Sun Cobalt™ Control Station

Health Monitoring Module



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Health Monitoring Module

This document explains the features and services available through the Health Monitoring control module. This module allows you to:

- view a summary of the Active Monitor data for an appliance or group of appliances
- update the Active Monitor data for an appliance or group of appliances
- configure the parameters for the Health Monitoring module

For more information on Active Monitor, see "Active Monitor" on page 3.



Note: In most of the short procedures in this chapter, the first step is to click the **Control Modules** tab in the top menu bar and the second step is to click on a selection from the left menu bar.

To reduce the number of steps in each procedure, the menu commands are grouped together and shown in **bold** type face. Right angle brackets separate the individual items.

For example, select **Control Modules > Health Monitor > Summary** means to click the **Control Modules** tab in the top menu bar, click the **Health Monitor** menu category in the left menu bar and finally click the **Summary** sub-menu item.

Progress bar

When you execute a task in the control modules, a progress bar displays the status of the task. You do not have to wait until the task is completed before performing another operation on the control station. You can select other commands or menu items on the Server Desktop UI while the task continues in the background.

Event-based monitoring

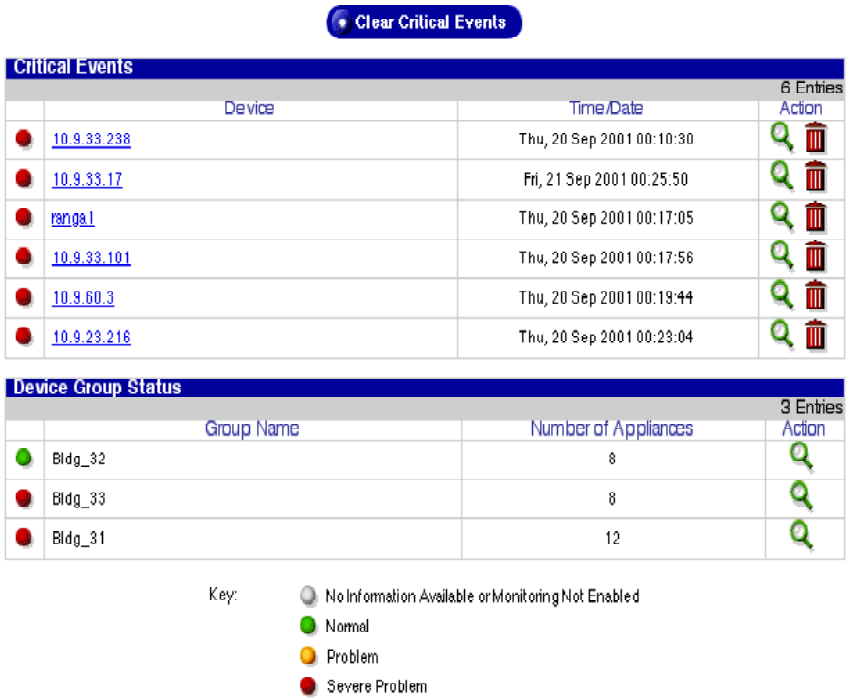
The model implemented for the Health Monitoring Module is event-based. This simply means that the managed appliance informs the control station when it has a problem. This model provides a faster process for collecting health data from the managed appliances.

Figure 1 shows the “Health Monitor” tables.

Note: To ensure that integrity of the system is maintained, the Sun Cobalt Control Station also runs a poller. You can set the interval at which this poller runs; a large interval (for example, 12 hours) ensures that the control station does not generate constant network traffic or waste CPU cycles.

The poller reads the Active Monitor information from each appliance. For more information, see “Active Monitor” in the PDF *Administrator Manual*.

Figure 1. Health Monitor tables



Active Monitor

Active Monitor is a utility that runs on a Sun Cobalt server appliances and updates key system and service status every 15 minutes.

The Health Monitoring Module reads this information from each appliance and uses this information to determine the state of the appliance.

Status colors

The status of each service or hardware component is indicated by a grey, green, yellow or red circle beside each item. The colors have the following significance:

- **Grey—**No information is available, or the service or the monitoring feature is not enabled on the appliance.
- **Green**—The services and components are functioning normally.
- **Yellow—**There is moderate use on the server or a component is recovering.
- **Red—**There is heavy use on the server or a failure.

Health Monitor icon



The Health Monitor icon in the top right corner flashes red if there is a problem with any of the services or hardware components on a managed appliance.

The Events table is checked every two minutes. If a transition to a “warning” or “critical” event is detected, then icon begins to flash red.

Health Monitor screen

When you click the **Health Monitor** menu item on the left, the sub-menu items allow you to view the current status or update the status of the services and hardware components for managed appliances.

The sub-menu items are:

- Summary (see “Summary” on page 5)
- View all devices (see “View all devices” on page 10)
- Settings (see “Settings” on page 11)

Summary

The **Summary** sub-menu item displays a summary of the health-monitoring data for the managed appliances.

When you click on the **Summary** sub-menu item, the "Critical Events" and "Device Group Status" tables appear; see Figure 1.

- The "Critical Events" table displays events that the Administrator should address immediately.
- The "Device Group Status" table displays the general status of the groups of appliances on the control station.

When you click a green *magnifying-glass* icon to see more detailed information for an appliance, three tables appear:

- The "Base System Components" table displays information on: CPU, Disk, Memory and Network.
- The "Base Services" table displays information on the various services that are running on that particular appliance, for example, FTP server, telnet server, Email server or DNS server. These items can vary depending on the type of appliance you are viewing.
- The "Other System Services" table displays information on third-party or customized services that the administrator has added to an appliance.



Note: To add a new Health Monitoring service, see "Adding new services to the Health Monitoring module" on page 13.

Link to Administration screen of a managed appliance

In the information tables, the host name or IP address of an individual appliance appears as a hypertext link. If you click on a link, a new browser window opens to the Administration screen of that appliance.



Note: You require the user name and password of the administrator to access this appliance.

Viewing the health-monitoring data

To view a summary of the health-monitoring data on a managed appliance:

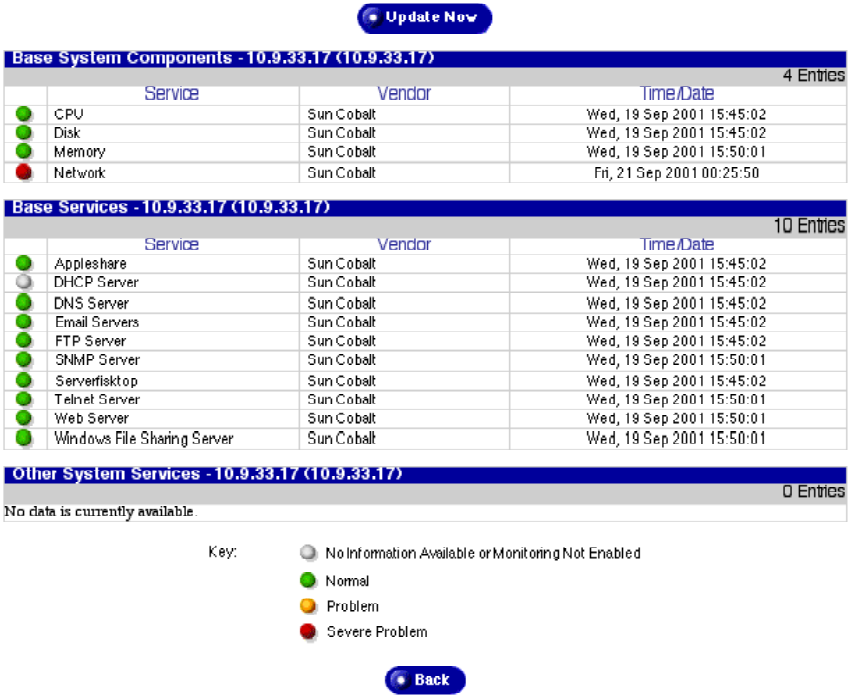
1. Select **Control Modules > Health Monitor > Summary**. The "Critical Events" and "Device Group Status" tables appear.
2. To view more detailed information on an appliance or a group, click the green *magnifying-glass* icon next to the item in the Action column. More detailed tables of information appear; see Figure 2.
3. If you view the details for a critical event, the following information tables appear:
   - Base System Components
   - Base Services
   - Other System Services

   Click **Back** to return to the previous screen.
4. If you view the details for a device group, the table listing the appliances belonging to that group appears.

   You can then click on the green *magnifying-glass* icon next to the appliance in the Action column. The same information tables appear:

   Click **Back** to return to the previous screen.

Figure 2. Detailed information tables



Clearing a critical event

To clear a particular critical event from the "Critical Events" table or to clear all critical events:

1. Select **Control Modules > Health Monitor > Summary**. The "Critical Events" and "Device Group Status" tables appear.
2. To clear a particular critical event from the table, click the red *trashcan* icon next to the event in the Action column.

   The "Critical Events" table refreshes with that critical event removed from the table.
3. To clear all critical events from the table, click **Clear Critical Events** at the top of the table.

   A confirmation box appears, stating that this choice will clear the device-generated critical events, and that this device will be ignored until the critical event or events are cleared from the managed device.
4. Click **OK**. The "Critical Events" table reappears with no entries.

Updating the health-monitoring data

You update the information for each machine individually. The Update feature is available when you are viewing the detailed information tables for an individual appliance.

To update the health-monitoring data on a managed appliance:

1. Select **Control Modules > Health Monitor > Summary**. The "Critical Events" and "Device Group Status" tables appear.
2. To view more detailed information on an appliance or a group, click the green *magnifying-glass* icon next to the item in the Action column. The detailed tables of information appear.
3. If you view the details for a critical event, the following information tables appear:

   - Base System Components
   - Base Services
   - Other System Services

   Click **Back** to return to the previous screen.
4. If you view the details for a device group, the table listing the appliances belonging to that group appears.

   You can then click on the green *magnifying-glass* icon next to the appliance in the Action column. The same tables appear:

   Click **Back** to return to the previous screen.
5. When you reach the screen showing the detailed information tables for an appliance, click **Update Now** above the table. This forces the managed appliance to send its health data to the control station.

   A confirmation box appears, asking if you want to update the current information.
6. Click **OK**. After a few moments, the screen refreshes with the updated information.

View all devices

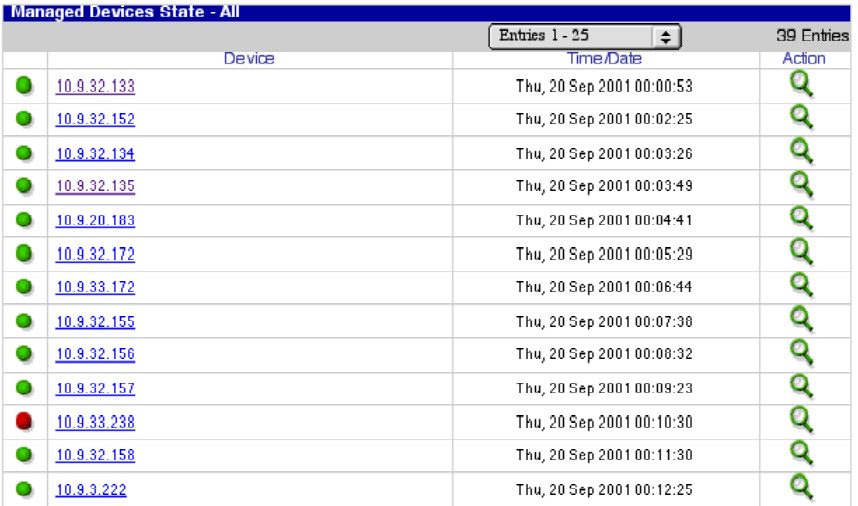
To view the overall health for each of the managed appliances in one table:

1. Select **Control Modules > Health Monitor > View All Devices**. The "Managed Devices State – All" table appears, displaying the list of managed appliances; see Figure 3.
2. To see more details on an individual appliance, click the green *magnifying-glass* icon next to the appliance in the Action column. The following information tables appear:
   - Base System Components
   - Base Services
   - Other System Services

   Click **Back** to return to the previous screen.
3. When you reach the screen showing the detailed information tables for an appliance, you can click **Update Now** above the table. This forces the managed appliance to send its current health data to the control station.

   A confirmation box appears, asking if you want to update the current information.
4. Click **OK**. After a few moments, the screen refreshes with the updated information.

Figure 3. View all devices table



Settings

The Poller Interrval indicates when a polling cycle begins (for example, every four hours). However, if a polling cycle is still in progress, a second polling cycle does not begin until the first cycle has finished.

For example, if, due to the number of managed appliances, a complete polling cycle takes 20 minutes and you set the poller interval to five minutes, the second polling cycle does not begin until the first cycle has finished after 20 minutes.

To configure the settings for the Health Monitoring application:

1. Select **Control Modules > Health Monitor> Settings**. The "Health Monitor Properties" table appears; see Figure 4.
2. You can configure the following parameters:

   - **Poller Interval (in hours)**. Set the interval at which the control station performs the periodic query for state data from the managed appliances. Use the pull-down menu to select a value.
   - **Notification Email Address**. This email address receives alerts from the Health Monitoring module when there are critical system events (red circle).

     You can enter only one email address in this field.



Note: If you enter an email address for an appliance's administrator when adding the appliance to the control station, that email address also receives from the Health Monitoring Module the notifications for that particular appliance.

   - **CPU Yellow Alarm**. Enter the threshold at which a yellow alarm is generated. This value represents the average load of the CPU. The default value is 3; a recommended maximum is 7.
   - **CPU Red Alarm**. Enter the threshold at which a red alarm is generated. This value represents the average load of the CPU. The default value is 6; a recommended maximum is 15.
   - **Disk Yellow Alarm**. Enter the threshold at which a yellow alarm is generated. This value represents a percentage of hard-disk-drive usage. The default value is 80; a recommended maximum is 90.

     For example, a value of 80 means that a yellow alarm is generated when the 80% of the capacity of the hard disk drive is used.

- **Disk Red Alarm**. Enter the threshold at which a red alarm is generated. This value represents a percentage of hard-disk-drive usage. The default value is 90; a recommended maximum is 95.

  For example, a value of 90 means that a yellow alarm is generated when the 90% of the capacity of the hard disk drive is used.

- **Memory Yellow Alarm**. Enter the threshold at which a yellow alarm is generated. This value represents a percentage of memory usage. The default value is 50; a recommended maximum is 75.

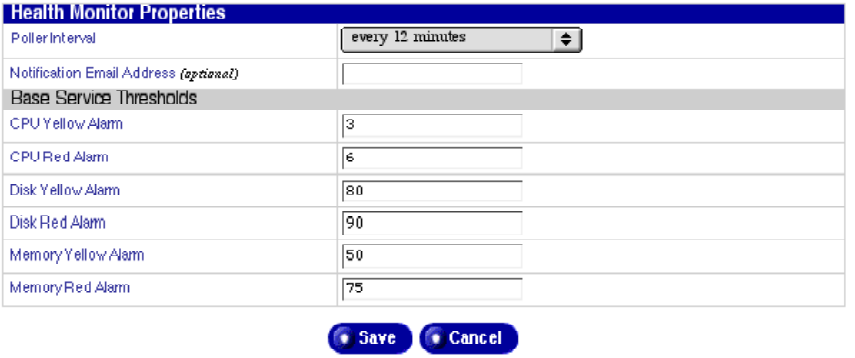
  For example, a value of 50 means that a yellow alarm is generated when the 50% of the memory is in use.

- **Memory Red Alarm**. Enter the threshold at which a red alarm is generated. This value represents a percentage of memory usage. The default value is 75, a recommended maximum is 90.

  For example, a value of 75 means that a red alarm is generated when the 75% of the memory is in use.

3. Click **Save**. The "Health Monitor Properties" table refreshes.

Figure 4. Health Monitor Properties table



Adding new services to the Health Monitoring module

The Health Monitoring Module allows you to incorporate customized scripts to execute and monitor. A script is executed and, based on the results, may send an event that causes an alarm or critical event on the Sun Cobalt Control Station. The specific information associated with the event are presented in the "Other Services" table in the detailed-information screen. Clearing the "Critical Event" table resets the alarms (meaning that the Health Monitoring icon returns to normal).

To make it easy to customize the Health Monitoring Module, the module uses a configuration file to specify details on the customized scripts. From this configuration file, the Health Monitoring daemon acquires the name of the monitor, description, program to run, and the text for each of the states that the program will supply.

The states are 0, 1, 2 or 3; they correspond to the criticality of the problem and thus to the color of the state presented in the Health Monitoring tables. The states are defined as:

- State 0 = Unavailable service (gray circle)
- State 1 = Service is all OK (green circle)
- State 2 = Warning state (yellow circle)
- State 3 = Critical state (red circle)

Format of the configuration file

The format of the configuration file is as follows:

- **version**—the version of the configuration file or monitor script

  Example: version 1.0

- **program**—the full path name of the script to be run at each interval

  Example: /usr/mgmt/bin/cobalt_db.pl

- **vendor**—a string that specifies the vendor or owner of the monitor

  Example: Vendor Test

- **interval**—the interval at which the monitor runs, in minutes

  Example: 10

- **name**—a string specifying the name of the monitor

  Example: Database Check

- **description**—a string specifying a brief description of the monitor

  Example: Monitors the database

- **state0msg**—the string specifying the message to send with an event when the state is “unavailable” (gray circle)

  Example: The database server is not monitored/state unavailable.

- **state1msg**—the string specifying the message to send with an event when the state is “good” (green circle)

  Example: The database server is online.

- **state2msg**—the string specifying the message to send with an event when the state is “warning” (yellow circle)

  Example: The database server is in limbo.

- **state3msg**—the string specifying the message to send with an event when the state is “critical” (red circle)

  Example: The database server is offline.

The program specified in the configuration file is required to return a “numeric” value of 0, 1, 2 or 3. When the Health Monitoring daemon runs a polling pass (approximately every 15 minutes), the program specified in the configuration file is executed.

The results (a value of 0, 1, 2 or 3) are captured and stored after the program is executed for the first time. From that point on, each time the Health Monitoring daemon runs, the results are compared to the previous results. If the results are different, an event is generated and sent to the control station. The event contains the state, message associated with the state, name, version and description of the service. If a “yellow” or “red” state is returned, a critical event is generated on the control station and the Health Monitor icon in the top-right corner begins to flash.

The configuration file must be placed in the `/usr/mgmt/etc/hmd` directory and the monitor script in the `/usr/mgmt/bin` directory. The Health Monitoring daemon looks at all the configuration files upon startup and sends this information to the Sun Cobalt Control Station where it is loaded into the database. The daemon must therefore be restarted each time a new service is added.

Include these steps in the install script so that, during installation, the files are placed in the correct directories and the daemon is restarted.

Creating a new service

To create a new Health Monitoring service:

1. Create the configuration file with the various settings for the new service.

   Name the configuration `filename.conf` (for example, `cobalt_db.conf`. All of the configuration files are placed in the `/usr/mgmt/etc/hmd` directory.

   This is what a sample configuration file would look like:

```
version 1.0
program /usr/mgmt/bin/cobalt_db.pl
vendor Vendor Test
interval 10
name Database Check
description DB Monitor
state0msg The database server is not monitored/state
unavailable.
state1msg The database server is online.
state2msg The database server is in limbo.
state3msg The database server is offline.
```

2. Create a script to monitor the new service (the *program* setting in the configuration file). All of these monitor scripts are placed in the `/usr/mgmt/bin` directory.

   For example, the monitor script for the service Database Check (`cobalt_db.pl`) would look like:

```
#!/usr/bin/perl
use Cobalt::Meta;

$PGDATABASE = "cobalt";
$PGPORT     = 5583;
$PGUSER     = "admin";

## Check whether you can connect to the database
$dbc = Cobalt::Meta::connect($PGDATABASE, $PGUSER, $PGPORT);
if ($dbc && $dbc->status eq Pg::PGRES_CONNECTION_OK) {
  print "connection to db is successful.. \n";
  Cobalt::Meta::db_reset($dbc);
  exit 1;
}
else {
  print "error connecting to db.. \n";
  exit 3;
}
```

   In this case, there are only two possible states: the database is either online or offline. The only two states required are 1 and 3. The configuration file could have just two state messages:

   state1msg The database server is online.

   state3msg The database server is offline.

3. In the install script, include two directives specifically for the new Health Monitoring service.

   a. Copy the configuration file and the monitor script to the correct locations

   ```
   echo "Copying script to /usr/mgmt/bin " >> $LOG
   cp /YourDirectory/patches/cobalt_db.pl /usr/mgmt/bin/
   echo "Copying config file to /usr/mgmt/etc/hmd " >> $LOG
   cp /YourDirectory /patches/cobalt_db.conf /usr/mgmt/etc/hmd/
   ```

   b. Restart the Health Monitoring daemon so that it reads the new service settings and sends the data to the control station.

   ```
   /etc/rc.d/init.d/hmd.init restart
   ```

4. Create a package file for each type of appliance on which you wish to install this new Health Monitoring service (for example, a Sun Cobalt CacheRaQ™ and a Sun Cobalt Qube™ 3).

5. Upload the package to the control station through the Software Management Module. Use Software Management Module either to publish the package or to install on selected appliances.

   For more information, refer to the PDF *Software Management Module*.