

EMC ControlCenter
5.2 Service Pack 4

Integration Packages
Product Guide

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EMC Corporation
Corporate Headquarters:
Hopkinton, MA 01748 -9103
1-508 -435 -1000
www.emc.com

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As part of its effort to continuously improve and enhance the performance and capabilities of its product line, EMC periodically releases new revisions of its hardware and software. Therefore, some functions described in this guide may not be supported by all revisions of the software or hardware currently in use. For the most up-to-date information on product features, please refer to your product release notes.

Audience

This guide is part of the EMC ControlCenter documentation set and is intended for system administrators who will set up, configure, and manage the EMC ControlCenter Integrated Packages for the following third-party products:

- ◆ BMC PATROL Enterprise Manager
- ◆ BMC PATROL
- ◆ IBM Tivoli NetView
- ◆ IBM Tivoli Enterprise Console
- ◆ Microsoft Operations Manager
- ◆ NetCool/OMNIbus by Micromuse
- ◆ OpenView Network Node Manager by Hewlett-Packard
- ◆ OpenView Operations by Hewlett-Packard
- ◆ Unicenter by Computer Associates

Readers of this guide are expected to be familiar with the following:

- ◆ Storage array operation
- ◆ Windows and UNIX operating environments
- ◆ Specific third-party product operation

Organization

This guide is organized as follows:

Chapter 1, *Integration Packages Overview*, introduces the EMC ControlCenter Integration Packages for third-party applications and provides a brief description of the EMC ControlCenter application.

Chapter 2, *Features and Functions*, describes Integration Packages architecture as well as active and passive integration.

Chapter 3, *Integrating with Netcool/OMNIBus*, shows how to install, configure, and operate an integration with Netcool/OMNIBus.

Chapter 4, *Integrating With the IBM Tivoli Enterprise Console*, shows you how to install, configure, and operate Integration Packages with the Tivoli Enterprise Console.

Chapter 5, *Integrating with HP OpenView Operations (OVO)*, shows you how to install, configure and operate Integration Packages with HP OpenViewHP Operations (OVO), formerly OpenView Vantage Point Operations (VPO), and HP OpenView-It/Operations (ITO).

Chapter 6, *Integrating With CA Unicenter*, shows you how to install, configure, and operate Integration Packages with CA Unicenter.

Chapter 7, *Integrating With HP OpenView NNM*, shows you how to install, configure, and operate Integration Packages with HP OpenView Network Node Manager (NNM).

Chapter 8, *Integrating With IBM Tivoli NetView*, shows how to install, configure, and operate Integration Packages with Tivoli NetView.

Chapter 9, *Integrating with Microsoft Operations Manager*, shows you how to install, configure and use the Integration Packages with Microsoft Operations Manager.

Chapter 10, *Integrating With BMC PATROL Enterprise Manager*, shows you how to install, configure and use the Integration Packages with BMC PATROL Enterprise Manager.

Chapter 11, *Integrating With BMC PATROL*, shows you how to install, configure and use the Integration Packages with BMC PATROL.

Appendix A, *MIBs and Traps*, discusses the MIBs and Traps used by the Integration Packages.

Appendix B, *Configuration Settings*, discusses the configuration settings used by the Integration application, `ecc3pi`.

Appendix C, *Configuring ControlCenter to Send Alerts*, discusses how to configure ControlCenter to accept multiple trap destinations.

Related Third-Party Documentation

The following documentation contains information about or related to the products described in this guide.

- ◆ CA Unicenter TNG documentation set from Computer Associates, especially the following guides:
Unicenter TNG Administrator Guide
Unicenter TNG Getting Started
- ◆ OpenView IT/Operations documentation set from Hewlett-Packard, especially the following guides:
HP OpenView IT/Operations Concepts Guide
HP OpenView IT/Operations Administrator's Task Guide
HP OpenView IT/Operations Administrator's Reference
- ◆ Open View /Network Node Manager documentation set from Hewlett-Packard, especially the following guides:
HP OpenView/Using Network Node Manager
HP Open View/Administrator's Reference
- ◆ Netcool/OMNIBus documentation set from Micromuse, especially the following guides:
Netcool/OMNIBus Administration Guide
Netcool/OMNIBus Probe Reference
- ◆ IBM Tivoli Enterprise Console documentation set, especially the following guides:
TME 10 Enterprise Console User's Guide
TME 10 Enterprise Console Adapter's Guide
- ◆ IBM Tivoli NetView documentation set, especially the following guides:
TME 10/NetView Administrator's Guide
TME10/NetView Mid-Level Manager's User's Guide
- ◆ Microsoft Operations Manager 2000 documentation set from Microsoft, especially the following guides:
Microsoft Operations Manager 2000 User Guide
Microsoft Operations Manager 2000 Installation Guide

Conventions EMC uses the following conventions for notes, cautions, warnings, and danger notices.

A note presents information that is important, but not hazard-related.



CAUTION

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Palatino, bold	◆ Specific filenames or complete paths ◆ Dialog box, button, icon, and menu items in text ◆ Selections you can make from the user interface, including buttons, icons, options, and field names
<i>Palatino, italic</i>	◆ New terms or unique word usage in text ◆ Command line arguments when used in text ◆ Book titles
<i>Courier, italic</i>	Arguments used in examples of command line syntax
Courier	System prompts and displays and specific filenames or complete paths. For example: working root directory [/user/emc]: c:\Program Files\EMC\Symapi\db
Courier, bold	User entry. For example: sympoll -p

Related ControlCenter Documentation

The most up-to-date documentation for the ControlCenter family of products is available from the EMC Powerlink website at:

<http://powerlink.emc.com>

Where to Get Help

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For service, call:

United States: (800) 782-4362 (SVC-4EMC)

Canada: (800) 543-4782 (543-4SVC)

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Integration Packages Overview

This chapter introduces the EMC ControlCenter Integration Packages software as part of the EMC ControlCenter suite of products.

- ◆ Introduction 1-2
- ◆ Overview of EMC ControlCenter 1-4

Introduction

The EMC ControlCenter® Integration Packages is one of the EMC® ControlCenter family products. The Integration Packages software integrates EMC ControlCenter into industry-leading enterprise management frameworks.

Each third-party Integration Package expands the functionality of these frameworks by providing support for ControlCenter-managed storage resources. By processing EMC-specific events in the form of SNMP traps, Integration Packages provides the ability to launch available EMC-specific tools. Integration Packages provides two modes of integration: active and passive.

Active Integration

Active integration works with network (SNMP) management products that use a centralized Console or server to collect information from SNMP agents. The Console provides the intelligent processing. The Integration Package provides an application that resides with the third-party framework Console to interpret the SNMP traps issued by ControlCenter.

Passive Integration

Passive integration converts SNMP traps issued by ControlCenter into framework (existing third-party enterprise software) messages. Use passive integration with systems management products that rely on intelligent agents to send messages to a central server or Console. Integration Packages provide the files you need to configure agents to interpret the SNMP traps issued by ControlCenter. These agents then forward the traps as framework-specific messages to the framework Console.

Supported Third-Party Frameworks

Refer to the Third-Party Framework Applications Support table in the *EMC ControlCenter 5.2 SP4 Support Matrix* as well as to E-Lab Navigator for the most up-to-date information about supported third-party frameworks. Both the Support Matrix and E-Lab Navigator are available through the Powerlink website at <http://powerlink.emc.com>.

Components

Depending on the third-party framework, additional configuration files are available that perform various operations. These include:

- ◆ Application configuration files that help you configure the Integration Packages application.
- ◆ Event configuration files that define trap formats for third-party frameworks.
- ◆ Files containing framework-specific symbols and graphics.

Overview of EMC ControlCenter

EMC ControlCenter is designed to be the centralized control center for an entire distributed storage environment. It is a powerful, flexible, unified framework and suite of tools that provides end-to-end management of storage networks, storage devices, and other storage resources.

ControlCenter provides a centrally managed, single point of control for resources throughout the entire storage environment. From the graphical front end, ControlCenter lets you manage:

- ◆ **Connectivity components** — Such as Fibre Channel switches and hubs.
- ◆ **Storage components** — Such as EMC Symmetrix® arrays.
- ◆ **Host components** — Such as logical volume managers, file systems, databases, and backup applications.

Every physical and logical element that ControlCenter manages is known as a *managed object*. From a Console anywhere on the network, ControlCenter shows a consolidated view of the storage environment, allowing you to monitor the health of, track the status of, report on, and control each managed object.

Features and Functions

This chapter discusses the features and functions of the Integration Packages.

- ◆ Integration Packages Architecture.....2-2
- ◆ Active Integration2-4
- ◆ Passive Integration.....2-11

Integration Packages Architecture

The Integration Packages consist of one or more software components that expand the functionality of enterprise management frameworks by providing support for ControlCenter-managed objects.

The Integration Packages can launch specific object management tools that reside on the same host, or launch a Web browser to access Web-enabled management tools. The Integration Packages provide both active and passive integration, discussed in detail in the following sections of this chapter.

Components

The Integration Packages consist of software components that vary depending on the third-party frameworks software and the supported integration type. The Integration Package for each third-party frameworks product provides components including:

- ◆ Integration Gateway
- ◆ Configuration files
- ◆ Application files
- ◆ Third-party frameworks files

Integration Gateway

The three basic functions during active integration are discovery, event processing, and launch. (See *Active Integration* on page 2-4.) For discovery and event processing, the Integration Packages rely on an Integration Gateway that provides an SNMP interface on the front end including an SNMP MIB (Management Information Base) for discovery information, and SNMP traps for the events. Therefore, the protocol between the Integration Packages and the Integration Gateway is SNMP.

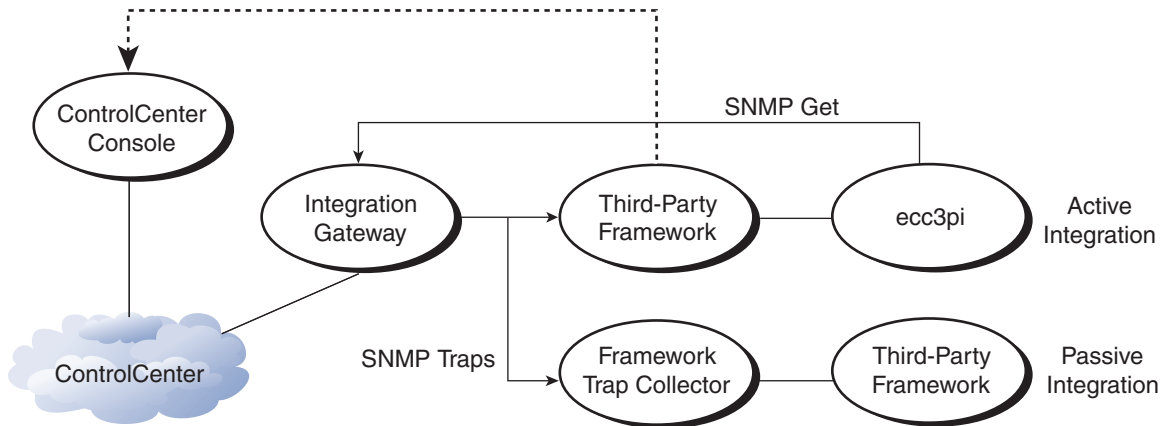
To install the Integration Gateway, refer to the *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*. After installing the Integration Gateway, configure ControlCenter as follows to have SNMP traps sent to the third-party frameworks software:

- ◆ Define Trap Destination Address
- ◆ Create a Management Policy to Use SNMP
- ◆ Modify Alerts to Use the Management Policy

For more information on traps used by the Integrations Packages, refer to Appendix A, *MIBs and Traps*.

The Integration Gateway uses registered UDP port 1273, instead of the standard SNMP port 161, so it does not conflict with any other SNMP agent that may reside on the host with the Integration Gateway.

Figure 2-1 shows the architecture of the Integration Packages.



CC-000125

Figure 2-1 ControlCenter Integration Packages Architecture

Active Integration

Active integration with third-party frameworks software involves three basic functions:

- ◆ **Discover** — ControlCenter managed objects are added to the framework topology map.
- ◆ **Event Processing** — ControlCenter events are received and processed.
- ◆ **Launch** — Applications that provide specific object management are launched.

The Integration Gateway provides an SNMP interface to obtain information about the objects being managed by ControlCenter.

Integration Packages software resides with the third-party frameworks. This software provides the functions described above by retrieving and receiving information from ControlCenter and using the third-party framework's API to display this information.

Discovery

In active integration, the third-party frameworks provide basic IP discovery of the physical hosts and other infrastructure components (objects). ControlCenter manages a variety of storage-related network entities including storage systems and other logical elements that cannot be discovered by the frameworks without an active integration.

An active integration queries the Integration Gateway for a set of managed objects and adds an EMC View icon to the framework topology. An EMC View submap contains ControlCenter server icons and icons for various Console groups by default. (Refer to *Managed Objects* on page 2-5 for further discussion.)

With display mode set to Object View, all managed objects appear in the EMC View submap within the third-party framework console. To change this type of display mode, refer to Appendix B, *Configuration Settings*.

In addition, active integration displays group object (icons) for the ControlCenter Console group that may contain one or more objects or other groups. Included are standard static groups that include managed objects for:

- ◆ Storage
- ◆ Hosts
- ◆ Connectivity

User-defined group icons also appear on the Console. Only *shared* groups appear in the top-level view. A folder labeled *All Objects* also appears that contains all managed objects defined in the MIB.

Managed Objects

ControlCenter manages a wide variety of network-related entities including storage systems, switches, hubs, and other logical elements such as databases and file systems. ControlCenter also manages container elements such as groups and fibre zones. All of the entities are stored as managed objects within a relational model in ControlCenter. (Refer to the discussion on *Discovery* on page 2-4.)

The Integration Gateway exposes only those objects that allow the Integration Packages to provide the functionality mentioned earlier. This means that only objects at a certain level of abstraction are exposed through the SNMP MIB.

For example, if an Integration Gateway exposes a Symmetrix system but not the subcomponents such as directors or devices, an icon appears for the Symmetrix system. Director and device events are logged against the Symmetrix system and cause its icon to change color. The event contains enough information to identify the specific fault.

Listed below are some of the objects that can exist within ControlCenter. These objects can be exposed through an SNMP MIB.

- | | |
|---------------------|--------------|
| • Symmetrix | • Switches |
| • Celerra | • Groups |
| • CLARiiON | • Hosts |
| • 3rd party storage | • ECC Server |

Automatic Discovery

When you start the Integration Gateway, it sends a `coldStart` trap to the third-party frameworks. The third-party frameworks then invoke the Integration Package to process the trap. If the gateway doesn't exist in the topology, it is added to the topology and a full discovery of its managed objects is performed. If the gateway already exists in the topology, the Integration Packages refreshes the gateway's status and that of its managed objects.

Integration Packages also adds gateway and object icons to the topology in response to status change traps and delete traps. When you receive one of these traps, Integration Packages adds either the gateway or object icon, if it doesn't already exist. The object status is then set.

Integration Packages adds only the Integration gateway and the object. You need to refresh the gateway or wait until the next polling cycle to refresh *all* objects for the gateway.

Integration Packages has a polling mechanism that periodically refreshes the status of all gateways and their managed objects in the topology. Figure 2-2 shows a sample topology window.

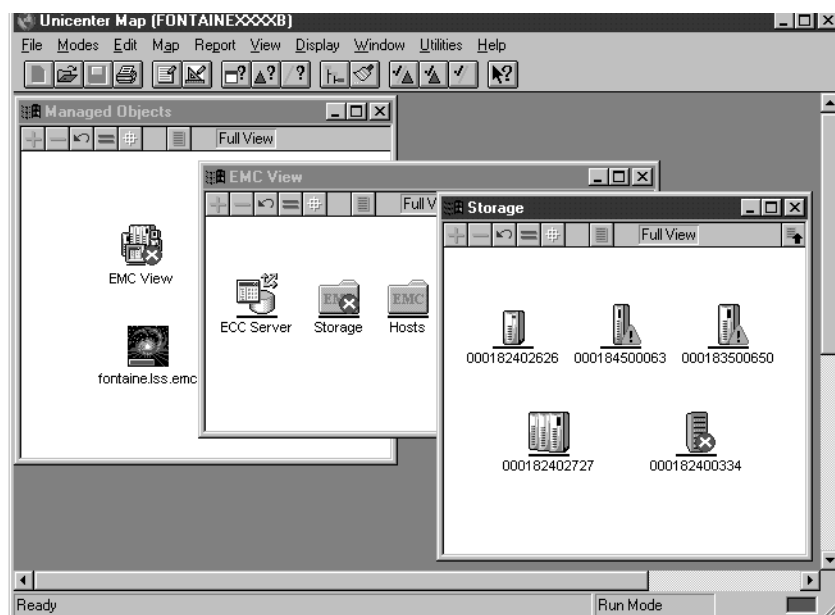


Figure 2-2 Topology Window Example

Manual Discovery You can also manually add a gateway icon to the topology. After you add the icon, you can force a discovery of the gateway's managed objects by selecting the refresh function.

If you do not select refresh for the manually added gateway icon, then the managed objects are discovered automatically during the next refresh cycle.

To manually add an Integration Gateway, enter a label for the icon, and then enter the IP address and port number of the gateway. Refer to the chapters on each Integration Package for exact procedures on how to add a gateway.

Refresh When you perform a refresh for an Integration Gateway, the Integration Packages:

- ◆ Perform a discovery and rebuilds the object view in its submaps.
- ◆ Add any new objects.
- ◆ Set any unknown or delete objects to unknown status.

If you refresh a single object, the Integration Packages retrieve the current object status from the gateway and updates the object.

Event Processing The Integration Packages receive events from the Integration Gateway in the form of SNMP traps. These traps are:

- ◆ Status change trap
- ◆ Object delete trap
- ◆ Event trap

The third-party frameworks receive all traps and save them within their event Consoles and logs. ControlCenter Integration Gateway related traps are forwarded to the Integration application for processing.

Status Change Trap

Status change traps indicate a change in the status of managed objects. The Integration application uses these traps to change the status of an object and the object's icon using an icon color scheme similar to that of the ControlCenter Console. Colors are third-party framework dependent and may be different for each product.

Table 2-1 Trap Status and Object Color Correspondences

Trap Status	Icon Color
Normal	Green
Warning	Yellow
Critical	Red
Unknown	Blue

Object Delete Trap

When ControlCenter no longer manages an object, the Integration Gateway sends a delete trap. This trap indicates that the ControlCenter administrator removed an object from the server. When the Integration application receives a delete trap, it changes the object icon status to unknown. This gives the third-party framework administrator an opportunity to investigate the event, and then manually delete the icon.

Event Trap

The Integration Gateway uses event traps to send messages to the third-party frameworks. The messages can be events, alarms, or alerts associated with a managed object. An example is an environmental alarm for a Symmetrix system.

If an event causes a status change within the managed object, the Integration Gateway sends a corresponding status change trap.

Launch

The Integration Packages enables you to launch the ControlCenter Console from within the frameworks. The ControlCenter Console is launched from a default location, however if your ControlCenter Console is located in a directory other than the default, refer to *Configuring Console for Launch* in Appendix B, *Configuration Settings* on page B-5.

Polling

The Integration Packages provide a polling function that periodically checks the status of the EMC Views and their managed objects. Polling parameters include:

- ◆ Frequency
- ◆ Retry count
- ◆ Refresh rate

You set these values in `ecc3pi.ini`.

Frequency

When the Integration Package starts, it refreshes all EMC Views in the topology, and then pings each Integration Gateway on every poll cycle. If an Integration Gateway continues to respond, its status remains the same. If an Integration Gateway responds but didn't respond to the previous ping, or, if you add a new EMC View after the previous poll, then the EMC View is refreshed as described in *Discovery* on page 2-4.

Retry Count

If an Integration Gateway does not respond to a poll, the Integration Package sets all of its managed objects to unknown status and sets the EMC View status to critical. The Integration Package assumes that the Integration Gateway is temporarily unavailable, and will repoll that Integration Gateway every minute up to a specified number of retries (default retry count is 4). The Integration Package returns to its normal polling rate after it performs the specified number of retries or if the Integration Gateway responds during one of the polling cycles.

Refresh Rate

The Integration Package periodically refreshes all EMC Views based on a specified refresh rate. Normally, traps cause updates to an EMC View and its managed objects. This refresh cycle provides a way for you to reestablish a status baseline in case traps get lost.

The refresh rate is normalized to start at midnight. The default refresh rate is 480 minutes (every 8 hours). This causes a refresh at 12:00 A.M., 8:00 A.M., and 4:00 P.M. When you start the Integration application, it performs the next refresh at the normalized time. For example, if you start the Integration Package at 5:00 A.M., with a 480 minute refresh rate, the next refresh occurs at 8:00 A.M. The refresh cycle is reset at midnight.

User Interface

The Integration Packages provide the same functionality across all supported third-party frameworks. However, differences in the third-party frameworks and their APIs necessitate slight changes in the actual implementation.

The following chapters provide integration details for each supported third-party framework.

Passive Integration

For system management products that rely on intelligent agents to forward ControlCenter messages and events to the third-party frameworks Console, Integration Packages provide configuration files and settings that define traps and formats.

Integration Packages provide the necessary interface to display ControlCenter events on the third-party framework Console. The Integration Gateway sends traps to the third-party framework agent, which interprets and formats the event based on the Integration Packages files, and sends a message to the third-party framework Console. You can then use these events to trigger other actions such as:

- ◆ Trouble ticketing
- ◆ Paging
- ◆ E-mail

EMC ControlCenter provides specific integration for the following system management products:

- ◆ IBM Tivoli Enterprise Console
- ◆ Netcool/OMNIBus by Micromuse
- ◆ HP OpenView Operations (OVO) (formerly VPO/ITO)
- ◆ Microsoft Operations Manager (MOM)

Other supported third-party framework products that can receive SNMP traps can also be used for passive integration by default. Products such as CA Unicenter or OpenView can receive traps without an integration package.

Integrating with Netcool/OMNIBus

This chapter describes how to install, configure, and operate Integration Packages with Netcool/OMNIBus by Micromuse.

- ◆ Overview 3-2
- ◆ Components 3-3
- ◆ Installing and Configuring for Netcool/OMNIBus 3-4
- ◆ Using Integration Package for Netcool/OMNIBus 3-6

Overview

The Integration Package for Netcool/OMNIBus incorporates ControlCenter-generated events into Netcool/OMNIBus software to provide a unified approach for enterprise system management.

This is a passive integration. (Refer to *Passive Integration* on page 2-11.)

Netcool/OMNIBus

Netcool/OMNIBus by Micromuse provides a consolidated view of enterprise-wide events and status information. It collects events or messages from many different data sources and presents a single view of the current state of managed systems.

Netcool/OMNIBus tracks the state of events in a distributed database and presents information of interest through individually configured filters and views. It also can be used to perform intelligent processing on the current state of managed objects. The product runs on Windows NT and UNIX platforms.

By integrating ControlCenter within the Netcool/OMNIBus Console, the Integration Package for Netcool enables enterprise administrators to be aware of their valuable EMC storage component status, using their global unified Enterprise Management suite.

Integration Package for Netcool/OMNIBus

The Integration Package for Netcool/OMNIBus enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use Netcool/OMNIBus software look and feel in combination with ControlCenter functionality.

Components

The Integration Package for Netcool/OMNIBus incorporates EMC events into the Netcool OMNIBus Console. ControlCenter contains an Integration Gateway that creates SNMP traps in response to events and alerts generated by ControlCenter.

The integration uses the Netcool Trapd probe. The Trapd probe receives SNMP traps and forwards them to Netcool/OMNIBus. The Trapd probe uses the standard SNMP trap port 162. This probe cannot run on a host that is running a trap daemon.

Integration Packages provides two files for Netcool:

- ◆ `ecc3pi_nco.rules`
- ◆ `README.txt`

The `ecc3pi_nco.rules` file contains EMC trap descriptions. You need to insert the contents of this file into the Trapd rule file on the host where the Trapd probe resides.

The `README.txt` file contains instructions to configure the system for ControlCenter integration.

Installing and Configuring for Netcool/OMNIBus

You must have EMC ControlCenter Integration Packages installed on your system, as well as Netcool/OMNIBus.

The installation of these products is not discussed in this manual. For further information, see the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *Netcool/OMNIBus Installation Guide*

Configuring the Trapd Probe

The Trapd probe is installed as part of Netcool/OMNIBus. Make sure the probe is installed and operating correctly before you proceed with this installation.

To configure the Trapd probe, follow these steps:

1. Make a backup copy of the current Trapd rules file located in `$OMNIHOME/probes/<arch>`, where `$OMNIHOME` points to the OMNIBus home directory and `arch` specifies the system architecture.
2. Edit the `trapd.rules` file. Follow these steps:
 - a. Insert the contents of the `ecc3pi_nco` rules file.
 - b. Place the first block of EMC rules before the `RMON` rules.
 - c. Merge the EMC cold-start rule with the generic `coldStart` trap so that it looks like:

```
{
    @Summary = "Cold Start"
    @AlertGroup = "Generic"
    @Severity = "4"
    if (match($enterprise, ".1.3.6.1.4.1.1139.3"))
    {
        @Agent = "EMC"
        @AlertGroup = "Enterprise"
        @Summary = "EMS Gateway started on" +
        $PeerIPAddress
        Severity = 3
    }
}
```

3. Start or restart the probe to invoke the new rule set.

To restart a running probe, enter the following command:

```
kill -HUP pid
```

where `pid` is the process ID of the running Trapd probe.

Figure 3-1 illustrates the Netcool/OMNIBus integration configuration.

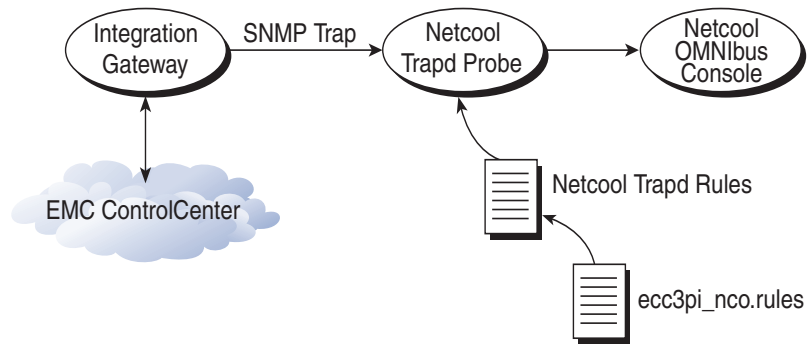


Figure 3-1 Netcool/OMNIBus Integration Configuration

Configuring the OMNIBus Server

No changes are required on the OMNIBus Server to display ControlCenter events.

Uninstalling the Integration Package

To uninstall the Integration Package:

1. Restore the Trapd rules file from the backup copy you created in step 1 of the Trapd configuration procedure, *Configuring the Trapd Probe* on page 3-4.
2. Restart the Trapd probe. Enter the following command:

```
kill -HUP pid
```

Where `pid` is the process ID of the running Trapd probe.

Using Integration Package for Netcool/OMNIBus

The Integration Package for Netcool/OMNIBus provides support for ControlCenter managed storage resources. It enables you to view events such as Symmetrix system status as well as to interpret and respond to alarms and messages.

You can monitor alarms and events with the Netcool/OMNIBus Event List window (Figure 3-2).

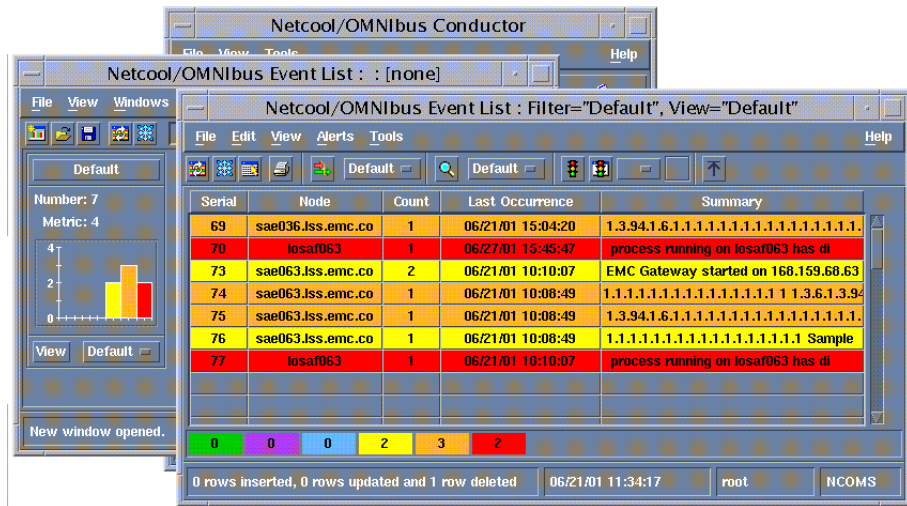


Figure 3-2 Netcool/OMNibus Event List Window

Double-click the desired alert to view details with the Event Information Alert window (Figure 3-3).

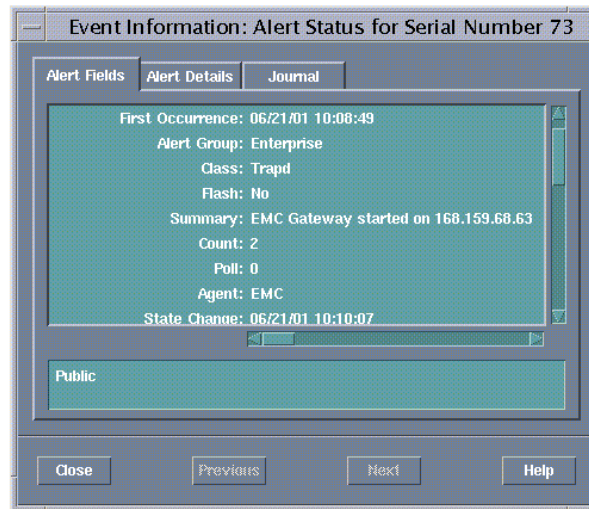


Figure 3-3 Netcool/OMNIBus Event Information Alert Window

Integrating With the IBM Tivoli Enterprise Console

This chapter describes how to install, configure, and operate the Integration Package for the IBM Tivoli Enterprise Console. Topics include:

- ◆ Overview4-2
- ◆ Components4-3
- ◆ Installing and Configuring4-4
- ◆ Using the Integration Package4-9

Overview

The Integration Package for the IBM Tivoli Enterprise Console incorporates ControlCenter generated events into the Tivoli Enterprise Console software to provide a unified approach for enterprise system management.

This is a passive integration. (Refer to *Passive Integration* on page 2-11.)

The Tivoli Enterprise Console

The Tivoli Enterprise Console Environment is the foundation for a suite of management applications that simplify systems and network management operations. The Tivoli Enterprise Console is one such application. The Tivoli Enterprise Console is a rule-based, event-management system that integrates network, systems, and database and application management. The Tivoli Enterprise Console offers a centralized, global view of the enterprise computing environment.

By integrating ControlCenter tools within the Tivoli Enterprise Console, the Integration Packages enables enterprise administrators to be aware of their valuable EMC storage component status, using their global unified Enterprise Management suite.

Integration Package for the Tivoli Enterprise Console

The Integration Package for the Tivoli Enterprise Console enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use Tivoli Enterprise Console software look and feel in combination with ControlCenter functionality.

Components

The Integration Package for the Tivoli Enterprise Console incorporates ControlCenter events into this Console. ControlCenter contains an Integration Gateway that creates SNMP traps in response to events and alerts generated by ControlCenter.

Tivoli Adapters

The Integration Package for the Tivoli Enterprise Console uses either the Tivoli SNMP Adapter or the Tivoli NetView Adapter to process SNMP traps into events for the Tivoli Event Console.

The Tivoli SNMP Adapter receives SNMP traps and forwards them to the Tivoli Event Console. The SNMP Adapter uses the standard SNMP trap port 162. This adapter cannot run with Tivoli NetView to the Tivoli Event Console.

The Tivoli NetView Adapter runs with Tivoli NetView and forwards traps received by NetView to the Tivoli Event Console. For information on the Integration Package for Tivoli NetView refer to Chapter 8, *Integrating With IBM Tivoli NetView*.

Distributed Files

Integration Packages provides five files for the Tivoli Enterprise Console:

- ◆ `ecc3pi_tec.baroc` — Contains ControlCenter event class definitions. You need to import this file into a rule base, and then compile and load the rule base into the event server.
- ◆ `ecc3pi_tec.cds` — Contains ControlCenter event class definitions. You need to append this file to the adapter `.cds` file.
- ◆ `ecc3pi_tec.conf` — Contains ControlCenter event class filters. You need to append this file to the adapter `.conf` file if the adapter is configured for `FilterMode=IN`.
- ◆ `ecc3pi_tec.oid` — Contains ControlCenter variable identifiers, names, and object identifiers. You need to insert this file in numerical order into the adapter `.oid` file.
- ◆ `README.txt` — Contains instructions about how to configure the Tivoli Enterprise Console system for ControlCenter integration.

Installing and Configuring

You must have EMC ControlCenter Integration Packages installed on your system, as well as the Tivoli Enterprise Console.

The installation of these products is not discussed in this manual. For further information, see the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *The Tivoli Enterprise Console Adapter's Guide*

The Integration Package for the Tivoli Enterprise Console uses either the Tivoli SNMP Adapter or the Tivoli NetView Adapter to process EMC traps into events for the Tivoli Event Console.

Configuring the SNMP Adapter

You install the Tivoli Event Console SNMP Adapter from the Tivoli Event Console to endpoint nodes. Before you proceed with this configuration, make sure the SNMP Adapter is installed and operating correctly.

Follow these steps to configure the SNMP Adapter:

1. Stop the SNMP Adapter with one of the following commands:
 - For Windows:


```
net stop TECSNMPAdapter
```
 - For UNIX:


```
$TECADHOME/bin/init.tecad_snmp stop
```
2. Make backup copies of the current adapter files located in `$TECADHOME/etc`, where `TECADHOME` points to the adapter installation directory. The adapter files are:
 - `tecad_snmp.cds`
 - `tecad_snmp.conf`
 - `tecad_snmp.oid`
3. Edit the adapter `.cds` file, `tecad_snmp.cds`, by appending the contents of the `ecc3pi_tec.cds` to the `tecad_snmp.cds` file.
4. Move the definition of the `emcGW_start` event class up to a location before the generic `SNMP Cold_Start` class.
5. Edit the adapter `.conf` file, `tecad_snmp.conf`, to specify the location of the Tivoli Event Console.

6. Set `ServerLocation=@EventServer` or the IP address of the Tivoli Event Console.
7. If you currently have the adapter `.conf` file, `tecad_snmp.conf`, set to `FilterMode=IN`, then edit this file to include the ControlCenter event classes and append the contents of `ecc3pi_tec.conf` to this file.
8. Edit the adapter `.oid` file, `tecad_snmp.oid`, by inserting, in numerical order, the contents of `ecc3pi_tec.oid`.
9. Restart the SNMP Adapter with one of the following commands:

- For Windows:

```
net start TECSNMPAdapter
```

- For UNIX:

```
$TECADHOME/bin/init.tecad_snmp start
```

Figure 4-1 illustrates the configuration of the Tivoli SNMP Adapter.

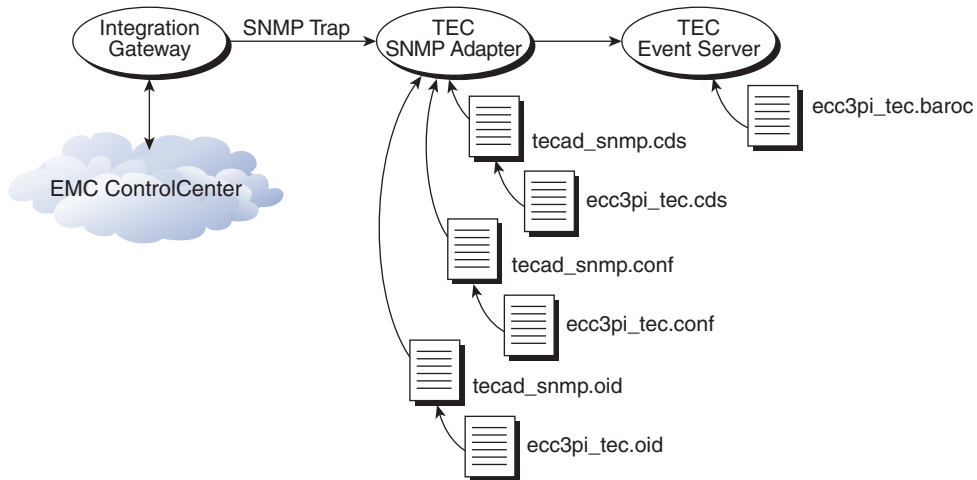


Figure 4-1 Tivoli SNMP Adapter Integration

Configuring the NetView Adapter

You install the NetView Adapter as part of Tivoli NetView. Before you proceed with this configuration, make sure the adapter is installed and operating correctly.

Follow these steps to configure NetView to use the TEC NetView Adapter:

1. Run the following command to configure the NetView Adapter:

```
\usr\ov\bin\tecconfig.bat
```

2. Stop the NetView adapter with the command:

```
\usr\ov\bin\ovstop tecad_nv6k
```

3. Make backup copies of the current adapter files located in `\usr\ov\conf`. The adapter files are:

- `tecad_nv6K.cds`
- `tecad_nv6K.conf`
- `tecad_nv6K.oid`

4. Edit the adapter `.cds` file, `tecad_nv6K.cds`, and append the contents of `ecc3pi_tec.cds` to this file.
5. Move the definition of the `emcGW_start` event class up to a location before the generic `SNMP Cold_Start` class.
6. Edit the adapter `.conf` file, `tecad_nv6K.conf`, to specify the location of the TEC server. Set `ServerLocation=@EventServer` or the IP address of the TEC server.
7. If the adapter `.conf` file, `tecad_nv6K.conf`, currently has `FilterMode=IN` set, then edit this file to include the `ControlCenter` event classes and append the contents of `ecc3pi_tec.conf` to this file.
8. Edit the adapter `.oid` file, `tecad_nv6K.oid`, and append the contents of `ecc3pi_tec.oid` into this file in numerical order.
9. Start the NetView adapter with the command:

```
\usr\ov\bin\ovstart tecad_nv6k
```

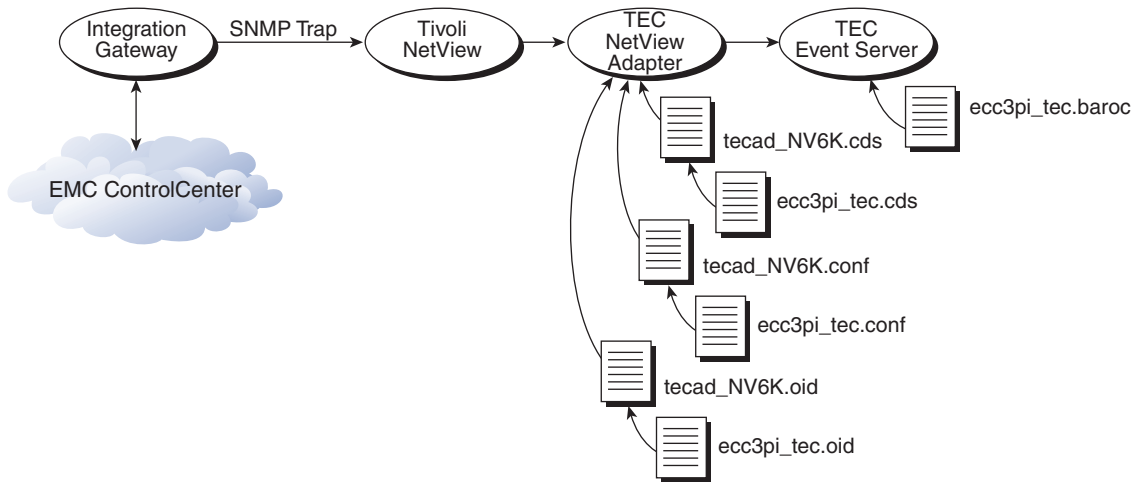


Figure 4-2 Tivoli NetView Adapter Configuration

Configuring the TEC Event Server

You must configure the Tivoli Event Console Event Server when using either the SNMP adapter or the NetView adapter.

To configure the TEC Event Server, follow these steps:

1. Shut down the TEC Event Server.
2. Create a new rule base to incorporate the EMC events.
3. Import the EMC event classes defined in the file, `ecc3pi_tec.baroc`, into the rule base at the last position.
4. Compile the rule base.
5. Load the rule base and specify that the rule base activates when the server restarts.
6. Restart the TEC Event Server.

Uninstalling the Integration Package

To uninstall the Integration Package for the Tivoli Enterprise Console, follow these steps:

1. Restore the class definitions, configurations, and `oids` from the backup file copies you created during the installation.
2. Stop the SNMP adapter or the NetView adapter, depending on which one you used for the integration.
3. Restore the respective `.cds`, `.conf`, and `.oid` files.
4. Restart the adapter.
5. On the TEC Event Server, reload and activate the rule base that you used before you installed Integration Packages.

Using the Integration Package

The Integration Package for the Tivoli Enterprise Console provides support for ControlCenter-managed storage resources. It enables you to view events such as Symmetrix system status, as well as interpret and respond to alarms and messages.

The Tivoli Enterprise Console provides two windows where you can access EMC information at the top level (Figure 4-3).

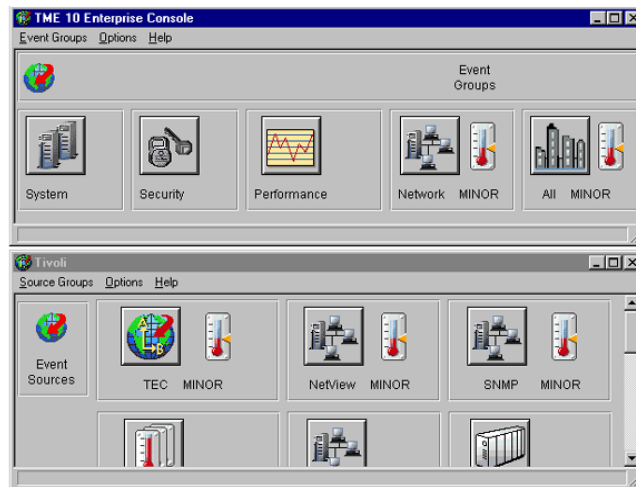


Figure 4-3 Event Groups and Source Groups Windows

With the Event Groups and Source Groups windows, you can view EMC events by selecting:

- ◆ Event group — All
- ◆ Source group — NetView (if you use the NetView adapter)
- ◆ Source group — SNMP (if you use the SNMP adapter)

When you select one of the above groups, the Message View window is displayed (Figure 4-4).



Double-click the desired event to view the event details in the Event Group Message Viewer (Figure 4-5 on page 4-11).

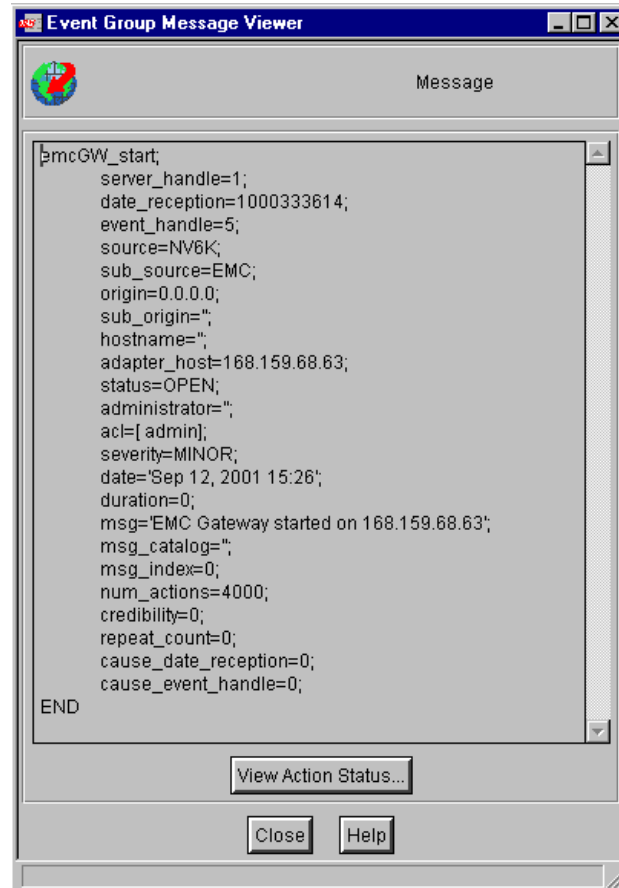


Figure 4-5 Event Group Message Viewer

Integrating with HP OpenView Operations (OVO)

This chapter describes how to install, configure, and operate Integration Packages with OpenView Operations (OVO), formerly known as HP OpenView Vantage Point Operations (VPO), and HP OpenView-IT/Operations (ITO).

- ◆ Overview 5-2
- ◆ Components 5-4
- ◆ Installing and Configuring for OVO 5-5
- ◆ Using the Integration Package for OVO 5-8

Overview

The Integration Package for HP OpenView Operations (OVO) integrates EMC ControlCenter functionality into the OVO framework to provide a unified approach for enterprise system management.

This is a passive integration. (Refer to *Passive Integration* on page 2-11.)

HP OpenView Operations (OVO)

HP OpenView Operations is a core operation and problem management application for distributed multi vendor systems. OVO provides:

- ◆ Central message management for consolidation, simplification, and message processing automation
- ◆ Central monitoring for proactive problem resolution
- ◆ Central problem management for problem notification, resolution, and tracking
- ◆ Central control for efficient management

In the spring of 2000, the HP OpenView-IT/Operations (ITO) was rebranded HP OpenView Vantage Point Operations (VPO). VantagePoint Operations (VPO) version 5.3 is identical to IT/Operations (ITO) version 5.3. Version 7.0 of this product and higher is now called OpenView Operations (OVO). In this manual we refer to the product as OVO.

By integrating ControlCenter tools within the OVO Enterprise Management Console, the Integration Package for OVO enables enterprise administrators to be aware of their valuable EMC Storage component status, using their global unified Enterprise Management suite.

HP OpenView Network Node Manager (NNM)

HP OpenView Network Node Manager (NNM) is a subcomponent of OVO. They share similar processes, services, and configuration files. EMC ControlCenter also integrates with Network Node Manager. (Refer to Chapter 7, *Integrating With HP OpenView NNM*, for details.)

Integration Package for HP OpenView Operations (OVO)

The EMC ControlCenter Integration Package for HP OpenView Operations enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use OVO software look and feel in combination with ControlCenter functionality.

The EMC ControlCenter Integration Package for OVO defines, with the OVO management server, different EMC groups to encapsulate all characteristics of an EMC View such as:

- ◆ Message browsing
- ◆ Node status visualization
- ◆ Application launching

Components

The Integration Package for OVO incorporates ControlCenter events into the OVO software where they can be processed. The integration includes an EMC Node, Message Group, and Application.

Please consult the HP OpenView documentation for further details regarding these OpenView components.

Distributed Files

Integration Package provides two files for the OVO integration:

- ◆ `ecc3pi_hpov.tar` — This file contains the following:
 - Symbols, definitions, and icons — used for EMC-specific objects for both OVO and Network Node Manager
 - Environment and configuration definitions
 - Operational scripts
 - Application binaries — the `ecc3pi` application for active Network Node Manager integration
 - Registration — used by Network Node Manager to register (define) EMC fields and traps
 - Groups — used to organize and display OVO messages
- ◆ `README.txt` — This file contains instructions you use to configure your system for the ControlCenter integration.

OVO Groups

Table 5-1 shows the OVO groups established by the Integration Packages within the OVO management views.

Table 5-1 Integration Groups

Name	View on This Screen	Description
EMC Node Group	Node Group Bank	Provides access to all EMC messages and contains the EMC_View Node.
EMC_View Node	Node Group: EMC	Provides access to all EMC messages.
EMC Alarms	Message Group Bank	Provides access to all EMC messages.
EMC ControlCenter	Application Bank	Invokes a script that runs the ControlCenter Console (must be installed and supported).
EMC_Traps	Message Source Template	Defines the format for EMC events.

Installing and Configuring for OVO

You must have EMC ControlCenter Integration Packages installed on your system as well as OVO.

The installation of these products is not discussed in this manual. For further information, see the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *HP OpenView IT/Operations Administrator's Reference*

Before you begin the integration installation, make sure the OVO software is installed and operating correctly.

This package contains the files for both Network Node Manager (NNM) and OVO. If you are running OVO you can choose to install both. (For integration installation information for HP OpenView NNM, refer to Chapter 7, *Integrating With HP OpenView NNM*.)

Configuring for OVO

Figure 5-1 illustrates the integration configuration for OVO.

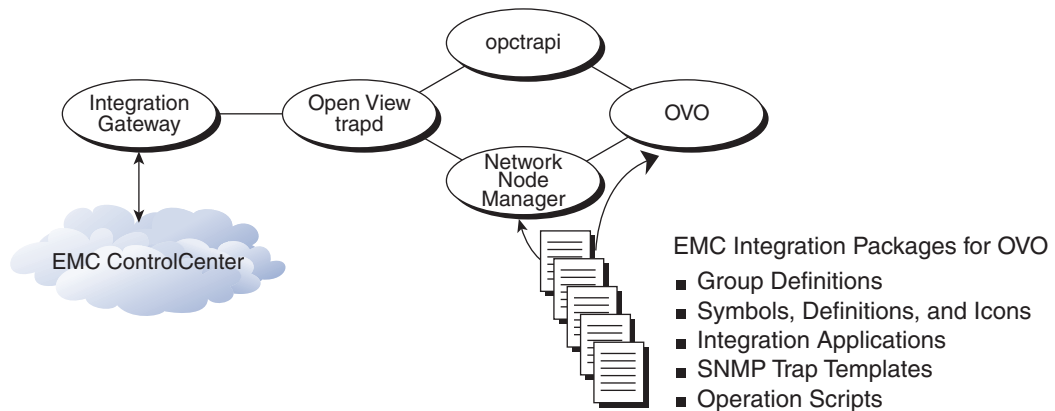


Figure 5-1 OVO Integration Configuration

Installing the Integration Package for OVO

Follow these steps to install the Integration Package for OVO:

1. Move the integration tar file to a disk directory. We suggest either `/usr/emc/ecc3pi` or `/opt/OV/emc`.
2. Go to that directory and unpack the tar file with the command:

```
tar -xvf ecc3pi_hpov.tar
```

3. Run the install script with the command:

install.sh

You are prompted to install the integration for NNM, VPO, or both. Enter the appropriate option.

Some scripts still use the terms VPO/ITO or VPO instead of OVO.

4. Follow the instructions displayed by the script. For OVO you need to assign user responsibilities in order to see EMC alarms and restart any open sessions.

Below is a sample installation script.

```
# install.sh

EMC ControlCenter Integration Packages for OpenView (UNIX) Installation

Select package to install:

    [1] HP OpenView Network Node Manager (NNM) integration
    [2] HP OpenView Operations (VPO/ITO) integration
    [3] Both NNM and VPO integrations

    [0] Exit this installation

Enter your choice: [0] 1

WARNING: This package is already installed on this system.
If you continue the installation then running integration programs
will be terminated and existing integration files will be overwritten.
Continue (y/n)? [y]

Install common files..
  Starting necessary OpenView processes..
  Installing symbols..
  Installing bitmaps..
  Loading mibs..
  Installing trap definitions..
Install common files complete.
Install NNM files..
  Starting necessary OpenView processes..
  Installing binaries..
  Installing registration files..
  Installing field definitions..
  Updating object database..
Install NNM files complete.

Installation complete.
#
```

Receiving ControlCenter Events

For reasons out of the scope of the ControlCenter integration with OVO, the following procedure may be necessary to receive ControlCenter events into the message browser:

OVO Administrators must reload their GUI if it is open and OVO users must restart their GUI sessions in order to see EMC integration.

OVO Administrators must configure users to see EMC Alarms. Update the responsibilities matrix for user `opc_adm` and any others to allow messages for EMC Node Group and EMC_Alarms Message Group.

1. Bring up OVO after the ControlCenter integration software is installed.
2. On the shell prompt, type `opcsv -stop`.
3. When the prompt is back, type `opcsv -start`.
4. When the server is started again, traps should begin to be received.
5. If events are still not being received, restart OVO.

Uninstalling the Integration Package

To uninstall the Integration Packages for OVO, do the following:

1. Go to the directory where you originally moved and unpacked the integration files, and then run the remove script, `remove.sh`.
2. Follow the instructions displayed by the script.

Some components cannot be removed automatically. You must manually delete NNM objects and OVO templates and icons.

Using the Integration Package for OVO

The Integration Package for OVO enables you to view the EMC Storage status from OVO displays. It also enables you to launch a ControlCenter application and work with specific ControlCenter managed objects.

The OVO Message Browser

The OVO Message Browser, Figure 5-2, is the Administrator's unique view of all active messages received at the OVO Management server. These messages come from the Integration Gateway as traps.

Ack	Cor	Severity	Date/Time	Source	Message
		Warning	Wed Sep 05 07:54:47	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Warning	Wed Sep 05 07:54:47	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Minor	Wed Sep 05 07:54:47	152.62.122.103	EMC Status trap: experimental.fcmgmt.connSet.connUnitTable.connUnitEn
		Warning	Wed Sep 05 07:54:47	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Minor	Wed Sep 05 07:55:25	152.62.122.103	EMC Status trap: experimental.fcmgmt.connSet.connUnitTable.connUnitEn
		Warning	Wed Sep 05 07:56:36	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Minor	Wed Sep 05 07:56:44	152.62.122.103	EMC Status trap: experimental.fcmgmt.connSet.connUnitTable.connUnitEn
		Warning	Wed Sep 05 07:56:49	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Warning	Wed Sep 05 07:56:49	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Warning	Wed Sep 05 07:56:50	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Warning	Wed Sep 05 07:56:50	152.62.122.103	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Minor	Tue Sep 11 09:39:02	losae063.lss.emc.com	EMC Status trap: experimental.fcmgmt.connSet.connUnitTable.connUnitEn
		Minor	Tue Sep 11 09:39:07	losae063.lss.emc.com	EMC Delete trap: experimental.fcmgmt.connSet.connUnitTable.connUnitEn
		Warning	Tue Sep 11 09:39:10	losae063.lss.emc.com	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn
		Normal	Tue Sep 18 09:32:40	losae063.lss.emc.com	EMC Gateway started on losae063.lss.emc.com
		Minor	Tue Sep 18 09:32:40	losae063.lss.emc.com	EMC Status trap: experimental.fcmgmt.connSet.connUnitTable.connUnitEn
		Minor	Tue Sep 18 09:32:40	losae063.lss.emc.com	EMC Delete trap: experimental.fcmgmt.connSet.connUnitTable.connUnitEn
		Warning	Tue Sep 18 09:32:40	losae063.lss.emc.com	EMC Event trap: experimental.fcmgmt.connSet.connUnitEventTable.connUn

3408 Alarms - Critical:0 Major:0 Minor:533 Warning:2874 Normal:1

Figure 5-2 OVO Message Browser

From the Message Browser you can select and view specific EMC events by double-clicking on the desired event. Details of the event appear in the Message Details window (Figure 5-3).

Message Details					
Node	EMC_View				
Application	EMC_ControlCenter				
Message Group	EMC_Alarms				
Object	10sae036.1ss.emc.com				
Source	SnmpTrap:EMC_Traps				
Annotations	0				
Attributes	0				
Message ID	a26-699a-71d5-08b2-ac1792380000				
Forwarding Manager	0				
Severity	Normal				
Service Name	0				
Message Key	0				
Message Type	0				
Time Created on Managed Node	06/25/01 14:43:58				
Time Received on Mgmt. Server	06/25/01 14:43:58				
Number of Duplicates	0				
Time Last Received on Mgmt. Server	0				
Owned by	0 at 0				
Message Text					
EMC Gateway started on 10sae036.1ss.emc.com					
Actions					
	Status	Node	Command	Anno.	Ackn.
Automatic	0	0	0	No	No
Operator Initiated	0	0	0	No	No
Notification	0	0	0	0	0
Trouble Ticket	No	0	0	0	No
Escalations					
Escalated to	0	by	0	at	0
Instructions... Show Original Message... Own Modify...					
Close Highlight Annotations... Acknowledge Help					

Figure 5-3 Message Details Window

Launching the Message Browser

You can launch the Message Browser from any top-level screen. Follow these steps:

1. On the menu bar of the desired screen, select **Window**. The Window pop-up menu appears (Figure 5-4 on page 5-10).
2. From the Window pop-up menu, select **Message Browser**. OVO displays the Message Browser (Figure 5-2).

Accessing EMC Groups, Nodes, and Specific Events

There are several ways to launch the Message Browser for EMC-specific events. You can start from any top-level screen (such as the Application Bank) and select **Window** on the menu bar.

The Window pop-up menu appears, Figure 5-4 on page 5-10, giving you several options to view OVO groups that contain specific EMC groups and nodes.

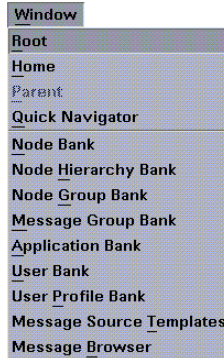


Figure 5-4 Window Pop-up Menu

Node Group Bank If you select **Node Group Bank** from the Window pop-up menu, the ITO Node Group Bank window appears (Figure 5-5).

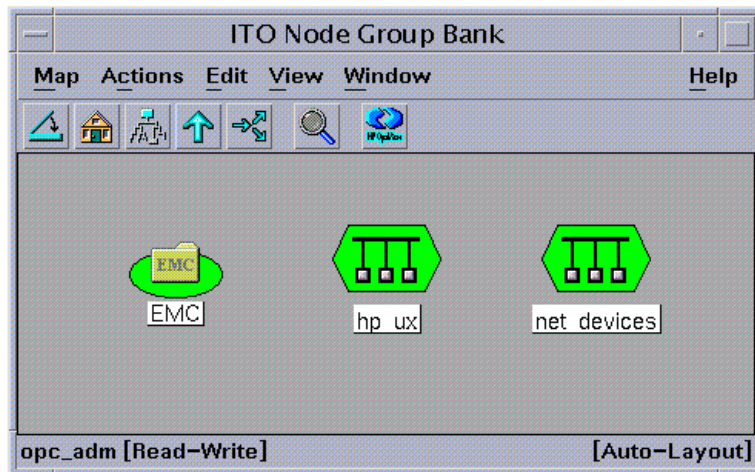


Figure 5-5 Node Group Bank

To launch the Message Browser, right-click the **EMC icon**, and select **Message Browser** from the pop-up menu.

Additionally, if you double-click the **EMC icon**, the Node Group EMC window appears (Figure 5-6).

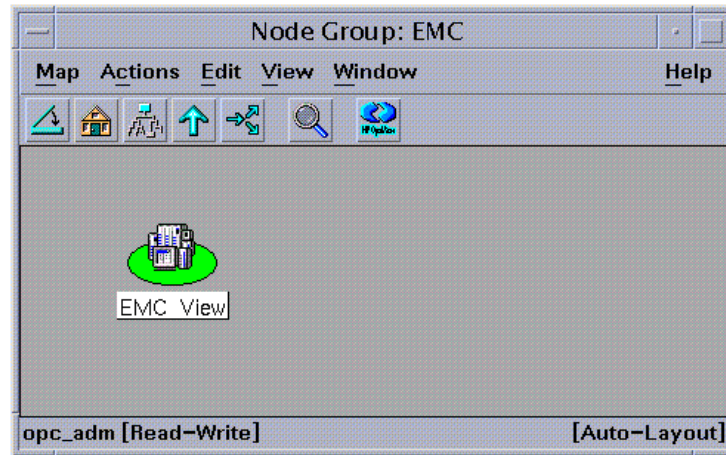


Figure 5-6 Node Group EMC

To launch the Message Browser, right-click **EMC View**, and select **Message Browser** from the Window pop-up menu.

Message Group Bank

If you select **Message Group Bank** from the Window pop-up menu, the ITO Message Group Bank window appears (Figure 5-7). Right-click **EMC Alarms**, and then select **Message Browser** from the pop-up menu to display the Message Browser for EMC-specific events (Figure 5-7).

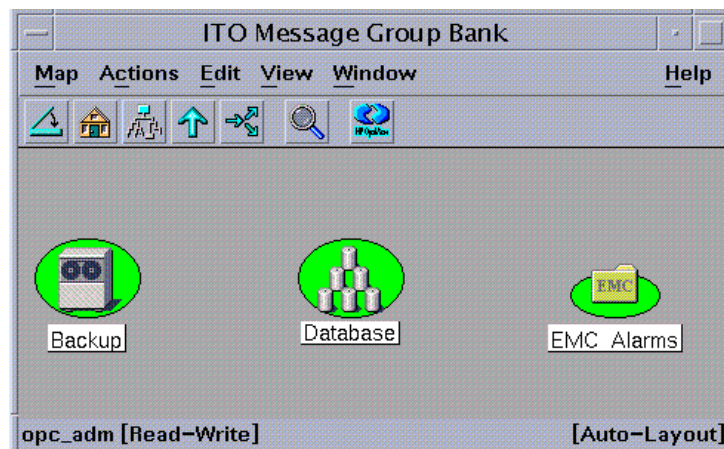


Figure 5-7 Message Group Bank

Message Source Templates

Integration Packages adds OVO message templates that define the traps sent by the Integration Gateway.

To access the message source templates, select **Message Source Templates** from the Window pop-up menu.

The system displays the Message Source Templates window (Figure 5-8).

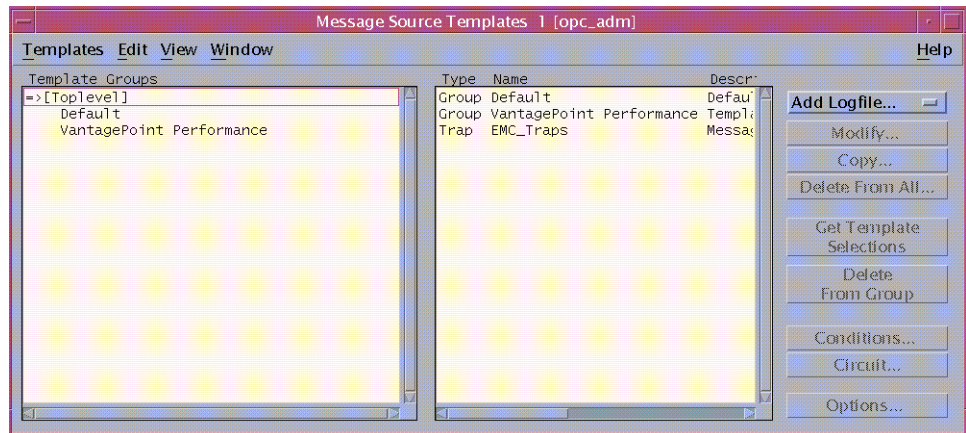


Figure 5-8 Message Source Templates

Customizing EMC Event Actions

You may want the system to perform certain actions when it receives EMC-specific events. You can specify these actions by customizing the templates found in the Message Source Templates window.

To customize EMC event actions, follow this procedure:

1. In the Message Source Templates window, Figure 5-8, double-click **EMC_Traps**.

The Message and Suppress Conditions window appears (Figure 5-9).

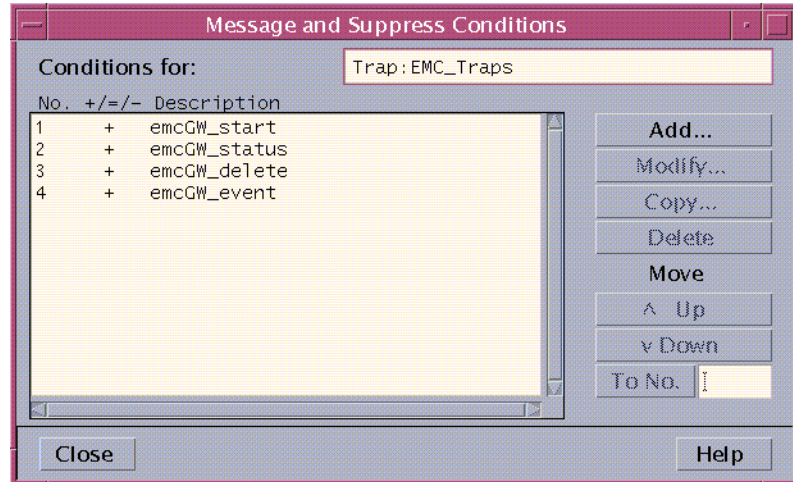


Figure 5-9 Message and Suppress Conditions

2. Select one of the four EMC event types, and then click **Modify**. The SNMP Trap Condition window appears (Figure 5-10).

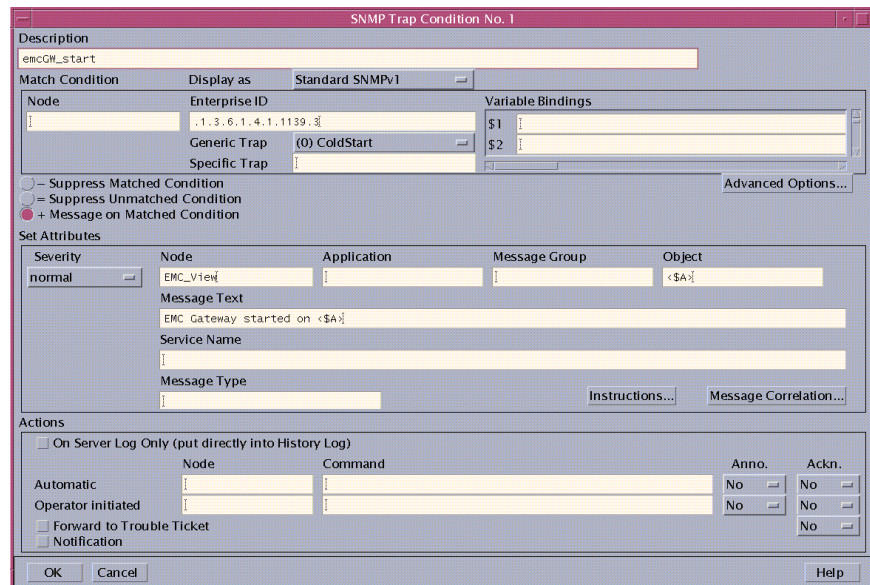


Figure 5-10 SNMP Trap Condition

3. Make your modifications in this window.

Launching EMC ControlCenter

The Integration Packages for OVO enable you to launch ControlCenter from the OVO Management Server.

To launch EMC ControlCenter:

1. Select **Application Bank** from the Windows pop-up menu.
The ITP Application Bank window appears (Figure 5-11).
2. Double-click the **EMC ControlCenter** icon to launch ControlCenter.

You can also right-click the **EMC ControlCenter** icon, and then select **Execute** from the pop-up menu to launch ControlCenter.

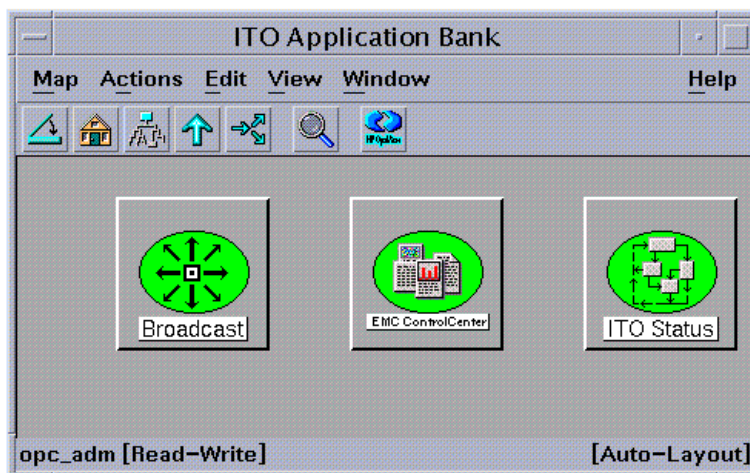


Figure 5-11 Application Bank

Integrating With CA Unicenter

This chapter describes how to install, configure, and operate Integration Packages with CA Unicenter.

- ◆ Overview6-2
- ◆ Components6-3
- ◆ Installing and Configuring for Unicenter6-4
- ◆ Using the Integration Package for Unicenter6-12

Overview

The Integration Package for CA Unicenter integrates EMC ControlCenter functionality into CA Unicenter to provide a unified approach for enterprise system management.

This is an active integration. (Refer to *Active Integration* on page 2-4.)

CA Unicenter

Unicenter by Computer Associates is a suite of products that lets you manage your storage environment at the enterprise level. These products are built on an object-oriented, multitiered architecture and flexible manager or client infrastructure.

The basic architecture of Unicenter includes a user interface, a common object repository, various managers, and agents.

Integration Package for CA Unicenter

The Integration Package for CA Unicenter enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use Unicenter software look and feel in combination with ControlCenter storage management functionality.

Components

The Integration Package for Unicenter incorporates ControlCenter events into Unicenter software where they can be processed.

The Integration Package for Unicenter includes the following components:

- ◆ Application files (bin directory) — Including:
 - Install and remove batch files
 - Integration application — `ecc3pi`
 - Trap test application — `ecc3pi_test`
 - ControlCenter launch batch file (`ecc_launch.bat`)

Settings for launching the ControlCenter Console appear in `ecc_launch.bat`. The ControlCenter Console is launched from a default location. However if your Console is located in a directory other than the default, refer to *Configuring Console for Launch* in *Appendix B, Configuration Settings* on Page B-5.

- ◆ Icons for managed objects in the TNG 2-D World View
- ◆ Icons and images for Unicenter 3.0 Explorer 2-D and 3-D views
- ◆ Images for managed objects displayed in the TNG 3-D World View
- ◆ MIBs implemented by the Integration Gateway and used by the Integration Packages `gateway.mib` and `fcmgmt.mib`
- ◆ Models working in conjunction with images to define the managed objects in TNG 3-D World View
- ◆ Trix files (TNG Repository Import Export Utility) which include:
 - Definitions for ControlCenter objects and events
 - Files used to add and remove these definitions from the TNG Repository

Installing and Configuring for Unicenter

You must have Integration Packages installed on your system, as well as Unicenter.

The Integration Packages detects whether or not Unicenter 3.0 is installed and, if so, installs additional components.

The installation of these products is not discussed in this manual. For further information please see the following guides:

- ◆ EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1
- ◆ Unicenter TNG Getting Started

Make sure Unicenter is running properly before beginning the installation of the Integration Packages.

Configuration

Figure 6-1 illustrates the configuration of the Integration Package for Unicenter.

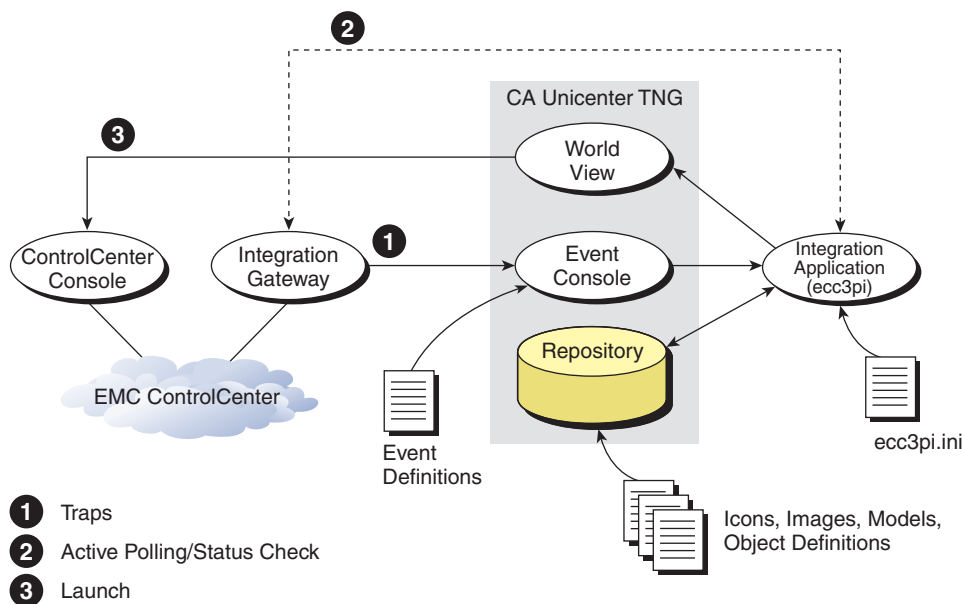


Figure 6-1 Unicenter Integration

Installing the Integration Package for Unicenter

Integration Packages uses a configuration file called `ecc3pi.ini`, which is created in TNG's bin directory. This file contains grouping for polling, SNMP, and Repository attributes.

The Integration Package installation for Unicenter contains an Install Wizard. Before you begin this installation, uninstall any previous versions of the Integration Package, and make sure that Unicenter is operating properly.

The default file location for the Integration Package is
`C:\ecc\ecc3pi`

Assign Privileges

Before you install the Integration Package, ensure that users are assigned privileges so that they can issue commands when using the Integration Package.

Select **Start, Programs, Unicenter TND, Enterprise Management, EM Settings**.

Edit the **Users authorized to issue commands** field shown in Figure 6-2 to assign these privileges. Enter specific user names or place a star (*) in the Setting column to authorize *all* users.

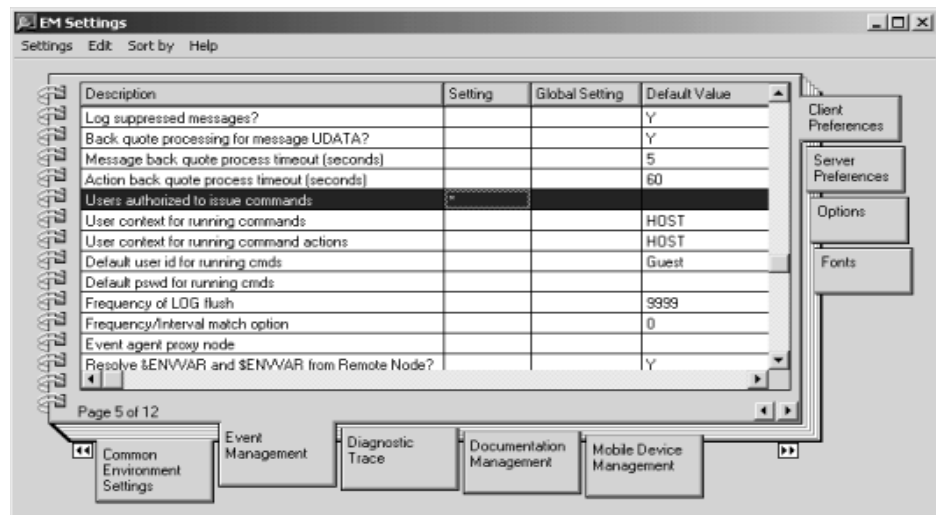


Figure 6-2 Unicenter Settings Window

Installation Procedure

The Integration Packages is a client application installed from the ECC Server (http://<ecc_server>:30000). It contains the Integration Packages for all of the supported third-party frameworks. For information on this installation, refer to the *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*.

The Integration Packages software for Unicenter is located in the Win32 directory.

Follow these steps to install the Integration Packages for Unicenter:

1. Enable the Windows *Guest* account.

Because of permission limitations, the Windows *Guest* account must be enabled for the installation. After the installation is completed and functionality of the integration confirmed, the Guest account can be disabled or set to its original state.

2. From the Win32 directory, double-click `setup.exe`.

The Install Shield starts and the Welcome screen appears (Figure 6-3).

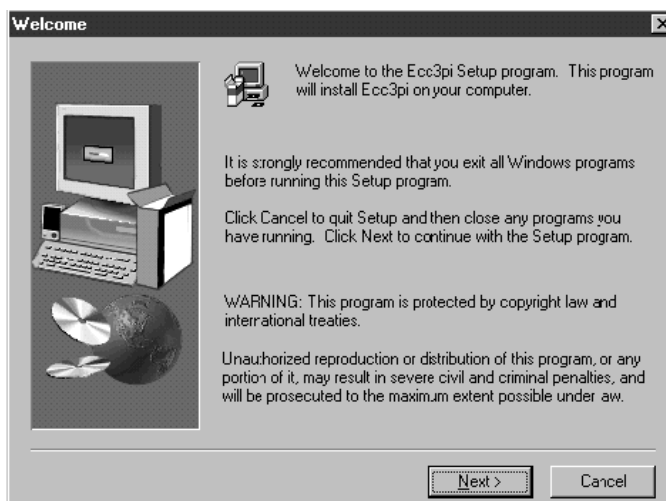


Figure 6-3 Welcome Screen

3. Click **Next** in the Welcome screen.

The Software License Agreement window appears (Figure 6-4).

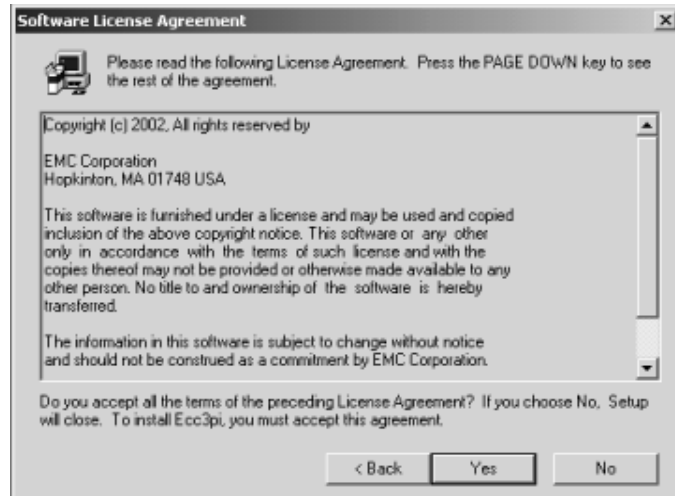


Figure 6-4 Software License Agreement Screen

4. Click **Yes** in the Software License Agreement screen.
The Select Components window appears (Figure 6-5).



Figure 6-5 Select Components Window

5. Select the **CA Unicenter Integration** checkbox, and then click **Next**.

The Select Destination window appears (Figure 6-6).



Figure 6-6 Select Destination Window

6. Click **Next** in the Select Destination window to accept the default destination location, or select a location from the **Browse** option, and then click **Next**.

The Information window appears (Figure 6-7).

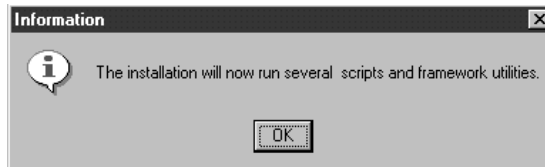


Figure 6-7 Information Window

7. Click **OK**.

A Windows NT Command window and the Repository Selection window appear (Figure 6-8 on page 6-9).

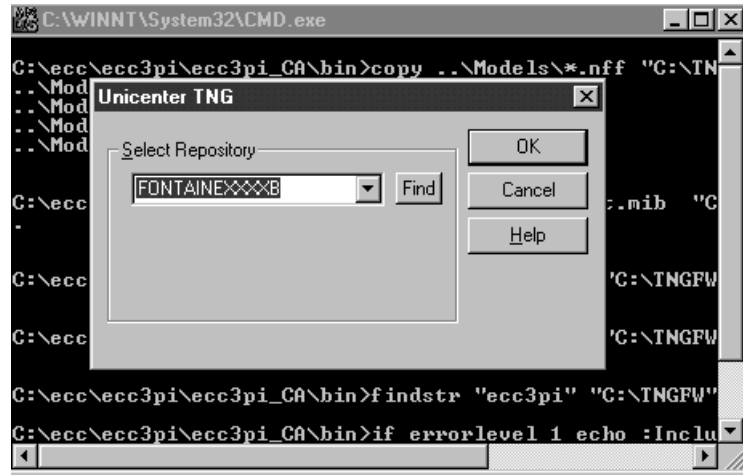


Figure 6-8 Command and Repository Windows

8. Scroll through the list of your Repositories, and then select the one you want to use with the Integration Package; then click **OK**.

The Command window displays the `install.bat` file including the Trix utility, and shows the movement of the files into TNG directories.

If you are using Unicenter 3.0, then Figure 6-8 appears again as the installation loads 3.0-specific information into the Repository.

You are prompted to start the Integration application as a service with the following window (Figure 6-9):

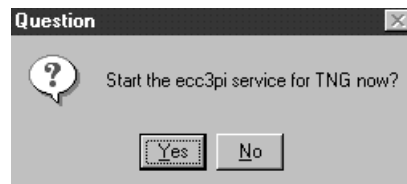


Figure 6-9 Start Service

9. Click **Yes**.

If Unicenter *is* running, the Setup Complete window appears (Figure 6-11 on page 6-10). Click **Finish**. Your installation is complete.

10. If Unicenter *is not* running, the system displays Figure 6-10. Select the desired Repository, and then click **OK**.

The Setup Complete window appears (Figure 6-11). Click **Finish**. Your installation is complete.

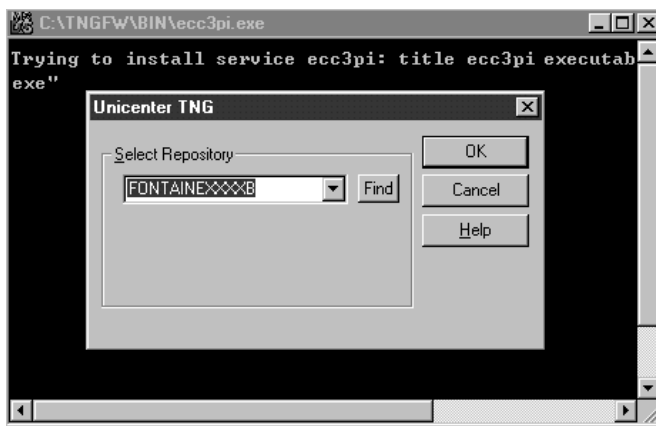


Figure 6-10 Trying to Start Service



Figure 6-11 Setup Complete Window

11. After you complete the installation and setup of the integration, the Windows Guest account that you created in Step 1 can be disabled or set to its original state.

Uninstalling the Integration Package

To uninstall the Integration Package for Unicenter, follow these steps:

1. Go to the directory where you installed the `ecc3pi` folder, and open the folder.
2. Double-click on `uninstall.bat`.

A command prompt window appears displaying the deletion process.

3. Go to Control Panel, and then double-click **Add/Remove Programs**.

The Add/Remove Programs window appears (Figure 6-12).

4. Select **Ecc3pi**, click **Add/Remove**.

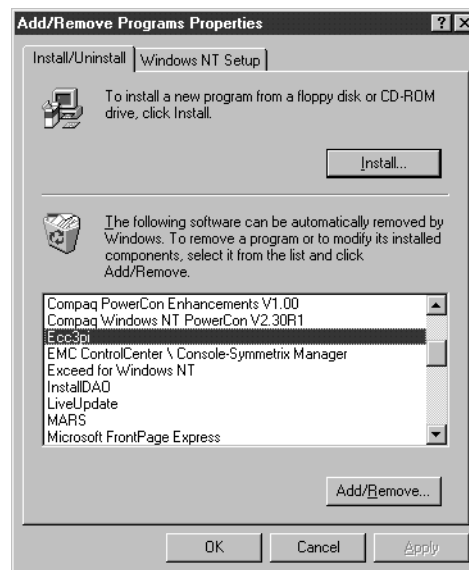


Figure 6-12 Add/Remove Programs Properties

Using the Integration Package for Unicenter

The Integration Package for CA Unicenter provides support for ControlCenter-managed objects. It enables you to view object status and perform specific ControlCenter functions.

The sections that follow explain how you use the Integration Package with Unicenter.

Starting the Integration Application

The Integration application for Unicenter runs as a Windows NT Service that starts automatically when you restart your system.

Starting Unicenter

- ◆ To start Unicenter 2.4 using either the 2-D Map View, or the 3-D Map View:
 - Select **Start, Programs, Unicenter TNG, 2-D Map** or **3-D Map**.
- ◆ To start Unicenter 3.0:
 - Select **Start, Programs, Unicenter TND, WorldView, 2-D Map**.

The Integration Package supports 2-D, 3-D, and Explorer Maps; however, the remainder of this section provides only 2-D samples.

EMC View

The EMC View is the top-level view and starting point from which you monitor the status of ControlCenter-managed objects. It is a graphical representation of objects and status information retrieved by the Integration application from the Integration Gateway. The Integration application maintains the status of the objects by processing traps received from the Integration Gateway and by periodically polling it.

Figure 6-13 shows a sample 2-D Map with an EMC View icon, and its submap that contains an icon for the server and each managed object.

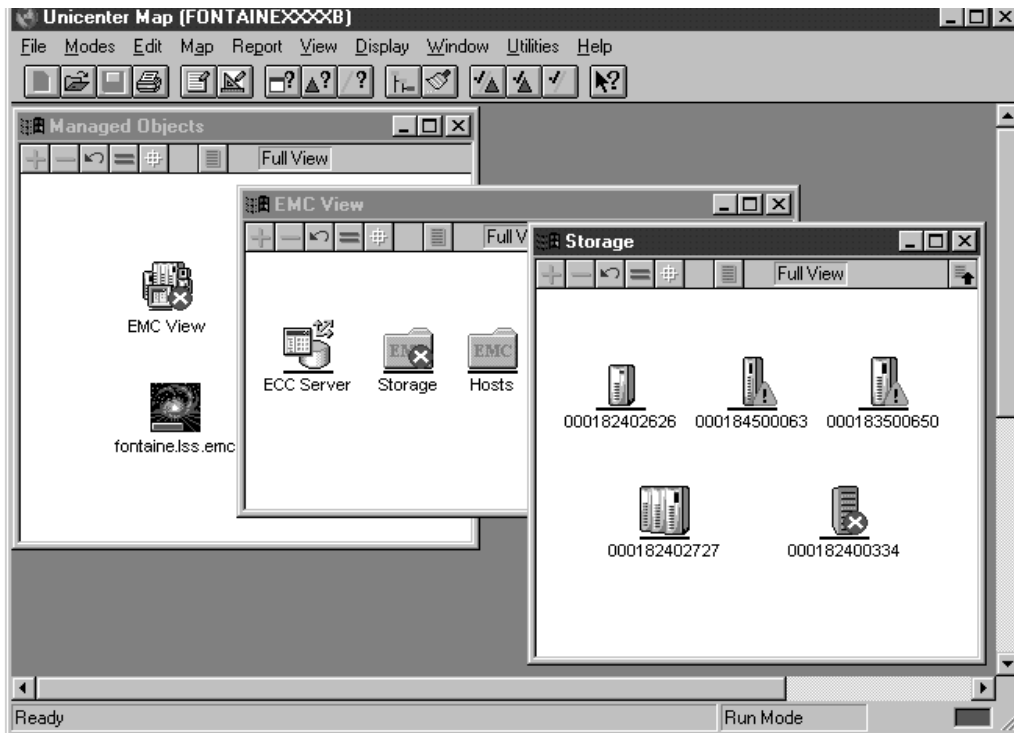


Figure 6-13 Managed Objects with EMC View

Icon Status Indicators

ControlCenter managed object icons contain an indicator in the lower right corner to indicate the status of the object. The EMC View icon is an aggregated status representing the highest severity status of the components that are included in the EMC View.

The EMC icons are explained in Table 6-1.

Table 6-1 EMC View Icon Status Indicators

Icon	Indicator	Status
	None	Normal—The status of the object is Normal.
	Blue Question Mark	Unknown—The status of the object is Unknown.
	Yellow Exclamation Point	Warning—The status of the object is Warning.
	Red X	Critical—The status of the object is Critical.

Status Colors in the 3-D Map View

Status is indicated on the 3-D images as colored balls. They are described in Table 6-2.

Table 6-2 3-D Maps View Icon Color Status

Color	Status
No ball	Normal—The status of the EMC View is Normal.
Gray	Unknown—The status of the object is Unknown.
Yellow	Warning—The status of the object is Warning.
Red	Critical—The status of the object is Critical.

NOTE: The actual status indicators displayed in the framework for the EMC View and any group (folder) icons are dependent on the internal status propagation rules used by the framework. Depending on the framework, this means that the EMC View or any group icon may be set to the highest severity of its contained objects or calculated based on the severity of all contained objects. Consult your framework documentation for specific status propagation rules.

Expanding the EMC View

To expand the EMC View, double-click the **EMC View** icon to display all objects being managed by ControlCenter including the server and storage devices.

Getting Information About EMC Objects

If you left-click on any EMC icon, a cross hair appears (Figure 6-14), that contains textual information about the object. The cross hair is highlighted in yellow.

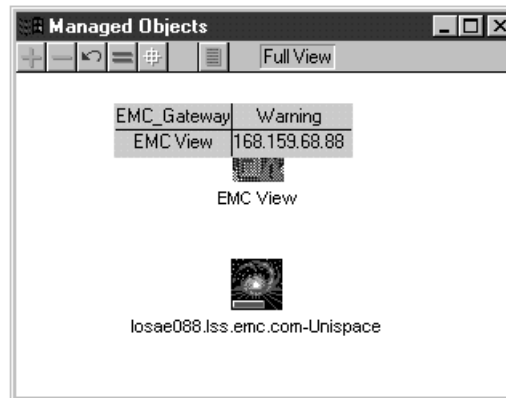


Figure 6-14 Cross Hair View

The cross hair displays the object information in sections described below:

- ◆ Upper left — Object type
- ◆ Upper right — Status
- ◆ Lower left — Label
- ◆ Lower right — IP address (Only appears with EMC View icon.)

Discovering an Integration Gateway

Automatic Discovery

The Integration application automatically discovers the Integration Gateway. The Integration Gateway sends a `coldStart` trap to Unicenter. The Integration application processes the trap and adds an EMC View icon to the Managed Objects map, and then performs a discovery of all managed objects.

Manual Discovery

You can manually discover an Integration Gateway by adding an EMC View object to the topology map.

Follow these steps to add Integration Gateway:

1. Select **Start, Programs, Unicenter TND, WorldView, Object Browser**. Select **Unicenter repository host**.

- After the Object Browser application loads, expand the tree root **TNGRoot**, **ManagedObjects** node, and select node **EMC_Gateway** (Figure 6-15).

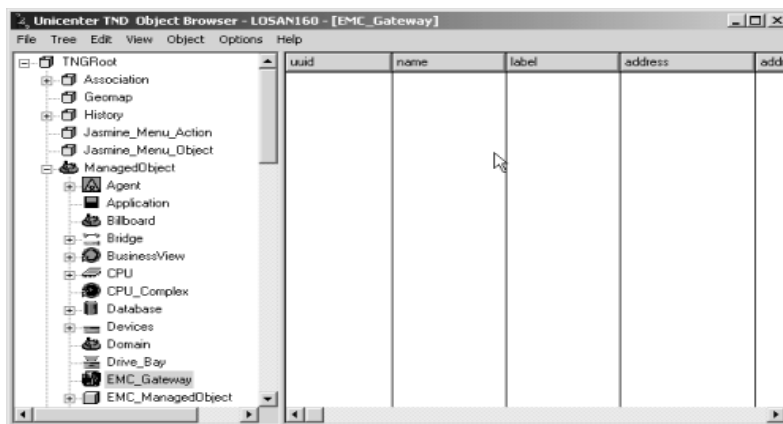


Figure 6-15 Unicenter TND Object Browser Console

- Select **Object, New**.

The Managed Object Notebook window appears (Figure 6-16).

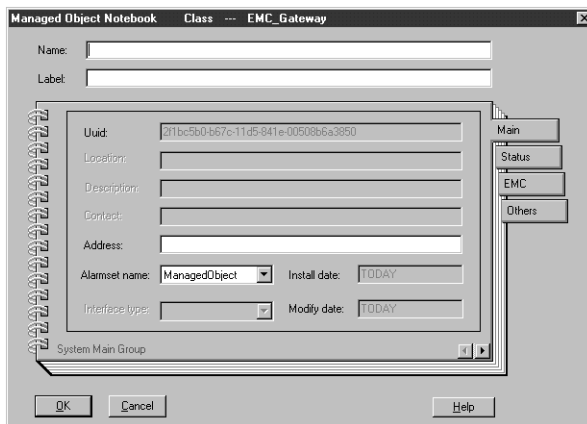


Figure 6-16 Managed Object Toolbox

- Enter the name of the object in the **Name** field.
- Enter the label information in the **Label** field.

6. Click the **EMC** tab on the right side of the window.

The Managed Object Details window appears (Figure 6-17).

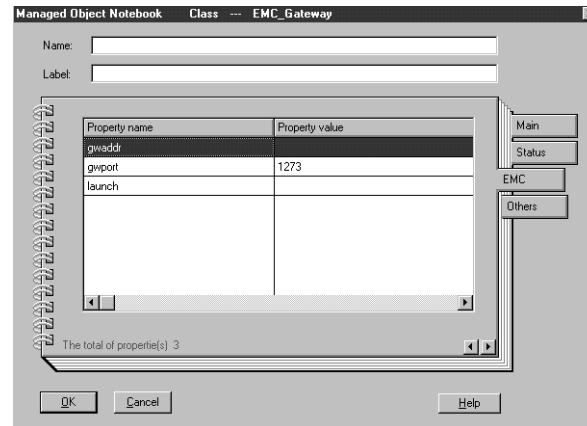


Figure 6-17 Managed Object Details

7. In the **gwaddr** field, enter the IP address of the current Integration Gateway.
8. In the **gwport** field, enter the port number the Integration Gateway uses. The default is 1273.
9. In the **launch** field, enter **ECC Console** (this is the application you want to launch).
10. Click **OK**.

An EMC View icon appears with the specified label.

11. When the icon appears, right-click the icon, and then select **Refresh** from the functions pop-up menu.

If you do not perform the manual refresh, the Integration application automatically refreshes on the next polling cycle.

The Integration application discovers all ControlCenter managed objects and adds them to the topology. All discovered objects, including the server, appear in the EMC View window.

The Integration application provides launch and refresh functions described in the following sections.

Launch The Integration Package for Unicenter enables you to launch the ControlCenter Console and track the status of ControlCenter managed objects.

To launch the ControlCenter Console, follow these steps:

1. Right-click an **EMC** icon.
2. Select **Launch** from the pop-up menu (Figure 6-18).

Refresh Refreshing the EMC View lets you discover the Integration Gateway and all managed objects, add new objects to the topology, and set the status of all objects.

To refresh the EMC View follow these steps:

1. Right-click an **EMC** icon.
2. Select **Refresh** from the pop-up menu (Figure 6-18).

The status of any objects in the topology that are no longer managed by ControlCenter will be deleted from the Integration Gateway MIB and updated to Unknown.

Refreshing a single object, such as a Symmetrix system, updates its status.

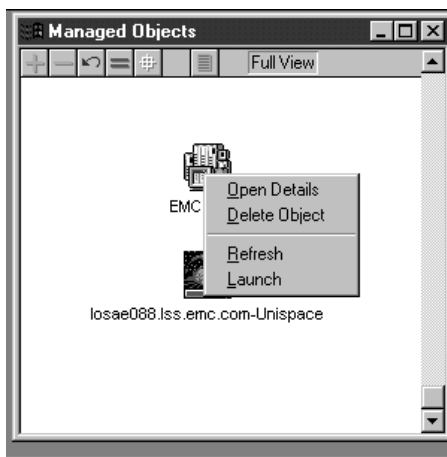


Figure 6-18 Refresh EMC View

Tracking Managed Object Status

By opening the TNG Update Log window (Figure 6-19) and the Network Alarm window (Figure 6-20) you can track all changes and actions taken since the TNG session started. These log windows show when changes are made to objects in the Repository (such as adding and deleting).



Figure 6-19 Update Log

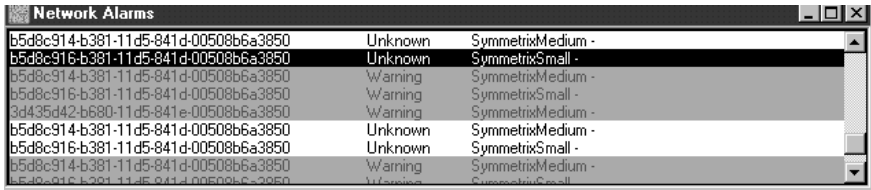


Figure 6-20 Network Alarms

Unicenter Console Messages

From the Unicenter Console (Figure 6-21 on page 6-20) you can view event logging. For example, in the Update Log display area you can view:

- ◆ Integration Gateway traps that are received by Unicenter
- ◆ Status of the Integration application

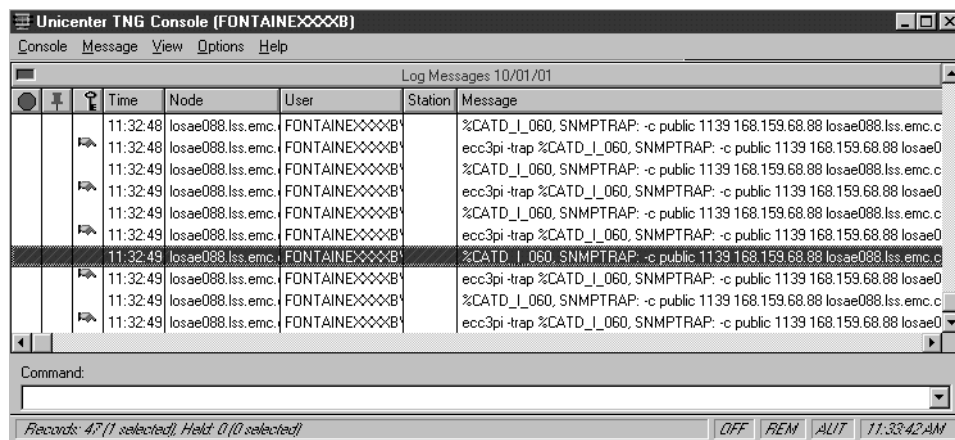


Figure 6-21 Unicenter Console

The CA Trapd process must be running in order for Unicenter to receive traps and forward them to ecc3pi for processing.

With Integration Gateway traps, you see two entries in the TNG Console. The first entry is the trap that TNG received. TNG creates the second entry when it invokes ecc3pi to process the trap.

- ◆ If traps do not appear in the TNG Console, enter the following in the **Command** field:

catrapd start

To obtain more information on an event, double-click the event in the TNG Console. The event Details window appears (Figure 6-22).

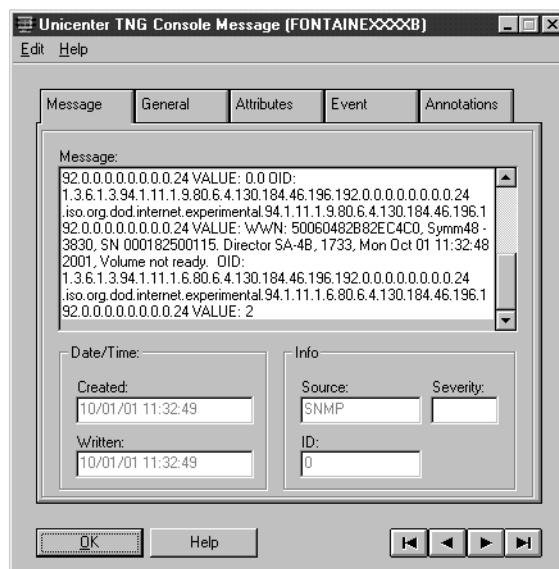


Figure 6-22 Details Window

Integrating With HP OpenView NNM

This chapter describes how to install, configure, and operate the Integration Packages with HP OpenView Network Node Manager (NNM).

- ◆ Overview 7-2
- ◆ Components 7-3
- ◆ Installing and Configuring for OpenView NNM 7-4
- ◆ Using the Integration Package for OpenView NNM 7-11

Overview

The Integration Package for OpenView NNM integrates EMC ControlCenter functionality into the OpenView NNM framework to provide a unified approach for enterprise system management.

This is an active integration. (Refer to *Active Integration* on page 2-4.)

OpenView NNM

HP OpenView products support IT service management with a set of flexible and scalable tools. They can help you manage individual hardware and software elements in a business-oriented perspective of response times and overall system availability. HP OpenView consists of many products that address different aspects of the process.

Network Node Manager (NNM) is the foundation from which most of the HP OpenView products operate. NNM functions as a solution on its own or can collect data for, and forward data to, other HP OpenView products.

Integration Package for OpenView NNM

The EMC ControlCenter Integration Package for OpenView NNM enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use OpenView NNM software look and feel in combination with ControlCenter storage management functionality.

Components

The Integration Package for OpenView NNM incorporates ControlCenter events into OpenView NNM software where they can be processed.

The Integration Package for OpenView NNM includes the following components:

- ◆ Application files (bin directory) including:
 - Install and remove batch files
 - Integration application (ecc3pi)
 - Trap test application (ecc3pi_test)
 - ControlCenter launch batch file (ecc_launch.bat)

Settings for launching the ControlCenter Console appear in `ecc_launch.bat`. The ControlCenter Console is launched from a default location. However if your Console is located in a directory other than the default, refer to *Configuring Console for Launch* in Appendix B, *Configuration Settings*, on page B-5.

- ◆ Bitmaps for managed object icons in the OpenView Windows
- ◆ MIBs implemented by the Integration Gateway and used by the Integration Package `gateway.mib` and `fcmgmt.mib`
- ◆ Symbols working in conjunction with the bitmaps to define the class of managed objects
- ◆ Registration files used to register the Integration application, traps, and fields with NNM

Installing and Configuring for OpenView NNM

You must have Integration Packages installed on your system, as well as OpenView NNM.

The installation of these products is not discussed in this manual. For further information, see the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *Managing Your Network with HP OpenView Network Node Manager*

Make sure OpenView NNM is running properly before beginning the installation of the Integration Package for OpenView NNM.

Configuration

Figure 7-1 illustrates the configuration of the Integration Package for OpenView NNM.

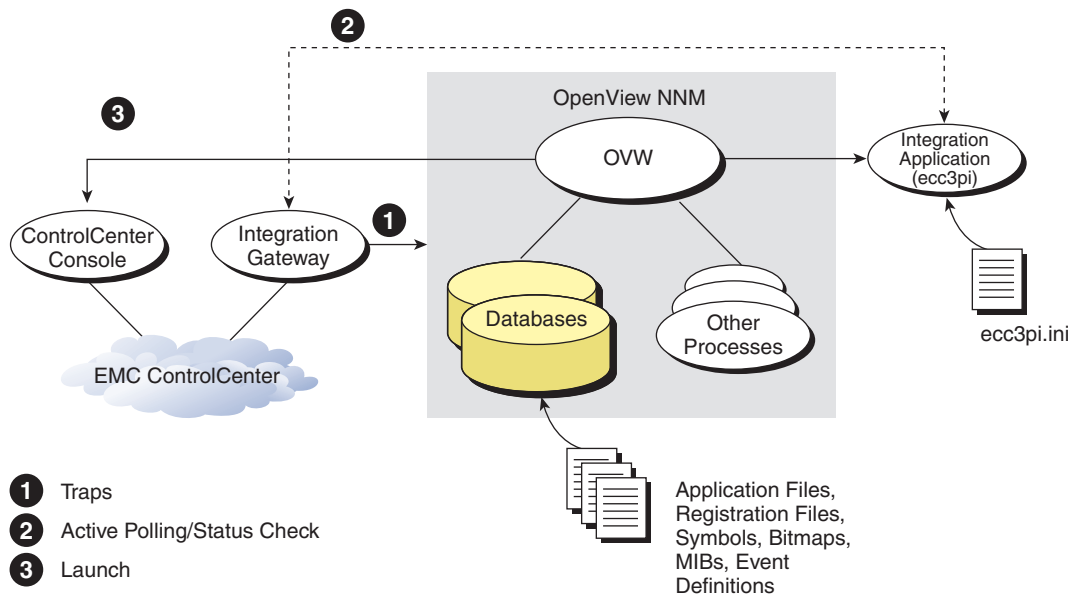


Figure 7-1 OpenView NNM Integration

The Integration Package uses a configuration file called `ecc3pi.ini` which is created in OpenView NNM's bin directory. This file contains groupings for polling and SNMP attributes.

Installing the Integration Package for OpenView NNM

The Integration Package's installation for OpenView NNM contains an Install Wizard. Before you begin this installation, uninstall any previous versions of the Integration Packages and make sure that OpenView NNM is operating properly.

The default file location for the Integration Package for NNM is `C:\ecc\ecc3pi`.

Installation Procedure

The Integration Packages is a client application installed from the ECC Server. It contains the Integration Packages for all of the supported third-party frameworks. For information on this installation, refer to the *EMC ControlCenter 5.2 Planning and Installation Guide, Volume1*.

The Integration Package software for OpenView NNM is located in the Win32 directory.

Follow these steps to install the Integration Package for OpenView NNM:

1. From the Win32 directory, double-click `setup.exe`.

The Install Shield starts and the Welcome screen appears (Figure 7-2).



Figure 7-2 Welcome Screen

2. Click **Next** in the Welcome screen.

The Select Components Window appears (Figure 7-3).

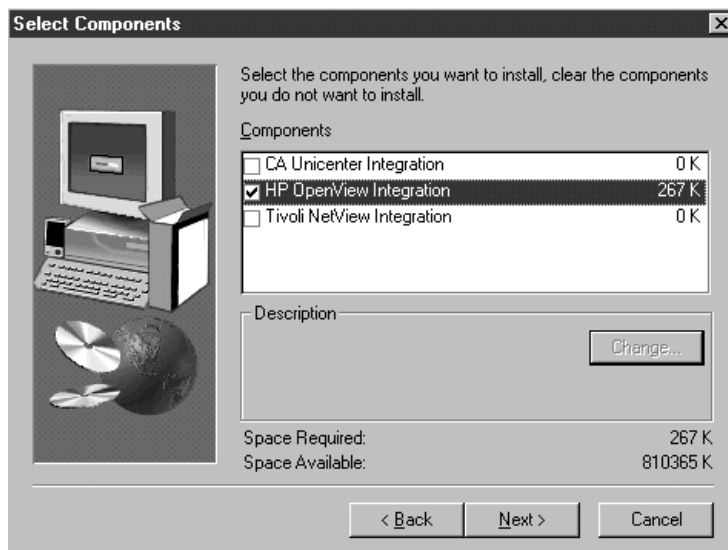


Figure 7-3 Select Components Window

3. Select the **HP OpenView Integration** checkbox, and then click **Next**.

The Select Destination window appears (Figure 7-4).



Figure 7-4 Select Destination Window

4. Click **Next** in the Select Destination window to accept the default destination location, or select a location from the **Browse** option, and then click **Next**.

The Information window appears (Figure 7-5).

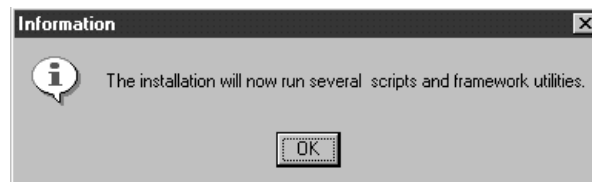


Figure 7-5 Information Window

5. Click **OK**.

A Windows NT command window appears (Figure 7-6 on page 7-8), as well as the NNM Console Output Display window (Figure 7-7 on page 7-8).

6. Close the Command window and the Console Output Display window.

The Setup Complete window appears (Figure 7-8).

7. Click **Finish**. Your installation is complete.



Figure 7-8 Setup Complete Window

Uninstalling the Integration Package

To uninstall the Integration Package for OpenView NNM, follow these steps:

1. Go to the directory where you installed the `ecc3pi` folder and open the folder.
2. Double-click `uninstall.bat`.

A command prompt window appears displaying the deletion process.

3. Go to Control Panel and double-click **Add/Remove Programs**.

The Add/Remove Programs properties window appears (Figure 7-9 on page 7-10).

4. Select **Ecc3pi** and then click **Add/Remove**.

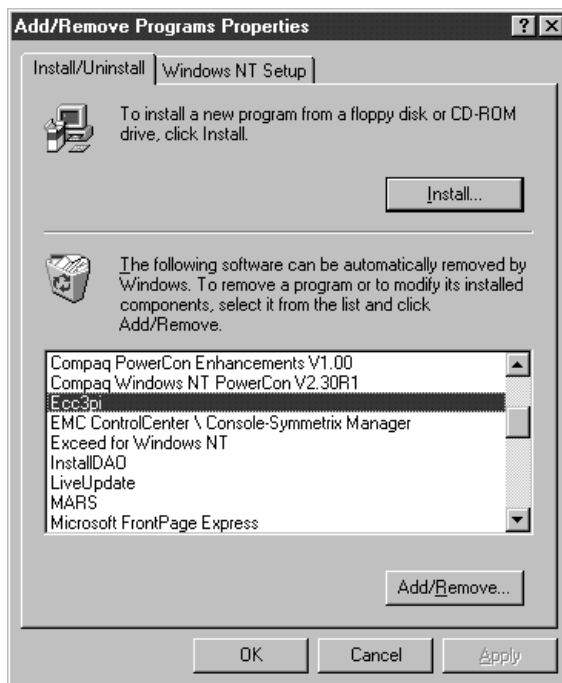


Figure 7-9 Add/Remove Programs Properties

Using the Integration Package for OpenView NNM

The Integration Package for OpenView NNM provides support for ControlCenter managed objects. It enables you to view object status and perform specific ControlCenter functions.

The sections that follow explain how you use the Integration Package for OpenView NNM.

Starting the Integration Application

The Integration application for OpenView NNM runs as an OpenView application that starts automatically when you start NNM.

Starting OpenView NNM on Windows

To start NNM on Windows:

- ◆ Select **Start, Programs, HP OpenView, Network Node Manager**.

Starting OpenView NNM on UNIX

To start NNM on UNIX:

- ◆ Enter the following commands:

```
cd /opt/OV/bin  
./ovw&
```

The Integration Package supports both Window and UNIX maps, however, the remainder of this section provides Windows map samples.

EMC View

The EMC View is the top-level view and starting point from which you monitor the status of ControlCenter managed objects. It is a graphical representation of objects and status information retrieved by the Integration application from the Integration Gateway. The Integration application maintains the status of the objects by processing traps received from the Integration Gateway and by polling periodically.

Figure 7-10 on page 7-12 shows a sample root map with an EMC View icon. Figure 7-11 on page 7-12 shows the EMC View submap that contains an icon for the server and each managed object.

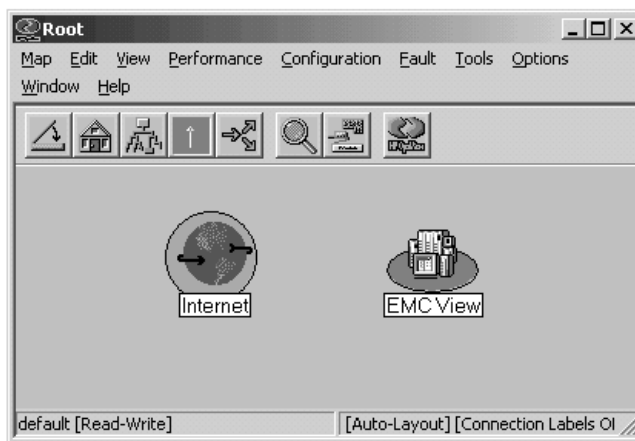


Figure 7-10 Root Topology Window

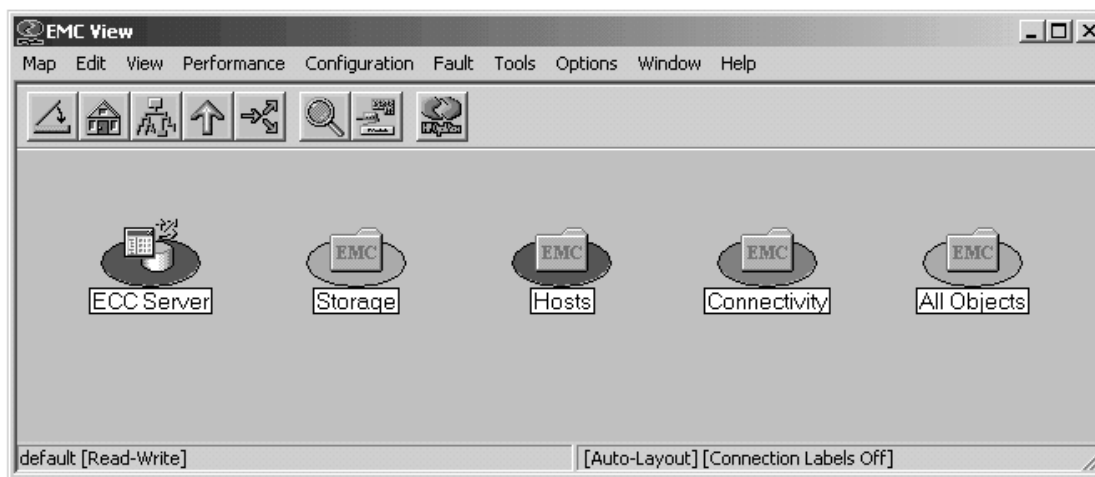


Figure 7-11 EMC View Window

Icon Status Indicators

ControlCenter managed object icons use a color scheme to indicate the status of an object. The EMC View icon is an aggregated status representing the highest severity status of the components that are included in the EMC View.

The EMC icons are explained in Table 7-1.

Table 7-1 EMC View Icon Status Indicators

Icon	Color	Status
	Green	Normal—The status of the object is Normal.
	Blue	Unknown—The status of the object is Unknown.
	Yellow	Warning—The status of the object is Warning.
	Red	Critical—The status of the object is Critical.

Note: The actual status indicators displayed in the framework for the EMC View and any group (folder) icons are dependent on the internal status propagation rules used by the framework. Depending on the framework, this means that the EMC View or any group icon may be set to the highest severity of its contained objects or calculated based on the severity of all contained objects. Consult your framework documentation for specific status propagation rules.

Expanding the EMC View

To expand the EMC View, double-click the **EMC View** icon to display all objects being managed by ControlCenter, including the server and storage devices (Figure 7-11 on page 7-12).

Expanding Groups

Double-click on any group object (shown as a folder icon), to view the objects contained within the group. For example, if you click on the Storage icon in Figure 7-11, a screen appears displaying the objects contained in the storage group (Figure 7-12 on page 7-14).

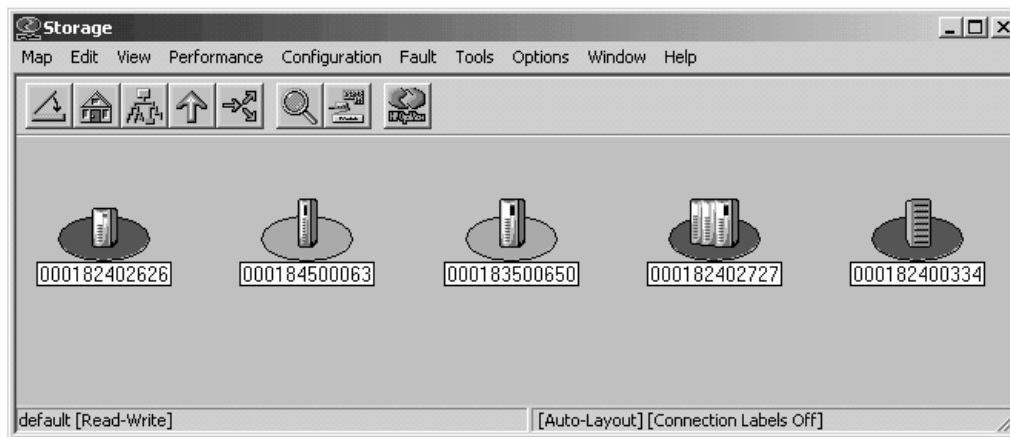


Figure 7-12 Storage Group Objects

Getting Information About EMC Objects

If you right-click any object icon in the group window (for example, any icon in Figure 7-12), a pop-up menu appears (Figure 7-13).

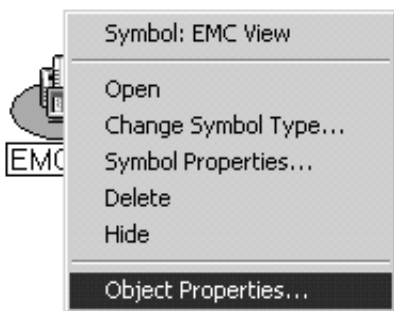


Figure 7-13 Object Pop-up Menu

From this menu select object properties. A window appears with information about the selected managed object.

Discovering an Integration Gateway

Automatic Discovery

Discovery of the Integration Gateway is automatically performed by the Integration application. The Integration Gateway sends a `coldStart` trap to OpenView NNM. The Integration application

processes the trap and adds an EMC View icon to the Root map, Figure 7-10 on page 7-12, and then performs a discovery of all managed objects.

Manual Discovery

You can manually discover an Integration Gateway by adding an EMC View object to the Root map (Figure 7-10 on page 7-12).

Follow these steps to add Integration Gateway:

1. From the **Edit** menu in the Root topology map, select **Add Object**.

The Add Object Palette appears (Figure 7-14).

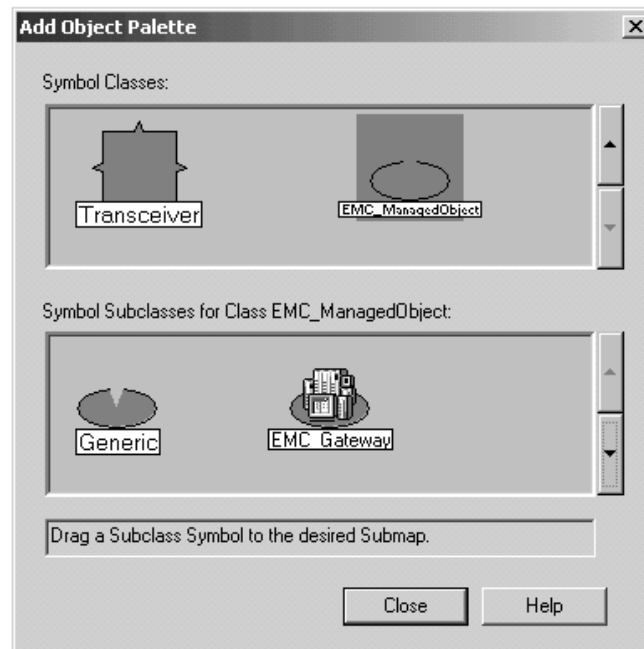
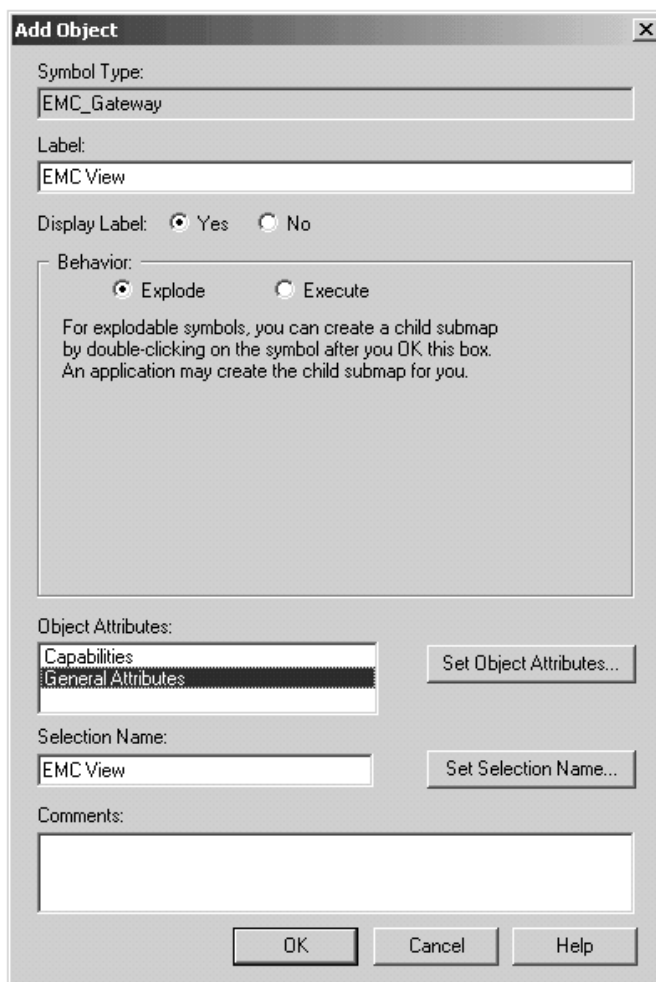


Figure 7-14 Add Object Palette

2. Select **EMC_ManagedObject** in the Symbol Classes panel.
3. Drag the **EMC Gateway** icon to the Root topology map.

The Add Object window appears (Figure 7-15 on page 7-16).



The 'Add Object' dialog box is a standard Windows-style window with a title bar and a close button. It contains several input fields and a list box. The 'Symbol Type' field is set to 'EMC_Gateway'. The 'Label' field is set to 'EMC View'. The 'Display Label' section has two radio buttons, 'Yes' and 'No', with 'Yes' selected. The 'Behavior' section has two radio buttons, 'Explode' and 'Execute', with 'Explode' selected. Below the radio buttons is a text box containing the following text: 'For explodable symbols, you can create a child submap by double-clicking on the symbol after you OK this box. An application may create the child submap for you.' The 'Object Attributes' section contains a list box with two items: 'Capabilities' and 'General Attributes', with 'General Attributes' selected. To the right of the list box is a button labeled 'Set Object Attributes...'. The 'Selection Name' field is set to 'EMC View', and to its right is a button labeled 'Set Selection Name...'. The 'Comments' section is a large text area. At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

Add Object

Symbol Type:
EMC_Gateway

Label:
EMC View

Display Label: ☒ Yes ☐ No

Behavior:
☒ Explode ☐ Execute

For explodable symbols, you can create a child submap by double-clicking on the symbol after you OK this box. An application may create the child submap for you.

Object Attributes:
Capabilities
General Attributes

Set Object Attributes...

Selection Name:
EMC View

Set Selection Name...

Comments:

OK Cancel Help

Figure 7-15 Add Object Window

4. In the **Label** field, enter the label name.
5. Select **General Attributes**, and then click **Set Object Attributes**.
Figure 7-16 appears.

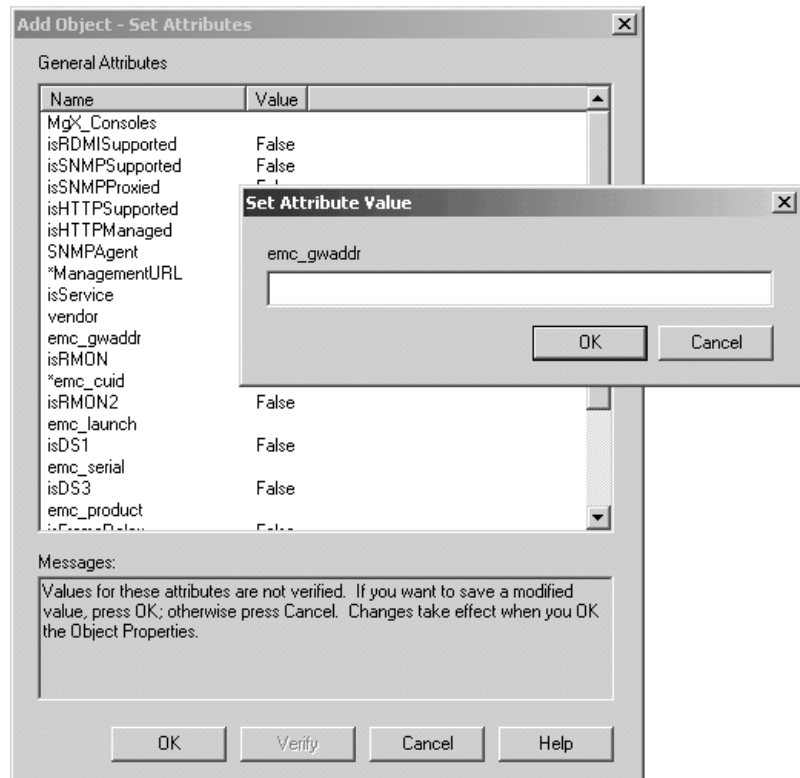


Figure 7-16 Set Attributes Window

6. In the **emc_gwaddr** field, enter the IP address of the current Integration Gateway.
7. In the **emc_gwport** field, enter the port number the Integration Gateway uses. The default is 1273.
8. In the **emc_launch** field, enter **ECC Console** (this is the application you want to launch).
9. In the **emc_cuid** field, enter the IP address of the current Integration Gateway.
10. In the **emc_product** field, enter **EMC_Gateway**.
11. Click **OK**.

An EMC View icon appears with the specified label.

12. When the icon appears, click the icon, and then select **Tools, EMC, Refresh** (Figure 7-17).

If you do not perform the manual refresh, the Integration application automatically refreshes on the next polling cycle.

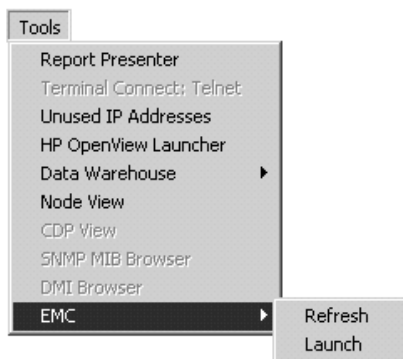


Figure 7-17 EMC Tools Menu

The Integration application discovers all ControlCenter managed objects and adds them to the topology. All discovered objects, including the server, appear in the EMC View submap.

Integration Application Functions

The Integration application provides launch and refresh functions described in the following sections.

Launch

With the Integration Package for OpenView NNM, you can launch the ControlCenter Console and track the status of ControlCenter managed objects.

To launch the ControlCenter Console, follow these steps:

1. Right-click an **EMC** icon.
2. Select **Launch** from the EMC Tools menu (Figure 7-17).

The EMC Tools menu is context-sensitive. It is disabled until you select an EMC icon.

Refresh Refreshing the EMC View lets you discover the Integration Gateway and all managed objects, add new objects to the topology, and set status of all objects.

The status of any objects in the topology that are no longer managed by ControlCenter will be deleted from the Integration Gateway MIB and updated to Unknown.

Refreshing a single object such as a Symmetrix system, updates its status.

To refresh the ControlCenter Console, follow these steps:

1. Right-click on an **EMC** icon.
2. Select **Refresh** from the EMC Tools menu (Figure 7-17).

The EMC Tools menu is context-sensitive. It is disabled until you select an EMC icon.

Tracking Managed Object Status

To view EMC-related events, follow these steps:

1. Click **EMC Alarms** in the Alarm Categories window (Figure 7-18).

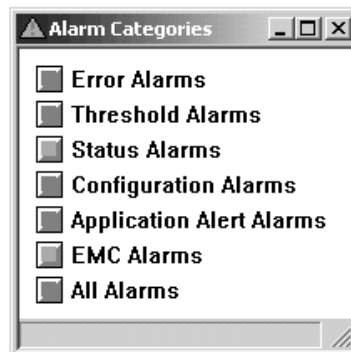


Figure 7-18 Alarm Categories Window

The EMC Alarms Browser opens (Figure 7-19).

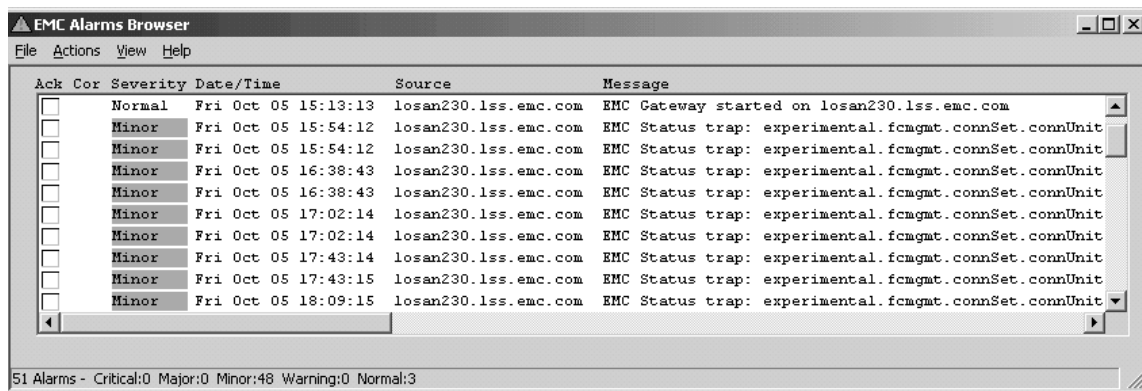


Figure 7-19 EMC Alarms Browser

- To view the details of an alarm, select it, and then select **Actions, Alarm Details**.

The Alarm Details window appears (Figure 7-20).

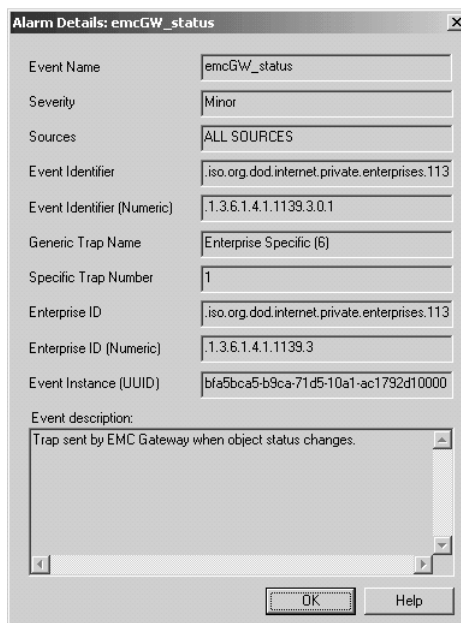


Figure 7-20 Alarm Details Window

This chapter describes how to install, configure, and operate the Integration Packages with IBM Tivoli NetView.

- ◆ Overview8-2
- ◆ Components8-3
- ◆ Installing and Configuring for NetView8-4
- ◆ Using the Integration Package for NetView8-10

Overview

The Integration Package for IBM Tivoli NetView integrates EMC ControlCenter functionality into the NetView framework to provide a unified approach for enterprise system management.

This is an active integration. (Refer to *Active Integration* on page 2-4.)

Tivoli NetView

Tivoli NetView provides a comprehensive set of features that help you manage your heterogeneous enterprise network. These features include configuration, fault, and performance management along with dynamic device discovery. Tivoli NetView is an open management framework that can integrate both SNMP and IP applications.

Integration Package for Tivoli NetView

The Integration Package for Tivoli NetView enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use NetView software look and feel in combination with ControlCenter storage management functionality.

Components

The Integration Package for NetView incorporate ControlCenter events into NetView software where they can be processed.

The Integration Package for NetView include the following components:

- ◆ Application files (bin directory) including:

- Install and remove batch files
- Integration application (ecc3pi)
- Trap test application (ecc3pi_test)
- ControlCenter launch batch file (ecc_launch.bat)

Settings for launching the ControlCenter Console appear in `ecc_launch.bat`. The ControlCenter Console is launched from a default location. However if your Console is located in a directory other than the default, refer to *Configuring Console for Launch* in Appendix B, *Configuration Settings*, on page B-5.

- Bitmaps for managed object icons in the OpenView Windows
- ◆ MIBs implemented by the Integration Gateway and used by the Integration Packages `gateway.mib` and `fcmgmt.mib`
- ◆ Symbols working in conjunction with the bitmaps to define the class of managed objects
- ◆ Registration files used to register the Integration application, traps, and fields with NetView

Installing and Configuring for NetView

You must have Integration Package installed on your system, as well as NetView.

The installation of these products is not discussed in this manual. For further information, refer to the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *Tivoli NetView Installation and Configuration Guide*

Make sure NetView is running properly before beginning the installation of the Integration Packages.

Configuration

Figure 8-1 illustrates the configuration of the Integration Package for NetView.

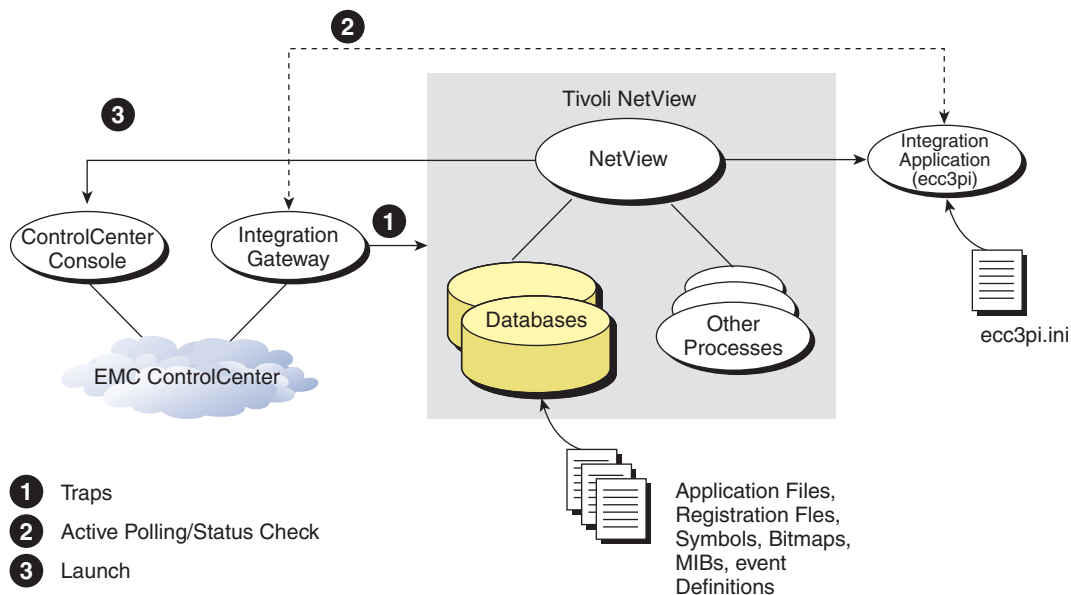


Figure 8-1 NetView Integration

Integration Packages uses a configuration file called `ecc3pi.ini`, which is created in NetView's bin directory. This file contains groupings for polling and SNMP attributes.

Installing the Integration Package for NetView

The Integration Package's installation for NetView contains an Install Wizard. Before you begin this installation, uninstall any previous versions of the Integration Packages, and make sure that NetView is operating properly.

The default file location for the Integration Packages is
C:\ecc\ecc3pi.

Installation Procedure

The Integration Packages is a client application installed from the ECC Server. It contains the Integration Packages for all of the supported third-party frameworks. For information on this installation, see *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*.

The Integration Package software for NetView is located in the Win32 directory.

Follow these steps to install the Integration Package for NetView:

1. From the Win32 directory, double-click `setup.exe`.

The Install Shield starts and the Welcome screen appears (Figure 8-2).



Figure 8-2 Welcome Screen

2. Click **Next** in the Welcome screen.

The Select Components window appears (Figure 8-3 on page 8-6).

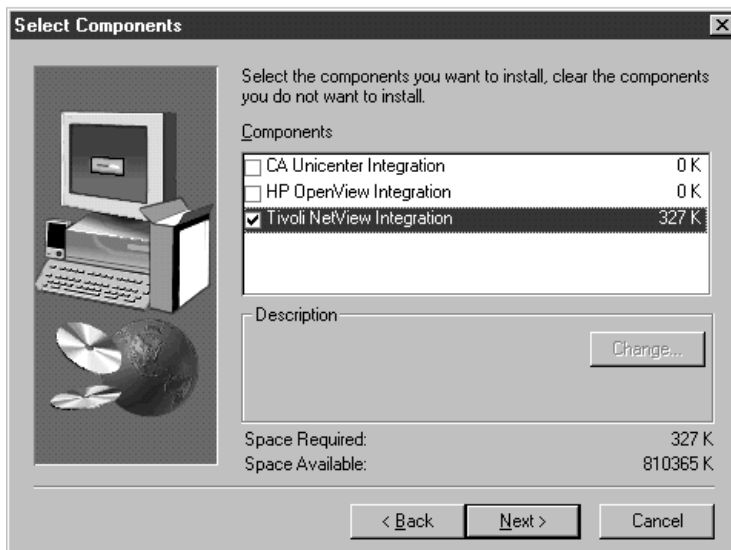


Figure 8-3 Select Components Window

3. Select the **Tivoli NetView Integration** checkbox, and then click **Next**.

The Select Destination window appears (Figure 8-4).



Figure 8-4 Select Destination Window

4. Click **Next** in the Select Destination window to accept the default destination location, or select a location from the **Browse** option, and then click **Next**.

The Information window appears (Figure 8-5).

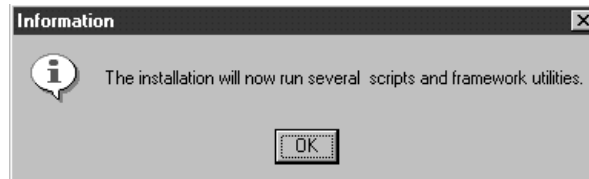


Figure 8-5 Information Window

5. Click **OK**.

A Windows NT Command window appears (Figure 8-6).

```

C:\WINNT\System32\CMD.exe
..\.bitmaps\sgmmL.32.p
..\.bitmaps\sgmmM.32.m
..\.bitmaps\sgmmN.32.p
..\.bitmaps\sgmmN.32.m
..\.bitmaps\sgmmS.32.p
..\.bitmaps\sgmmS.32.m
..\.bitmaps\sgmmS.32.p
26 File(s) copied

C:\ecc3pi\Ecc3pi_NU\bin>copy .\ecc3pi.cnt "C:\usr\ov\help\C\
1 file(s) copied.

C:\ecc3pi\Ecc3pi_NU\bin>copy .\ecc3pi.hlp "C:\usr\ov\help\C\
1 file(s) copied.

C:\ecc3pi\Ecc3pi_NU\bin>attrib -R "C:\usr\ov\help\C\netview.cnt
C:\ecc3pi\Ecc3pi_NU\bin>findstr "ecc3pi" "C:\usr\ov\help\C\netview.cnt
:Include ecc3pi.cnt

C:\ecc3pi\Ecc3pi_NU\bin>if errorlevel 1 echo :Include ecc3pi.cnt 1>>"C:\usr
\ov\help\C\netview.cnt

C:\ecc3pi\Ecc3pi_NU\bin>loadmib -load ..\mibs\fcngmt.mib -replace

```

Figure 8-6 Command Window

6. Close the Command window.

The Setup Complete window appears (Figure 8-7 on page 8-8).

7. Click **Finish**. Your installation is complete.

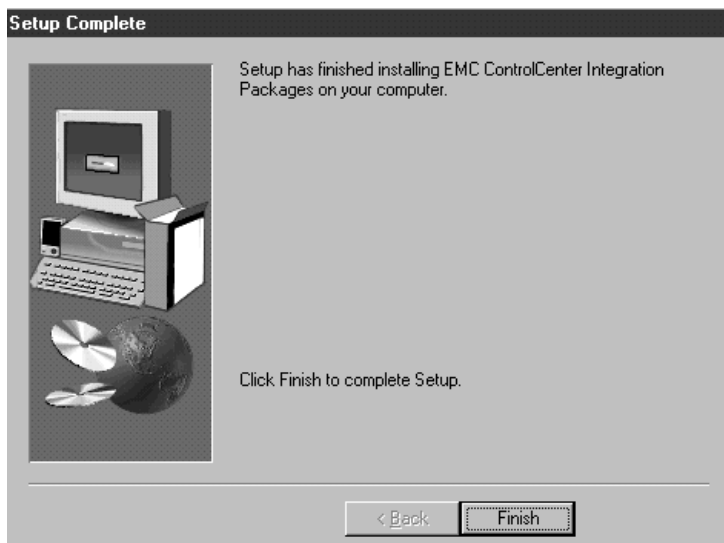


Figure 8-7 Setup Complete Window

Uninstalling the Integration Package

To uninstall the Integration Package for NetView, follow these steps:

1. Go to the directory where you installed the `ecc3pi` folder and open the folder.
2. Double-click **`uninstall.bat`**.
A command prompt window appears, displaying the deletion process.
3. Go to Control Panel and double-click **Add/Remove Programs**.
The Add/Remove Programs Properties window appears (Figure 8-8).
4. Highlight **Ecc3pi** and click **Add/Remove**.

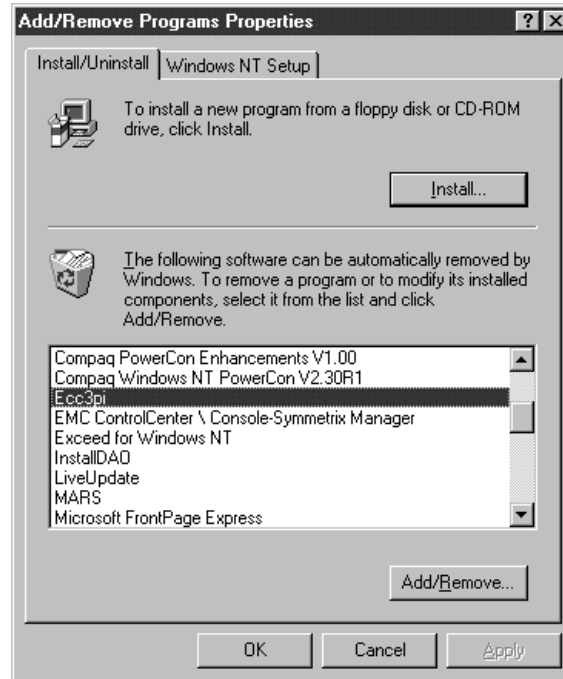


Figure 8-8 Add/Remove Programs Properties

Using the Integration Package for NetView

The Integration Package for NetView provides support for ControlCenter managed objects. It enables you to view object status and perform specific ControlCenter functions.

The sections that follow explain how to use the Integration Package with NetView.

Starting the Integration Application

The Integration application for NetView runs as a NetView application that starts automatically when you start NetView.

Starting NetView on Windows

To start NetView:

- ◆ Select **Start, Programs, NetView Console**.

EMC View

The EMC View is the top-level view and starting point from which you monitor the status of ControlCenter managed objects. It is a graphical representation of objects and status information retrieved by the Integration application from the Integration Gateway. The Integration application maintains the status of the objects by processing traps received from the Integration Gateway and by polling periodically.

Figure 8-9 shows a sample root window with an EMC View, and a sample EMC view topology window.

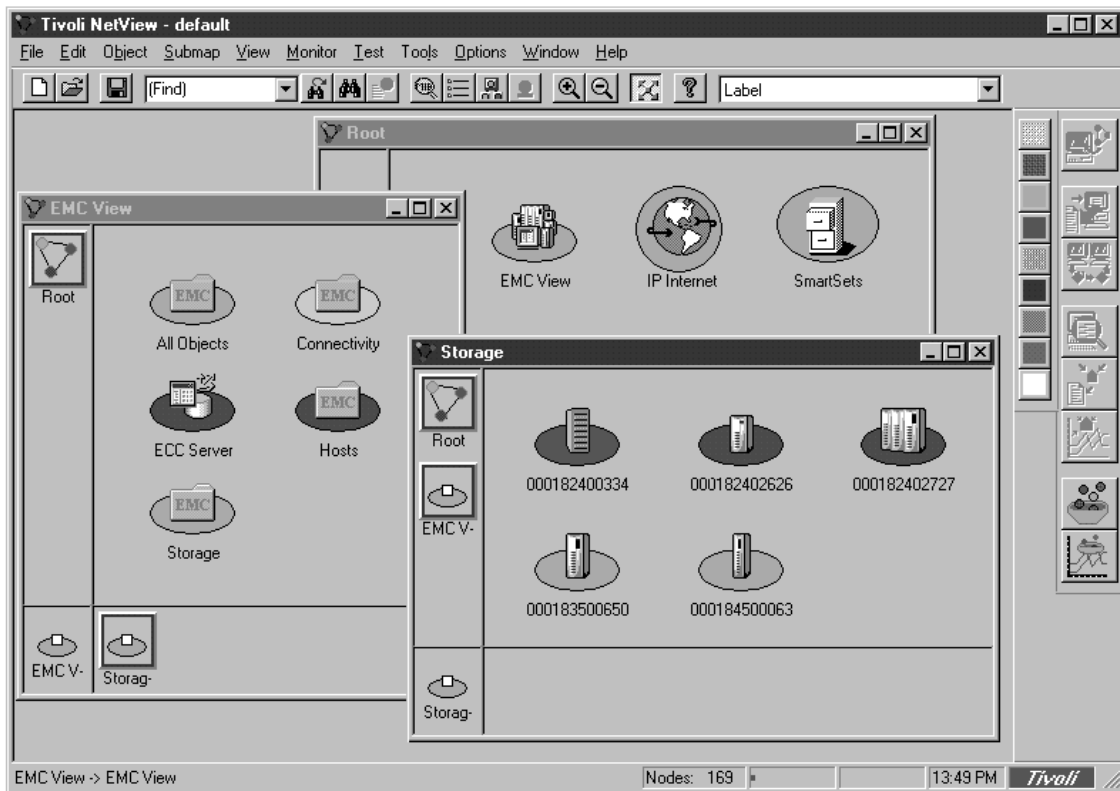


Figure 8-9 EMC View Window

Icon Status Indicators

ControlCenter managed object icons use a color scheme to indicate the status of an object. The EMC View icon is an aggregated status representing the highest severity status of the components that are included in the EMC View.

The EMC icons are explained in Table 8-1 on page 8-12.

Table 8-1 EMC View Icon Status Indicators

Icon	Color	Status
	Green	Normal –The status of the object is Normal.
	Blue	Unknown – The status of the object is Unknown.
	Yellow	Warning – The status of the object is Warning.
	Red	Critical –The status of the object is Critical.

NOTE: The actual status indicators displayed in the framework for the EMC View and any group (folder) icons are dependent on the internal status propagation rules used by the framework. Depending on the framework, this means that the EMC View or any group icon may be set to the highest severity of its contained objects or calculated based on the severity of all contained objects. Consult your framework documentation for specific status propagation rules.

Expanding the EMC View

To expand the EMC View, double-click the **EMC View** icon to display all objects being managed by ControlCenter including the server and storage devices.

Getting Information About EMC Objects

If you right-click any EMC icon, a pop-up menu appears (Figure 8-10).

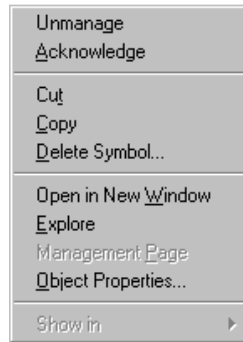


Figure 8-10 Object Pop-up Menu

From this menu select **Object Properties**. A window appears with information about the selected managed object.

Discovering an Integration Gateway

Automatic Discovery

Discovery of an Integration Gateway is automatically performed by the Integration application. The Integration Gateway sends a `coldStart` trap to NetView. The Integration application processes the trap and adds an EMC View icon to the Root window, and then performs a discovery of all managed objects.

Manual Discovery

You can manually discover an Integration Gateway by adding an EMC View object to the Root map, Figure 8-9 on page 8-11.

Follow these steps to add an Integration Gateway:

1. From a Tivoli NetView top-level window, select **Object, New**.

The Object Wizard — Step 1 of 2 window appears (Figure 8-11 on page 8-14).



Figure 8-11 Object Wizard

2. In the Type list box, select **EMC Managed Object**.
3. Select **EMC_Gateway**, and then click **Next**. The Object Wizard selection window appears (Figure 8-12).

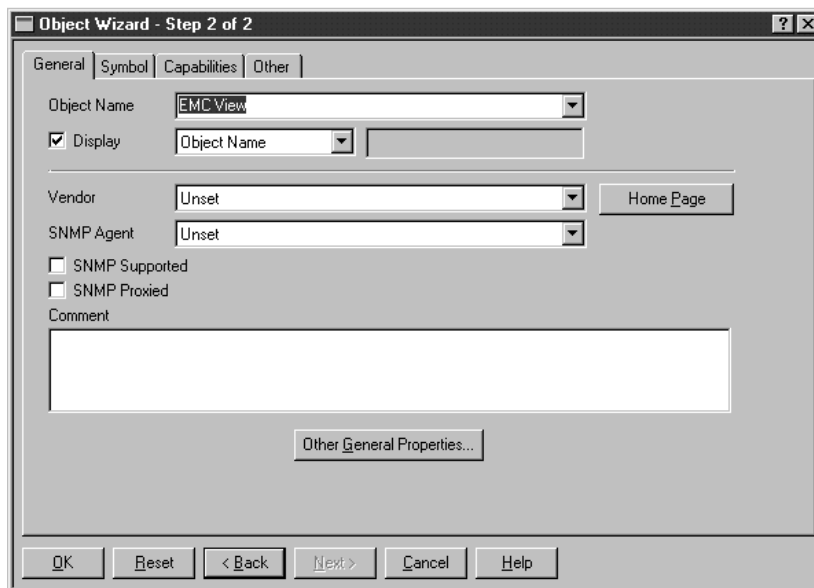


Figure 8-12 Object Wizard Selection Window

4. In the **Object Name** field, enter the name of the object, and then select **Other General Properties**.

The Object Wizard properties window appears (Figure 8-13).

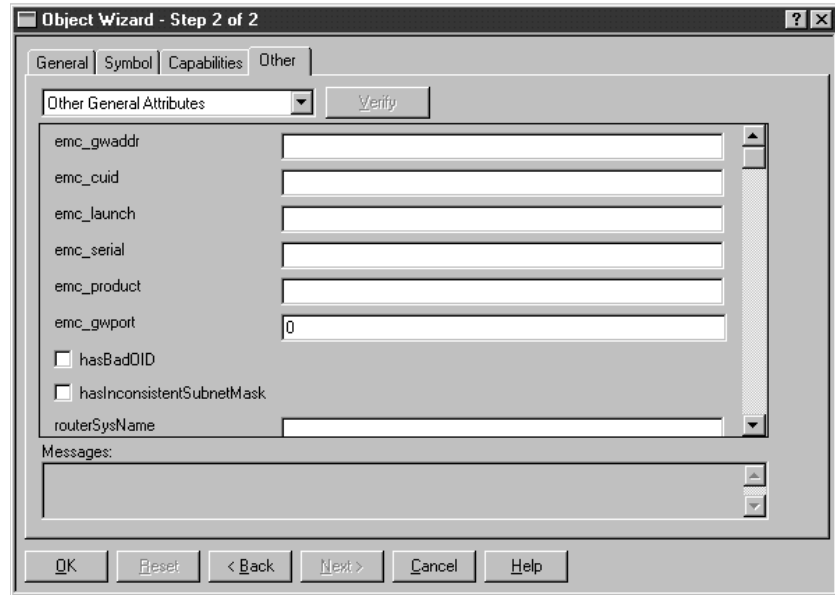


Figure 8-13 Object Wizard Properties Window

5. Select **Other General Attributes** in the list box at the top of the window.
6. In the **emc_gwaddr** field, enter the IP address of the current Integration Gateway.
7. In the **emc_cuid** field, enter the IP address of the current Integration Gateway.
8. In the **emc_product** field, enter **EMC_Gateway**.
9. In the **emc_gwport** field, enter **1273**.
10. Click **OK**.

An EMC View icon appears with the specified label.

11. When the icon appears, click the icon, and then select **Tools, EMC, Refresh** (Figure 8-14 on page 8-16).



Figure 8-14 Tools Menu

If you do not perform the manual refresh, the Integration application automatically refreshes on the next polling cycle.

The Integration application discovers all ControlCenter managed objects and adds them to the topology. All discovered objects, including the server, appear in the EMC View submap.

Integration Application Functions

The Integration application provides launch and refresh functions described in the following sections.

Launch

With the Integration Package for NetView, you can launch the ControlCenter Console and track the status of ControlCenter managed objects.

To launch the ControlCenter Console, follow these steps:

1. Click an **EMC** icon.
2. Select **Tools, EMC, Launch** (Figure 8-14).

The EMC Tools menu is context-sensitive. It is disabled until you select an EMC icon.

Refresh

Refreshing the EMC View on the Tools menu lets you discover the Integration Gateway, and all managed objects, add new objects to the topology, and set status of all objects.

The status of any objects in the topology that are no longer managed by ControlCenter will be deleted from the Integration Gateway MIB, and updated to Unknown.

Refreshing a single object, such as a Symmetrix system, updates its status.

To refresh the ControlCenter Console, follow these steps:

1. Click an **EMC** icon.
2. Select **Tools, EMC, Launch** (Figure 8-14).

The EMC Tools menu is context-sensitive. It is disabled until you select an EMC icon.

Tracking Managed Object Status

To view EMC-related events, follow these steps.

1. From the NetView main menu, select **Monitor, Events, All** (Figure 8-15).

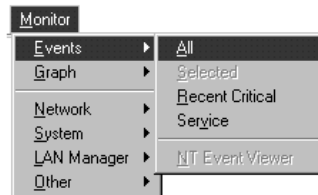


Figure 8-15 Event Monitor Menu

The Event Browser opens (Figure 8-16 on page 8-18).



2. To view only EMC-related events, select **EMC_Alarms** from the listbox.
3. To view the details of an event, highlight the event, and then select **Event, Details** from the Browser menu.

The Event Details window appears (Figure 8-17).

Integrating with Microsoft Operations Manager

This chapter describes how to install, configure, and operate Integration Packages with Microsoft Operations Manager (MOM).

- ◆ Overview 9-2
- ◆ Components 9-3
- ◆ Installing and Configuring for MOM 9-5
- ◆ Using the Integration Package for MOM 9-8

Overview

The Integration Package for Microsoft Operations Manager (MOM) integrates EMC ControlCenter-generated events into MOM software to provide a unified approach for enterprise system management.

This is a passive integration. (Refer to *Passive Integration* on page 2-11.)

Microsoft Operations Manager

MOM is a comprehensive server-monitoring solution that provides a consolidated view of enterprise-wide events and status information. It collects events or messages from many different data sources and presents a single view of the current state of managed systems.

Integration Package for Microsoft Operations Manager

The EMC ControlCenter Integration Package for MOM enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use MOM software look and feel in combination with ControlCenter functionality.

Components

The Integration Package for MOM incorporates ControlCenter events into the MOM Console. ControlCenter contains an Integration Gateway that creates SNMP traps in response to events and alerts generated by ControlCenter. The Integration Gateway can also be configured to write events to the Windows Event Log.

Distributed Files

Integration Package provides two files for the MOM integration:

- ◆ `ecc3pi_mom.akm` — This file contains the following:
 - EMC ControlCenter Management Pack for MOM.
You need to import this file through the MOM Administrators Console.
- ◆ `README.txt` — This file contains instructions to configure your system for the ControlCenter integration.

MOM Components

The integration creates the following components within MOM:

- ◆ Public Views — EMC Alarms
- ◆ Computer Groups — EMC View
- ◆ Processing Rule Groups — EMC Rules

The rule group, EMC Rules, contains four event entries, one for each possible event (trap) written to the event log by the Integration Gateway. This rule group is associated with the EMC View Computer group, Figure 9-1 on page 9-4.

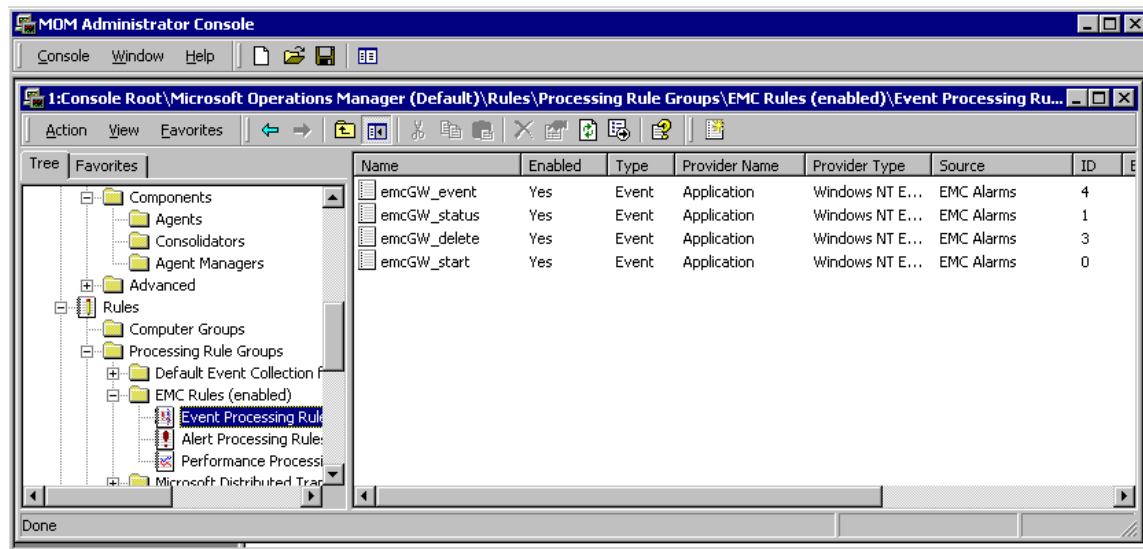


Figure 9-1 Public View/EMC Rules

Installing and Configuring for MOM

You must have EMC ControlCenter Integration Packages installed on your system as well as MOM. The ControlCenter Integration Gateway (along with a MOM agent) can be installed on a Windows host, or it can be installed on the MOM Administrators Console host.

The installation of these products is not discussed in this manual. For further information, see the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *Microsoft Operations Manager 2000 Installation Guide*

Configuring for MOM

Figure 9-2 illustrates the configuration of the Integration Packages for MOM. The ControlCenter Management Pack for MOM contains the rules that are used to recognize ControlCenter events. These rules are processed by either the MOM consolidator or a MOM agent, depending on where you install the Integration Gateway.

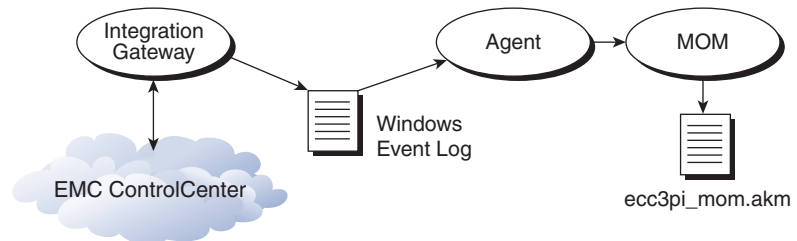


Figure 9-2 MOM Integration Configuration

Configuring the Integration Gateway

You must configure the ControlCenter Integration Gateway to write events to the Windows Event Log. This is done by editing the Gateway INI file. Follow these steps:

- ◆ Add the following entry:


```
[EccGatewayConfig]
NT_EventLog_Key = EMC_Alarms
```
- ◆ Restart the Gateway.

This adds the following registry key entry on the host, which MOM looks for to determine if the host is running the Gateway:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\EventLog\Application\EMC_Alarms
```

Installing the Integration Package for MOM

Installation Procedure

The Integration Package for MOM is in the form of a MOM Management Pack. Before you begin this installation, uninstall any previous versions of the MOM Integration Package, and then make sure that MOM is operating properly.

The Integration Packages is a client application installed from the ECC Server. It contains the individual Integration Packages for all of the supported third-party frameworks. For information on this installation refer to the *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*.

The Integration Package for MOM software is located in the MOM directory.

Follow these steps to install the Integration Package for MOM:

1. Start the MOM Administrator Console.
2. Right-click on **Rules, Processing Rule Groups**, and then select **Import Management Pack** (Figure 9-3). The Import Management dialog box appears.

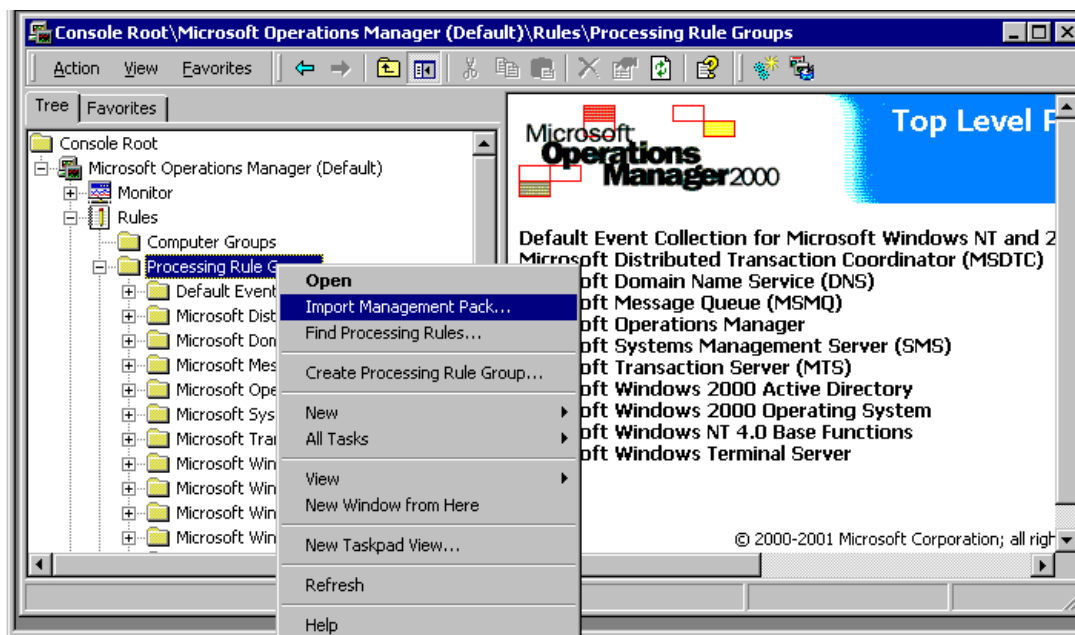


Figure 9-3 MOM Administrator Console with Import Screen

3. Ensure that the option "Replace existing rule groups with those of imported Management Pack." is checked.
4. Select `ecc3pi_mom.akm`, and then click **Import**. Refer to Figure 9-4.

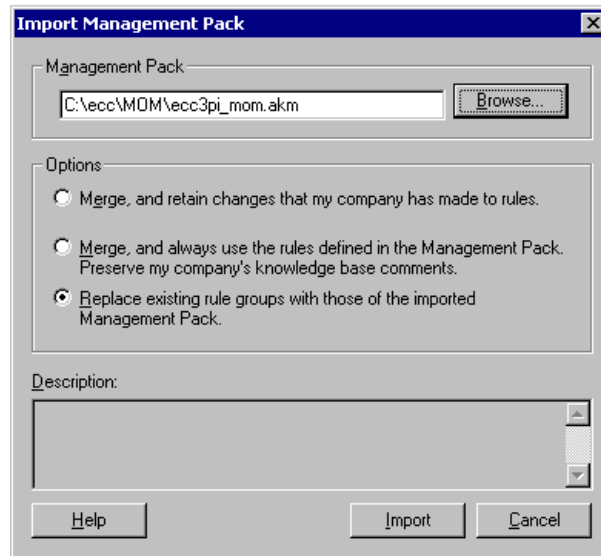


Figure 9-4 Import Management Pack

5. Rescan either all hosts, or only the specific host where you installed the Integration Gateway.
6. Restart MOM Console.

Uninstalling the Integration Package

MOM does not currently facilitate easy removal of an installed Management Pack. Therefore, the individual elements of the Integration Packages must be deleted manually. To uninstall the Integration Package for MOM, follow these steps:

- ◆ Start the MOM Console.
- ◆ Manually delete the EMC integration components:
 - Public Views — EMC Alarms
 - Computer Groups — EMC View
 - Processing Rule Groups — EMC Rules

Using the Integration Package for MOM

The Integration Package for MOM enables you to view EMC events from the MOM Console. You can then define appropriate actions and responses within MOM for these events.

EMC events are displayed in the EMC Alarms public view, Figure 9-5. All events from the EMC Alarms source are displayed in this view.

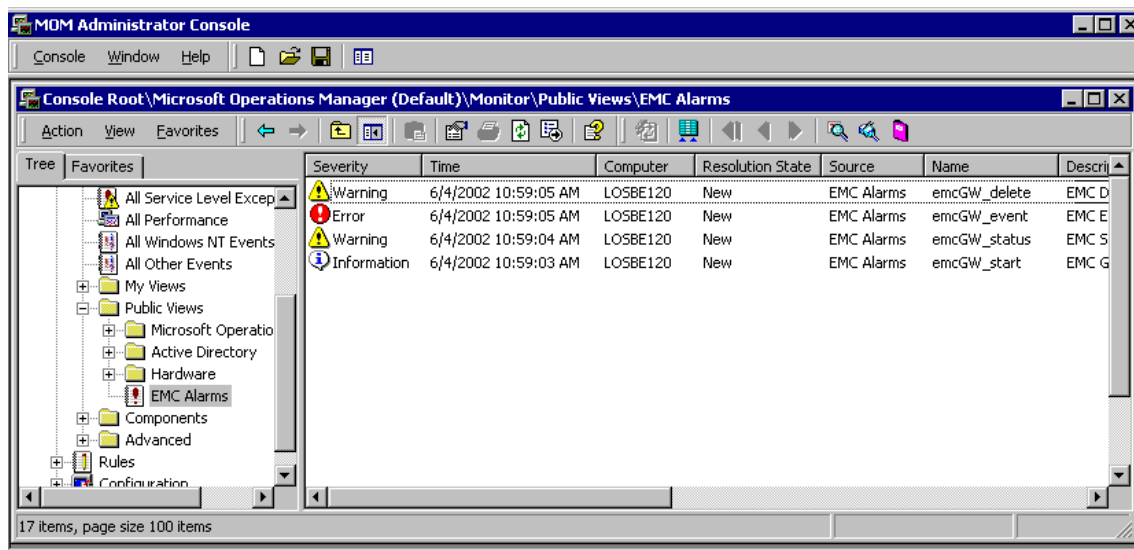


Figure 9-5 EMC Alarms — Public View

EMC events are also displayed within the EMC View computer group, Figure 9-6. This group shows the Windows host where you installed the Integration Gateway.

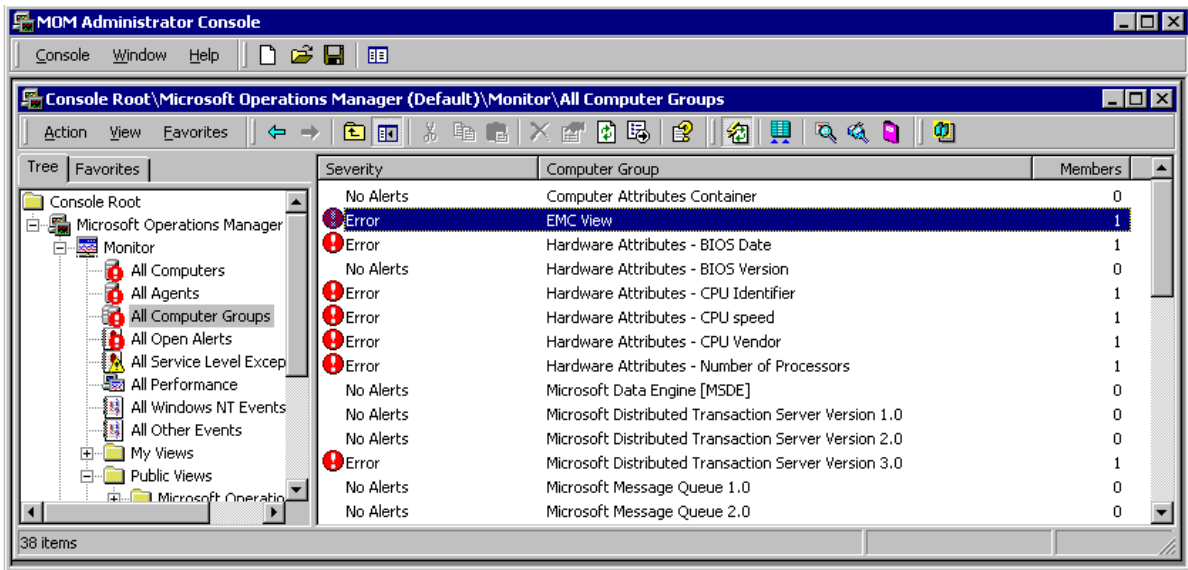


Figure 9-6 EMC View — Computer Group

Double-click the EMC View group to see the Integration Gateway host, and then double-click the host to show the specific events. For a sample figure, refer to Figure 9-7.

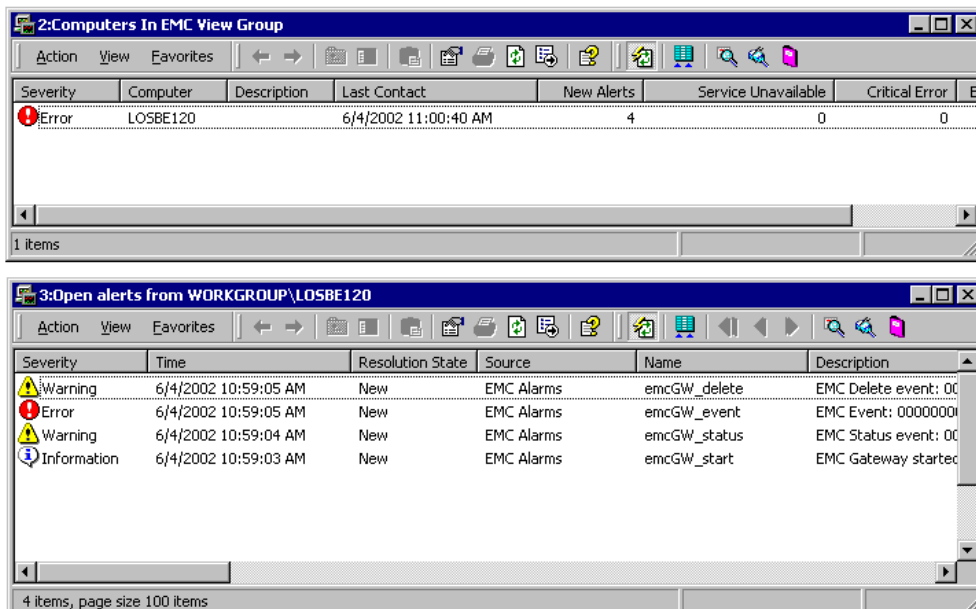
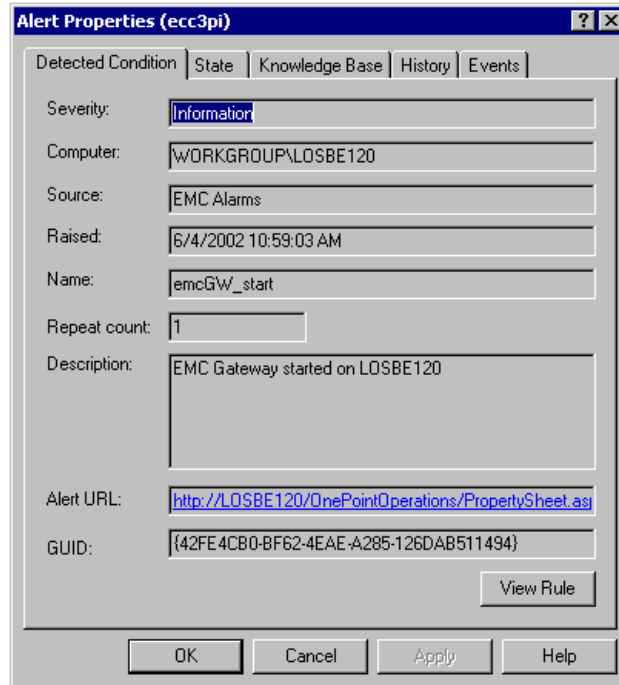


Figure 9-7 Sample Screens

Double-click on the desired event to view the specific details, Figure 9-8.



The image shows a Windows-style dialog box titled "Alert Properties (ecc3pi)". It has a tabbed interface with tabs for "Detected Condition", "State", "Knowledge Base", "History", and "Events". The "Detected Condition" tab is active. The dialog contains several text fields and a description box. At the bottom, there are buttons for "OK", "Cancel", "Apply", "Help", and a "View Rule" button.

Field	Value
Severity	Information
Computer	WORKGROUP\LOSBE120
Source	EMC Alarms
Raised	6/4/2002 10:59:03 AM
Name	emcGW_start
Repeat count	1
Description	EMC Gateway started on LOSBE120
Alert URL	http://LOSBE120/OnePointOperations/PropertySheet.asp
GUID	{42FE4CB0-BF62-4EAE-A285-126DAB511494}

Figure 9-8 Alert Properties

This chapter describes how to install, configure, and operate the Integration Packages with BMC PATROL Enterprise Manager (PATROL EM).

- ◆ Overview 10-2
- ◆ Components 10-3
- ◆ Installing and Configuring for PATROL EM 10-4
- ◆ Using the Integration Package for PATROL EM 10-7

Overview

The Integration Package for BMC PATROL Enterprise Manager (PATROL EM) integrates EMC ControlCenter-generated events into PATROL EM software to provide a unified approach for enterprise system management.

This is a passive integration. (Refer to *Passive Integration* on page 2-11.)

BMC PATROL Enterprise Manager

PATROL EM is a powerful management system that allows you to manage virtually every tool in your enterprise—such as computers, applications, and network devices—from a single screen. Once a tool is connected to PATROL EM, it gathers, filters, translates, and prioritizes messages from the tool, and displays them on a color graphic workstation. An operator then can respond to the messages as if each tool was being managed individually.

Integration Package for BMC PATROL EM

The EMC ControlCenter Integration Package for PATROL EM enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use PATROL EM software look and feel in combination with ControlCenter functionality.

Components

The Integration Package for PATROL EM incorporates ControlCenter events into PATROL EM. ControlCenter contains an Integration Gateway that creates SNMP traps in response to events and alerts generated by ControlCenter. The Integration Packages for PATROL EM uses a PATROL EM filter path to receive the traps.

Distributed Files

The Integration Package provides the following files for the PATROL EM integration:

- ◆ `ecc3pi` — Trap receiver daemon
- ◆ `ecc3pi.ini` — Configuration parameters for the daemon
- ◆ `ecc3pi.aflt` — Integration filter definitions text file
- ◆ `install.sh` — Script to install the Integration Package for PATROL EM
- ◆ `remove.sh` — Script to uninstall the Integration Package for PATROL EM
- ◆ `README.txt` — Instructions to configure your system for the ControlCenter integration.

PATROL EM Components

The integration creates the following components that are installed within PATROL EM:

- ◆ `ecc3pi filter`
- ◆ `ecc3pi filter path`
- ◆ `ecc3pi rules`

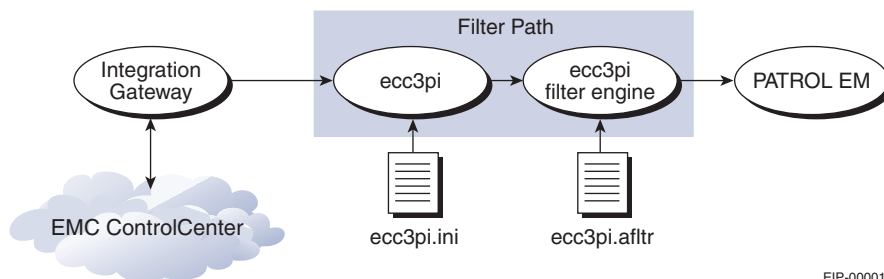
Installing and Configuring for PATROL EM

You must have the EMC ControlCenter Integration Packages installed on your system as well as PATROL EM. The installation of these products is not discussed in this manual. For further information, see the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *PATROL Enterprise Manager Installation and Configuration Guide*

Configuring for PATROL EM

Figure 10-1 illustrates the configuration of the Integration Packages for PATROL EM. The ControlCenter Management Pack for PATROL EM consists of filter path containing a connection tool (trap daemon), and a filter engine that are used to receive ControlCenter events. The filter path contains rules that are used to format and display ControlCenter events.



EIP-000013

Figure 10-1 PATROL EM Integration Configuration

Configuring the Integration Gateway

You must configure the ControlCenter Integration Gateway to send traps to the PATROL EM host by editing the Integration Gateway .ini file. Follow these steps:

1. Modify or enter the line:

```
trap_client_registration=a.b.c.d,nnnn,10,ACTIVE
```

where *a.b.c.d* is the IP address of the PATROL EM host, and *nnnn* is the port number specified for the ecc3pi daemon.

The default port is USA 1273 which does not conflict with PATROL EM trapd.

For example:

```
trap_client_registration=172.23.154.166,1273,10,ACTIVE
```

2. Restart the Gateway.

Installing the Integration Package for PATROL EM

Installation Procedure

The Integration Package for PATROL EM is in the form of a .tar file. Before you begin this installation, uninstall any previous versions of the PATROL EM Integration Package, and then make sure that PATROL EM is operating properly.

Follow these steps to install the Integration Package for PATROL EM:

1. Move the integration .tar file to a disk directory. We suggest /usr/emc/ecc3pi.
2. Go to that directory and unpack the .tar file with the command:
tar -xvf ecc3pi_pem.tar
3. Start the PATROL EM Administrator's Console.
4. As NetCmmnd, run the install.sh script from the directory where the integration files were loaded. Below is a sample installation script:

```
% ./install.sh
```

```
Install EMC ControlCenter Integration Packages for PEM
Copying the ecc3pi files..
```

```
Create the ecc3pi filter (waiting 10 seconds)..
Creating filter /usr/emc/ecc3pi/BMC/ecc3pi.fltr.
Messages logged into /usr/emc/ecc3pi/BMC/ecc3pi.msg
```

```
Create the ecc3pi filter engine (waiting 10 seconds)..
Generating filter /usr/emc/ecc3pi/BMC/ecc3pi.fltr.
Messages logged into /usr/emc/ecc3pi/BMC/ecc3pi.msg
```

```
Adding ecc3pi filter path and path prototype..
```

```
Installation of EMC ControlCenter Integration Packages
complete!
```

You should now modify the filter and alert parameters for your specific installation, and then start the ecc3pi filter path.

5. Through the PATROL EM console, modify the `ecc3pi` filter and alert parameters (if necessary) to meet your specific monitoring requirements. If you modify the `ecc3pi` filter, you must regenerate the `ecc3pi` filter engine.
6. Start the `ecc3pi` filter path.

Uninstalling the Integration Package for PATROL EM

To uninstall the Integration Package for PATROL EM, follow these steps:

1. Go to the directory where you originally moved and unpacked the integration files, and then run the remove script, `remove.sh`. Below is a sample remove script:

```
% ./remove.sh
```

```
Remove EMC ControlCenter Integration Packages for  
PATROL EM
```

```
Stopping ecc3pi filter path if running..
```

```
Deleting the ecc3pi files..
```

```
Deleting ecc3pi filter path and path prototype..
```

```
Deleting ecc3pi filter and filter engine files..
```

```
Removal of EMC ControlCenter Integration Packages  
complete!
```

Using the Integration Package for PATROL EM

The Integration Package for PATROL EM enables you to view EMC events from PATROL EM Active Alert Displays. You can then define appropriate actions and responses within PATROL EM for these events.

The rules for ControlCenter events display the events as they are received. You can modify these rules to meet your specific enterprise management requirements using the Customization menu, Figure 10-2.

To modify the ecc3pi rules and alerts:

- ◆ In the NetCmmnd console window, select **Customization**, **ALFE**, **ecc3pi.fltr** from the NetCmmnd Customization Menu Figure 10-6 on page 10-10.

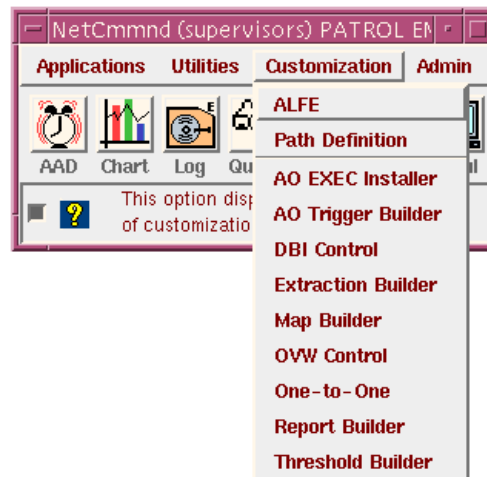


Figure 10-2 NetCmmnd Customization Menu

In the ALFE window there are four rules, one for each Integration Gateway trap: EMC_Delete, EMC_Event, EMC_Start, and EMC_Status. You can select and modify alerts as necessary. Figure 10-3 shows a sample ALFE window.

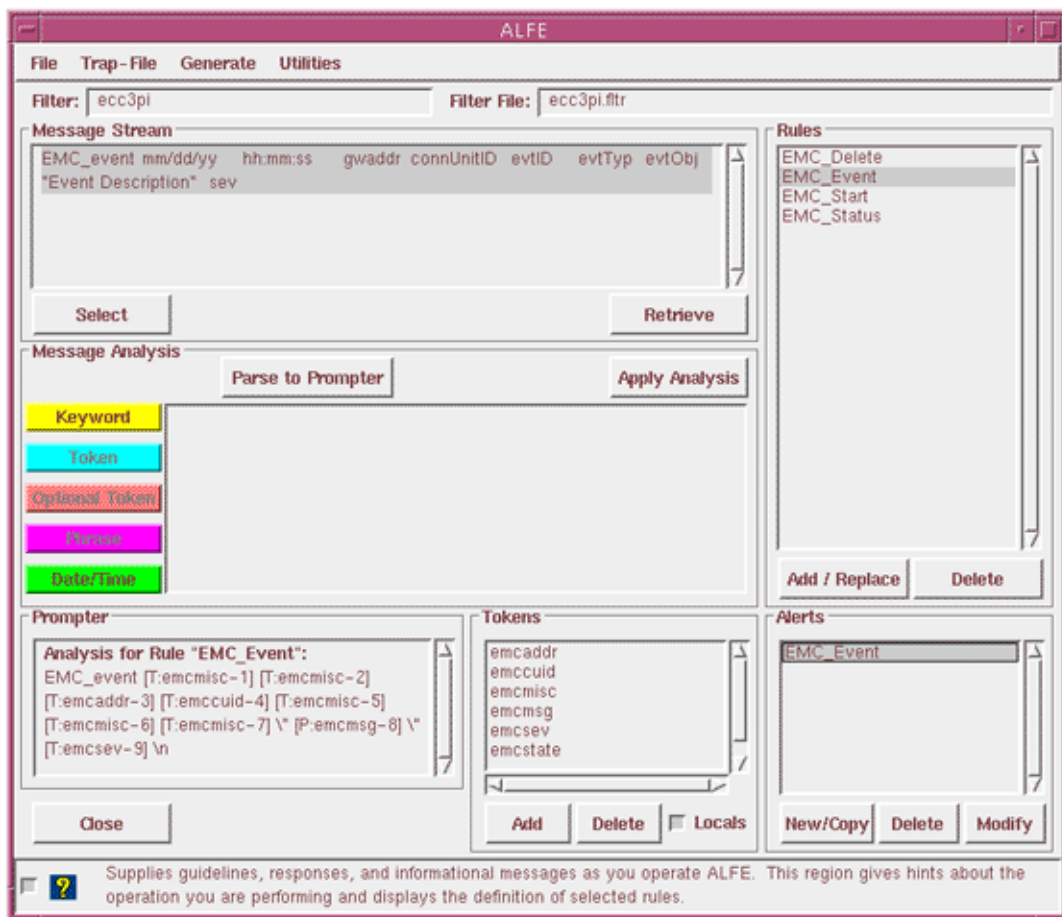


Figure 10-3 ALFE Window

If you make any changes to the rules you must regenerate the filter. Follow these steps:

- ◆ In the ALFE window, select **Generate, Generate Production Filter**.
- ◆ Select **File**, and then **Save** to update the ecc3pi filter.

To activate the ecc3pi filter path:

- a. Select **Admin, Filter Path Mgmt** from the Admin Menu, Figure 10-4.



Figure 10-4 Admin Menu

The Filter Path Management window appears, Figure 10-5 on page 10-10.

- b. In the Filter Path Management window, select **ecc3pi**, and then **Start**.

[illegible]

Figure 10-6 Active Alerts Window

To view the details of a specific alert, select **Action**, and then **About**, for the desired alert.

The About Window appears.

The 'About Window' dialog box displays the following information:

- AlertId:** 596
- Filter:** ecc3pi
- Path:** NA
- AlertType:** EMC_Start
- Template:** EMC Gateway started on [emcaddr]
- Text:** EMC Gateway started on 172.23.154.166
- Dates:**

	Date	Time
Received	6/Jan/2003	15:09
Assigned	--	--
Accepted	--	--
Acknowledged	--	--
Closed	--	--
- State:** active
- Operator:** --
- Priority:** 7
- Occurrences:** 1
- Severity:** Informational
- Category:** Software
- Comments:** (Empty text area with an 'Add Comment' button)
- Description:** Alert has no description
- Stored Tokens:** emcaddr: "172.23.154.166"
- Close** button

At the bottom, a status bar contains a question mark icon and the text: 'Move cursor over an item for help information'.

Figure 10-7 About Window

Integrating With BMC PATROL

This chapter describes how to install, configure, and operate the EMC ControlCenter Knowledge Module for PATROL.

- ◆ Overview 11-2
- ◆ Components 11-3
- ◆ Installing and Configuring for PATROL 11-4
- ◆ Using the EMC ControlCenter KM for PATROL 11-14

Overview

The EMC ControlCenter Knowledge Module for PATROL integrates EMC ControlCenter managed objects and generated events into BMC PATROL to provide a unified approach for enterprise system management.

BMC PATROL

BMC PATROL is an agent based monitoring technology that is widely used in multiple industry sectors. The PATROL product includes a central console which displays information from PATROL agents. PATROL agents employ Knowledge Modules (KM) which are essentially sub-agents that monitor specific objects — devices or applications. The agent maintains a namespace of information about all the objects.

The EMC ControlCenter Knowledge Module for PATROL includes a Knowledge Module. This Knowledge Module will import object information and alerts from ControlCenter and maintain this information in the PATROL agent namespace. Once inserted into the PATROL agent namespace this information can be made available to other BMC products that interface with PATROL.

Integration Package for BMC PATROL

The EMC ControlCenter Knowledge Module for PATROL enables you (the Enterprise manager) to:

- ◆ Manage valuable EMC storage components as part of the global unified enterprise management suite.
- ◆ Use PATROL software look and feel in combination with ControlCenter functionality.

Components

The EMC ControlCenter Knowledge Module for PATROL incorporates ControlCenter objects and events into PATROL. ControlCenter contains an Integration Gateway that exposes ControlCenter managed objects via an SNMP mib, and creates SNMP traps in response to ControlCenter events and alerts. The ControlCenter KM for PATROL gets object information and events from the gateway and maintains that data within PATROL.

Distributed Files

The Integration Package includes the following files for the PATROL:

- ◆ `EMC_ECC_KM.tar`
 - ControlCenter Knowledge Module — Process ControlCenter information into PATROL.
 - `ecc3pi` — Trap receiver daemon that passes ControlCenter info to the KM.
 - `parser` — Parser that translates information received from `ecc3pi`.
 - Various icons and miscellaneous files for PATROL.
- ◆ `README.txt` — Instructions to configure your system for the ControlCenter integration.

Installing and Configuring for PATROL

You must have the EMC ControlCenter Integration Packages installed on your system as well as PATROL. The installation of these products is not discussed in this manual. For further information, see the following guides:

- ◆ *EMC ControlCenter 5.2 Planning and Installation Guide, Volume 1*
- ◆ *PATROL Installation and Configuration Guide*

Configuring for PATROL

Figure 11-1 illustrates the configuration of the EMC ControlCenter Knowledge Module for PATROL. The ControlCenter KM, including the ecc3pi adapter, are packaged as a standard PATROL KM. This KM can be installed directly to an agent or through the PATROL distribution server.

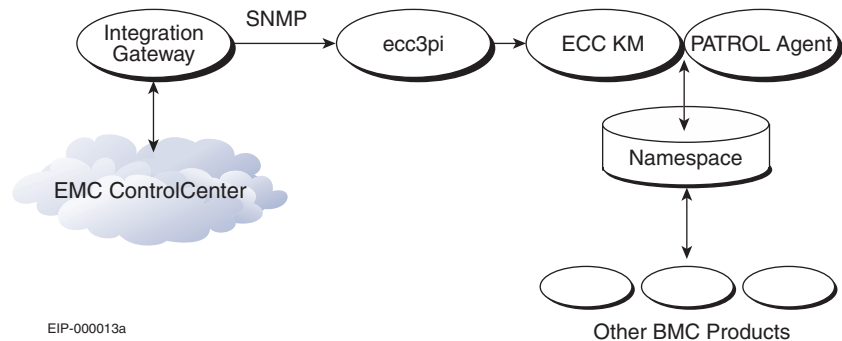


Figure 11-1 PATROL Integration Configuration

Configuring the Integration Gateway

The ControlCenter KM receives traps on a port other than the standard SNMP port 162 so as not to conflict with other SNMP trap daemons. You must configure the ControlCenter Integration Gateway to send traps to this port by editing the Integration Gateway .ini file. Follow these steps:

1. Modify or enter the line:

```
trap_client_registration=a.b.c.d,nnnn,10,ACTIVE
```

where *a.b.c.d* is the IP address of the PATROL agent host, and *nnnn* is the port number specified for the ecc3pi adapter. The default port is UDP 1273.

For example:

```
trap_client_registration=172.23.154.166,1273,10,ACTIVE
```

2. Restart the Gateway.

Installing the EMC ControlCenter Knowledge Module for PATROL

Direct Installation Procedures

The EMC ControlCenter Knowledge Module for PATROL is in the form of a .tar file. Before you begin this installation, uninstall any previous versions of the PATROL Integration Package, and then make sure that the PATROL agent is operating properly.

This section provides procedures for installing the integration package either locally on a host or through a distribution server.

Follow these steps to install the EMC ControlCenter Knowledge Module for PATROL on a local host:

1. Download the BMC Software Common Install engine (version 7.4.40) that is required for your platform from the BMC Software website or FTP site. Each install engine is contained in an Electronic Product Download (EPD) consisting of a self-extracting executable for Windows systems or a TAR (.tar) file for UNIX systems.

When uncompressing the EMC_ECC_KM.tar file using WinZip, please use WinZip version 9.0. WinZip version 7.0 is unable to uncompress the EMC_ECC_KM.tar file correctly.

2. Extract the downloaded install engine to a local directory on the system where the install will be performed. The contents of the extracted file should resemble the following directory structure:

```
./bmc_products
  /Index
  /Install
  /Products
```

3. Move the EMC_ECC_KM.tar file to the directory in step 2 and extract it. The files and directories extracted from this .tar file will overlay the install engine's Index and Products directories.
4. Start the installation by running the appropriate executable:
 - Microsoft Windows operating systems: setup.exe
 - UNIX operating systems: setup.sh

The Common Install engine requires a web browser to render its installation wizard. If your computer does not have a supported web browser installed, you need to start the installation in *Server Only* mode and then connect to the install engine's web server from a machine that does have a supported web browser. Start the installation in *Server Only* mode with `setup.exe -serveronly` or `setup.sh -serveronly` and follow the on-screen instructions.

5. Follow the instructions presented in the web browser based install wizard:
 - a. Welcome to the Installation Utility screen: Click **Next**.
 - b. Review License Agreement screen: Select **Accept** and click **Next**.
 - c. Selection Installation option screen: Select **Install products on this computer now** and click the **Next** button.
 - d. Select Type of Installation screen: Select **Typical** and click **Next**.
 - e. Specify Installation Directory screen: Enter or browse to the BMC Software Product Installation directory where PATROL has been installed.
 - f. Select one or more roles for the computer on which you are planning to install the ControlCenter KM and click **Next**.

A given system role may not install all of the ControlCenter KM files. See Direct Installation Examples table below for more information.

- Select the **Console Systems** role if you previously installed the PATROL Classic Console.
 - Select the **Managed System** role if you previously installed the PATROL agent.
 - Select the **Common Services** role if you previously installed the PATROL Console Server.
- g. Select the Products and Components to Install screen: Expand the EMC ControlCenter folder, select **PATROL Knowledge Module for EMC ControlCenter product**, and click **Next**.
 - h. Review Selections and Install screen: Click **Start install**.

For classic PATROL the ControlCenter KM files are dropped relative to the \$PATROL_HOME. Therefore, the \$PATROL_HOME location must be known before the files are extracted.

6. Restart the PatrolAgent once the ControlCenter KM files are installed.

Direct Installation Examples

This section provides examples of the extracted ControlCenter KM files for both UNIX and Windows installations.

UNIX Directory Structure

Example directories:

```
$PATROL_HOME = /opt/bmc/Patrol3/Solaris28-sun4
```

```
$PATROL_ROOT = /opt/bmc/Patrol7
```

Table 11-1 lists examples of extracted ControlCenter KM files for UNIX.

Table 11-1 Examples of Extracted ControlCenter KM Files—UNIX

Directory/Files	System Role	Notes
\$PATROL_HOME/bin/ ecc3pi eccprx	Managed System	Installs on hosts where PATROL Agent is installed.
\$PATROL_HOME/lib/knowledge/ EMC_ECC.kml EMC_ECC.km EMC_ECC_OBJ.km EMC_ECC_EVENT.km EMC_ECC_STAT.km EMC_ECC_VIEW.km EMC_ECC_GROUP.km EMC_ECC_HOST.km EMC_ECC_ENTERPRISE_DISK.km EMC_ECC_CONNECTIVITY.km	Managed System, Console Systems	Installs on hosts where PATROL Agent or PATROL Classic Console is installed.

Table 11-1 Examples of Extracted ControlCenter KM Files—UNIX (*continued*)

Directory/Files	System Role	Notes
\$PATROL_HOME/lib/psl/ emc_ecc_cmh.lib emc_ecc_usr.lib	Managed System, Console Systems	Installs on hosts where PATROL Agent or PATROL Classic Console is installed.
\$PATROL_HOME/lib/images/ emc_ecc_entdisk_ok.msk emc_ecc_entdisk_ok.xpm emc_ecc_group_ok.msk emc_ecc_group_ok.xpm emc_ecc_host_ok.msk emc_ecc_host_ok.xpm emc_ecc_ok.msk emc_ecc_ok.xpm emc_ecc_stat_ok.msk emc_ecc_stat_ok.xpm emc_ecc_switch_ok.msk emc_ecc_switch_ok.xpm emc_ecc_view_ok.msk emc_ecc_view_ok.xpm	Console Systems	Installs on hosts where PATROL Classic Console is installed.
\$PATROL_ROOT/lib/knowledge/EMC_ ECC_1_2_00/ package.mof resource.mk4	Common Services	Installs on hosts where PATROL Console Server is installed.

Windows Directory Structure

Example directories:

%PATROL_HOME% = C:\Program Files\BMC Software\Patrol3

%PATROL_ROOT% = C:\Program Files\BMC Software\patrol7

Table 11-2 on page 11-9 lists examples of extracted ControlCenter KM files for Windows.

Table 11-2 Examples of Extracted ControlCenter KM Files—Windows

Directory/Files	System Role	Notes
%PATROL_HOME%\Windows_NT-x86\bin\ ecc3pi.exe eccprx.exe eccpsk.exe	Managed System	Installs on hosts where PATROL Agent is installed.
%PATROL_HOME%\lib\knowledge\ EMC_ECC.kml EMC_ECC.km EMC_ECC_OBJ.km EMC_ECC_EVENT.km EMC_ECC_STAT.km EMC_ECC_VIEW.km EMC_ECC_GROUP.km EMC_ECC_HOST.km EMC_ECC_ENTERPRISE_DISK.km EMC_ECC_CONNECTIVITY.km	Managed System, Console Systems	Installs on hosts where PATROL Agent or PATROL Classic Console is installed.
%PATROL_HOME%\lib\ps\ emc_ecc_cmh.lib emc_ecc_usr.lib	Managed System, Console Systems	Installs on hosts where PATROL Agent or PATROL Classic Console is installed.
%PATROL_HOME%\lib\images\ emc_ecc_entdisk_ok.bmk emc_ecc_entdisk_ok.bmp emc_ecc_group_ok.bmk emc_ecc_group_ok.bmp emc_ecc_host_ok.bmk emc_ecc_host_ok.bmp emc_ecc_ok.bmk emc_ecc_ok.bmp emc_ecc_stat_ok.bmk emc_ecc_stat_ok.bmp emc_ecc_switch_ok.bmk emc_ecc_switch_ok.bmp emc_ecc_view_ok.bmk emc_ecc_view_ok.bmp	Console Systems	Installs on hosts where PATROL Classic Console is installed.
%PATROL_ROOT%\lib\knowledge\EMC_EC C_1_2_00\ package.mof resource.mk4	Common Services	Installs on hosts where PATROL Console Server is installed.

Distribution Server installation

Use the following procedure to install the integration package using a distribution server.

Preconditions for KM deployment

Refer to BMC documentation for details. Ensure that the following preconditions are met before beginning KM distribution:

- ◆ BMC Distribution Manager was installed.
- ◆ BMC Distribution Manager was configured for deployment to systems where KM will be installed:
 - Connection accounts and Privileged account(s) were created for the systems targeted for deployment.
 - Distribution Profiles were created for each system type (Windows and UNIX).
 - System groups were created containing the systems/hosts where the knowledge module will be deployed.
- ◆ BMC Distribution Client was deployed to systems.
- ◆ PATROL 3.5 Agent, PATROL 3.5 Classic Console, PATROL 7 Central Operator for Windows, PATROL 7 RT Server, and/or PATROL 7 Console Server was installed on systems.

KM Distribution instructions

Use the following steps to distribute KM:

1. Extract the `EMC_ECC_KM.tar` file to a local directory on the Distribution Manager (for example: `C:\ecc_km`).

When uncompressing `EMC_ECC_KM.tar` using WinZip, please use WinZip version 9.0. WinZip version 7.0 is unable to uncompress the `EMC_ECC_KM.tar` file correctly.

2. Import the ControlCenter KM Components into the Distribution Manager Repository with the following steps.
 - a. Select the **Components** tab on the main Distribution Manager screen.
 - b. Select the **Components** link and click **Import**. The Import components dialog box displays.
 - c. Enter the full path to the `bmc_products` directory created when you extracted the `.tar` file (for example: `C:\ecc_km\bmc_products`). Or, click **Browse** and select the directory. Then, click **Next**.

A tree of components that can be imported displays.

- d. Expand the EMC ControlCenter folder and checkmark the checkbox for the **PATROL Knowledge Module for EMC ControlCenter (1.2.00)** component. Then, click **OK**.
 - e. Click **Import** on the following screen to perform the import of the component you selected. When the import completes, click **Close**.
3. Set up a collection that contains the ControlCenter KM for each system type as follows:
 - a. Select the **Collections** tab on the main Distribution Manager screen.
 - b. Click the **Selections** link and click **Add**. The Add collection dialog box displays.
 - c. Enter a Collection name (for example, **ControlCenter KM**) and click **Add**. A new link appears under the Collections list with this name.
 4. Configure the newly added collection as follows:
 - a. Click the link with the collection name you specified. This presents a collection screen in the right panel.
 - b. Select the **Components** tab on the collection screen. This displays the list of components selected for this collection (which should be empty). Click **Add**. This presents a tree of all components that have been imported into the Distribution Manager.
 - c. On the component tree expand the EMC ControlCenter folder, check the **PATROL Knowledge Module for EMC ControlCenter (1.2.00)**, and then click **OK**. This adds the component to the collection's component list.
 - d. Select the Configurations tab on the collection screen to display the collection Configurations screen.
 - e. Click **Add** to open the Add configuration screen.
 - f. Enter a configuration name and description then click **Next**.
 - g. Click **Next** on the following Instructions screen to begin answering questions that are specific to the install of the EMC ControlCenter Knowledge Module.

Note, there are no uninstall questions for this knowledge module.

- h. Enter the PATROL 3.x Product Directory and click **Next**. For example, if you installed the PATROL 3.5 Agent to the C:\Program Files\BMC Software\Patrol3 directory, enter **Patrol3**.
5. Schedule the ControlCenter KM distribution as follows:
 - a. Select the **Distribution** tab on the Distribution Manager.
 - b. Click **Add**. The Add Distribution Set dialog box displays.
Enter a **Distribution set** name (for example, EMC ControlCenter Distribution) and click **Add**. This causes the newly add distribution set's properties to display in the right panel.
 - c. Select the **Distribution's Items** tab in the right panel.
 - d. Click **Add Item** to display the Add distribution Item dialog box.
 - e. Select the name of the **collection** you created from the Collection drop down list box.
 - f. Select the name of the **configuration** you created from the Configuration drop down list box.
 - g. Select the name of the **System group** where you want to deploy your collection/configuration.
Click **Add** to finish creating the distribution set.
 - h. Select the **Distribution's Schedule** tab in the right panel to display the Schedule screen.
 - i. Click **Add Schedule**.
 - j. Select either **Distribute immediately** or **Schedule distribution** and enter start date and start time information for when to distribute.
 - k. Click **Install**.
 - l. Click **Add** to complete the scheduling of the distribution.
6. Review deployment status and history by selecting the Distribution Manager's **Reports** tab.

- a. Select the **Active** tab to view the status of scheduled deployments currently under way.
- b. Select a distribution name from the **Distribution** drop down list box to view that active distribution's status. The status of the distribution for each host will be displayed.
- c. Select the **History** tab to view the status of distributions that have completed.
- d. Select a distribution name from the **Distribution** drop down list box to view the completed distribution's status. The status of the distribution for each host will be displayed.
- e. Click **installation.log** links to view the installation log file for specific hosts.

Uninstalling the Integration Package for PATROL

The uninstall can be handled by the BMC Common Install engine or Distribution Server based on how the ControlCenter KM was installed.

Alternatively, the files listed in the direct installation example may be manually removed (there are not many) or an uninstall script may be written to remove the ControlCenter KM package.

Using the EMC ControlCenter KM for PATROL

The EMC ControlCenter Knowledge Module for PATROL enables you to view EMC objects and events from PATROL console. You can then define appropriate actions and responses within PATROL for these events. ControlCenter information can also be forwarded from PATROL to other BMC products.

EMC ControlCenter Objects in PATROL

ControlCenter objects will be instantiated within PATROL and displayed in the PATROL console.

The objects include:

```
EMC_ECC
EMC_ECC_VIEW
EMC_ECC_GROUP
EMC_ECC_OBJECT
```

The `EMC_ECC` top level object acts as a container for the discovered ECC objects. The `EMC_ECC_VIEW` represents each gateway object. Contained within any gateway object are the discovered ECC groups (both preset and any user-defined). Each ECC group will contain the top-level objects which are designated to that group.

Figure 11-2 on page 11-15 shows the ControlCenter KM configured to collect data and event objects from two Gateways (`losae039` and `losav139`). The ControlCenter default groups of Hosts, Storage, Connectivity and also several use-defined groups can be seen under the `losav139` gateway object.

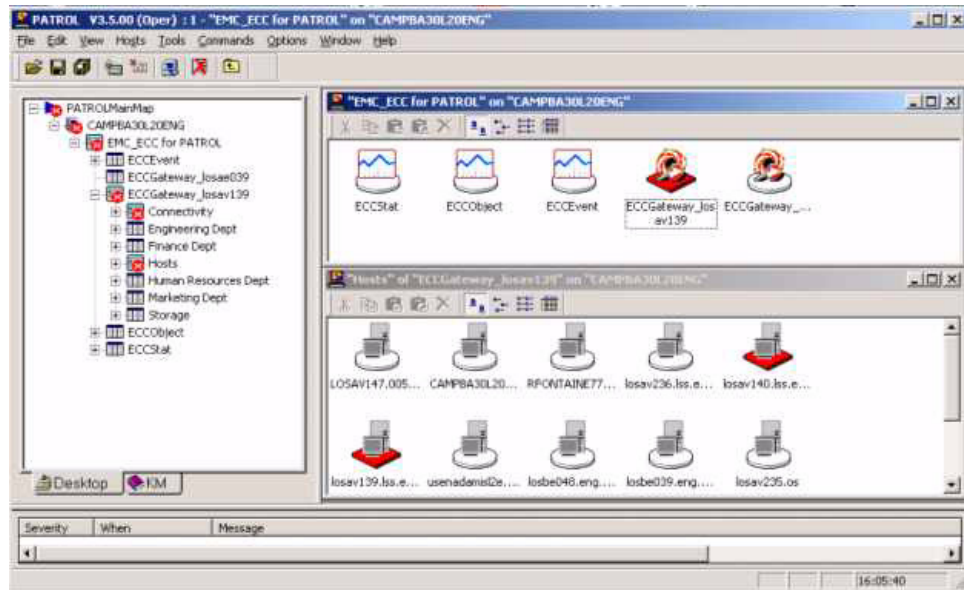


Figure 11-2 Configuration Collecting Data and Events from Two Gateways

EMC ControlCenter Events in PATROL

As ControlCenter alerts/events are received by the ControlCenter KM they are associated with the respective object. Events can be viewed through PATROL by selecting the event icon (Figure 11-3).

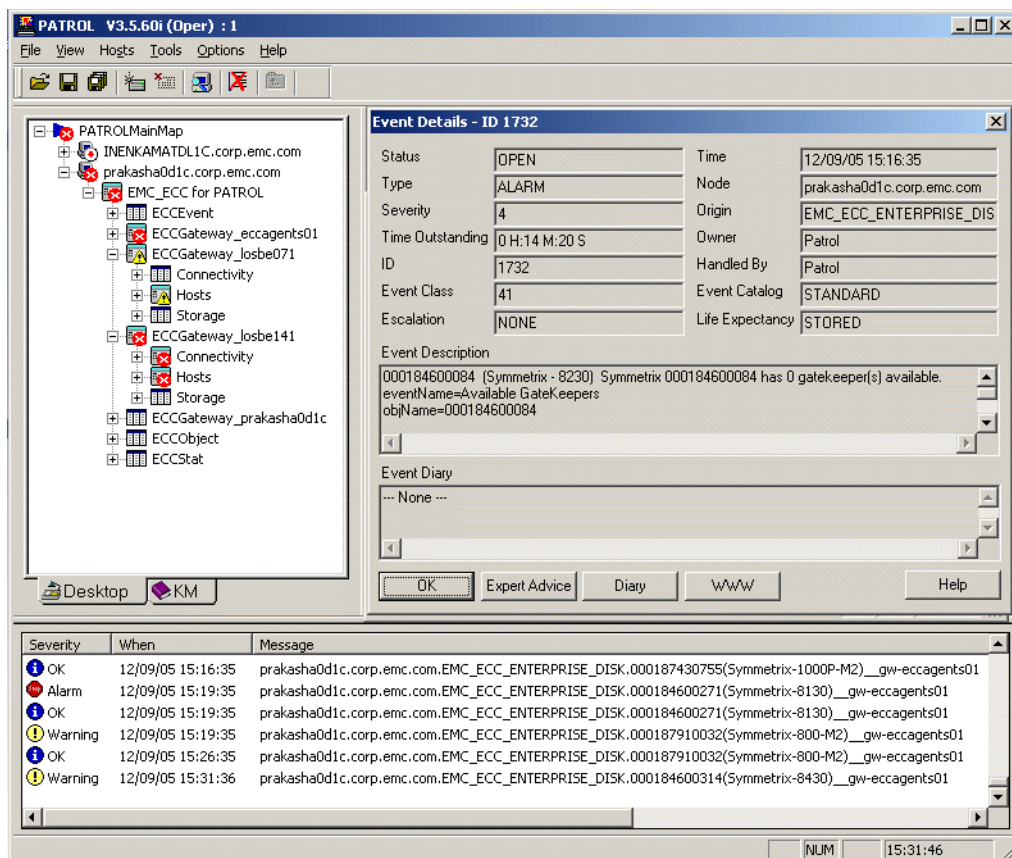


Figure 11-3 PATROL Event Details

The following naming conventions are used:

```
<hostname>.EMC_ECC_HOST.<OSHostName>(Product or OS type)_gw_<ECC GatewayName>
<hostname>.EMC_ECC_ENTERPRISE_DISK.<arraySerialNumber>(Product Type)_gw_<ECC GatewayName>
<hostname>.EMC_ECC_CONNECTIVITY.<switchSerialNumber>(Product Type)_gw_<ECC GatewayName>
```

Where <hostname> is the host on which the PATROL agent is running.

Figure 11-4 provides an example of the PATROL Event Manager window detailing the ControlCenter alerts.

ID	Status	Type	Date/Time	Host	Origin	Description
626	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC CONNECTIVITY	1000006069800540 (-12000)
627	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC CONNECTIVITY	1000006069800540 (-12000)
628	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC CONNECTIVITY	1000006069800540 (-12000)
630	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC HOST eccagents	Alarm #2 of global parameter 'event' triggered on 'EMC ECC HOST eccagents01(Microsoft-X86) qw-e
632	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC HOST eccagents	State Change: OK ALARM
633	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC HOST	State Change: OK ALARM
634	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC GROUP.Hosts	State Change: OK ALARM
635	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC VIEW.eccagents0	State Change: WARN ALARM
638	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC HOST eccagents	eccagent001.corp.emc.com (Microsoft-X86) Database Agent for Oracle has become inactive on host
643	OPEN	INFORM	12/09/05 11:4	prakash0d1c.corp	EMC ECC ENTERPRISE_D1	000187910032 (Symmetrix - 800-M2) Symmetrix 000187910032: KB/sec read is 141.095833
645	OPEN	WARN	12/09/05 11:4	prakash0d1c.corp	EMC ECC HOST.iosbd215IS	Alarm #1 of global parameter 'event' triggered on 'EMC ECC HOST.iosbd215(SunMicrosystems-sundul)
647	OPEN	WARN	12/09/05 11:4	prakash0d1c.corp	EMC ECC HOST.iosbd215IS	State Change: OK WARN
650	OPEN	WARN	12/09/05 11:4	prakash0d1c.corp	EMC ECC HOST.iosbd215IS	iosbd215.80f747df (Sun Microsystems - sundul) CPU usage is at 59%
654	OPEN	INFORM	12/09/05 11:4	prakash0d1c.corp	EMC ECC ENTERPRISE_D1	000187910034 (Symmetrix - 800-M2) Symmetrix 000187910034: KB/sec read is 41.541667
655	OPEN	INFORM	12/09/05 11:4	prakash0d1c.corp	EMC ECC ENTERPRISE_D1	000187910034 (Symmetrix - 800-M2) Symmetrix 000187910034: KB/sec written is 1259.216667
656	OPEN	INFORM	12/09/05 11:4	prakash0d1c.corp	EMC ECC ENTERPRISE_D1	000187910032 (Symmetrix - 800-M2) Symmetrix 000187910032: KB/sec written is 324.008333
657	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC CONNECTIVITY	1000006069800540 (-12000)
658	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC CONNECTIVITY	1000006069800540 (-12000)
659	OPEN	ALARM	12/09/05 11:4	prakash0d1c.corp	EMC ECC CONNECTIVITY	1000006069800540 (-12000)

Figure 11-4 PATROL Event Manager

Define Gateways:

The Gateway Setup configuration dialog allows the user to define which ECC Gateways are used to collect data and receive events (Figure 11-5 on page 11-18).

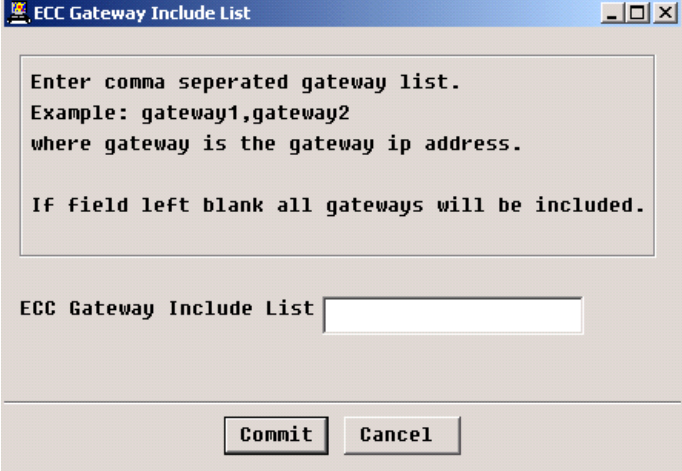


Figure 11-5 ECC Gateway Setup

Filters

The user can define certain filters which limit the types of ControlCenter objects that get exposed to PATROL. Only those specified objects and their associated alerts appear in PATROL. You can specify to filter objects by Gateway, Group(s), or individual object(s).

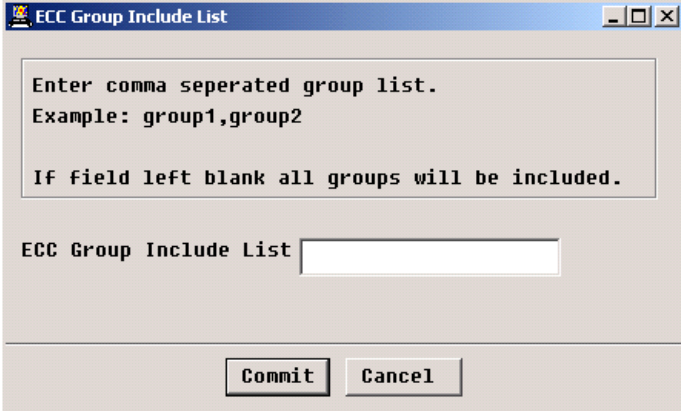
The **Gateway Include List** configuration dialog allows you to define which ECC Gateway(s) will be exposed to PATROL (Figure 11-6 on page 11-19).



The dialog box titled "ECC Gateway Include List" contains the following text: "Enter comma seperated gateway list. Example: gateway1,gateway2 where gateway is the gateway ip address. If field left blank all gateways will be included." Below this text is a text input field labeled "ECC Gateway Include List". At the bottom are "Commit" and "Cancel" buttons.

Figure 11-6 ECC Gateway Include List

The **Group Include List** configuration dialog allows you to define which ECC Groups will be exposed to PATROL (Figure 11-7).



The dialog box titled "ECC Group Include List" contains the following text: "Enter comma seperated group list. Example: group1,group2 If field left blank all groups will be included." Below this text is a text input field labeled "ECC Group Include List". At the bottom are "Commit" and "Cancel" buttons.

Figure 11-7 ECC Group Include List

The **Object Include List** configuration dialog allows the user to define which ECC Objects will be exposed to PATROL (Figure 11-8).

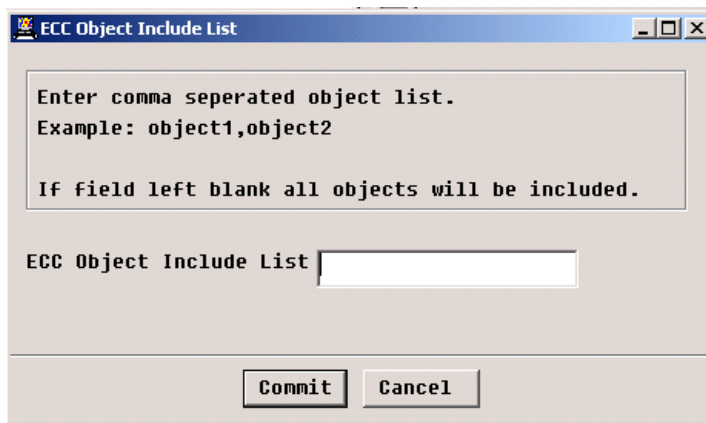


Figure 11-8 ECC Object Include List

MIBs and Traps

This Appendix discusses the MIBs and Traps used by the Integration Packages.

- ◆ EMC ControlCenter MIBs.....A-2
- ◆ EMC ControlCenter TrapsA-3

EMC ControlCenter MIBs

The Integration Gateway supports the FibreAlliance MIB (`fcmgmt.mib`), version 3. This MIB is included with the Integration Packages and loads, if necessary, as part of the installation.

MIB Definition

The Integration Packages implement the `iso.org.dod.internet.experimental.fcmgmt (1.3.6.1.3.94)` branch of the MIB.

For further information on this MIB, refer to:
<http://www.fibrealliance.org>

connUnitTable

The Integration Gateway stores ControlCenter managed objects in the `connUnitTable` within the MIB, one entry per object. The Integration Packages read this MIB table as part of the discovery process.

SNMP Port

The Integration Gateway, by default, uses a different port number than the standard SNMP port 161. The Integration Gateway implements a standard MIB and SNMP. It uses a different port, so it does not conflict with any other SNMP agents that may reside on the host with the Integration Gateway.

The Integration Gateway uses registered port 1273 by default. This can be manually changed in the `CNG.ini` file by modifying the following line:

```
udp_port_number = 1273
```

EMC ControlCenter Traps

The Integration Gateway supports four SNMP traps:

- ◆ `coldStart` trap
- ◆ `connUnitStatusChange` trap
- ◆ `connUnitDeletedTrap`
- ◆ `connUnitEventTrap`

The `coldStart` trap is a standard SNMP MIB-II trap. The other traps are defined in the `fccmgmt` MIB.

coldStart Trap

The Integration Gateway sends a `coldStart` trap to the third-party frameworks when it starts and initializes. The Integration Packages uses this trap to trigger the automatic discovery process. The trap contains the IP address of the Integration Gateway host.

The Integration Packages read the `connUnitTable` from the MIB using SNMP `get` and `getNext` requests and add any ControlCenter managed objects that are stored in this table to the framework topology.

connUnitStatusChange Trap

The Integration Gateway sends the `connUnitStatusChange` trap when the state or status of a managed object changes. The trap identifies the object and its state and status. The Integration Packages use this information to set the status (icon color) for the object in the topology.

If the object doesn't exist, the Integration Packages adds it to the topology.

connUnitDeleted Trap

The Integration Gateway sends the `connUnitDeletedTrap` when a managed object is deleted from the ControlCenter repository. The trap identifies the deleted object, and the Integration Packages use this information to set the status (icon color) of the object to unknown to indicate that the trap occurred. You must, however, manually delete the object from the framework topology.

connUnitEventTrap

The Integration Gateway sends a `connUnitEventTrap` to report all other alerts and events. The trap identifies the object involved in the event, and includes the event description.

The event description contains the event details. The individual agents supply the event description. For example, the Symmetrix agent generates appropriate Symmetrix alerts.

Alerts sent to the Integration Gateway are part of your ControlCenter alert policies. With the ControlCenter Console, you can set alerts for objects and specify the alerts sent to the Integration Gateway that generate event traps.

The integration application only processes event traps of type:
`connUnitEventType=5 (topology)`

The Integration Gateway sends these traps for group objects, when an object is deleted from a group. A topology event also causes a refresh of the object. All other traps are logged in the frameworks event log.

If an event causes a change in state or status for an object, the Integration Gateway also sends a `connUnitStatusChange` trap.

Trap Definitions

The following trap definitions appear in the `fcmgmt.mib`:

```
connUnitStatusChange TRAP-TYPE
    ENTERPRISE fcmgmt
    VARIABLES { connUnitStatus, connUnitState }
    DESCRIPTION
        "The overall status of the connectivity unit
        has changed.
        Recommended severity level (for filtering):
        alert"
        ::= 1
connUnitDeletedTrap TRAP-TYPE
    ENTERPRISE fcmgmt
    VARIABLES { connUnitId }
    DESCRIPTION
        "A connUnit has been deleted from this agent.
        Recommended severity level (for filtering):
        warning"
        ::= 3
connUnitEventTrap TRAP-TYPE
    ENTERPRISE fcmgmt
    VARIABLES { connUnitEventId,
                connUnitEventType,
                connUnitEventObject,
                connUnitEventDescr }
    DESCRIPTION
        "An event has been generated by the
        connectivity unit.
        Recommended severity level (for filtering):
        info"
        ::= 4
```

Event Severity Mapping

This section shows the severity mapping for events for each supported third-party framework.

The tables in this section show the mapping between ControlCenter severity level values and Fibre Channel MIB SNMP values, and between the Fibre Channel MIB SNMP values and framework-specific values.

The Integration Gateway maps ControlCenter severity levels to Fibre Channel MIB values. Table A-1 shows the relationship between ControlCenter severity levels, `connUnitEventSeverity`, and `connUnitStatus`.

Table A-1 Severity Mapping Reference Table

ControlCenter Severity Level	connUnitEventSeverity	connUnitStatus
Fatal	emergency (2)	failed (5)
Critical	critical (4)	failed (5)
Warning	warning (6)	warning (4)
Minor	notify (7)	warning (4)
Information Normal	info (8)	ok (3)

For the frameworks shown in Table A-2, the ControlCenter integration maps `connUnitStatusChanged` traps to icon status based on the `connUnitStatus` variable within the trap.

Table A-2 connUnitStatus Mapping Reference Table

connUnitStatus	HP OpenView NNM	Tivoli NetView	CA Unicenter
Unknown	Unknown	Unknown	Unknown
Unused	Unknown	Unknown	Unknown
OK	Normal	Normal	OK
Warning	Marginal	Marginal	Warning
Failed	Critical	Critical	Failed

For the frameworks shown in Table A-3, the ControlCenter integration maps the Gateway trap type to a severity level in the framework event display, and ignores the status or severity variables within the trap.

Table A-3 Gateway to Framework Event Mapping Reference Table

Gateway Trap Type	PEM	MOM	TEC	NetCool	OVO
coldStart	Information	Information	Minor	Minor	Normal
connUnitStatusChanged	Minor	Warning	Warning	Major	Minor
connUnitDeleted	Minor	Warning	Warning	Major	Minor
connUnitEvent	Warning	Error	Minor	Minor	Warning

The BMC PATROL integration maps `connUnitEvent` severity to icon status and ignores other traps as shown in Table A-4.

Table A-4 BMC PATROL Mapping Reference Table

connUnitEventSeverity	BMC PATROL
emergency (2)	Alarm
critical (4)	Alarm
warning (6)	Warning
notify (7)	Warning
info (8)	Information

Configuration Settings

This appendix discusses the configuration settings used by the `ecc3pi` Integration application.

- ◆ Configuration Settings B-2
- ◆ Sample Configuration File B-4
- ◆ Configuring Console for Launch B-5

Configuration Settings

The integration application, `ecc3pi`, creates an `.ini` file of configuration settings in the framework `bin` directory. The default settings are appropriate in most situations, however, you can modify them.

The configuration settings contain three groups:

- ◆ Polling
- ◆ SNMP
- ◆ Repository (for CA only)

In addition, these global settings appear in the `.ini` file:

- ◆ ECC — Console mode is an `EMC_View` that shows groups including the **All Objects** group.
- ◆ MIB — Object mode is an `EMC_View` that shows all managed objects.

Polling Frequency

The integration application constantly polls the Integration Gateway for status information. There are polling frequency parameters that control the polling cycle that are defined in `ecc3pi`. They are:

- ◆ Heartbeat
- ◆ Retry
- ◆ Refresh

The integration application polls the gateway at a default specified heartbeat interval. If the gateway doesn't respond, the integration application repolls the Integration Gateway every minute up to the specified retry limit.

The default polling frequency is every 15 minutes and the retry limit is four.

The periodic polling checks the status of the Integration Gateway. The periodic refresh triggers a rediscovery of the ControlCenter managed objects. You can use these features to re-synchronize the framework in the event that traps get lost.

The refresh default time is every eight hours.

The default refresh normalization time is midnight.

SNMP Request

The integration application sends SNMP requests to the gateway as part of polling, discovery, and event processing. These parameters control the request retry frequency.

- ◆ The heartbeat timeout is the quantity of time that the integration application waits for a response from a periodic Integration Gateway poll. The heartbeat default is three seconds.
- ◆ The data timeout is the time the integration application waits for a response for a request for object information during a discovery. The data timeout default is five seconds.
- ◆ Both requests use the same number of specified retries. The default retry number is three.

Repository (CA Unicenter)

The Integration Packages require a repository name, and a username and password, to connect to the CA repository. You can manually edit the `.ini` file to add your username and password.

If you specify a username and password, then you will not be prompted for this information when you start the Integration Package for CA Unicenter.

This may be a security concern since the username and password are saved in plain text. If this is a security concern, or if you don't want automatic login, then delete these entries. You will then be prompted for this information each time you start the integration.

Configure ECC Server to Enable Status Traps

Active integrations like NNM, Unicenter, and Tivoli NetView (Windows) process `connUnitStatusChange` traps to display color changes on objects. Passive integrations are usually configured to suppress these traps since this helps to eliminate unnecessary traps, traffic and so on.

To control this feature, edit the following file on the ECC Server:

```
<install_directory>\ecc_inf\data\<servername>\class\TOPLINK\Cache_Listener.properties
```

Edit the following line (**false** is the default—the alert will not be sent, changing to **true**—the alert will be sent):

```
emitLocalObjectStatus=true (or false)
```

Sample Configuration File

The following is a sample `ecc3pi.ini` file:

```
; ecc3pi.ini
; EMC Integration Packages configuration settings
[Global Settings]
; Allows the user to change the display mode within the
; framework.
; valid choices are MIB and ECC. The system default is
; ECC
display_mode=ECC
[Polling Attributes]
; Specify the heartbeat polling frequency for EMC
; gateways, in minutes.
; A value of zero disables polling.
; Specify the retry count for non-responding EMC gateways
; before returning to normal polling frequency.
; Specify the periodic refresh of EMC gateways to
; discover new Managed Objects, in minutes.
; Recommended defaults:
; heartbeat=15
; retry=4
; refresh=480
heartbeat=15
retry=4
refresh=480
[SNMP Attributes]
; Specify the SNMP heartbeat polling timeout for EMC
; gateways, in seconds.
; Specify the SNMP data request timeout for EMC gateways,
; in seconds
; Specify the SNMP request retry count
; Specify the SNMP GET community string
; Recommended defaults:
; heartbeat=3
; data=5
; retry=3
; get_community=public
heartbeat=3
data=5
retry=3
get_community=public
; Parameter is for CA/Unicenter ONLY.
; Specify CA/Unicenter Repository information as:
; repository name, user name, password
[Repository]
repository=FONTAINEXXXB
username=
password=
```

Configuring Console for Launch

For active integrations, the ControlCenter Console can be launched by selecting the EMC launch menu function from within the frameworks. The ControlCenter Console does not provide the capability to specify a specific device or view upon startup, so the top-level Console view is always displayed. Also, a new instance of the ControlCenter Console is launched each time the launch menu function is selected.

The ControlCenter Console is launched via a batch file called `ecc_launch.bat`. The `ecc_launch.bat` file is moved and remains in the framework bin directory after installation of the Integration Packages. You need to edit this file if the location or method of launching the ControlCenter Console changes. If this location has changed, modify the following lines:

```
:: Default - launch ECC 5.0 Console
cd "C:\Program Files\ecc\console\bin "
"C:\Program Files\ecc\console\bin\createprocessfg.exe"
    launch.bat
goto done
```


Configuring ControlCenter to Send Alerts

This appendix discusses how to configure ControlCenter to accept multiple trap destinations.

- ◆ Multiple Trap Destinations C-2
- ◆ Trap Variables C-3

Multiple Trap Destinations

When you install the Integration Gateway, you specify the framework IP address as the initial default trap destination. If you need more than one trap destination, you need to manually edit the `CNG.ini` file. by performing this procedure:

- ◆ Open the `CNG.ini` file, and then duplicate the following line:
`trap_client_registration(ip,port,severity,state)`

In addition, you can filter traps on a severity level as described in `FcEventSeverity`. For example, if you do not want low severity alerts to trigger traps, and you want only critical and fatal alerts to be sent to the framework, then you can modify the severity parameter from 10 (all messages) to 4. Each trap destination can be configured to receive traps from a specified severity level and up.

The gateway will then send traps to all destinations specified.

Trap Variables

In addition to the variables defined in the `connUnitStatusChange` and `connUnitEventTrap` of the `fcmgmt.mib`, the Integration Gateway adds variables to the trap when it is sent. You can use these variables for further processing on the framework side for tasks such as parsing and event log filtering.

Table C-1 describes `connUnitStatusChange` trap variables:

Table C-1 ConnUnitStatusChange (Trap 1) Variables

Variable #	Variables Sent From Integration Gateway	Values	Description
	Date/Time		Timestamp of the trap
	Source		IP/Hostname of Integration Gateway
1	connUnitStatus	Unknown (1) Ok (3) Warning (4) Failed (5)	New status of object as defined in MIB
2	connUnitState	Unknown (1) Online (2) Offline (3)	New state of object as defined in MIB
3 ^a	connUnitName		Top level source of the alert
4 ^a	FcUnitType	Other (2) Switch (4) Host (10) Storage-subsystem (11)	Type of the top level source as defined in the MIB

a. additional variable

Table C-2 describes `connUnitEventTrap` variables:

Table C-2 ConnUnitEventTrap (Trap 4) Variables

Variable #	Variables Sent From Integration Gateway	Values0	Description
	Date/Time		Timestamp of trap
	Source		IP/Hostname of Integration Gateway
1	<code>connUnitEventId</code>	Number	Sequential number for each event per <code>connUnitEntry</code>
2	<code>connUnitEventType</code>	Status (3)	Fixed value
3	<code>connUnitEventObject</code>	<code>.ccitt.zeroDotZero</code>	
4	<code>connUnitEventDescr</code>	Alert ID Alert Name Alert Object Alert Description	Unique identifier Name of alert Name for source object Detailed description
5 ^a	<code>FcEventSeverity</code>	Unknown (1) Fatal (2) Critical (4) Warning (6) Minor (7) Information (8)	This is the severity from ControlCenter and can be mapped to framework templates or events
6 ^a	<code>connUnitName</code>		Top level source of the alert
7 ^a	<code>FcUnitType</code>	Other (2) Switch (4) Host (10) Storage-subsystem (11)	Type of the top level source as defined in the MIB

a. Additional variable.

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