

- Configure Primary CMS:**
 - IP Settings:** Hostname or IP Address (text field: milan), Port # and/or Port Pools (text field: 1918, with a help icon ?).
 - IP.PIPE Settings:** Hostname or IP Address (text field: FLORENCE), Port number (text field: 1918), Partition Name (text field).
 - For Warehouse Proxy Only:** Partition File (text field) with "Modify" and "Edit File" buttons.
- SNA Settings:**
 - Primary CMS:** Network Name (text field), LU Name (text field), LU6.2 LOGMODE (text field: CANCTDCS), TP Name (dropdown menu: SNASOCKETS).
 - Local LU Alias:** (text field, with note: not required if using defined default).
- Entry Options:**
 - ☐ Use case as typed
 - ☒ Convert to upper case

At the bottom right are "OK" and "Cancel" buttons.

Figure 7-8 Agent's CMS connection settings

14. Once the installation is complete, you will see a menu stating that the install is complete and it presents the option to view the README file. Click **Finish**.

Installing on UNIX

The UNIX installation can be completed using the GUI or command line options. In this section, we will use the command line options. If you choose to use the GUI options, see 7.2.2, "Setting up the environment prior to installation" on page 199 for a suggested environment setup.

Do the following to install on UNIX:

1. Log on to the system as root.
2. Load the installation image (choose one of the following methods):
 - Mount the CD locally.
 - Access the image via NFS mount.
 - Copy the image locally to the system.
3. Change directories to the image location.
4. Execute install.sh.

Note: The install.sh script can be executed with optional flags; however, we will execute it without any flags. See *Installing and Setting up IBM Tivoli OMEGAMON XE for WebSphere Business Integration*, SC31-6885 for details.

5. Since we did not provide a directory at the command line, it will prompt for CANDLEHOME. Press Enter to use the default.

```
Enter the name of the CANDLEHOME directory
[ default = /candle ]:
```

6. If the CANDLEHOME directory exists, it will ask if you will to use this. Press Enter to take the default.

```
CANDLEHOME directory "/candle" already exists.
OK to use it [ y or n; "y" is default ]?
```

7. Next, it will provide the listing of installation options (Figure 7-9). Select the option you wish to use; in this section, we have selected option 2:

```
Prior to installing OMEGAMON XE agents, you should already
have installed Candle Management Server on at least one machine.
You will need to know the IP address or host name and IP port number
for the Candle Management Server in order to configure your agents.
The Candle Management Server is available on the OMEGAMON Platform CD.
```

```
Select one of the following:
```

- 1) Install products or maintenance via GUI.
- 2) Install products via command line.
- 3) Install maintenance via command line.
- 4) Create remote packages via GUI.
- 5) Create remote packages via command line.
- 6) View readme files.
- 7) Exit install.

```
Please enter a valid number: 2
```

Figure 7-9 Installation options

8. You are provided with the operating systems for the product packages (Figure 7-10 on page 209). Select the default unless you want to override it. It will then ask you to verify that the information is correct. Review and verify this information. If correct, press Enter.

Product packages are available for the following operating systems:

- 1) AIX R4.3.3
- 2) AIX R5.1 (32 bit)
- 3) AIX R5.1 (64 bit)
- 4) AIX R5.2 (32 bit)
- 5) AIX R5.2 (64 bit)
- 6) HP-UX R11
- 7) HP-UX R11 (64 bit)
- 8) Linux Intel R2.4 (32 bit)
- 9) Linux Intel R2.4 (64 bit)
- 10) Linux S390 R2.4 (32 bit)
- 11) Linux S390 R2.4 (64 bit)
- 12) Solaris R7 (32 bit)
- 13) Solaris R7 (64 bit)
- 14) Solaris R8 (32 bit)
- 15) Solaris R8 (64 bit)
- 16) Solaris R9 (32 bit)
- 17) Solaris R9 (64 bit)
- 18) _CMS support for products running on UNIX

Type the number for the OS you want, or type "q" to quit selection
[number "4" or "AIX R5.2 (32 bit)" is default]:

You selected number "4" or "AIX R5.2 (32 bit)"

Is the selection system correct [y or n; "y" is default]?

Figure 7-10 Available operating systems

9. Next, a screen with the list of agents to install appears (Figure 7-11 on page 210). Enter the number 1 for the WebSphere Integration Brokers Agent. Then it will ask for verification that this is the agent to install. Press Enter to install the agent.

```
The following products are available for installation:

1) WebSphere Integration Brokers V130R106
2) WebSphere InterChange Server Data Source V110R110
3) WebSphere InterChange Server V110R109
4) WebSphere MQ V370R108
5) all of the above

Type the numbers for the products you want to install, or type "q" to
quit selection.
If you enter more than one number, separate the numbers by a comma or
a space.

Type your selections here: 1

The following products will be installed:

WebSphere Integration Brokers V130R106

Are your selections correct [ y or n; "y" is default ]?
```

Figure 7-11 Agent selection

10. Then the installer will ask if you want to install any other agents. Select the default (n). It will then inform you to make sure that the CMS is installed with the agent support.

Now that the agent has been successfully installed on the target system(s), the next steps are to configure the CMS and the agent.

7.4 Installing the seed file on the CMS

Before monitoring can be used, the CMS to which the agent reports must be seeded. The seed process adds product data, including situations, templates, and sample data to the CMS database.

Installing the seed files on UNIX and Windows must be done using the local option, while seeding a CMS on z/OS can be done using the remote option. The following steps detail the seed process for UNIX and Windows.

7.4.1 Seeding the CMS on Windows

Follow these steps to install the seed data on a Windows CMS.

1. Log on to the Windows system.
2. Install the CMS agent support from the IBM Tivoli OMEGAMON XE for WebSphere Business Integration media.
 - a. Switch directories to WINDOWS.
 - b. Run setup.exe.
 - c. Click **Next** on the Welcome screen and information screen.
 - d. Read and accept the software license.
 - e. Ensure that the location screen points to the CANDLEHOME of the CMS. If it does not then update the location. Click **Next**.
 - f. Select **OMEGAMON XE for WebSphere Business Integration Support** from the Select Features menu, as shown in Figure 7-12.

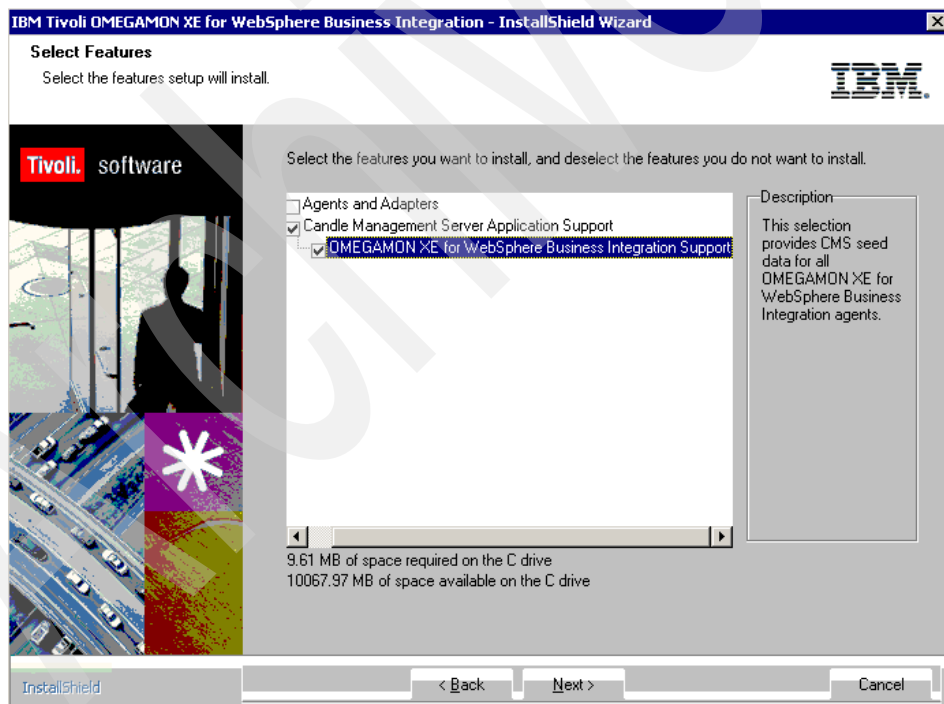


Figure 7-12 Agent Select Features

- g. Click **Next** on the Select Program Folder menu.
- h. Review the settings and click **Next** on the Start Copying Files menu.

- i. The installer will then copy files to the CMS.
 - j. After the file copy completes, it will provide a menu with options to seed the CMS. We will not select that option here, but will proceed to step 3 to seed the CMS from the Manage Candle Services application.
3. Launch Manage Candle Services application by selecting **Start** → **Programs** → **Candle OMEGAMON XE** → **Manage Candle Services**.
 4. Right-click the **Candle Management Server** and select **Advanced** → **Seed CMS....**
 5. The Seed CMS menu is displayed. Select **On this computer** and click **OK**.
 6. The Select Product to Seed menu is displayed. Select the **CMS data for WebSphere Integration Brokers**. Click **OK**.
 7. The seeding of the CMS may take several minutes. Once it is complete, the “Seed data operation complete” menu appears. Click **Close**.
 8. The CMS must be recycled. Click **Yes** when prompted to recycle the CMS.

7.4.2 Seeding the CMS on UNIX

Follow these steps to load the seed data on a UNIX CMS.

1. Log onto the UNIX system and start the CMS.
2. Make sure that the installation media is available for IBM Tivoli OMEGAMON XE for WebSphere Business Integration.
3. Switch to the media's root directory. We will use /om_wbi_media:

```
cd /om_wbi_media
```

4. Run the installer:

```
./install.sh -h CANDLEHOME
```

Note: CANDLEHOME is the root directory for the CMS; the default is /candle.

5. Press Enter to accept the default of y when asked to use CANDLEHOME.
6. Enter 2 and press Enter to use the command line install.
7. Enter 18 (not the default), as shown in Example 7-1 on page 213. The default will be the operating system on which you are running the installer and this will install the actual agent code and not just the seed data.

Example 7-1 OS selection

18) _CMS support for products running on UNIX

Type the number for the OS you want, or type "q" to quit selection
[number "15" or "Solaris R8 (64 bit)" is default]: 18

8. Press Enter to accept the default of y when asked to confirm the install (Example 7-2).

Example 7-2 Selection confirmation

You selected number "18" or "_CMS support for products running on UNIX"

Is the selection system correct [y or n; "y" is default]?

9. The next selection is for the package to install. Enter 1 for the WebSphere Integration Brokers (Example 7-3).

Example 7-3 Select package to install

The following products are available for installation:

- 1) UNIX WebSphere Integration Brokers V130R106
- 2) UNIX WebSphere InterChange Server V110R109
- 3) UNIX WebSphere MQ V370R108
- 4) all of the above

Type the numbers for the products you want to install, or type "q" to quit selection.

If you enter more than one number, separate the numbers by a comma or a space.

Type your selections here: 1

10. Press Enter to accept the default for the confirmation question (Example 7-4).

Example 7-4 Confirmation question.

The following products will be installed:

UNIX WebSphere Integration Brokers V130R106

Are your selections correct [y or n; "y" is default]?

11. Press Enter to accept the default of n on install products for a different operating system (Example 7-5 on page 214).

Install products for a different operating system [y or n; "n" is default]?

12. Now you can seed the CMS using the CandleSeed command located in CANDLEHOME/bin:

```
cd CANDLEHOME/bin
./CandleSeed -t cms_name qi
```

13. Stop the CMS:

```
./CandleServer stop cms_name
```

14. Restart the CMS:

```
./CandleSever start cms_name
```

Now the CMS has been seeded with the data for the OMEGAMON agent for WebSphere Business Integration Broker and you are ready to proceed to the next step and configure the agent.

7.5 Configuring the WebSphere Integration Brokers Monitoring Agent

This section covers general configuration of the WebSphere Integration Brokers Monitoring Agent. During the install of the agent, there may have been some basic configuration, depending on the selections made during installation and the operating system on which the agent was installed. In this section, we will assume that the agent has not been previously configured and will start with the first steps.

7.5.1 Configuring the agent on Windows

The following steps provide details for configuring the agent on Windows.

1. Log on to the Windows system as an administrator.
2. Start the Manage Candle Services tool by selecting **Start** → **Programs** → **Candle OMEGAMON XE** → **Manage Candle Services**.

This launches the Manage Candle Services application (Figure 7-13 on page 215), which will be used to perform some of the configuration tasks.

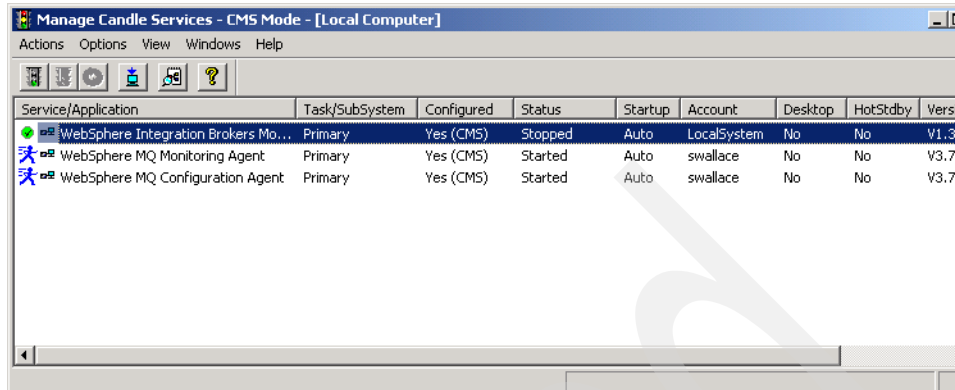


Figure 7-13 Manage Candle Services

3. Configure the agent.
 - a. Right-click the agent in the Manage Candle Services application and select **Configure Using Defaults**. If this option is greyed out, you can select **Reconfigure**.
 - b. This will display the Agent Advanced Configuration menu. If you configured the agent during the install process, then click **OK** to maintain the settings. If you wish to modify the settings, then make the necessary changes and click **OK** when complete.
 - c. The menu to configure the primary CMS appears. If this step was completed during install, click **OK**.
 - d. You will be asked if you wish to update the kqi.xml configuration file. This file contains the agent's configuration parameters. For now, leave this at the default (we will cover the parameters of this file later in this chapter). Click **No**.
 - e. The agent is now configured, as the status column indicates.
4. Authorize the agent.
 - a. Create a user ID or use an existing ID. The ID must have the following aspects:
 - i. Authority to subscribe to broker event publications.
 - ii. Belongs to the groups mqm, mqbrkr, and Administrators.
 - b. In Manage Candle Services, right-click the agent and select **Change Startup**.

Note: If the agent has not been configured at all, the Configured column shows No; you will not be able to select Change Startup. In this case, go back to step one and configure the agent.

- c. In the Log On As section, change the SystemAccount to the user you defined (Figure 7-14).

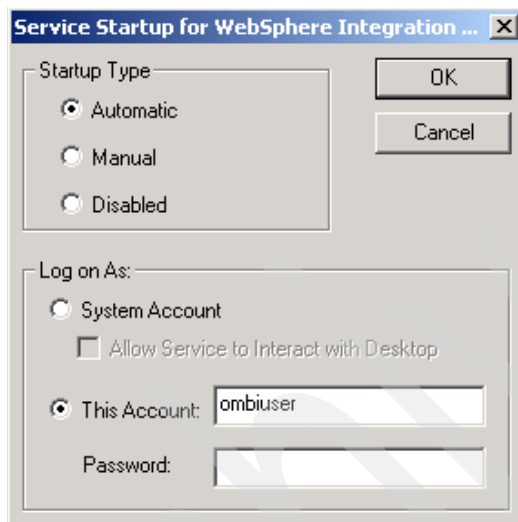


Figure 7-14 Change startup for Windows agent

Note: If your site restricts subscriber access to topics beginning with \$SYS/Broker, then an ACL entry for topics beginning with \$SYS/Broker must be added with subscriber access set to Allow for the user ID of the agent.

5. This completes the initial configuration and you can start the agent at this point by double clicking the agent in the Manage Candle Services window.
6. Install the CandleMonitor Node (optional).

If you wish to use the CandleMonitor Node to collect statistics on message flow performance, then follow these steps.

- a. Verify that the file kqinode.lil was copied into the WebSphere MQ Business Integration Broker's directory. The default directory is in c:\Program Files\IBM\WebSphere Business Integration Message Brokers\bin.

- b. If kqinode.lil is not present, then install it now by doing the following steps:
 - i. Shut down the broker.
 - ii. Copy kqinode.lil from CANDLEHOME\CMA to the broker's bin directory.
 - iii. Restart the broker.
- 7. Make the CandleMonitor Node available.
 - a. Determine the level of the Message Broker. First, you must make sure you have the following versions of the Control Center and the Message Broker Toolkit.
 - i. Control Center for V2.1.
 - ii. Message Broker Toolkit for V5 or V5.1.
 - b. Exit the Control Center or Message Broker Toolkit.
 - c. Locate the correct file to make the CandleMonitor Node available. The files are located in CANDLEHOME\CMA.
 - i. Control Center V2.1: kqicm210.exe.
 - ii. Message Broker Toolkit V5: kqicm500.exe.
 - iii. Message Broker Toolkit V5.1: kqicm510.exe.
 - d. Execute the file based on the version. This is a self-extracting executable and will unzip the files to the default Message Broker install path. If your path is different, enter it in the zip utility.
 - i. Control Center V2.1 defaults to C:\Program Files\IBM\WebSphere MQ Integrator 2.1.
 - ii. Message Broker Toolkit V5 defaults to C:\Program Files\WebSphere Business Integration Message Brokers\eclipse\plugins.
 - iii. Message Broker Toolkit V5.1 defaults to C:\Program Files\WebSphere Business Integration Message Brokers\evtoolkit\eclipse\plugins.
 - e. If this is for Control Center V2.1, follow these steps:
 - i. The extraction tool creates a directory called CandleMonitor. It places the files where they should go, with the exception of two files that it places in CandleMonitor directory. The two files in this directory need to be copied to C:\Program Files\IBM\WebSphere MQ Integrator 2.1\Tool\repository\private\hostname\ConfigMgr Qmgr Name\MessageProcessingNodeType, where hostname is the name of the system of the ConfigMgr and ConfigMgr Qmgr Name is name of the queue manager associated with the ConfigMgr.
 - ii. Start the Control Center and go to the **Message Flows** tab.

- iii. Right-click **Message Flows**.
 - iv. Select **Create**.
 - v. Click **Message Flow** and name the category Candle.
 - vi. Click **Finish**.
 - vii. Right-click the **Candle category**.
 - viii. Select **Add**.
 - ix. Click **Message Flow**.
 - x. In the displayed list, select **CandleMonitor** and click **Finish**.
 - xi. Right-click **CandleMonitor** and select **Check In**.
- f. If this is for Message Broker Toolkit V5 or V5.1, the extraction creates and populates a directory called com.candle.monitor_1.3.0. Restart the Message Broker Toolkit.

7.5.2 Configuring the agent on UNIX

The following steps will configure the agent on UNIX.

1. Log on to the UNIX system.
2. Authorize the agent:
 - a. Create a user ID that will run the agent or you can use the ID that runs the broker.
 - b. This user ID must have mqm as its primary group and be a member of the group mqbrkrs.
 - c. The user ID needs to be running with a profile supplied in the broker samples directory.
 - d. Ensure that this ID can create and write these directories:
 - CANDLEHOME/logs
 - CANDLEHOME/config
 - CANDLEHOME/architecture/qi/hist

Notes:

- CANDLEHOME is the root directory for the CMS.
- *architecture* is the operating system architecture directory. For a full listing of the architecture codes, see *Installing and Setting up IBM Tivoli OMEGAMON XE for WebSphere Business Integration on Windows and UNIX*, SC31-6885.

- e. If your site restricts subscribe access to topics beginning with \$SYS/Broker, then an ACL entry for topics beginning with \$SYS/Broker must be added with subscribe access set to Allow for the user ID of the agent.
3. Configure the agent. This can be done using the GUI or the command line. We will use the command line option here. Execute CandleConfig, as shown in Figure 7-15.

```
# cd /candle/bin
# ./CandleConfig -A qi
CandleConfig      : installer level  350 / 600.
CandleConfig      : running aix433 jre.
Agent configuration started...

Will this agent connect to a CMS? [YES or NO] (Default is: YES):
CMS Host Name (Default is: milan): hellsinki

Will the agent connect through a firewall? [YES or NO] (Default is: NO):

Network Protocol [ip, sna, or ip.pipe] (Default is: ip):

    Now choose the next protocol from one of these:
    - sna
    - ip.pipe
    - none
Network Protocol 2 (Default is: none):
IP Port Number (Default is: 1918):

Configure connection for a secondary CMS? [YES or NO] (Default is: NO):
Enter Optional Primary Network Name or "none" (Default is: none):
Agent configuration completed...
```

Figure 7-15 Configuring the UNIX agent from the command line

4. Now that the agent is configured, it can be started from the command line as well. Make sure that you are the user that was authorized in step 2 and then execute the CandleAgent command as follows:

```
cd /candle/bin
./CandleAgent start qi
```

Note: By default, one agent will monitor all the brokers on the system. You can start multiple agents and specify the broker and agentID using the -o and -p flags. This will automatically create an agent configuration file using the broker name and agentID *hostname_qi_brokrname_agentID.xml*.

5. Next, the CandleMonitor Node can be optionally installed. Installing the CandleMonitor Node involves creating softlinks, so this step should be done by a user ID with root authority.

Note: Creating the softlinks can optionally be done as part of the UNIX command line installation. See *Installing and Setting up IBM Tivoli OMEGAMON XE for WebSphere Business Integration*, SC31-6885 for all available options for the command line installation.

The following was taken from the *Installing and Setting up IBM Tivoli OMEGAMON XE for WebSphere Business Integration on Windows and UNIX*, SC31-6885:

- a. On AIX, run the code shown in Example 7-6.

Example 7-6 Installing the CandleMonitor Node on AIX

```
ln -sf candlehome/aix433/qi/bin/kqipnode.lil
/usr/opt/mqsi/lil/kqipnode.lil
ln -sf candlehome/aix433/qi/bin/kqipnode.cfg
/usr/opt/mqsi/lil/kqipnode.cfg
ln -sf candlehome/aix433/qi/bin/CandleMonitorNode.cat
/usr/opt/mqsi/messages/En_US/CandleMonitorNode.cat
ln -sf candlehome/aix433/qi/bin/CandleMonitorNode.cat
/usr/lib/nls/msg/En_US/CandleMonitorNode.cat
```

- b. On Solaris, run the code shown in Example 7-7.

Example 7-7 Installing the CandleMonitor Node on Solaris

```
ln -sf candlehome/sol273/qi/bin/kqipnode.lil
/opt/mqsi/lil/kqipnode.lil
ln -sf candlehome/sol273/qi/bin/kqipnode.cfg
/opt/mqsi/lil/kqipnode.cfg
ln -sf candlehome/sol273/qi/bin/CandleMonitorNode.cat
/opt/mqsi/messages/En_US/CandleMonitorNode.cat
ln -sf candlehome/sol273/qi/bin/CandleMonitorNode.cat
/usr/lib/locale/C/LC_MESSAGES/CandleMonitorNode.cat
```

- c. On HP-11, run the code shown in Example 7-8.

Example 7-8 Installing the CandleMonitor Node on HP-11

```
ln -sf candlehome/hp11/qi/bin/kqipnode.lil
/opt/mqsi/lil/kqipnode.lil
ln -sf candlehome/hp11/qi/bin/kqipnode.cfg
/opt/mqsi/lil/kqipnode.cfg
ln -sf candlehome/hp11/qi/bin/CandleMonitorNode.cat
/opt/mqsi/messages/En_US/CandleMonitorNode.cat
```

```
ln -sf candlehome/hp11/qi/bin/CandleMonitorNode.cat
/usr/lib/nls/msg/C/CandleMonitorNode.cat
```

- d. On Linux on Intel, run the code shown in Example 7-9.

Example 7-9 Installing the CandleMonitor Node on Linux on Intel

```
ln -sf <candlehome>/li6243/qi/bin/kqipnode.lil
/opt/mqsi/lil/kqipnode.lil
ln -sf <candlehome>/li6243/qi/bin/kqipnode.cfg
/opt/mqsi/lil/kqipnode.cfg
ln -sf <candlehome>/li6243/qi/bin/CandleMonitorNode.cat
/opt/mqsi/messages/En_US/CandleMonitorNode.cat
ln -sf <candlehome>/li6243/qi/bin/CandleMonitorNode.cat
/usr/share/locale/C/LC_MESSAGES/CandleMonitorNode.cat
```

- e. On Linux on zSeries, run the code shown in Example 7-10.

Example 7-10 Installing the CandleMonitor Node on Linux on zSeries

```
ln -sf <candlehome>/ls3243/qi/bin/kqipnode.lil
/opt/mqsi/lil/kqipnode.lil
ln -sf <candlehome>/ls3243/qi/bin/kqipnode.cfg
/opt/mqsi/lil/kqipnode.cfg
ln -sf <candlehome>/ls3243/qi/bin/CandleMonitorNode.cat
/opt/mqsi/messages/En_US/CandleMonitorNode.cat
ln -sf <candlehome>/ls3243/qi/bin/CandleMonitorNode.cat
/usr/share/locale/C/LC_MESSAGES/CandleMonitorNode.cat
```

- f. In addition, Linux on zSeries requires the following steps:

- i. Edit the profile used by your service user ID that starts your broker. This is shipped by IBM as the following file, but if you have changed to a different profile for your service user ID, edit that one:

`/opt/mqsi/sample/profiles/profile.lnx`

- ii. Include the following lines in the file:

```
MQSI_PRELOAD=/opt/gcc295/lib/libstdc++-libc6.2-2.so.3
export MQSI_PRELOAD
```

- iii. Save the file.

- iv. Run the profile for the service user ID before restarting the broker. If you are already logged onto the user ID, enter this command to enact the new settings:

```
./opt/mqsi/sample/profiles/profile.lnx
```

- g. Restart the broker.

7.6 The agent's configuration file

While you are not required to modify the agent's configuration file, this file can be modified to control the agent. Once the agent has run for a while and you are comfortable making changes to this file based on the needs of your monitoring, then review this section.

The configuration file is located in the following directories:

- ▶ UNIX: CANDLEHOME/config/kqi.xml.
- ▶ Windows: CANDLEHOME\CMA\kqi.xml.
- ▶ z/OS: The member name is KQIXML and is in the dataset &rhilev.RKANDATV (default).

On UNIX and Windows, there is a sample configuration file (kqismp1.xml) located in the following directories:

- ▶ UNIX: CANDLEHOME/architecture/qi/files
- ▶ Windows: CANDLEHOME/CMA

Figure 7-16 on page 223 shows a simple kqi.xml file that has been modified to only monitor one broker on the system.

```

<KqiAgent version="130"
  defaultRetainBrokerEvents="10"
  defaultRetainFlowEvents="10"
  retainProductEvents="10"
  discoveryInterval="300"
  defaultStatisticInterval="60"
  defaultFlowEventInterval="15"
  defaultHistoricalAccountingType="Archive"
  defaultRetainRecentSnapshotSamples="15"
  defaultRetainRecentArchiveSamples="5"
  holdTimeForQuery="180"
  defaultReplyQueueName="KQI.AGENT.REPLY.QUEUE"
  defaultReplyQueueModel="SYSTEM.BROKER.MODEL.QUEUE"
  defaultTakeActionAuthUsers="*"
  >
  <MonitorBroker name="WBRK_BROKER"
    statisticInterval="60"
    flowEventInterval="20"
    retainBrokerEvents="5"
    retainFlowEvents="5"
    takeActionAuthUsers="wbrk,mqm">
  </MonitorBroker>
</KqiAgent>

```

Figure 7-16 Sample kqi.xml file

There are three elements that can be configured in this file: KqiAgent, MonitorBroker, and ConnectQueueManager. The KqiAgent tag is the top level tag and must encapsulate the entire file. The MonitorBroker and ConnectQueueManager are nested tags that provide more control for the actions of the agent.

Table 7-2 on page 224 presents the tags, attributes, and a brief description of kqi.xml. For more details on these attributes, see *Using IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers, V 1.3.0*, SC31-6890.

Table 7-2 Attributes of *kqi.xml*

Tag	Attribute	Description
KqiAgent	version	This is the version of the agent.
	agentID	This is the short identifier of the agent. The maximum length is 4 characters. The default is "".
	defaultRetainBrokerEvents	Determines how many broker events to retain per broker for viewing in reports. The default is 10.
	defaultRetainFlowEvents	Determines how many message flow events to retain per broker for viewing in reports. The default is 10.
	retainProductEvents	Determines the total number of product events to retain for viewing in reports. The default is 10.
	discoveryInterval	Determines the period of time in seconds between the agent's attempts to rediscover brokers created on the system. The default is 300.
	defaultStatisticInterval	Determines the minimum period of time in seconds between collections of broker statistics. The default is 60.
	defaultFlowEventInterval	Determines the period of time in seconds for the message flow event sampling interval. The default is 15.
	defaultReplyQueueName	Specifies the name of the queue that will be used for the agent's receipt of replies and publications for any queue manager to which the agent connects. The default is KQI.AGENT.REPLY.QUEUE.

Tag	Attribute	Description
	defaultReplyQueueModel	Specifies the name of the queue that will be used as a model for creation of the agent reply queue for any queue manager to which the agent connects. The default is SYSTEM.BROKER.MODEL.QUEUE.
	defaultTakeActionAuthUsers	Specifies which CandleNet Portal users are authorized to issue Take Action commands associated with this agent. The default is <code>"**"</code> .
	commandTimeoutInterval	Specifies the period of time in seconds before the agent issues a message indicating the broker is not responding. The default is 60.
	maximumCommandRetryCount	Specifies the number of times that the agent will attempt to reissue a command before stopping. The default is 4.
	maximumAgentCollectionThreads	Used to increase or decrease the number of brokers that the agent can monitor. The default is 42, which is enough to monitor 10 brokers.
	holdTimeForQuery	The amount of time, in seconds, that the agent should retain data for the ability to go down into a more detailed level in Accounting workspaces and still see the same sample of data that was selected in the higher level workspace. The default is 180.
	defaultHistoricalAccountingType	Tells the agent which two types of accounting data are to be logged historically. The value can be All, Snapshot, Archive, or None. The default is Archive.

Tag	Attribute	Description
	defaultRetainRecentSnapshotSamples	Gives the default value used by the agent for the number of recent snapshot records it keeps for any given message flow. The default is 15, which results in about five minutes of snapshot data.
	defaultRetainRecentArchiveSamples	Gives the default value used by the agent for the number of recent archive records kept for any give message flow. The default is 5, which results in about five hours of archive data.
MonitorBroker	name	Specifies the name of the broker to be monitored and required.
	statisticInterval	Determines the minimum period of time in seconds between collections of broker statistics. It overrides the defaultStatisticInterval attribute; however, if it is not specified, the default attribute is used.
	flowEventInterval	Determines the period of time in seconds for the message flow event sampling interval. It overrides the defaultFlowEventInterval attribute; however, if it is not specified, the default attribute is used.
	retainBrokerEvents	Determines how many broker events to retain per broker for viewing in reports. It overrides the defaultRetainBrokerEvents attribute; however, if it is not specified, the default attribute is used.
	retainFlowEvents	Determines how many message flow events to retain per broker for viewing in reports. It overrides the defaultRetainFlowEvents attribute; however, if it is not specified, the default attribute is used.

Tag	Attribute	Description
	componentDirectory	Specifies the directory path created when the broker to be monitored was customized. This is required on z/OS and it ignored on UNIX or Windows.
	takeActionAuthUsers	Specifies which CandleNet Portal users are authorized to issue Take Action commands associated with this agent on this broker. It overrides the defaultTakeActionAuthUsers attribute; however, if it is not specified, the default attribute is used.
	historicalAccountingType	Gives the value used by the agent for the given broker for which of the types of accounting data is to be logged historically. It overrides the defaultHistoricalAccounting. If the Type attribute is not specified, the default attribute is used.
	retainRecentSnapshotSamples	Gives the value used by the agent for the given broker for the number of recent snapshot records to keep for any give message flow. It overrides the defaultRetainRecentSnapshotSamples attribute; however, if it is not specified, the default attribute is used.
	retainRecentArchiveSamples	Gives the value used by the agent for the given broker for the number of recent archive records to keep for any given message flow. It overrides the defaultRetainRecentArchiveSamples attribute, however, if it is not specified, the default attribute is used.
ConnectQueueManager	name	Specifies the name of the queue manager to which the agent will connect.

Tag	Attribute	Description
	replyQueueName	Specifies the name of the queue that will be used for the agent's receipt of replies and publications for this queue manager. If it is not specified, the defaultReplyQueueName will be used.
	replyQueueModel	Specifies the name of the queue that will be used as a model for creation of the agent reply queue on this queue manager. If it is not specified, the defaultReplyQueueModel is used.

7.7 Using situations

IBM Tivoli OMEGAMON XE for WebSphere Business Integration Brokers provides predefined situations to monitor critical activity and serve as a template for creation of customized situations.

The predefined situations are grouped into two categories: Alerts and Historical. The alert based situations are prefaced with the letters QI and are activated when they are distributed to the node to be monitored.

Table 7-3 shows the predefined alert based events and lists their description.

Table 7-3 Predefined alert based situations

Situation	Component	Sub-component	Description
QI_Broker_Not_Started	QI Broker	Broker Information	The Broker Status value is found to be not started.
QI_Broker_QMgr_Not_Connected	QI Broker	Broker Information	The Queue Manager Status value is found to be not connected.
QI_Status_Stop_Event	QI Broker	Broker Events	The Broker Events row occurs for a Status Stop event.
QI_Message_Flow_Events	QI Broker	Message Flow Events	The Message Flow Events row occurs.
QI_Product_Events	QI Agent	Product Events	The Product Events row occurs.

Situation	Component	Sub-component	Description
QI_Publication_Expiry_Event	QI Broker	Broker Events	The Broker Events row occurs for a Publication Expiration event type.
QI_Subscription_Expiry_Event	QI Broker	Broker Events	The Broker Events row occurs for a Subscription Expiration event type.
QI_Average_Flow_Time_High	QI Broker	Message Flow Statistics	The Average Flow Seconds value is found to exceed a threshold. The default threshold is 10.
QI_Automation_Start_Component	QI Agent	Components	The Component Status value is found to be not started. This situation demonstrates reflex automation: if the situation becomes true, the proper command is issued to start the component.

Situations can be created using the Situation Editor in the CandleNet Portal. It is recommended that you copy an existing situation and modify the copy instead of making changes to the original predefined situation. This has three advantages:

1. It preserves the original.
2. When maintenance is installed, updates to the product provided situations are implemented.
3. If the CMS is re-seeded, the updates are not lost.

Figure 7-17 on page 230 shows the Situation Editor opened against the QI_Broker_Not_Started situation with the Condition tab being viewed.

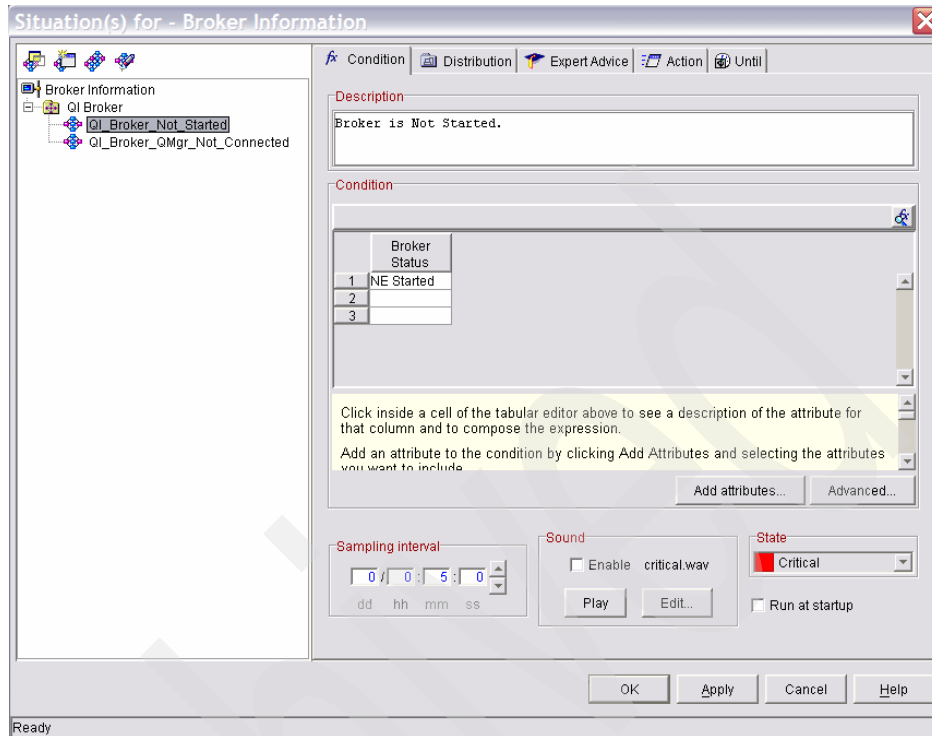


Figure 7-17 Situation Editor with QI_Broker_Not_Started

When creating or modifying a situation, there are several things to consider:

- ▶ Condition tab items
 - Condition: This is the test(s) that cause the situation to be activated.
 - Sampling interval: Sets the interval of the situation. This should not be set to a smaller timeframe than the statisticInterval of the agent configuration.
 - State: This is the severity of the situation.
 - Advanced: This allows the setting of situation persistence and the display item.
- ▶ Distribution tab items
 - Assigned.
 - Available Managed Systems.
 - Available Managed Systems Lists.
- ▶ Take Action tab items
 - Action Selection.

- System Command.
- Where should the action be executed.
- Until tab items
 - Close this event when either occurs.

Do you want situation's actions to automatically perform an operation on the managed system or do you want the situation to notify the correct people to perform some action?

7.8 Using Take Actions

Take Actions allow you to submit commands to the WebSphere Business Integration Brokers from the CandleNet Portal using the agent. They can be submitted from situations, from the Navigator, or from a row in a table view. The Take Action commands for this product are prefaced with the letters *QI*.

Which users can initiate Take Actions is controlled by the agent parameter file at two levels:

- Agent level: Using defaultTakeActionAuthUsers parameter
- Broker level: Using takeActionAuthUsers parameter

The default setting is for the agent level with defaultTakeActionAuthUsers="*". This means any CandleNet Portal user can issue Take Actions for the agent. The commands are executed within the context of the agent's authority.

Table 7-4 shows the Take Actions provided with the product.

Table 7-4 Take Actions provided by the product

Take Action	Managed System	Description
QI Start Component	QI Agent	Starts one of the following components: UserNameServer, ConfigMgr, or broker. Uses the mqsisstart command.
QI Stop Component	QI Agent	Stops one of the following components: UserNameServer, ConfigMgr, or broker. Uses the mqsisstop command.

Take Action	Managed System	Description
QI Stop Component and its Queue Manager	QI Agent	Stops one of the following components and its associated queue manager: UserNameServer, ConfigMgr, or broker. Uses the mqsisstop command.
QI Change Trace Component	QI Agent	Changes the trace level of the IBM broker component. Uses the mqsichangeTrace command.
QI Start Broker	QI Broker	Starts the selected broker. Uses the mqsiStart command.
QI Stop Broker	QI Broker	Stops the selected broker. Uses the mqsisstop command.
QI Stop Broker and its Queue Manager	QI Broker	Stops the selected broker and its associated queue manager. Uses the mqsisstop command.
QI Change Trace Broker	QI Broker	Changes the broker's trace level. Uses the mqsichangeTrace command.
QI Change Broker	QI Broker	Allows the broker to be modified. Uses the mqsichangebroker command.
QI Change Flow Stats	QI Broker	Allows the activation/deactivation of Message Flow Accounting and Statistics. Uses the mqsichangeFlowStats command.
QI Start Message Flow(s)	QI Broker	Starts one or all message flows associated with an execution group. Leaving the Message_Flow argument blank will cause all flows to be started in the give execution group.
QI Stop Message Flow(s)	QI Broker	Stops one or all message flows associated with an execution group. Leaving the Message_Flow argument blank will cause all flows to be stopped in the give execution group.

Take Action	Managed System	Description
QI Delete Retained Publication	QI Broker	Deletes a retained publication for the given topic and subscription point.
QI Create User Statistics	QI Broker	Creates user statistics associated with the CandleNet Portal logon ID that issues the command. The MaxInactivityTime is in minutes.
QI Sample User Statistics	QI Broker	Causes the agent to take a sample of CandleMonitor statistics for the CandleNet Portal logon ID that issues the command.
QI Destroy User Statistics	QI Broker	Cleans up all user statistics associated with the CandleNet Portal logon ID that issues the command. It also releases the storage held by these statistics.
QI Reset Statistics	QI Broker	Resets the statistics collected by the Candle Monitor node to zero.

The destination of the Take Action is either at the agent or broker level, as indicated in Table 7-4 on page 231. The amount of detail pre-filled for you depends on from where you open the Take Action menu. In the following two images, you can see that, depending on where we launched, the menu controlled the amount of detailed that we were provided.

The image in Figure 7-18 on page 234 shows the level of detail when the Take Action is accessed by right-clicking the QI Broker object in the Navigator. Notice that the “Execution_Group” and “Message_Flow” are not filled in and are highlighted in yellow.

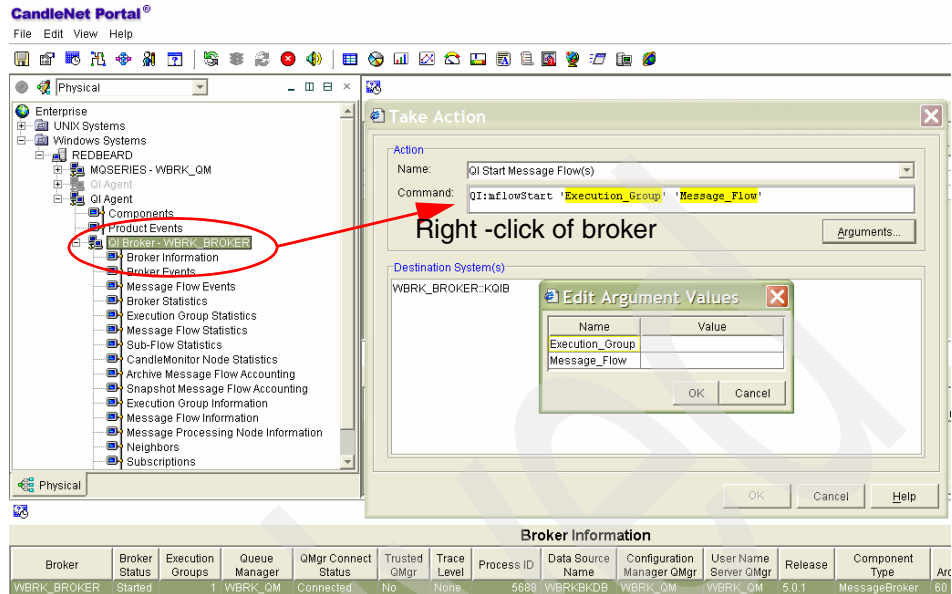


Figure 7-18 Take Action by right-clicking the QI Broker

The image in Figure 7-19 on page 235 shows more detail and has all the fields pre-filled, since the Take Action was accessed by right-clicking the execution group within the Message Flow Statistics section. In both instances, a destination must be selected from the “Destination System(s)” field in the menu. In our case, there is only one QI Broker managed system; however, if there are multiple systems, then more options will appear in the menu.

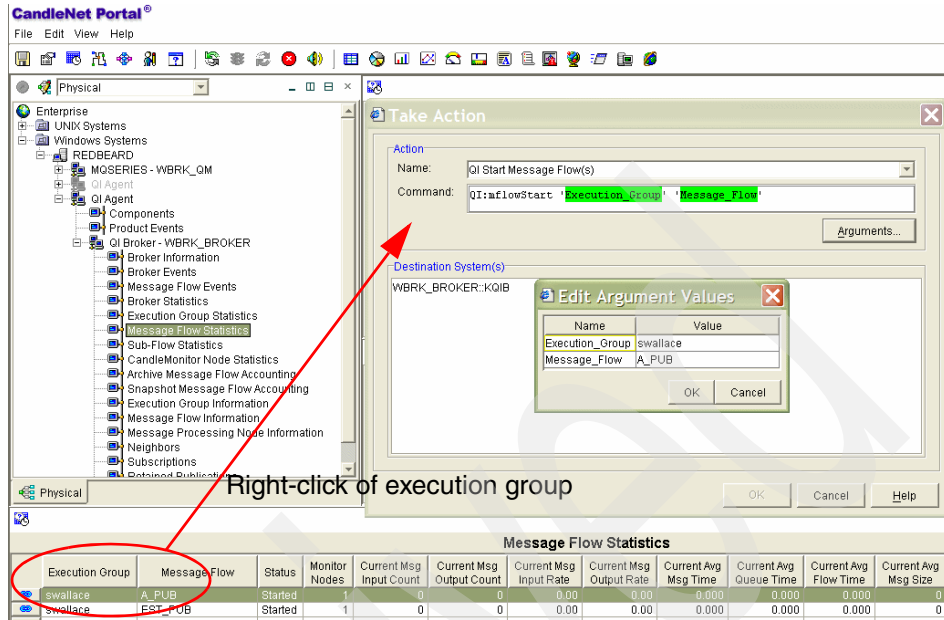


Figure 7-19 Take Action from right-clicking an Execution Group

Once the Take Action is run, the status of the execution is returned to the CNP. It should be noted that this is not the status of the Take Action command; it is the status of the running of the Take Action. For example, the status of the QI Start Message Flow(s) returns a Return Code of 2056 with the message 2056-Successfully-Processed-XML; it does not tell you the status of the start command. In order to see if the start command was successful, you will have to check the “Status” column in the “Message Flow Information” section of the CNP. You could also check the “Message Flow Statistics” instead of “Message Flow Information”, but remember that for the “Message Flow Statistics” to show a message flow, you have to be monitoring it with the CandleMonitor node. The “Message Flow Information” workspace will show all message flows defined to the broker.

7.9 Automating responses

Now that we have covered the use of Situations and Take Actions it is time to combine them to have the product automate this process. This can be considered one of the strengths of this product: the ability to automatically initiate an action based on an event. The term *reflex automation* is used to refer to a situation that executes an action or command.

We have chosen to automate the restart of the broker when the situation (QI_Broker_Not_Started) detects that the broker is down. In this case, the situation will post an event to the Event Console and it will run the Take Action. As long as the command executed by the Take Action is successful, the next sampling interval will detect that the broker is started and send a clearing event.

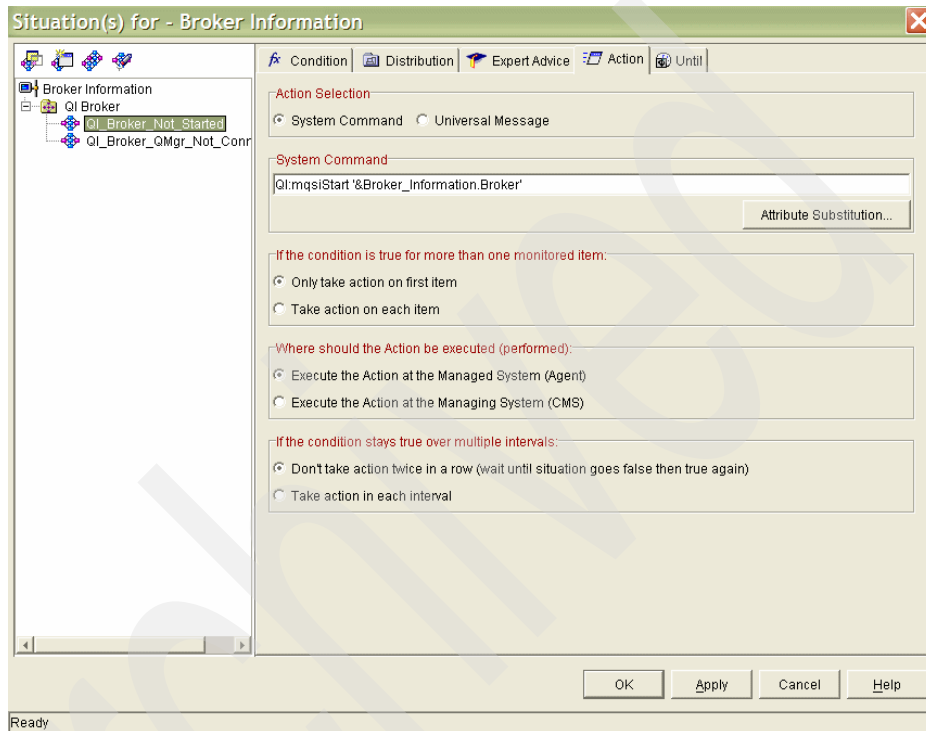


Figure 7-20 Reflex automation for QI_Broker_Not_Started situation

The following steps were used to set up this reflex automation in Figure 7-20.

1. Right-click **Broker Information** in the Navigator under the QI Broker managed system.
2. Select **Situations** from the context menu.
3. Select **QI_Broker_Not_Started** from the available situations
4. Set the **Sampling Interval** (the default is five minutes).
5. Click the **Action** tab.
6. In Action Selection, click **System Command**.
7. In System Command input field, enter QI:mqsisstart ' (that is one single quote mark).

8. Click the **Attribute Selection** button.
9. Select **Broker_Information** from the Group.
10. Select **Broker** from the list under Item.
11. Enter another single quote so that the &Broker_Information.Broker is enclosed in single quotes. The input field will now look like this:
`QI:mqsisstart '&Broker_Information.Broker'`
12. Click the **Distribution** tab.
13. Make sure that the Assigned list shows the broker managed system that you wish this situation to be executed.
14. Right click the **QI_Broker_Not_Started** situation label in the left hand portion of the menu and choose **Start Situation**.
15. Click the **OK** button at the bottom of the menu.

This is the basic setup of the situation and takes the defaults for other settings. You can test this situation by stopping the broker using a Take Action. Allow the situation sample time to be exceeded and you should receive an event in the Event Console informing of the critical situation that the broker is down. The situation should execute the action and, on the next sample, the broker should be running, assuming that the action was successful.

Other actions can be automated using the same steps that we just outlined. You can create your own actions or use those provided with the product. You can also create your own situations and automate actions for those situations in a similar fashion.

7.10 Workspaces

The IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers product is installed with default views that are displayed in workspaces. Links are provided in many cases to take the user to a more detailed view of the selected information. This section will look at using the workspaces to view data provided by the agent.

The workspaces can be accessed from the Navigator in the CandleNet Portal. Figure 7-21 on page 238 shows the Navigator view of the workspaces; to access the workspaces detailed in the table, click the associated icon to display the default workspace. You can also right-click an icon and select **Workspace**, and other available Workspace links are revealed. All of these workspaces are detailed in Figure 7-5 on page 238.

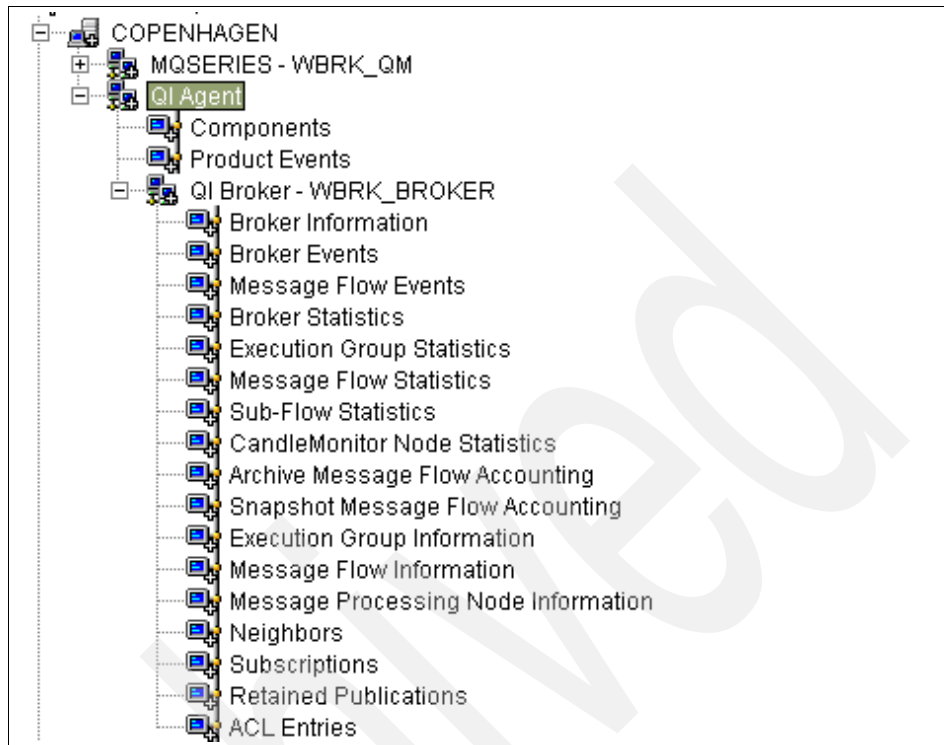


Figure 7-21 Agent workspaces within the Navigator

Figure 7-5 shows the workspaces provided with the product. Most of the workspaces have a corresponding history workspace. The default history workspaces will not be shown in this table, since they show the historical view of the same information. The historical workspaces are accessed by right clicking the workspace icon in the Navigator and selecting **Workspace** →

Workspace_name History. For more details on workspaces, see *Using IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers, V1.3.0, SC31-6890*.

Table 7-5 Agent workspace information

Workspace	Default Views	Description
ACL Entries	<ul style="list-style-type: none"> ► Enterprise Event Log ► ACL Entries 	Displays Access Control List entries per topic. To access the workspace, click the ACL Entries icon.

Workspace	Default Views	Description
Agent Status	<ul style="list-style-type: none"> ▶ Product Events ▶ Components 	Summarizes event and component information at the agent level. To access the workspace, click the QI Agent icon.
Archive Message Flow Accounting	<ul style="list-style-type: none"> ▶ Message Flow Elapsed Time ▶ Message Flow CPU Time ▶ Archive Message Flow Accounting 	Provides statistics pertaining to entire message flows for the current archive collection. To access the workspace, click the Archive Message Flow Accounting icon.
Archive Node Accounting	<ul style="list-style-type: none"> ▶ Archive Node Accounting ▶ Node Elapsed Time ▶ Node CPU Time 	Displays statistics for nodes used by message flows for the current archive interval. To access the workspace, right-click the Archive Message Flow Accounting icon and select Workspace → Archive Node Accounting .
Archive Terminal Accounting	<ul style="list-style-type: none"> ▶ Archive Terminal Accounting ▶ Terminal Invocation Rate 	Displays statistics for terminals on nodes used by message flows for the current archive interval. To access on, right-click the Archive Message Flow Accounting icon and select Workspace → Archive Terminal Accounting .
Archive Thread Accounting	<ul style="list-style-type: none"> ▶ Archive Thread Accounting ▶ Thread Elapsed Time ▶ Thread CPU Time 	Displays statistics pertaining to the threads used by message flows for the current archive interval. To access on, right-click the Archive Message Flow Accounting icon and select Workspace → Archive Thread Accounting .

Workspace	Default Views	Description
Broker Events	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Broker Events 	Lists events generated by the broker as they occur. To access the workspace, click the Broker Events icon.
Broker Information	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Broker Information 	Displays information about the broker including status. To access the workspace, click the Broker Information icon.
Broker Statistics	<ul style="list-style-type: none"> ▶ Current Message Rates ▶ Current Average Message Time ▶ Broker Statistics 	Displays message flow statistics at the broker level. To access the workspace, click the Broker Statistics icon.
Broker Status	<ul style="list-style-type: none"> ▶ Broker Events ▶ Message Flow Events ▶ Broker Information 	Displays summary information of events, status, and definition information for the broker. To access the workspace, click the broker icon. If multiple agents are running on a system, you will see multiple icons under QI Broker.
Broker Summary	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Broker Information 	This is displayed when there are multiple brokers monitored by one agent on a system. It lists information about each broker. To access the workspace, click the QI Broker folder icon.

Workspace	Default Views	Description
CandleMonitor Node Statistics	<ul style="list-style-type: none"> ▶ Current Message Rate ▶ Current Average Message Time ▶ CandleMonitor Node Statistics 	Provides message flow statistics at the individual node level as collected by the CandleMonitor Node. At least one CandleMonitor node must be deployed in the broker. To access the workspace, click the CandleMonitor Node Statistics icon.
Components	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Components 	Displays a list of broker product components and their state at the agent level. To access the workspace, click the Components icon.
Execution Group Information	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Execution Group Information 	Displays execution groups defined for the broker and definition information for each execution group. To access the workspace, click the Execution Group Information icon.
Execution Group Statistics	<ul style="list-style-type: none"> ▶ Current Message Rates ▶ Current Average Message Time ▶ Execution Group Statistics 	Displays message flow statistics summarized at the execution group level. The broker must have at least one deployed CandleMonitor node. To access the workspace, click the Execution Group Statistics icon.
Message Flow Events	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Message Flow Events 	Displays events generated by the CandleMonitor node as they occur. The number of events shown depends on the number retained by the agent, and controlled by the agent parameter file. To access the workspace, click the Message Flow Events icon.

Workspace	Default Views	Description
Message Flow Information	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Message Flow Information 	Displays defined message flows by execution group as well as definition information for each. To access the workspace, click the Message Flow Information icon.
Message Flow Statistics	<ul style="list-style-type: none"> ▶ Current Message Rates ▶ Current Average Message Time ▶ Message Flow Statistics 	Displays message flow statistics summarized at the message flow level. The broker must have at least one deployed CandleMonitor node. To access the workspace, click the Message Flow Statistics icon.
Message Processing Node Attributes	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Message Processing Node Attributes 	Displays all attribute values for the selected message processing node within a message flow. To access the workspace, right-click the Message Processing Node Information icon and select Workspace → Message Processing Node Attributes .
Message Processing Node Information	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Message Processing Node Information 	Displays defined message processing nodes by their execution group and message flow. To access the workspace, click the Message Processing Node Information icon.

Workspace	Default Views	Description
Message Processing Nodes with Queue	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Message Processing Nodes with <i>queue name</i> 	Lists all message processing nodes in the enterprise with the same queue name. To access the workspace, click Message Processing Node Information, select a row in the Message Processing Node Information table view that has the value of QueueName in the Attribute 1 column, and then right-click the row and select Link To → Message Processing Nodes with Queue .
Neighbors	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Neighbors 	Displays a list of neighbors to the broker in the publish/subscribe topology. To access the workspace, click the Neighbors icon.
Product Events	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Product Events 	Displays product events generated by the agent when a problem occurs that affects the agent's ability to collect broker data. To access the workspace, click the Products Events icon.
Retained Publications	<ul style="list-style-type: none"> ▶ Enterprise Event Log ▶ Retained Publications 	Displays a list of topic and subscription points that have a retained publication. Note that the update of this workspace is controlled by the defaultStatisticInterval. To access the workspace, click the Retained Publications icon.

Workspace	Default Views	Description
Snapshot Message Flow Accounting	<ul style="list-style-type: none"> ▶ Message Flow Elapsed Time ▶ Message Flow CPU Time ▶ Snapshot Message Flow Accounting 	Displays snapshot statistics pertaining to entire message flows for the current snapshot collection interval. The broker must be enabled to collect snapshot data for information to be displayed. To access the workspace, click the Snapshot Message Flow Accounting icon.
Snapshot Node Accounting	<ul style="list-style-type: none"> ▶ Node Elapsed Time ▶ Node CPU Time ▶ Snapshot Node Accounting 	Displays statistics for nodes used by message flows for the current snapshot interval. To access the workspace, right-click the Snapshot Message Flow Accounting icon and select Workspace → Snapshot Node Accounting .
Snapshot Terminal Accounting	<ul style="list-style-type: none"> ▶ Terminal Invocation Rate ▶ Snapshot Terminal Accounting 	Displays statistics for terminals on nodes used by message flows for the current snapshot interval. To access the workspace, right-click the Snapshot Message Flow Accounting icon and select Workspace → Snapshot Terminal Accounting .
Snapshot Thread Accounting	<ul style="list-style-type: none"> ▶ Thread Elapsed Time ▶ Thread CPU Time ▶ Snapshot Thread Accounting 	Displays statistics for threads used by message flows for the current snapshot interval. To access the workspace, right-click the Snapshot Message Flow Accounting icon and select Workspace → Snapshot Thread Accounting .

Workspace	Default Views	Description
Sub-Flow Statistics	<ul style="list-style-type: none"> Current Message Rates Current Average Message Time Sub-Flow Statistics 	Displays statistics for any defined sub-flows. To access the workspace, click the Sub-Flow Statistics icon.
Subscriptions	<ul style="list-style-type: none"> Enterprise Event Log Subscriptions 	Displays a list of subscriptions to topics. To access the workspace, click the Subscriptions icon.

Figure 7-22 shows the Message Flow Statistics workspace in the CNP.

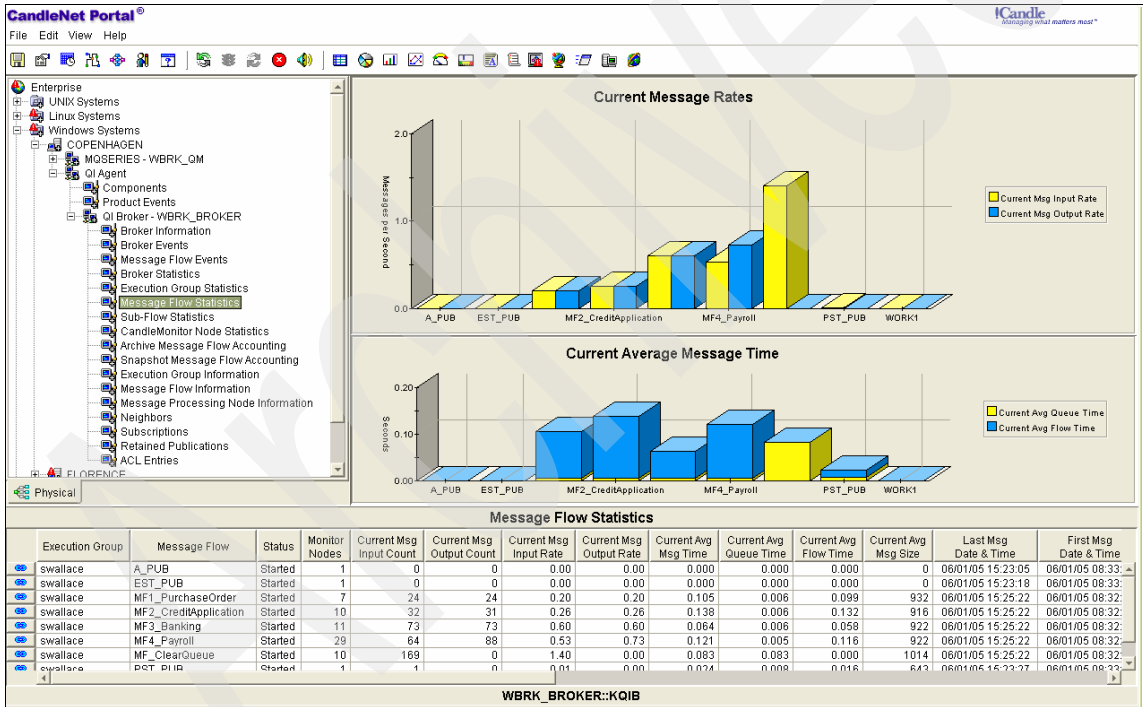


Figure 7-22 Message Flow Statistics workspace

7.11 Monitoring scenarios

Now that we have discussed the product and installing and configuring it, it is time to look at some monitoring scenarios. There are essentially two types of situations to monitor within the WebSphere Business Integration product: failures and performance degradation. See 7.1.2, “How does the agent work?” on page 195 for the overview of the agent. We will show some monitoring scenarios; however, the needs of your business will dictate that other items be monitored.

The following is a list of some things that can be monitored. Several things should be considered when setting up the monitoring: frequency of the situation, statisticInterval setting, severity of the event generated, and any automated actions.

- ▶ Broker stopped
 - Use the QI_Broker_Not_Started situation.
 - Consider using the Action to restart the broker. Take into account that this will attempt to restart the broker even if this is an administrator initiated shutdown of the broker.
 - The severity of the event should be critical.
- ▶ Broker started, Queue Manager not connected
 - Use the QI_Broker_QMgr_Not_Connected situation.
 - The severity of the event should be critical.
- ▶ Broker started, execution group count is 0
 - Create a situation with the following condition: Broker Status EQ Started and Execution Groups EQ 0. Both of these attributes are part of Broker Information.
- ▶ Execution Group stopped
 - Create a situation under Execution Group Statistics and set the condition to check Status NE Started. Use of situation persistence would be advisable (see 7.7, “Using situations” on page 228). The Advanced button on the Condition tab of the Situation Editor will allow the changing of the persistence (see Figure 7-23 on page 247), from the default of one occurrence to multiple based on your needs.

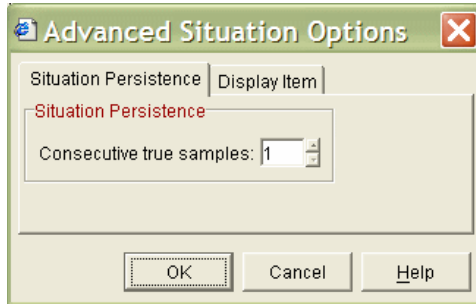


Figure 7-23 Situation Persistence

- ▶ Message flow stopped
 - Create a situation in the Message Flow Statistics workspace and set the condition to check Status EQ Stopped. Use situation persistence to ensure this is not a temporal problem.
- ▶ Insufficient instances of a message flow
 - Check the Threads in Pool attribute within the “Archive Message Flow Accounting” group. This indicates the number of configured instances for the specified message flow.
- ▶ Number of times MaxThreads reached for a message flow
 - Check the “Times MaxThreads Reached” attribute of the “Archive Message Flow Accounting” group.
- ▶ Excessive execution time for a message flow
 - Can indicate a performance issue in the overall execution of the indicated message flow.
 - If you are using Version 5.0 (or higher) brokers, check the “Avg Elapsed Microseconds” or “Max Elapsed Microseconds” attributes against a specified threshold. These attributes are part of the Archive Message Flow Accounting group. Make sure to enable accounting statistics in the broker.
 - You can also check “Overall Avg Flow Time” or “Overall Max Flow Time” attributes against a specified threshold. These attributes are within the Message Flow Statistics group and require that the CandleMonitor Node be used in the message flows. This can be used with versions of the broker prior to V5.0.
 - You can use and/or modify the QI_Average_Flow_Time_High situation to meet the needs of this monitoring.

- ▶ Excessive CPU time for a message flow
 - Can indicate that the message flow is not coded in an optimized fashion or that the ESQL coding within one or more nodes is not optimized.
 - Check the “Avg CPU Microseconds” or “Max CPU Microseconds” attributes within the Archive Message Flow Accounting group. Create a situation to check these values against a threshold.
- ▶ Excessive CPU or Execution time in a message flow node
 - Can help isolate which node(s) is causing the overall message flow to perform poorly.
 - Check the “Avg CPU Microseconds”, “Max CPU Microseconds”, “Avg Elapsed Microseconds”, or “Max Elapsed Microseconds” attributes against a specified threshold. These attributes are within the Archive Node Accounting group.
- ▶ Excessive time spent in a message flow input queue
 - Indicates that the message flow is encountering excessive overall execution times and/or that there are insufficient instances of the message flow.
 - Check the “Current Avg Queue Time” or “Overall Avg Queue Time” attributes against a specified threshold. These attributes are part of the Message Flow Statistics group.
- ▶ Transition backouts in a message flow
 - Can be indicative of several issues:
 - Bad data in the message
 - Database error
 - Temporal error
 - Check this using the “Total Backouts” attribute of the Archive Message Flow Accounting group. If this number is greater than 0, then transactions are being dropped.
- ▶ Messages traversing a specified path in a message flow
 - Can be useful to business application support teams to show when messages traverse an error handling path.
 - Requires at least one CandleMonitor node with “other” personalities configured into the relevant section of the message flows. Set the eventMessage property to the required text string.
 - Check the “Event Message” attribute in the Message Flow Events group for the specified text.

- ▶ Inadequate Input Message Rate for the message flow
 - Could be of interest to applications checking for volumes flowing through message flows. The rate below a certain value may be cause for alarm for certain business groups.
 - Requires at least one CandleMonitor node with an “input” personality configured in the message flow.
 - Check the “Current Msg Input Rate” attribute of the Message Flow Statistics group against a specified threshold. Other relevant attributes include “Current Msg Input Count”, “Overall Msg Input Rate”, and “Overall Msg Input Count”.
- ▶ Inadequate Output Message Rate for the message flow
 - Could indicate that the message flow is encountering excessive errors during message processing.
 - Requires at least one CandleMonitor node with an “output” personality configured in the message flow.
 - Check the “Current Msg Output Rate” attribute of the Message Flow Statistics group against a specified threshold. Other relevant attributes include “Current Msg Output Count”, “Overall Msg Output Rate”, and “Overall Msg Output Count”.

There are several additional components that can be monitored to give an overall view of the broker; however, these require additional agents outside of the broker agent. These include the broker processes, the database, and the MQ Queue Manager. The MQ Queue Manager agents are included in the IBM Tivoli OMEGAMON XE for WebSphere Business Integration package and are described in this redbook. The broker processes can include bipservice, bipbroker, biphttplistener, bipconfigmgr, and bipuns. In order to monitor these processes, a Tivoli operating system agent would need to be deployed. The database can be monitored using an operating system agent or a database specific agent. These are outside of the scope of this chapter; however, they are mentioned to make you aware of other components that may need to be monitored.

7.12 Other considerations

This section provides details on some considerations when using the agent. These include performance considerations, working with the CandleMonitor Node, and using the sample programs provided with this book.

7.12.1 Performance considerations

We recommend running one agent per system; however, if you are monitoring a large number of brokers, the performance of the agent is negatively impacted. The best rule is if the agent has high CPU usage and response times are high, as seen in the CNP workspaces or the Situation responses, then you should experiment with using multiple agents. On AIX, the shared memory limitations make it a best practice to monitor only up to 10 brokers with a single agent.

Here are the steps to split the agents so that multiple agents can run on one host system.

- ▶ Windows
 - Log in to the agent system.
 - Start the Manage Candle Services application by selecting **Start** → **Programs** → **Candle OMEGAMON XE** → **Manage Candle Services**.
 - Right-click the agent and select **Create Instance**. It will request that the agent configuration file be updated.
 - Update the MonitorBroker and agentId keywords to define the brokers to this new agent.
 - Start the new agent once the configuration is complete.
- ▶ UNIX
 - Nominate one broker as the lead broker to be named in the CandleAgent command.
 - Log in to the agent system.
 - Start the agent using the CandleAgent `./CandleAgent -o WBRK_BROKER1 -p BRK1 start qi` command, where:
 - The -o flag specifies the broker name.
 - The -p specifies the agent ID (maximum of four characters).
 - This automatically creates a new configuration file named `host_qi_brokename_##_agentID.xml`.
 - Edit this newly created configuration file and specify additional brokers to monitor using the MonitorBroker keyword.

- Stop and start the agent using the CandleAgent commands in Example 7-11.

Example 7-11 Stop and start the agent

```
./CandleAgent -o WBRK_BROKER1 -p BRK1 stop qi  
./CandleAgent -o WBRK_BROKER1 -p BRK1 start qi
```

7.12.2 Working with the CandleMonitor Node

The CandleMonitor node can be customized to control how it functions using the following information.

- ▶ Customizing the CandleMonitor Node
 - This allows the behavior of the CandleMonitor node to be controlled.
 - Changes to these variables require a restart of the broker to take effect.
 - All variable names and values are case sensitive.
 - On Windows, the variables are stored in the registry.
 - Modify the variables using Manage Candle Services.
 - Right-click the primary agent and select **Advanced** → **Edit Variables**.
 - Select **Edit** or **Add**, depending on the current settings.
 - On UNIX and z/OS, these variables are stored in a configuration file named kqipnode.cfg.
 - UNIX location: CANDLEHOME/*platform-version*/qi/bin. In our environment, this would be /candle/aix433/qi/bin/kqipnode.cfg.
 - z/OS location: HFS directory CANDLEHOME/kqi/lil.
 - The variables and values are detailed in Table 7-6 on page 252.

Table 7-6 *CandleMonitor node variables*

Variable name	Description
KQIMemorySize	The size in bytes of a shared memory segment created by the plug-in. The plug-in actually creates three of these for holding different types of data. The default value is 32768 bytes. Only modify this value at the direction of from IBM Software Support.
KQITempDirectory	The full directory path name to be used for shared memory and mutexes. The broker and the agent must have the ability to create files in, write, and read this directory. The default is /tmp. It is not available on Windows.
KQINodeTrace	Specifies whether or not kqipnode.lil tracing is turned on. The possible values are Off and On. The default is Off. For tracing to actually occur, the broker's normal tracing must be turned on for the applicable broker, execution group, or message flow.

Variable name	Description
KQIActivateNode	<p>This parameter provides an override capability for the CandleMonitor node activateNode attribute for any broker on the system. The default is NoOverride. Possible values are:</p> <ul style="list-style-type: none"> ▶ NoOverride: The value of the activateNode attribute deployed for each instance of the CandleMonitor node is honored; no override takes place. ▶ Yes: Every instance of the CandleMonitor node is activated. ▶ No: All instances of the CandleMonitor node are deactivated. No statistics or message flow events are generated. ▶ EventOnly: An instance of CandleMonitor node is activated only if the eventMessage attribute is assigned. No statistics are produced, only message flow events. ▶ InputOutputOnly: An instance of the CandleMonitor node is activated only if the type is input or output. Statistics are generated (and events, if the eventMessage attribute is assigned). ▶ InputOutputAndEventOnly: Instances of CandleMonitor node are activated only if the type is input or output, or if the eventMessage attribute is assigned. Statistics are produced, and message flow events are produced if the eventMessage attribute is assigned.
KQIActivateNodeFor <i>BrokerName</i>	<p>Provides the same override capability as KQIActivateNode, except that it applies only to the named broker. This overrides the KQIActivateNode for the specified broker. This variable does not exist in the kqipnode.cfg file (UNIX and z/OS) or in the Windows drop down and it must be added by the user.</p>

7.12.3 Using the sample programs

There were several programs provided to us by the IBM Tivoli OMEGAMON verification team. These programs can be used to generate activity in the brokers that can be used to display how the agent can be used in a production environment.

- ▶ Refer to the instructions in Appendix A, “Additional material” on page 303 for downloading these programs. The zip file name is SG246768.zip.
- ▶ There is a document explaining how to use the samples. This document is called QI_redbook_README.doc and is included in SG246768.zip.
- ▶ We made the following modifications to the SETVAR.BAT to match our system (Example 7-12). You will need to make updates to match your system.

Example 7-12 Our modifications to the SETVAR.BAT to match our system

```
set QIPATH=C:\projects\omegamon\samples\program
set MQPATH="C:\Program Files\IBM\WebSphere MQ"
set USERID=ombiuser
set IPADDRESS=copenhagen
set CLIENTCHL=SYSTEM.AUTO.SVRCONN
set QMGR=WBK_QM
set PORT=1415
```

WebSphere Interchange Server Monitoring

This chapter provides high-level introduction to WebSphere InterChange Server Monitoring provided by IBM Tivoli OMEGAMON XE for WebSphere Business Integration V1.1.

The following topics are covered in this chapter:

- ▶ 8.1, “OMEGAMON XE for WebSphere InterChange Server overview” on page 256
- ▶ 8.2, “WebSphere InterChange Server configuration for monitoring” on page 261
- ▶ 8.3, “Monitoring your integration systems” on page 270

8.1 OMEGAMON XE for WebSphere InterChange Server overview

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server (OMEGAMON XE for WebSphere InterChange Server or OMEGAMON XE for WICS) is a component product of the IBM Tivoli OMEGAMON XE for WebSphere Business Integration package. The IBM Tivoli OMEGAMON XE for WebSphere InterChange Server software can help you monitor, analyze, and manage your IBM WebSphere InterChange Server implementations and your entire business integration system.

8.1.1 What does OMEGAMON XE for WICS do?

OMEGAMON XE for WebSphere InterChange Server helps ensure the reliability and performance of your integration environment by detecting and correcting problems before they have an impact upon availability and service levels. IBM Tivoli OMEGAMON XE for WebSphere InterChange Server also reduces the amount of time involved in the deployment of distributed applications by helping you debug data flows and providing statistics you can use to tune your environment.

You can use OMEGAMON XE for WebSphere InterChange Server to:

- ▶ Track and report the status of the WebSphere InterChange Servers in your enterprise
- ▶ Start and stop servers, collaborations, and connectors
- ▶ Monitor and report on the processing of data flows in each WebSphere InterChange Server
- ▶ Monitor activity levels and processing statistics for each collaboration and connector
- ▶ Report error and exception conditions for servers, collaborations, and connectors, as recorded in the each server's log file
- ▶ Trigger alerts or actions for the connector controller when specified conditions arise

8.1.2 How does OMEGAMON XE for WICS help you?

OMEGAMON XE for WebSphere InterChange Server enables you to:

- ▶ Pinpoint issues before they become disruptive or crippling
- ▶ Identify trouble areas, determine the cause of the problem, and decide what corrective action to take

- ▶ Detect outages and performance degradations and take automated recovery actions
- ▶ Support the evolution of applications and processes in your environment
- ▶ Analyze historical trends

8.1.3 How does OMEGAMON XE for WICS work?

Typically, OMEGAMON XE products use an agent on each managed system to collect monitored data. OMEGAMON XE for WebSphere InterChange Server, however, uses only one agent, which collects data from the WebSphere InterChange Server SNMP Agent and from its own data sources on the host of each monitored WebSphere InterChange Server instance. It presents the data in charts and tables that you can examine to monitor the performance of your WebSphere InterChange Server integration systems. The agent also evaluates the data to detect when specified values meet criteria you have defined, and triggers alerts or programmed actions in response.

The WebSphere InterChange Server Monitoring Agent acts as an SNMP Manager, collecting data from WebSphere InterChange Server SNMP Agents. The monitoring agent also collects server log data from client programs, known as WebSphere InterChange Server data sources, which are installed on the hosts of monitored servers. Figure 8-1 on page 258 shows the product components and how data are transmitted among them.

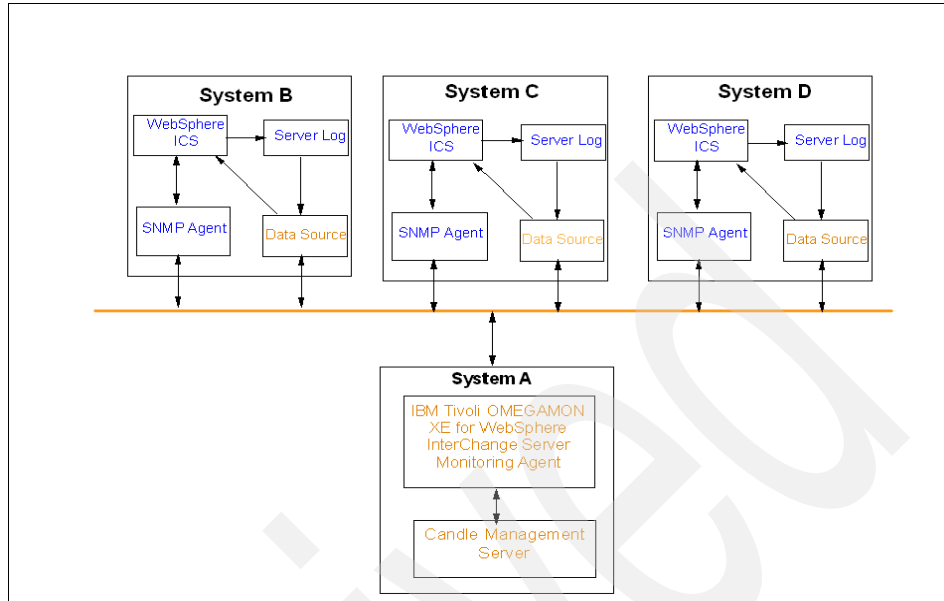


Figure 8-1 WebSphere InterChange Server Monitoring architecture

8.1.4 OMEGAMON XE for WICS key features

This section discusses the key features of OMEGAMON XE for WebSphere InterChange Server.

Predefined workspaces and views

Workspaces are the heart of OMEGAMON XE for WebSphere InterChange Server. They present you with status, configuration, and statistical information in tabular and graphical views. You can use the information provided by these workspaces to monitor the performance and availability of servers and their components, to identify potential problems, to trace the causes leading to alerts or exceptions, and to define specific conditions to monitor.

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server includes a set of predefined workspaces. The views in these workspaces display:

- Server status and performance statistics

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server provides status and summary and detailed statistics for each server discovered or configured on the network, including boot time, uptime, memory use, number of flows processed since boot, number of failed and successful flows processed, and rate of processing. You can view summary and overview

statistics for all servers, and overview and detailed information for individual servers.

- Collaboration status and performance statistics

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server provides current status and performance statistics for all collaborations running on the network. You can view summary data for all collaborations, for the collaborations associated with a particular server instance, or for an individual collaboration.

- Connector status and performance statistics

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server provides current status and performance statistics for all connectors running on the network. You can view summary data for all connectors, or detailed information about an individual connector.

Note: For purposes of data display and aggregation, the connector controller is considered to be part of the server, not of the connector agent that it controls. The Server Access Interface is also considered part of the server.

- Log messages

View messages from all servers, or from an individual server, collaboration, or connector

You can customize the predefined workspaces and views, or create your own.

For detailed information about individual predefined workspaces, see the IBM Tivoli OMEGAMON XE for WebSphere InterChange Server section of the CandleNet Portal online help. For information about creating and customizing views and workspaces, see the CandleNet Portal online help.

Predefined monitoring situations

Situations are descriptions of conditions to which you want to be alerted. When situations are distributed to monitored systems they can, for example, alert you to a connector that has stopped, or to a failed flow. Situations can also be used to automate responses to problems, such as pausing a component or stopping a message flow that is consuming too much resources.

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server provides a set of predefined situations designed to enable you to monitor critical activity and to serve as templates for creating customized situations of your own.

For details on the predefined situations that come with this product, see the IBM Tivoli OMEGAMON XE for WebSphere InterChange Server section of the CandleNet Portal online help. For information on creating, editing, and distributing situations, see the CandleNet Portal online help.

Attributes

Attributes are characteristics or properties of objects monitored by IBM Tivoli

OMEGAMON XE for WebSphere InterChange Server. For example, the status of servers or the number of failed flows. Attributes are used in the definition of the queries used to collect the information presented in workspace views and to specify the conditions, or situations, that trigger alerts and automated actions.

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server monitors these groups of attributes:

- ▶ WICS_Server (for WebSphere InterChange Server V4.2)
- ▶ WICS_Server43 (for WebSphere InterChange Server V4.3)
- ▶ WICS_Collaboration
- ▶ WICS_Connector
- ▶ WICSLog

You can use these attributes to customize the predefined views or to create your own views and workspaces. You can use them to define situations that target specific thresholds, events, or performance problems you want to monitor.

For more information about these attributes, see the IBM Tivoli OMEGAMON XE for WebSphere InterChange Server section of the CandleNet Portal online help.

Take Action commands

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server lets you interact directly with InterChange Server components, systems, and applications through the CandleNet Portal Take Action feature. You can add a Take Action command to a monitoring situation to execute when the situation becomes true. If you have IBM Tivoli OMEGAMON DE, you can create automation policies using Take Action commands.

The Take Action commands provided with IBM Tivoli OMEGAMON XE for WebSphere InterChange Server enable you to:

- ▶ Start and stop a server instance
- ▶ Activate, deactivate, pause, and shut down a collaboration
- ▶ Activate, deactivate, pause, and shut down a connector controller

See the IBM Tivoli OMEGAMON XE for WebSphere InterChange Server section of the CandleNet Portal online help for information on these commands. For information on defining and sending your own Take Action commands, see the CandleNet Portal online help.

Historical data collection

You can use the facilities of CandleNet Portal's historical data collection function to store and save the data being collected by IBM Tivoli OMEGAMON XE for WebSphere InterChange Server. The historical data collection function permits you to specify:

- ▶ The interval at which data is to be collected
- ▶ The interval at which data is to be warehoused (if you choose to do so)
- ▶ The location (either at the agent or at the CMS) at which the collected data is to be stored

Information about using the historical data collection function can be found in the CandleNet Portal online help and in the Historical Data Collection Guide for IBM Tivoli OMEGAMON XE products.

8.2 WebSphere InterChange Server configuration for monitoring

In this section, we shall see how to configure WebSphere InterChange Server for monitoring.

Tivoli OMEGAMON XE for WBI uses WebSphere InterChange Server SNMP Agent as the interface to access the information of WebSphere InterChange Server and its resources. You must configure Tivoli OMEGAMON XE and WebSphere InterChange Server in order to get the information of WebSphere InterChange Server.

Configuring WebSphere InterChange Server for monitoring has three steps on Windows systems.

- ▶ SNMP Agent configuration
- ▶ SNMP Configuration Manager configuration
- ▶ WebSphere InterChange Server Monitoring Agent configuration on Candle Management Server (CMS Hub) configuration

8.2.1 SNMP Agent configuration

To start the SNMP Configuration Wizard, select **Start** → **Programs** → **IBM WebSphere InterChange Server** → **SNMP Configuration Wizard**. You will see the SNMP Configuration window shown in Figure 8-2.

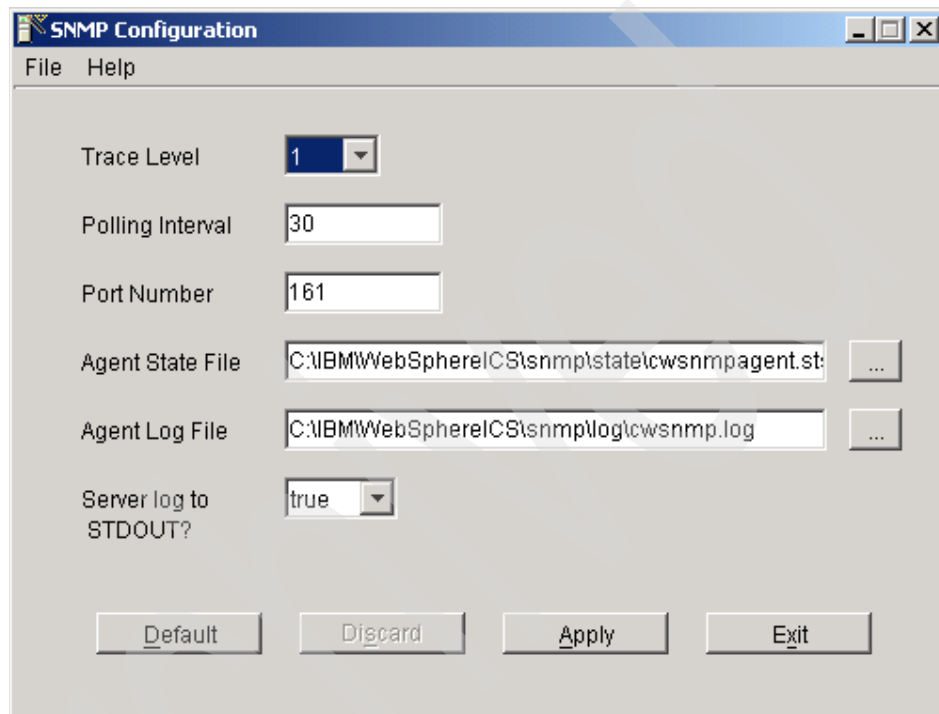


Figure 8-2 SNMP Configuration Wizard

The following list explains the parameters in this window:

Trace Level

The level of the trace information. The options are 0 through 5. The higher trace levels produce more verbose output, while 0 (the default) produces no output.

Polling Interval

The polling interval, in seconds, that SNMP uses to periodically poll InterChange Server for information. A polling interval of 0 denotes no polling. The default value is 30.

Note: The SNMP polling interval (set in the SNMP Agent Configuration Wizard) should not exceed five minutes.

Port Number	The port on which the SNMP Agent listens for requests from the SNMP Manager. The default value is 161.
Agent State File	The path of the file that contains the agent's state.
Agent Log File	The path of the log file.
Server log to STDOUT?	The output location for the server log. Setting it to "true" displays the tracing information in the SNMP Agent's command window as well as the .log file. Setting it to "false" puts the tracing information in the .log file only. The information is not displayed in the SNMP Agent's command window

The SNMP Agent gets information from the InterChange Server by polling the InterChange Server at defined intervals. The information reported to the Tivoli environment about the InterChange Server is only as current as the information reported by the SNMP Agent. The polling delay tells the SNMP how often to get InterChange Server information. It is important to have reasonably current information from the SNMP Agent in order for the InterChange Server Status resource model to report meaningful information.

Making the polling delay too short increases processing time in the SNMP Agent and the InterChange Server to handle additional status requests. Making the polling delay too long affects the ability of IBM Tivoli Monitoring for Business Integration: WebSphere InterChange Server to report current information about the InterChange Server. The default polling delay is 30 seconds. This is a reasonable value to use until you gain more experience with the SNMP Agent.

On Windows, port 161 is the default; on UNIX, it is 1161. Increase the trace level if you require more verbose output from the SNMP Agent.

8.2.2 SNMP Configuration Manager configuration

The SNMP Agent Configuration Manager allows you to configure the MIB tables associated with the SNMP Agent. These tables include the Community table, the Trap Forwarding table, and the Server Access table. Do the following to customize the SNMP Configuration Manager.

1. To start the SNMP Configuration Manager select, **Start → Programs → IBM WebSphere InterChange Server → SNMP Configuration Manager.**

Note: The SNMP Agent Configuration Manager must be run on the same machine as the SNMP Agent.

You will see the SNMP Configuration Manager window, as shown in Figure 8-3.

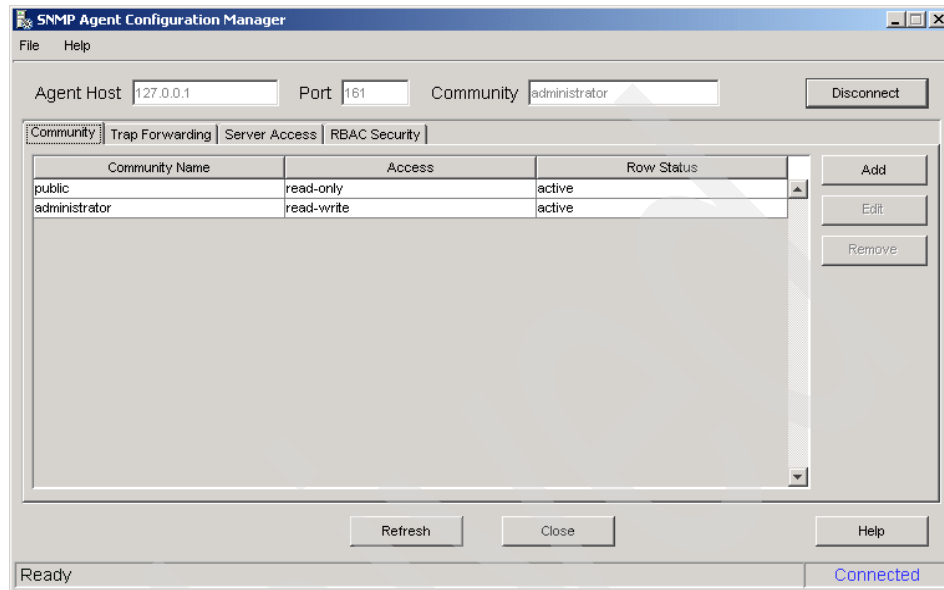


Figure 8-3 SNMP Configuration Manager

2. Perform the following steps to connect the SNMP Agent Configuration Manager to a running SNMP Agent:
 - Agent Host: Enter the host name or IP address of the machine where the SNMP Agent is running.
 - Port: Enter the port number that the SNMP Agent will use to listen for SNMP commands. If you do not know your SNMP Agent port number, you can find it in `wbi_snmpagent.cfg`, located in the `<WebSphere Business Integration Install Dir>\snmplconfig` directory, where `<WebSphere Business Integration Install Dir>` is the directory where you installed the WebSphere InterChange Server product. The default port number is 1161 for UNIX and 161 for Windows.
 - Community: Enter the read-write community name of the SNMP Agent. By default, the read-write community name is “administrator” and the read-only community name is “public.” The difference between the two types of community names is as follows:
 - Read-write: Read-write access permits the user to edit MIB table components, query values, start and stop components, and register for traps.

- **Read-only:** Read-only access permits the user to perform "Get" operations only. This user can view but not edit the MIB table components and cannot change the status of any component.
3. Click **Connect**. When the SNMP Agent Configuration Manager connects to the SNMP Agent, the Agent Host, Port, and Community fields become disabled, and the Connect button changes to a Disconnect button.

In order to manage the WebSphere InterChange Server through Tivoli OMEGAMON XE for WBI 1.1, we have to configure the server access tab in the configuration manager.

The server access entries allow you to link specific SNMP Managers with the specific InterChange Servers to be managed. The table has three entries, as shown in Figure 8-4.

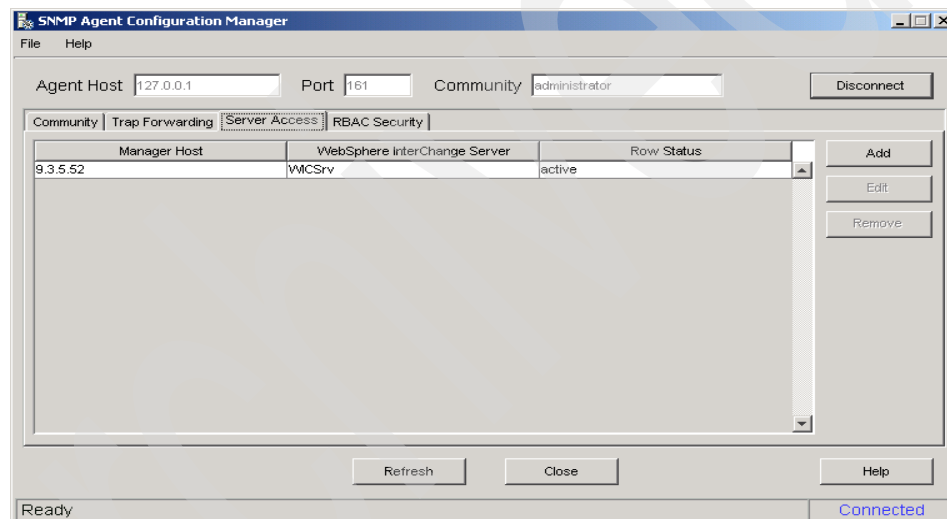


Figure 8-4 Server Access in SNMP Configuration Manager

4. Click **Add** to add server access entries. You need to enter the following:
 - **Manager Host:** The host name of the SNMP Manager.
 - **WebSphere InterChange Server:** The host name of the machine where InterChange Server is installed.
 - **Row Status:** The link status (active or not in service).

This is the minimum configuration you require to monitor the WebSphere InterChange Server. For advanced configuration settings, please refer to the WebSphere InterChange Server Administration documentation, which can be found at:

http://publib.boulder.ibm.com/infocenter/wbihelp/index.jsp?topic=/com.ibm.wics_user_administrator.doc/doc/administration/administration19.htm

8.2.3 WebSphere InterChange Server Monitoring Agent configuration

Now we shall configure WebSphere InterChange Server Monitoring Agent in CMS.

1. To configure the server monitor agent, start the Candle Service Manager by selecting **Start** → **Programs** → **Candle OMEGAMON** → **Manage Candle Services**. You will see the window shown in Figure 8-5.

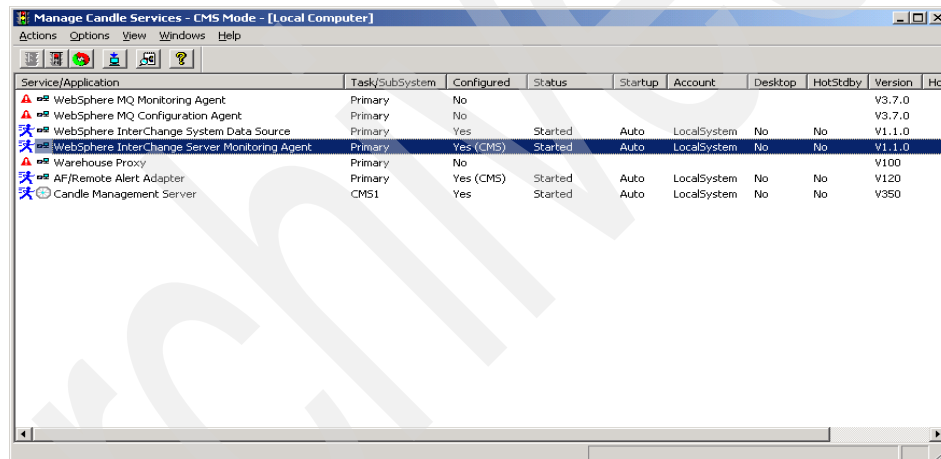


Figure 8-5 Manage Candle Services

2. Select **WebSphere InterChange Server Monitoring Agent**. Right-click and select **Configure using defaults**.

A new window with title “WebSphere InterChange Server Monitoring Agent: Agent Advance Configuration” will pop up, as shown in Figure 8-6 on page 267.

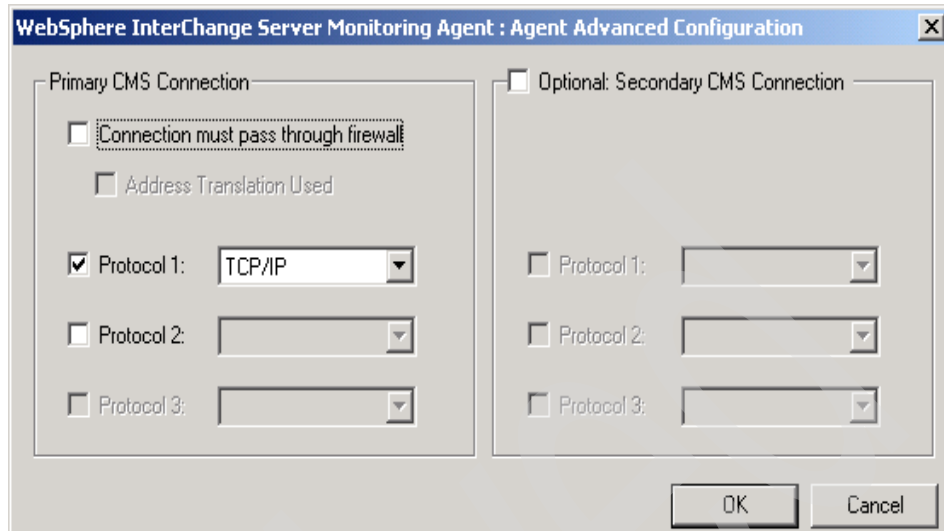


Figure 8-6 Agent Advanced Configuration window

3. Click **OK**. You will see the window shown in Figure 8-7. Check that the values are correctly entered and then click **OK**.

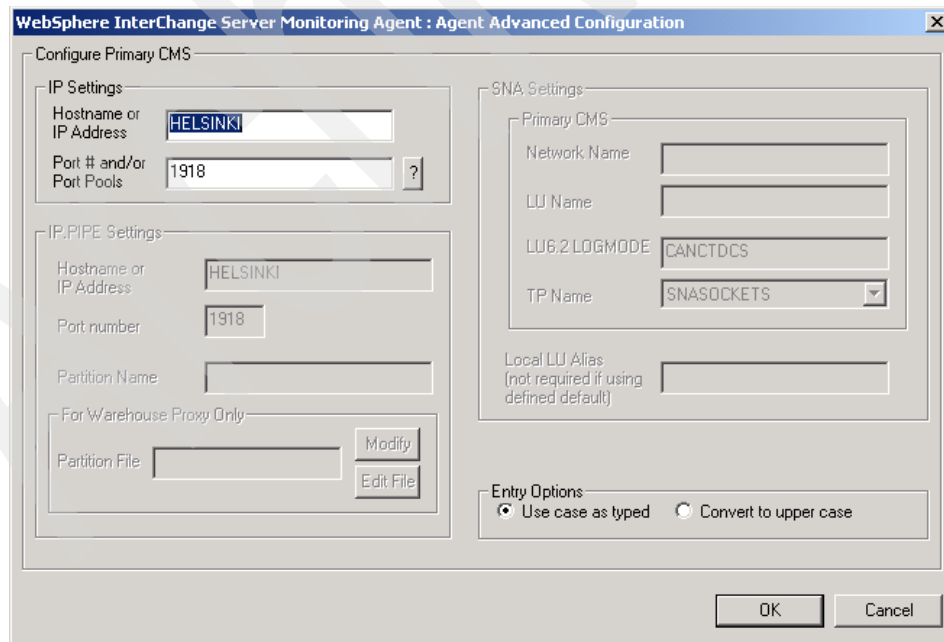


Figure 8-7 Agent Advance Configuration

4. In the next window (Figure 8-8), click **Add** to add a new server to monitor.

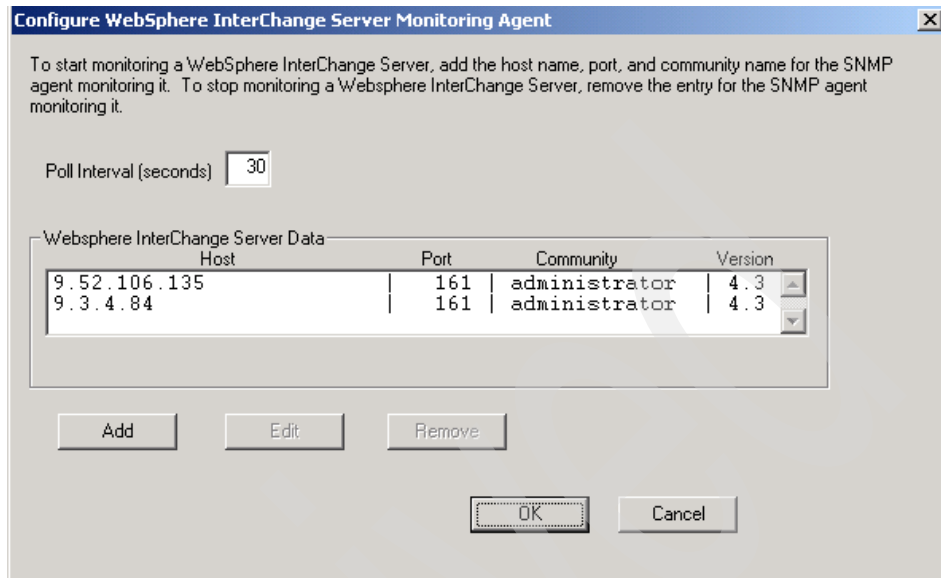


Figure 8-8 Monitoring Agent configuration

5. In the Data for WebSphere InterChange Server Host window, enter the WebSphere InterChange Server host name or IP address and port number where SNMP Agent is running and click **OK** (see Figure 8-9).

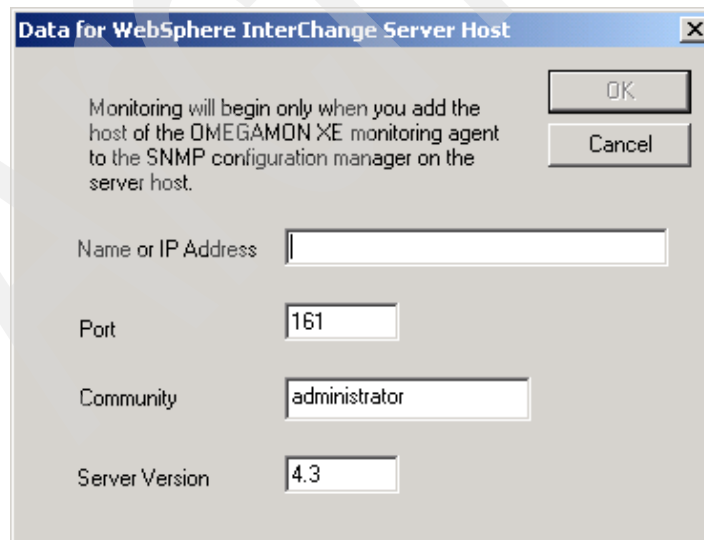


Figure 8-9 WebSphere InterChange Server Host

6. Start the WebSphere InterChange Server Monitoring Agent by double-clicking the agent. Once you start the WebSphere InterChange Server, SNMP Agent, and Monitoring Agent in CMS, you can see your server monitoring status in Candle Net Portal (CNP), as shown in Figure 8-10.

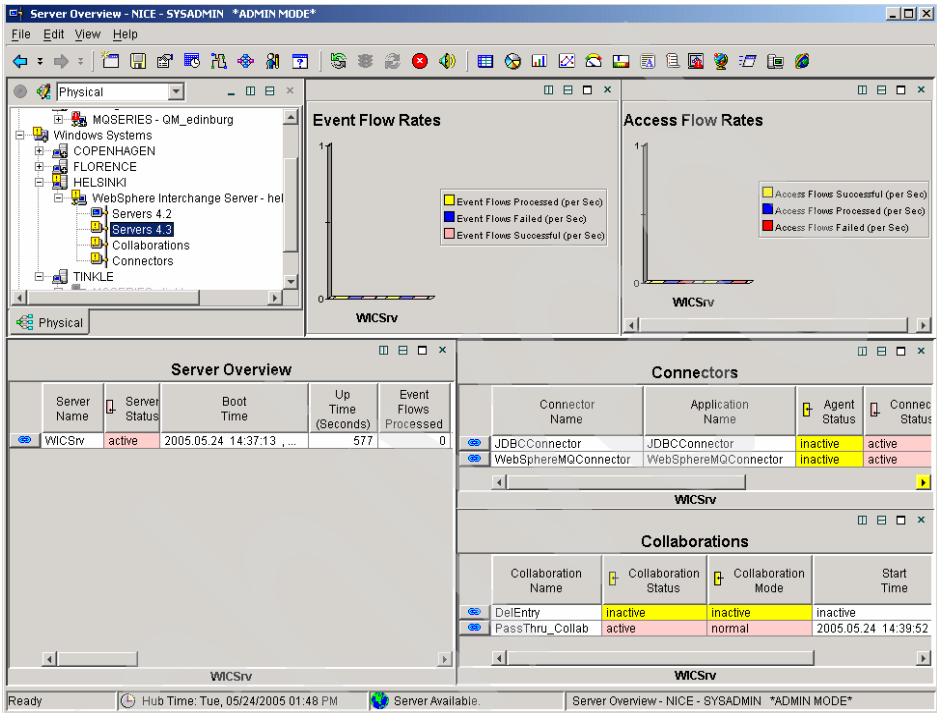


Figure 8-10 WebSphere InterChange Server status in CNP

8.3 Monitoring your integration systems

In previous sections, we have seen how to configure SNMP Agent, SNMP Manager, and CMS. In this section, we will explore WebSphere InterChange Server workspaces in Candle Net Portal (CNP).

8.3.1 Workspaces

Typically, OMEGAMON XE products use multiple monitoring agents, one on each managed system. In the CandleNet Portal Navigator tree, each agent is represented with a subnode under its host system. Its associated workspaces are listed below, identified by attribute group. Candle Net Portal workspaces are seen in Figure 8-11.



Figure 8-11 Candle Net Portal workspaces

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server uses only one agent, which collects data from WebSphere InterChange Server SNMP Agents and its own data sources on the hosts of the WebSphere InterChange Servers it monitors, so it appears in the Navigator only once. (The node takes the form WebSphere InterChange Server - *hostname:KIC00_SNMP*.)

Underneath the node, representing the agent, there are, by default, four subnodes, one for each type of monitored component: Version 4.2 servers, Version 4.3 servers, collaborations, and connectors.

Figure 8-12 shows the WebSphere InterChange Server workspaces in CNP.

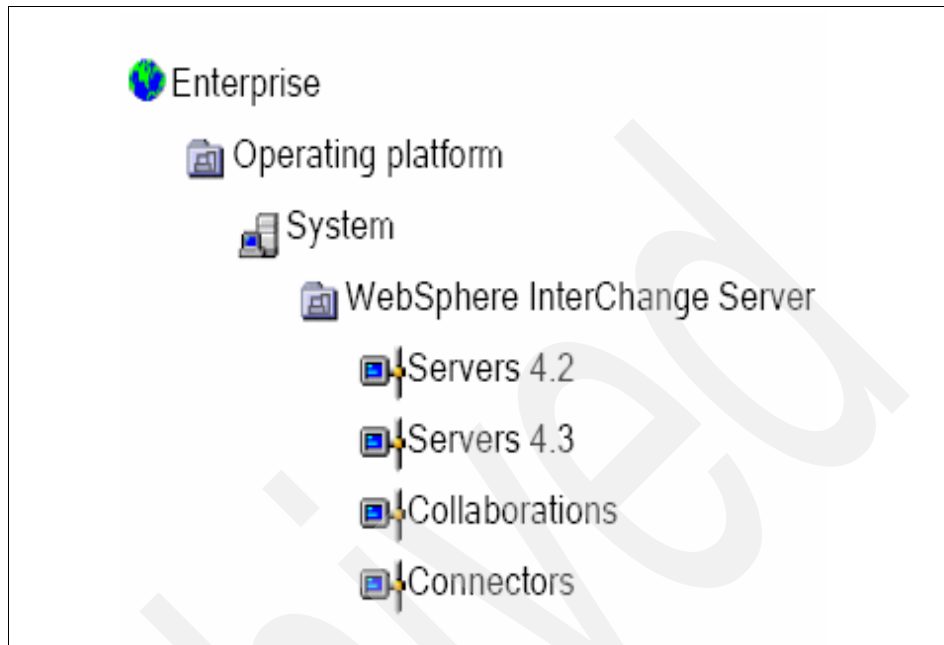


Figure 8-12 WebSphere InterChange Server workspaces in CNP

Each of these subnodes is associated with one or more workspaces that present data for all monitored WebSphere InterChange Server instances, collaborations, or connectors. From these workspaces, you can link to workspaces showing more detailed data for individual components.

For example, when you select the Servers 4.3 node, the Server Summary workspace is displayed. By clicking the table row in this workspace, you can link to an overview workspace for a specific server, and from there to a workspace containing more detailed server information, or to a workspace associated with a collaboration or connector running on the server

Although they are not represented in the Navigator, the systems hosting WebSphere InterChange Server data sources appear in the Take Action and Situation Editor Destination System(s) list. They take the form *hostname:KIC00_APIS*.

Figure 8-13 on page 272 shows the WebSphere InterChange Servers in CNP. To get further details of a particular server, click the server, which will take you the server specific workspace.

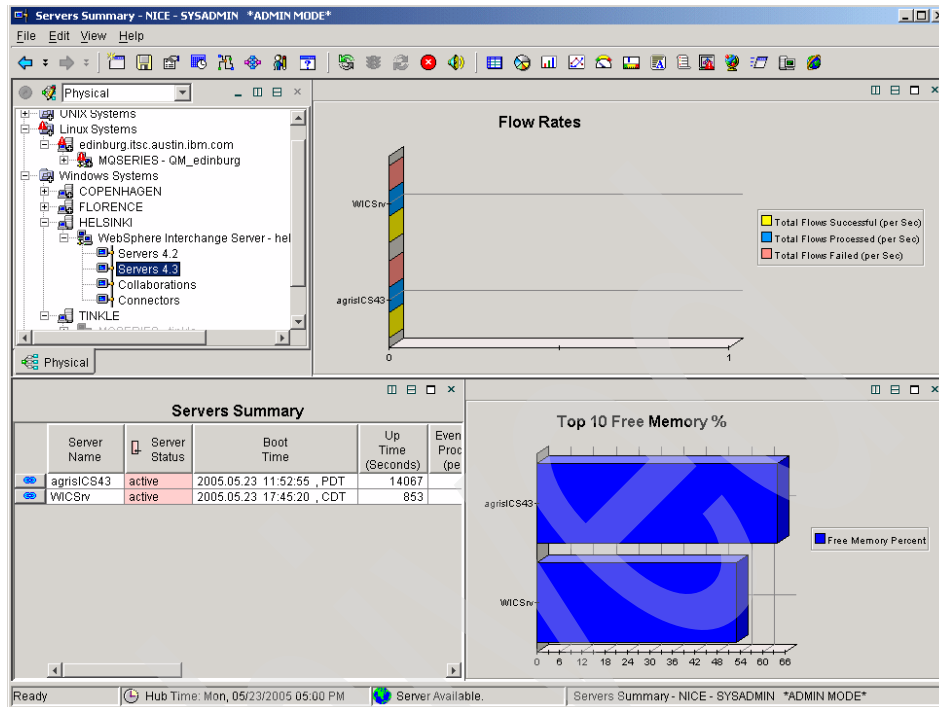


Figure 8-13 WebSphere InterChange Servers in CNP

Clicking a specific server will give you more details of the connectors and the collaborations running in that specific server with statistics, as shown in Figure 8-14 on page 273.

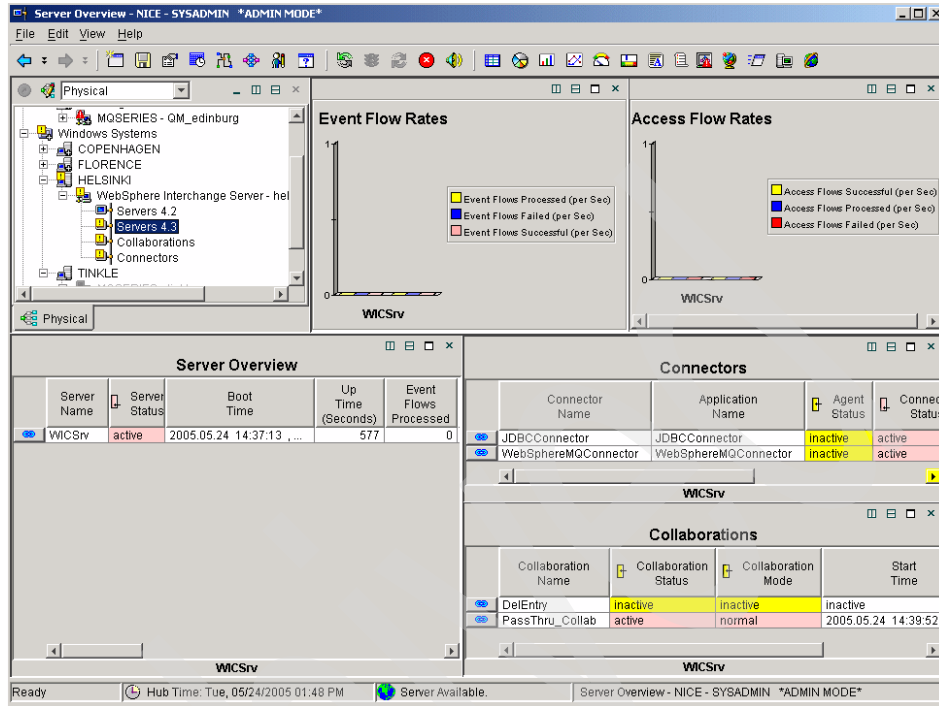


Figure 8-14 CNP workspace for WebSphere InterChange Server

Clicking a specific server will give you more details of the connectors and the collaborations running in that specific server with statistics.

8.3.2 Customizing the monitoring

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server gathers data on the server instances on your network and stores the data as system elements called attributes.

You can use these attributes to:

- ▶ Create queries and build custom views of the performance of your WebSphere business integration systems or individual components
- ▶ Create situations to monitor and respond to conditions of interest or concern in a particular environment or set of circumstances.

Attributes and attribute groups

Related attributes are grouped into attribute groups, or attribute tables. A given view contains information provided by a single attribute group.

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server uses five attribute groups:

1. WICS_Server (for WebSphere InterChange Server V4.2)
2. WICS_Server43 (for WebSphere InterChange Server V4.3)
3. WICS_Collaboration
4. WICS_Connector attributes are based on SNMP data
5. WICSLog attributes get data from WebSphere InterChange Server data sources, which monitor server logs

Creating and monitoring situations

Identifying the correct monitoring requirements is very important to minimize the downtime of an enterprise system. Understanding the components of a WebSphere InterChange Server and the impact of a component failure on enterprise system would help a business in formulating monitoring requirements.

A top down approach would be more suitable in identifying the monitoring requirements. For example, at the business level, you would want to get the answers for the following questions:

- ▶ How are orders flowing?
- ▶ Are deliveries being stuck?

Normally, answers to these questions on the WICS are provided by a subprocess (also called a source connector) that sends events into the WICS. WICS sends these events to one or more systems after performing the necessary transformation steps.

IT users would need finer grained monitoring at each step or subprocess level. Having such information, they can easily pinpoint the problematic subprocess or a collaboration, connector, or other system that ICS would need to complete a business process. Often, IT users would also need statistics on physical resources like CPU, memory, disk, and network usage for future and capacity planning.

The IBM Tivoli OMEGAMON XE for WebSphere InterChange Server attributes enable you to create situations that monitor the status or performance of WebSphere InterChange Servers and their components.

A situation describes a condition you want to test. When you start a situation, CandleNet Portal compares the values you have assigned for the situation's attributes with the values collected by Tivoli OMEGAMON XE for WebSphere InterChange Server and registers an event if the condition is met. You are alerted to events by indicator icons that appear in the Navigator.

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server comes with predefined situations. For information about the predefined situations included with this product, refer to the IBM Tivoli OMEGAMON XE for WebSphere InterChange Server section of the CandleNet Portal online help (installed with the product). For detailed information about creating situations and about using the Situation Editor, see the CandleNet Portal online help.

Investigating an event

When the conditions of a situation have been met, the situation evaluates to True, causing an event indicator to appear in the Navigator. You can investigate the cause of an event by opening its workspace.

The event workspace shows two table views: one with the values of the attributes when the situation evaluated True, and the other with the current values of the attributes.

The event workspace also contains a display view that can contain expert advice for responding to the situation and a Take Action view from which commands can be sent to affected systems.

8.3.3 Monitoring scenarios

IBM Tivoli OMEGAMON XE for WebSphere InterChange Server comes with a predefined situation named `IC_Connector_Not_Active`. This situation raises a warning (yellow) alert, as shown in Figure 8-15 on page 276.

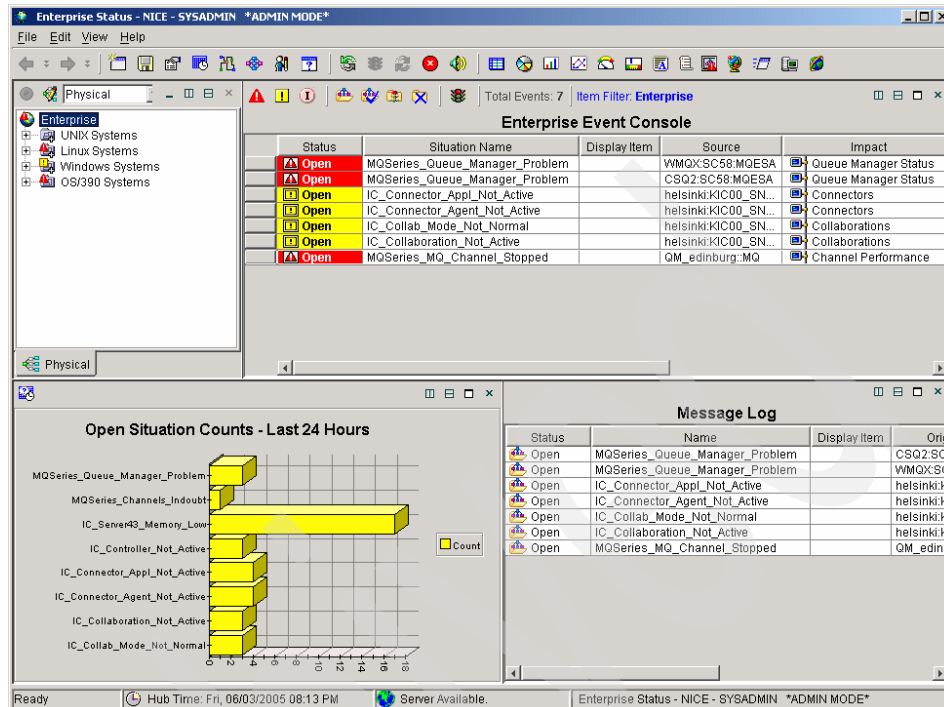


Figure 8-15 CNP showing alterations in the Enterprise view

As you notice, CNP can alert you about situations in the enterprise system. Now we will show you how to acknowledge the WICS alerts.

To get more details on specific server status, browse the OS systems; in our case, the WICS server was installed on a Windows system called HELSINKI, so first click **Windows Systems** and then **HELSINKI**. Click **WebSphere Interchange Server** and expand the Servers 4.3 tab to get list of servers running on Windows environment, as shown in Figure 8-16 on page 277.

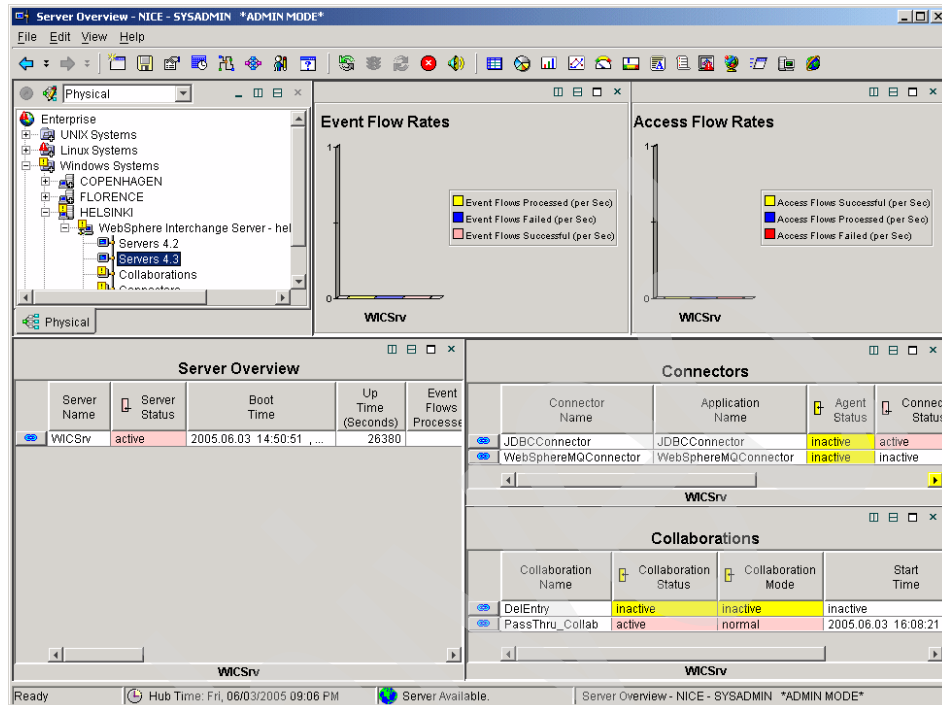


Figure 8-16 WebSphere InterChange Server alert for MQ Connector

Now you can see that WebSphereMQ Connector is inactive (Figure 8-17 on page 278). To make MQ Connector active, follow the steps below:

1. Place the cursor on WebSphere MQ Connection, right-click, and select **Take Action** (Figure 8-17 on page 278).

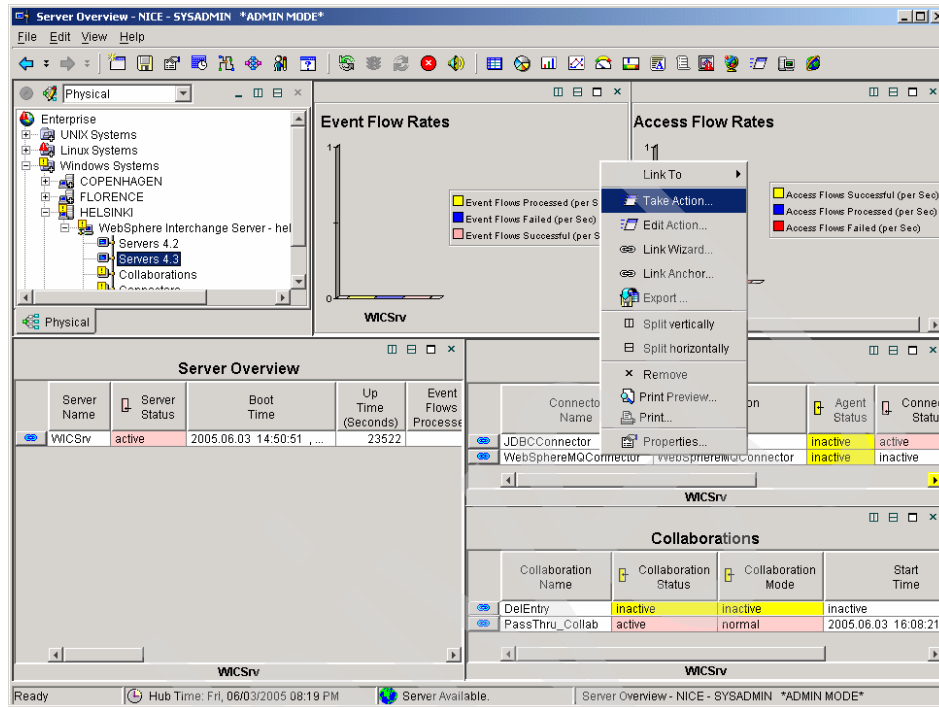


Figure 8-17 WebSphere InterChange Server taking action on alert

2. A new take action window pops up, as shown in Figure 8-18 on page 279.

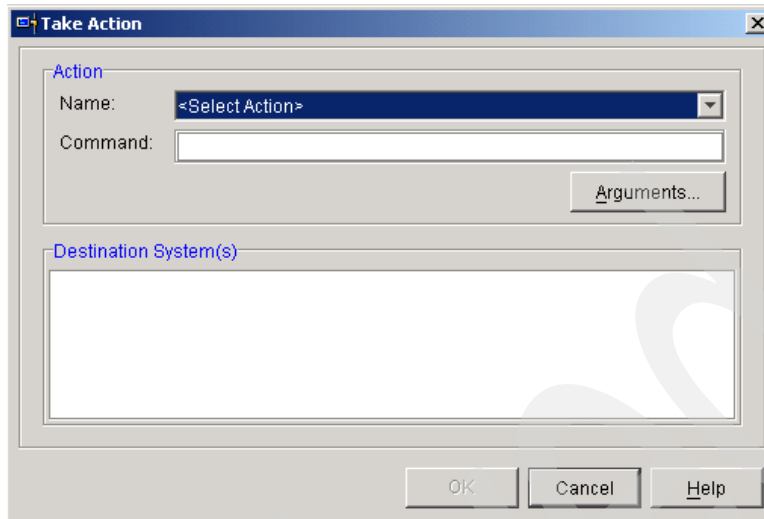


Figure 8-18 Take Action window

3. From the drop-down menu, select **Change WIC Connector Status** (see Figure 8-19).

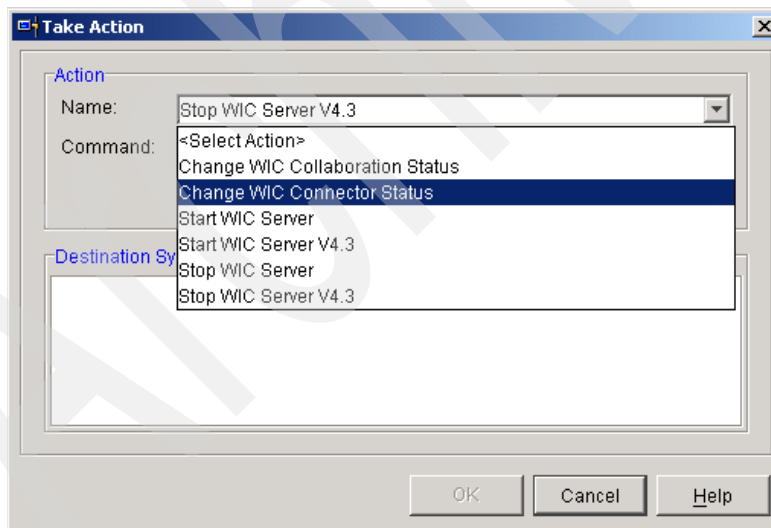
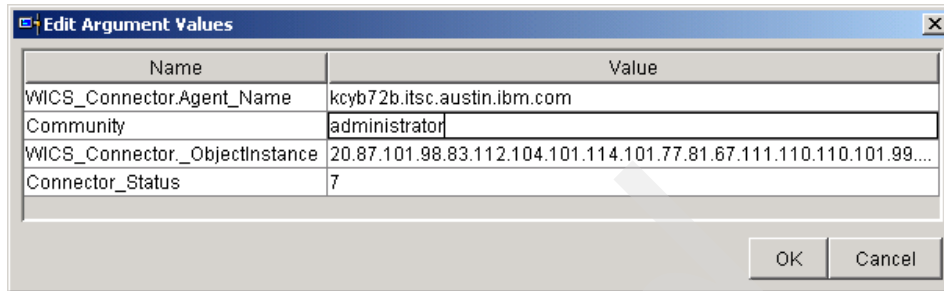


Figure 8-19 Take Action window

4. A new window called “Edit Argument Values” will pop up (Figure 8-20 on page 280).



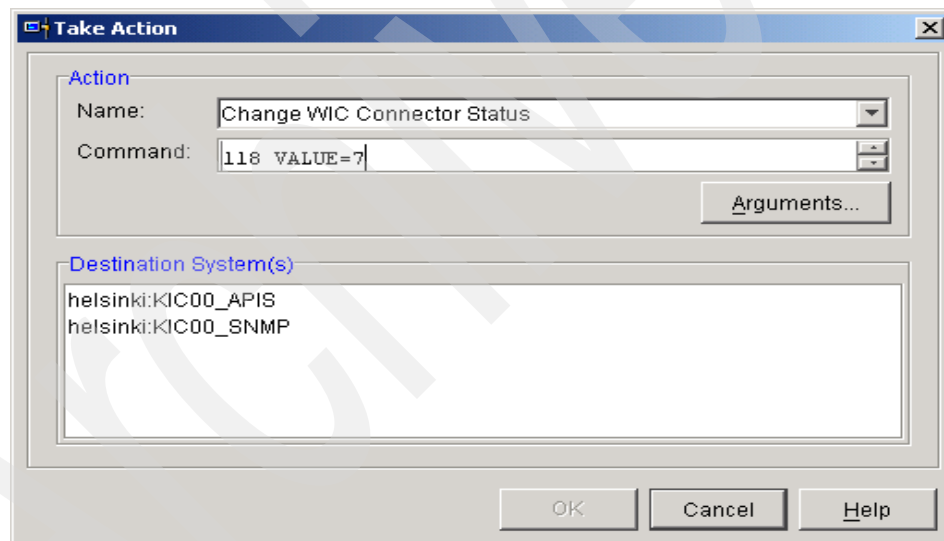
The 'Edit Argument Values' dialog box contains a table with the following data:

Name	Value
WICS_Connector.Agent_Name	kcyb72b.itsc.austin.ibm.com
Community	administrator
WICS_Connector_ObjectInstance	20.87.101.98.83.112.104.101.114.101.77.81.67.111.110.110.101.99....
Connector_Status	7

At the bottom right, there are 'OK' and 'Cancel' buttons.

Figure 8-20 Edit Argument window

Edit the values if required. You have to supply a valid Community ID, which should match the one that was coded on WICS SNMP Manager. In Connector Status, you can give verbs like active, inactive, shutdown, and paused. Click **OK** after giving the right values (Figure 8-21).



The 'Take Action' dialog box has the following fields and controls:

- Action** section:
 - Name: Change WIC Connector Status (dropdown menu)
 - Command: 118 VALUE=7 (text field)
 - Arguments... (button)
- Destination System(s)** section:
 - helsinki:KIC00_APIS
 - helsinki:KIC00_SNMP

At the bottom, there are 'OK', 'Cancel', and 'Help' buttons.

Figure 8-21 Take Action window with arguments

You will see the Take Action window again. Select **KIC00_SNMP** and click **OK**. A small window will pop up confirming that the SNMP command was sent to the agent. After a few seconds (depending on network latency and the workload on the WICS server), the connector will be activated (Figure 8-22 on page 281).

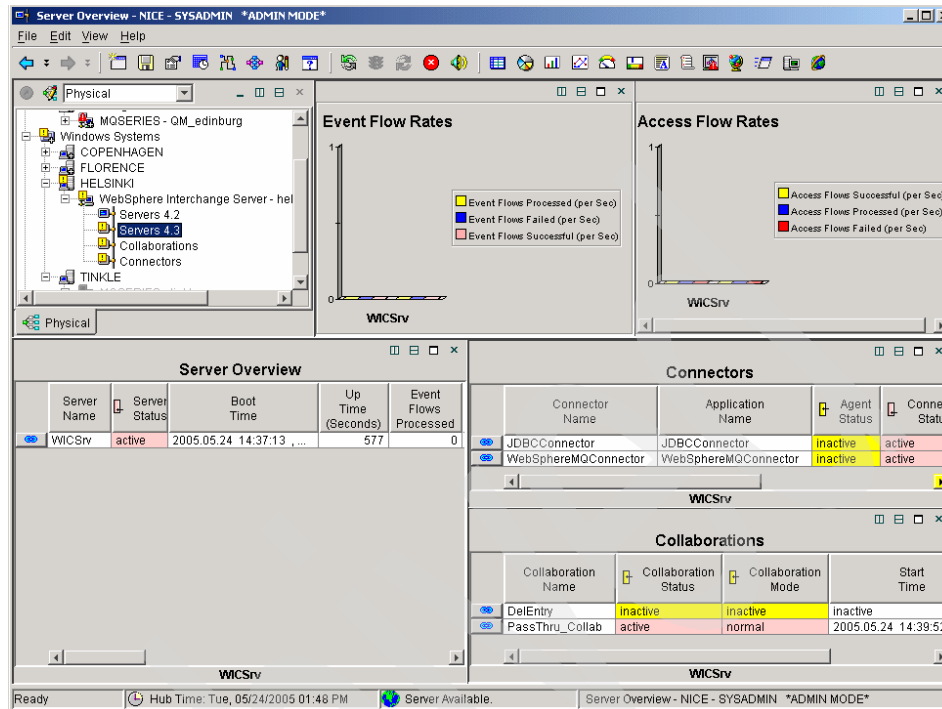


Figure 8-22 WICS Server with active connectors

Troubleshooting

This chapter provides tips on troubleshooting the IBM Tivoli OMEGAMON agents. It covers the top issues and how to isolate and correct problems.

The following topics are covered:

- ▶ 9.1, "Overview" on page 284
- ▶ 9.2, "Tracing" on page 284
- ▶ 9.3, "Logs" on page 289
- ▶ 9.4, "Top issues" on page 291
- ▶ 9.5, "Miscellaneous tips and tools" on page 299

9.1 Overview

Troubleshooting is an important skill when using any highly configurable and powerful tool like the IBM Tivoli OMEGAMON XE for WebSphere Business Integration agents. Understanding how to enable detailed tracing along with locating and using the logs can help you resolve problems, especially configuration issues. We will also cover some of the top issues handled by the IBM Support teams regarding this product.

9.2 Tracing

Each component of the IBM Tivoli OMEGAMON XE for WebSphere Business Integration has a trace facility. These include CNPS, CMS, CNP, agent, and installation.

9.2.1 Enabling trace settings for the CNPS

Setting the trace parameters for the CNPS can be accomplished using the Manage Candle Services application on the CNPS system. The following steps provide details on changing the trace parameters:

1. Open **Manage Candle Services**.
2. Right-click the **CandleNet Portal Server**, as seen in Figure 9-1 on page 285, and select **Advanced** → **Edit Trace Params**.

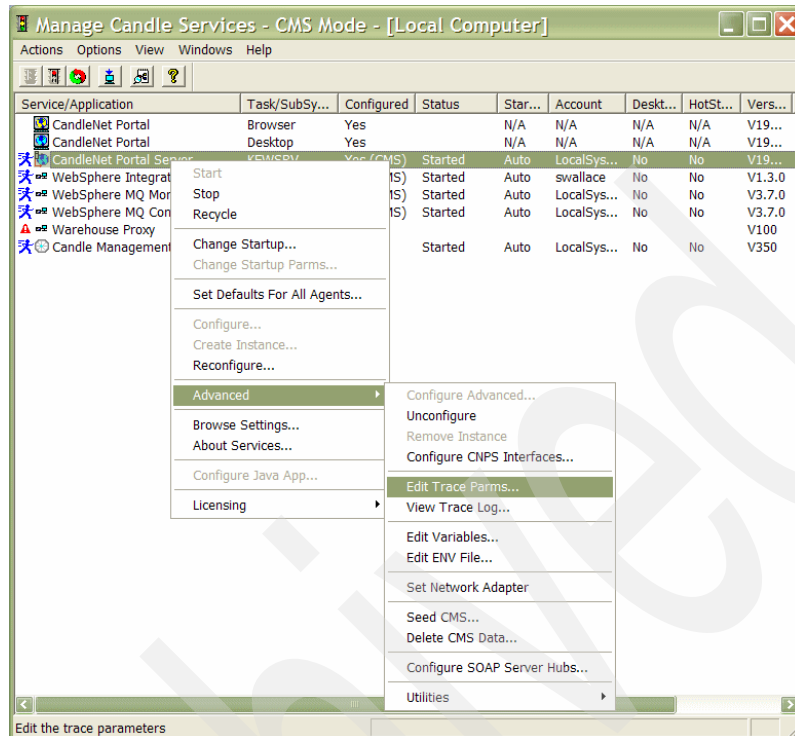


Figure 9-1 Accessing trace parameters for the CNPS

3. Select **KFWENV** in the Select a File menu that appears. This will display the Trace Parameter selection menu, as shown in Figure 9-2 on page 286. In this menu, you can choose from several parameters. The options are:

- RAS1 filters.
 - none: No error tracing.
 - ERROR: Trace general errors.
 - ERROR (UNIT:ctdatabus INPUT) (UNIT:ctsql INPUT): Trace client request flow / failures.
 - ERROR (UNIT:CTPresentation ALL)(UNIT:CTKeyedAccess ALL)(UNIT:CTBTree ALL): Trace presentation, keyedaccess, and ctbtree.
- Trace logfile name: The default is KFWRAS1.LOG.
- KDC_DEBUG settings.
 - N: No
 - Y: Yes.

- A: All.
- M: Maximum.
- D: Detail.
- None.

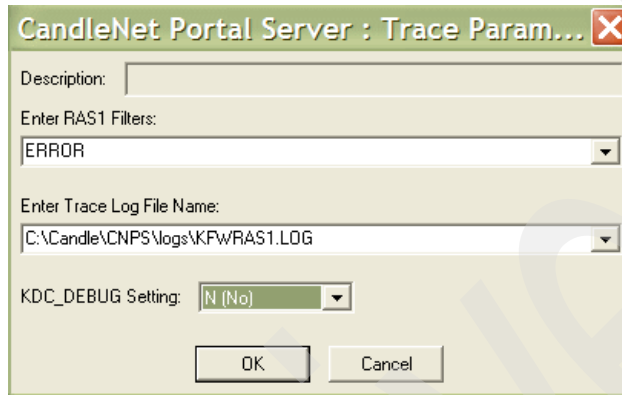


Figure 9-2 CNPS Trace Parameter settings

4. Make the changes and click **OK**.

You must restart CNPS. The next menu will ask if you wish to recycle the service and the options are Yes or No. Click **Yes** if you can restart the CNPS service at this time.

Trace settings can also be modified dynamically using the following steps:

1. Open a Web browser and point it to the IP address or host name of the CNPS:

<http://ipaddress:1920>

2. This will open the Candle Services Index; from this page, select **Service Point: cnp** → **Candle Technologies Service Console**. This will display the CT Services Console page, as seen in Figure 9-3 on page 287.

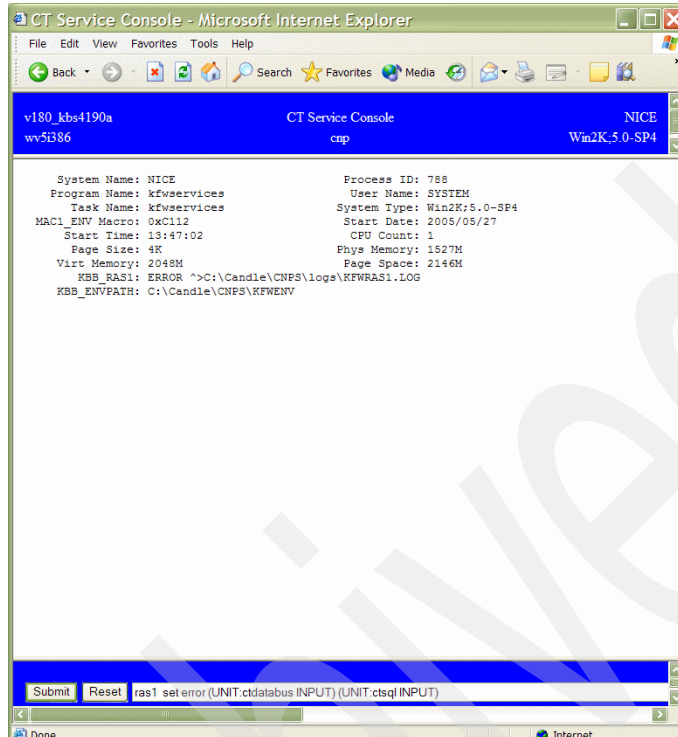


Figure 9-3 CT Services console

3. In the entry field at the bottom of the page, enter the following:
`ras1 set <error level>`
 The level can be one of the following:
 - none: No error tracing.
 - ERROR: Trace general errors.
 - ERROR (UNIT:ctdatabus INPUT) (UNIT:ctsql INPUT): Trace client request flow / failures.
 - ERROR (UNIT:CTPresentation ALL)(UNIT:CTKeyedAccess ALL)(UNIT:CTBTree ALL): Trace presentation, keyedaccess, and ctbtree.
4. This setting is in effect until the agent is restarted or another level is set.

9.2.2 Enabling trace settings for the CMS

Setting the trace parameters for the CMS can be accomplished using the Manage Candle Services application on the CMS system. The following steps provide details on changing the trace parameters on Windows:

1. Open **Manage Candle Services**.
2. Right-click the **Candle Management Server** and select **Advanced** → **Edit Trace Parm**s (similar to the CNPS in Figure 9-1 on page 285).
3. This will display the Trace Parameters menu, where you can set the trace levels. The available settings are:
 - RAS1 filters
 - ERROR: General error tracing.
 - (UNIT:ko4sitma all) (UNIT:ko4crtsq details) (UNIT:ko4dsply all): Trace non-firing situations.
 - (UNIT:kfaadloc all) (UNIT:ko4async all) (UNIT:ko4tobje all): Trace lodged situations.
 - (COMP:SMAF all) (COMP:IBSTREAM all): Trace IB/SM and policies.
 - (UNIT:kpx all): Trace agent/proxy problems.
 - (COMP:MHM ALL): Trace Hot Standby.
 - (UNIT:kdsdc state): Trace data server (Catalog MGR).
 - (UNIT:kdsnc state): Trace data server (NCS).
 - (UNIT:kdsrq state): Trace data server (Request MGR).
 - (UNIT:kdssqprs input): Trace data server (SQL Parser).
 - (UNIT:kdssqrun state): Trace data server (SQL1 API).
 - (UNIT:kdsruc1 state): Trace data server (Rules).
 - (UNIT:kdsstc state): Trace data server (Tables).
 - (UNIT:kdsvws state): Trace data server (Dispatch).
 - (UNIT:kfauadlc all): Trace hub tables/FA (Uadvisor).
 - (UNIT:kfaxins all) (UNIT:kfaxins2 all): Trace hub tables/FA (Inserter).
 - (UNIT:kfaxcom all): Trace hub tables/FA (Common routines).
 - (UNIT:kfaxloc all): Trace hub tables/FA (Locator).
 - (UNIT:kfast all) (UNIT:kfaib all) (UNIT:kfaadloc all) (UNIT:kfaixlod all): General FA traces.

- KDC_DEBUG settings
 - N: No.
 - Y: Yes.
 - A: All.
 - M: Maximum.
 - D: Detail.
 - None.
- 4. Once the changes are made, click **OK**.
- 5. The CMS service must be restarted and it will prompt you to recycle at this time. Click **Yes** if you can recycle now or **No** if you need to wait to recycle the CMS service.

9.3 Logs

Each component has its own log(s) that provide insight into the activity of the component. The level of detail of the information in the log is controlled by the debug level set for the component.

9.3.1 CNPS and CNP

There are logs for both the CNP Server (CNPS) and the CNP client.

- ▶ The CNPS logs are located in CANDLEHOME/CNPS/logs and the default name is KFWRAS1.log, for example, c:\candle\CNPS\logs\kfwras1.log.
- ▶ The CNP logs are located in CANDLEHOME/CNP/logs. These logs are located on the system running the CandleNet Portal desktop. The default log file name is KCJRAS1.logs, for example, c:\candle\CNP\logs\kcjras1.log.

9.3.2 CMS

The CMS logs differ depending on the operating system where the CMS is running.

- ▶ Windows
 - The CMS logs are located in CANDLEHOME\CMS\logs.
 - The error trace log is called KMSRAS1.log by default, for example, c:\CMS\logs\KMSRAS1.log.
 - The seed function creates a log, depending on activity. These logs start with the name seed and end with a log. The rest of the name may contain

the product component name and an action (see Example 9-1 for an example).

Example 9-1 Seed function logs

```
c:\candle\CMS\logs\seedkmq.log - Install of MQ agent seed file
c:\candle\CMS\logs\seedkic42_del.log - Removal of WICS seed file
```

► UNIX

- The CMS logs are located in CANDLEHOME/logs. The naming of this file is *host_ms_timestamp.log*. The *ms* is the product code for the CMS. This timestamp is an encoded timestamp generated on the CMS system, for example, */candle/logs/milan_ms_1115822514.log*.
- There is also a process ID file that matches the CMS log file. This file is empty and has the naming structure of *host_ms_timestamp.pid*. The *pid* from the file name is the process ID for the CMS process on UNIX (see Example 9-2 for an example).

Example 9-2 Process ID file

```
# /candle/logs/milan_ms_1115822514.pid40424
# ps -ef | grep 40424
# root 40424 1 0 15:41:22 - 0:00 /candle/aix433/ms/bin/cms start
# root 56840 40424 0 15:41:22 - 0:15 /candle/aix433/ms/bin/kdsmain
```

- Additionally, on UNIX, the *candle_installation.log* contains useful information about activities on the CMS. It records the stop/start of the CMS in addition to logging installation information and other pertinent data.

9.3.3 Agents

Each agent has a unique log file and these are located differently by operating system.

► Windows

- The logs are located in CANDLEHOME\CMA\logs.
- WebSphere Business Integration Broker.
 - *kqi.log*
 - *KQIIRA_agent service name.log*
- WebSphere Business Integration MQ Monitoring.
 - *QMgr_agent service name_MQ*
- WebSphere Business Integration MQ Configuration.

- RKMCMQLG
- WebSphere Business Integration WICS.
 - KICCMA_PrimaryRAS1.log
- ▶ UNIX
 - The logs are located in CANDLEHOME/logs.
 - WebSphere Business Integration Broker.
 - host_qi_timestamp.log
 - WebSphere Business Integration MQ Monitoring.
 - host_mc_timestamp.log
 - WebSphere Business Integration MQ Configuration.
 - host_mf_timestamp.log
 - WebSphere Business Integration WICS.
 - <hostname>_ic_<date>.log

9.4 Top issues

In this section, we introduce some of the top issues when troubleshooting IBM Tivoli OMEGAMON agents.

9.4.1 Installation

Most of the issues surrounding installation of the product are related to failure to ensure that the prerequisite installation information is met before continuing with the installation. Some areas to ensure include:

- ▶ On the CNPS system, make sure that the correct level of DB2 is installed.
- ▶ On the CNPS system, make sure that a supported version of Java Runtime Environment (JRE) is installed.
- ▶ Make sure that the target file system or directory has sufficient space.
- ▶ Make sure the user ID that is being used to perform the install has the appropriate levels of authority, depending on the operating system.

9.4.2 Configuration

Each agent has different configuration challenges; we will detail some of these challenges here.

WebSphere Business Integration Broker Agent

This section contains some problem determination tips associated with WebSphere Business Integration Broker Agent.

Several configuration errors can occur when updating the `kqi.xml` or configuration file, such as:

- ▶ Misspelling a keyword
- ▶ Failing to correctly close a tag block.

Consider Example 9-3, where a tag block is missing.

Example 9-3 Errors in updating the `kqi.xml`

Incorrect

```
<MonitorBroker name="WBRK_BROKER"
  statisticInterval="60"
  flowEventInterval="20"
  retainBrokerEvents="5"
  retainFlowEvents="5"
  takeActionAuthUsers="mqm,sysadmin" Notice the missing closing >
</MonitorBroker>
```

Correct

```
<MonitorBroker name="WBRK_BROKER"
  statisticInterval="60"
  flowEventInterval="20"
  retainBrokerEvents="5"
  retainFlowEvents="5"
  takeActionAuthUsers="mqm,sysadmin" >
</MonitorBroker>
```

The correct setting will produce the output in Example 9-4 in the `kqi.log` on a Windows system.

Example 9-4 Output produced by the incorrect setting in Example 2-3

```
06/07/05 16:07:47 KQIA091E (kqixmlr.012) XML parser error for initial
message parse, primary return code 20005.
06/07/05 16:07:47 KQIA092E (kqixmlr.013) XML parser error message:
KXMRC_PARSE_ERROR Pos(0) ErrorType(ERROR),
Unterminated start tag, 'MonitorBroker' ( line 1, char 834 )
```

06/07/05 16:07:47 KQIA053E (kqiaparm.002) XML parse error occurred while parsing agent XML parameters in file C:\Candle\CMA\kqi.xml.

- ▶ Entering an incorrect value such as the wrong broker name in the configuration file will produce an error similar to Example 9-5.

Example 9-5 Error when entering a wrong broker name

06/07/05 16:11:32 KQIA033W (kqiagent.033) KQIAgent has not discovered any brokers to monitor, or that match MonitorBroker name parameters.

WebSphere MQ Monitoring Agent

The following are some problem determination tips associated with WebSphere MQ Monitoring Agent:

- ▶ By default, the account of each WebSphere MQ Agent is set to LocalSystem in Manage Candle Services. If you want to run the monitoring agent under a user account rather than under the system account, you must first authorize the user account. Only user IDs that are members of group mqm are authorized to start and stop the monitoring agent.
- ▶ If your site does not have a default queue manager specified, or if you are configuring the agent to monitor a queue manager other than the default, input the WebSphere MQ queue manager name in the MANAGER NAME() and MGRNAME() parameters of the .cfg file, then save and close the Notepad session.
- ▶ The WebSphere MQ Agent monitors a single WebSphere MQ queue manager. If you want to monitor multiple queue managers, create one instance of the monitoring agent for each queue manager.
- ▶ Before starting the WebSphere MQ Agent, WebSphere MQ default objects such as SYSTEM.DEFAULT.MODEL.QUEUE must exist. If they do not exist in your environment, create them before starting the agent.

Remember that there is no separate installation of WebSphere MQ Monitoring Agent. When you install WebSphere MQ Agent, both WebSphere MQ Monitoring Agent and WebSphere MQ Configuration Agent are installed.

WebSphere MQ Configuration Agent

The following are some problem determination tips associated with WebSphere MQ Configuration Agent:

- ▶ Make sure to provide the correct CMS host/IP.
- ▶ If you have multiple queue managers running on a monitored system, you only need one WebSphere MQ Configuration agent.
- ▶ The WebSphere MQ Configuration Agent must be started.

WebSphere InterChange Server Monitoring Agent

WebSphere InterChange Server comes with SNMP Agent. You can monitor and manage InterChange Server using Tivoli OMEGAMON XE for WebSphere InterChange Server Agents in CMS.

WebSphere InterChange Server does not provide protection against multiple management clients (such as System Monitor, Process Designer, or SNMP Agent instances) that may be performing simultaneous management of the same component. As a result, it is possible for several clients to manage the same component and cause conflicting behavior. Use the SNMP Agent with caution when other management clients are operating on the same InterChange Server.

Below is the list of commonly seen problems in monitoring WebSphere InterChange Server.

The SNMP Agent will not start

Make sure that the `wbi_snmpagent.cfg` file exists in the *WebSphere InterChange Server Install Location*.snmp/config directory and has the correct entries.

With the incorrect format or entries, SNMP Agent could print misleading information, such as `cfg file not found`. For example, the config file in Example 9-6 has a typo near `CONFIGURATION_FILE` (a `[` is missing). An attempt to start the SNMP Agent produced an error message that the `cfg` file is missing.

Example 9-6 SNMP Agent configuration file with a missing [

```
# IBM Corporation
# SNMP Agent Configuration
# Generated by updating Configuration file: Tue Jun 07 17:14:33 CDT 2005
CONFIGURATION_FILE]
Version = 3.1.2
[SNMP_AGENT]
TraceLevel = 1
PollInterval = 30
AgentStateFile = C:\WICS\snmp\state\wbi_snmpagent.sts
LogFile = C:\WICS\snmp\log\wbi_snmpagent.log
```

```
Port = 161  
[LOGGING]  
MIRROR_LOG_TO_STDOUT = false
```

```
C:\WICS\bin>REM restricted by GSA ADP Schedule Contract with IBM Corp.  
Running WBI SNMP Agent...  
Error: Cannot locate the WBI Snmp Agent Configuration (.cfg) File.
```

The managed WebSphere InterChange Servers in CNP do not appear

There might be many possible reasons for this message:

- ▶ Make sure that you have the correct community name with read-write access in SNMP Agent Manager and WebSphere InterChange Server Monitoring Agent at CMS.
- ▶ Make sure that the SNMP protocol and ports are not blocked on your network. Check that no personal firewalls are blocking SNMP data on the system. If you are in doubt, consult your network administrator or firewall administrator to check that SNMP is not blocked in your network.
- ▶ On Windows, the default port for SNMP is 161/udp, and for UNIX, it is 1161/udp for general purpose (request/response) communications. Make sure these ports are not blocked if the agent is configured with the default ports.

There are SNMP requests from other machines to the WICS SNMP Agent

It is likely that your machine or service is exposed. Take a closer look at your SNMP Agent log file on WebSphere InterChange Server. An example line from the SNMP Agent log is shown in Example 9-7.

Example 9-7 SNMP Agent log

```
[Time: 2005/06/02 16:46:55.188] [System: SNMPAgent] [SS: SNMP Agent] [Thread:  
PacketListenerThread (#1089167913)] [Type: Trace] [MsgID: 50021] [Mesg: A GET  
request command sent from hacker.happyhacking.com host with community  
administrator.]
```

If hacker.happyhacking.com is not your CMS server and not a known SNMP manager, it is likely that your system is exposed. To protect your systems, try the following steps:

1. Change the default SNMP community names in SNMP Configuration Manager.

2. Control access to the WebSphere InterChange Server SNMP Agent using the SNMP Agent Configuration Manager Server Access tab. Add only those servers that need access.
3. Consult the system administrator to stop nonessential SNMP services on system.
4. Consult your network or firewall administrator to control network access. Make sure that SNMP data originated from known systems.
5. Consider enabling RBAC using SNMP Agent configuration manager.

9.4.3 Maintenance

When system maintenance is done on systems, there are several things that can cause product failure. These are a few common situations that occur.

IP address change

If the agent connects to the CMS using an IP address instead of a host name and the IP address changes, then the agent will need to be re-configured to update the IP address information. Each agent chapter in this redbook has a configuration section; see the appropriate section for updating the agents.

- ▶ For the Agent for WebSphere Business Integration MQ, see 4.1, “WebSphere MQ Agent installation and configuration” on page 60.
- ▶ For the Agent for WebSphere Business Integration Brokers, see 7.5, “Configuring the WebSphere Integration Brokers Monitoring Agent” on page 214.
- ▶ For the Agent for WebSphere Business Integration WebSphere Interchange Server, see 8.2.3, “WebSphere InterChange Server Monitoring Agent configuration” on page 266.

Database password change

This change impacts the CandleNet Portal Server. When the database user that the CNPS employs to connect to the database changes the password, then the CNPS will fail. This failure may be seen when first attempting to log in to the CNPS. The CNPS service will start. The user may see the error shown in Figure 9-4 on page 297. If an incorrect user name is entered into the logon menu, the user will see User authorization has failed instead of Unable to connect to CNP Server.

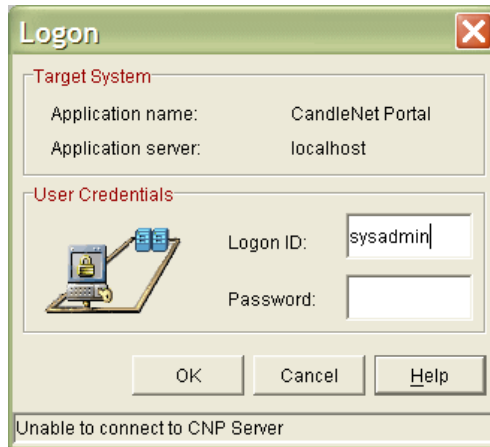


Figure 9-4 Unable to connect to CNPS

To check if this is a password issue, look in the CNPS log KFWRAS1.log for an error similar to this one (see Example 9-8). The DB2 error message will be SQL30082N.

Example 9-8 KFWRAS1.log

```
(42A49B9B.0B626DC0-144C:kbbssge.c,52,"BSS1_GetEnv")
DSCNPS2="DSN=CNPS2;UID=CNPS;PWD=xxxxxxx;CONNECTION_LIMIT=32"
(42A49B9B.31880DC0-1168:ctsqlconnectionodbc.cpp,92,"CTSQLEvaluatorODBC_i::sqlErrorCheck") SQLDriverConnect rc=-1: SQL_ERROR
SQLSTATE: 08001, ERR: -30082, MSG: [IBM][CLI Driver] SQL30082N Attempt to
establish connection failed with security reason "24" ("USERNAME AND/OR
PASSWORD INVALID"). SQLSTATE=08001
(42A49B9B.31880DC0-1168:ctpropertysequence.cpp,532,"CTPropertySequence::Dump")
---> name = SQL Exception: accessElement = 02347740, connection = 023484A8
(42A49B9B.31880DC0-1168:ctpropertysequence.cpp,532,"CTPropertySequence::Dump")
-----> -2101 = -1 L
(42A49B9B.31880DC0-1168:ctpropertysequence.cpp,532,"CTPropertySequence::Dump")
-----> -2102 = "SQLDriverConnect rc=-1: SQL_ERROR
SQLSTATE: 08001, ERR: -30082, MSG: [IBM][CLI Driver] SQL30082N Attempt to
establish connection failed with security reason "24" ("USERNAME AND/OR
PASSWORD INVALID"). SQLSTATE=08001
```

This can be fixed by the following steps:

1. Log on to the CNPS system.
2. Open the **Manage Candle Services** application.
3. Right-click the CNPS icon and select **Advanced** → **Utilities** → **Build CNPS Database**, as seen in Figure 9-5 on page 298.

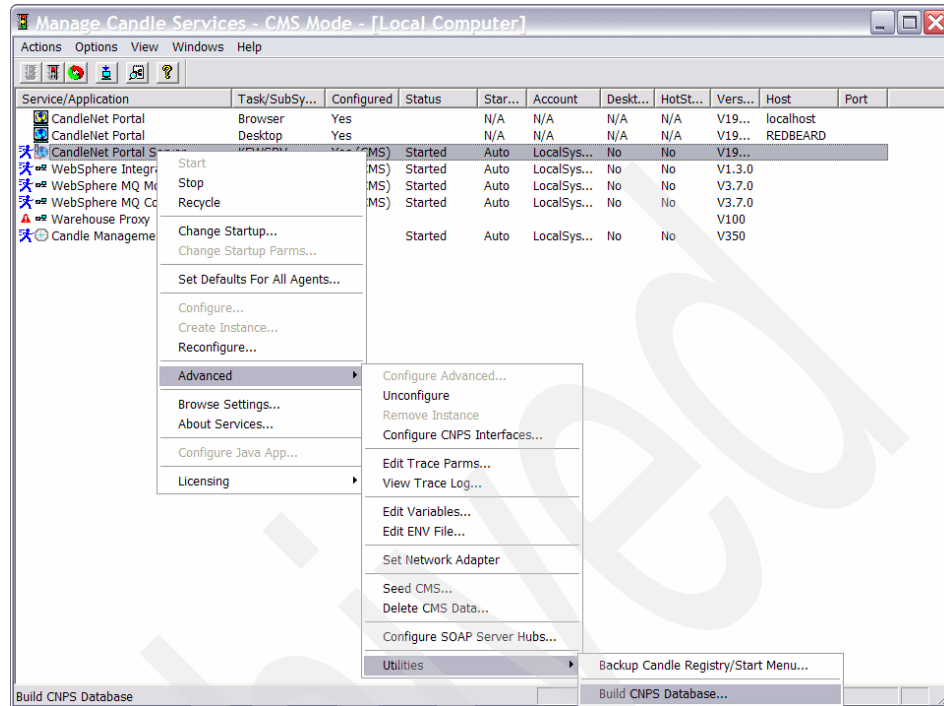


Figure 9-5 Accessing Build CNPS Database menu

- This will bring up the CNPS Data Source Configuration menu (see Figure 9-6 on page 299). In this menu, enter the new password and click **OK**.

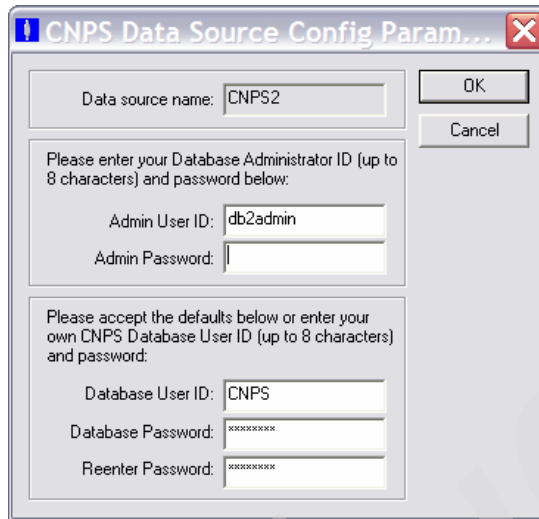


Figure 9-6 CNPS Data Source Configuration menu

5. Restart the CNPS service using the Manage Candle Services application.
6. Reconnect to the CNPS and enter the valid user ID and password (if required).

9.5 Miscellaneous tips and tools

This section provides some additional tips to configure the product. Note that some of these tips are unsupported and if problems arise, you should back out the change.

9.5.1 Changing the JRE version of the CNPS

The CNPS supports quite a few versions of the Java Runtime Environment; however, if you desire to use a newer version of the JRE than is supported by the CNPS, then follow these steps. Only supported versions of the JRE will be considered if you encounter problems with the CNPS.

1. Log in to the CNPS.
2. Edit CANDLEHOME\CNP\javareg.vbs.
 - a. Modify the variable javaRels.
 - b. Add the version you want to work with, in our case, we added 1.4.2_08.

3. Next, edit CANDLEHOME\CNB\javaversions.js and modify the versions, clsids, and codebases arrays.
 - a. For versions, add 1.4.2_08.
 - b. For clsids, add CAFEEFAC-0014-0002-0008-ABCDEFFEDCBA.
 - c. For codebases, add jinstall-1_4_2_08-windows-i586.cab#version=1,4,2,8.
4. Exit the browser.
5. Load the 1.4.2_08 plugin/jre.
6. Restart the browser.
7. Note that with untested versions of the JRE, the user may encounter problems.

9.5.2 Using the digup tool on UNIX

This program builds a tar image of the OMEGAMON installation for the CMS where it is run. This can be very useful when sending data to customer support.

- It is located in candlehome/bin. The relevant command is:

```
digup [-h candle_directory] [-a] [-s] [-k] [-i] [-t] [-l label]
```

Where:

- The -a option builds a tar file of all your site information.
- The -s option is used to get a one line OS summary.
- The -k option keeps the working directory after completion.
- The -i option ignores agent logs when building the site info tar file.
- The -t option gets cms tables.
- The -l option defines a label or text string identifier to display on the output.
- The -h option specifies a CANDLEHOME directory.
- The command collects and stores the following information:
 - The CANDLEHOME directory listing.
 - A copy of the /etc/hosts file from the system stored in host.info.
 - Information about the server (uname, architecture, processor info, and ulimit) stored in system.info.
 - An archive of the CANDLEHOME/logs directory stored in logs.tar.
 - An archive of the candlehome/tables directory stored in tables.tar.
 - An archive of the candlehome/config directory stored in config.tar.
 - An archive of the candlehome/registry directory stored in registry.tar.

9.5.3 Mutex and shared memory cleanup

On UNIX, Linux, and z/OS platforms, improper stopping of the broker or agent coupled with an element of unfortunate timing may lead to a need to manually clean up mutexes and shared memory used in the communication of data between the CandleMonitor node and agent.

Symptoms of this problem are:

- ▶ When restarted, the agent does not fully initialize.
- ▶ Subsequent attempts to shut down the agent hang.
- ▶ Data is missing, that is, information data is missing without a Broker_Not_Responding event. Statistics data are missing with at least one CandleMonitor node deployed.

Follow these steps to clean up mutexes and shared memory:

1. Stop the agent and broker(s) monitored by agent.
2. On UNIX, Linux, or USS (on z/OS):
 - a. Issue the command **ipcs -a**.
 - b. In the generated output, find all message queues with the “brokers?” user IDs and “agents?” user ID, and note the IDs and KEY field for each.
 - c. Find all semaphores with a matching KEY field to those noted for message queues, and note the ID field for each.
 - d. Find all shared memory with the “brokers?” user IDs and “agents?” user ID and an NATTC field of 0, and note the ID field for each.
 - e. Switch to a user ID that can issue the **ipcrm** command, whether it is the owner user ID (in the **ipcs -a** output), a user ID in the same group as the owner, or a root user ID.
 - f. For each message queue noted, issue the command **ipcrm -q <ID>**.
 - g. For each semaphore noted, issue the command **ipcrm -s <ID>**.
 - h. For each shared memory noted, issue the command **ipcrm -m <ID>**.
3. Restart the broker(s) and agent.

9.5.4 WebSphere MQ Configuration problem determination

This section contains some problem determination tips associated with IBM Tivoli OMEGAMON XE for WebSphere MQ Configuration. This information is a quick reference designed to address the most common problems.

1. You cannot see the Configuration view.

- Make sure that your CandleNet Portal user ID has the Navigator Configuration view as an Assigned View.
 - It is possible that this product is not properly installed.
2. You cannot enable update mode.
 - Make sure that your CandleNet Portal user ID has modify WebSphere MQ Configuration permission.
 3. You are unable to create new objects or add information to settings lists.
 - Make sure you are in Update mode.
 - Make sure that you have the appropriate WebSphere MQ permissions on the object.
 - Make sure that the WebSphere MQ command server is running for the queue manager you are attempting to configure.
 4. After running the Discover feature, there are no new queue managers visible in the defined view tree.
 - Refresh the Defined View.
 - Make sure the configuration agent is online.
 5. The “Update defined from actual” operation does not update the defined view tree.
 - Refresh the Defined View.
 - Make sure that you have the appropriate CandleNet Portal user authority.
 - Make sure that the configuration agent is online.
 - Make sure that the queue manager and the command server are both running.
 6. The “Update actual from defined” operation does not update WebSphere MQ.
 - ▶ Make sure that the defined objects are valid.
 - You must start the queue manager and the command server before you run the “Update actual from defined” operation.
 - ▶ Right-click the object you want to validate and select **Validate**. The Discrepancy Display lists the corrections you need to make. Run the **Update actual from defined** operation again.
 7. Updates or changes made to prototypes are not reflected in the “based on” sections of objects in the Defined View.
 - Refresh the Defined View.

Additional material

This redbook refers to additional material that can be downloaded from the Internet as described below.

Locating the Web material

The Web material associated with this redbook is available in softcopy on the Internet from the IBM Redbooks Web server. Point your Web browser to:

<ftp://www.redbooks.ibm.com/redbooks/SG246768>

Alternatively, you can go to the IBM Redbooks Web site at:

ibm.com/redbooks

Select the **Additional materials** and open the directory that corresponds with the redbook form number, SG246768.

Using the Web material

The additional Web material that accompanies this redbook includes the following files:

<i>File name</i>	<i>Description</i>
SG246768.zip	Zipped Sample Broker Program

System requirements for downloading the Web material

The following system configuration is recommended:

Hard disk space: 10 MB minimum

Operating System: Windows/Linux/UNIX

How to use the Web material

Create a subdirectory (folder) on your workstation, and unzip the contents of the Web material zip file into this folder.

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

IBM Redbooks

For information on ordering these publications, see “How to get IBM Redbooks” on page 306. Note that some of the documents referenced here may be available in softcopy only.

- ▶ *IBM Tivoli Monitoring Version 5.1: Advanced Resource Monitoring*, SG24-5519
- ▶ *IBM WebSphere Everyplace Server Service Provider and Enable Offerings: Enterprise Wireless Applications*, SG24-6519
- ▶ *MQSeries Primer*, REDP0021

Other publications

These publications are also relevant as further information sources:

- ▶ *IBM Tivoli OMEGAMON XE for WebSphere Application Server Business Integration Release Notes*, GI11-4058
- ▶ *IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring on z/OS V4.0 Program Directory*, GI11-4061
- ▶ *IBM Tivoli OMEGAMON XE for WebSphere MQ on z/OS Configuration and Customization Guide*, GC32-9329 - NOT FOUND
- ▶ *Installation and Configuration of Candle Products on OS/390 and z/OS*, GC32-9214
- ▶ *Installing and Setting up IBM Tivoli OMEGAMON XE for WebSphere Business Integration on Windows and UNIX*, SC31-6885
- ▶ *Using IBM Tivoli OMEGAMON XE for WebSphere Integration Brokers, V1.3.0*, SC31-6890
- ▶ *Using IBM Tivoli OMEGAMON XE for WebSphere MQ Monitoring*, SC31-6888

Online resources

These Web sites and URLs are also relevant as further information sources:

- ▶ ICS Admin guide at infocenter
http://publib.boulder.ibm.com/infocenter/wbihelp/index.jsp?topic=/com.ibm.wics_user_administrator.doc/doc/administration/administration19.html
- ▶ Information on the configuration of the Warehouse Agent
<http://www-306.ibm.com/software/tivoli/features/ccr2/ccr2-2003-10/techtip-warehouse.html>
- ▶ J2SE Downloads
<http://java.sun.com/j2se/downloads/index.html>
- ▶ OMEGAMON XE for WebSphere MQ on z/OS Program Directory link
<http://www-3.ibm.com/software/sysmgmt/products/support/>
- ▶ OMEGAMON XE for WebSphere MQ on z/OS product manuals link
<http://publib.boulder.ibm.com/tividd/td/tdprodlist.html>

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IBM Tivoli OMEGAMON XE for WebSphere Business Integration is a new product in Tivoli portfolio that manages WebSphere MQ, Message Broker, and InterChange Server environments from a single console. IBM Tivoli OMEGAMON XE for WebSphere Business Integration supports distributed and mainframe systems and provides an end-to-end view across all systems. It analyzes application performance and identifies slowdowns and monitors message rates, brokers, message flows, and sub-flows.

This IBM Redbook covers the installation, configuration, and troubleshooting of IBM Tivoli OMEGAMON XE for WebSphere Business Integration on Windows, AIX, Linux, and z/OS platforms, with real life scenarios. OMEGAMON Framework architecture is also covered with typical deployment scenarios, best practices, and scalability considerations.

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