HiCommand™ Tuning Manager Installation and Administration Guide for GUI

Trademarks

Document Revision Level

Revision	Date	Description
	July 2, 2002	Initial Release
	July 12, 2002	Revision 1, supersedes and replaces July 2, 2002

Referenced Documents

- HiCommand™ Tuning Manager™ HiCommand Tuning Manager Reference Guide for GUI (DRAFT)
- Hitachi Lightning 9900T User and Reference Guide, MK-90RD008
- Hitachi Lightning 9900T Remote Console User's Guide, MK-90RD003
- Hitachi Lightning 9900T LUN Manager, LUSE, SANtinel User's Guide, MK-91RD049
- Hitachi Thunder 9200T User and Reference Guide, MK-90DF504
- Hitachi Thunder 9200T Resource Manager 9200 User's Guide, MK-90DF505
- Hitachi Thunder 9200T LUN Security 9200 User's Guide, MK-91DF554

Preface

This document describes how to install and administer server-side software for Hitachi HiCommand Tuning Manager, v 1.0.

For information on operating client software for HiCommand™ Tuning Manager, see the HiCommand Tuning Manager Reference Guide for GUI (DRAFT).

This document is intended for:

- System Administrators
- Storage Administrators

Note: HiCommand™ Tuning Manager requires the installation of certain third-party applications, software components and operating system software. Since this manual does not detail such procedures, users must rely upon the instructions supplied by the vendors of those products.

This user's guide assumes that:

- The user has a background in data processing and understands peripheral storage device subsystems and their basic functions.
- The user has read and understands the user guide for the storage subsystem (e.g., Hitachi Lightning 9900™ User and Reference Guide, Hitachi Thunder 9200™ User and Reference Guide).
- The user has read and understands the user guide(s) for the subsystem configuration functions (e.g., Hitachi Lightning 9900TM LUN Manager User's Guide, Hitachi Thunder 9200TM Resource Manager 9200 User's Guide).
- The user has read and understands the user guide(s) for the data management functions (e.g., Hitachi Lightning 9900™ TrueCopy User and Reference Guide, Hitachi Thunder 9200™ TrueCopy User and Reference Guide).
- The user is familiar with the operating system which hosts the HiCommand™ Web Client software (e.g., Solaris™ or Windows NT™).

Note: Note: The term "9900" refers to the entire Hitachi Lightning 9900™ subsystem family (e.g., 9960, 9910), unless otherwise noted. Please refer to the Hitachi Lightning 9900™ User and Reference Guide (MK 90RD008) for further information on the 9900 disk array subsystems.

Note: Note: Please refer to the Hitachi Thunder 9200™ User and Reference Guide (MK-90DF504) for further information on the 9200 disk array subsystems.

Note: Note: The use of HiCommand™ and all other Hitachi Data Systems products is governed by the terms of your license agreement(s) with Hitachi Data Systems.

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1 - System Requirements

1.1 Server Platforms For HiCommand™ Tuning Manager

The following are supported hardware and operating systems capable of running the HiCommand™ Tuning Manager system and services:

Table 1.1 Supported server platforms

Host Platform	Server Operating System	Minimum Memory	Minimum Disk Space
Sun	Solaris 2.7, 2.8	512 MB	1 GB
Intel processors	Windows 2000	256 MB	1 GB

1.2 Agent Platforms

Agents collect storage capacity and performance metrics for the resources on which they are installed and make the data available to HiCommand™ Tuning Manager.

HiCommand™ Tuning Manager agents can run on the following platforms:

Table 1.2 Servers supported by agents

Host Platform	Server Operating System
Sun	Solaris 2.7, 2.8
Intel processors	Windows 2000
HP	UX 11.0, 11i

1.2.1 Storage Subsystems

HiCommand™ Tuning Manager will support storage and capacity metrics retrieval from the following storage systems:

Table 1.3 Supported storage subsystems

Host Platform	Storage Subsystems
Hitachi	- Thunder 9200 - Lighning 9900 series - Lightning 9900V

1.2.2 Applications

Agents collect storage capacity and performance metrics for the servers on which they are installed and make the data available to HiCommand™ Tuning Manager.

1.2.3 Oracle

HiCommand™ Tuning Manager provides an agent that accesses Oracle metrics for the following combinations of operating systems and Oracle versions:

Table 1.4 Supported Oracle environments

Operating System	Oracle 8.1.6	Oracle 8.1.7
HP 11.0	Yes	Yes
HP 11i	Yes	Yes
Solaris 2.6, 2.7, 2.8	Yes	Yes
Windows NT, 2000	Yes	Yes

1.3 Clients

The HiCommand™ Tuning Manager GUI supports the following browsers:

- Microsoft Internet Explorer (version 5.0 and higher)
- Netscape Navigator (version 4.76 and higher)

1.4 Software Components

1.4.1 Client Components

The Client Software Components table lists the software components required to support HiCommand™ Tuning Manager in clients. Install the components listed in the Client Software Components table on client machines that are to access HiCommand™ Tuning Manager.

Table 1.5 Supported web clients

	Provider	Platform	Version	Comment
Browser: Internet Explorer	Microsoft	Client	5.x and higher	**http://www.microsoft.com/ie/**
Browser: Netscape Navigator	Netscape	Client	4.76 and higher	**http://www.netscape.com/download/**

1.4.2 The HiCommand™ Tuning Manager Database

The HiCommand™ Tuning Manager database is hosted by the Interbase Open Source database server. Information about Interbase functionality can be found within the electronic manuals included with the HiCommand™ Tuning Manager distribution media:

- For information about Interbase installation procedures, please refer to the *Getting Started Installation and Migration* manual (provided with the Interbase software).
- For information about Interbase backup and restore procedures, please refer to the *Operations Guide* (provided with the Interbase software).
    - At the time of publication, Interbase documentation was publicly available at **http://www.borland.com/techpubs/interbase/**.

Note: The Interbase database server is a necessary component because it serves as the repository for collected metrics used by HiCommand™ Tuning Manager.

2 - Before You Install

2.1 - Installation Package

The HiCommand™ Tuning Manager installation package contains two CD-ROM disks:

- HiCommand™ Tuning Manager 1.0 CD1
  (For more information, see **Contents of HiCommand™ Tuning Manager 1.0 CD1** on page 7.)
- HiCommand™ Tuning Manager 1.0 CD2
  (For more information, see **Contents of HiCommand™ Tuning Manager 1.0 CD2** on page 8.)

Note: For installation instructions, see **Installing HiCommand™ Tuning Manager (Windows)** on page 33 or see **Installing HiCommand™ Tuning Manager (Solaris)** on page 9.

2.2 Administrator Privileges

2.2.1 For Windows Installation

You must be able to login to the host with machine Administrator privileges or higher.

For detailed installation instructions, See **Installing HiCommand™ Tuning Manager (Windows)** on page 33.

2.2.2 For Solaris Installation

You must be able to login to the host as root.

For detailed installation instructions, See **Installing HiCommand™ Tuning Manager (Solaris)** on page 9.

2.3 HiCommand™ Tuning Manager Data Repository

HiCommand™ Tuning Manager employs Interbase 6 for its data store.

- If your server already hosts an Interbase database, please be sure you are running Interbase 6.
- If an earlier version is in place, ***you must uninstall it*** before proceeding with HiCommand™ Tuning Manager installation.
- If your server is already hosting Interbase 6, HiCommand™ Tuning Manager will gracefully install. The installer will not attempt to replace your existing Interbase server.

2.4 Choosing the HTTP Port

During installation, you will be asked to specify the port that HiCommand™ Tuning Manager uses to communicate with web clients.

HiCommand™ Tuning Manager is flexible about the port you choose. By default, the installer will use the standard HTTP port 80. However, this is not a requirement for successful operation of HiCommand™ Tuning Manager.

The key factor in choosing which HTTP port to use is whether there are potential conflicts:

- Do you already have another HTTP server running on the host where HiCommand™ Tuning Manager will be running?
- Do you prefer to reserve the standard port 80 for another web server for a future purpose?
- Do you want to reserve the standard port 80 for security reasons?
- Do you want to use the standard port 80 to simplify the URL for users?

Note: When you use the standard port, users need only specify the hostname. (Example: `http://yourhost`)

But when you use a nonstandard port, users are required to specify that port number when launching HiCommand™ Tuning Manager. (Example: `http://yourhost:7070`)

2.4.1 Contents of HiCommand™ Tuning Manager 1.0 CD1

The HiCommand™ Tuning Manager Auxiliary disk contains the software that must be installed on the servers.

- Install the Auxiliary disk first.

Table 2.1 HiCommand™ Tuning Manager 1.0 Auxiliary Disk Contents

	Provider	Version	Comment	Web Sites)
Apache	Apache Software Foundation	1.3	Web server Apache project	http://www.apache.org/
Tomcat	Apache Software Foundation	4.0.2	Servlet/JSP container (Jakarta project)	http://jakarta.apache.org/tomcat
struts	Apache Software Foundation	1.0.2	Template-driven generation of web pages (Jakarta subproject)	http://jakarta.apache.org/struts http://jakarta.apache.org/struts/kickstart.html#license
log4j	Apache Software Foundation	1.1.3	Logging tool Jakarta project - component of Tomcat	http://jakarta.apache.org/log4j
Interbase	Borland Interbase Open Source	6.0.1	Database (open source version)	http://www.borland.com/devsupport/interbase/opensource/
xerces	Apache Software Foundation	2.0.1	XML parser (used internally by Tomcat)	http://xml.apache.org/xerces2-j/index.html
jclass serverchart	Sitraka	2.1	Graphing function Jakarta project (component of Tomcat)	http://www.sitraka.com/software/jclass/jclassserverchart.html
printf for Java	Sharkysoft	n/a	printf function for logging	http://sharkysoft.com/software/java/printf/
javamail	Sun Microsystems	1.2	mail interface for alert notification	http://java.sun.com/products/javamail/
Java Virtual Machine	Sun Microsystems	1.3	Server-side execution environment	http://java.sun.com/

2.4.2 Contents of HiCommand™ Tuning Manager 1.0 CD2

The HiCommand™ Tuning Manager Product disk contains the main HiCommand™ Tuning Manager software. Install the Product disk after the Auxiliary disk.

Table 2.2 HiCommand™ Tuning Manager 1.0 Product Disk Contents

	Provider	Version	Comment
HiCommand™ Tuning Manager Server	Hitachi, Ltd.	1.0	HiCommand™ Tuning Manager Server
Performance Management Manager	Hitachi, Ltd.	1.0	Resource monitoring agents
HiCommand™ Tuning Manager Performance Management proxy	Hitachi, Ltd.	1.0	Interface between HiCommand™ Tuning Manager and Performance Management

3 - Installing HiCommand™ Tuning Manager (Solaris)

The HiCommand™ Tuning Manager installation package contains one CD-ROM disk.

HiCommand™ Tuning Manager uses the PackageAdd utility for installing on a Solaris platform.

Note: During the Interbase installation phase, the script attempts to start up the Interbase server. To ensure success, you can make a small configuration change before starting the installation script. Add the following line to this configuration file: /etc/hosts.equiv. (If necessary, create the file.)

1. Login to the host as root.
2. If you have intalled a previous version of HiCommand™ Tuning Manager, uninstall that previous revision as per instructions in the README file of that version. (This can be found on that version's installation CD's.)
3. Consult the installation CD for a readme file containing the name of the tar.z file containing the installer objects.
4. `% uncompress` <tar.z filename>
5. `% mkdir tmp`
6. `% cd tmp`
7. `% tar xf ../`<filename>
8. `% ./install.csh`

   The installer prompts:
   `Enter the absolute path name of install directory:`
9. Enter the directory where HTM should be installed.
10. The installer prompts:
    `Enter http port:`
11. Enter the port number on which the HiCommand™ Tuning Manager HTTP services will run.

Note: The choice of the HTTP port has multiple implications. For more information on this, **Choosing the HTTP Port** on page 6.

The install script continues with **Apache Installation Phase** on page 10.

3.1 Apache Installation Phase

The install script displays:

```
Processing package instance <HTMApache> from <path>
HTM Apache
(sparc) 1.3.24
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

Installing HTM Apache as <HTMApache>

## Installing part 1 of 1.
/opt/htm/apache/bin/ab
/opt/htm/apache/bin/apachectl
```

... file list continues...

```
[ verifying class <none> ]
/opt/htm/apache/libexec/libhttpd.so.1 <linked pathname>

Installation of <HTMApache> was successful.
```

The install script continues with **Tomcat Installation Phase** on page 11.

3.2 Tomcat Installation Phase

```
Installing package: HTMTomcat ...

Processing package instance <HTMTomcat> from <path>

HTM Tomcat
(sparc) 4.0.3
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

Installing HTM Tomcat as <HTMTomcat>

## Installing part 1 of 1.
/opt/htm/tomcat/LICENSE
/opt/htm/tomcat/README.txt
```

... file list continues...

```
/opt/htm/tomcat/work/localhost/examples/jsp/num/
numguess$jsp.class
/opt/htm/tomcat/work/localhost/examples/jsp/num/
numguess$jsp.java
[ verifying class <none> ]

Installation of <HTMTomcat> was successful.
```

The install script continues with **SNMP Installation Phase** on page 12.

3.3 SNMP Installation Phase

The install script displays:

```
Installing package: HTMSNMP ...

Processing package instance <HTMSNMP> from </export/
home/ajit/tmp>

HTM SNMP
(sparc) 4.2.3
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

Installing HTM SNMP as <HTMSNMP>

## Installing part 1 of 1.
/opt/htm/snmp/bin/encode_keychange
/opt/htm/snmp/bin/mib2c
/opt/htm/snmp/bin/snmpbulkget
```

... file list continues...

```
/opt/htm/snmp/share/snmp/snmpconf/snmptrapd.conf/
formatting
/opt/htm/snmp/share/snmp/snmpconf/snmptrapd.conf/
traphandle
[ verifying class <none> ]

Installation of <HTMSNMP> was successful.
```

The install script continues with **Java Classes Installation Phase** on page 13.

3.4 Java Classes Installation Phase

The install script displays:

```
Installing package: HTMJava ...

Processing package instance <HTMJava> from </export/
home/ajit/tmp>

HTM Java
(sparc) 1.3.1.02
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

Installing HTM Java as <HTMJava>

## Installing part 1 of 1.
/opt/htm/jdk/COPYRIGHT
/opt/htm/jdk/LICENSE
/opt/htm/jdk/README
/opt/htm/jdk/README.html
/opt/htm/jdk/bin/.java_wrapper
```

... file list continues...

```
/opt/htm/jdk/src.jar
[ verifying class <none> ]

Installation of <HTMJava> was successful.
```

The install script continues with **JAR Files Installation Phase** on page 14.

3.5 JAR Files Installation Phase

The install script displays:

```
Installing package: HTMJars ...

Processing package instance <HTMJars> from </export/
home/ajit/tmp>

HTM Jars
(sparc) 1.0
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
   1 package pathname is already properly installed.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

Installing HTM Jars as <HTMJars>

## Installing part 1 of 1.
/opt/htm/tomcat/lib/commons-beanutils.jar
/opt/htm/tomcat/lib/cs-interclient.jar
```

... file list continues...

```
/opt/htm/tomcat/lib/struts.jar
[ verifying class <none> ]

Installation of <HTMJars> was successful.
```

The install script continues with **ANT Installation Phase** on page 15.

3.6 ANT Installation Phase

The install script displays:

```
Installing package: HTMAnt ...

Processing package instance <HTMAnt> from </export/
home/ajit/tmp>

HTM Ant
(sparc) 1.4.1
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

Installing HTM Ant as <HTMAnt>

## Installing part 1 of 1.
/opt/htm/ant/KEYS
/opt/htm/ant/LICENSE
/opt/htm/ant/README
/opt/htm/ant/WHATSNEW
```

... file list continues...

```
[ verifying class <none> ]

Installation of <HTMAnt> was successful.
```

The install script continues with **HiCommand Tuning Manager Agent Installation Phase** on page 16.

3.7 HiCommand Tuning Manager Agent Installation Phase

The install script displays:

```
Installing package: HTM ...

Processing package instance <HTM> from </space/home/
ajit>

HiCommand Tuning Manager
(sparc) Dev Release 07/06/2002
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

This package contains scripts which will be executed
with super-user
permission during the process of installing this
package.

--> Do you want to continue with the installation of
<HTM> [y,n,?]
```

1. Type **Y** to continue.

```
Installing HiCommand Tuning Manager as <HTM>

## Executing preinstall script.
> ##################################################
> # Script starts: before installation script
> # date:          <system date>
> Check nameserver.
>     /opt/jp1pc/jpcns.ini: No such a file.
> Shutdown all HTM processes.
> # Script completed:  before installation script
>
##################################################
```

```
## Installing part 1 of 1.
```
... list of files ...
```
[ verifying class <none> ]
## Executing postinstall script.
>
##########################################################
> # Script starts: after installation script
> # date:          Fri Jul 12 10:09:35 PDT 2002
> Selected /opt/jp1pc_V6 to copy to /opt/jp1pc
x ./etc, 0 bytes, 0 tape blocks
x ./etc/init.d, 0 bytes, 0 tape blocks
x ./etc/init.d/jp1_pc, 975 bytes, 2 tape blocks
x ./etc/rc0.d, 0 bytes, 0 tape blocks
x ./etc/rc0.d/K01_JP1_10_PC symbolic link to /etc/
init.d/jp1_pc
x ./etc/rc2.d, 0 bytes, 0 tape blocks
x ./etc/rc2.d/S99_JP1_90_PC symbolic link to /etc/
init.d/jp1_pc
x ./opt, 0 bytes, 0 tape blocks
x ./opt/jp1pc_V6, 0 bytes, 0 tape blocks
x ./opt/jp1pc_V6/bin, 0 bytes, 0 tape blocks
x ./opt/jp1pc_V6/bin/action, 0 bytes, 0 tape blocks
x ./opt/jp1pc_V6/bin/action/log, 0 bytes, 0 tape blocks
```
... list of files ...
```
>     cpio: Completed.
> Remove temporary PP files
> /bin/rm -rf /opt/jp1pc_V6
> Added: jp1pcnsvr    22285/tcp       # HiCommand
Tuning Manager
> Added: jp1pcvsvr    22286/tcp       # HiCommand
Tuning Manager
> Created: /opt/jp1pc/jpccomm.ini
> Created: /opt/jp1pc/jpcns.ini
KAVE05087-I The connecting host has changed. (localhost
-> blade1)
> /opt/jp1pc/tools/jpcnshostname -u -force: Completed.
> Created: /opt/jp1pc/jpcplist.ini
> Created: /opt/jp1pc/bin/action/jpcah.ini
> Created: /opt/jp1pc/mgr/namesvr/jpcnsvr.ini
```

```
> Created: /opt/jp1pc/mgr/manager/jpcmm.ini
> Created: /opt/jp1pc/mgr/store/jpcsto.ini
> Created: /opt/jp1pc/mgr/clator/jpcep.ini
> Created: /opt/jp1pc/mgr/viewsvr/jpcvsvr.ini
> Created: /opt/jp1pc/mgr/trapgen/jpctrap.ini
>     jpcagtsetup: Completed.
> # Script completed:  after installation script
> ##################################################

Installation of <HTM> was successful.
```

The install script continues with **Main Installation Phase** on page 19.

3.8 Main Installation Phase

The install script displays:

```
Installing package: HTMMain

Processing package instance <HTMMain> from <path>

HTM Main
(sparc) 1.0
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
   5 package pathnames are already properly installed.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

This package contains scripts which will be executed
with super-user
permission during the process of installing this
package.
```

The install script prompts:

```
Do you want to continue with the installation of
<HTMMain> [y,n,?] y
```

2. Enter `y` and continue.

```
Installing HTM Main as <HTMMain>

## Installing part 1 of 1.
/etc/init.d/htm-apache
/etc/init.d/htm-tomcat
/etc/rc2.d/K99htm-apache <symbolic link>
/etc/rc2.d/K99htm-tomcat <symbolic link>
```

... file list continues...

```
[ verifying class <none> ]
## Executing postinstall script.
Running postinstall ...
Updating configuration files ...
```

```
Executing: /opt/htm/ant/bin/ant -buildfile /opt/htm/
conf/build.xml -Dhttp.port=80 -Ddestination=/opt/htm
ANT CLASSPATH : /opt/htm/ant/bin/../lib/parser.jar:/
opt/htm/ant/bin/../lib/optional.jar:/opt/htm/ant/bin/
../lib/jaxp.jar:/opt/htm/ant/bin/../lib/crimson.jar:/
opt/htm/ant/bin/../lib/ant.jar
Buildfile: /opt/htm/conf/build.xml

htm-deploy:

BUILD SUCCESSFUL
Total time: 6 seconds
Done!

Installation of <HTMMain> was successful.
```

The install script continues with **Interbase Installation Phase** on page 21.

3.9 Interbase Installation Phase

The install script displays:

```
Checking if Interbase is already installed ...
Installing Interbase ...

Processing package instance <IBCSN60> from <path>

InterBase Client and Server with no documentation
(sparc) InterBase Version 6.0
# The contents of this file are subject to the
Interbase Public
# License Version 1.0 (the "License");
```

The install script prompts:

```
Enter the absolute path name of the install directory
[?,q]  /usr
```

1. Type in **/usr** (or another directory of your choosing) and continue.

   The install script displays:

```
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already
installed.
## Checking for setuid/setgid programs.

This package contains scripts which will be executed
with super-user
permission during the process of installing this
package.
```

The install script prompts:

```
Do you want to continue with the installation of
<IBCSN60> [y,n,?]
```

2. Enter `y` and continue.

```
Installing InterBase Client and Server with no
documentation as <IBCSN60>

## Installing part 1 of 1.
/usr/interbase/ReleaseNotes.pdf
/usr/interbase/UDF/ib_udf
```

... file list continues...

```
[ verifying class <none> ]
## Executing postinstall script.
TmpLogFile=/tmp/ibinstall.log
LogFile=ibinstall.log
INTERBASE=/usr//interbase
SUPERSERVER=SUPERSERVER
IBSymLink=/usr/interbase
IBINSTALL=/usr/
Updating access permissions... Creating the
interbase.log...
Done
Creating symbolic links... Done
Updating service name database... Done
Updating configuration file for inetd... Done
Creating the ibmgr shell script... Done
Creating /usr/interbase symbolic link...
Done
Install completed successfully
Install log can be found at /usr//interbase/
ibinstall.log

Installation of <IBCSN60> was successful.
Checking if Interclient is already installed ...

The installation is logged in the file
<path>/install.log.
Press Enter to continue
Executing : tar xpvf <path>/tmp/
```

```
interclient_install_temp_dir/interclient.tar ...
```

The Interbase license agreement is displayed

The installer prompts:

```
Enter the Company Name [Q to quit] :
```

3. Type in your company name and continue.

   The installer prompts:

   ```
   Enter your Name [Q to quit] :
   ```

4. Type in your name and continue.

   The installer prompts:

   ```
   Enter the installation directory as an absolute path
   starting from root.
   If the default directory /usr/interclient is not used,
   a soft link /usr/interclient will be created to point
   to your installation directory.
   Enter the root directory [/usr/interclient] :
   The directory /usr/interclient does not exist.
   ```

5. Type in `/usr/interclient` (or a physical directory of your choice) and continue.

   The installer prompts:

   ```
   Select "Q" to quit, or
          "Y" to create the directory, or
          "N" to select a new directory.
   --> Enter selection [Y] :
   ```

6. Type in `Y` and continue.

```
Creating root directory /usr/interclient ...
Directory /usr/interclient created.
Executing : zcat icserver.tar.Z | tar xpvf - ...
Executing : zcat icdriver.tar.Z | tar xpvf - ...

Checking /etc/services...
interserver3060/tcp

If the above services entry is not identical to
interserver3060/tcp
Then this services entry must be modified manually with
an editor

Checking /etc/inetd.conf...
Adding interserver entry to /etc/inetd.conf...
Sending restart signal to inet daemon...

To run local InterClient Java applications you must
append your CLASSPATH environment variable as follows

  /usr/interclient/interclient.jar:$CLASSPATH
Test your installation with the CommDiag Java
application using:
  java interbase.interclient.utils.CommDiag

Browse the InterClient documentation from the local
URL:
  /usr/interclient/docs/index.html
The above installation notes and a record of the
installation
can be found in the file /export/home/ajit/tmp/
interclient_install_temp_dir/install.log.

InterClient Installation is complete.
Done installing HiCommand Tuning Manager
```

Note: The Interbase installation script attempts to start up the Interbase server. If you see an error, add the following line to this configuration file: /etc/hosts.equiv. Then restart ibmgr.

3.10 Uninstalling HiCommand™ Tuning Manager

3.10.1 Apache Phase

The script prompts:

```
Uninstalling HiCommand Tuning Manager
Uninstalling package: HTMApache

The following package is currently installed:
   HTMApache       HTM Apache
                   (sparc) 1.3.24

-->Do you want to remove this package?
```

1. Type in `Y` and continue.

```
## Removing installed package instance <HTMApache>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
/opt/htm/apache/proxy
/opt/htm/apache/man/man8/rotatelogs.8
/opt/htm/apache/man/man8/logresolve.8
```

file list continues...

```
## Updating system information.

Removal of <HTMApache> was successful.
```

The uninstall script continues with **Tomcat Phase** on page 26.

3.10.2 Tomcat Phase

The script prompts:

```
Uninstalling package: HTMTomcat

The following package is currently installed:
   HTMTomcat       HTM Tomcat
                   (sparc) 4.0.3

--> Do you want to remove this package? y
## Removing installed package instance <HTMTomcat>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
/opt/htm/tomcat/work/localhost/webdav
/opt/htm/tomcat/work/localhost/tomcat-docs
```

file list continues...

```
/opt/htm/tomcat <shared pathname not removed>
## Updating system information.

Removal of <HTMTomcat> was successful.
```

The uninstall script continues with **SNMP Phase** on page 27.

3.10.3 SNMP Phase

The script prompts:

```
Uninstalling package: HTMSNMP

The following package is currently installed:
   HTMSNMP          HTM SNMP
                    (sparc) 4.2.3
```

The uninstall script prompts:

```
Do you want to remove this package?
```

1. Type in `Y` and continue.

```
## Removing installed package instance <HTMSNMP>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
```

list of pathnames ...

```
## Updating system information.

Removal of <HTMSNMP> was successful.
```

The uninstall script continues with **Java Classes Phase** on page 28.

3.10.4 Java Classes Phase

The script prompts:

```
Uninstalling package: HTMJava

The following package is currently installed:
   HTMJava          HTM JRE
                    (sparc) 1.3.1.02
```

The uninstall script prompts:

```
Do you want to remove this package?
```

1. Type in **Y** and continue.

```
## Removing installed package instance <HTMJava>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
/opt/htm/jre/plugin/sparc/ns600/libjavaplugin_oji.so
/opt/htm/jre/plugin/sparc/ns600
```

file list continues...

```
## Updating system information.

Removal of <HTMJava> was successful.
```

The uninstall script continues with **JAR files Phase** on page 29.

3.10.5 JAR files Phase

The script prompts:

```
Uninstalling package: HTMJars

The following package is currently installed:
   HTMJars          HTM Jars
                    (sparc) 1.0
```

The uninstall script prompts:

```
Do you want to remove this package?
```

1. Type in `Y` and continue.

```
## Removing installed package instance <HTMJars>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
/opt/htm/tomcat/lib/struts.jar
/opt/htm/tomcat/lib/printf.jar
/opt/htm/tomcat/lib/log4j.jar
```

file list continues...

```
## Updating system information.

Removal of <HTMJars> was successful.
```

The uninstall script continues with **ANT Phase** on page 30.

3.10.6 ANT Phase

The script prompts:

```
Uninstalling package: HTMAnt

The following package is currently installed:
   HTMAnt           HTM Ant
                    (sparc) 1.4.1
```

The uninstall script prompts:

```
Do you want to remove this package?
```

1. Type in `Y` and continue.

```
## Removing installed package instance <HTMAnt>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
/opt/htm/ant/lib/parser.jar
/opt/htm/ant/lib/optional.jar
```

file list continues...

```
## Updating system information.

Removal of <HTMAnt> was successful.
```

The uninstall script continues with **Main Phase** on page 31.

3.10.7 Main Phase

The script prompts:

```
Uninstalling package: HTMMain

The following package is currently installed:
   HTMMain          HTM Main
                    (sparc) 1.0
```

The uninstall script prompts:

```
Do you want to remove this package?
```

1. Type in `Y` and continue.

```
## Removing installed package instance <HTMMain>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
/opt/htm/webapps/cs-orion.war
```

file list continues...

```
## Updating system information.

Removal of <HTMMain> was successful.
Done uninstalling HiCommand Tuning Manager
```

4 - Installing HiCommand™ Tuning Manager (Windows)

The HiCommand™ Tuning Manager installation package contains two CD-ROM disks:

- HiCommand™ Tuning Manager Auxiliary disk
- HiCommand™ Tuning Manager Product disk

When installing HiCommand™ Tuning Manager on a Windows platform, the InstallShield installation tool will be used.

4.1 Before You Install

Before beginning the installation procedure, be sure to consult **Before You Install** on page 5. This chapter contains warnings and preconditions to ensure a successful installation of HiCommand™ Tuning Manager.

4.2 Logging In

- Login to the host with machine Administrator privileges or higher.

Note: The installation sequence is required. You must install CD1 ***before*** CD2.

4.3 Starting CD1

To install the CD1:

1. Load the HiCommand™ Tuning Manager ***CD1*** disk.
2. Execute the installer. (HTM-CD1.exe)

   The installation wizard reads its internal configuration file then begins extracting files.

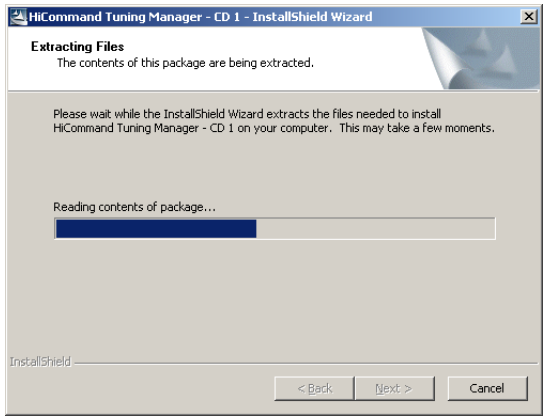


Figure 4.1 Installer extracts files

When extraction is complete, the welcome panel is displayed.

3. Click on **Next**.

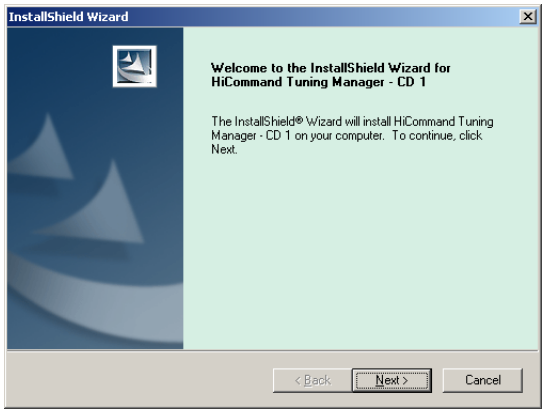
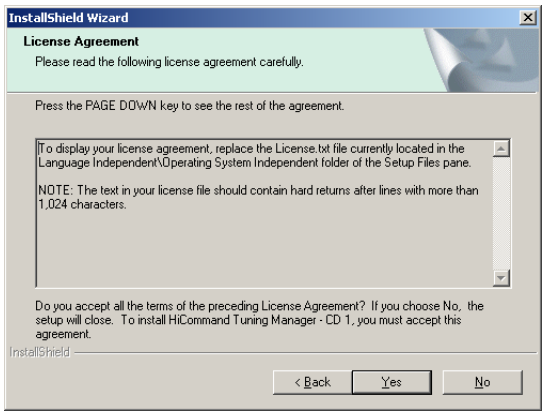


Figure 4.2 Installer welcome panel

4. The license agreement panel is displayed.



5. Click on **Yes** to accept the terms of the license agreement. (Or click on **No** to terminate installation.)

Figure 4.3 Installer license agreement panel

The customer information panel appears.

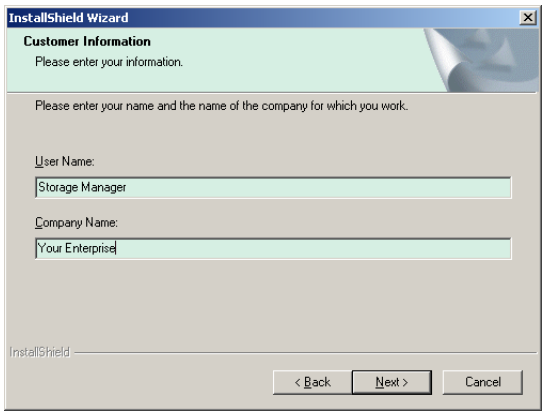


Figure 4.4 The customer information panel

6. Type in name and organization.
7. Click on **Next**.

   The installer displays the destination panel.

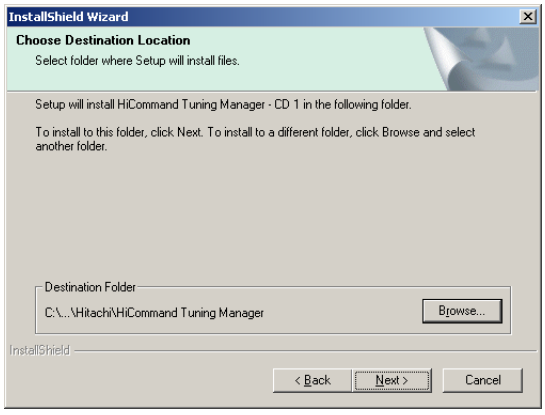


Figure 4.5 The destination panel with default path

8. Accept the default installation path for HiCommand™ Tuning Manager. (Or click on **Browse** to specify an alternative location.

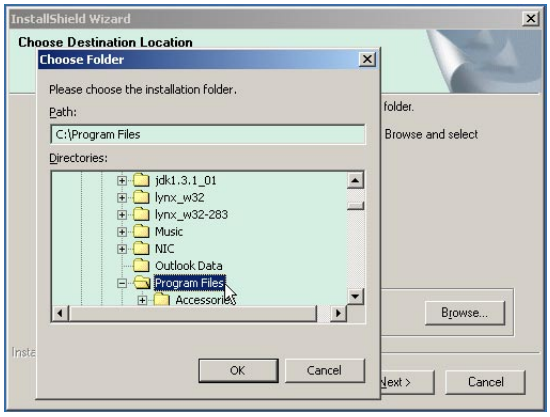


Figure 4.6 The file browser for selecting an alternate installation location.

9. Click on **Next**.

The installer displays a confirmation panel before copying files to the destination.

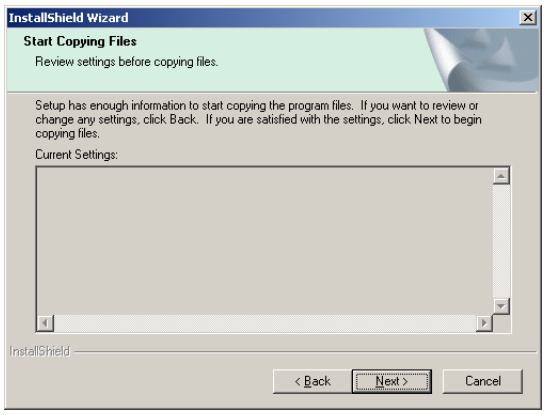


Figure 4.7 Confirmation panel before copying files to the destination

10. Click on **Next** to proceed.
    The installer begins copying files.

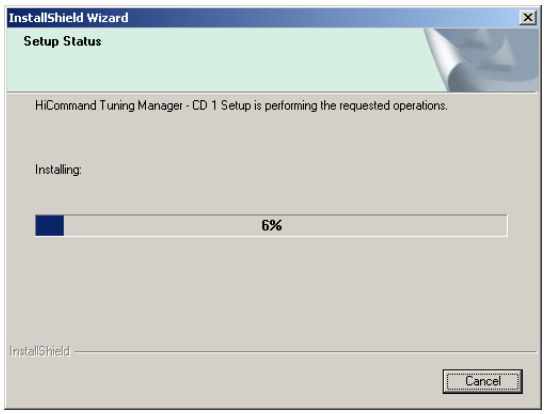


Figure 4.8 Installer copy status panel

11. Continue with **Interbase Installation Phase** on page 39.

4.3.1 Interbase Installation Phase

The installer begins the database installation.

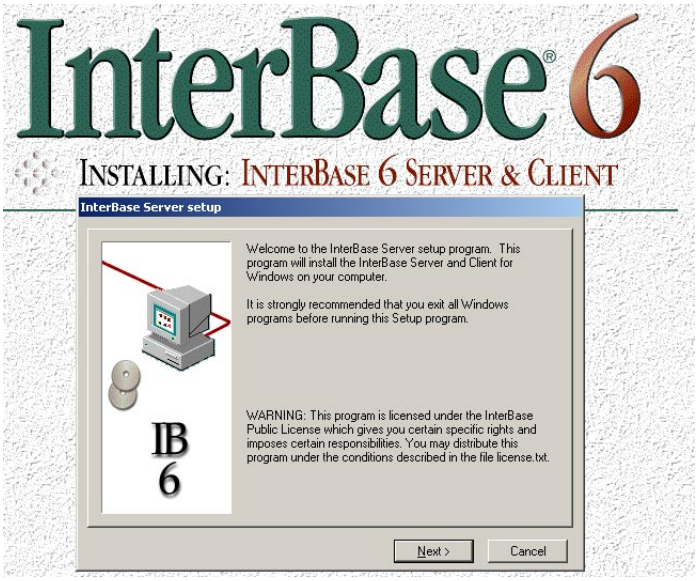


Figure 4.9 The Interbase installer begins

1. Click on Next to proceed with database installation.

The installer displays release notes.

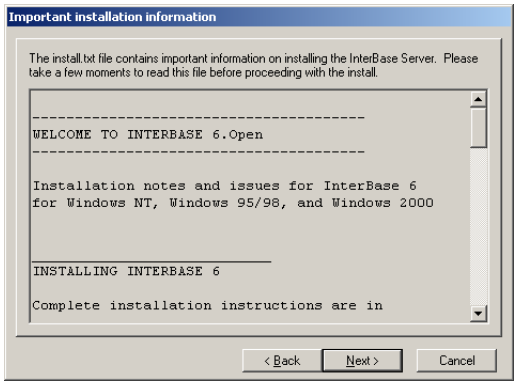


Figure 4.10 Database release notes

2. Click on **Next** to proceed.

   The installer displays the database license agreement.

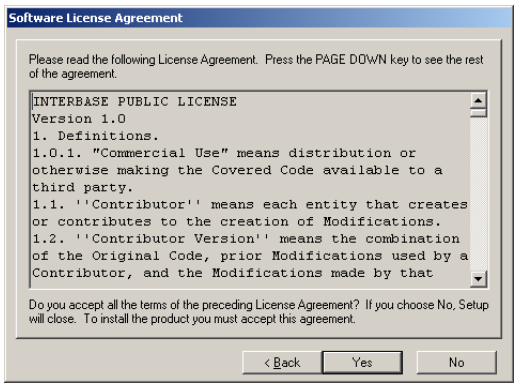


Figure 4.11 Database license agreement

3. Click on **Yes** to accept the terms of the license agreement. (Or click on **No** to terminate installation.)

   The component selection panel is displayed

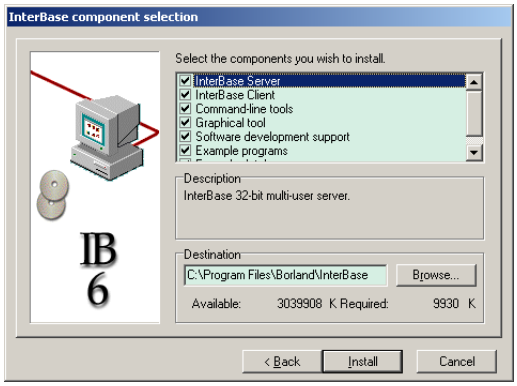


Figure 4.12 The database components panel

4. Select all listed components. (default)

5. Click **Next** to proceed.

   A file copy status dialog is displayed.

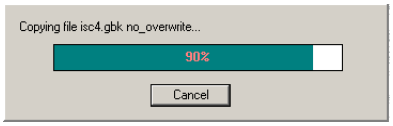


Figure 4.13 File copy status dialog

Note: In some cases, the operating system is not able to update Windows components or start services during the installation. In these cases, the installer displays a warning dialog. This does not indicate a fatal error condition. Once the full installation has completed for all of HiCommand™ Tuning Manager, reboot your computer and the update operation will resume successfully upon reloading of the operating system.

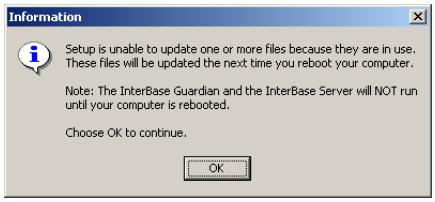


Figure 4.14 Update warning during installation

The next panel indicates that the Interbase database server component is installed.

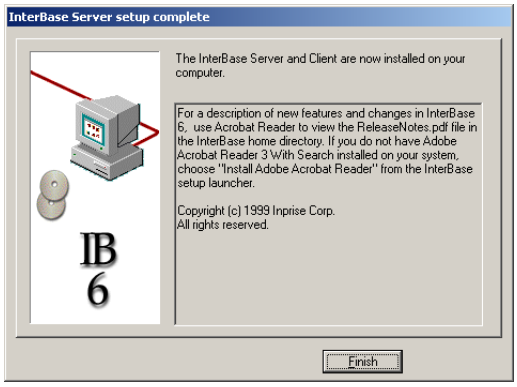


Figure 4.15 Confirmation of completed database server installation

Note: Interbase installation requires two major segments: the database service and the interface components (InterClient). Please proceed with the installation.

6. Click **Yes** to proceed with installation of the Java database interface components.

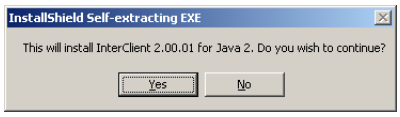


Figure 4.16 InterClient installation requires user confirmation

A status dialog confirms copying of files.

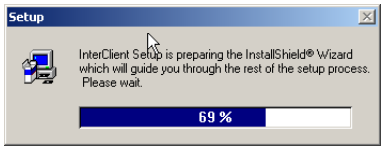


Figure 4.17 InterClient file copying status dialog

The first InterClient installation panel is displayed.

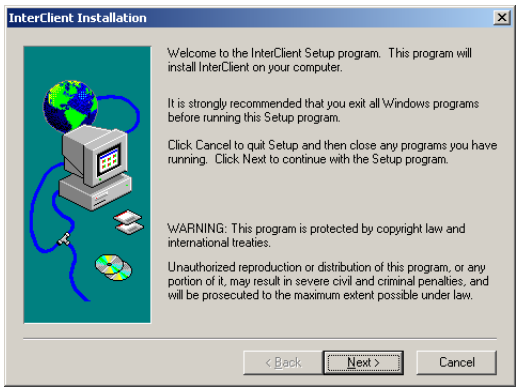


Figure 4.18 InterClient introduction panel

7. Click **Next** to proceed.

The InterClient software license agreement is displayed.

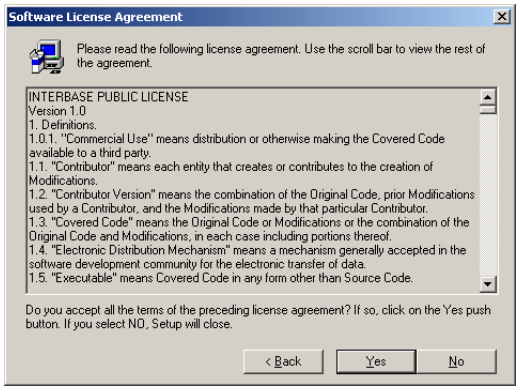


Figure 4.19 InterClient license agreement

8. Click on **Yes** to accept the terms of the license agreement. (Or click on **No** to terminate installation.)

The installation notes panel is displayed.

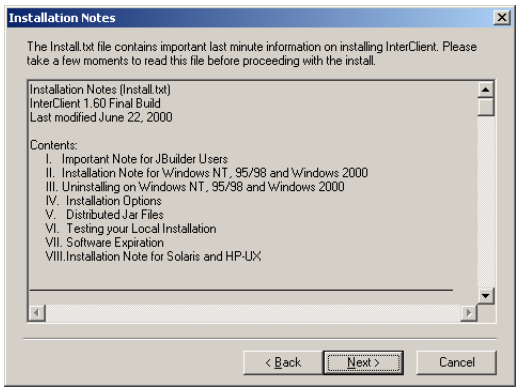


Figure 4.20 Installation notes panel for InterClient

9. Click **Next** to proceed.

   The installer displays an information panel prior to installation of components.

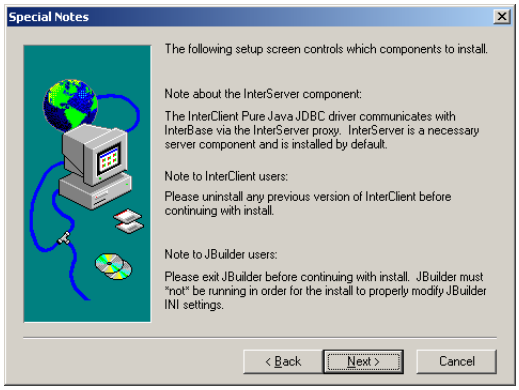


Figure 4.21 information panel

10. Please read the onscreen instructions to determine whether these conditions apply to your installation.

11. Click on **Next** to proceed. (Or click on **Cancel** to terminate installation.)
    The components selection panel is displayed.

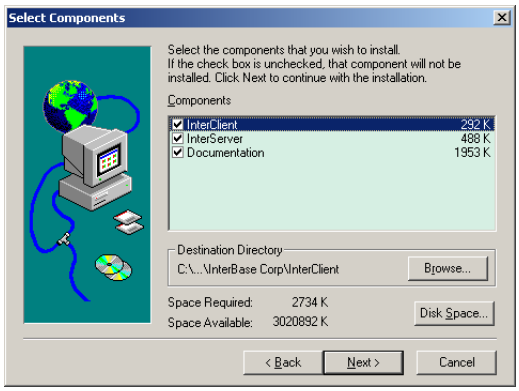


Figure 4.22 The components section panel for InterClient

12. Select all components (default).
13. Click **Next** to proceed.
    An information panel is displayed about InterClient.

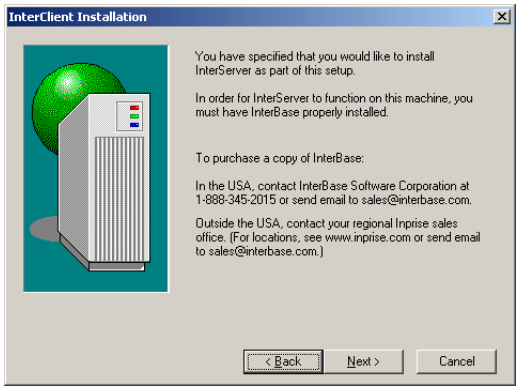


Figure 4.23 InterClient information panel

Note: HiCommand™ Tuning Manager includes an open source version of Interbase. This does not require the purchase of additional software.

14. Click **Next** to proceed.
    Interbase requires an entry in the services file for the operating system.

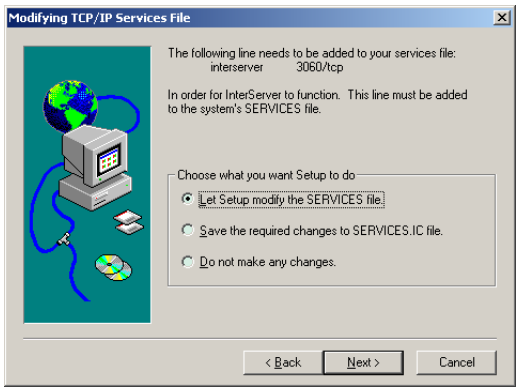


Figure 4.24 IP services selection panel

15. Select **Let Setup modify the SERVICES file**.

Note: This panel will only appear the first time that Interbase is installed on your computer.

16. Click **Next** to proceed.

    The pre-copying panel is displayed.

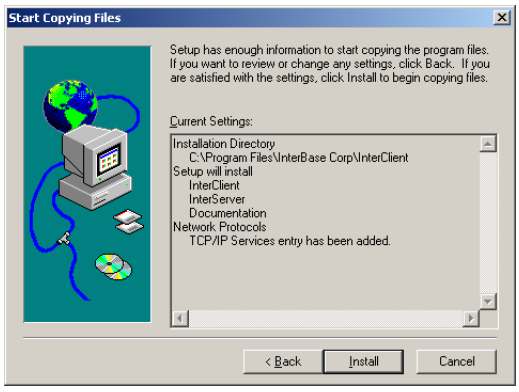


Figure 4.25 The copying introduction panel

17. Click **Next** to proceed.

Files are copied from the installer.

The InterServer configuration panel is displayed.

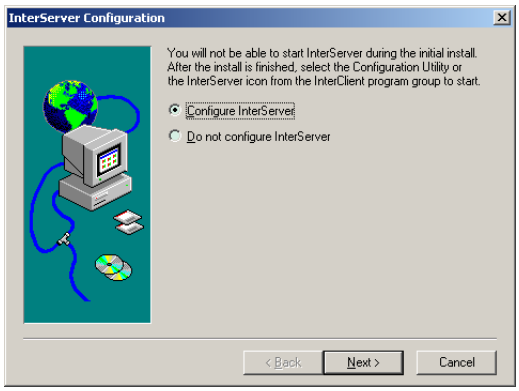


Figure 4.26 InterServer configuration panel

18. Select **Configure InterServer**.
19. Click **Next** to proceed.

    The InterServer configuration dialog is displayed.
20. For **Server Startup** select **Service**.

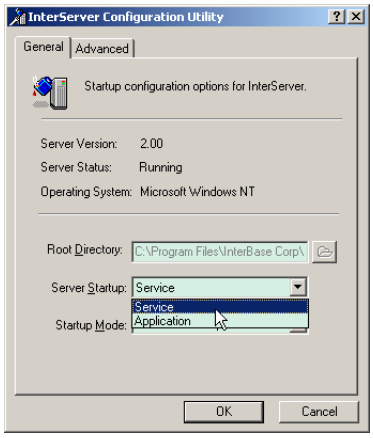


Figure 4.27 Setting Server Startup as a Service

21. For **Startup Mode** select **Windows Startup**.

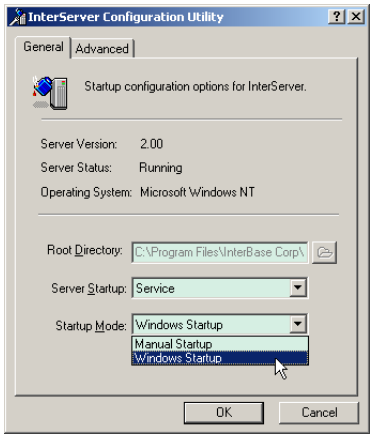


Figure 4.28 Setting InterServer Startup Mode to Windows Startup

Note: In some cases, the operating system is not able to update Windows components or start services during the installation. In these cases, the installer displays a warning dialog. This does not indicate a fatal error condition. Once the full installation has completed for all of HiCommand™ Tuning Manager, reboot your computer and the update operation will resume successfully upon reloading of the operating system.

22. Click **OK** to complete Interbase installation.
    The View Readme File? dialog is displayed.

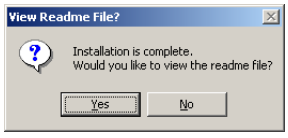


Figure 4.29 The View Readme File? dialog

23. Click **Yes** to view the readme file. (Or click **No** to bypass this step.)
    The installer confirms that InterClient installation is now complete.

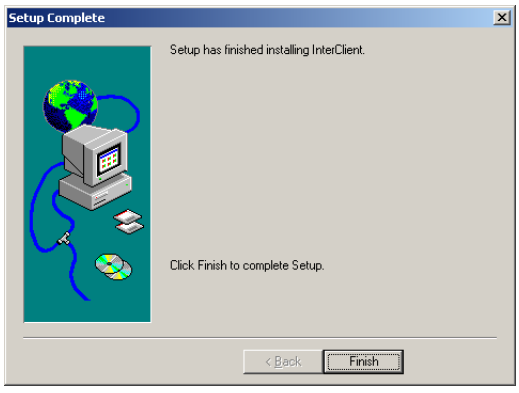


Figure 4.30 InterClient installation completion panel

24. Click on Finish to complete installation of InterClient.

4.3.2 Completing CD1

The installer displays an information dialog about the Start Menu.

Figure 4.31 Information dialog

1. Click **OK** to dismiss the information dialog.
   The installer displays the completion panel for CD1.

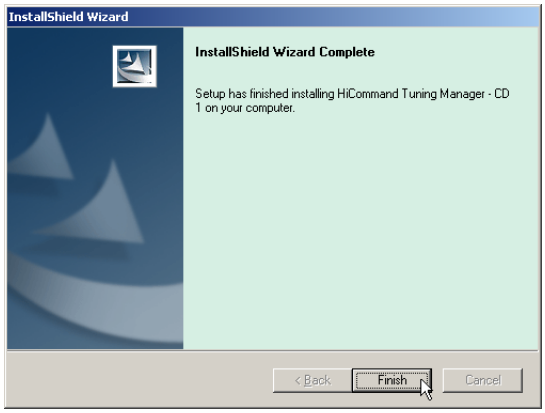


Figure 4.32 Completion dialog

2. Click **Finish** to conclude installation of CD1.
3. Continue the HiCommand™ Tuning Manager installation procedure by following the instructions in **Starting CD2** on page 49.

4.4 Starting CD2

1. Load the HiCommand™ Tuning Manager ***CD2*** disk.
   The installer displays an introduction panel.

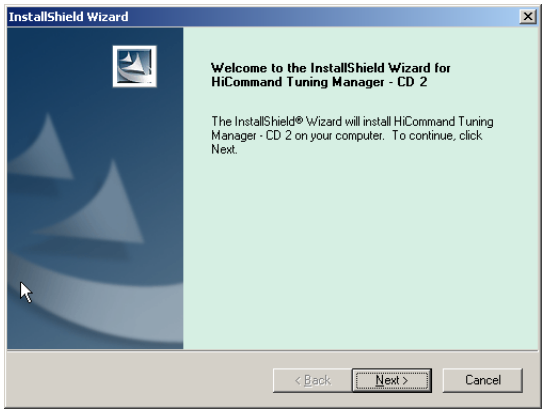


Figure 4.33 The CD2 introduction panel

1. Click **Next** to proceed.
   The license agreement panel is displayed.

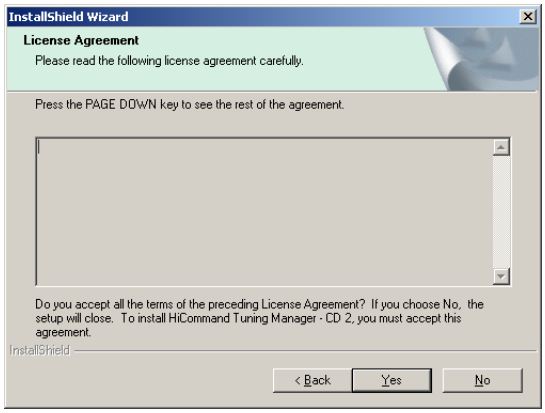
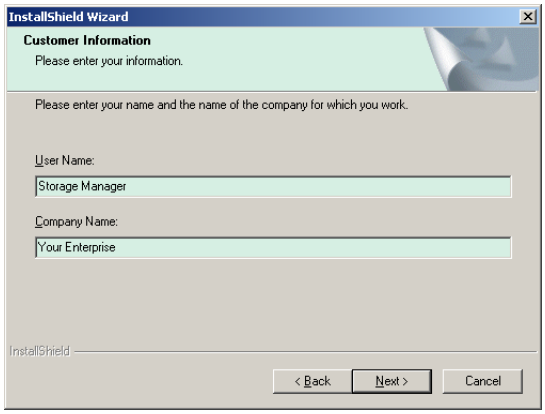


Figure 4.34 The license agreement panel

2. Click on **Yes** to accept the terms of the license agreement. (Or click on **No** to terminate installation.)

   The customer information panel is displayed.



3. Type in name and organization.

   The HTTP port configuration panel is displayed.

Note: The choice of the HTTP port has multiple implications. For more information on this, **Choosing the HTTP Port** on page 6.

4. Specify the appropriate HTTP server port number for your installation.

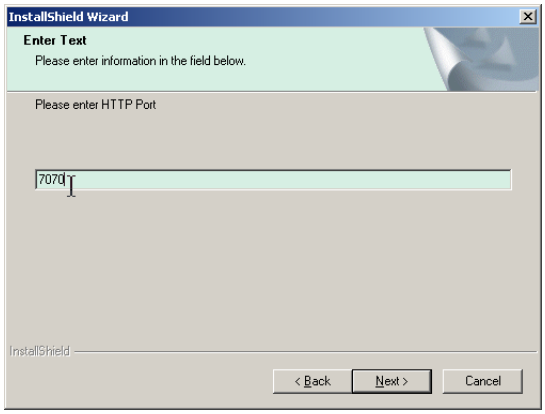


Figure 4.35 Specifying the HTTP port

5. Click **Next** to proceed.

   The installer displays the pre-copy panel.

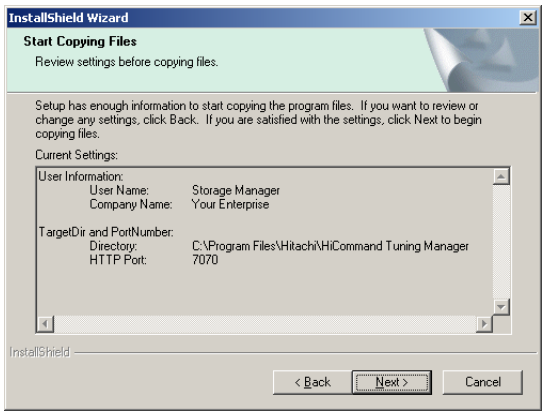


Figure 4.36 The pre-copy panel

6. Click **Next** to proceed.

   The installer displays a file copy status dialog.

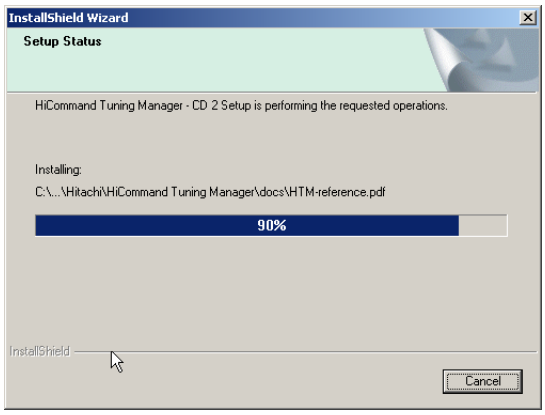
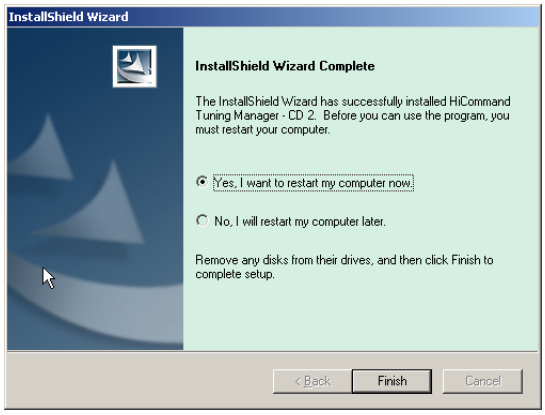


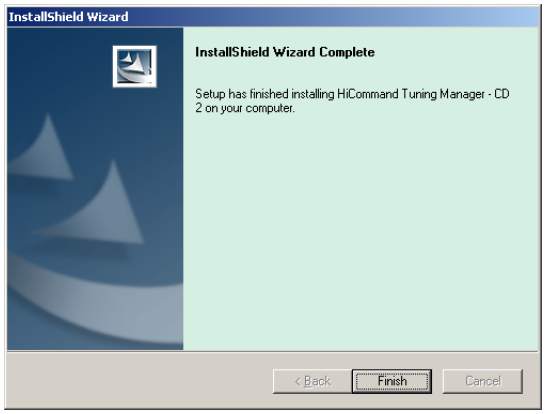
Figure 4.37 The file copy dialog

When all files have been copied, the installer displays the restart panel. We strongly recommend that you accept the option of restarting the computer.

7. Click on **Yes, I want to restart my computer now**.



The installer then displays the Finish panel.



8. Click **Finish** to conclude installation of CD2.
9. Restart the host to allow Windows to start all installed services using the installed configurations.

4.5 Uninstalling HiCommand™ Tuning Manager

Note: Before you uninstall, first determine whether you require Interbase for other purposes. The uninstaller logic for HiCommand™ Tuning Manager will not remove Interbase if you need to retain that component.

1. If you no longer need Interbase for other purposes, consult Interbase documentation for instructions on uninstalling the database.

Note: In most installations, you can find a text file in the Start menu. (Start/ Programs/Interbase InterClient/Install Notes)

2. Load the Windows Control Panel.

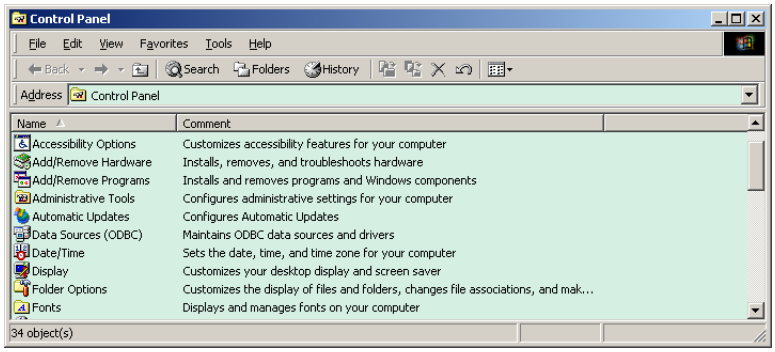


Figure 4.38 Windows control panel

3. Click on **Add/Remove Programs**.
   The Add/Remove utility appears.

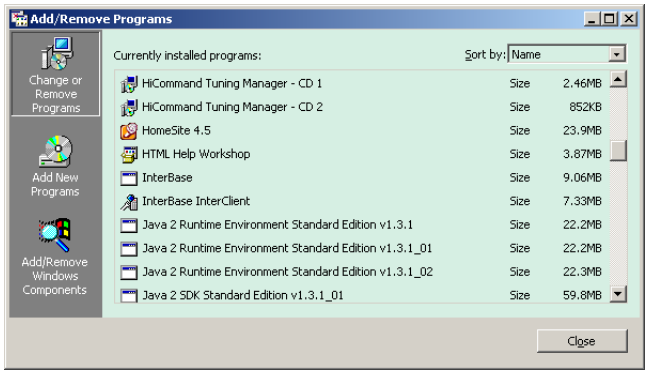


Figure 4.39 The Windows Add/Remove Utility

4. Click on HiCommand™ Tuning Manager CD2.

Note: This sequence is required. You must uninstall CD2 ***before*** CD1.

5. Follow the removal instructions provided in the uninstaller panel.

6. Click on HiCommand™ Tuning Manager CD1.
7. Follow the removal instructions provided in the uninstaller panel.

5 - HiCommand™ Tuning Manager Administration

5.1 About the Administration User Interface

The HiCommand™ Tuning Manager Administration area shares the two-frame design employed throughout the software:

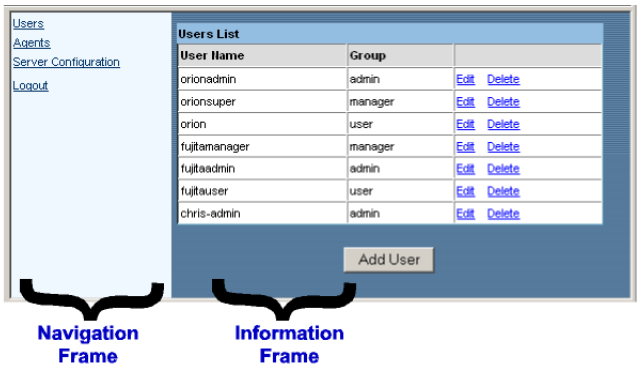


Figure 5.1 Navigation Frame and Information Frame

- **Navigation Frame**- the vertical area to the left of the page where you select administration tasks.
- **Information Frame**- the vertical area to the right of the page where HiCommand™ Tuning Manager presents data for viewing and interaction.

5.1.1 Logging In As Administrator

To login as an Administrator in HiCommand™ Tuning Manager:

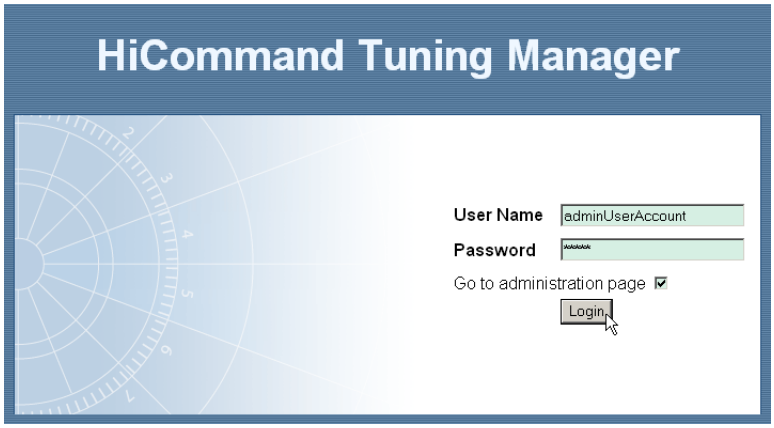


Figure 5.2 Logging in as Administrator

1. Launch HiCommand™ Tuning Manager using the hostname and port for your installation.
2. Enter your user name.
3. Enter your password.
4. Check the **Go to administration page** checkbox.
5. Click Login.

5.1.2 Logging Out

Click the **Logout** hyperlink.

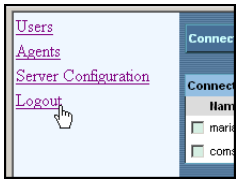


Figure 5.3 Logging out

5.2 About User Administration

Before people can interact with HiCommand™ Tuning Manager, they must be provided with logins.

- The HiCommand™ Tuning Manager administrator may add, delete, and modify HiCommand™ Tuning Manager users and designate group members. (For more information, see "About User Permissions" below.)
- The HiCommand™ Tuning Manager administrator provides each user with a login name and a password. Optionally, the administrator can designate group membership.

Note: Only members of the HiCommand™ Tuning Manager Admin Group are permitted access to the HiCommand™ Tuning Manager administration area.

5.2.1 About User Permissions

HiCommand™ Tuning Manager classifies users into these groups:

	Permitted Tasks		
Group	- View Performance - View Capacity - View Alerts	- Define alerts - Bind alerts to resources	- Administration area - Add, delete, edit users - Add, delete agents - Server configuration
User*	Yes	No	No
Manager	Yes	Yes	No
Administrator	Yes	Yes	Yes

Note: *Users lacking explicit group assignments are automatically designated members of the ***User*** group.

5.2.2 Adding Users

To gain access to HiCommand™ Tuning Manager users must be provided a login and password.

To add a user to HiCommand™ Tuning Manager:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Users** in the navigation frame.

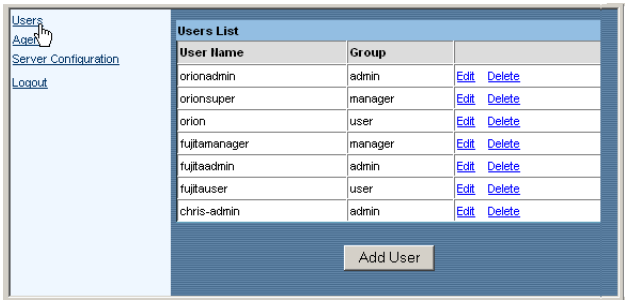


Figure 5.4 User administration list

3. Click on **Add User**.

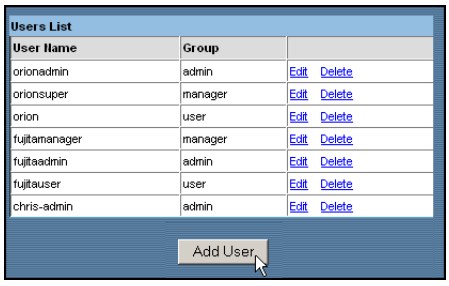


Figure 5.5 Clicking on Add User

The User Profile form appears.

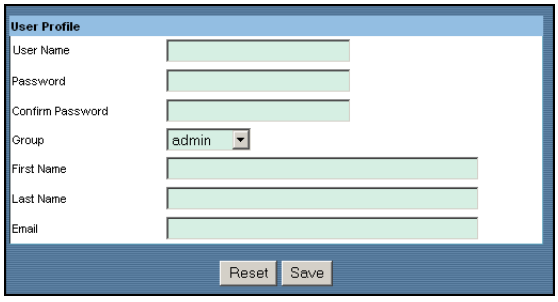


Figure 5.6 User profile form

4. Enter data for the following fields:

- User Name
- Password
- Group (admin, manager or user)
  (For detailed information, see **About User Permissions** on page 59.)

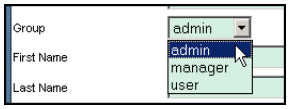


Figure 5.7 Selecting user permission

- First name
- Last name
- Email address

5. Click on **Save** to add the new user (or **Reset** to abandon data entry).

5.2.3 Editing Users

To change information about a user:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Users**.

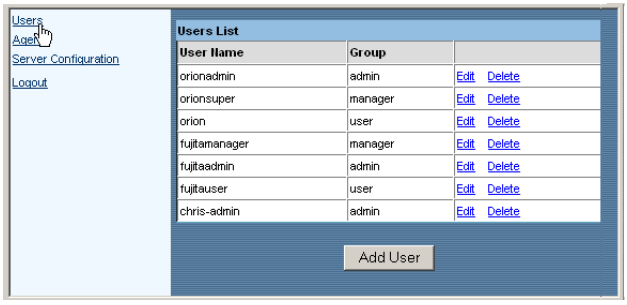


Figure 5.8 User administration list

3. Select the user you wish to edit.
4. Click on **Edit**.

   The User Profile form appears.

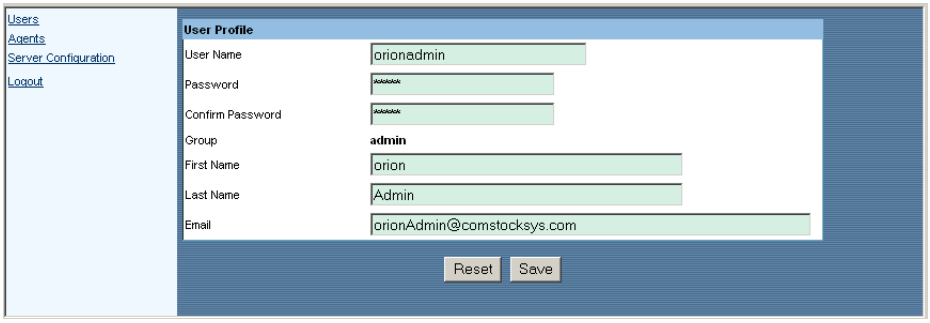


Figure 5.9 Editing user profile form

5. Modify user profile information as required.
6. Click on **Save** to Edit the user information(or **Cancel** to abandon adding this profile).

5.2.4 Deleting Users

To remove a user from the access list:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Users**.

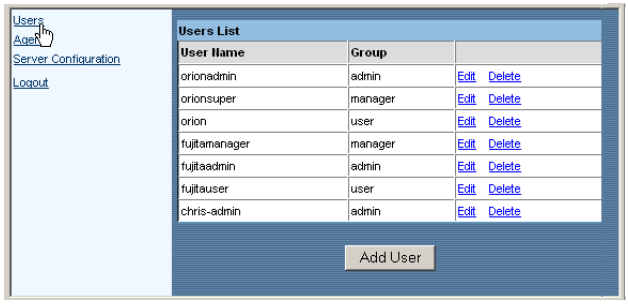


Figure 5.10 User administration form

3. Select the user you wish to delete.
4. Click on **Delete**.
   A dialog appears confirming this action will delete the user.
5. Click on **OK**.

5.3 About Agent Management Policies

HiCommand™ Tuning Manager uses agents to monitor resources and to update its database. HiCommand™ Tuning Manager automatically detects the availability of agents through ongoing polling.

This section explains the behavior of HiCommand™ Tuning Manager for each of the available policy combinations.

- For information on how to set the policies, see **Setting Connect and Disconnect Policies** on page 72.

How and when HiCommand™ Tuning Manager connects to or disconnects from agents is dependent on how you configure the server side software. HiCommand™ Tuning Manager provides these policies:

- Automatic Connection / Automatic Disconnection
  - Upon detection of an available agent, HiCommand™ Tuning Manager will connect to it.
  - When an agent has not communicated for a specified amount of time, HiCommand™ Tuning Manager will disconnect from it.
- Manual Connection / Manual Disconnection
  - HiCommand™ Tuning Manager posts all agents it detects in the Available Agents list. The HiCommand™ Tuning Manager administrator is responsible for specifying which of the agents in the Available Agents should be connected.
  - HiCommand™ Tuning Manager displays when connected agents have not communicated for a specified amount of time. The HiCommand™ Tuning Manager administrator is responsible for disconnecting and deleting these agents.
- Automatic Connection / Manual Disconnection
  - Upon detection of an available agent, HiCommand™ Tuning Manager will connect to it.
  - HiCommand™ Tuning Manager displays when connected agents have not communicated for a specified amount of time. The HiCommand™ Tuning Manager administrator is responsible for disconnecting and deleting these agents.
- Manual Connection / Automatic Disconnection
  - HiCommand™ Tuning Manager posts all agents it detects in the Available Agents list. The HiCommand™ Tuning Manager administrator is responsible for specifying which of the agents in the Available Agents should be connected.

- When an agent has not communicated for a specified amount of time, HiCommand™ Tuning Manager will disconnect from it.

Note: We strongly recommend evaluating all of the above combinations before deciding on your Connection and Disconnection policies. For most sites, the Automatic Connection/Automatic Disconnection combination simplifies administration and provides the best reporting on monitored resources.

5.3.1 About Adding Agent Data Connections

To introduce new agent data connections, choose one of these options:

- **Automatic Data Connection**- HiCommand™ Tuning Manager adds all detected agents to the Data Connections list.
- **Manual Data Connection**- You selectively add agents by selecting them from the list of Available Agents.

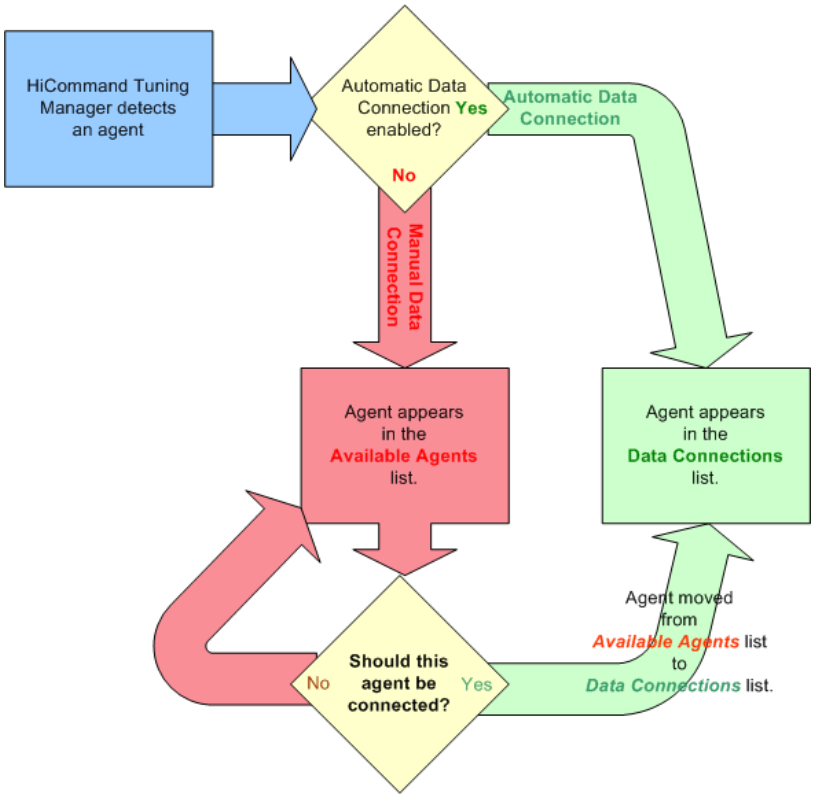


Figure 5.11 Logic flow diagram: adding data connections

5.3.2 About Ending Agent Data Connections

HiCommand™ Tuning Manager provides these options for disconnecting an Agent Data Connection:

- **Automatic Agent Disconnection**- When an agent has not communicated with HiCommand™ Tuning Manager for the specified amount of time, HiCommand™ Tuning Manager removes it from its Data Connections list. The agent does not appear in the Available Agents list. (You set the threshold for disconnecting agents in the Administration interface.)
- **Manual Agent Disconnection**- When you have reason to stop monitoring a resource, you can selectively disconnect its agent manually.

5.3.3 When An Agent Stops Communicating

Automatic Disconnection- When you have configured HiCommand™ Tuning Manager to automatically disconnect agents, the process is transparent. As soon as the an agent has not communicated for the specified amount of time, HiCommand™ Tuning Manager removes the non-communicating agent from the Data Connections list. (If you have opted for Automatic Connection, HiCommand™ Tuning Manager will re-register any newly discovered agents.)

Manual Disconnection- If you have opted for Manual Disconnection, non-communicating agents will remain in the Data Connections list. However, these agents will display a Down status and the timestamp for the last successful communication event.

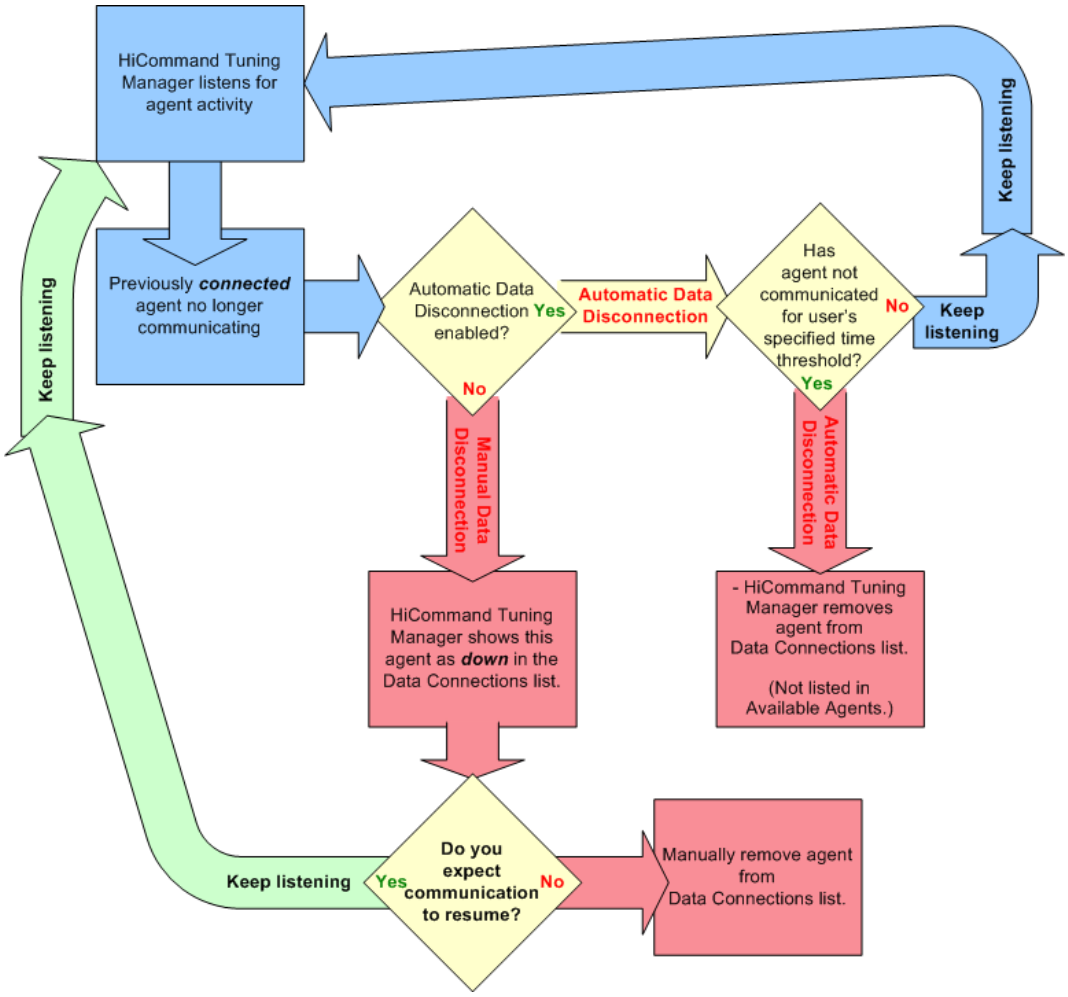


Figure 5.12 Logic flow diagram: disconnecting agents

Note: When an agent is unavailable at a polling time, HiCommand™ Tuning Manager will perform metric substitution for that storage resource. This is achieved by using the most recently collected value for that resource. If this agent subsequently reconnects, it will be queried for the missing metrics. At the next polling time, the newly available metrics will replace any substitute values in the Tuning Manager database. However if the agent cannot reconnect, metric substitution will continue until the agent is disconnected. (Your connection and disconnection policies will determine how long metric substitution will continue.)

Note: In the event that the agent never reconnects to Tuning Manager, and the administrator has set Tuning Manager to "automatic disconnect", the agent will be dropped automatically based upon your configuration policy. If the administrator has set Tuning Manager to "manual disconnect", the administrator must manually remove the agent from Tuning Manager's active agent list.

5.3.4 About Deleting Available Agents

If you have an Automatic Connection policy: To exclude agents from being automatically connected, keep them in the Available Agents list. You do this by manually disconnecting them. (For details, see **Disconnecting Agents Manually** on page 75.)

Note: If you delete an agent from the **Available Agents** list under the Automatic Connection policy, the HiCommand™ Tuning Manager Automatic Connection policy will reinstate that agent every time it resumes communicating. Therefore, if you want to prevent an agent from being automatically reconnected, retain it in the Available Agents list.

5.4 Setting Connect and Disconnect Policies

To set Connection and Disconnection policies (automatic and/or manual):

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Agents.**

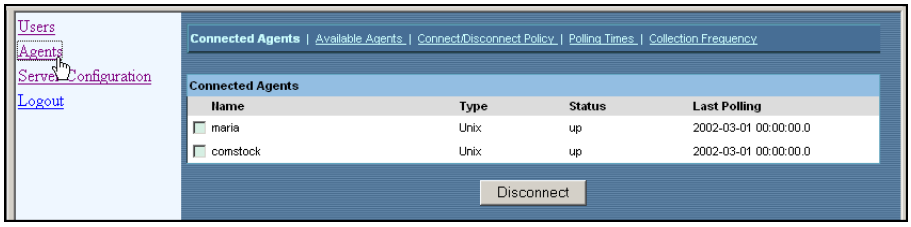


Figure 5.13 Agent list

3. Click on **Connect/Disconnect Policy**.

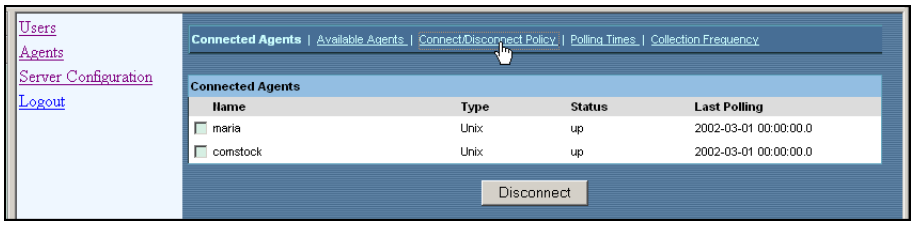


Figure 5.14 Agent Connect/Disconnect Policy

4. Click on **Automatic** or **Manual** under **Connect Detected Agents**.

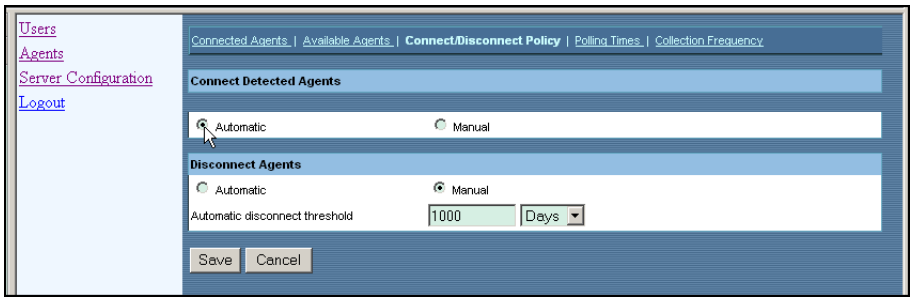


Figure 5.15 Automatic or Manual connect policy

5. Click on **Automatic** or **Manual** under **Disconnect Agents**.

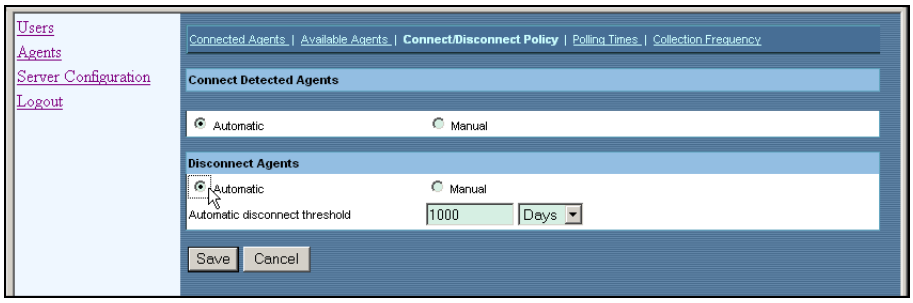


Figure 5.16 Automatic or Manual disconnect policy

6. If you chose Automatic removal, specify the time threshold HiCommand™ Tuning Manager uses by setting **Automatic Disconnect Threshold** (page 74).

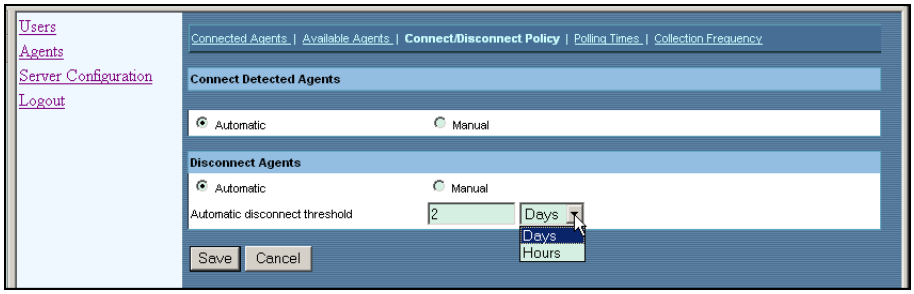


Figure 5.17 Automatic disconnect threshold

7. Click on **Save**.

5.4.1 Automatic Disconnect Threshold

If you specify the Automatic Disconnection policy, HiCommand™ Tuning Manager will watch for agents that stop communicating.

The value you specify for Automatic Disconnect Threshold governs how long HiCommand™ Tuning Manager will wait before automatically disconnecting an agent.

To set the Automatic Disconnect Threshold for automatic agent removal:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Agents**.

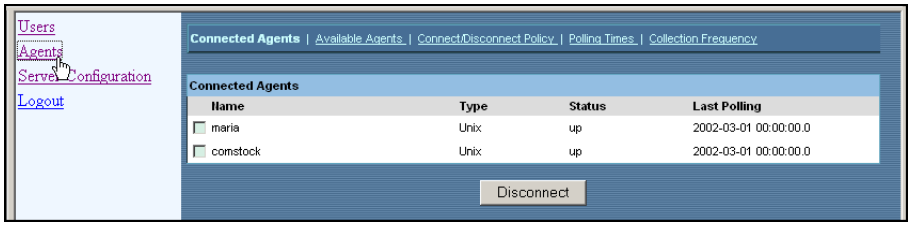


Figure 5.18 Agent list

3. Click on **Connect/Disconnect Policy**.

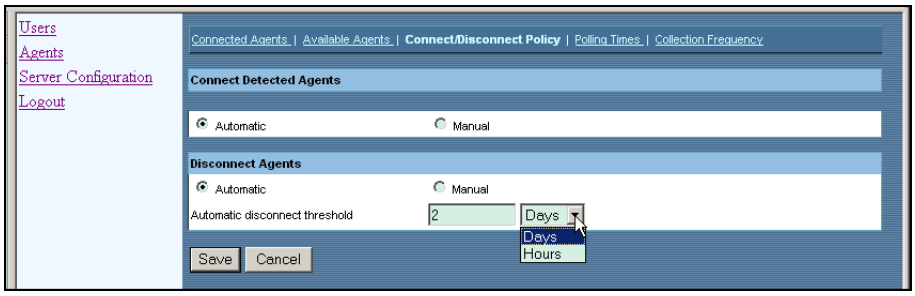


Figure 5.19 Automatic disconnect threshold

4. Specify an integer value in the **Automatic Disconnect Threshold** field.
5. Select the time interval (Days or Hours).
6. Click **Save**.

5.4.2 Disconnecting Agents Manually

An agent continues to monitor a given resource as long as that resource is available. If you are not interested in collecting data on this resource, you can choose to manually disconnect the agent.

To manually disconnect an agent:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Agents**.

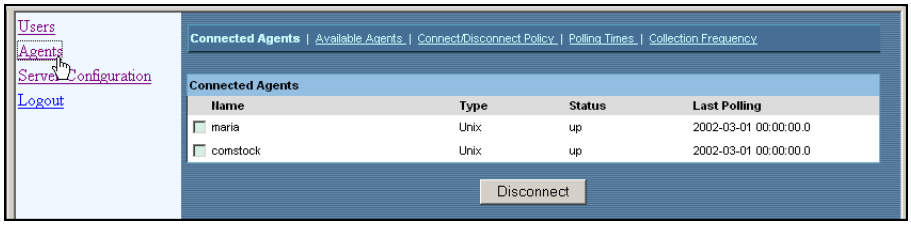


Figure 5.20 Agent list

3. Click on **Connected Agents**.

HiCommand™ Tuning Manager displays a list of active agents.

4. Click on the checkbox for each agent you wish to disconnect.

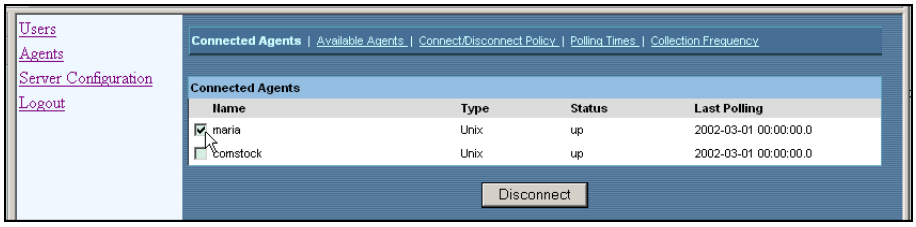


Figure 5.21 Manually disconnecting agents

5. Click **Disconnect**.

5.4.3 Connecting Agents Manually

Agents do not monitor resources and report to HiCommand™ Tuning Manager until you make them active. To make one or more agents active:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Agents**.

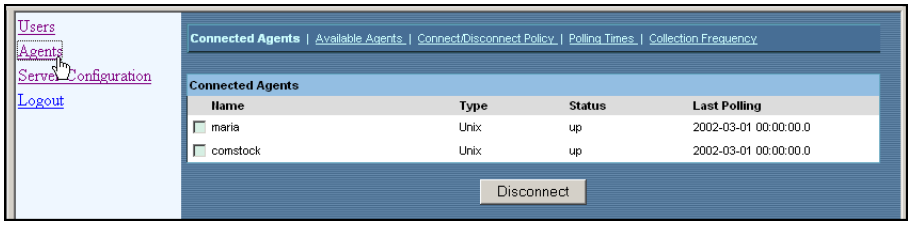


Figure 5.22 Agent list

3. Click on **Available Agents**.

HiCommand™ Tuning Manager displays a list of available inactive agents.

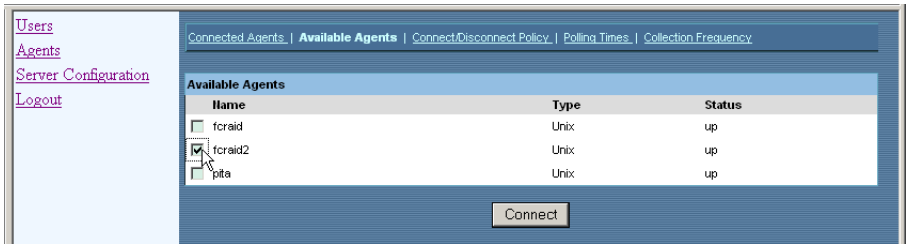


Figure 5.23 Manually connecting agents

4. Click on the checkbox for any agent(s) you wish to connect.
5. Click on **Connect**.
6. The agent(s) you checked no longer appear in the Available Agents list. The agent(s) now appear in the **Connected Agents** list.

Figure 5.24 Connected Agents list

5.5 Polling Times

Agents collect data hourly on the hour. You control what times HiCommand™ Tuning Manager polls the agents to collect the data from the agents. At each of the polling times, HiCommand™ Tuning Manager obtains resource data collected by the agent since the previous polling time.

5.5.1 About Polling Retries

HiCommand™ Tuning Manager provides for cases when a polling attempt fails. You can specify the number of retry attempts and the time intervals between each attempt.

5.5.2 Setting Polling Times

To set the times when HiCommand™ Tuning Manager will poll agents:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Agents**.

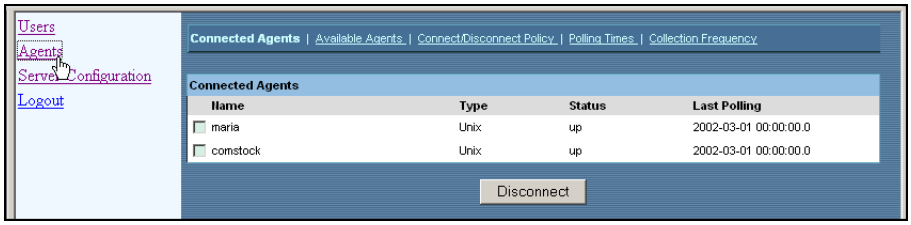


Figure 5.25 Agent list

3. Click on **Polling Times**.

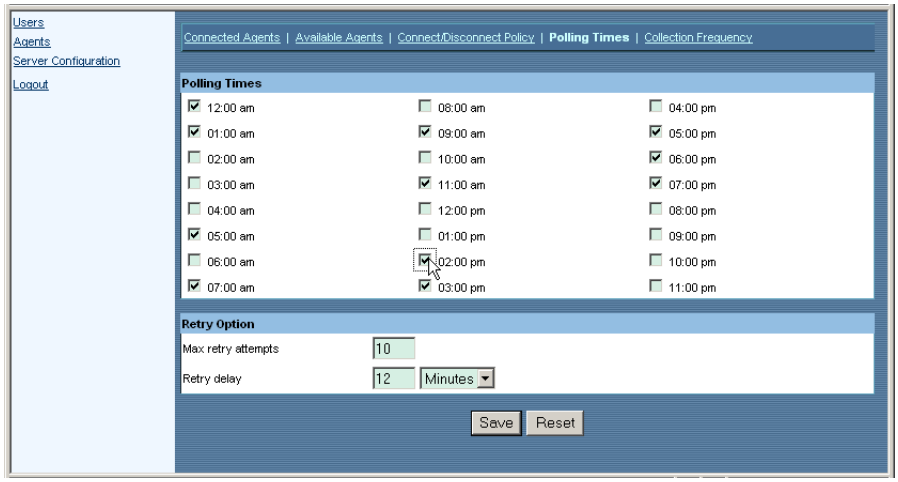


Figure 5.26 Polling times

4. Click on the checkboxes to select each polling time.
5. To control retry attempts, see **Setting Polling Retry Options** on page 79.
6. Click on **Save** to update HiCommand™ Tuning Manager. (Click on **Cancel** to abandon changes.)

5.5.3 Setting Polling Retry Options

You can determine how many times HiCommand™ Tuning Manager will attempt to poll agents for cases when an initial attempt fails.

To set the values for retry attempts.

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Agents**.

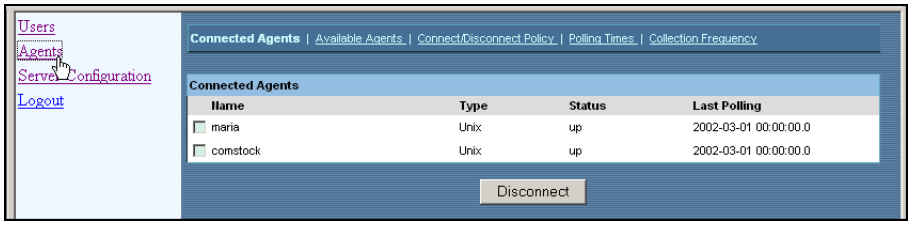


Figure 5.27 Agent list

3. Click on **Polling Times**.

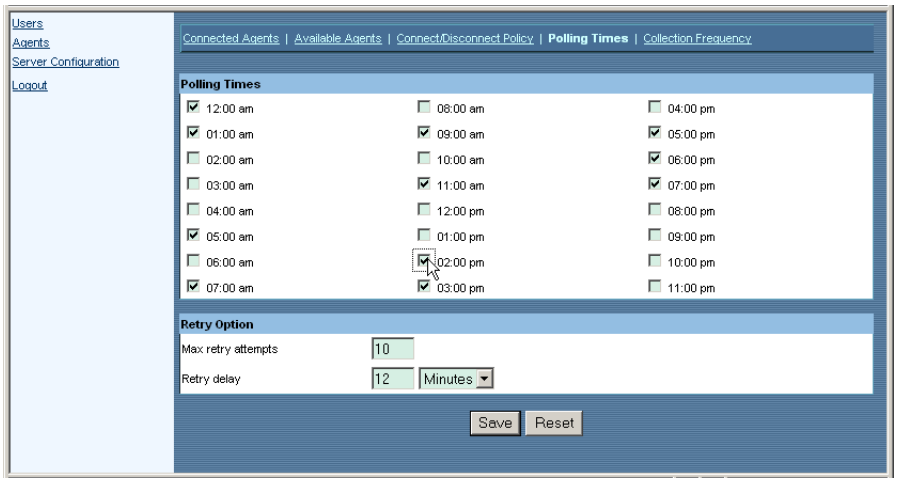


Figure 5.28 Polling times

4. Specify an integer value for **Max Retry Attempts**. (Use 0 to prevent retries.)
5. Specify an integer value for **Retry Delay**.
6. Click on **Save** to update HiCommand™ Tuning Manager. (Click on **Cancel** to abandon changes.)

5.6 Collection Frequency (Every Minute)

When you want a closer look at a particular resource, HiCommand™ Tuning Manager can institute an intensive minute-by-minute data collection routine at selected agents. You select as few or as many agents as you want for this intensive data collection feature.

- Minute data collection does not provide real-time access and analysis. HiCommand™ Tuning Manager obtains this data stream during the assigned polling times. (These occur no more frequently than hourly. For details see **Setting Polling Times** on page 78.)
- The data points collected using this capability are available only for displaying Basic Information. Minute data cannot be used for Advanced Information reporting. (For example, forecasts cannot be generated using this minute data.)
- Specifying an agent for minute data collection does not disrupt selection of the data connections that you specified for consolidation and reporting. (For details see **About Adding Agent Data Connections** on page 68)

5.6.1 Setting Data Collection To Every Minute

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Agents**.

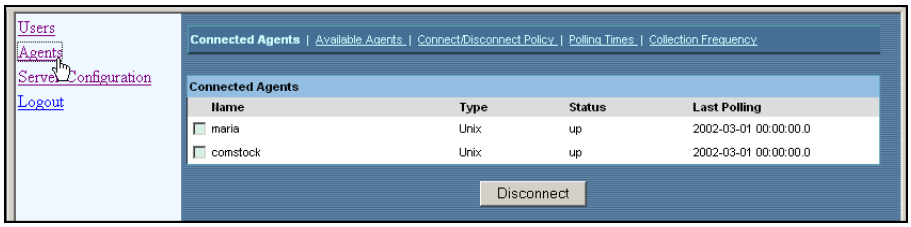


Figure 5.29 Agent list

3. Click on **Collection Frequency**.

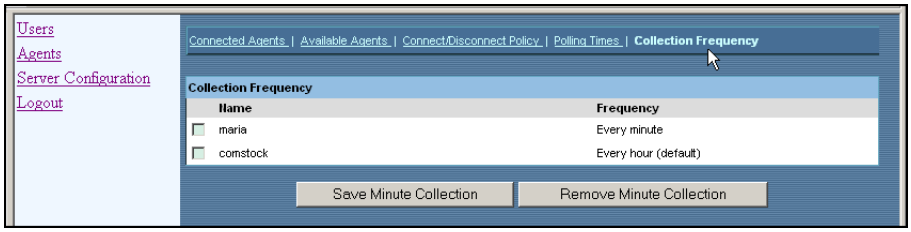


Figure 5.30 Collection frequency

4. Click on the checkbox for each of the agents from which you want to collect data on a minute-by-minute basis.
5. Click on **Save Minute Collection** to update HiCommand™ Tuning Manager.

(Click on **Remove Minute Collection** to abandon changes.)

Note: Minute data collection is not supported for Oracle agents.

5.7 Server Configuration

5.7.1 About Metrics Data Retention

This series of settings determines how long HiCommand™ Tuning Manager will hold data points for each time period before purging data from its database.

Each time period has a minimum acceptable value:

Time Period	Minimum Acceptable Value
Minutes	0
Hours	24
Days	31
Weeks	0
Months	3
Quarters	4
Years	0

- As you might expect, your choice of a retention value will determine the data storage usage in the HiCommand™ Tuning Manager database.
- The number of data points you specify for data retention will affect the scope of metrics reports.

5.7.2 Setting Metrics Data Retention

To set the retention periods for data in the HiCommand™ Tuning Manager database:

1. Login to the administration page. (See **Logging In As Administrator** on page 58.)
2. Click on **Server Configuration**.

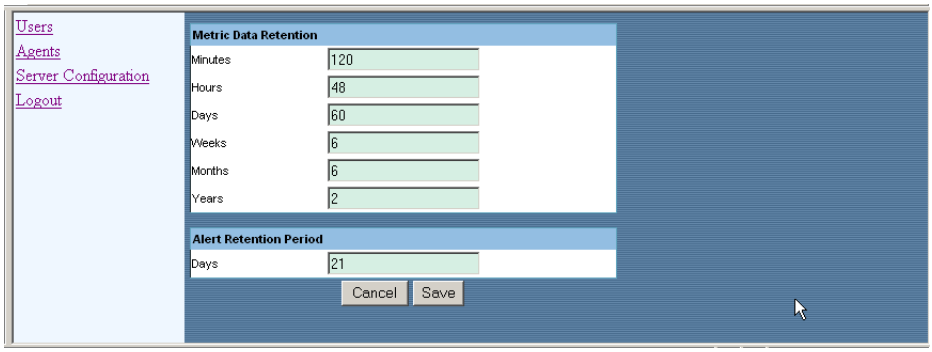


Figure 5.31 Metrics data retention settings

3. Type an integer value for Minutes.
4. Type an integer value for Hours.
5. Type an integer value for Days.
6. Type an integer value for Months.
7. Type an integer value for Quarters.
8. Type an integer value for Years.
9. Click on **Save** to update HiCommand™ Tuning Manager. (Click on **Cancel** to abandon your changes.)

5.7.3 Alert Retention

To set the maximum number of days for which Alerts will be retained:

1. Click on Server Configuration in the Navigation Frame.
2. Type in an integer value for the number of days.
3. Click on Save to update HiCommand™ Tuning Manager. (Click on Cancel to abandon your changes.)

6 - Troubleshooting

6.1 Errors

Table 6.1 HiCommand™ Tuning Manager errors

Message Code	Message
alerts-FATAL-0000	One time boundary is null, lastTs=%s , currTs=%s
alerts-FATAL-0001	Exception occured in method %s, Exception : %
api-FATAL-1000	No AttributeDef found for id : %s
api-FATAL-1804	Failed while removing agents.
api-FATAL-1801	Failed while updating the user information
api-FATAL-1001	No AttributeDef found for tagName : %s
api-FATAL-1002	User Profile could not be created. Error : %s
api-FATAL-1003	Unable to get the next Sequence Id.
api-FATAL-1004	Server Property File does not exist : %
pwproxy-FATAL-1000	Agent: %s: %s ResourceDef not found
pwproxy-FATAL-1001	Agent: %s: %s AttributeDef not found
pwproxy-FATAL-1002	Agent: %s: Unable to find %s resource: %s
pwproxy-FATAL-2000	PW: Function %s failed: %s

6.2 Logs

These are the logs maintained by HiCommand™ Tuning Manager:

Table 6.2 HiCommand™ Tuning Manager log files

Log File	Notes
/logs/htm.log	Contains all HiCommand™ Tuning Manager errors.
/logs/stderr.log	Contains low level messages from the Tomcat application server. **Note:**
/logs/stdout.log	Contains low level messages from the Tomcat application server. **Note:**

7 - Glossary

Average IOPS

The mean value of all **IOPS** measures for the **Viewpoint** time period.

Average Transfer

The mean value of all **Transfer** measures for the **Viewpoint** time period.

Bookmarks

Named links kept in HiCommand™ Tuning Manager which you save for easy access to pages throughout the software.

Capacity

Total storage space.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Capacity Forecast

Predicted future storage free space and usage. A **Forecast** uses historical data as a sample to anticipate future values.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Capacity History

Total storage space over your specified time span.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Collection Interval

HiCommand™ Tuning Manager stores metrics values for these intervals: hourly (every hour), daily (every day), monthly (every month) and yearly (every year).

Confidence Level

The confidence level you select for a forecast determines how broad a charted region will be drawn between likely upper and lower bounds.

At a 0.95 confidence level, there is a 95% likelihood that the forecasted values will appear between the upper and lower error margins. (If you specify a 0.99 confidence level, the resulting chart presents a broader region between the upper and lower error margins.)

CPU Usage

Percentage of total CPU capacity used.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Data File

A collection of data stored on media as a unit within the filesystem.

Data Files

Collections of data stored on media as a unit within the filesystem.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Data Point

A value for a specific metric at a specific point in time.

Device File

On systems running the UNIX operating system, a file with specifications for a physical device. A device file indicates the location, type and method of access to a physical device

Disk Group

A group of disks representing a single logical storage resource.

Filesystems

The number of filesystems.

A filesystem is the scheme defining logical structures and software routines used to control access to the storage on a hard disk system.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Also see **Local Filesystems**, **Filesystem Type**, **Imported Filesystem** and **Filesystems Over Capacity**.

Filesystems Over Capacity

Filesystems where usage exceeds a predetermined percentage threshold of used capacity.

You set this threshold in the **Profile** section.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Filesystem Type

The method used for storing and organizing data within a given operating system.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Forecast

Forecast reports depict linear and non-linear trends in time series and allow you to project (forecast) those data in to the future.

Forecast History

The collection of **Data Point**s used to make a forecast. At least 6 data points should be in the history to ensure meaningful forecasts.

Forecast Horizon

The number of **Data Point**s to be forecasted, or the time span to be forecasted e.g.: 3 months, 5 days. The forecast horizon should not span more then 20% to 25% of the forecast history. (e.g.: If you have 12 monthly data points in your history, then your forecast horizon should be set no higher than 3 monthly **Data Point**s.

The data period is always the same for history and horizon. (If the history is made up of daily data points, then the periods used in the forecast are also daily.)

Forecast Interval

See **Forecast Period**.

Forecast Period

Defines the time between two forecasted data points. (e.g.: monthly, weekly, daily)

Free

The total available capacity.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Free %

The percentage of free capacity as a percentage of all capacity.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Growth Rate

The growth rate compares the current and previous capacity usage values within the **Collection Interval** currently set in your **Viewpoint**. (If your Viewpoint is set to hourly, the base value will be the **Used** measured in the previously collected hour. This will be compared to the current usage measure.

Assuming that the current Viewpoint period is set to Hourly, the growth rate reported by HiCommand™ Tuning Manager is the result of this formula:

```
(Current Hour Capacity - Previous Hour Capacity)
/ Previous Hour Capacity
```

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Host

A TCP/IP-accessible computer (or entity) to which one or more storage subsystems are attached. In addition to its TCP/IP address, each host also has a name or alias.

Imported Filesystem

External filesystems mounted on a UNIX host or made accessible to a Windows operating systems via sharing.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Information Frame

The area in the HiCommand™ Tuning Manager web client displaying data about the level you have chosen in the **Resource Tree**.

Inodes

In UNIX filesystems, inodes contain critical information about a file's user and group ownership and access permissions.

- To find the inode number for a given UNIX file, use the command: `ls -i`.
- To determine the inode information for a given UNIX file, use the command `ls -l`.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Instance

An allocated memory area known as the "SystemGlobalArea" and one or more Oracle processes. Every Oracle database must be associated with at least one Oracle instance.

IOPS

Input/Output operations per second.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Also see **Read IOPS** and **Write IOPS**.

Local Filesystems

Filesystems directly connected to a host computer.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Logical Device

A numbered component using a logical or physical connection to a host. Each logical device has its own set of resources.

Logical Disk

A series of drives linked in such a way that the operating system views the entirety as a single storage device.

RAID controllers provide one form of managing logical disks while providing benefits in the form of improved reliability, data availability and performance.

(Also known as: logical drives, volumes, volume sets, logical storage units, logical units, units, and LUNS.)

LUN (Logical Unit)

See **Logical Disk**.

Maximum IOPS

The highest value of all **IOPS** measures for the **Viewpoint** time period.

Maximum Transfer

The highest value of all **Transfer** measures for the **Viewpoint** time period.

Memory

Random Access Memory.

Metric Substitution

When an agent is unavailable at a polling time, HiCommand™ Tuning Manager will substitute the most recently collected metric for that storage resource. (For more information, see **When An Agent Stops Communicating** on page 69.)

Minimum IOPS

The minimum value of all **IOPS** measures for the **Viewpoint** time period.

Minimum Transfer

The minimum value of all **Transfer** measures for the **Viewpoint** time period.

Mountpoint

Before a device is accessible (mounted) by UNIX, a directory must be specified as the logical location for that device. The mountpoint is a directory used for that purpose.

HiCommand™ Tuning Manager reports the number of mountpoints on the monitored whole network and its resources. (This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Navigation Frame

The area in the HiCommand™ Tuning Manager web client where you control what kinds of data will be displayed. The Navigation Frame includes the **Resource Tree** and choices for editing your **Profile** and setting **Bookmarks**.

Operating System

The controlling software managing a computer's routing of storage, memory, display and peripheral devices.

Oracle Capacity

The total storage capacity allocated to Oracle.

Oracle Instances

One or more Oracle processes. Every Oracle database must be associated with at least one Oracle instance.

Port

A logical connection to a disk array allowing multiple simultaneous read and write transactions.

Profile

Your user identity for HiCommand™ Tuning Manager login and your email account.

RAID

Redundant Array of Independent Disks. An assemblage of two or more disk drives to improve fault tolerance and/or performance.

RAID Level

Level of functionality for a RAID subsystem:

Level 0: Provides data striping (placing blocks of each file across multiple drives). This provides performance benefits but no redundancy.

Level 1: Provides mirroring where duplicate data is written redundantly to more than one drive.

Level 3: Provides striping plus error correction. One drive is dedicated to storing error correction data.

Level 5: Provides byte-level data striping and also stripe error correction.

RAID Group

A logical volume consisting of an array of disk drives that using ports in one or more multiples of four channels. Normally this array makes use of striping. This provides good load balancing with a high degree of data availability

Raw Devices

Devices not allocated to a filesystem.

Read IOPS

Read operations per second.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Read Hit Ratio

The number of read transactions divided by the number of transactions. (When presented as a percentage, the resulting value is multiplied times 100.)

Read Transfer

The speed of data movement for read operations.

Resource Tree

A hierarchical presentation of the storage-related and application-related resources monitored by HiCommand™ Tuning Manager. The Resource Tree appears within the **Navigation Frame**.

Rollback Segments

The number of rollback segments within the tablespace(s).

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Server

Servers are storage-oriented hosts on a given network or subnetworks.

The Servers metric displays the number of storage hosts at the level you have selected in the **Resource Tree**.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Servers

Servers are storage-oriented hosts on a given network or subnetworks.

The Servers metric displays the number of storage hosts at the level you have selected in the **Resource Tree**.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

SNMP

Simple Network Management Protocol. A standard protocol with interfaces for managing and monitoring network resources.

SNMP trap

An event notification issued by an SNMP agent.

Sort Segments

The number of sort segments within the tablespace(s).

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Storage Subsystem

A physical device containing an array of disk drives acting as a single unit for the purposes of data storage and retrieval.

Subnetwork

A subset of a larger network with its own IP range.

Subnet Capacity

Total storage capacity for a subnetwork.

Subnet Capacity History

Total storage capacity for a subnetwork for the time frame you specify.

Subnet

The name and/or IP range for a subnetwork (a subset of a larger network with its own IP range).

Tablespace

A logical allocation of Oracle capacity dedicated to storing table data.

Tablespaces

A logical allocation of Oracle capacity dedicated to storing table data.

Tablespace name

Name of an Oracle logical allocation dedicated to storing table data.

Target

The resource for which information is requested or has been gathered.

Transfer

The rate at which data is moved.

Also see **Read Transfer** and **Write Transfer**.

URL

Uniform Resource Locator: the global address scheme for documents and other resources on the World Wide Web.

Used

The portion of capacity consumed.

Viewpoint

Your specifications for time frame and interval:

- Time
- Period interval

A viewpoint yields a snapshot for:

- A point in time.
  Specify current time (default), or a date/time combination of your choice.
- A specific reporting period interval.
  Your choices are hourly (default), daily, weekly, monthly, yearly.

Virtual Disk

See **Logical Disk**.

Whole network

The entire scope of resources available to HiCommand™ Tuning Manager along with its subnetworks and storage-related servers.

Whole Network Capacity

Total storage space for all resources available to HiCommand™ Tuning Manager along with its subnetworks and storage-related servers.

Write Hit Ratio

The number of write transactions divided by the number of transactions. (When presented as a percentage, the resulting value is multiplied times 100.)

Write IOPS

Write operations per second.

(This value is aggregated for all sub-resources below the level you have selected in the **Resource Tree**.)

Write Transfer

The speed of data movement for write operations.

WWN Node

A resource with at least one unique IP address addressable by **URL**.

WWN Port

A port on an **WWN Node**.

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