

PATROL[®]
for Microsoft Windows Clustering
Getting Started

Version 1.5

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Address BMC Software, Inc.
2101 CityWest Blvd.
Houston TX 77042-2827

Telephone 713 918 8800 or
800 841 2031

Fax 713 918 8000

Outside United States and Canada

Telephone (01) 713 918 8800

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 - serial numbers
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- sequence of events leading to the problem
- commands and options that you used
- messages received (and the time and date that you received them)
 - product error messages
 - messages from the operating system, such as `file system full`
 - messages from related software

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Product Components and Capabilities

The *PATROL for Microsoft Windows Clustering Getting Started* guide provides information and instructions necessary for using the PATROL for Microsoft Windows Clustering components (also referred to as PATROL for Windows Clustering). This chapter provides a brief overview of PATROL for Windows Clustering and covers the following topics:

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What Is PATROL for Microsoft Windows Clustering?

With the PATROL for Microsoft Windows Clustering (PATROL for Windows Clustering) components, you can monitor and manage elements of your cluster server environment. Your cluster server environment can include the following platforms:

- Microsoft Windows NT Server 4.0, Enterprise Edition
- Microsoft Windows XP Professional
- Microsoft Windows 2000 Server
- Microsoft Windows 2000 Advanced Server
- Microsoft Windows 2000 Datacenter Server
- Microsoft Windows .NET Server—Standard, Enterprise, or Datacenter Edition

PATROL for Windows Clustering monitors the following elements in your cluster server environment:

- Microsoft Cluster Server
- Microsoft Network Load Balancing (NLB)

PATROL for Windows Clustering Components

The PATROL for Windows Clustering components are Knowledge Module™ (KM) components that manage and monitor elements of your cluster server environment. A KM is a set of instructions that the PATROL Agent uses to monitor objects in your enterprise. For modularity and convenience, these features have been grouped into smaller component pieces that can be installed and loaded independently.

PATROL for Windows Clustering contains two KM components, and a wizard to help you easily set up PATROL to monitor and manage your cluster server environment. The three PATROL for Windows Clustering components are

- PATROL Knowledge Module for Microsoft Cluster Server (PATROL KM for Cluster Server)
- PATROL Knowledge Module for Microsoft Network Load Balancing (PATROL KM for Network Load Balancing)
- PATROL Cluster Configuration (PCC) Wizard

These PATROL for Windows Clustering components will often be referred to individually throughout this book because you can use one or more depending on your environment.

PATROL KM for Cluster Server Features

The PATROL KM for Cluster Server component monitors, analyzes, and manages activities of a Microsoft Cluster Server (MCS) and its associated nodes, groups, resources, and services. The PATROL KM for Cluster Server allows you to obtain the current status of all essential cluster objects and perform cluster operations from a central point, which includes monitoring of

- all clusters in a domain
- individual clusters
- cluster communication networks
- cluster network interfaces
- cluster nodes
- cluster objects and resources
- cluster groups
- workload data
- group resources
- quorum device

For more information on specific functionality that supports these features see the PATROL KM for Cluster Server KM online Help.

PATROL KM for Cluster Server Applications and Icons

Table 1-1 contains information about the PATROL KM for Cluster Server applications and icons.

Table 1-1 PATROL KM for Cluster Server Applications and Icons

Icon and Name	Description
 MCS_Clusters	MCS_Clusters is a base application class for all clusters, and it contains parameters that report the status and availability of the cluster services.
 MCS_Cluster	MCS_Cluster is a container for cluster components. It contains parameters that monitor the status and availability of each cluster.
 MCS_Collectors	MCS_Collectors is a container for all KM collectors and general parameters. The parameters monitor all cluster objects and resources, and also the availability of debug and configuration files.
 MCS_Group	MCS_Group is a container application class for MCS_Groups. It does not have any InfoBox items, menu commands, or parameters.
 MCS_Groups	MCS_Groups is an instance container for all cluster groups and related status parameters.

Table 1-1 PATROL KM for Cluster Server Applications and Icons

Icon and Name	Description
 <p>MCS_Group_Resources</p>	<p>MCS_Group_Resources is an instance container for all cluster resources belonging to a specific cluster group and contains related status parameters.</p> <p>Resource application instances, and the icons representing them, appear under MCS_Groups application instances. Icons for physical disk resources and file share resources are displayed as follows when the large icons view is activated.</p> <p>This icon represents physical disk resources.</p>  <p>This icon represents file share resources.</p>  <p>Other types of cluster resources are represented by default Microsoft icons.</p>
 <p>MCS_Networks</p>	<p>MCS_Networks is an instance container for all networks and related status parameters.</p>
 <p>MCS_Network_Interfaces</p>	<p>MCS_Network_Interfaces is an instance container for all network interfaces used by a cluster and contains related status parameters.</p>
 <p>MCS_Nodes</p>	<p>MCS_Nodes is an instance container for each member node running the cluster service. The parameters provide node status and monitor for keyword matches within the cluster log file.</p>

Table 1-1 PATROL KM for Cluster Server Applications and Icons

Icon and Name	Description
 MCS_Performance	MCS_Performance is a container for performance-related parameters that monitor the workload of cluster nodes.
 MCS_Quorum	MCS_Quorum is a container for the cluster quorum device and contains related status parameters.

PATROL KM for Network Load Balancing Features

The PATROL KM for Network Load Balancing component provides a central point for monitoring and administrating Microsoft Network Load Balancing clusters and nodes through the PATROL Console. It monitors and manages load balancing of Internet/intranet traffic across Microsoft Network Load Balancing cluster nodes. The PATROL KM for Network Load Balancing allows you to obtain the following information:

- status of the NLB cluster
- status of nodes within the NLB cluster
- cluster-related events
- cluster performance data

For more information on specific functionality that supports these features, see the PATROL KM for Network Load Balancing online Help.

PATROL KM for Network Load Balancing Applications and Icons

Table 1-1 contains information about the PATROL KM for Network Load Balancing applications and icons.

Table 1-2 PATROL KM for Network Load Balancing Applications and Icons

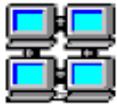
Icon and Name	Description
 <p>LBS_Clusters</p>	<p>LBS_Clusters is the base application class for all network load balancing (NLB) clusters. This application class is a container for all NLB clusters that were added to the PATROL Console. The LBS_Clusters application class provides the following features:</p> <ul style="list-style-type: none"> • reports the number of NLB clusters being monitored on the network • reports the number of active NLB nodes being monitored on the network • provides a list of monitored NLB clusters from which you can select the clusters you no longer want to monitor • allows you to manually enter the IP Address or name of a cluster you want to monitor
 <p>LBS_Cluster</p>	<p>LBS_Cluster is the base application class for each network load balancing (NLB) cluster. This application class provides monitoring and management functions for each individual NLB cluster. The LBS_Cluster application class provides the following features:</p> <ul style="list-style-type: none"> • displays cluster status (OK, Warn, Alarm) • displays a list of monitored NLB nodes that are members of the current cluster • allows you to configure port rules for the entire cluster (port rules must be consistent for all nodes in the cluster) • suspends cluster operations on all monitored nodes • drains all ports, then stops cluster operations on all monitored nodes • resumes all suspended ports on all monitored nodes • starts cluster operations on all monitored nodes • allows you to enable or disable multicast support for all monitored nodes (all cluster nodes must operate in multicast or unicast mode) • allows you to manually add or remove nodes for monitoring by the KM

Table 1-2 PATROL KM for Network Load Balancing Applications and Icons

Icon and Name	Description
 <p>LBS_Events</p>	<p>LBS_Events is a subclass of LBS_Cluster. This application class provides information about WLBS events in the Microsoft Windows Servers System Log. The parameters in this application class show the number of events that have occurred for Error, Warning, or Information. The LBS_Events application class provides the following functions:</p> <ul style="list-style-type: none"> • reports the total number of WLBS errors recorded in the Windows 2000 System Event Logs for all monitored nodes of a cluster and alarms if an error event is received • reports the total number of WLBS warnings recorded in the Windows 2000 System Event Logs for all monitored nodes of a cluster and displays a warning if a warning event is received • reports the total number of WLBS information events recorded in the Windows 2000 System Event Logs for all monitored nodes of a cluster
 <p>LBS_Node</p>	<p>LBS_Node is the base application class for each node within a network load balancing (NLB) cluster. The LBS_Node application class provides the following functions:</p> <ul style="list-style-type: none"> • displays node status (OK, Warning, Alarm) • alarms if a node does not respond to a ping request • provides WMI status
 <p>LBS_Performance</p>	<p>LBS_Performance is a subclass of LBS_Node. This application class contains node-performance parameters and provides the following functions:</p> <ul style="list-style-type: none"> • displays the percentage of page file usage and alarms when the percentage exceeds a threshold • displays the amount of physical memory currently available on the node • displays the percentage of total physical memory available on the node • displays total CPU usage percent for all processes running on the current node and alarms when the percentage exceeds a threshold

PATROL Cluster Configuration Wizard Features

The PATROL Cluster Configuration Wizard provides an easy-to-use interface that allows you to configure the PATROL Agent for failover in a Microsoft Cluster Server environment. While guiding you through the process, the wizard collects the required configuration data and updates the system environment to integrate the PATROL Agent into the cluster. Configuring the PATROL Agent for failover support allows you to record history data for a clustered application in the same history database. This feature prevents you from having to reconcile the two different history files that are normally created when an application is failed-over from one node to another.

Related Documentation

For additional information about PATROL for Windows Clustering, see the online Help for the component of interest, and the *PATROL for Microsoft Windows Servers Release Notes*. For information about the PATROL for Windows Clustering parameters, see the component online Help or the *PATROL Parameter Reference Manual*. For additional information about PATROL, see the following documentation:

- *PATROL Console for Microsoft Windows User Guide, Volume 1*
- *PATROL Console for Microsoft Windows User Guide, Volume 2*
- *PATROL Console for Microsoft Windows User Guide, Volume 3*
- *PATROL Console for Unix User Guide*
- *PATROL Central Operator - Microsoft Windows Edition Getting Started*
- *PATROL Central Operator - Web Edition Getting Started*
- *PATROL Agent Reference Manual*
- Help for your PATROL Console

To view the complete PATROL documentation library, visit the support page on the BMC Software Web site at **<http://www.bmc.com/support.html>**. Log on and select a product to access the related documentation. (To log on if you are a first-time user and have purchased a product, you can request a permanent user name and password by registering at the Customer Support page. To log on if you are a first-time user and have *not* purchased a product, you can request a *temporary* user name and password from your BMC Software sales representative.)

The complete PATROL documentation library is also available on the PATROL documentation CD included with major releases of the PATROL Console and Agent.

Where to Go from Here

The following table suggests topics that you should read next:

If you want information about	See
how to install PATROL for Windows Clustering	Chapter 2, "Installing and Migrating PATROL for Windows Clustering"
how to load and configure the PATROL KM for Cluster Server or PATROL KM for Network Load Balancing using the PATROL Console	Chapter 3, "Loading and Configuring PATROL for Windows Clustering KMs"
how to use the PCC Wizard to help you configure the PATROL Agent for failover in a Microsoft Cluster Server environment	Chapter 4, "Using the PATROL Cluster Configuration Wizard"
how to use the PATROL for Windows Clustering KMs, and detailed descriptions of the applications, menu commands, and InfoBoxes	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help
parameter descriptions and defaults	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help or• <i>PATROL Parameter Reference Manual</i>
accessing menu commands, InfoBoxes, and online Help	Appendix A, "Accessing Menu Commands, InfoBoxes, and Online Help"
PATROL Agent configuration variables	Appendix B, "Agent Configuration Variables"

Installing and Migrating PATROL for Windows Clustering

This chapter provides the information that you need to install PATROL for Windows Clustering. For additional information about the PATROL installation process, see the *PATROL Installation Reference Manual*. The following topics are discussed in this chapter:

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Migrate Your Customizations.	2-40
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Verifying Installation Requirements

Before installing PATROL for Windows Clustering, verify that your environment meets the following requirements:

- system
- license
- account
- port

System

Verify that the target computer meets the installation requirements listed in Table 2-1.

Table 2-1 System Requirements for Installing PATROL for Windows Clustering (Part 1 of 2)

Resource	Requirements	Comments
operating systems that run the PATROL Agent	<ul style="list-style-type: none"> • Windows NT Server 4.0, Enterprise Edition with SP5 or later • Windows XP Professional • Windows 2000 Server with SP1 or later • Windows 2000 Advanced Server with SP1 or later • Windows 2000 Datacenter Server with SP1 or later • Windows .NET Server–Standard, Enterprise, or Datacenter Edition 	<ul style="list-style-type: none"> • If your cluster-level agent is on Windows NT 4.0, you must install the Microsoft Cluster Server Administrator tools. After you install the Administrator tools, make sure that you reapply all service packs and hot fixes. • The PATROL KM for Microsoft Network Load Balancing only supports Network Load Balancing clusters running on the following platforms: Microsoft Windows 2000 Advanced Server and Datacenter Server, and Microsoft Windows .Net Server 2003 Standard Edition, Enterprise Edition and Web Edition. The PATROL KM for Microsoft Network Load Balancing does not support Windows NT 4.0 Load Balancing Service clusters. • The PATROL KM for Network Load Balancing requires Windows Management Instrumentation (WMI) on all PATROL Agent machines used for monitoring NLB clusters. WMI is included with Windows 2000. If you are running Windows NT 4.0, you must install WMI. WMI will be installed during the PATROL installation if it is not already on the system. • The PATROL KM for Microsoft Network Load Balancing requires Windows Script Host (WSH) version 5.0 or later on all PATROL Agent machines used for monitoring NLB clusters. WSH is required, at version 5.0 or later, because the PATROL KM for Microsoft Network Load Balancing uses encoded Visual Basic scripts to perform remote operations on nodes in an NLB cluster. WSH is included with Windows 2000. If you are running Windows NT 4.0, you must install WSH version 5.0 or later for the correct operation of the PATROL KM for Microsoft Network Load Balancing.
operating systems that run the PATROL Console	PATROL for Windows Clustering supports all BMC-supported operating systems that run the PATROL Console.	

Table 2-1 System Requirements for Installing PATROL for Windows Clustering (Part 2 of 2)

Resource	Requirements	Comments
applications managed by PATROL for Windows Clustering	<ul style="list-style-type: none"> • Microsoft Cluster Server • Microsoft Network Load Balancing 	PATROL for Windows Clustering supports the application versions that are shipped with the supported operating systems.
PATROL products	<ul style="list-style-type: none"> • NT_Base.kml from the PATROL KM for Microsoft Windows Operating System (Windows OS) 3.6 or later • PATROL Agent 3.4.11 or later <p>One of the following consoles:</p> <ul style="list-style-type: none"> • PATROL Classic Console for Microsoft Windows–Developer 3.4.11 or later • PATROL Classic Console for Unix–Developer 3.4.11 or later • PATROL Central Operator–Microsoft Windows Edition 7.x • PATROL Central Operator–Web Edition 7.x 	<ul style="list-style-type: none"> • The PATROL KM for Cluster Server is dependent on having the NT_BASE.kml loaded. • The PATROL KM for Windows OS 3.8 or later is highly recommended. Without the PATROL KM for Windows OS 3.8 or later, you cannot properly configure some application classes such as NT_LOGICAL_DISKS.
disk space needed to install	82 MB	<p>This value is the <i>maximum</i> amount of disk space needed to install and it includes the disk space used by</p> <ul style="list-style-type: none"> • PATROL for Windows Clustering product files • PATROL for Windows Clustering report templates for use with PATROL Adapter for Microsoft Office (PAMO) <p>These values do not include the disk space required by the PATROL Agent, the PATROL Console, and associated files.</p>
browser	Netscape Navigator 3.01	You need Netscape Navigator version 3.01–4.78 to use online Help with the PATROL Classic Console for Unix. For information about installing and using Navigator to view the Help, see “Install the Unix Version of the Help Browser” on page 2-48.

License

Verify that you have a valid demonstration license (typically good for 30 days) or a permanent license to run your PATROL products. If you have not yet installed a permanent license, contact your BMC Software sales representative or the BMC Software Contract Administration department for licensing information.

Account

This section describes how to set up a PATROL installation account for Windows platforms.

PATROL

PATROL requires a dedicated user account, known as the PATROL default account, in the Windows environment. The PATROL default account must be created before you install PATROL. The PATROL default account can be either a local or a domain account.

Stand-alone workgroup servers must use a local user account as a PATROL default account. Servers that are trusted members of a domain may use either a local or domain account. In each case, the PATROL default account must be a member of the local Administrators group of the computer where the agent will reside.

PATROL default accounts on domain controllers should be only domain accounts. The account on a domain controller must be a member of the domain Administrators group.

Although you can use an existing Windows user account, BMC Software recommends that you create a separate Windows user account for PATROL.

Warning

Do not use a built-in Windows domain or local Administrator account as the PATROL default account. Such account usage causes files created by PATROL to be owned by the Administrator, which could result in security or file access problems.

PATROL KM for Cluster Server

The PATROL KM for Cluster Server uses a user-defined cluster account separate from the PATROL default account to connect to and manage a cluster. This account must have cluster administrative privileges. The PATROL MCS Monitor Service (**McsService.exe**) also runs under this account.

PATROL KM for Network Load Balancing Security Requirements

Specific security requirements are necessary for the PATROL KM for Microsoft Network Load Balancing. For this KM to work successfully, the user account that you use with the PATROL Agent and PATROL Console must exist on the monitored computers or be a domain account. It is best to use this KM within a domain so that a domain account can be used for the PATROL Agent, the PATROL Console, and the monitored computers. Using this method, the user account does not have to be added to each computer.

This KM uses privileged operations, such as rebooting the operating system (OS) or stopping a service, to manage the monitored computers. All permissions and privileges are based on the user account used by the PATROL Agent. The privileges defined by your user account are duplicated by WMI so that only the information and actions you are allowed to perform are available on the monitored computer.

For privileged operations, the PATROL Agent and PATROL Console user account must be part of the local Administrators group. For example, performing a remote shutdown requires that the remote shutdown privilege be granted to the agent and console user accounts. Members of the Administrators security group have this privilege by default.

Port

Unless you are doing a KM-only installation, you will be asked to specify a port number for connecting to all of the agent machines and to the Knowledge Module Deployment Server (KMDS).

The default port numbers are 3181 for agents and 3182 for the PATROL KMDS.

Preparing for Installation

BMC Software recommends that you first install PATROL for Windows Clustering on a limited number of development or test machines, then configure and test PATROL for Windows Clustering before installing it onto production machines.

Note

If you want to install a KM into the PATROL KMDS, *do not launch the installation utility from the installation CD*. See “Upgrade and Preserve Customizations” on page 2-32 for information about how to install into the PATROL KMDS.

The installation utility installs only to a local computer. The installation utility cannot perform remote installations. You must install the PATROL KM for Cluster Server and a PATROL Agent locally on each cluster node and cluster-level agent that you want to monitor. (The cluster-level agent is the computer you designate to monitor the cluster.) You must install the PATROL KM for Network Load Balancing and a PATROL Agent on the computer you designate to monitor an NLB Cluster. You also must install PATROL for Windows Clustering and a PATROL Console locally on each computer from which you want to view results.

Note

The installation utility provides you with the ability to create an installable image of the products that you select during install. After you create the installable image, you can export it to a shared **BMC Software** directory to install the package on all computers that share the same **BMC Software** product installation directory, PATROL default logon, PATROL Agent port number, PATROL 3.x product directory, PATROL 7.x product directory, and security option. For more information about creating and exporting installation packages, see “Creating and Installing Installable Images” on page 2-45.

Before you install, you must

- make sure you are using the appropriate version of the installation utility (page 2-10)
- understand target machines and their roles (page 2-10)
- determine where to install KMs based on architecture (page 2-12)
- choose between typical and custom installation options (page 2-12)
- select which components to install (page 2-13)
- understand how to install the PATROL KM for Cluster Server (page 2-15)

- (if you are using PATROL KMDS) learn how to install into the KMDS (page 2-18)
- choose among PATROL security options (page 2-18)

Determine the Version of the Installation Utility

The installation instructions contained in this version of *PATROL for Microsoft Windows Clustering Getting Started* pertain to version 7.3.10 of the PATROL Installation Utility. This version of the installation utility might be different from the version included on another product CD or from a version that you downloaded from the BMC Software Electronic Product Download (EPD) site. If you use a version of the PATROL Installation Utility other than version 7.3.10, the instructions in this manual may not accurately describe what you see on your screen.

To determine the version of an installation utility, perform the following steps:

- Step 1** Open a command prompt.
- Step 2** Navigate to the directory where the installation utility is located.
- Step 3** Enter one of the following commands:
- `setup.exe -v` (Windows)
 - `setup.sh -v` (Unix)

A message box displays the version of the installation utility.

Target Computers and Their Roles

The PATROL installation utility prompts you to select the roles performed by the computer that you are installing BMC Software products on (the target computer). Before beginning the installation process, review the following definitions of the roles that are presented in the installation utility and decide which of these roles is performed by each computer in your environment.

- **Console Systems** (also referred to as console computers) host user desktop applications such as consoles, user interfaces, viewers, and browsers. Select this option if the computer to which you are installing will perform any of the following roles:
 - monitor and manage on Windows by using a PATROL Central Operator – Microsoft Windows Edition console (PATROL 7.x architecture)
 - monitor, manage, and develop KMs on Unix by using a PATROL Console for Unix (PATROL 3.x architecture)
 - monitor, manage, and develop KMs on Windows by using a PATROL Console for Windows (PATROL 3.x architecture)

- **Managed Systems** (also referred to as agent computers) host software that manages the resources on the computer, such as a Cluster Server, PATROL Agent, PATROL Knowledge Modules, and Service Reporting Retrievers. Select this option if the computer to which you are installing will perform any of the following roles:
 - host a PATROL Agent 3.5 (works with both the PATROL 3.x and PATROL 7.x architecture)
 - host KMs and components that contain the knowledge that PATROL uses to monitor the resources on this computer

- **Common Services** (new with PATROL 7.x architecture) hosts services that are shared among managed systems and console systems. You can install each of these common services on any computer in the network. Select this option if the computer to which you are installing will perform any of the following roles:
 - host the PATROL Central Operator – Web Edition (PATROL 7.x architecture) Web server
 - host the PATROL Console Servers
 - host the RTservers

For more information about these products, see *PATROL Console Server and RTserver Getting Started*, *PATROL Central Operator – Web Edition Getting Started*, and *PATROL Central Operator – Web Edition online Help*.

Determine Where to Install KMs Based on Architecture

PATROL 3.x and PATROL 7.x architectures differ as to which target computers store Knowledge Modules and how much KM information is required by each type of system. During installation, ensure that you select the appropriate types of systems according to the following information:

PATROL 3.x

Install KM packages to Managed Systems and Console Systems.

PATROL 7.x

For PATROL Central Operator – Microsoft Windows Edition, install KM packages to Console Systems, Common Services Systems, and Managed Systems.

For PATROL Central Operator – Web Edition, install KM packages to Common Services Systems and Managed Systems.

Typical and Custom Installation Types

The installation utility prompts you to select one of the following installation types:

- Use the **Typical** installation type in any or all of the following instances:
 - You are new to the product you want to install.

- You are performing a first-time installation (you are not upgrading).

Note

If you are installing PATROL for Windows Clustering to an existing PATROL Agent or Console environment, *use Custom. Do not use Typical*. Typical will overwrite your existing PATROL Agent and/or PATROL Console.

- Use the **Custom** installation type in any or all of the following instances:
 - You are upgrading PATROL for Windows Clustering from a previously installed version.
 - You are installing into a PATROL 3.4.x environment.

Selecting Components to Install

Table 2-2 describes each PATROL for Windows Clustering component you can install. If you select the Typical installation type and the PATROL Adapter for Microsoft Office component, you automatically install the PAMO report templates that complement the KM component you choose. If you select the Custom installation type, you can install the PATROL Adapter for Microsoft Office, PAMO report templates, or both.

Table 2-2 Component Descriptions

Components	Description	What is Included
PATROL Cluster Configuration Wizard	Provides an easy-to-use interface that allows you to configure the PATROL Agent for failover in a Microsoft Cluster Server environment. PATROL for Microsoft Cluster Server does not require the PCC Wizard. However, to configure the PATROL Agent for failover in a Microsoft Cluster Server environment, you must install and run the PCC Wizard.	PCC Wizard
PATROL Knowledge Module for Microsoft Cluster Server	<ul style="list-style-type: none"> monitors the cluster as a unit and alarms when failover occurs allows a server to act as a cluster-level agent machine, which resides outside the cluster, to collect data from cluster nodes installs on at least one Windows 2000 Server in a clustered environment, which can include both Windows Advanced Server and Windows Datacenter Server 	PATROL KM for Cluster Server
PATROL Knowledge Module for Microsoft Network Load Balancing	<ul style="list-style-type: none"> monitors and balances TCP/IP connection loads across multiple ports and servers according to a configurable set of rules install on a Windows server that monitors remote computers, and for performance purposes, preferably not on an NLB node 	PATROL KM for Network Load Balancing

If you have a PATROL Agent installed on the computer where you are installing a PATROL for Windows Clustering KM component, the installation script designates the KM as preloaded in the agent configuration file. When a KM is designated as a preloaded KM on a PATROL Agent, it automatically loads and begins to monitor resources and applications whenever the agent is started.

If you have a PATROL Console installed on the computer where you are installing a PATROL for Windows Clustering KM component, the installation script loads the KM into the console.

Note

The KM components cannot preload unless you have a PATROL Agent or a PATROL Console installed on the target computer.

For more information about preloading, see the *PATROL Agent Reference Manual*.

PATROL Cluster Configuration Wizard

You can install PCC on any computer in the cluster domain. The target computer does not have to be a cluster node. The Cluster Administration Tools must be installed on the target computer.

Overview of PATROL KM for Cluster Server Installation

Install the PATROL KM for Cluster Server component only if you will monitor and manage Microsoft Cluster Server (MCS).

Note

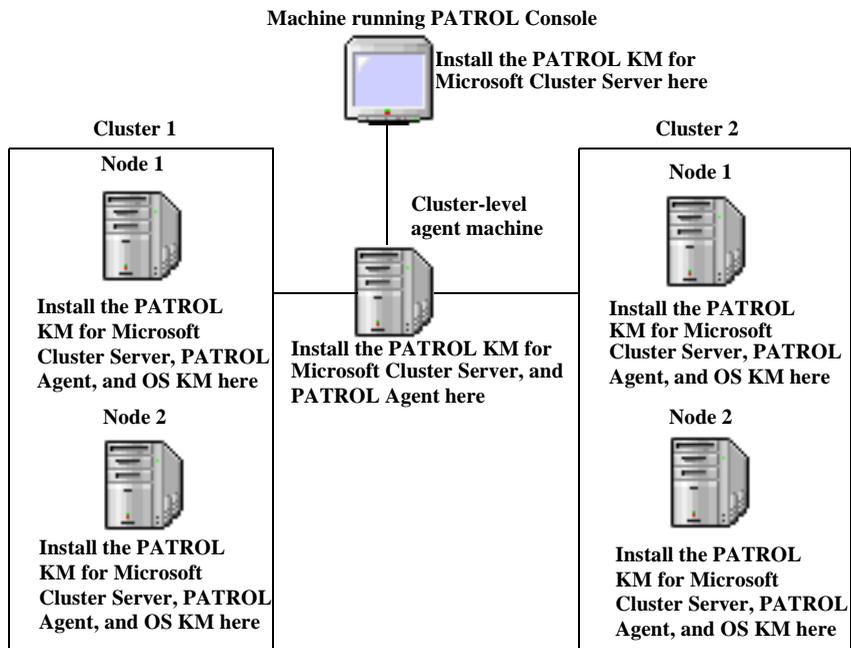
If you are upgrading from an earlier version of the PATROL KM for Cluster Server, review the information in “Migrate Your Customizations” on page 2-40.

The PATROL KM for Cluster Server uses a three-tier architecture as shown in Figure 2-1, and has components that you install inside and outside of a cluster. The PATROL KM for Cluster Server uses a cluster-level agent machine, which resides outside the cluster, to collect data from cluster nodes of all of the clusters you monitor.

Note

Use only one cluster-level agent to monitor one or more clusters. BMC Software recommends that you monitor up to ten clusters from one cluster-level agent for performance reasons. A cluster can be monitored by only one cluster-level agent.

Figure 2-1 PATROL KM for Microsoft Cluster Server Installation Summary



Before You Begin

Before you begin installing the PATROL KM for Cluster Server, you must

- know the user name and password of the cluster administrator account
- have installed the Microsoft Cluster Administrator on the cluster-level agent machine
- have installed the PATROL KM for Windows OS, which preloads the `NT_BASE.kml`
- have reapplied all service packs and hot-fixes on the cluster-level agent machine on Windows NT 4.0 only (the necessary APIs are available on Microsoft Windows 2000 by default)

- have installed the PATROL Agent

Note

For each cluster, the cluster connection account (specified in the cluster administrator) must have the appropriate permissions and trusts to establish a session with the cluster. You can verify that the cluster connection account has the appropriate permissions by logging into the cluster-level agent with the selected account and connecting to the cluster with either the Microsoft Cluster Administrator GUI or the **cluster.exe** command-line tool.

For information about how the PATROL Agent supports an application in a cluster environment and what type of failover tolerance the agent provides, see the *PATROL Agent Reference Manual*.

Installation Process

The PATROL KM for Cluster Server installation process consists of the following tasks:

Warning

Do not install the PATROL KM for Cluster Server to a cluster virtual server.

1. Install the following components on each cluster node:
 - PATROL Agent
 - PATROL KM for Microsoft Cluster Server
 - PATROL KM for Microsoft Windows OS 3.6 or later

Note

The PATROL KM for Windows OS 3.8 or later is highly recommended. Without the PATROL KM for Windows OS 3.8 or later, you cannot properly configure some application classes such as NT_LOGICAL_DISKS.

2. Install the following components on each machine you plan to use as a cluster-level agent:
 - PATROL Agent
 - PATROL KM for Microsoft Cluster Server
3. Install the PATROL KM for Microsoft Cluster Server on the machine that has your PATROL Console. This component can exist on the same machine as the cluster-level agent or a cluster node.

PATROL KM for Network Load Balancing

BMC Software recommends that the PATROL Agent has a network path to the load balance side of the Network Load Balancing cluster.

Installing into the PATROL KMDS

If you want to install PATROL for Windows Clustering into the PATROL KMDS, you must launch the installation utility from the command line as described in “Installing the New Version of PATROL for Windows Clustering If You Are Migrating Customizations Using the KMDS” on page 2-33.

PATROL Security Levels

You can secure the data passed between PATROL components and restrict unauthorized users from accessing your data by implementing PATROL security. PATROL now contains five *security policy* levels in a predefined set of security configurations that you can select from when you install PATROL.

Basic security (level 0) is a minimal level of security with no configuration requirements. At the highest level of advanced security (4), all communicating components must authenticate with each other and key databases must validate connection requests.

High security requires more configuration of the communicating components (the agent and the console) and is more difficult to use than lower levels of security. You can select the security level that best balances the ease of use with your need for security.

All components in a system, including agents and consoles, must operate at the same level of security in order to communicate with each other. This requirement is ensured when you install PATROL with basic security (the default level of 0).

Review the security level definitions in the PATROL Security User Guide before installing PATROL to determine the appropriate security level for your system needs. If you want to implement a new security level after having previously installed PATROL security, see the PATROL Security User Guide for instructions.

For more information about implementing and using PATROL security, see the following documentation:

- *PATROL Security User Guide*
- *PATROL Security Release Notes*

How PATROL Security Affects the PATROL KM for Cluster Server

PATROL security is installed as part of the agent and console. KMs inherit the security policy from the agent and console on which they are installed. When PATROL security is set to level 3 or 4, the communication between the PATROL Agent and the PATROL KM for Cluster Server is disrupted. See “Using PATROL KM for Cluster Server at PATROL Security Level 3 or 4” on page 2-51 for more information and a workaround.

Installing For the First Time

The PATROL Installation utility offers two types of installations: Typical and Custom. For a description of the two types of installations, please see “Typical and Custom Installation Types” on page 2-12. BMC Software recommends using the Typical installation type in the following situations:

- if you are installing for the first time into a managed system that does not contain a PATROL Agent or PATROL for Windows Clustering
- if you want to install PATROL for Windows Clustering for the first time to a console system

Note

By default, the Typical installation type configures the PATROL Agent to connect through port 3181. If you want to connect the agent from a different port, you must use the Custom installation type. See “Upgrading from an Earlier Version” on page 2-23 for instructions about using the Custom installation type.

Before You Begin

You first should install on a limited number of machines in the test environment, test the installation thoroughly, and then install in your production environment.

To Install Using the Typical Installation Type

- Step 1** From the installation CD or from an electronically downloaded installation (EPD) image, run **setup.exe** (Windows) or **setup.sh** (Unix).
- Step 2** In the Welcome to the Installation Utility window, click **Next** to begin your installation.
- Step 3** Review the license agreement, select **Accept**, and click **Next** to continue.

Step 4 In the Select Installation Option window, select one of the following options:

- If you want to install the products without creating an installable image, select **I want to install products on this computer now** and click **Next** to continue.
- If you want to create an installable image that you can use to install the products on this computer and other computers later, select **I want to create an installable image to be installed later**, enter the directory where you want to store the installable image, and click **Next** to continue.

Note

If you select to create an installable image, all of the computers where you plan to use the installable image must share the same **BMC Software** product installation directory, PATROL default logon, PATROL Agent port number, platform, and security option. For more information, see “Creating and Installing Installable Images” on page 2-45.

Step 5 In the Select Type of Installation window, select **Typical** and click **Next** to continue.

Step 6 In the Specify Installation Directory window, accept the default directory and click **Next** to continue.

Step 7 In the Select System Roles window, select **Managed Systems, Console Systems, Common Services**, or all to indicate the components you want to install and click **Next**.

- Select **Console Systems** if you are installing to a computer that hosts or will host a PATROL Console.
- Select **Managed Systems** if you are installing to a computer that hosts or will host a PATROL Agent.
- Select **Common Services** if you are installing to a computer that hosts or will host the PATROL Central Operator – Web Edition (PATROL 7.x architecture) Web server, the PATROL Console Servers, or the RTservers.

For more information, see “Target Computers and Their Roles” on page 2-10.

Note

For more information about the PATROL consoles, PATROL Console Server, or RT Server, see the *PATROL Central Operator – Web Edition Getting Started* and the *PATROL Console Server User Guide*.

- Step 8** From the Select Products and Components to Install window, select the components that you want to install (see Figure 2-2 on page 2-22 and Table 2-2 on page 2-14) and click **Next**.

Figure 2-2 Select Products and Components to Install Window—Typical Path



- Step 9** In the Confirm BMC Startup Information window, select **Yes** or **No** to restart the PATROL Agent automatically and click **Next**:

- If you want the installation utility to restart the PATROL Agent after the installation is complete, select **Yes**.
- If you want to restart the PATROL Agent after the installation is complete, select **No**.

Note

This window does not display if you are not installing into a managed system.

- Step 10** In the Review Selections and Install or the Review Selections and Create Installable Image window, review the selections carefully to make sure they are correct.
- If you want to change your selections, click **Back** and make those changes.
 - If the selections are correct, select **Start Install** to start installing or **Create Image** to start exporting the image to the directory you entered in Step 4 on page 2-21.

A status window opens that contains current messages, current milestones and percent complete.

Note

If you selected to create an installable image to install on several computers or on the local computer at a later time, see “Creating and Installing Installable Images” on page 2-45.

- Step 11** When the status window reports that the installation is 100% complete, click **Next** to view the results window. (*Next* does not appear until the installation is 100% complete.)
- Step 12** In the results window, click **View Log** to review the details of the installation or click **Exit** to close the installation utility.

Upgrading from an Earlier Version

If you have a previous version of PATROL for Windows Clustering installed on the target computer, you have two options for upgrading to the new version of PATROL for Windows Clustering. Use Table 2-3 to help you choose an upgrade procedure.

Table 2-3 Choosing an Upgrade Procedure

Choose This Procedure	If You Have This Situation
Upgrade Without Saving Customizations	<ul style="list-style-type: none">• have not made any customizations to your previous version of PATROL for Windows Clustering• want to overwrite your customizations with the default values of the new version of PATROL for Windows Clustering
Upgrade and Preserve Customizations	made customizations to your previously installed version of PATROL for Windows Clustering and want to save those customizations and migrate them to the new version of PATROL for Windows Clustering

Whether you choose to save and migrate your KM customizations or not, the customizations you have made to agents and consoles are preserved and incorporated into the new version automatically. Only customizations to Knowledge Modules must be migrated.

Note

Throughout this section, all references to *PATROL_HOME* represent *\$PATROL_HOME* in Unix and *%PATROL_HOME%* in Windows; all references to *PATROL_CACHE* represent *\$PATROL_HOME/patrol* in Unix and *%PATROL_CACHE%* in Windows.

Prepare to Upgrade

Whether you are upgrading and migrating customizations or simply upgrading, you must first

- back up the current installation
- remove PATROL for Windows Clustering files from *PATROL_CACHE*

Back Up the Current Installation

Whether you are upgrading and migrating any customizations or simply upgrading, back up the current PATROL installation before starting to install. Follow these steps to back up the current installation:

- Step 1** Shut down any PATROL Agents, Consoles, and related services that are currently running.
- Step 2** Ensure that no one is accessing any PATROL files or directories.
- Step 3** Perform a full backup of the two directories where PATROL executables and data are typically stored. These directories are listed in Table 2-4.

Table 2-4 PATROL Installation Directories to Back Up

Operating System	Directory
Windows	%PATROL_HOME% for agent and console installation directories %PATROL_CACHE% for the console working cache
Unix	\$PATROL_HOME for agent and console installation directories \$PATROL_CACHE for the console working cache
Linux	\$PATROL_HOME for agent and console installation directories \$PATROL_CACHE for the console working cache

Remove PATROL for Windows Clustering Files from *PATROL_CACHE*

You must remove the current PATROL for Windows Clustering files from the *PATROL_CACHE* directory for the console. If you do not, old product files in *PATROL_CACHE* are loaded instead of the newly installed files from *PATROL_HOME*.

Delete all PATROL for Windows Clustering files with the following naming patterns from *PATROL_CACHE*\knowledge and *PATROL_CACHE*\psl:

- **MCS*** (for the PATROL KM for Cluster Server)
- **LBS*** (for the PATROL KM for Network Load Balancing)

Upgrade Without Saving Customizations

Use this procedure in the following circumstances:

- you have performed the procedures in “Prepare to Upgrade” on page 2-24

- you want to install PATROL for Windows Clustering into an existing PATROL environment
- you want to install individual components
- you want to upgrade PATROL for Windows Clustering, but do not want to migrate existing customizations to PATROL for Windows Clustering

Step 1 If you are installing into PATROL 3.4.x in a *Unix* environment, follow these steps to start the installation utility. If you are installing into PATROL 3.4.x in a Windows environment or into PATROL 3.5 in a Unix or Windows environment, skip to Step 2.

- 1.A** Open a command line prompt.
- 1.B** Change to the drive where the installation CD is located.
- 1.C** At the Unix command line prompt, enter **setup.sh -releaseversion v.r** where *v.r* is the version of the PATROL environment into which you are installing.
- 1.D** Skip to Step 3.

Step 2 From the installation CD or from an electronically downloaded installation (EPD) image, run **setup.exe** (Windows) or **setup.sh** (Unix).

Step 3 In the Welcome to the Installation Utility window, click **Next** to begin your installation.

Step 4 In the Review License Agreement window, review the license agreement, select **Accept**, and click **Next** to continue.

Step 5 In the Select Installation Option window, select one of the following options:

- If you want to install the products without creating an installable image, select **I want to install products on this computer now** and click **Next** to continue.

- If you want to create an installable image that you can use to install the products on this computer and other computers later, select **I want to create an installable image to be installed later**, enter the directory where you want to store the installable image, and click **Next** to continue.

Note

If you select to create an installable image, all of the computers where you plan to use the installable image must share the same **BMC Software** directory, PATROL default logon, PATROL Agent port number, platform, and security option. For more information, see “Creating and Installing Installable Images” on page 2-45.

Step 6 From the Select Type of Installation Window, select **Custom** and click **Next**.

Step 7 In the Specify Installation Directory window, enter the correct information based on your installation scenario and click **Next**.

- If you are installing the PATROL Agent version 3.5 over the top of an existing installation, enter the directory path up to the PATROL product directory.

For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **D:\Program Files\BMC Software** in the Specify Installation Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Windows*, enter the directory path up to the PATROL product directory.

For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **D:\Program Files\BMC Software** in the Specify Installation Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Unix*, enter the full directory path to your previously installed products.

For example, if you previously installed your PATROL products to `/opt/patrol/PATROL3.4`, you should enter `/opt/patrol/PATROL3.4` in the Specify Installation Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment and you previously installed your existing PATROL products into a top-level directory (such as `C:\PATROL3-4`), enter the full directory path to your previously installed products.

For example, if you previously installed your PATROL products to `D:\PATROL3-4`, enter `D:\PATROL3-4` in the Specify Installation Directory window.

The PATROL product directory is appended to the path that you enter in this step. You will specify the PATROL installation directory in Step 10 on page 2-29.

Step 8 In the Select System Roles window, select **Managed System**, **Console System**, **Common Services**, or all and click **Next**.

- Select **Console System** if you are installing to a computer that hosts or will host a PATROL Console.
- Select **Managed System** if you are installing to a computer that hosts or will host a PATROL Agent.
- Select **Common Services** if you are installing to a computer that hosts or will host the PATROL Central Operator – Web Edition (PATROL 7.x architecture) Web server, the PATROL Console Servers, or the RTservers.

For more information, see “Target Computers and Their Roles” on page 2-10.

Note

For more information about the PATROL consoles, PATROL Console Server, or RT Server, see the *PATROL Central Operator – Web Edition Getting Started* and the *PATROL Console Server User Guide*.

- Step 9** In the Select Products and Components to Install window, select the KMs that you want to install (see Figure 2-3 on page 2-29 and Table 2-2 on page 2-14) and click **Next**.

Figure 2-3 Select Products and Components to Install Window—Custom Path



- Step 10** In the Provide the PATROL 3.x Product Directory window, enter the directory where you want to install PATROL for Windows Clustering as appropriate for your installation scenario. This directory is appended to the base directory path that you entered in Step 7 on page 2-27.

- If you are installing the PATROL Agent version 3.5 over the top of an existing installation, enter only the PATROL product directory to which you want to install.

For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **PATROL3-4** in the PATROL 3.x Product Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Windows*, enter only the PATROL product directory to which you want to install.

- For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **PATROL3-4** in the PATROL 3.x Product Directory window.
- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Unix*, *do not enter anything*. Delete any default inputs on this window.
- For example, if you previously installed your PATROL products to **/opt/patrol/PATROL3.4**, you must ensure that the PATROL 3.x Product Directory window is blank.
- If you are installing PATROL for Windows Clustering into an existing PATROL environment and you previously installed your existing PATROL products into a top-level directory (such as **D:\PATROL3-4** or **/PATROL3.4**), you must ensure that the PATROL 3.x Product Directory window is blank. Delete any default inputs in this window.

Step 11 Complete the Confirm BMC Startup Information window:

- 11.A** In the **Specify the Current Agent Port Number** field, enter the port number you want the PATROL Agent to use. The default is 3181.

Note

If your previous installation used a different port number, change the default to the current port number for the PATROL Agent.

- 11.B** In the **Restart the PATROL agent automatically?** field, select **Yes** or **No**:
- If you want the installation utility to restart the PATROL Agent after the installation is complete, select **Yes**.

- If you want to restart the PATROL Agent after the installation is complete, select **No**.

Note

This window does not display if you are not installing into a managed system.

Step 12 In the Review Selections and Start Install or in the Review Selections and Create Installable Image window, review the selections carefully to make sure they are correct.

- If you want to change your selections, click **Back** and make those changes.
- If the selections are correct, select **Start Install** to start installing or **Create Image** to start exporting the image to the directory you entered in Step 4 on page 2-21.

A status window opens that contains current messages, current milestones and percent complete.

Note

If you selected to create an installable image to install on several computers or on the local computer at a later time, see “Creating and Installing Installable Images” on page 2-45.

Step 13 When the status window reports that the installation is 100% complete, click **Next** to view the results window. (*Next* does not appear until the installation is 100% complete.)

Step 14 In the results window, click **View Log** to review the details of the installation or click **Exit** to close the installation utility.

Upgrade and Preserve Customizations

Use the appropriate procedure in this section if you want to upgrade to the new version of PATROL for Windows Clustering and you want to preserve any customizations you have made to the previous version of PATROL for Windows Clustering.

After you have finished this procedure, see “Migrate Your Customizations” on page 2-40 for instructions about incorporating your customizations into the new version. You should complete this process on a limited number of machines in the test environment first, test the merged KMs thoroughly, and then deploy them to your production environment.

Note

To upgrade and preserve customizations, you must either migrate your customizations manually or use the PATROL Migration Tools version 3.5 (no KMDS required), or have the latest version of KMDS installed as well as any available patches.

Determine Whether You Can Migrate

Before migrating customizations, you must determine whether or not the customizations to the previous version of PATROL for Windows Clustering that you have installed can be migrated to the new version of PATROL for Windows Clustering. See Table 2-5 to determine whether migration is supported for your current version of PATROL for Windows Clustering. If migration is supported, choose one of the following installation procedures to migrate your customizations:

- migrating customizations using the PATROL Migration Tools version 3.5 (page 2-33)
- migrating customizations using the PATROL Migration Tools and the PATROL KMDS (page 2-33)

- migrating customizations manually (page 2-35)

Table 2-5 Versions That You Can Migrate

Component	Version
PATROL KM for Cluster Server	1.1.00, 1.1.01, 1.2.00, 1.3.00, 1.4.00, 1.4.01
PATROL KM for Network Load Balancing	1.1.00, 1.1.01

Installing the New Version of PATROL for Windows Clustering If You Are Migrating Customizations Using the PATROL Migration Tools Version 3.5

The process of migrating KM customizations from a PATROL 3.x environment to PATROL 3.5 no longer depends on the PATROL KMDS. Because the PATROL Migration Tools version 3.5 copy the new product files directly from the product CD rather than from KMDS, you do not have to install the new version of PATROL for Windows Clustering. Just ensure that the product CD is accessible when you are running the migration tools.

For specific instructions and detailed information about using the PATROL Migration Tools version 3.5, see the *PATROL Migration Tools User Guide*.

Installing the New Version of PATROL for Windows Clustering If You Are Migrating Customizations Using the KMDS

Note

Ensure that you have installed the latest version of PATROL KMDS, including any available patches.

If you want to install PATROL for Windows Clustering into the KMDS so that you can migrate the customizations that you have made to the currently installed version of PATROL for Windows Clustering to the new version of PATROL for Windows Clustering, you must follow these steps to run the installation utility in KMDS mode:

- Step 1** Open a command line prompt.
- Step 2** Change to the drive where the installation CD is located.
- Step 3** Enter the correct command for your operating system (Table 2-6 describes the command line options):
- At the Windows command line prompt, enter **setup.exe -kmds [-kmdsportnum *portnum*]**
 - At the Unix command line prompt, enter **setup.sh -kmds [-kmdsportnum *portnum*] [-releaseversion *v.r*]**

Table 2-6 Command Line Options for Installing in a KMDS Environment

KMDS Installation Options	Description
-kmdsportnum <i>portnum</i>	optional; use only if you are not using the default KMDS number 3182
-releaseversion <i>v.r</i>	optional; use only if you are installing to a <i>Unix</i> PATROL 3.4.x environment. <i>v.r</i> designates the version number of the PATROL environment into which you are installing (for example, -releaseversion 3.4).

The installation utility opens in KMDS mode.

- Step 4** In the Welcome to the Installation Utility window, click **Next** to begin your installation.
- Step 5** In the Review License Agreement window, review the license agreement, select **Accept**, and click **Next** to continue.
- Step 6** In the Select Installation Option window, select one of the following options:
- If you want to install the products without creating an installable image, select **I want to install products on this computer now** and click **Next** to continue.

- If you want to create an installable image that you can use to install the products on this computer and other computers later, select **I want to create an installable image to be installed later**, enter the directory where you want to store the installable image, and click **Next** to continue.

Note

If you select to create an installable image, all of the computers where you plan to use the installable image must share the same **BMC Software** directory, **PATROL** default logon, **PATROL** Agent port number, platform, and security option. For more information, see “Creating and Installing Installable Images” on page 2-45.

- Step 7** In the Specify KMDS directory window, enter the full path to the directory in which the KMDS is installed and click **Next**.
- Step 8** From the Select Products and Components to Install window, select the KMs that you want to install (see Figure 2-3 on page 2-29 and Table 2-2 on page 2-14) and click **Next**.
- Step 9** In the Review Selections and Install window, review the selections carefully to make sure they are correct.
- To change your selections, click **Back** and make those changes.
 - If the selections are correct, click through the rest of the windows in the installation utility to install **PATROL** for Windows Clustering into the KMDS.

Installing the New Version of **PATROL** for Windows Clustering If You Are Migrating Customizations Manually

After you have performed the procedures in “Prepare to Upgrade” on page 2-24 and reviewed the information in “Determine Whether You Can Migrate” on page 2-32, use this installation procedure *if you do not want to use the **PATROL** Migration Tools version 3.5 or the **PATROL** KMDS* to migrate the customizations that you have made to the currently installed version of **PATROL** for Windows Clustering.

Step 1 If you are installing into PATROL 3.4.x in a *Unix* environment, follow these steps to start the installation utility. If you are installing into PATROL 3.4.x in a Windows environment or into PATROL 3.5 in a Unix or Windows environment, skip to Step 2.

1.A Open a command line prompt.

1.B Change to the drive where the installation CD is located.

1.C At the Unix command line prompt, enter **setup.sh -releaseversion v.r** where *v.r* is the version of the PATROL environment into which you are installing.

1.D Skip to Step 3.

Step 2 If you have already installed PATROL 3.5 or PATROL 7.x, or you are installing to a Windows environment, start the installation utility by running **setup.exe** (Windows) or **setup.sh** (Unix) from the installation CD or from an electronically downloaded (EPD) installation image.

Step 3 In the Welcome to the Installation Utility window, click **Next** to begin your installation.

Step 4 In the Review License Agreement window, review the license agreement, select **Accept**, and click **Next** to continue.

Step 5 In the Select Installation Option window, select one of the following options:

- If you want to install the products without creating an installable image, select **I want to install products on this computer now** and click **Next** to continue.

- If you want to create an installable image that you can use to install the products on this computer and other computers later, select **I want to create an installable image to be installed later**, enter the directory where you want to store the installable image, and click **Next** to continue.

Note

If you select to create an installable image, all of the computers where you plan to use the installable image must share the same **BMC Software** directory, PATROL default logon, PATROL Agent port number, platform, and security option. For more information, see “Creating and Installing Installable Images” on page 2-45.

Step 6 From the Select Type of Installation Window, select **Custom** and click **Next**.

Step 7 In the Specify Installation Directory window, enter the appropriate directory information based on your installation scenario and click **Next**.

- If you are installing the PATROL Agent version 3.5 over the top of an existing installation, enter the directory path up to the PATROL product directory.

For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **D:\Program Files\BMC Software** in the Specify Installation Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Windows*, enter the directory path up to the PATROL product directory.

For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **D:\Program Files\BMC Software** in the Specify Installation Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Unix*, enter the full directory path to your previously installed products.

For example, if you previously installed your PATROL products to `/opt/patrol/PATROL3.4`, you should enter `/opt/patrol/PATROL3.4` in the Specify Installation Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment and you previously installed your existing PATROL products into a top-level directory (such as `C:\PATROL3-4`), enter the full directory path to your previously installed products.

For example, if you previously installed your PATROL products to `D:\PATROL3-4`, enter `D:\PATROL3-4` in the Specify Installation Directory window.

The PATROL installation directory is appended to the path that you enter in this step. You will specify the PATROL installation directory in Step 10 on page 2-39.

- Step 8** From the Select System Roles window, select **Managed System, Console System, Common Services**, or both, using the information provided in “Target Computers and Their Roles” on page 2-10, and click **Next**.

Note

For more information about the PATROL consoles, *PATROL Console for Unix User Guide*, *PATROL Console for Microsoft Windows User Guide*, *PATROL Console Server*, or *RTserver*, see *PATROL Central Operator – Web Edition Getting Started*, *PATROL Central Operator – Microsoft Windows Edition Getting Started*, and *PATROL Console Server and RTserver Getting Started*.

- Step 9** From the Select Products and Components to Install window, select the KMs that you want to install (see Figure 2-3 on page 2-29 and Table 2-2 on page 2-14) and click **Next**.

Note

If your previous installation used a different port number, change the default to the current port number for the PATROL Agent.

Step 10 In the Provide the PATROL 3.x Product Directory window, enter the correct information based on your installation scenario and click **Next**.

- If you are installing the PATROL Agent version 3.5 over the top of an existing installation, enter only the PATROL product directory to which you want to install.

For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **PATROL3-4** in the PATROL 3.x Product Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Windows*, enter only the PATROL product directory to which you want to install.

For example, if you want to install PATROL into **D:\Program Files\BMC Software\PATROL3-4**, enter **PATROL3-4** in the PATROL 3.x Product Directory window.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment on *Unix*, *do not enter anything*. Delete any default inputs on this window.

For example, if you previously installed your PATROL products to **/opt/patrol/PATROL3.4**, you must ensure that the PATROL 3.x Product Directory window is blank.

- If you are installing PATROL for Windows Clustering into an existing PATROL environment and you previously installed your existing PATROL products into a top-level directory (such as **D:\PATROL3-4** or **/PATROL3.4**), you must ensure that the PATROL 3.x Product Directory window is blank. Delete any default inputs in this window.

Step 11 Complete the Confirm BMC Startup Information window:

- 11.A** In the Specify the Current Agent Port Number field, enter the port number you want the PATROL Agent to use. The default is 3181.

Note

If your previous installation used a different port number, change the default to the current port number for the PATROL Agent.

- 11.B** In the Restart the PATROL agent automatically? field, select Yes or No:

- If you want the installation utility to restart the PATROL Agent after the installation is complete, select **Yes**.
- If you want to restart the PATROL Agent after the installation is complete, select **No**.

Note

The Confirm BMC Startup Information window displays only if you are installing into a managed system.

Step 12 Complete the remaining windows. The number and content of the windows depend on your KM selections and your inputs to the windows. Proceed to “Migrate Your Customizations” on page 2-40.

Migrate Your Customizations

Customizations made to PATROL for Windows Clustering may include changes to the parameter alarm ranges, recovery actions, states, or other parameter properties.

You can migrate customizations manually or through the KMDS. Migration of **.km** files through the KMDS is automated, with the following exceptions:

- modified PSL code, whether it is embedded in **.km** files or in **.psl** files
- parameter overrides done with a PATROL Operator Console (3.3.00 and later)
- new Knowledge Modules that you created

Note

Even if you are not using the PATROL KMDS, you can use the PATROL migration tools to help you migrate customizations. For more information about the PATROL migration tools, see the *PATROL Migration Tools User Guide*.

Preparing to Migrate

Before you migrate the customizations from the previously installed version of PATROL for Windows Clustering to the newly installed version of PATROL for Windows Clustering, you remove any obsolete KMs from the list of preloaded KMs on each PATROL Agent. See the *PATROL Agent Reference Manual* for instructions on removing KMs from the preload list.

To Migrate Using the PATROL Migration Tools Version 3.5

The following procedure is a general workflow for using the PATROL Migration Tools version 3.5 to migrate your customizations to the new version of PATROL for Windows Clustering. For detailed explanation and instruction on using the migration tools, see the *PATROL Migration Tools User Guide*.

Follow this migration procedure only after you have met the following criteria:

- completed the procedures in “Prepare to Upgrade” on page 2-24.
- installed version 3.5 of the PATROL migration tools, including the KM archive

- Step 1** Run the migration probe to locate the base version of PATROL for Windows Clustering from the KM archive and the new version of PATROL for Windows Clustering from the product CD.
- Step 2** Run the merge tool to merge the base and customized versions of PATROL for Windows Clustering with the new version of PATROL for Windows Clustering.
- Step 3** Choose one of the following methods to transfer merged KMs to your test environment:
- Copy the contents of the results directory to the /lib directory where the new version of PATROL for Windows Clustering is installed.
 - Copy the contents of the packaged results to a CD image and then use that CD to install.
 - Deploy the contents of the merged results directory using a third-party deployment system.
- Step 4** Perform any additional optional migration tasks as described in the PATROL Migration Tools User Guide.

To Migrate Using the PATROL Migration Tools Version 3.4.11 and the KMDS

Note

Before beginning this procedure, ensure that you use the PATROL KMDS version 3.4.11 and apply any available patches.

After you have checked your customizations to the previous version of PATROL for Windows Clustering into the KMDS, use the following steps to migrate your customizations to the new version of PATROL for Windows Clustering. For detailed instructions about migrating customizations using the KMDS, see the *PATROL Migration Tools User Guide*.

Step 1 Use the Probe and Merge tools to identify, preserve, and merge customizations from the prior version of PATROL for Windows Clustering into the newly installed version of PATROL for Windows Clustering. See the *PATROL Migration Tools User Guide* to run the Probe and Merge tools.

Step 2 When prompted during the merge phase of the migration, enter the following map file name:

- **mcs_km_1_5_00.map**
- **lbs_km_1_5_00.map**

Warning

Make sure that you use the merge map file that was shipped with the *new* version of PATROL for Windows Clustering. The default location is ***PATROL_HOME*\lib\migration\new\lib\kmmmerge.map**.

Step 3 Use KMDS to merge.

Step 4 After you have completed the migration of your changes, load the new version and save the configuration.

To Migrate Customizations Manually

If you do not want to use the KMDS to migrate customizations, use the following steps to migrate your customizations manually:

Step 1 Move the old PATROL for Windows Clustering to a new directory that is different from **PATROL_HOME**.

Step 2 Identify the customizations in PATROL for Windows Clustering by comparing the content of the text file of the KM in the current PATROL for Windows Clustering version with the content of the text file for the customized KM that is saved in the PATROL Console cache backup directory.

Step 3 Incorporate your customizations to the new PATROL for Windows Clustering by performing the following steps:

- 3.A** Restart the PATROL Console.
- 3.B** Load the newly installed PATROL for Windows Clustering.
- 3.C** Using a PATROL Developer Console, enter the customizations that you identified in Step 2, one by one.

To Migrate Customized PATROL Script Language Code

Customizations made to PATROL Script Language (PSL) code are not automatically migrated. These customizations may be embedded in **.km** files or stored in separate **.psl** files. Migrate these customizations manually, using the following guidelines:

- If you modified **.psl** files that were shipped by BMC Software, you must manually re-edit the PSL code in the new KM by using a PATROL Developer Console to reapply your changes.
- If you modified PSL code embedded in a KM, that code will be overwritten when you install a new version of the product. You must manually edit the **.km** files by using a PATROL Developer Console to reapply your changes.
- If you created a new PSL file (not shipped by BMC Software) outside of a **.km** file, or if you created new PSL code (not shipped by BMC Software) and embedded it in a KM that was shipped by BMC Software, use the `pslsearch` utility to search your KM for terms that you may have used that have since been adopted by BMC Software as PSL keywords. Reapply your changes by using a PATROL Developer Console. For instructions about using the `pslsearch` utility, see the *PATROL Migration Tools User Guide*.

Note

If you have customized a PSL library that was compiled with an earlier version of the PSL compiler than the version that was provided with PATROL 3.2.09i, you must manually recompile the library by using the PATROL 3.4.11 or later compiler.

Creating and Installing Installable Images

The PATROL installation utility installs only to a local computer. The installation utility cannot perform remote installations. You must install a PATROL Agent and PATROL for Windows Clustering locally on each computer that you want to monitor. You also must install a PATROL Console and PATROL for Windows Clustering locally on each computer from which you want to view results.

The installation utility does provide you with the ability to create an installable image from the products that you select during a regular local installation. If you place the installable image in a shared directory, you can use that installable image to install the selected BMC Software products on all computers that perform the same roles and have these identical requirements:

- same shared **BMC Software** directory
- same PATROL default logon
- same PATROL Agent port number
- same platform
- same security option

You can also use a distribution server to distribute the installable images that you create.

Create an Installable Image

If you selected the **I want to create an installable image to be installed later** option in the Select Installation Option window during the installation process, then you elected to create an installation image that you can execute later on the current computer or on several computers that share the same roles and installation selections.

Once you select **Create Image** in the Review Selections and Create Installable Image window, the installation utility finishes exporting the installation image.

The installation utility creates an **install.ctl** file in the specified directory that includes all the configuration information needed to install the products that you selected in the Product Selection window.

Before you run the installation image, you might want to change the properties for the image. Read the following instructions and decide whether changing the image is appropriate for your environment:

- If you want to run the installation package more than once from the same location, change the properties on the installation image file, **install.ctl**, to **Read-Only**.

Warning

The **install.ctl** file includes the encrypted password for the account that was used during the install process. If the **install.ctl** file is set to Read-Only, ensure that the **install.ctl** file is removed from all computers to which the installation image is copied.

- If you want to distribute the installation image from a central location to multiple machines, do *not* change the properties of the **install.ctl** file to **Read-Only**.

Warning

If you do not change the **install.ctl** file to Read-Only, it is deleted after the first time you execute the installation image, and you will not be able to use the exported installation image more than once.

Install the Created Installable Image

After you create the installable image, as described on page 2-45, you can then use it to install PATROL for Windows Clustering on a local computer of the same platform that performs the same roles and has the same shared **BMC Software** directory, PATROL default logon, PATROL Agent port number, and security options as the options in the installable image. Use the following steps:

Step 1 Navigate to the directory where the installable image resides.

Step 2 Run the installation utility:

- On Windows, double-click the **install.exe** file or type **install.exe** at a command prompt.
- On Unix, type **./install.sh** at a command prompt.

The installation utility executes and then creates an installation log that lists the products installed, which you can view. The text at the end of the installation log indicates whether or not the installation was successful.

Installing the Online Help

The online Help for PATROL for Windows Clustering is automatically installed into the PATROL Console for Microsoft Windows when you install the KM. However, the online Help does not automatically install into the PATROL Central–Microsoft Windows Edition console; you must install it separately.

If you plan to install the Unix version of PATROL for Windows Clustering on a PATROL for Unix console, you must install the Unix version of the Help browser separately if it is not already installed.

Install Help into PATROL Central - Microsoft Windows Edition

Use the following instructions to install the PATROL for Windows Clustering Help into the PATROL Central–Microsoft Windows Edition console from the PATROL Foundations Kit CD:

Step 1 Insert the PATROL Foundations Kit CD into your CD-ROM drive.

Step 2 From the CD, run **setup.exe** (Windows) or **setup.sh** (Unix).

Step 3 Follow the installation instructions until you reach the **Select Type of Installation** window.

- Step 4** Select **Custom** and click **Next**.
- Step 5** In the Select Installation Directory window, enter the directory where PATROL for Windows Clustering is installed and click **Next**.
- Step 6** In the Select System Roles window, select **Common Services** and click **Next**.
- Step 7** In the Select Products and Components to Install window, expand the **PATROL Console Server (PATROL 7.x)** folder.
- Step 8** Expand the **KM Help Files for PATROL Central – Microsoft Windows Edition** folder.
- Step 9** Select **PATROL for Microsoft Windows Clustering Help** and click **Next**.
- Step 10** Finish the installation, selecting the same options that you used when installing PATROL for Windows Clustering.

Install the Unix Version of the Help Browser

The browser required for the Unix version of PATROL Help is Netscape Navigator version 3.01 through 4.78. However, if you are running a Red Hat Linux platform, you must run Netscape Navigator version 4.x to display the online Help. Currently, PATROL Help does not support Netscape Navigator 6.0.

You must install Netscape Navigator on the computer where the PATROL Console resides. You can install Netscape anywhere on your Unix computer as long as the binary is in the path.

Netscape Navigator is supplied by Netscape Communications Corp. You can locate the browser at <http://home.netscape.com/download>.

Additional Considerations for Using Online Help for Unix

When you select Help from the PATROL Console on a Unix system, it may take a few seconds for the Help browser to launch. Two windows will be displayed. First the Netscape Navigator window is displayed as an icon, and then a browser window that contains the Help is displayed.

In addition, you must be aware of the following restrictions:

- Netscape Navigator displays warning messages when it is invoked multiple times within the same user account because of its file-locking mechanism. It will, however, continue functioning.
- By default, when Netscape Navigator starts, it uses a private color map. As a result, you might experience color flashing on your workstation. If so, you can set the value of PATROL_BROWSER so that the *colormap* option is not specified. However, some subsequent color requests might fail and the online Help will be improperly displayed.
- The eXceed for Windows NT X Window Server product by Hummingbird Communication Ltd. may not always display the Help files properly.

Consult your Netscape Navigator documentation for specific platform requirements and restrictions.

Setting Environment Variables for the Browser

The LANG, PATH, and PATROL_BROWSER environment variables must be set for the Help browser to run properly. The following sections describe these variables.

LANG Variable

On some platforms, the Unix LANG environment variable must be set to C so that Netscape Navigator will work properly. Otherwise, you might experience product failures.

Set your user or system **.profile** for Bourne or Korn shells as follows:

```
LANG=C
export LANG
```

For C shell users, issue the following command:

```
setenv LANG C
```

PATH Variable

The PATROL user account PATH variable must contain the location of the directory containing the Netscape files. If the directory containing the Netscape files is not on the path, add the directory to the PATROL user account path.

This requirement applies only to the PATROL user account on the same computer as the PATROL Console.

PATROL_BROWSER Variable

When PATROL starts the Help browser, it uses the command in the PATROL_BROWSER environment variable. As a default, the PATROL_BROWSER environment variable contains the following command:

```
netscape -display $DISPLAY -install -iconic
```

To use different arguments, set the value of PATROL_BROWSER to the appropriate string. For example:

```
export PATROL_BROWSER=/usr/local/bin/netscape -raise
```

Using PATROL KM for Cluster Server at PATROL Security Level 3 or 4

Please read the following explanation and perform the procedure to use the PATROL KM for Cluster Server at PATROL Security Level 3 or 4.

Issue With Using PATROL for Microsoft Cluster Server at PATROL Security Level 3 or 4

Note

Security level settings at each of the cluster nodes must be identical to the security level at the cluster-level agent machine.

With PATROL security level 3 or 4, communication between the PATROL Agent and the PATROL KM for Cluster Server is disrupted because of the following:

- The McsGateway process, spawned by the PATROL MCS Monitor service, can operate only within the context of a domain account, rather than within a local system account.
- At security levels 3 and 4, the PATROL security components do not interact with a service running under the context of a domain account, without prompting you with an access dialog box.

A workaround for this issue exists only if the KM is operating in unattended mode. (No workaround is available for attended mode in which access dialog boxes are displayed.)

Providing Support for Security Levels 3 or 4 in Unattended Mode

To enable the KM functionality—in unattended mode only—at security level 3 or 4, perform these three steps on the cluster-level agent machine:

Step 1 Run the PATROL Security Utility `plc_password` with appropriate command-line parameters:

- Path to utility:

**C:\Program Files\BMC
Software\common\security\bin\Windows-x86\plc_password.exe**

- Full *example* command-line entry, with parameters:

```
plc_password -r client -P PATROL\SecurityPolicy\esi  
-m unattended -f "C:\Program Files\BMC  
Software\common\security\keys\tree.bin" -k <key  
database file>
```

Note

The `-k` command-line parameter specifies the path and file name of the user-defined SSL Key Database file (**.kdb**). See the *PATROL Security User Guide* for details about the SSL Key Database file and PATROL Security Utilities.

Step 2 If you are installing and configuring PATROL KM for Cluster Server on a cluster-level agent machine, add clusters to the monitoring list:

- To select a cluster for monitoring, access the **MCS_Clusters** application class menu, then choose **PATROL Admin => Select Cluster to Monitor**. (See also *PATROL KM for Microsoft Cluster Server Help*, “Maintaining the monitored cluster list.”)
- If you are prompted for authorized account information, provide the domain name, user name, and password for the cluster administrator account.

Step 3 Stop and start the PATROL MCS Monitor service:

To start or stop the PATROL MCS Monitor service on a cluster-level agent machine, access the **MCS_Clusters** application class menu, then choose **PATROL Admin => MCS Monitor Stop/Start**. (See also *PATROL KM for Microsoft Cluster Server Help*, “Starting or stopping the PATROL MCS Monitor (McsService).”)

Uninstalling

For instructions about uninstalling PATROL products see the *PATROL Installation Guide*.

Where to Go from Here

The following table suggests topics that you should read next:

If you want information about	See
overview of PATROL for Windows Clustering components and capabilities	Chapter 1, "Product Components and Capabilities"
how to load and configure the PATROL KM for Cluster Server or PATROL KM for Network Load Balancing using the PATROL Console	Chapter 3, "Loading and Configuring PATROL for Windows Clustering KMs"
how to use the PCC Wizard to help you configure the PATROL Agent for failover in a Microsoft Cluster Server environment	Chapter 4, "Using the PATROL Cluster Configuration Wizard"
how to use the PATROL for Windows Clustering KMs, and detailed descriptions of the applications, menu commands, and InfoBoxes	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help
parameter descriptions and defaults	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help or• <i>PATROL Parameter Reference Manual</i>
accessing menu commands, InfoBoxes, and online Help	Appendix A, "Accessing Menu Commands, InfoBoxes, and Online Help"
PATROL Agent configuration variables	Appendix B, "Agent Configuration Variables"

Loading and Configuring PATROL for Windows Clustering KMs

This chapter provides you with information that you will need to load and configure the PATROL for Windows Clustering KMs. The following topics are discussed:

Preparing to Use PATROL for Windows Clustering	3-2
Configuration Tasks	3-3
Loading the PATROL for Windows Clustering KMs	3-3
Configuring the PATROL KM for Cluster Server	3-13
Configuring the PATROL KM for Network Load Balancing ...	3-16
Configuring Recovery Actions	3-19
Displaying PATROL Data Using the PATROL Adapter for Microsoft Office.....	3-21
Using the PATROL Adapter for Microsoft Office to Display PATROL Data in Microsoft Excel	3-21
Built-In Report Templates	3-22
Where to Go from Here	3-24

Preparing to Use PATROL for Windows Clustering

If PATROL for Microsoft Windows Clustering has not been installed, see Chapter 2, “Installing and Migrating PATROL for Windows Clustering.” After installing, return to this section for information on how to configure the components.

Before configuring the PATROL for Microsoft Windows Clustering components, you should verify that the following software requirements are met:

- The PATROL Console version 3.4.11 or later and PATROL for Microsoft Windows Clustering must be installed on the computer you want to use for the PATROL Console.
- The PATROL Agent version 3.4.11 or later and PATROL for Microsoft Windows Clustering must be installed on the computers you want to monitor and manage.
- The PATROL KM for Windows OS must be installed on the cluster nodes.
- The necessary product component files must be installed on the PATROL Console computers and the PATROL Agent computers.

You should also verify that you have access to all required information about the domain controllers or Windows servers that you want to monitor and manage.

Configuration Tasks

This section describes how to load and configure the PATROL for Windows Clustering components: PATROL KM for Cluster Server and PATROL KM for Network Load Balancing.

Loading the PATROL for Windows Clustering KMs

If you did not install KM components to PATROL Classic Console for Windows, then you must load the KMs to your PATROL Console before configuring the KMs. KMs are automatically loaded into the PATROL Classic Console for Windows after installation. If you installed KMs to PATROL Classic Console for Windows, then skip to “Configuring the PATROL KM for Cluster Server” on page 3-13 or “Configuring the PATROL KM for Network Load Balancing” on page 3-16.

If you delete KMs, you can refer to this section if you want to reload them. This section provides instructions for loading KMs with the following PATROL Consoles:

- PATROL Central Operator–Windows Edition
- PATROL Central Operator–Web Edition
- PATROL Console for Windows
- PATROL Console for Unix

Note

After you install components from the Select Products and Components to Install dialog box during the installation process, you must load the corresponding **.kml** files before the PATROL Agent and PATROL Console can use them.

Before You Begin Loading a KM

Make sure you have met the following requirements:

- the components that you want to load on the agent and console computers are installed

- the agents to which you want to load components are running
- the PATROL Console is running and connected to the agent(s) you want to manage

Loading Knowledge Modules

Summary: Before you can begin using Knowledge Modules (KMs) that have not been preloaded, you must first load them with a PATROL Console. Follow the instructions that apply to your console.

Loading KMs with PATROL Central Operator–Windows Edition

PATROL Central Operator–Windows Edition has a Loading KMs wizard with which you can select KMs and the computers on which they are loaded.

Step 1 In the Common Tasks tab of the taskpad, click the Load Knowledge Modules icon.

PATROL displays the wizard.

Step 2 Click **Next** to start the wizard.

The wizard displays a list of computers on which a PATROL Agent has been installed.

Step 3 Select the check boxes for the computers on which you want to load KMs, and then click **Next**.

The wizard displays a list of available **.kml** files for each computer selected in the previous step. **MCS_Load.kml** loads the PATROL KM for Cluster Server and **LBS.kml** loads the PATROL KM for Network Load Balancing. Each **.kml** file is listed once for each computer. You can display **.km** files by changing the filter.

Step 4 Select the check boxes for the KM and computer pair that you want to load.

Note

Unless you are an advanced PATROL user, use the **.kml** files to load product component files. Loading individual **.km** files can break the interdependencies between the **.km** files, while loading **.kml** files preserves these dependencies.

Step 5 Click **Next**, and then click **Finish**.

PATROL loads the selected KMs on the selected computers.

Loading KMs with PATROL Central Operator–Web Edition

PATROL Central Operator–Web Edition has a Loading KMs feature with which you can select KMs and the computers on which they are loaded.

Step 1 From the Managed Systems page, click the Load/Unload KMs button.

The Load KMs page opens, listing each computer on which a PATROL Agent has been installed.

Step 2 Select the computer (or computers) on which you wish to load KMs, and then click **Next**.

The Load KMs page displays a list of available **.km** and **.kml** files. **MCS_Load.kml** loads the PATROL KM for Cluster Server and **LBS.kml** loads the PATROL KM for Network Load Balancing.

If you selected more than one computer in this step, the only **.km** and **.kml** files that are shown are the ones that have been installed on all of the selected computers. If a particular **.km** or **.kml** file was installed on only one computer, then you must choose that computer by itself to load the file.

Step 3 Select the **.km** or **.kml** files that you want to load.

Note

Unless you are an advanced PATROL user, use the **.kml** files to load product component files. Loading individual **.km** files can break the interdependencies between the **.km** files, while loading **.kml** files preserves these dependencies.

Step 4 Click **Finish**.

PATROL loads the selected KMs on the selected computers.

Note

If you want to load a **.km** or **.kml** file that was not listed in step 2, ensure that the KM is installed on the appropriate computer and select only that computer in step 2.

Loading KMs with the PATROL Console for Windows

Step 1 From the PATROL Console menu bar, choose **File => Load KM**.

The Load KMs dialog box displays a list of available **.kml** files. **MCS_Load.kml** loads the PATROL KM for Cluster Server and **LBS.kml** loads the PATROL KM for Network Load Balancing.

Step 2 Select one or more of the **.kml** files, and click **Open**.

PATROL loads the selected KMs on all of the computers listed in the PATROLMainMap.

Loading KMs with the PATROL Console for Unix

Step 1 From the PATROL Console menu bar, choose **File => Load KM**.

The Load KMs dialog box displays a list of available **.kml** files. **MCS_Load.kml** loads the PATROL KM for Cluster Server and **LBS.kml** loads the PATROL KM for Network Load Balancing.

Step 2 Select one or more of the **.kml** files and click **Open**.

PATROL loads the selected KMs on all of the computers to which your console is connected.

Unloading Knowledge Modules

Summary: If you no longer want to use an application class that you previously loaded, you can unload the **.km** file so that its application class will no longer appear in your console. In some consoles, unloading is referred to as *deleting*. When you unload or delete a **.km** file using a console, the file is not deleted from the **patrol\knowledge** directories on the PATROL Console or the PATROL Agent computers.

Unloading a KM in the PATROL Central Operator–Windows Edition

PATROL Central Operator–Windows Edition has a wizard with which you can unload specified **.km** files from specified computers.

Step 1 In the Common Tasks tab of the taskpad, click the **Unload Knowledge Modules** icon.

PATROL displays the wizard.

Step 2 Click **Next** to start the wizard.

The wizard lists each computer on which a PATROL Agent has been installed.

Step 3 Select the check boxes for the computers from which you want to unload **.km** files, and then click **Next**.

The wizard displays a list of application class names (that correspond to **.km** file names) for each computer selected in the previous step. Each application class name is listed once for each computer.

Step 4 Select the check boxes for the **.km** and computer pair that you want to unload, and then click **Next**.

Step 5 Click **Finish**.

The console removes the selected **.km** files from the current management profile.

Unloading a KM in the PATROL Central Operator–Web Edition

PATROL Central Operator–Web Edition has a feature with which you can unload specified **.km** files from specified computers.

Step 1 From the Managed Systems page, click the **Load/Unload KMs** button.

The Load KMs page opens, listing each computer on which a PATROL Agent has been installed.

Step 2 Select the computers from which you want to unload **.km** files, and then click **Next**.

The Load KMs page displays a list of **.km** files. Currently loaded **.km** files are highlighted in the list.

Step 3 Deselect the **.km** files that you want to unload.

Step 4 Click **Finish**.

PATROL removes the **.km** files that you deselected in step 3.

Unloading a KM in the PATROL Console for Microsoft Windows Servers

Unloading a KM is also referred to as *deleting* a KM in the PATROL Console for Microsoft Windows Servers.

Step 1 From the KM tab of the tree view, right-click the application class name that you want to delete and choose **Delete** from the pop-up menu.

The console displays a dialog box that asks if you want to delete the selected application.

Step 2 Click **Yes** to delete the application class.

The application class is removed from your cache directory and your console session file.

Step 3 Repeat Step 1 and Step 2 until you have deleted all of the application classes associated with the KM that you want to delete.

Step 4 From the console menu bar, choose **File => Save KM** to save your changes.

Unloading a KM in the PATROL Console for Unix

Unloading a KM is also referred to as *deleting* a KM in the PATROL Console for Unix.

Step 1 From the PATROL Main window, choose **Attributes => Application Classes**.

The console displays the List of Application Classes window.

Step 2 Click the name of the application class that you want to delete.

The console highlights the application class name.

Step 3 From the List of Application Classes menu bar, choose **Edit => Delete**.

The application class is removed from your cache directory and your console session file. The PATROL Console removes the application class name from the List of Application Classes.

Step 4 Repeat Step 2 and Step 3 until you have deleted all of the application classes associated with the KM that you want to delete.

Step 5 From the List of Application Classes menu bar, choose **File => Save KM** to save your changes.

Configuring the PATROL KM for Cluster Server

This task assumes that you are connected to a cluster-level agent machine with your PATROL Console.

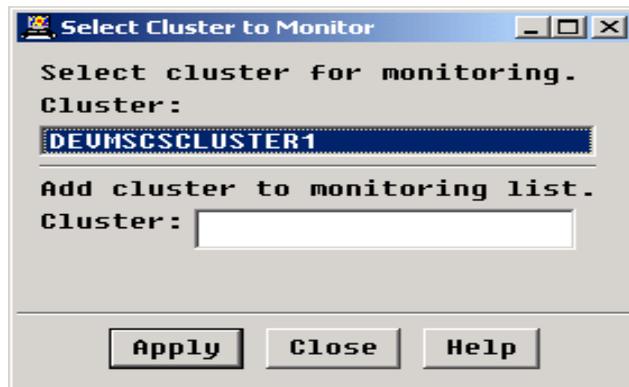
- Step 1** Add the host, which corresponds to your cluster-level agent by choosing **Host => Add**.

The Add Host dialog box is displayed.

- Step 2** Complete the Add Host dialog box information and click **OK**.

The Select Cluster to Monitor dialog box (Figure 3-1) is displayed.

Figure 3-1 Select Cluster to Monitor Dialog Box



- Step 3** From the Select Cluster to Monitor dialog box, select or add the clusters you want to monitor and click **Apply**.

Note

You can monitor a cluster with only one cluster-level agent at one time.

- Step 4** Click **Close** to close the dialog box and to display the Authorized Account dialog box (Figure 3-2 on page 3-14).

Figure 3-2 Authorized Account Dialog Box



The image shows a standard Windows-style dialog box titled "Authorized Account". It features four text input fields stacked vertically, each with a label to its left: "Domain name:", "User name:", "Password:", and "Verify Password:". At the bottom of the dialog, there are three buttons: "OK", "Close", and "Help". The dialog box has a standard Windows window border with minimize, maximize, and close buttons in the top right corner.

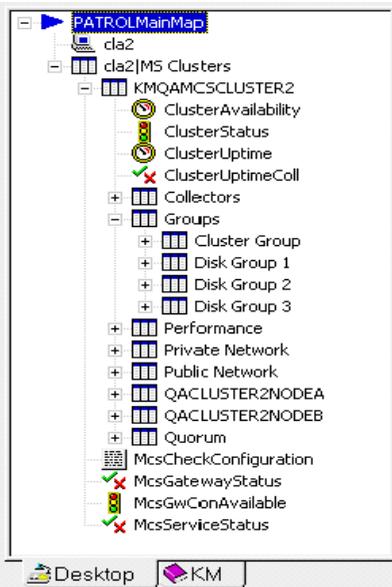
Step 5 Enter an account that has access type *Full Control* for the clusters you want to monitor. This account allows the cluster-level agent and external executables to access the cluster nodes you want to monitor.

- In the **Domain name** field, enter the domain of the authorized account you want to use.
- In the **User name** field, enter the user name of the authorized account you want to use.
- In the **Password** field, enter the password of the authorized account you want to use.
- In the **Verify Password** field, reenter the password of the authorized account you want to use.

Step 6 Click **OK**, and then **Close**.

You have completed the PATROL KM for Cluster Server configuration. Your Desktop tree view should look similar to Figure 3-3 on page 3-15.

Figure 3-3 Desktop Tree View of PATROL KM for Cluster Server



Configuring the PATROL KM for Network Load Balancing

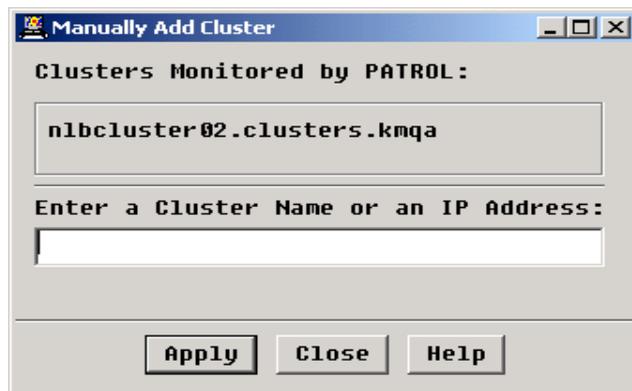
This task assumes that you

- are connected to a PATROL Agent machine with your PATROL Console.
- have loaded the PATROL KM for Network Load Balancing.

Step 1 From the LBS_Clusters application icon, choose **KM Commands => Manually Add Cluster**.

The Manually Add Cluster dialog box (Figure 3-4) is displayed.

Figure 3-4 Manually Add Cluster Dialog Box



Step 2 In the **Enter a Cluster Name or an IP Address** field, enter the cluster name or IP address of the cluster you want to add.

Step 3 Click **Apply**.

Step 4 Repeat steps 2 and 3 for each cluster you want to add.

Step 5 Click **Close**.

Step 6 From the LBS_Cluster application class (the cluster you just added), choose **KM Commands => Manually Add a Node**.

The Manually Add a Node dialog box (Figure 3-5) is displayed.

Figure 3-5 Manually Add a Node Dialog Box



- Step 7** In the **Enter a Node Name or an IP Address** field, enter the node name or IP address of the cluster node you want to add.
- Step 8** Click **Apply**.
- Step 9** Repeat steps 7 and 8 until all cluster nodes have been added.

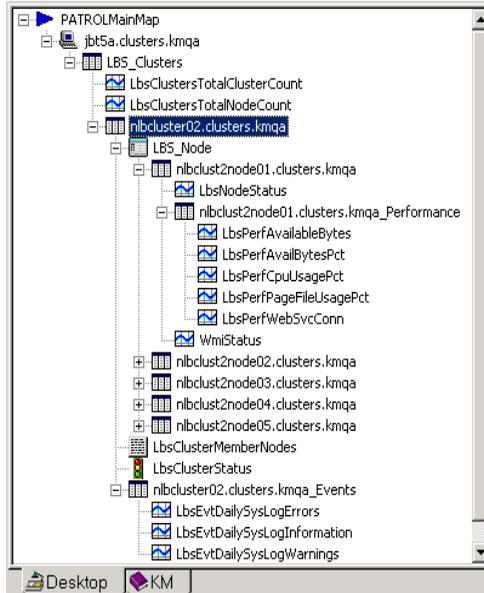
Warning

You must add all nodes within a Network Load Balancing cluster. If you monitor only some of the Network Load Balancing cluster nodes, the cluster may enter a converging state when PATROL runs the Converge NLB Nodes recovery action or when you execute the following menu commands: **Configure Port Rules** or **Cluster Control**. (Convergence is the process of verifying port rules consistency and joining nodes to the cluster.)

- Step 10** Click **Close** to finish the configuration.

You have completed the PATROL KM for Network Load Balancing configuration. Your Desktop tree view should look similar to Figure 3-6 on page 3-18.

Figure 3-6 Desktop Tree View of PATROL KM for Network Load Balancing



Configuring Recovery Actions

PATROL for Microsoft Windows Clustering provides built-in recovery actions (corrective actions taken by PATROL when a parameter reaches a set value or is in a warning or alarm state) for many KMs. Use these procedures to configure specific recovery actions.

- Step 1** Right-click the host application menu and choose **KM Command => Configure Recovery Actions** from the pop-up menu.
- Step 2** From the list of recovery actions, highlight the desired recovery action and click **Accept**.
- Step 3** From the list of recovery action instances, highlight the instance and click **Edit**. For information about which instance to select, see Table 3-1.

Table 3-1 Selecting a Recovery Action Instance

Purpose	Recovery Action to Select
configure the recovery action for a specific instance (for example, a monitored process)	the recovery action instance that displays the name of the application instance in the INSTANCE column
configure the recovery action for all instances (for example, all monitored processes)	the recovery action that displays an asterisk (*) in the INSTANCE column

Step 4 From the Configure Recovery Action dialog box, choose from the settings described in Table 3-2.

Table 3-2 Recovery Action Configuration Options

Setting	Description
Mode: Run automatically	If you select this mode, PATROL runs the recovery action automatically, without prompting you.
Mode: Run only with operator confirmation	If you select this mode, PATROL prompts you before running the recovery action. Note: If you select this option, be sure to keep a console connected to the PATROL Agent on the managed machine. If you have no console connection, PATROL is unable to prompt you. The recovery action will time out and not run.
Mode: Do not execute	If you select this mode, PATROL does not perform the recovery action.
Suspend Recovery Action	If you select this option, PATROL temporarily pauses the recovery action. When you resume the recovery action (by deselecting this check box) the previous recovery action settings take effect.
Attended Mode Dialog Timeout	If the recovery action is configured in Run only with operator confirmation mode, this setting specifies the amount of time PATROL waits for confirmation to run the recovery action. If you do not provide confirmation within the allotted time, PATROL does not run the recovery action.

Note

For more information on the recovery action and its configuration options, click the **Help** button.

Step 5 To save your changes, click **Accept**.

Displaying PATROL Data Using the PATROL Adapter for Microsoft Office

If you install the PATROL Adapter for Microsoft Office during the console pass of the PATROL for Microsoft Windows Clustering installation, you can display PATROL data in Microsoft Excel through the PATROL Adapter for Microsoft Office wizard. For information on how to view PATROL data through the PATROL Adapter for Microsoft Office wizard, see “Using the PATROL Adapter for Microsoft Office to Display PATROL Data in Microsoft Excel” on page 3-21.

Using the PATROL Adapter for Microsoft Office to Display PATROL Data in Microsoft Excel

To start the PATROL Adapter for Microsoft Office from Microsoft Excel, follow these steps:

- Step 1** Start Microsoft Excel.
- Step 2** Choose **File => New**.

The **New** dialog box appears.
- Step 3** Choose the **Spreadsheet Solutions** tab.
- Step 4** Choose the **Patrol Report.xlt** template.
- Step 5** Click **OK**.

The **New** dialog box is dismissed and the Microsoft Excel macros message appears.

- Step 6** Click **Enable Macros**.

To run the wizard, the Microsoft Excel security level must be either **Low** or **Medium**. If the security level is **High**, the wizard does not run and displays no error messages. To change the Microsoft Excel security level, start Excel and choose **Tools => Macro => Security**.

Step 7 See the *PATROL Adapter for Microsoft Office User Guide* for instructions on generating a report.

How to Use the PATROL Adapter for Microsoft Office

For more information on how to use the PATROL Adapter for Microsoft Office, see the *PATROL Adapter for Microsoft Office User Guide*.

Built-In Report Templates

Several products have predefined reports that you can use immediately. For a list of these predefined reports, see the following sections.

Report Options for PATROL for Microsoft Windows Clustering

The predefined report templates in Table 3-3 are available when you use the PATROL Adapter for Microsoft Office:

Table 3-3 Reports for PATROL KM for Microsoft Cluster Server

Report name	Description
Cluster Avg. Workload - Weekly	the average workload handled by the cluster during a seven-day period
Cluster Object Status - Weekly	the status of the cluster during a seven-day period
FShare-IP Availability - Weekly	the availability of the file share and IP during a seven-day period
IP Response Time - Weekly	the IP response time during a seven-day period

Table 3-4 Reports for PATROL KM for Network Load Balancing

Report name	Description
Daily Alarm & Warning Summary	a summary of all alarms and warnings for the past 24 hours
Daily Available Bytes	a summary of available bytes for each monitored node for the past 24 hours
Daily CPU Usage Pct.	a summary of CPU usage for each monitored node for the past 24 hours

Table 3-4 Reports for PATROL KM for Network Load Balancing

Report name	Description
Daily Events	a summary of events for all monitored nodes for the past 24 hours
Daily Page File Usage Pct.	a summary of page file usage for each monitored node for the past 24 hours
Daily Web Service Connections	a summary of the number of Web connections for each monitored node for the past 24 hours
Weekly Alarm & Warning Summary	a summary of all alarms and warnings for the past 7 days
Weekly Available Bytes	a summary of available bytes for each monitored node for the past 7 days
Weekly CPU Usage Pct.	a summary of CPU usage for each monitored node for the past 7 days
Weekly Events	a summary of events for all monitored nodes for the past 7 days
Weekly Page File Usage Pct.	a summary of page file usage for each monitored node for the past 7 days
Weekly Web Service Connections	a summary of the number of Web connections for each monitored node for the past 7 days

Where to Go from Here

The following table suggests topics that you should read next:

If you want information about	See
overview of PATROL for Windows Clustering components and capabilities	Chapter 1, "Product Components and Capabilities"
how to install PATROL for Windows Clustering	Chapter 2, "Installing and Migrating PATROL for Windows Clustering"
how to use the PCC Wizard to help you configure the PATROL Agent for failover in a Microsoft Cluster Server environment	Chapter 4, "Using the PATROL Cluster Configuration Wizard"
how to use the PATROL for Windows Clustering KMs, and detailed descriptions of the applications, menu commands, and InfoBoxes	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help
parameter descriptions and defaults	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help or• <i>PATROL Parameter Reference Manual</i>
accessing menu commands, InfoBoxes, and online Help	Appendix A, "Accessing Menu Commands, InfoBoxes, and Online Help"
PATROL Agent configuration variables	Appendix B, "Agent Configuration Variables"

Using the PATROL Cluster Configuration Wizard

This chapter provides you with information that you will need to use the PATROL Cluster Configuration Wizard (also referred to as PCC). The following topics are discussed:

Using the PATROL Cluster Configuration Wizard.	4-2
Overview	4-2
Before You Begin.	4-3
Access Requirements for Running the PCC Wizard	4-4
Starting the PCC Wizard	4-4
How to Use the PCC Wizard	4-4
Post-PCC Configuration.	4-10
Manually Configuring the PATROL Agent for Clustering.	4-11
Install the Application on each Cluster Node	4-11
Install the PATROL Agent on each Cluster Node	4-11
Assign a Unique Port Number.	4-12
Distribute License File.	4-12
Define the PATROL Cluster-Specific Environment Variables.	4-12
Create and Register a New Service for the PATROL Agent	4-13
Define the PATROL Agent as a Member of the Group	4-13
PATROL Cluster-Specific Environment Variables for History and	
Configuration	4-20
Variables.	4-20
Operation	4-21
Example	4-22
Where to Go from Here	4-23

Using the PATROL Cluster Configuration Wizard

Install the PATROL Cluster Configuration (PCC) Wizard to help you configure the PATROL Agent for failover in a Microsoft Cluster Server environment. For installation instructions, see “PATROL Cluster Configuration Wizard” on page 2-15.

Overview

The PCC Wizard allows you to easily configure the PATROL Agent to monitor cluster-aware applications such as Microsoft Exchange Server. It does this by

- configuring the agent to operate on a virtual server name and separate port
- storing the agent history and configuration data on cluster-shared media

Thus, in the event of a node failure, the agent will failover to another node with the monitored application, while providing a consistent view of the data being collected. For example, the history data is kept intact.

The Wizard does not enable the monitoring of clustered resources. That functionality is handled by the PATROL Agent and the PATROL KM for Cluster Server. The Wizard automates and simplifies cluster configuration of the PATROL Agent, and eliminates configuring the agent manually.

Before You Begin

Before you begin using the PCC Wizard, you must

- install PCC on any computer in the cluster domain
- install PATROL Agent on all nodes in the cluster
- know the user name and password of a cluster administrator account
- install the Microsoft Cluster Administrator
- identify a group to install the PATROL virtual Agent into; this group will need to contain the following (at a minimum):

— Physical Disk

The PATROL virtual Agent stores history and configuration data on a standard cluster-shared disk which, if possible, should not be the quorum disk.

— IP Address

In conjunction with the Network Name resource, the PATROL virtual Agent uses the IP address to allow access by the PATROL Console.

— Network Name

A network name is required for each PATROL virtual Agent configured. The PATROL virtual Agent uses the network name to form a virtual server for the PATROL Console to access. Thus, the PATROL virtual Agent can fail over to any node capable of running the resource.

Note

The node that you run the PCC Wizard from should be the current owner of the group you select. This recommendation prevents some caution pop-up windows from appearing.

For information about how the PATROL Agent supports an application in a cluster environment and what type of failover tolerance it provides, see the *PATROL Agent Reference Manual*.

Access Requirements for Running the PCC Wizard

The account you use to run the PCC Wizard must be a member of the local administrator group.

Starting the PCC Wizard

You can start the wizard by

- choosing **Start => Programs => BMC PATROL => PATROL Cluster Configuration Wizard**.
- typing `pcc` from the Run command.

How to Use the PCC Wizard

Once you have installed PCC Wizard on all nodes, use the following instructions to use the PCC Wizard to configure the PATROL Agent resources. You will only need to run the PCC Wizard once, from a single node. All nodes will be configured at that time.

Information Required by PCC

Use the table below to plan your configuration of each PATROL Agent resource.

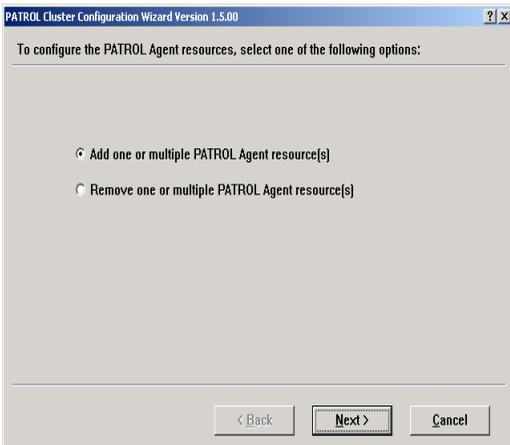
Table 4-1 Information Required by PCC

Required Information	Your Information	PCC
Cluster Name		adds the PATROL Agent resource to the cluster you select or enter.
Group Name(s)		adds the PATROL Agent resource to one or more cluster groups.
Resource Name		adds the PATROL Agent service as a Generic Service resource type with this name. The resource name must be unique for this cluster.

Table 4-1 Information Required by PCC

Required Information	Your Information	PCC
Service Name		creates registry entries for this PATROL Agent service name on each node you select. The service name must be unique for this system and comply with the rules for a service name. Note: PATROL does not rename the PatrolAgent.exe .
Network Name		sets the PATROL_VIRTUALNAME_PORT# environment variable to this network name, which the PATROL Agent uses instead of the host name to store the PATROL configuration and history data. For easy identification, this name should be the virtual server name of the cluster group with which the agent is bundled. For example, the network name for an agent on port 3182 is PATROL_HISTORY_3182=BMC_ExchangeHou.
Port Number		sets the port number that the PATROL Agent is using and that is referenced by all environment variables. Each PATROL virtual Agent must have a unique port number.
Shared Drive		sets the drive shared by a cluster on which the configuration and history data will be stored. The PATROL Agent must be able to access this shared drive at agent startup, and the shared drive should belong to the cluster group with which the PATROL Agent is bundled.
History Path		sets the PATROL_HISTORY_PORT# environment variable to this path on the shared drive, which stores the agent history files. For example, the history data location for an agent on port 3182 is PATROL_HISTORY_3182=X:\patrol\history.
Config DB Path		sets the PATROL_CONFIG_PORT# environment variable to this path on the shared drive, which stores the PATROL Agent configuration database. For example, the configuration database location for an agent on port 3182 is PATROL_CONFIG_3182=X:\patrol\config.
Node(s)		creates a registry entry for the PATROL Agent service on each cluster node you select.

Configuring the PATROL Agent

Action	Dialog	Notes
1. Click Next .		
2. Select the appropriate option and click Next .		If you are installing the first resource, select Add one or multiple PATROL Agent resource(s) . Adding a PATROL Agent as a cluster resource performs the following actions: <ul style="list-style-type: none">• Sets the required environment variables• Registers the PATROL Agent with a new service name• Adds the PATROL Agent to the cluster as a Generic Service resource type and sets the resource properties

Action

3. Select the groups to which you want to add the agent and click **Next**.

Dialog

The screenshot shows the 'PATROL Cluster Configuration Wizard Version 1.5.00' dialog box. The title bar includes a help icon and a close icon. The main text reads 'Select the cluster and the group(s) to which you want to add the PATROL Agent.' Below this, there is a 'Cluster Name' dropdown menu with 'DATAMCSCUSTER1' selected. Underneath, there are two columns: 'Available Groups' and 'Selected Groups'. The 'Available Groups' list contains 'Disk Group 1', 'Disk Group 2', 'Disk Group 3', and 'Disk Group 4'. Between these columns are three buttons: 'Add >', '< Remove', and 'Select All'. The 'Selected Groups' list is currently empty. At the bottom of the dialog are three buttons: '< Back', 'Next >', and 'Cancel'.

Notes

You can select multiple groups. In most cases, the groups will correspond to the applications you want to monitor.

4. Enter the appropriate information and click **Node List**.

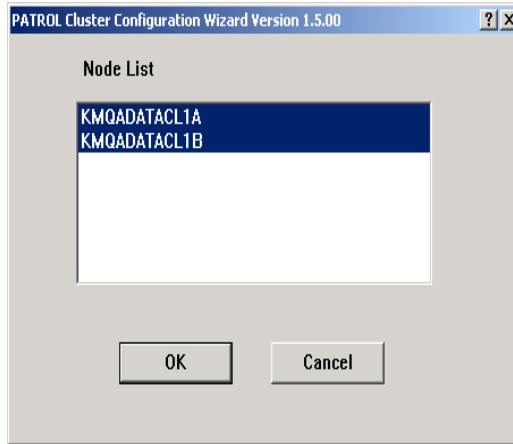
The screenshot shows the 'PATROL Cluster Configuration Wizard Version 1.5.00' dialog box. The title bar includes a help icon and a close icon. The main text reads 'Specify the information for the PATROL Agent.' Below this, there are several input fields: 'Cluster Name' (DATAMCSCUSTER1), 'Group Name' (Cluster Group), 'Resource Name' (PATROL Agent for Cluster Group_4), 'Service Name' (PATROLAgent_4), 'Network Name' (DATAMCSCUSTER1), 'Port Number' (3188), 'Shared Drive' (Disk Q:), 'History Path' (Q:\PATROL\history), and 'Config DB Path' (Q:\PATROL\config). At the bottom of the dialog are three buttons: 'Node List', '< Back', 'Next >', and 'Cancel'.

If you do not know what names to use, accept the defaults. The port number must be a port that is not in use by any other process.

Action

5. Verify that all nodes that you want to configure are selected and click **OK**. You are returned to the PATROL Agent configuration screen. Click **Next**.

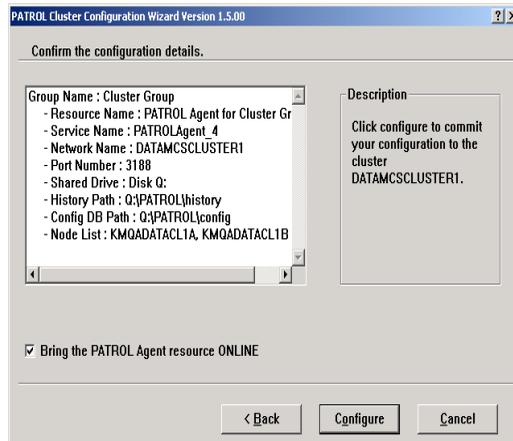
Dialog



Notes

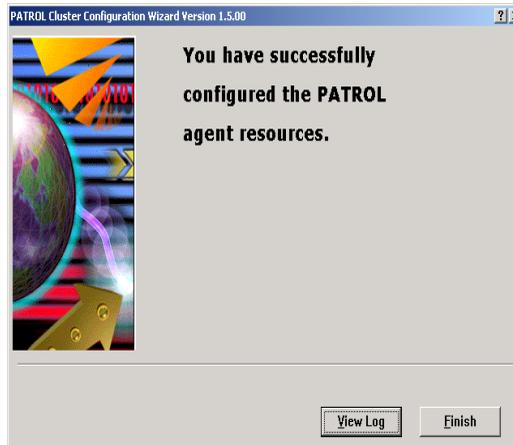
You can select or deselect nodes by clicking on the node. All nodes are selected by default.

6. Verify the configuration information and click **Configure**.



Action

7. Click **View Log** or **Finish**.

Dialog**Notes**

You have finished configuring the agent.

Your configuration of the PATROL Agent using PCC performs the following actions:

- Registers the PATROL Agent service with a new service name within the Service Control Manager.
- Sets the registry parameters and port number.
- Sets the service startup to manual.
- Creates the resource of type Generic Service in the cluster.
- Sets the Generic Service resource properties to restart without affecting the cluster group; remaining properties have default values.
- Sets the service name parameter of the Generic Service and enables use Network Name for computer name.
- Creates PATROL Agent history and configuration files on shared disk.
- Creates environment variables for cluster nodes.
- Brings the newly created resource online if the selection box is checked.
- Sets resource dependencies on the specified Physical Disk and Network Name.

Where to Go Next

Now that you configured the PATROL Agent using PCC, See “Post-PCC Configuration” on page 4-10.

Post-PCC Configuration

Now that you have finished using PCC to configure multiple PATROL Agents, you must perform some post-wizard configuration.

Each of the group agents in the cluster need to monitor resources that are a only part of that group. The node agents should not monitor group resources. This generally requires using wpconfig to modify the disabledKMs list for each group agent, and configuring the remaining KMs to monitor only resources that are instances of that group. This also means that you only need to modify the preloadedKMs list using wpconfig to preload KMs that are appropriate for that node or group agent.

Manually Configuring the PATROL Agent for Clustering

Note

BMC Software recommends that you use the PCC Wizard to cluster your PATROL Agent. PCC simplifies the configuration process. See “Using the PATROL Cluster Configuration Wizard” on page 4-2. However, the manual instructions have been included in case you prefer manual configuration or want to know what the PCC Wizard is configuring.

The information in this section provides a general idea of the processes involved in setting up a Windows cluster environment and integrating PATROL into that environment. Procedures and steps describing how to set up third-party software are intended as a general outline of the process for that product and are not intended as step-by-step instructions.

Setting up PATROL to run in a Windows cluster environment consists of several standard tasks. The standard cluster administration tasks and the PATROL-specific tasks are described in general terms. This section provides a high-level overview of building a Windows cluster and integrating PATROL into that environment.

The manual process defined in this chapter requires you to run multiple PATROL Agent executables on your CPU if you want to monitor more than one application on the cluster.

Install the Application on each Cluster Node

Install the cluster application on the local disk. In the Windows environment, the executable must be installed on the local disk.

Install the PATROL Agent on each Cluster Node

Install the PATROL Agent on the local disk of the node. You should have at least two separate agent executables installed on the node:

- one to monitor the node's operating system
- one to monitor the cluster application

Install the agent once. Include only those Knowledge Modules that support the application and the operating system. Then see “Create and Register a New Service for the PATROL Agent” on page 4-15 for information on setting up a second agent to monitor the cluster application.

Assign a Unique Port Number

During installation of the agent on each node, assign a unique, listening port number to the PATROL Agent bound to the cluster application. This port must be the same across all nodes within the cluster.

Distribute License File

Duplicate the license file on each node. Use the naming convention “license” without the host name as an extension. During startup, the PATROL Agent searches for “license.*hostname*,” using its own host name. If it can't find the file, it searches for “license” without an extension.

If you duplicate a license file and do not delete or change the file's host name extension, the agent cannot find the license and will not start.

Define the PATROL Cluster-Specific Environment Variables

Create and set the PATROL Cluster-Specific variables. For more information, see “Define the PATROL Cluster-Specific Environment Variables” on page 4-14.

Create and Register a New Service for the PATROL Agent

Set up a separate PATROL Agent process that can be bound to the cluster application. For more information, see “Create and Register a New Service for the PATROL Agent” on page 4-15.

Define the PATROL Agent as a Member of the Group

Associate the PATROL Agent process with the cluster application. For more information, see “Define the PATROL Agent as a Member of the Group” on page 4-17.

Define the PATROL Cluster-Specific Environment Variables

Summary: In this task, you will define the PATROL cluster-specific environment variables on each node. This action ensures that all the agents in a cluster read their configuration information and write their history information to the same set of files.

Perform the following tasks on each node in the cluster, then reboot each node. Rebooting enables each system to read the new variables and store them in memory.

- Step 1** From the Windows Taskbar, select **Start => Settings => Control Panel**.
- Step 2** Double-click the System icon and select the Environment tab.
- Step 3** Enter the variable name and value in the appropriate fields and click Set. The variables and their values are listed below. Repeat this step for the remaining variables.

```
PATROL_VIRTUALNAME_PORT=VirtualServerName  
PATROL_HISTORY_PORT=Drive:\History_Directory  
PATROL_CONFIG_PORT=Drive:\Config_Directory
```

For more information about specific variables, see “PATROL Cluster-Specific Environment Variables for History and Configuration” on page 4-20.

Create and Register a New Service for the PATROL Agent

Summary: In this task, you will create a PATROL Agent executable and register it as a service so that you can dedicate it to monitoring a cluster application. This task involves copying and renaming the agent's executable and then registering the service in the Windows Services Applet.

Perform the following task on each node in the cluster.

- Step 1** Copy the PatrolAgent.exe in `%PATROL_HOME%\bin` directory.
- Step 2** Rename the executable. Use a name that indicates that the agent is an executable dedicated to monitoring an application.
- Step 3** Paste the executable into the `%PATROL_HOME%\bin` directory.

Note

Name the executable the same on every node in the cluster.

`PatrolAgent-application_name.exe`

- Step 4** Install the executable at the command line, navigate to the `%PATROL_HOME%\bin` directory, and enter the following command:

```
PatrolAgent-application_name -install
```

The system acknowledges that the service installed successfully.

```
Tue MON DD HH:MM:SS CCYY PatrolAgent-application_name
PID 318 Success 1000:
The PatrolAgent Service was successfully installed.
```

The PatrolAgent COM Server registered successfully

Note

The PatrolAgent COM Server can only be registered once. Additional attempts to register it will fail; however, the multiple agent processes will run.

- Step 5** From the Windows Taskbar, select **Start => Settings => Control Panel**.
- Step 6** Double-click the Services icon and select *application_name* service from the list box. Click **Startup**.
- Step 7** In the Startup Type pane, select the Manual radio button and click OK. The service displays Manual in the Startup column.

Define the PATROL Agent as a Member of the Group

Summary: In this task, you will add the new PatrolAgent service as a resource of type “Generic Service” to the cluster. This task is commonly referred to as binding the agent to the cluster application.

Note

This task description uses Windows Cluster Management Software as an example. The steps describing how to set up the software are intended as a general outline of the process and are not intended as step-by-step instructions.

Perform the following task on only the master node of the cluster. The cluster software provides two methods for binding a service to a cluster: GUI or command line. Regardless of which method you choose, you must provide the information listed in Table 4-2.

Table 4-2 Cluster Administration Properties (Part 1 of 2)

Arguments	Description
cluster.exe	Cluster Administration Executable (command line only)
clusterName	User-defined name of the cluster
RES	Specifies the service as a resource of the cluster
"PatrolAgent for MyApplication"	Description of the service
/CREATE /Group: /TYPE:	Create a group and assign it a resource type.
/ADDEP	Establish a dependency between the service and the cluster.
/Prop:RestartAction	Determines what the cluster does (shut down, wait, etc.) if PATROL Agent service fails and is unable to restart.
/Priv: ServiceName	Identify the service name of the PATROL Agent service bound to the cluster application.

Table 4-2 Cluster Administration Properties (Part 2 of 2)

Arguments	Description
/Priv: StartupParameters	Specify startup characteristics such as port number.
/ON	Make the PATROL Agent service available (online) to the cluster.

Using Cluster Administration GUI

Add the new PatrolAgent service as a resource of type “Generic Service” to the cluster using the Cluster Administrator GUI.

Using the Command Line

To bind a PATROL Agent service to the cluster application, you must issue a number of commands. Each command contains the name of the cluster registration executable, the name of the cluster, RES, description of the service, and various attributes.

Note

For each command, you must reenter the name of the cluster executable, the name of the cluster, the resource option, and the service name.

Step 1 Go to the command line.

Step 2 Name the service, designate it as a resource of the cluster, create a group, and assign it a resource type of “Generic Service”.

```
cluster.exe clusterName RES "PatrolAgent for  
MyApplication" /CREATE /Group:MyGroup /TYPE:"Generic  
Service"
```

Step 3 Add the disk that stores the PATROL Agent configuration and history information as a dependency. This command instructs the cluster software to bring up the disk with configuration information before it attempts to start the PATROL Agent.

```
cluster.exe clusterName RES "PatrolAgent for
MyApplication" /ADDDEP:"Disk MyGroupDisk"
```

- Step 4** Set the restart action. This command determines what the cluster does if an application fails and is unable to restart. A value of one (1) indicates that if the application is unable to restart, the cluster will continue to run.

```
cluster.exe clusterName RES "PatrolAgent for
MyApplication" /Prop:RestartAction=1
```

- Step 5** Identify the service name to the cluster software. The service name must be identical to the service name assigned to the PATROL Agent executable on each cluster node.

```
cluster.exe clusterName RES "PatrolAgent for
MyApplication" /Priv
ServiceName="PatrolAgent-application_name"
```

- Step 6** Set the port number for the PATROL Agent bound to the cluster application. This number must be the same as the number assigned as a suffix to the PATROL cluster-specific environment variables.

For details about the PATROL cluster-specific environment variables, see “Define the PATROL Cluster-Specific Environment Variables” on page 4-14.

```
cluster.exe clusterName RES "PatrolAgent for
MyApplication" /Priv StartupParameters="-p Port#"
```

- Step 7** Set the service to be available (online) when the cluster is running.

```
cluster.exe clusterName RES "PatrolAgent for
MyApplication" /ON
```

PATROL Cluster-Specific Environment Variables for History and Configuration

To take advantage of failover tolerance for history files, you must create and set the value of three environment variables. When creating and writing to history files, the PATROL Agent searches for information in these files.

Variables

Table 4-3 lists the PATROL cluster-specific environment variables and describes their purposes.

Table 4-3 PATROL Cluster-Specific Environment Variables

Environment Variable	Description
PATROL_HISTORY PATROL_HISTORY_PORT ^a	the location of history files If this variable is empty or doesn't exist, the agent writes the history files to <i>PATROL_HOME</i> \log\history\ <i>host</i> \ <i>portnumber</i> .
PATROL_VIRTUALNAME PATROL_VIRTUALNAME_PORT ^a	an alias for the host name If this variable is empty or doesn't exist, the agent uses the host name to identify history data within the history files.
PATROL_CONFIG PATROL_CONFIG_PORT ^a	the location of the configuration files If this variable is empty or doesn't exist, the agent stores the configuration file in <i>PATROL_HOME</i> \config.

^a To manage multiple PATROL Agents running on separate ports, append the port number to the variable name. This situation occurs when individual PATROL Agents are bound to individual applications such as Oracle, Exchange, Sybase, etc. Each agent uses a separate port number.

Operation

When searching for configuration information and creating and writing to the history database, the PATROL Agent uses the following logic to check for the existence of PATROL cluster-specific variables.

Table 4-4 Operation of Configuration and History Environment Variables

Variable Type	Exists?	Description
Virtual Name	yes	<p>PATROL_VIRTUALNAME_8888 exists, the agent writes history using the virtual name as the host name. Using the virtual name provides continuous history for an application regardless of which host the application is running on.</p> <p>The agent also uses the virtual host name to identify the configuration file changes and the history database. Configuration file changes are written to <i>PATROL_HOME\config\config_virtualname_port.cfg</i>. The history database is written to the subdirectory structure <i>history\virtualname\port</i>, which will be located in the directory pointed to by <i>PATROL_HISTORY_PORT</i>.</p>
	no	<p>The agent writes history using the actual host name. If the application fails over, the agent writes history using the new agent's name. Using the actual hostname creates gaps in the results of any <i>dump_hist</i> commands because the command does not recognize that the same application ran on different hosts.</p>
Configuration File	yes	<p>PATROL_CONFIG_8888 exists, then the agent reads configuration information from the location specified by this variable.</p>
	no	<p>The agent reads from the default directory, <i>PATROL_HOME\config\config_virtualname or hostname-port</i></p>
History Database	yes	<p>PATROL_HISTORY_8888 exists, then the agent writes history to the location specified by this variable</p>
	no	<p>the agent writes to the default directory, <i>PATROL_HOME\log\history\virtualname or hostname\port</i></p>

Example

The following example illustrates how the environment variables would be named for a host using port 8888. It also depicts the directory structure and file location.

Environment Variables

```
PATROL_HISTORY=K:\doc\work\histdir  
PATROL_VIRTUALNAME=AliasHostName  
PATROL_CONFIG=K:\doc\work\config
```

Directory Structure

For the values provided in the “Environment Variables” section of this example, the PATROL Agent stores configuration information and records the history data in the following directory structure:

```
K:\doc\work\histdir\AliasHostName\8888\annotate.dat  
K:\doc\work\histdir\AliasHostName\8888\param.hist  
K:\doc\work\config\config_AliasHostName-8888
```

If these variables do not exist or they are empty, the PATROL Agent stores configuration information and records the history data in the following directory structure:

```
%PATROL_HOME%\log\history\HostName\8888\annotate.dat  
%PATROL_HOME%\log\history\HostName\8888\param.hist  
%PATROL_HOME%\config\config_HostName-8888
```

Where to Go from Here

The following table suggests topics that you should read next:

If you want information about	See
overview of PATROL for Windows Clustering components and capabilities	Chapter 1, "Product Components and Capabilities"
how to install PATROL for Windows Clustering	Chapter 2, "Installing and Migrating PATROL for Windows Clustering"
how to load and configure the PATROL KM for Cluster Server or PATROL KM for Network Load Balancing using the PATROL Console	Chapter 3, "Loading and Configuring PATROL for Windows Clustering KMs"
how to use the PATROL for Windows Clustering KMs, and detailed descriptions of the applications, menu commands, and InfoBoxes	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help
parameter descriptions and defaults	<ul style="list-style-type: none">• PATROL KM for Cluster Server online Help or• PATROL KM for Network Load Balancing online Help or• <i>PATROL Parameter Reference Manual</i>
accessing menu commands, InfoBoxes, and online Help	Appendix A, "Accessing Menu Commands, InfoBoxes, and Online Help"
PATROL Agent configuration variables	Appendix B, "Agent Configuration Variables"

Accessing Menu Commands, InfoBoxes, and Online Help

BMC Software offers several PATROL consoles from which you can view a PATROL Knowledge Module (KM). Because of the different environments in which these consoles run, each one uses a different method to display and access information in the KM. This appendix provides instructions for accessing the KM menu commands and InfoBoxes. It also provides instructions for accessing the online Help for the KM that uses each of the PATROL consoles. See the PATROL KM for Microsoft Cluster Server online Help or PATROL KM for Microsoft Network Load Balancing online Help for more detailed information about navigation in the PATROL Consoles.

Accessing KM Commands and InfoBoxes.	A-2
Accessing Online Help.	A-3

Accessing KM Commands and InfoBoxes

Table A-1 provides information about how to access KM commands and InfoBoxes from the various PATROL consoles.

Table A-1 Accessing KM Commands and InfoBoxes

Console	To access menu commands	To access InfoBoxes
PATROL Classic Console for Microsoft Windows–Developer	In either the Desktop tree tab or work area, right-click a computer or application icon and choose KM Commands from the pop-up menu.	In either the Desktop tree tab or the work area, right-click an application class or parameter icon and choose InfoBox from the pop-up menu.
PATROL Classic Console for Unix–Developer	In the work area, right-click a computer or application icon to display a pop-up menu that contains KM-specific commands.	With the middle mouse button, click an application class or parameter icon.
PATROL Central Operator–Microsoft Windows Edition	In the navigation pane, right-click a managed system or application icon and choose Knowledge Module Commands from the pop-up menu.	In the navigation pane, right-click a PATROL object and choose InfoBox from the pop-up menu.
PATROL Central Operator–Web Edition	In the tree view area, right-click an application icon and choose Knowledge Module Commands from the pop-up menu.	In the tree view area, right-click a PATROL object and choose Infobox from the pop-up menu.

Accessing Online Help

Table A-2 provides information about how to access Help from each console.

Note

If you are trying to access Help from a Unix console, see Chapter 2, “Installing the Online Help,” for specific instructions about installing and setting up a browser in the Unix environment.

Table A-2 Accessing Online Help (Part 1 of 2)

Console	To access product help	To access application class help	To access parameter help
PATROL Classic Console for Microsoft Windows–Developer	From the console menu bar, choose Help => Help Topics => PATROL Knowledge Modules .	Double-click an application class in the KM tab of the console. From the the Application Properties dialog box, click the Help tab. Then click Show Help .	<ul style="list-style-type: none"> • Right-click a parameter icon and choose Help On from the pop-up menu. • Double-click a parameter icon; click the ? icon or Help button in the parameter display window. • Double-click a parameter in the KM tab of the console; from the properties dialog box, click the Help tab; then click Show Help.
PATROL Classic Console for Unix–Developer	From the console menu bar, choose Help On => Knowledge Modules .	Choose Attributes => Application Classes and double-click the application name. Click Show Help in the Application Definition dialog box.	Right-click a parameter icon and click Help On .

Table A-2 Accessing Online Help (Part 2 of 2)

Console	To access product help	To access application class help	To access parameter help
PATROL Central Operator–Microsoft Windows Edition	From the console menu bar, choose Help => Help Topics . In the Contents tab, click the name of your product.	In the Operator tab of the navigation pane, select an application icon and press F1 .	In the Operator tab of the navigation pane, select a parameter icon and press F1 .
PATROL Central Operator–Web Edition	In the upper right corner of PATROL Central, click Help and choose PATROL KM Help .	In the tree view, right-click an application class and choose Help .	In the tree view, right-click a parameter and choose Help .

Agent Configuration Variables

The variables described in this section are PATROL for Windows Clustering variables that are set in the PATROL Agent. Use the agent configuration utility to view these variables.

Warning

Changing any of these variables can prevent some functions from working properly and affect your entire installation. Make a record of the original setting for a variable before you change it.

Managing Configuration Variables.	B-2
PATROL KM for Cluster Server Configuration Variables.	B-2
PATROL KM for Network Load Balancing Configuration Variables	B-5

Managing Configuration Variables

BMC Software recommends that you set variables by using a console to configure PATROL for Windows Clustering KMs. Use the PATROL Configuration Manager or the wpcfg utility only to view variable settings or deploy them to other machines.

Warning

Do not use the wpcfg utility or PATROL Configuration Manager to remove variables or add new variables. Doing so may prevent some functions from working properly and can affect your entire installation.

The PATROL KM for Cluster Server configuration variables are described in Table B-1.

Table B-1 PATROL KM for Cluster Server Configuration Variables (Part 1 of 3)

Variable	Description
/MCS/AccountInfo	stores the Cluster account information
/MCS/applicationClass_AnnotationMode	stores the annotation mode setting (On, Off, or Error) for the MCS_Groups, MCS_Group_Resources, MCS_Nodes, and MCS_Performance application classes. The annotation mode is set through the PATROL Admin => Configure Annotation Mode menu command.
/MCS/clusterInstance_CluDBBackupPath	stores backup path for the Cluster database. The path is not set by default, and therefore the BackupClusterDatabase parameter is offline. The path is set through the Quorum Admin (MCS_Quorum) => Set Backup Path menu command.
/MCS/clusterInstance_FileShareExclusionList	stores excluded file shares. If a file share has been excluded, then it will not be monitored by the FileShareUnAvailable parameter. Excluded file shares are displayed in the Desktop tree and data is collected from them by the ResourceStatus parameter. You can exclude file shares through the PATROL Admin (MCS_Groups) => Maintain Exclusion List => Exclude File Shares menu command.

Table B-1 PATROL KM for Cluster Server Configuration Variables (Part 2 of 3)

Variable	Description
/MCS/clusterInstance_IPExclusionList	stores excluded IP addresses. If an IP address has been excluded, then it will not be monitored by the CheckIPResourceColl parameter. Excluded IP addresses are displayed in the Desktop tree and data is collected from them by the ResourceStatus parameter. You can exclude IP addresses through the PATROL Admin (MCS_Groups) => Maintain Exclusion List => Exclude IP Address menu command.
/MCS/clusterInstance_ResourceExclusionList	stores excluded resources. If a resource has been excluded, then the resource will not be monitored and an instance will not be created. You can exclude resources through the PATROL Admin (MCS_Groups) => Maintain Exclusion List => Exclude Resources menu command.
/MCS/clusterInstance_UpTimeBaseLine	stores the start date and time for the ClusterAvailability parameter. The date and time is set to the current date and time by default. Set the start date and time through the PATROL Admin (MCS_Cluster) => Set Available Start Date.
/MCS/DomainInclusionList	<p>stores the domain name being monitored. To monitor an additional domain, you must add a variable to the agent's configuration database using wpconfig and a change file. Before loading and configuring the KM, a one way trust between the domains has to be established. The domain with the cluster nodes has to trust the domain with the "cluster-level" agent.</p> <p>Adding a domain:</p> <ol style="list-style-type: none"> 1. Create a change file as a plain text file using any text editor with the following content: Note: the options of the wpconfig command are case sensitive. PATROL_CONFIG "/MCS/DomainInclusionList" = { REPLACE = "DomainName" } 2. Execute on the command line: wpconfig +Reload your-filename

Table B-1 PATROL KM for Cluster Server Configuration Variables (Part 3 of 3)

Variable	Description
/MCS/hostname_LogMonKeyAlarm	stores keywords that the KM searches for in the cluster log file. If any of the keywords are found, the ClusterLogFileError parameter sends an alarm. Define the keywords through the PATROL Admin (MCS_Nodes) => Maintain Keywords menu command. By default, no keywords are defined, and the parameter is offline.
/MCS/hostname_LogMonKeyDate	stores the date from which the KM searches for defined keywords in the cluster log file. If any of the keywords are found, the ClusterLogFileError parameter sends an alarm or warning. Define the date and keywords through the PATROL Admin (MCS_Nodes) => Maintain Keywords menu command. By default, no date or keywords are defined, and the parameter is offline.
/MCS/hostname_LogMonKeyWarn	stores keywords that the KM searches for in the cluster log file. If any of the keywords are found, the ClusterLogFileError parameter sends a warning. Define the keywords through the PATROL Admin (MCS_Nodes) => Maintain Keywords menu command. By default, no keywords are defined, and the parameter is offline.
/MCS/MenuCmdROMode	stores the read-only setting for the Cluster Admin Commands. Change the read-only setting through the PATROL Admin (MCS_Clusters) => Configure Menu Cmd RO Mode menu command. Read-only is disabled by default.
/MCS/monitoredClusterList	stores the clusters you are monitoring. Change the list through the PATROL Admin (MCS_Clusters) => Select Cluster to Monitor menu command.
/MCS/Port	stores the port number of the agent on the cluster-level agent and the nodes. If you are monitoring multiple clusters, the port number must be the same. Change the port number through the PATROL Admin (MCS_Clusters) => Maintain Port Information menu command. The port number is 3181 by default.

The PATROL KM for Network Load Balancing configuration variables are described in Table B-2.

Table B-2 PATROL KM for Network Load Balancing Configuration Variables

Variable	Description
<i>/LBS/monClusterAndIPList</i>	stores the name or IP address of a cluster in the following format: name or IP address = IP address of the cluster. Change the name or IP address through the Manually Add Cluster (LBS_Clusters) menu command.
<i>/LBS/monClusterList</i>	stores the name or IP address of a cluster (the first part of the format: name or IP address = IP address of the cluster). Change the name or IP address through the Manually Add Cluster (LBS_Clusters) menu command.
<i>/LBS/cluster_instance/clusterNodeAndIPList</i>	stores the name or IP address of a node in the following format: name or IP address = IP address of the node. Change the name or IP address through the Manually Add a Node (LBS_Cluster) menu command.
<i>/LBS/cluster_instance/clusterNodeList</i>	stores the name or IP address of a node (the first part of the format: name or IP address = IP address of the node). Change the name or IP address through the Manually Add a Node (LBS_Cluster) menu command.
<i>/LBS/cluster_instance/defaultNode</i>	stores the default node (default host) of the LBS cluster.
<i>/LBS/cluster_name/lastCollectTime</i>	stores the last time when the parameter LbsEvtColl ran. The value is the number of seconds that have elapsed since 00:00:00 GMT, Jan 01, 1970.

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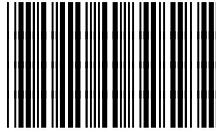
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