

# *InCharge*<sup>TM</sup>

## Application Connectivity Monitor User's Guide

Version 6.0



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# Preface

## Intended Audience

This document is intended for those who need to configure and use the InCharge Application Connectivity Monitor.

## Prerequisites

It is assumed that InCharge Service Assurance Manager, Application Services Manager, and IP Availability Manager are installed. It also assumes that InCharge Application Connectivity Monitor is installed.

## Document Organization

This guide consists of the following chapters.

<b>1. APPLICATION CONNECTIVITY MONITOR OVERVIEW</b>	Provides an overview of Application Connectivity Monitor and its interaction with other InCharge products.
<b>2. CONFIGURING AND USING APPLICATION CONNECTIVITY MONITOR</b>	Details the configuration and operation of Application Connectivity Monitor.
<b>A WILDCARD PATTERNS</b>	Describes wildcards that can be used to create matching patterns.

**Table 1: Document Organization**

# Documentation Conventions

Several conventions may be used in this document as shown in Table 2.

CONVENTION	EXPLANATION
sample code	Indicates code fragments and examples in Courier font
<b>keyword</b>	Indicates commands, keywords, literals, and operators in bold
%	Indicates C shell prompt
#	Indicates C shell superuser prompt
<parameter>	Indicates a user-supplied value or a list of non-terminal items in angle brackets
[option]	Indicates optional terms in brackets
<i>/InCharge</i>	Indicates directory path names in italics
<b><i>yourDomain</i></b>	Indicates a user-specific or user-supplied value in bold, italics
<i>File &gt; Open</i>	Indicates a menu path in italics
▲ ▼	Indicates a command that is formatted so that it wraps over one or more lines. The command must be typed as one line.

**Table 2: Documentation Conventions**

Directory path names are shown with forward slashes (/). Users of the Windows operating systems should substitute back slashes (\) for forward slashes.

Also, if there are figures illustrating consoles in this document, they represent the consoles as they appear in Windows. Under UNIX, the consoles appear with slight differences. For example, in views that display items in a tree hierarchy such as the Topology Browser, a plus sign displays for Windows and an open circle displays for UNIX.

Finally, unless otherwise specified, the term InCharge Manager is used to refer to InCharge programs such as Domain Managers, Global Managers, and adapters.

## InCharge Installation Directory

In this document, the term **BASEDIR** represents the location where InCharge software is installed.



- For UNIX, this location is: `/opt/InCharge<n>/<productsuite>`.
- For Windows, this location is: `C:\InCharge<n>\<productsuite>`.

The `<n>` represents the InCharge software version number. The `<productsuite>` represents the InCharge product suite that the product is part of.

Table 3 defines the `<productsuite>` directory for each InCharge product.

PRODUCT SUITE	INCLUDES THESE PRODUCTS	DIRECTORY
IP Management Suite	<ul style="list-style-type: none"> <li>• InCharge IP Availability Manager</li> <li>• InCharge IP Performance Manager</li> <li>• InCharge Discovery Manager</li> <li>• InCharge Adapter for HP OpenView NNM</li> <li>• InCharge Adapter for IBM/Tivoli NetView</li> </ul>	/IP
Service Assurance Management Suite	<ul style="list-style-type: none"> <li>• InCharge Service Assurance Manager</li> <li>• Global Console</li> <li>• InCharge Service Assurance Manager Business Impact Manager</li> <li>• InCharge Service Assurance Manager Failover System</li> <li>• InCharge Service Assurance Manager Notification Adapters</li> <li>• InCharge Service Assurance Manager Adapter Platform</li> <li>• InCharge SNMP Trap Adapter</li> <li>• InCharge Syslog Adapter</li> <li>• InCharge XML Adapter</li> <li>• InCharge Adapter for Remedy</li> <li>• InCharge Adapter for TIBCO Rendezvous</li> <li>• InCharge Adapter for Concord eHealth</li> <li>• InCharge Adapter for InfoVista</li> </ul>	/SAM
Application Management Suite	<ul style="list-style-type: none"> <li>• InCharge Application Connectivity Monitor</li> </ul>	/APP
SMARTS Software Development Kit	<ul style="list-style-type: none"> <li>• Software Development Kit</li> </ul>	/SDK

**Table 3: Product Suite Directory for InCharge Products**

For example, on UNIX operating systems, version 6.0 of InCharge IP Availability Manager is, by default, installed to `/opt/InCharge6/IP/smarts`. This location is referred to as **BASEDIR**/`smarts`.

Optionally, you can specify the root of **BASEDIR** to be something other than `/opt/InCharge6` (on UNIX) or `C:\InCharge6` (on Windows), but you cannot change the `<productsuite>` location under the root directory.

For more information about the directory structure of InCharge software, refer to the *InCharge System Administration Guide*.

## Additional Resources

In addition to this manual, SMARTS provides the following resources.

### InCharge Commands

Descriptions of InCharge commands are available as HTML pages. The *index.html* file, which provides an index to the various commands, is located in the **BASEDIR**/*smarts/doc/html/usage* directory.

### Documentation

Readers of this manual may find other SMARTS documentation (also available in the **BASEDIR**/*smarts/doc/pdf* directory) helpful.

#### **InCharge Documentation**

The following SMARTS documents are product independent and thus relevant to users of all InCharge products:

- *InCharge Release Notes*
- *InCharge Documentation Roadmap*
- *InCharge Installation Guide*
- *InCharge System Administration Guide*
- *InCharge Operator's Guide*

#### **InCharge Application Services Manager Documentation**

The following SMARTS documents are relevant to users of InCharge Application Service Manager.

- *InCharge Application Services Manager Deployment Guide*
- *InCharge Application Services Manager User's Guide*
- *InCharge Application Services Manager Adapters User's Guide*

### **InCharge Service Assurance Manager Documentation**

The following SMARTS documents are relevant to users of the InCharge Service Assurance Management product suite.

- *An Introduction to InCharge Service Assurance Manager*
- *InCharge Service Assurance Manager Configuration Guide*
- *InCharge Service Assurance Manager Failover System User's Guide*
- *InCharge Service Assurance Manager User's Guide for Business Impact Manager*

The following SMARTS documents are relevant to InCharge Service Assurance Manager adapters.

- *InCharge Service Assurance Manager Notification Adapters User's Guide*
- *InCharge Service Assurance Manager Adapters User's Guide*
- *InCharge XML Adapter User's Guide*
- *InCharge Service Assurance Manager User's Guide for Remedy Adapter*
- *InCharge Service Assurance Manager User's Guide for Concord eHealth Adapter*
- *InCharge Service Assurance Manager User's Guide for InfoVista Adapter*

### **InCharge IP Management Documentation**

The following SMARTS documents are relevant to users of the InCharge IP Management product suite.

- *InCharge IP Availability Manager User's Guide*
- *InCharge IP Performance Manager User's Guide*
- *InCharge IP Adapters User's Guide*
- *InCharge IP Discovery Guide*

## Common Abbreviations and Acronyms

The following lists common abbreviations and acronyms that are used in the InCharge guides.

ASL	Adapter Scripting Language
CDP	Cisco Discovery Protocol
ICIM	InCharge Common Information Model
ICMP	Internet Control Message Protocol
IDS	Incremental Device Support
IP	Internet Protocol
MSFC	Multilayer Switch Feature Card
MIB	Management Information Base
MODEL	Managed Object Definition Language
RSFC	Router Switch Feature Card
RSM	Router Switch Module
SNMP	Simple Network Management Protocol
TCP	Transmission Control Protocol
VLAN	Virtual Local Area Network

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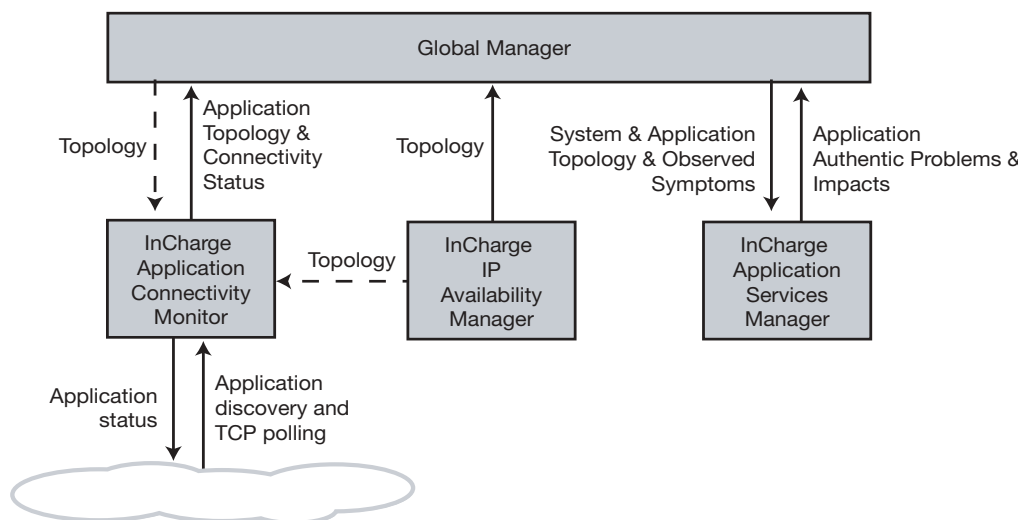
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# 1

## Application Connectivity Monitor Overview

InCharge Application Connectivity Monitor discovers TCP application services and measures their availability and response time. The adapter sends the results of its application polling to the Global Manager.

Figure 1 shows the flow of information to and from the InCharge Application Connectivity Monitor.



**Figure 1: Architecture of InCharge Application Connectivity Monitor**

When deployed, a system utilizing InCharge Application Connectivity Monitor includes the following components:

- InCharge Application Connectivity Monitor imports topology information from either the InCharge IP Availability Manager or the Global Manager, discovers application services, and polls the TCP ports on which the application services run. Application Connectivity Monitor sends its topology information and polling results to a Global Manager.
- InCharge IP Availability Manager discovers and manages the networks and systems on which the application services depend.
- Global Manager consolidates event and topology information from the InCharge IP Availability Manager and Application Connectivity Monitor. InCharge Application Services Manager retrieves application service events and topology information from the Global Manager.
- InCharge Application Services Manager analyzes event and topology information to isolate authentic problems in application components and to determine their impact on application services. Application Services Manager returns the results of this analysis to the Global Manager.

Additional adapters can be deployed to provide additional information.

# 2

## Configuring and Using Application Connectivity Monitor

### Overview of Configuration Steps

Configuring InCharge Application Connectivity Monitor involves the following steps:

- Specify the application services and TCP ports the adapter should discover and specify the discovery settings.
- Create polling and threshold groups as necessary and configure the settings that control the TCP polling and thresholds for each group.
- Start the adapter to automatically import hosts and begin application discovery.

# Modifying Configuration Files

As part of the InCharge deployment and configuration process, you will need to modify certain files. User modifiable files include InCharge tool scripts, configuration files, rule set files, and templates. Original versions of these files are installed into appropriate subdirectories under the **BASEDIR**/*smarts*/ hierarchy. For example, original versions of Global Manager configuration files are installed to **BASEDIR**/*smarts/conf/ics*.

To edit a user modifiable file, create a local copy of the file in **BASEDIR**/*smarts/local* or one of its subdirectories. For example, a modified *ics.conf* file should be saved to **BASEDIR**/*smarts/local/conf/ics*. InCharge software is designed to first search for user modifiable files in **BASEDIR**/*smarts/local* or one of its subdirectories. If a modified version of a file is not found in the local area, InCharge software then searches appropriate nonlocal directories.

---

**Note:** Original versions of files may be changed or updated as part of an InCharge software upgrade. However, files located in **BASEDIR**/*smarts/local* are always retained during an upgrade.

---

To facilitate proper file editing, SMARTS provides the *sm\_edit* utility. When used to modify an original version of a file, this utility automatically creates a local copy of the file and places it in the appropriate location under **BASEDIR**/*smarts/local*. This ensures that the original version of the file remains unchanged. In both UNIX and Windows environments, you can invoke *sm\_edit* from the command line. Optionally, you can configure Windows so that *sm\_edit* is automatically invoked when user-modifiable files are double-clicked in Windows Explorer.

To invoke the *sm\_edit* utility from the command line, specify the path and the name of the file you want to edit under **BASEDIR**/*smarts*. For example, to edit the configuration file for the Global Manager, you invoke the *sm\_edit* utility as follows:

```
% BASEDIR/smarts/bin/sm_edit conf/ics/ics.conf
```

The *sm\_edit* utility automatically creates a local copy of the *ics.conf* file in the **BASEDIR**/*smarts/local/conf/ics* directory, if necessary, and opens the file in a text editor. If a local version of the file already exists, the *sm\_edit* utility opens the local version in a text editor. In addition, *sm\_edit* creates any necessary directories.



For more information about how to properly edit user modifiable InCharge files and how to use the *sm\_edit* utility, refer to the *InCharge System Administration Guide*.

## Reconfiguring Application Connectivity Monitor

Application Connectivity Monitor loads its configuration files at startup. If you edit the configuration of Application Connectivity Monitor, you must restart the adapter in order for the changes to take effect.

## Topology and Notifications of InCharge Application Connectivity Monitor

Application Connectivity Monitor imports instances of the Host and Node classes from a Global Manager or an IP Availability Manager. With this source for topology, Application Connectivity Monitor discovers application services running on these systems and creates the appropriate topology elements. For each discovered application, Application Connectivity Monitor also creates instances of the Transaction class.

The application service and transaction topology created by Application Connectivity Monitor is retrieved by a Global Manager, which in turn passes it to Application Services Manager for analysis.

You can control which hosts Application Connectivity Monitor performs discovery on and the types of application services it discovers through the *applications.conf* file. For more information, see [Configuring the Discovery of InCharge Application Connectivity Monitor](#) on page 7.

Application Connectivity Monitor creates notifications based on the results of its TCP polling. To adjust the TCP polling parameters or the TCP polling thresholds, see [Default Settings for Application Connectivity Monitor](#) on page 13.

## Topology Elements Created

Application Connectivity Monitor creates the following topology elements and relationships:

- Instances of the Host and Node classes. Application Connectivity Monitor imports hosts and nodes from either an IP Availability Manager or the Global Manager. Hosts and nodes are related to the application services running on them by the HostsServices relationship.
- Instances of the Application class or one of its subclasses. Subclasses of the Application class include: FTPService, HTTPService, NTPService, SMTPService, SQLService or URLService. An application service is related to the host or node on which it runs by the HostedBy relationship. In addition, an application service is related to a transaction through the Produces relationship.
- Instances of the Transaction class, which represent the connection between an application service and its clients. A transaction is related to an application service by the ProducedBy relationship.

---

**Note:** Application Connectivity Monitor only creates topology elements for those hosts and applications that pass the filters specified in the *applications.conf* file.

---

## Notifications Created

Application Connectivity Monitor determines the status of an application service by initiating a TCP connection to the application. If the application responds to the connection request within the allotted thresholds, Application Connectivity Monitor closes the connection and determines that the application is responsive. If the application does not respond to the connection request, or its response is not within the allotted thresholds, Application Connectivity Monitor creates one of the following notifications:

- Transaction Slow indicates that the TCP connection took longer than expected. You can set a value for this threshold through the Polling and Thresholds Console. The name of the threshold is SlowThreshold, the default value is 500 milliseconds.
- Transaction TimedOut indicates that the TCP connection could not be established in the allotted time.

# Configuring the Discovery of InCharge Application Connectivity Monitor

The hosts and applications that Application Connectivity Monitor discovers, and the parameters for controlling the discovery process, are specified in the *applications.conf* configuration file. This file is located at **BASEDIR**/*smarts/conf/app-poller*. To modify the parameters related to TCP polling and event thresholds, you can use the Polling and Thresholds Console as described in [Modifying the Properties of a Group](#) on page 16.

## Editing the *application.conf* File

To edit the *applications.conf* file, use the *sm\_edit* utility to open a local copy of the file. The original file is located in the **BASEDIR**/*smarts/conf/app-poller* directory. For example, invoke the following command from the **BASEDIR**/*smarts/bin* directory:

```
# ./sm_edit conf/app-poller/applications.conf
```

## Contents of the *applications.conf* Configuration File

The *applications.conf* file is divided into four sections.

- ApplicationSection lists the types of applications to be discovered and monitored. It also specifies the TCP port that Application Connectivity Monitor should use to discover and poll the application.
- FilterSection lists one or more filters that Application Connectivity Monitor matches against the host name or IP addresses of the hosts which are candidates for discovery. If the host name or IP address of a host does not match a specified filter, application discovery is not performed on that host. Filters specified here are applied in the ApplicationSection.
- TCPSection lists parameters that control the TCP discovery of applications and the number of polling threads.
- DomainSection lists the Global Manager or the IP Availability Manager from which Application Connectivity Monitor imports hosts.

The following sections provide more information regarding the syntax and configuration of *applications.conf* file.

### ApplicationSection of applications.conf

The ApplicationSection is composed of one or more Application subsections. Each Application subsection specifies a ServiceName for the application and the TCP port that the application uses to communicate with its clients. In addition, you can specify the ClassName for discovered applications and one or more filters.

The following example illustrates the use of these fields and shows the syntax of the ApplicationSection. The fields of an Application subsection are described in Table 4.

```
ApplicationSection {
  Application
  {
    ServiceName = "FTP";
    ClassName   = "FTPSERVICE";
    Port        = 21;
  }
  Application
  {
    ServiceName = "SMTP";
    ClassName   = "SMTPSERVICE";
    Port        = 25;
    HostFilter  = "MailServers";
  }
  Application
  {
    ServiceName = "POP2";
    ClassName   = "Application";
    Port        = 109;
    HostFilter  = "MailServers";
  }
  Application
  {
    ServiceName = "POP3";
    ClassName   = "Application";
    Port        = 110;
    HostFilter  = "MailServers";
  }
}
```

Table 4 describes the fields of an Application subsection.

APPLICATION FIELDS	FIELD DESCRIPTIONS
ServiceName	<p>Describes the type of application service and is prefixed to the application's DisplayName. Providing a descriptive name is useful for applications that are instances of the Application class (and not one of its subclasses).</p> <p>The syntax for an application's display name is ServiceName/SystemName. For example, when the value of ServiceName is "POP3", the DisplayName for a mail application running on host mailhost.smarts.com would be <i>POP3/mailhost.smarts.com</i>.</p> <p>This field is required.</p>
ClassName	<p>Determines what ICIM class that instances of the discovered application are created from. Use Application or one of its more specific subclasses:</p> <ul style="list-style-type: none"> <li>• FTPService</li> <li>• HTTPService</li> <li>• NNTPService</li> <li>• SMTPService</li> <li>• SQLService</li> <li>• URLService</li> </ul> <p>When a value for ClassName is not specified, instances are created from the Applications class.</p> <p>This field is optional.</p>
Port	<p>Determines the TCP port that Application Connectivity Monitor uses to discover and monitor applications. To specify multiple ports for an application, create additional Application subsections.</p> <p>This field is required.</p>
HostFilter	<p>Specifies the name of the filter used to control discovery. The value specified for the HostFilter field must match a value specified in the Name field of a Filter subsection. The matching pattern of the specified filter is compared against the SystemName attribute of hosts and nodes. If the value of SystemName matches the pattern, Application Connectivity Monitor performs discovery of the specified application on the specified TCP port. If the value of SystemName does not match the pattern, no discovery is performed.</p> <p>When no filter is specified, all hosts and nodes are probed for this application. You can specify multiple filters within an Application subsection with additional HostFilter fields.</p> <p>This field is optional.</p>

**Table 4:** Description of ApplicationSection Fields

## FilterSection of applications.conf

The FilterSection is composed of one or more Filter subsections. Each Filter subsection defines a filter name and a matching pattern. Matching patterns are constructed using the wildcards described in [Wildcard Patterns](#) on page 23.

The following example illustrates the use of these fields and shows the syntax of the FilterSection. The fields of a Filter subsection are described in Table 5.

```
FilterSection
{
  Filter
  {
    Name = "WebServers";
    Pattern = "www*";
  }

  Filter
  {
    Name = "MailServers";
    Pattern = "mail*|pop.|imap*|smtp*";
  }

  Filter
  {
    Name = "LdapServers";
    Pattern = "ldap.*";
  }
}
```

Table 5 describes the fields of a Filter subsection.

FILTER FIELD	FIELD DESCRIPTION
Name	Provides a name for the filter. Filter names within the FilterSection must be unique.
Pattern	Lists the matching pattern that Application Connectivity Monitor compares against the SystemName attribute of the hosts and nodes imported from a Global Manager or an IP Availability Manager. The value of SystemName may be the host name or an IP address. Typically, the hosts and nodes imported from a Global Manager are discovered by InCharge IP Availability Manager. As such, the systems are named according to the convention used by Availability Manager. For information regarding matching patterns, see <a href="#">Wildcard Patterns</a> on page 23.

**Table 5: Description of Filter Fields**

## TCPSection of `applications.conf`

The TCPSection is composed of a Discovery and a Polling subsection. The fields and parameters of the subsections control the TCP discovery and polling performed by Application Connectivity Monitor.

---

**WARNING:** Unlike other sections of `applications.conf`, you cannot add or remove fields from the TCPSection.

---

The following example illustrates the use of the fields and shows the syntax of the TCPSection. The fields of the Discovery and Polling subsections are described in Table 6.

```
TCPSection {
  Discovery {
    Retries = 3;
    Timeout = 100;
    Threads = 10;
  }

  Polling {
    Threads = 10;
  }
}
```

Table 6 describes the fields of both the Discovery and Polling subsections.

TCPSECTION FIELD	FIELD DESCRIPTION
Discovery	Denotes the Discovery subsection of the TCPSection.
Retries	Specifies the number of times Application Connectivity Monitor should try to discover an application after receiving a timeout. The default value is 3.

TCPSECTION FIELD	FIELD DESCRIPTION
Timeout	Specifies the number of seconds Application Connectivity Monitor should wait before considering a connection attempt has failed because of a timeout. The default value is 100.
Threads	Specifies the number of simultaneous TCP discovery connections that Application Connectivity Monitor can perform. The default value is 10.
Polling	Denotes the Polling subsection of the TCPSection.
Threads	Specifies the number of simultaneous TCP polling requests that Application Connectivity Monitor can perform. For additional polling parameters, see <a href="#">Default Polling Settings</a> on page 13. The default value is 10.

**Table 6:** Description of the TCPSection Fields

## DomainSection of applications.conf

The DomainSection lists the Global Manager or IP Availability Manager from which Application Connectivity Monitor imports hosts and nodes. Application Connectivity Monitor adds the imported systems to its topology and then compares the names of these systems against the HostFilters, if any, specified in the *applications.conf* file. Systems whose names match the filters are probed for the specified application. For each application that it discovers, Application Connectivity Monitor adds an instance of that application to its topology as well as an instance of the Transaction class. For more information about the topology created by Application Connectivity Monitor, see [Topology Elements Created](#) on page 5.

The following example illustrates the use of these fields and shows the syntax of the DomainSection. A DomainSection is composed of a single Name field that identifies the Global Manager or IP Availability Manager from which Application Connectivity Monitor should import hosts and nodes.

```
DomainSection {
    Domain {
        Name = "INCHARGE-SA";
    }
}
```



# Default Settings for Application Connectivity Monitor

The configuration of an InCharge Application Connection also uses settings to assign polling and threshold parameters to the managed elements. These polling and threshold parameters define InCharge management policies.

A setting is a collection of parameters common to a particular type of analysis (for example, connectivity polling). A component called a group contains zero or more settings and is related to managed elements in your network based on matching criteria. There are two distinct types of groups: Polling Groups and Threshold Groups.

Each member of a group is configured according to the parameters defined in the group's settings. In this way, different polling and threshold values can be applied to different groups of devices.

## Default Polling Settings

The TCP Polling setting is accessible from the Polling tab of the Polling and Thresholds Console. This setting configures the TCP polling performed by Application Connectivity Monitor when it is monitoring applications.

The following parameters are included in the TCP Polling setting:

### **Polling Interval**

The time interval, in seconds, between polling attempts. The default value is 240 seconds. Valid values range from 30 to 3600 seconds.

### **Retries**

The number of times Application Connectivity Monitor should attempt a connection before generating a Transaction TimeOut notification. The default value is 3. Valid values range from 0 to 30.

### **Timeout Period**

The amount of time, in milliseconds, Application Connectivity Monitor waits for a response from a TCP connection attempt before determining that the connection has failed. The default value is 1000 milliseconds. Valid values range from 1 to 10000 milliseconds.

### **Timeout Policy**

The timeout policy determines how the polling interval is calculated between unsuccessful polling attempts.

- UNKNOWN uses the default timeout policy, which is CONSTANT.
- CONSTANT uses the same polling interval between polls. For example, with a polling interval of 240 seconds, Application Connectivity Monitor would wait 240 seconds after a failed poll before retrying.
- LINEAR increases the polling interval by the value of the polling interval between each successive poll. For example, with a polling interval of 240 seconds, Application Connectivity Monitor would wait 240 seconds after the first poll, 480 seconds after the second poll, 720 seconds after the third poll, and so on.
- EXPONENTIAL doubles the polling interval between each successive poll. For example, with a polling interval of 240 seconds, Application Connectivity Monitor would wait 240 seconds after the first poll, 480 seconds after the second poll, 960 seconds after the third poll, and so on.

### **Use DNS**

The UseDNS parameter controls whether Application Connectivity Monitor should resolve the host name of a system before attempting a TCP connection to determine the status of an application. When set to True, Application Connectivity Monitor always attempts to resolve the host name of a system before polling. When set to False, Application Connectivity Monitor always uses the same IP address to connect to the system.

Setting UseDNS to True is useful for monitoring round-robin DNS cluster configurations when you want to monitor the cluster as a whole and not the individual components of the cluster.

## **Default Threshold Settings**

The TCP Threshold setting is accessible from the Threshold tab of the Polling and Thresholds Console. This setting configures a threshold that determines when Application Connectivity Monitor generates a Transaction Slow notification.

### **Slow Threshold**

The SlowThreshold parameter enables you to set a threshold for the acceptable performance of successful TCP connections. If the response to a successful TCP connection takes longer than the specified threshold, Application Connectivity Monitor generates a Transaction Slow notification. The default value is 500 milliseconds. Valid values range from 1 to 10000 milliseconds.

## Working With Groups and Settings

This section describes how to configure an InCharge application using the Polling and Thresholds Console. The configuration of an InCharge application applies polling and threshold parameters to defined sets of managed elements.

- A group is composed of settings and members. There are two distinct types of groups: Polling Groups and Threshold Groups.
- A setting is composed of one or more related parameters. For example, parameters related to port or interface utilization analysis may be organized into a setting.
- A member is an element of the managed topology that belongs to a group. A managed element can be a member of one Polling group and one Threshold group.

Using the Polling and Thresholds Console, you can perform the following configuration tasks:

- Modify the properties of existing Polling and Threshold groups.
  - Determine what settings are applied to a group.
  - Modify the parameters of a setting.
- Create new Polling and Threshold groups.

## How Managed Elements Are Assigned to Groups

When InCharge performs discovery, it automatically assigns each managed element to a group based on the group's matching criteria and priority. Matching criteria are defined using the attributes of the managed element. The following components define a group:

- Name
- Settings associated with the group
- Matching criteria defined for the group
- Priority, which determines membership when a device meets the matching criteria for more than one group

A managed element can be a member of one Polling group and one Threshold group.

### Modifying the Properties of a Group

Although there are two distinct types of groups, Polling and Thresholds, both types of groups are configured similarly. A group is composed of settings and members. A setting includes one or more polling or threshold parameters. The matching criteria specified for the group and the group's priority determine which managed elements are members of the group.

When a group is selected in the left panel of the Polling and Thresholds Console, four tabs are displayed.

- Settings
- Priorities
- Matching Criteria
- Description

Modifying the properties under each of these tabs changes the configuration of the group. When you finish editing the properties of a group, click the **Apply** button to save the changes and then select **Reconfigure** from the Group menu to make the configuration changes take effect.

### Method for Adding or Removing Settings

A group's settings determine what polling parameters or threshold parameters are applied to the managed elements that are members of the group.

The Settings tab is divided into two sections: Current Settings and Available Settings. Current Settings lists the settings that are applied to the group. Available Settings lists additional available settings.

#### Adding or Removing a Setting

- 1 Select a setting from the Current Settings list or from the Available Settings list.
- 2 Click **Add** to move an available setting to the Current Settings list or click **Remove** to move a current setting to the Available Settings list.
- 3 Click **Apply**.
- 4 Select **Reconfigure** from the Group menu.

## Method for Modifying the Priority of Groups

Priority and Matching Criteria parameters determine which managed elements are members of what group. Priority determines what group a managed element belongs to when the element matches the criteria for two or more groups. When this occurs, the managed element becomes a member of the group with the highest priority.

The Priority tab lists groups in the order of their priority, from highest to lowest.

### Changing the Priority of a Group

- 1 Select the group that you want to change the priority of.
- 2 Click on the up or down arrow to change its position relative to the other groups.
- 3 Click **Apply**.
- 4 Select **Reconfigure** from the Group menu.

## Method for Editing Matching Criteria

Matching criteria and priority determine which managed elements are members of what group. Matching criteria consist of one or more wildcard patterns that are compared against the values of one or more attributes. If the value of the attribute matches the wildcard pattern, the managed element is eligible to become a member of that group. When more than one matching criterion is specified, a managed element must match all criteria to become a member of the group.

For example, if a matching criterion uses the attribute SystemName with a value of "172.16.\*", all members of the group must contain the string "172.16" in their SystemName attribute. If another matching criterion that uses the attribute CreationClassName with a value of "Host" is added, all members of the group must be hosts with the string "172.16" in their SystemName.

Active matching criteria, which appear in the top of the Matching Criteria tab, have three fields: Name, Description, and Value.

- Name identifies the attribute that is used as a matching criterion. The attributes of managed elements can be viewed in the Global Console.
- Description is the description of the attribute taken from the ICIM model.

- Value is the string that is matched against the value of the attribute in the managed element. The value field can contain any combination of text, integers, and wildcards.

---

**Note:** The Value field for a matching criterion is case-sensitive. Your matching criteria may need to account for this possibility.

---

### **Adding or Removing Matching Criteria**

- 1 Select a matching criterion.
- 2 Click **Enable** to make the criterion active, moving it to the top of the Matching Criteria tab.  
  
Use **Disable** to deactivate the criterion, moving it to the bottom of the Matching Criteria tab.
- 3 If you are adding a matching criterion, type a matching pattern in the Value field.
- 4 Click **Apply**.
- 5 Select **Reconfigure** from the Group menu.

### **Changing the Value of a Matching Criterion**

- 1 Select the string in the Value field or double-click the Value field to highlight the current value.
- 2 Type the text, integers, or wildcard to match against the attribute.
- 3 Click **Apply**.
- 4 Select **Reconfigure** from the Group menu.

InCharge processes matching criteria in the following manner. First, managed elements are compared against the matching criteria of the group with the highest priority. If an element matches all of the criteria, it is added as a member of the group. If an element does not match, it is compared against the matching criteria of the group with the second highest priority, and so on.

---

**Note:** When no matching criteria are active (or appear in the top of the Matching Criteria dialog box), the group matches all managed elements. Priority determines whether the group contains members.

---

## Method for Modifying the Parameters of a Setting

The parameters of a setting, whether they define a polling parameter or set a threshold, are adjusted in a similar manner. A setting can contain a drop-down menu from which you choose a value or a slider and a Value field where you can provide a value within a discrete range.

### Changing the Parameters of a Setting

- 1 Select the setting in the left panel of the Polling and Thresholds Console. The parameters of a setting are listed in the right panel of the console.
- 2 Change the value of a parameter using one of the following methods:  
For a drop-down menu, click on the menu and select a value.  
For a threshold, you can
  - Type a new number into the Value field and press **Enter**.
  - Select the slider and drag it with the mouse or select the slider and use the arrow keys to incrementally change the value.
- 3 Click **Apply** to save the changes.
- 4 Select **Reconfigure** from the Group menu.

### Restoring the Default Values of a Setting

The **Restore Defaults** button, which is visible when a setting is selected in the left panel of the Polling and Thresholds Console, restores the default values of all the parameters for the selected setting.

- 1 Select the setting.
- 2 Click **Restore Defaults**.
- 3 Select **Reconfigure** from the Group menu.

## Creating New Polling and Threshold Groups

Creating a new group enables you to customize the polling or threshold settings for a group of managed elements. After you create a new group, use procedures previously described to adjust the settings and thresholds of the new group.

You can use two methods to create a new group:

- Copy an existing group. The new group contains the same settings and thresholds as the original group. Matching criteria are not copied.

- Create an empty group. The new group does not contain any settings or members. You must add settings and matching criteria, and set the priority of the new group.

The resulting group, regardless of the method you use to create it, is assigned the lowest priority.

For information regarding settings, see [Method for Modifying the Parameters of a Setting](#) on page 19 and for information regarding groups, see [Modifying the Properties of a Group](#) on page 16.

### Copying an Existing Group

- 1 Right-click on the Polling or Threshold group that you want to copy.
- 2 Select **Copy** from the pop-up menu. This displays the Copy Group dialog.
- 3 Type a name and an optional description for the new group and click **OK**. The new group contains the same settings and thresholds as the group you copied.
- 4 Edit the settings, matching criteria, and priority of the new group. Change the value of any thresholds or parameters as necessary.
- 5 Select **Reconfigure** from the Group menu.

### Creating an Empty Group

- 1 In the left panel of the Polling and Threshold Console, right-click on the group type for which you want to create a new group. (When an InCharge application provides more than one default group, you may be able to create more than one type of group.)
- 2 Select **New Group** from the pop-up menu. This displays the New Group dialog.
- 3 Type a name and an optional description for the new group and click **OK**.
- 4 Add settings and matching criteria, and set the priority of the new group. Change the values of any thresholds or parameters as necessary.
- 5 Select **Reconfigure** from the Group menu.



## Starting and Stopping InCharge Application Connectivity Monitor

If you installed InCharge Application Connectivity Manager as a service, it automatically starts when the system starts up. The following instructions describe how to use the `sm_service` utility to manually start and stop the Application Connectivity Monitor.

Issue one of the following from the command line:

```
% BASEDIR/smarts/bin/sm_service start ic-app-poller
```

or

```
% BASEDIR/smarts/bin/sm_service stop ic-app-poller
```

---

**Note:** The `sm_service` utility is operating system independent and works the same way on both UNIX and Windows operating systems.

---

For more information about the ACM service's default start-up options or how to modify them, refer to the *InCharge System Administration Guide*.





## Wildcard Patterns

A wildcard pattern is a series of characters that are matched against incoming character strings. You can use these patterns when you define pattern matching criteria.

Matching is done strictly from left to right, one character or basic wildcard pattern at a time. Basic wildcard patterns are defined in Table 7. Characters that are not part of match constructs match themselves. The pattern and the incoming string must match completely. For example, the pattern *abcd* does not match the input *abcde* or *abc*.

A compound wildcard pattern consists of one or more basic wildcard patterns separated by ampersand (&) or tilde (~) characters. A compound wildcard pattern is matched by attempting to match each of its component basic wildcard patterns against the entire input string. For compound wildcard patterns, see Table 8.

If the first character of a compound wildcard pattern is an ampersand (&) or tilde (~) character, the compound is interpreted as if an asterisk (\*) appeared at the beginning of the pattern. For example, the pattern *~\*[0-9]\** matches any string not containing any digits. A trailing instance of an ampersand character (&) can only match the empty string. A trailing instance of a tilde character (~) can be read as “except for the empty string.”

---

**Note:** Spaces are interpreted as characters and are subject to matching even if they are adjacent to operators like “&”.

---

CHARACTER	DESCRIPTION
Note: Spaces specified before or after wildcard operators are interpreted as characters and are subject to matching.	
?	Matches any single character. For example, <i>server?.smarts.com</i> matches <i>server3.smarts.com</i> and <i>serverB.smarts.com</i> , but not <i>server10.smarts.com</i> .
*	Matches an arbitrary string of characters. The string can be empty. For example, <i>server*.smarts.com</i> matches <i>server-ny.smarts.com</i> and <i>server.smarts.com</i> (an empty match).
[set]	Matches any single character that appears within [set]; or, if the first character of [set] is (^), any single character that is <i>not</i> in the set. A hyphen (-) within [set] indicates a range, so that [a-d] is equivalent to [abcd]. The character before the hyphen (-) must precede the character after it or the range will be empty. The character (^) in any position except the first, or a hyphen (-) at the first or last position, has no special meaning. For example, <i>server[789-].smarts.com</i> matches <i>server7.smarts.com</i> through <i>server9.smarts.com</i> , but not <i>server6.smarts.com</i> . It also matches <i>server-.smarts.com</i> . Example: <i>server[^12].smarts.com</i> does not match <i>server1.smarts.com</i> or <i>server2.smarts.com</i> , but will match <i>server8.smarts.com</i> .
<n1-n2>	Matches numbers in a given range. Both <i>n1</i> and <i>n2</i> must be strings of digits, which represent non-negative integer values. The matching characters are a non-empty string of digits whose value, as a non-negative integer, is greater than or equal to <i>n1</i> and less than or equal to <i>n2</i> . If either end of the range is omitted, no limitation is placed on the accepted number. For example, <i>98.49.&lt;1-100&gt;.10</i> matches a range of IP addresses from <i>98.49.1.10</i> through <i>98.49.100.10</i> . Example of an omitted high end of the range: <i>&lt;50-&gt;</i> matches any string of digits with a value greater than or equal to 50. Example of an omitted low end of the range: <i>&lt;-150&gt;</i> matches any value between zero and 150. A more subtle example: The pattern <i>&lt;1-10&gt;*</i> matches 1, 2, up through 10, with * matching no characters. Similarly, it matches strings like 9x, with * matching the trailing x. However, it does not match 11, because <i>&lt;1-10&gt;</i> always extracts the longest possible string of digits (11) and then matches only if the number it represents is in range.
	Matches alternatives. For example, <i>"ab bc cd"</i> without spaces matches exactly the three following strings: "ab", "bc", and "cd". A   as the first or last character of a pattern accepts an empty string as a match. Example with spaces <i>"ab   bc"</i> matches the strings "ab " and " bc".
\	Removes the special status, if any, of the following character. Backslash (\) has no special meaning within a set ([set]) or range (<n1-n2>) construct.

**Table 7: Basic Wildcard Patterns**

Special characters for compound wildcard patterns are summarized below.

&	<p>“And Also” for a compound wildcard pattern. If a component basic wildcard pattern is preceded by &amp; (or is the first basic wildcard pattern in the compound wildcard pattern), it <i>must</i> successfully match.</p> <p>Example: *NY*&amp;*Router* matches all strings which contain NY and also contain Router.</p> <p>Example: &lt;1-100&gt;&amp;*[02468] matches even numbers between 1 and 100 inclusive. The &lt;1-100&gt; component only passes numbers in the correct range and the *[02468] component only passes numbers that end in an even digit.</p> <p>Example: *A* *B*&amp;*C* matches strings that contain either an A or a B, and also contain a C.</p>
~	<p>“Except” for a compound wildcard pattern (opposite function of &amp;).If a component basic wildcard pattern is preceded by ~, it <i>must not</i> match.</p> <p>Example: 10.20.30.*~10.20.30.50 matches all devices on network 10.20.30 except 10.20.30.50.</p> <p>Example: *Router*~*Cisco*&amp;*10.20.30.*~10.20.30.&lt;10-20&gt;* matches a Router, except a Cisco router, with an address on network 10.20.30, except not 10.20.30.10 through 10.20.30.20.</p>

**Table 8: Compound Wildcard Patterns**

