

# AppPerfect™

## Agentless Monitor 9.6.0

### User Guide

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#### Acknowledgement of Third Party Software

This AppPerfect software contains certain third party software as listed below which are acknowledged here. These are open source software for which you may obtain source and binaries from the URL listed next to the software.

- Apache Ant (<http://ant.apache.org/>)
- Apache BCEL Library (<http://jakarta.apache.org/bcel/index.html>)
- Apache Commons Library (<http://jakarta.apache.org/commons>)
- Apache Jakarta ORO (<http://jakarta.apache.org/oro/index.html>)
- Apache Log4J (<http://jakarta.apache.org/log4j>)
- Apache POI Excel Library (<http://jakarta.apache.org/poi/index.html>)
- Apache Struts Framework (<http://jakarta.apache.org/struts>)
- Apache Tomcat JSP/Servlet Engine (<http://jakarta.apache.org/tomcat>)
- Apache Xerces XML Servlet (<http://xml.apache.org/xerces2-j/index.html>)
- Eclipse.org (<http://www.eclipse.org>)
- HSQL Database Engine (<http://hsqldb.sourceforge.net/>)
- HTML Parser (<http://htmlparser.sourceforge.net>)
- HttpUnit (<http://httpunit.sourceforge.net/>)
- HtmlUnit (<http://htmlunit.sourceforge.net/>)
- Impression Math Expression Java parser (<http://impression.sourceforge.net/>)
- iText PDF Library (<http://sourceforge.net/projects/itext/>)
- Jasper Reports (<http://sourceforge.net/projects/jasperreports>)
- JavaAssist (<http://www.jboss.org/products/javassist>)
- Java Communications API (<http://java.sun.com/products/javacomm/>)
- JDesktop Integration Components (<https://jdic.dev.java.net/>)
- JDBM (<http://jdbm.sourceforge.net/>>)
- JgMail Java mail package (<http://www.messners.com/>)
- JoeSNMP (<http://www.opennms.org/files/releases/joesnmp/>)
- jregex - regular expressions for Java (<http://sourceforge.net/projects/jregex>)
- JUnit (<http://www.junit.org/index.html>)
- JCraft JSch (<http://www.jcraft.com/jsch/index.html>)
- Mibble SNMP MIB browser (<http://www.nongnu.org/mibble/index.html>)
- Quartz Scheduler (<http://www.quartzscheduler.org/>)
- Remote Tea ONC/RPC for Java (<http://www.plt.rwth-aachen.de/ks/english/remotetea.html>)
- Rhino (<http://www.mozilla.org/rhino/>)
- SmsJ SMS library for the Java platform (<http://sourceforge.net/projects/smsj/>)

- StrutsTestCase for JUnit (<http://strutstestcase.sourceforge.net/>)

## Introduction

AppPerfect Agentless Monitor is a system monitoring system that includes the AppPerfect Monitor and AppPerfect Controllers.

The AppPerfect Agentless Monitor is a new generation of Web-based server capable of continuously monitoring your application infrastructure and providing with online status as well as alert you of any conditions that need your attention. Going beyond the old paradigm of installing countless agents on each monitored device, the AppPerfect Agentless Monitor has sophisticated built-in intelligence to monitor devices without the need for intrusive and resource-consuming agents.

The AppPerfect Controllers are adapters that communicate with the monitored device and extract the necessary monitoring information. AppPerfect Controllers are capable of monitoring a wide range of devices and applications including operating systems, Java/J2EE application servers, databases, Web servers and any device with an SNMP agents such as routers.

A key aspect of ensuring optimal performance management of an application is to ensure it operates within acceptable "parameters". Such parameters could include general attributes such as the amount of system resources that are consumed to more fine-grained metrics such as response times for specific requests.

With some basic knowledge about your application infrastructure, well-designed parameters can be invaluable in ensuring the reliability and responsiveness of your application.

### Need for a Monitor

Imagine you were responsible for ensuring the availability and responsiveness of your application infrastructure. Some of the most basic questions you would need to know on an ongoing basis would be:

- Is my application available to my end users?
- Is my application's response time within acceptable parameters?
- Are sufficient system resources available to my application?
- How will I know if my application goes down in the middle of the night?
- Can I keep track of all my machines/systems/applications from a single place?
- How can I learn from my application's usage pattern to improve the end-user experience?
- Can I do all this without a lot of overhead on myself and my system resources?

The AppPerfect Monitor has been designed to answer such questions.

### AppPerfect Monitor Key Features

AppPerfect Monitor provides you a comprehensive solution to monitor a wide array of various application servers/operating systems/hardware devices/databases/Web Servers and so on present in your application infrastructure. The features provided are listed below:

- **Agentless** :AppPerfect Monitor is a new generation of monitoring systems that do not depend on the traditional/legacy agents-based approach to monitoring. Agents impose a great deal of complexity to the monitoring infrastructure and consume large amounts of resources and are intrusive. Agentless monitors, instead, depend on remotely taking advantage of services available on the monitored device. Technique utilized to monitor each device differs, however, the common goal is to make it unnecessary to spend huge amounts of time and resources dealing with a legacy agents-based monitoring system.
- **Pure Web-based, customizable UI** :The AppPerfect Monitor uses a three-tier application architecture with a pure Web-based user interface. The UI is intuitive and easy to use. No need to install large applications or applets to be able to monitor your application infrastructure. With only a browser and Web access, you can easily and seamlessly keep track of your application infrastructure from virtually anywhere.
- **Ultra light-weight device controllers** : Each supported "device" has a corresponding "controller" available inside the AppPerfect Monitor. These controllers monitor their respective devices in a non-intrusive manner. The overhead involved with this type of monitoring is often minimal. Most often, the device's built-in services are utilized to extract monitoring information. Configuring the controllers is a snap and often requires only the bare minimal information. A wide variety of devices are currently supported. With an open interface, custom controllers are also possible.
- **Robust data management** :AppPerfect Monitor provides extensive support to gather and manage the collected data. Frequency of data collection can be set to achieve a granular view of your application infrastructure. As the new devices and data grow, support for data consolidation and data archiving is provided. For data that is no longer needed, data purging is supported.
- **Sophisticated rules engine for alerts** :AppPerfect Monitor provides a sophisticated rules engine to help you design insightful rules to monitor your application infrastructure and alert you when something is not right. AppPerfect Monitor UI provides a "Rule Builder" which makes creation of rules a relatively simple task. Unlike some tools, AppPerfect Monitor fully supports rules where time and duration are a component. For example, send an alert if CPU Usage stays above 90% for 15 seconds.
- **Automated alert notification** :If a monitored application or device violates any of the rules that are defined, the notification server in AppPerfect Monitor will create an "alert" and automatically notify the necessary personnel about the violation. The recipients of the alert are defined when the rule is defined. Notification can be sent in a variety of mediums, including email and SMS. The notification server provides an open interface which can be extended to provide the user a customized notification mechanism.
- **Powerful reporting infrastructure** :AppPerfect Monitor provides powerful, real-time, informative and accurate reports that help you trace problems that might be present in the system. Reports are typically used to analyze data that spans over a period of time. Often, such data analysis helps in better understanding the user experience. AppPerfect provides you with extensive reporting capability. You can customize and generate reports that provide you information that is tailor made to your requirements. It allows you to leverage existing content in several formats. A full featured "Report Designer Wizard" makes it easy to build comprehensive, high-impact, presentation quality reports. Reports can be generated as HTML and PDF formats.
- **Security and access control** :AppPerfect Monitor provides for security and controlled access to all aspects including viewing status, reports, rules, alerts and so on for viewing of reports and access to the configuration sections of the AppPerfect Monitor. Access is based on users and groups, with a super-user controlled overall privilege structure.
- **Data Management** :AppPerfect Monitor provides support for data consolidation, archiving, purging of data.

### AppPerfect Controllers

AppPerfect Controllers are modules within AppPerfect Monitor that provide support and monitor different devices. Currently, the following controllers are available with AppPerfect Monitor:

#### Java/J2EE controllers

Provides support to monitor performance metrics of Java components present in your application infrastructure. Following data can be monitored

- Enterprise JavaBeans (EJB)
- Databases through JDBC
- Web applications through JSP/Servlets
- Java Messaging Service through JMS
- Any user-specified custom class or method

Currently, the following Java/J2EE application servers are supported:

- BEA WebLogic 7.x / 8.x / 9.x
- IBM WebSphere 4.x / 5.x / 6.x
- Apache Tomcat 5.0.9 and higher
- Sun ONE 7.x / 8.x
- JBoss Group JBoss 3.x / 4.x
- Macromedia JRun 4.x

#### System Monitor controllers

Provides support to monitor your system resources. Following system resources can be monitored:

- CPU Usage
- Memory Usage
- Network Usage
- Disk I/O
- Disk Space

Following operating systems are supported:

- Microsoft Windows 2000/XP/2003
- Linux x86
- Solaris Sparc 7/8/9
- Mac OSX

#### Database controllers

Provides support for most commonly used databases. Following databases are supported:

- Oracle v 8 / 9i
- MS SQL Server
- MySQL
- DB2
- Sybase

#### Web Server controllers

Provides support to monitor the administrative and performance statistics for an Apache HTTP server and the Microsoft IIS server:

- Total accesses
- Requests per second
- Bytes transferred per second
- Bytes transferred per request
- Total traffic

Following Web servers are supported:

- Apache HTTP Server 1.3.xx
- Apache HTTP Server 2.0.xx
- Microsoft IIS 5.0

#### SNMP controllers

Provides support for any device that provides an SNMP controller. Network devices such as routers and switches are the most commonly monitored SNMP devices. Following versions are supported:

- SNMP v 1
- SNMP v 2

#### Ping controller

A Controller to automate and manage ping of any device (machines / routers) at regular intervals to check for its availability.

#### MailServer controller

Communication through Email is the backbone of any organization's communication infrastructure. The Mailserver controller will watch your mailserver for critical attributes and alert you as soon as there seems to be some pre-defined error or warning condition. The following Mailservers are supported:

- Microsoft Exchange Server 2003 Enterprise Edition

## About AppPerfect Products

AppPerfect Code Analyzer is a part of the AppPerfect Suite a complete and comprehensive solution for testing and monitoring the performance of your application. The suite comprises of products that are designed to help you test your application throughout the development life-cycle. The **AppPerfect Suite** is made up of following parts: the **DevTest4J** for testing and tuning your java code, **Test Studio** for load / functional testing your web /windows applications, and the **Agentless Monitor** that helps you monitor various aspects of your application's availability and performance.

### AppPerfect DevTest4J:

The DevTest4J consists of the products that work in conjunction with each other to help you build a stable, scalable application. The products in the DevTest4J are as listed below:

**AppPerfect Unit Tester:** AppPerfect Unit Tester is a feature-rich wrapper for the popular JUnit and HtmlUnit testing frameworks for non-web and web-based Java projects respectively. It provides the Java programmer with an easy to use and fully customized unit-testing environment, which can be integrated with popular Java IDEs as well as the project's build process.

**AppPerfect Code Analyzer:** AppPerfect Code Analyzer reads your software code and analyzes it for optimization, errors, coding conventions, complexity and style based on industry-standard rules. Over 750 pre-defined, high-value rules can be applied to your code. AppPerfect Code Analyzer is an ideal tool to perform code reviews on an on-going basis to ensure high quality of code.

**AppPerfect Java Profiler:** AppPerfect Java Profiler profiles a Java Virtual Machine to assist you in understanding the behavior of your application as it performs its functions. AppPerfect Java Profiler recognizes that your application does not operate in a vacuum and hence provides a unique blend of Java information combined with operating system information.

### AppPerfect Test Studio:

The products in the Test Studio are as listed below:

**AppPerfect Windows Functional Tester:** AppPerfect Functional Tester performs regression and unit testing of your Windows applications. Performing manual functional testing by having a person sit and manually click away at the application is extremely expensive and error-prone. AppPerfect Functional Tester provides the means to perform such labor-intensive activity in an automated way.

**AppPerfect Web Functional Tester:** AppPerfect Functional Tester performs regression and unit testing of your Web applications. Performing manual functional testing by having a person sit and manually click away at the application is extremely expensive and error-prone. AppPerfect Functional Tester provides the means to perform such labor-intensive activity in an automated way.

**AppPerfect Load Tester:** AppPerfect Load Tester is a stress/load tester that can simulate hundreds of virtual users from a single machine. Features supported include site recording, dynamic variable substitution, cookies support, session tracking, SSL support and run strategies. It can run tests based on a variety of strategies such as burst, incremental, exponential, quadratic or loop.

**AppPerfect System Monitor:** AppPerfect System Monitor provides you a comprehensive solution to monitor various attributes of various operating systems present in your application infrastructure.

### AppPerfect Agentless Monitor:

The AppPerfect Agentless Monitor is an agentless, Web-based monitoring solution. It helps you monitor your applications and the underlying system resources. The AppPerfect Agentless Monitor consists of:

**AppPerfect Monitor:** A pure Web-based solution that helps you monitor your application infrastructure. Provides a rules engine to define alerts: a notification server for email and SMS notifications. Also includes a powerful report designer to create custom reports to analyze and understand the performance data.

**AppPerfect Controllers:** A series of modules designed to support specific devices. AppPerfect Monitor does not use the traditional agents-based approach to monitoring. Apart from being expensive, agents-based approach is also highly complex and error-prone. AppPerfect Controllers are designed to impose negligible overhead on the monitored system. These controllers are superbly optimized programs providing the maximum amount of information while imposing the lowest possible overhead.

### Currently, the following devices are supported:

- Java/J2EE App Servers (Tomcat, WebLogic, WebSphere, etc.)
- Operating Systems Resources (Windows, Linux, Solaris, Mac OS X)
- Databases (Oracle, MySQL, MS SQL, DB2, Sybase)
- Web Servers (Apache HTTP Server, MS IIS)
- SNMP Controllers (v1 and v2)
- Ping Controller (Device heartbeat monitor)
- Mail Server (MS Exchange)

## About AppPerfect Corporation

AppPerfect Corporation is an independent software development company dedicated to providing the developer community with the best-in-class tools throughout the entire software life-cycle. Our aim is to be your primary vendor for most of your development- and deployment-tool needs. Our mission is to help you reduce your software development costs, increase your productivity and help improve the availability and scalability of your applications. Please visit us on the Web at [www.AppPerfect.com](http://www.AppPerfect.com) for more information.

## Getting started

This book describes how to use the AppPerfect Monitor product. This book assumes that the AppPerfect Monitor has been correctly installed and configured. This book also assumes that a person acting as the AppPerfect Monitor administrator has defined the necessary controllers for devices that you are interested in monitoring.

Before you start, ensure that you have the URL, user name and password for the AppPerfect Monitor server. In some instances, this may be seamless to you. In other instances, you may be explicitly asked to log on to the Monitor server. Your AppPerfect Monitor administrator will provide you with the necessary details on how to connect to the server

## Logging Into the Server

Launching AppPerfect Monitor is a two-step process: starting the server and log on to it.

For Windows

1. Click **Start -> Programs -> AppPerfect Agentless Monitor -> AppPerfect Monitor Server -> Start**.
2. Once server starts, click **Start -> Programs -> AppPerfect Agentless Monitor -> AppPerfect Monitor Server -> Login**. Provide the user name and the password you have been assigned by your administrator.

For Linux and Solaris

1. Open the shortcuts folder **AppPerfect\_Agentless Monitor/AppPerfect Monitor Server** and double-click **Start**.
2. Open the shortcuts folder **AppPerfect\_Agentless Monitor/AppPerfect Monitor Server** and double-click **Login**. Provide the user name and the password you have been assigned by your administrator.

Once you are logged in, you will be able to view the status of your devices and perform a variety of tasks such as generate reports and view alerts. If you are new to AppPerfect Monitor, you should familiarize yourself with the UI by reviewing the **UI Reference** chapter.

**Note:** If you are using the system immediately after an installation, then the only user present is 'administrator'. Please contact your administrator who has installed the system, to get details on how to log on.

## Using the documentation

The AppPerfect Help System has been designed to be comprehensive and easy to use to get information regarding any topic related to the AppPerfect product you are working with. For the AppPerfect Monitor, you can click the "Help" link at the upper right of the Monitor UI. Context-sensitive help, based on the currently displayed page will be displayed. AppPerfect Help is fully Web-based, only requiring a browser to read.

The AppPerfect Help System provides a number of easy to use features, including:

1. **Table of Contents** - Clicking on the "Content" link at the upper left of the help pages displays the Table of Content for the book. By default, the ToC is displayed in the tree on the left side of the screen.
2. **Index** - You can view a list of available index of topics by clicking on the "Index" link located at the upper left of the help pages (to the right of the Content link)
3. **Search** - Search the entire book for specific words.
4. **Glossary** - The last chapter in the documentation. An excellent reference point to learn various terms used in the book.

## Getting product support

If you need additional assistance with our products, please contact AppPerfect at the email address specific to your query:

Sales: sales@AppPerfect.com

Support: support@AppPerfect.com

Online Technical support (FAQs, Tips, Tutorials, Docs): <http://www.AppPerfect.com/products/monitor.html>

## Comments and suggestions:

The AppPerfect Development Group welcomes and appreciates your comments and suggestions. Please send all comments/suggestions at our direct email address at: feedback@AppPerfect.com

## Java/J2EE Controller

The Java/J2EE controller is used to monitor application servers based on the Java and Java 2 Enterprise Edition (J2EE) platforms. It uses the Java Management Extensions (JMX) to extract performance data of the underlying appserver. Most commercially available Java/J2EE application servers are supported by the AppPerfect Monitor.

Listed below are some commonly monitored attributes of a Java/J2EE application server. Depending on how your AppPerfect administrator has setup the controller for your Java/J2EE server, you may or may not see some or all these attributes.

### Heap

- **Heap Used:** Used memory in JVM run time
- **Heap Total:** Total memory in JVM run time

### Server

- **Name:** Name of the server.
- **Current Open Sockets:** Returns the current number of sockets open.
- **Total Open Sockets:** Returns the total number of sockets open.
- **Server Restart Count:** Returns the total number of restarts for this server since the cluster was last activated.

### EJBs

#### Entity Beans

- **Name:** Name of the entity bean.
- **Domain:** Name of the domain.
- **Total nos of Activations:** Returns the total number of beans from the EJB home that have been activated.
- **Total nos of Passivations:** Returns the total number of beans from the EJB home that have been passivated.
- **Cache Count:** Returns the total number of beans from the EJB Home currently in the EJB cache.
- **Cache Accesses:** Returns the total number of attempts to access a bean from the cache.
- **Cache Hits:** Returns the total number of times an attempt to access a bean from the cache succeeded.
- **Beans in use:** Returns the total number of bean instances currently in use from the free pool.
- **Beans idle:** Returns the total number of idle bean instances in the free pool.
- **Timed out Threads:** Returns the total number of threads that have timed out waiting for an available bean instance from the free pool.
- **Threads Waiting:** Returns the total number of threads currently waiting for an available bean instance from the free pool.
- **Transactions Committed:** Returns the number of committed transactions.
- **Transactions Rolledback:** Returns the number of transactions that were rolled back.
- **Transactions Timedout:** Returns the number of transactions that were timed out.

#### Stateful Beans

- **Name:** Name of the stateful bean.
- **Domain:** Name of the domain.
- **Total nos of Activations:** Returns the total number of beans from the EJB home that have been activated.
- **Total nos of Passivations:** Returns the total number of beans from the EJB home that have been passivated.
- **Cache Count:** Returns the total number of beans from the EJB Home currently in the EJB cache.
- **Cache Hits:** Returns the total number of times an attempt to access a bean from the cache succeeded.

#### Stateless Beans

- **Name:** Name of the stateless bean.
- **Domain:** Name of the domain.
- **Beans in use from Pool:** Returns the total number of bean instances currently in use from the free pool.
- **Beans idle in Pool:** Returns the total number of idle bean instances in the free pool.
- **Timed out Threads:** Returns the total number of threads that have timed out waiting for an available bean instance from the free pool.
- **Threads Waiting:** Returns the total number of threads currently waiting for an available bean instance from the free pool.

#### Message Driven Beans

- **Name:** Name of the message driven bean.
- **Domain:** Name of the domain.
- **Beans in use from Pool:** Returns the total number of bean instances currently in use from the free pool.
- **Beans idle in Pool:** Returns the total number of idle bean instances in the free pool.
- **Timed out Threads:** Returns the total number of threads that have timed out waiting for an available bean instance from the free pool.
- **Threads Waiting:** Returns the total number of threads currently waiting for an available bean instance from the free pool.
- **Transactions Committed:** Returns the number of transactions that were committed.
- **Transactions Rolledback:** Returns the number of transactions that were rolled back.
- **Transactions Timedout:** Returns the number of transactions that were timed out.

### JSP/Servlets

- **Name:** Returns the Name of the JSP/Servlet.
- **Domain:** Name of the domain.
- **Invocations:** Returns the number of times the servlet is invoked.
- **Average Execution time:** Returns the average amount of time all invocations of the servlet have executed since creation.
- **Minimum Execution time:** Returns the amount of time the single shortest invocation of the servlet has executed since creation.
- **Maximum Execution time:** Returns the amount of time the single longest invocation of the servlet has executed since creation.

### Databases/JDBC

- **Name:** Names of the databases.
- **Domain:** Name of the domain.
- **Current Active Connections:** Current total number of active connections.
- **Maximum Active Connections:** Returns the maximum active connections in this JDBCConnectionPoolRuntimeMBean. The count starts at zero each time the JDBCConnectionPoolRuntimeMBean is instantiated.
- **Maximum Pool Capacity:** Returns the maximum capacity of this connection pool.
- **Total Connections:** Returns the total number of JDBC connections in this JDBCConnectionPoolRuntimeMBean since the pool is instantiated.

### JMS

JMS producer:

- **Name:** Name of the JMS Producer.
- **Domain:** Name of the domain.
- **Bytes Pending:** Returns the number of bytes pending (uncommitted and unacknowledged) by this producer.
- **Bytes Sent:** Returns the number of bytes sent by this producer since the last reset.
- **Messages Pending:** Returns the number of messages pending (uncommitted and unacknowledged) by this producer.
- **Messages Sent:** Returns the number of messages sent by this producer since the last reset.

JMS consumer:

- **Name:** Name of the JMS consumer.
- **Domain:** Name of the domain.
- **Bytes Pending:** Returns the number of bytes pending (uncommitted and unacknowledged) by this consumer.
- **Bytes Received:** Returns the number of bytes received by this consumer since the last reset.
- **Messages Pending:** Returns the number of messages pending (uncommitted and unacknowledged) by this consumer.
- **Messages Received:** Returns the number of messages received by this consumer since the last reset.

### JTA

- **Name:** Name of the Java transactions API.
- **Domain:** Name of the domain.
- **Transactions Committed:** Returns the number of committed transactions.
- **Transactions Abandoned:** Returns the number of transaction that were abandoned.

- **Transactions Rolled back:** Returns the number of transactions that were rolled back.

## System Monitor Controller

The System Monitor is one of the most powerful controllers provided by **AppPerfect Monitor Console**. It provides you with data relating to your operating system and when used in conjunction with other monitoring data from the application you get a true glimpse into the working of your system. The system monitor controller allows you to monitor crucial parameters such as CPU usage, memory consumption, network and disk usage and processes that are running on the system.

The Windows 2000/XP/2003 System Monitor Controller uses the PDH (Performance Data Helper) library. All attributes available for monitoring through this library are available in **AppPerfect Monitor Console**.

### Processor

This attribute reports the consumption percentage per CPU in your operating system. High CPU usage causes an application to slow down, or hangs the system hence it is very important to monitor the CPU usage of an application and take corrective action.

**CPU ID:** If there are multiple CPUs present on a machine AppPerfect Monitor provides a chart with the usage details for each CPU in separate charts. If there is only a single CPU on the machine a single chart with the Usage details of the CPU will be shown.

**CPU Usage:** The CPU Usage attribute shows a chart providing information about the usage of each individual CPU.

**Additional Attributes for Windows 2000/XP/2003 from the PDH (Performance Data Helper) library**

**% Processor Time:** This shows the percentage of Processor Time taken.

**Note:** A number of dynamic attributes are also available for PDH Controllers.

### Memory

This attribute measures virtual and physical memory usage. It gives you an easy interface to track the amount of virtual and physical memory usage. Running out of memory will cause applications to fail and excessive paging can have a drastic effect on performance. The memory attributes allow you to precisely catch these conditions as soon as they start occurring.

**Total Physical Memory:** The Available Physical Memory attribute provides information about the total physical memory available.

**Used Physical Memory:** The Used Physical Memory attribute displays information about the total memory being used by the system at a given time

**Total Virtual Memory:** This attribute displays information about the Total Virtual Memory set in the Windows 2000/XP/2003 operating system.

**Used Virtual Memory:** The Used Virtual Memory attribute displays information about the total virtual memory usage of the system at a given time.

**Additional Attributes for Windows 2000/XP/2003 from the PDH (Performance Data Helper) library**

**Available Physical Memory:** This shows the available physical memory of the system.

**Total Virtual Memory:** This shows the total virtual memory of the system.

**Used Virtual Memory:** This shows the used virtual memory of the system.

**Page Faults/sec:** This shows the rate of Page Faults per second.

**Note:** A number of dynamic attributes are also available for PDH Controllers.

### Network Interface

This attribute allows you to track network statistics. It monitors individual network interfaces for the numbers of packets received and sent via the network.

**Network Card Name:** If there are multiple network cards present in a machine the Network Card Name attribute will provide information in separate charts for each Network Card.

**Network Packets Sent:** This attribute provides a chart with information about the total number of network packets sent.

**Network Packets Received:** This attribute provides a chart with information about the total number of network packets received.

**Additional Attributes for Windows 2000/XP/2003 from the PDH (Performance Data Helper) library**

**Packets Received/sec:** This shows the rate at which packets are received in the network.

**Packets Sent/sec:** This shows the rate at which packets are sent in the network.

**Note:** A number of dynamic attributes are also available for PDH Controllers.

### Disk I/O

This attribute reports on the reads/writes to the disk. I/O operations that read/write to hard disk are always the most expensive operations. Memory, if not controlled, may have to be written to swap space on the hard disk, which therefore increases your I/O read/writes to disk. This attribute helps you know if your application's behaviour has changed and if new settings are required to cope with new environment.

**Disk Name:** If there are multiple disks present in a machine, the Disk Name attribute will provide separate information about each individual disks along with the number or partitions.

**Disk Writes:** The Disk Writes attribute displays information about the speed of Disk write operations at a given time.

**Disk Reads:** The Disk Reads attribute displays information about the speed of Disk read operations at a given time.

**Drive Name:** If the Hard disk of a machine has multiple partitions the Drive Name attribute will display separate information for each of the drives present on the machine.

**Used Space:** The Used Space attribute provides information about the total used space on a disk drive.

**Total Space:** The Total Space attribute provides information about the size of the disk partition or total space of a disk drive.

**Additional Attributes for Windows 2000/XP/2003 from the PDH (Performance Data Helper) library**

**Disk Writes:** The Disk Writes attribute displays information about the speed of Disk write operations at a given time.

**Disk Reads:** The Disk Reads attribute displays information about the speed of Disk read operations at a given time.

**Note:** A number of dynamic attributes are also available for PDH Controllers.

### Processes

The process attribute displays information on the total no of processes, process name, memory usage and processor time.

**Process ID:** This attribute displays the IDs of the various processes running at the time of monitoring a machine with a Windows2000/XP/2003 operating system.

**Process Name:** This attribute displays the name of each individual process running in a machine with a Windows 2000/XP/2003 operating system.

**Memory Usage:** The Memory Usage attribute provides information about the memory consumption of each individual processes.

**Processor Time:** The Processor Time attribute provides information about the CPU consumption time of each process.

**Additional Attributes for Windows 2000/XP/2003 from the PDH (Performance Data Helper) library**

**AppPerfect Monitor Console** shows you a list of processes for the Windows 2000/XP/2003 controller but since processes are *transient* - that is they are constantly changing, they are not stored in the Monitor Console database.

## Database Controller

AppPerfect Agentless Monitor can monitor your Oracle, MS SQL Server, MySQL, DB2 and Sybase databases for performance and robustness.

### Oracle 8/9

The Oracle Controller monitors the following details about an Oracle database instance.

#### SGA related Attributes

- Buffer Cache Hit Rate:** The buffer cache hit ratio is a measure of the proportion of requests for data which is satisfied by data already in the buffer cache. Higher ratios are better as access to data in memory is speedier than an I/O operation to disk.
- SQL Cache Hit Rate (also called Library Cache Hit ratio):** This ratio indicates the number of pin requests which result in pin hits. A pin hit occurs when the SQL or PL/SQL code you wish to execute is already in the library cache and is valid to execute.
- Row Cache Hit Rate:** The number of times an object was requested and not in memory versus the total number of requests for that data.
- Redo Log Space Requests:** This counts the number of times that a server process had to wait to acquire an entry in the redo log.
- Shared Pool Size:** Indicates the size (in bytes) of the shared pool. The shared pool contains shared cursors and stored procedures.
- DB Block Buffer:** Indicates the number of database blocks cached in memory of the SGA.
- Log Buffer:** Indicates the number of bytes allocated to the redo log buffer in the SGA.

#### System Statistic related Attributes

- Block Changes Per Transaction:** This ratio measures the amount of Data Manipulation Language (DML) work that each transaction performs. Creating or dropping indexes impacts this value, because changes to index blocks increment it.
- Changed Block Ratio:** This ratio measures the balance between queries and DML within this database application. Changes in this ratio indicate and/or quantify changes in indexation or application usage.
- Redo Log Space Wait Ratio:** A redo space wait is when there is insufficient space in the redo buffer for a transaction to write redo information. It is an indication that the redo buffer is too small given the rate of transactions occurring in relation to the rate at which the log writer is writing data to the redo logs.
- Block Get Rate:** The Block Get Rate is a basic measure of the rate at which the application system references the database. The time unit typically used in this ratio is one second.
- Call Rate:** This ratio measures the work demand rate being placed on the instance from all work sources. It should be noted, however, that this rate may not be directly comparable across application system version changes where row at a time loop constructs have been recorded as set operations or vice versa. Use of the array interface will also affect this ratio.
- Calls Per Transaction:** This ratio measures the number of client requests made per transaction. Calls per transaction can be used to detect changes in the application, or in the ways in which it is being used. This value may rise sharply as ad hoc queries increase.
- Consistent Change Ratio:** This ratio measures the extent to which applications are having to exercise the read consistency mechanism. In this connection, it is important to realize that the query processing parts of UPDATE and/or DELETE operations are subject to read consistency.
- Continued Row Ratio:** This ratio monitors the percentage of rows retrieved that extend over more than one block, which is called chained rows.
- Recursive To User Call Ratio:** Under Oracle7 and Oracle8, a change in this ratio can reflect an application change, or indicate a need to adjust the size of the shared pool. Any marked change in the DDL load also affects this ratio.
- Row Source Ratio:** This ratio measures the percentage of the total rows retrieved which came from full table scans. As soon as this percentage starts to rise much above 0, the interpretation of other statistics may need to be reviewed.
- Sort Overflow Ratio:** This ratio yields the ratio of the number of sorts which are using temporary segments. Under restricted circumstances when there is a predominance of medium size sorts, increasing the sort area size may be effective.
- Transaction Rate:** The transaction rate is a basic measure of application work, and would be calibrated in transactions per second (tps) for a typical OLTP benchmark. Administrators should be particularly concerned if a fall in this value is associated with a rise in the number of connected users or vice versa. Changes in application structure or work patterns can also distort this figure.
- User Call Rate:** This rate measures the work demand rate being posed by client side applications running under the instance. It should be noted, however, that this may not be directly comparable across application system version changes where code has been moved from client to server side or vice versa.
- User Calls Per Parse Rate:** This ratio indicates how well the application is managing its context areas. If it changes, then application change is the most likely explanation, but it may also indicate that usage patterns are changing and users are moving from one module to another either more frequently or less frequently. Although the shared SQL area makes the maximizing of this ratio less important than with earlier versions of Oracle, it is still possible to reduce resource usage by raising this ratio.
- User Rollback Ratio:** The user rollback ratio indicates the rate at which application transactions are failing. Rolling back a transaction uses significant resources, and would seem to indicate that all of the resources expended in executing the transaction have been wasted.

### MS SQL Server

The following attributes are monitored for MS SQL Server:

#### SQL Statistics

- Batch Requests Rate:** The number of batch requests that SQL Server receives per second.
- SQL Compilations Rate:** Number of compilations performed by SQL Server per second.

#### Access Methods

- Full Scans Rate:** Defined as the number of unrestricted full scans. These can either be base table or full index scans.
- Page Splits Rate:** One cause of excess I/O on an SQL Server is page splitting. Page splitting occurs when an index or data page becomes full, and then is split between the current page and a newly allocated page. While occasional page splitting is normal, excess page splitting can cause performance issues.

#### Buffer Manager

- Buffer Cache Hit Ratio:** Defined as the percentage of pages that were found in the buffer pool without having to incur a read from disk. When this percentage is high your server is operating at optimal efficiency (as far as disk I/O is concerned).
- Checkpoint Pages Rate:** Number of pages flushed by checkpoint or other operations that require all dirty pages to be flushed.
- Page Life Expectancy:** This tells you, on average, how long data pages are staying in the buffer.
- Lazy Writes Rate:** This tracks how many times a second that the Lazy Writer process is moving dirty pages from the buffer to disk in order to free up buffer space.
- Free Pages:** Total number of pages on all free lists.

#### Memory Manager

- Memory Grants Pending:** Defined as the current number of processes waiting for a workspace memory grant.
- Total Server Memory:** This tells you how much memory (in KB) the SQL Server is currently using.
- Target Server Memory:** This tells you how much memory (in KB) the SQL Server would like to have.

#### Databases

- Total Log Growths:** Defined as the total number of log growths.
- Total Percent Log Used:** Defined as the percentage of space in the log that is in use.
- Total Transaction Rate:** Defined as the number of transactions started.
- Total Log Flushes Rate:** This measures the number of log flushes per second.

**Note 1:** The above 4 attributes give summary value for all the databases. All the attributes are also available for individual databases.

**Note 2:** The list of database names is dynamically generated.

#### General Statistics

- User Connections:** Defined as the number of users connected to the system. Dramatic shifts in this value should be researched.

#### Latches

- Average Latch Wait Time:** Defined as the average latch wait time (in milliseconds) for latch requests that had to wait. If this number is high, your server may be facing contention for its resources.
- Latch Wait Rate:** Defined as the number of latch requests that could not be satisfied immediately and required the caller to wait before being granted the latch.
- Total Latch Wait Time:** Defined as the number of latch requests that resulted in a deadlock.

#### Locks

- Average Wait Time:** Defined as the average amount of wait time (milliseconds) for each lock request that resulted in a wait.
- Lock Wait Rate:** Defined as the number of lock requests that could not be satisfied immediately and required the caller to wait before being granted the lock.
- Number of Deadlocks Rate:** Defined as the number of lock requests that resulted in a deadlock.

#### Backup Device

- Device Throughput Rate:** This counter will give you a good feel for how fast your backups are performing.

#### Replication logreader

- LogReader Delivery Latency:** The latency that it takes the Log Reader to move transactions from a database's transaction log until it puts it in the distribution database.

#### Replication Distributor

- Distribution Delivery Latency:** The latency it takes the Distributor Agent to move transactions from the distribution database to the Subscriber database.

### MySQL

#### Server Status

- Bytes Received:** Number of bytes received from all clients.
- Bytes Sent:** Number of bytes sent to all clients.
- Connections:** Number of connection attempts to the MySQL server.
- Flush Commands:** Number of executed FLUSH commands.
- Handler Commit:** Number of internal COMMIT commands.
- Handler Read First:** Number of times the first entry was read from an index.
- Handler Read Key:** Number of requests to read a row based on a key.
- Handler Read Next:** Number of requests to read next row in key order.
- Handler Read Prev:** Number of requests to read previous row in key order.
- Handler Read Random:** Number of requests to read a row based on a fixed position.
- Handler Read Random Next:** Number of requests to read the next row in the datafile.
- Handler Rollback:** Number of internal ROLLBACK commands.
- Key Blocks Used:** The number of used blocks in the key cache.
- Key Read Requests:** The number of requests to read a key block from the cache.
- Key Reads:** The number of physical reads of a key block from disk.
- Key Write Requests:** The number of requests to write a key block to the cache.
- Key Writes:** The number of physical writes of a key block to disk.
- Max Used Connections:** The maximum number of connections in use simultaneously.
- Not Flushed Key Blocks:** Key blocks in the key cache that have changed but haven't yet been flushed to disk.
- Not Flushed Delayed Rows:** Number of rows waiting to be written in INSERT DELAY queues.
- Open Tables:** Number of tables that are open.
- Opened Tables:** Number of tables that have been opened.
- Select Full Join:** Number of joins without keys.
- Select Full Range Join:** Number of joins where we use a range search on reference table.
- Select Scan:** Number of joins where we use ranges on the first table.
- Select Range:** Number of joins where we did a full scan of the table.
- Select Range Check:** Number of joins without keys where we check for key usage after each row.
- Slow Queries:** Number of queries that have taken more than long\_query\_time seconds.
- Sort Merge Passes:** The number of Merge Passes the sort algorithm has had to do.
- Sort Range:** Number of sorts that were done with ranges.
- Sort Scan:** Number of sorts that were done by scanning the table.
- Table Locks Immediate:** Number of times a table lock was acquired immediately.
- Table Locks Waited:** Number of times a table lock could not be acquired immediately and a wait was needed.
- Threads Cached:** Number of threads in the thread cache.
- Threads Connected:** Number of currently open connections.
- Threads Created:** Number of threads created to handle connections.
- Threads Running:** Number of threads that are not sleeping.
- Uptime:** How many seconds the server has been up.

#### Server Attributes

- Back Log:** The number of outstanding connection requests MySQL can have.
- BDB Cache Size:** The size of the buffer that is allocated for caching indexes and rows for BDB tables.
- BDB Log Buffer Size:** The size of the buffer that is allocated for logs for BDB tables.
- BDB Max Lock:** The maximum number of locks you can have active on a BDB table.
- Binlog Cache Size:** The size of the cache to hold the SQL statements for the binary log during a transaction.
- Bulk Insert Buffer Size:** MySQL uses a special tree-like cache to make bulk inserts faster for INSERT ... SELECT, INSERT ... VALUES (...), (...), ..., and LOAD DATA INFILE. This variable limits the size of the cache tree in bytes per thread.
- Join Buffer Size:** The size of the buffer that is used for full joins (joins that do not use indexes).
- Key Buffer Size:** Index blocks for MYISAM and ISAM tables are buffered and are shared by all threads. key\_buffer\_size is the size of the buffer used for index blocks.
- Transaction Alloc Block Size:** The allocation size of memory blocks that are allocated for storing queries that are part of a transaction to be stored in the binary log when doing a commit.
- Transaction Prealloc Block Size:** The size of the persistent buffer for transaction\_alloc\_blocks that is not freed between queries.
- Table Cache:** The number of open tables for all threads.
- Read Buffer Size:** Each thread that does a sequential scan allocates a buffer of this size for each table it scans.
- Read Random Buffer Size:** When reading rows in sorted order after a sort, the rows are read through this buffer to avoid disk seeks.
- Sort Buffer Size:** Each thread that needs to do a sort allocates a buffer of this size.
- Query Alloc Block Size:** The allocation size of memory blocks that are allocated for objects created during query parsing and execution.
- Query Cache Limit:** This limit indicates that cache results bigger than this should not be stored.
- Query Cache Size:** The amount of memory allocated for caching query results.

### DB2

#### Buffer Pool Related Attributes

- Buffer Pool Hit Ratio:** Indicates the number of physical reads against number of logical reads, includes index plus data activity that have gone through the buffer pool.
- Buffer Pool Index Hit Ratio:** Indicates the number of physical reads against number of logical reads that have gone through the buffer pool.
- Data Page Hit Ratio:** Indicates the number of physical read requests against number of logical read requests for data pages that have gone through the buffer pool.
- Buffer Pool Data Writes:** Indicates the number of times a buffer pool data page was physically written to disk.
- Buffer Pool Index Writes:** Indicates the number of times a buffer pool index page was physically written to disk.
- Total Buffer Pool Physical Read Time:** Provides the total amount of elapsed time spent processing read requests that caused data or index pages to be physically read from disk to buffer pool.
- Total Buffer Pool Physical Write Time:** Provides the total amount of time spent physically writing data or index pages from the buffer pool to disk.
- Buffer Pool Asynchronous Data Reads:** The number of pages read asynchronously into the buffer pool.
- Buffer Pool Asynchronous Data Writes:** The number of times a buffer pool data page was physically written to disk by either an asynchronous page cleaner, or a prefetcher.
- Buffer Pool Asynchronous Index Writes:** The number of times a buffer pool index page was physically written to disk by either an asynchronous page cleaner, or a prefetcher.
- Buffer Pool Asynchronous Index Reads:** The number of index pages read asynchronously into the buffer pool by a prefetcher.
- Buffer Pool Asynchronous Read Time:** The total elapsed time spent reading by database manager prefetchers.
- Buffer Pool Asynchronous Write Time:** The total elapsed time spent writing data or index pages from the buffer pool to disk by database manager page cleaners.
- Data Pages Copied to Extended Storage:** Number of buffer pool data pages copied to extended storage.
- Index Pages Copied to Extended Storage:** Number of buffer pool index pages copied to extended storage.
- Data Pages Copied FROM Extended Storage:** Number of buffer pool data pages copied from extended storage.
- Index Pages Copied FROM Extended Storage:** Number of buffer pool index pages copied from extended storage.
- Time Waited for Prefetch:** The time an application spent waiting for an I/O server (prefetcher) to finish loading pages into the buffer pool.

#### Non-Buffered I/O Data Related Attributes

- Direct Reads From Database:** The number of read operations that do not use the buffer pool.
- Direct Writes to Database:** The number of write operations that do not use the buffer pool.
- Direct Read Reqs:** The number of requests to perform a direct read of one or more sectors of data.
- Direct Write Reqs:** The number of requests to perform a direct write of one or more sectors of data.
- Direct Read Time:** The elapsed time (in milliseconds) required to perform the direct reads.
- Direct Write Time:** The elapsed time (in milliseconds) required to perform the direct writes.

#### Catalog Cache Related Attributes

- Catalog Cache Hit Ratio:** Indicates the number of cache inserts against cache lookups in the catalog.
- Catalog Cache Overflows:** The number of times that an insert into the catalog cache failed due to the catalog cache being full.
- Catalog Cache Heap Full:** The number of times that an insert into the catalog cache failed due to a heap-full condition in the database heap.
- Package Cache Hit Ratio:** The package cache hit ratio tells you whether or not the package cache is being used effectively.
- Package Cache Overflows:** The number of times that the package cache overflowed the bounds of its allocated memory.
- Package Cache High Water Mark:** This element indicates the maximum number of bytes the package cache required for the workload run against the database since it was activated.

#### Log Info Related Attributes

- Total Log Space Used:** The total amount of active log space currently used (in bytes) in the database.
- Total Log Available:** The amount of active log space in the database that is not being used by uncommitted transactions (in bytes).
- Maximum Secondary Log Space Used:** The maximum amount of secondary log space used (in bytes).
- Maximum Total Log Space Used:** The maximum amount of total log space used (in bytes).
- Secondary Logs Currently Allocated:** The total number of secondary log files that are currently being used for the database.
- Number of Log Pages Read:** The number of log pages read from disk by the logger.
- Number of Log Pages Written:** The number of log pages written to disk by the logger.

#### Application Status Related Attributes

- Connects Since Database Activation:** Total number of connections since first database connection
- Maximum Connections:** The highest number of simultaneous connections to the database since the first application connected to the database.
- Secondary Connections:** The number of connections made by a subagent to the database at the node.
- Applications Connected Currently:** Indicates the number of applications that are currently connected to the database.
- Applications Executing Currently:** Indicates the number of applications that are currently connected to the database, and for which the database manager is currently processing a request.
- Number of Associated Agents:** The number of subagents associated with this application.

#### Database Manager Configuration Related Attributes

- Remote Connections:** The total number of current connections initiated from remote clients to the instance of the database manager that is being monitored.
- Remote Connections Executing:** The number of remote applications that are currently connected to a database and are currently processing a unit of work within the database manager instance being monitored.
- Local Connections:** The number of local applications that are currently connected to a local database within the database manager instance being monitored.
- Local Connections Executing:** The number of local applications that are currently connected to a local database within the database manager instance being monitored and are currently processing a unit of work.
- Committed Private Memory:** The amount of private memory that the instance of the database manager has currently committed at the time of the snapshot.
- Maximum Coordinated Agents:** The maximum number of coordinating agents working at one time.
- Agents Registered:** The number of agents registered in the database manager instance that is being monitored (coordinator agents and subagents).
- Agents Waiting:** The number of agents waiting for a token so they can execute a transaction in the database manager.
- Maximum Agents Registered:** The maximum number of agents that the database manager has ever registered, at the same time, since it was started (coordinator agents and subagents).
- Maximum Agents Waiting:** The maximum number of agents that have ever been waiting for a token, at the same time, since the database manager was started.
- Number of Idle Agents:** The number of agents in the agent pool that are currently unassigned to an application and are, therefore, "idle".
- Agents Assigned From Pool:** The number of agents assigned from the agent pool.
- Agents Created Due to Empty Pool:** The number of agents created because the agent pool was empty.

#### Sort Related Attributes

- Total Sort Heap Allocated:** The total number of allocated pages of sort heap space for all sorts at the level chosen and at the time the snapshot was taken.
- Average Sort Time:** This value shows the average sort time for all sorts performed by all applications connected to a particular database in the past interval.
- Sort Overflows:** Sort overflows are sorts that ran out of sort heap and required disk space for temporary storage.
- Active Sorts:** Number of sort operations running in the Database Manager

#### Hash Joins Related Attributes

- Total Hash Joins:** The total number of hash joins executed.
- Hash Join Threshold:** The total number of times that a hash join heap request was limited due to concurrent use of shared or private sort heap space.
- Total Hash Loops:** The total number of times that a single partition of a hash join was larger than the available sort heap space.
- Hash Join Overflows:** The number of times that hash join data exceeded the available sort heap space.
- Hash Join Small Overflows:** The number of times that hash join data exceeded the available sort heap space by less than 10%.

#### Fast Communication Manager

- FCM Buffers Currently Free:** This element indicates the number of FCM buffers currently free
- Minimum FCM Buffers Free:** The lowest number of free FCM buffers reached during processing.

#### Locks and Deadlocks

- Locks Held:** The number of locks currently held.
- Total Lock List Memory In Use:** The total amount of lock list memory (in bytes) that is in use.
- Deadlocks Detected:** The total number of deadlocks that have occurred.
- Number of Lock Escalations:** The number of times that locks have been escalated from several row locks to a table lock.
- Exclusive Lock Escalations:** The number of times that locks have been escalated from several row locks to one exclusive table lock, or the number of times an exclusive lock on a row caused the table lock to become an exclusive lock.
- Number of Lock Timeouts:** The number of times that a request to lock an object timed-out instead of being granted.
- Lock Waits:** The total number of times that applications or connections waited for locks.
- Time Waited On Locks:** The total time elapsed waiting for a lock.
- Agents Waiting on Lock:** Indicates the number of agents waiting on a lock.

#### SQL Statement Activity

- Commit Statements Attempted:** The total number of SQL COMMIT statements that have been attempted.
- Rollback Statements Attempted:** The total number of SQL ROLLBACK statements that have been attempted.
- Internal Automatic Rebinds:** The number of automatic rebinds.

### Sybase

The following attributes are monitored for the Sybase database.

- Connections :** The number of User Connections.
- NumDeadlocks :** The number of Deadlocks.
- LockWaits :** The number of processes that have waited longer than LockWaitThreshold seconds.

#### CPU

- CPU Time :** The total time (in seconds) the engine has been running.
- System CPU Time :** The total time (in seconds) the engine has been executing system database services.
- User CPU Time :** The total time (in seconds) the engine has been executing user commands.

#### Data Cache

- Physical Reads :** The number of buffers read into the cache from disk.
- Logical Reads :** The number of buffers retrieved from the cache.
- Physical Writes :** The number of buffers written from the cache to disk.

#### Procedure Cache

- Requests :** The number of stored procedures requested.
- Loads :** The number of stored procedures loaded into cache.
- Writes :** The number of times a procedure was normalized and the tree written back to sysprocedures

#### Worker Thread

- Parallel Queries :** The number of parallel queries that were attempted.
- Plans Altered :** The number of plans altered due to worker processes not being available.
- Worker Memory :** The amount of memory currently in use by worker processes.
- Total Worker Memory :** The amount of memory configured for use by worker processes.

#### Cache Pool

- Physical Reads :** The number of buffers that have been read from disk into the pool.
- Pages Touched :** The number of bytes that are currently being used within the pool.
- Pages Read :** The number of pages read into the pool.

#### Locks

- Average Wait Time :** The average time (in seconds) that the lock request has not been granted.

#### Deadlocks

- Average Wait Time :** The average time (in milliseconds) that the waiting processes were blocked before the deadlock was resolved.

#### Databases

- Append Log Requests :** The number of semaphore requests when attempting to append to the database transaction log.
- Append Log Waits :** The number of times a task had to wait for the append log semaphore to be granted.

**Note 1:** The above 2 attributes give summary value for all the databases. All the attributes are also available for individual databases.

**Note 2:** The list of database names is dynamically generated.

## SNMP Controller

Simple Network Management Protocol or SNMP is widely used to manage devices in a network. Its components typically include a manager and an agent. The SNMP agents run on each device which has to be managed and provide information regarding the devices. This information is hard to comprehend in its native form, and that's where MIB files come in. These files provide a structure to read the SNMP-related information sent out by agents for each particular device.

### About the SNMP Controller

The AppPerfect Monitor allows you to monitor devices like firewalls, routers, UPSes, Operating Systems, application servers and so on, that can communicate with the SNMP protocol.

The following points define how the AppPerfect SNMP Controller works:

1. First of all, SNMP agents must be deployed and running on the servers / devices that you wish to monitor.
2. You must provide the MIB file for each SNMP device that you wish to monitor. This is done at the time of creating the SNMP controller. (Requires administrator rights.) An MIB or Management Information Base file consists of a collection of objects organized into groups. An MIB is not a database or data store, it is just a logical grouping of data so that it is easily understood by all.
3. The AppPerfect SNMP controller fetches data from the SNMP agent using UDP. The MIB file allows the SNMP controller to present the attributes to you in an easy-to-use tree structure.
4. You can select the attributes you wish to monitor from this list instead of having to go through each MIB file yourself.
5. SNMP traps are shown as alerts in the AppPerfect Monitor.

## Web Server Controller

Web servers are perhaps the most commonly used server software products. AppPerfect Monitor provides support for several popular web/HTTP server products.

### Apache HTTP Server

AppPerfect Monitor provides with a controller to monitor the Apache HTTP server and the Microsoft IIS server. It uses the mod\_status module, a simple Apache module that is deployed in the server and used to monitor its performance and state of the server. It uses Apache API and can monitor the number of active requests, total requests, and bytes transferred.

There are separate controllers to provide support for both the 1.3 and 2 versions of the Apache server. You should use the appropriate version depending on the installation of the server that you want to monitor. There are several attributes that can be monitored using the apache controller and these are described below.

AppPerfect's System Monitor Controller can monitor the following individual attributes of the Apache HTTP Server.

- **Total Accesses:** This attribute provides information on the total number of hits on the Apache HTTP Server.
- **Total Traffic:** The attribute for Total Traffic displays information about the total bytes sent and received by the Apache HTTP Server.
- **Requests per Second:** The Requests per Second attribute provides information about the speed at which the requests are received.
- **Bytes per Second:** This attribute displays information about the speed at which the server sends the information.
- **Bytes per Request:** The Byte per Request attribute display the number of bytes sent by the Apache HTTP Server per request.
- **No of Busy Workers:** This attribute displays the number of threads currently processed at a given time.
- **No of Idle Workers:** This attribute displays the number of threads idle at a given time.
- **CPU Load:** The CPU Load attribute provides information about the total CPU time consumed by the Apache HTTP Server.

### Microsoft IIS Server

AppPerfect's System Monitor Controller can monitor the following individual attributes of the Microsoft's IIS Server. Microsoft IIS Server uses the PDH (Performance Data Helper) library. All attributes available for monitoring through this library are available in **AppPerfect Monitor Console**.

- **Internet Information Services Global :**
  - **File Cache Hits:** This attribute shows the number of file cache hits.
  - **File Cache Flushes:** This attribute shows the number of file cache flushes.
  - **File Cache Hit Rate:** This attribute shows the file cache hit rate.
- **Web Services**
  - **CGI Requests/sec:** This shows the rate at which CGI requests are received per second.
  - **ISAPI Extension Requests/sec:** This is the ISAPI Extension Request rate per second.
  - **Get Requests/sec:** This is the rate at which Get Requests are received, per second.
  - **Post Requests/sec:** This is the rate at which Post requests are received per second.
  - **Maximum Connections:** This indicates the maximum connections.
  - **Total Connection Attempts:** This indicates the total connection attempts to the server.
- **Active Server Pages**
  - **ASP Requests/sec:** This is the rate at which ASP requests are received.
  - **ASP Requests Executing:** This is the rate at which ASP requests are executed.
- **ASP Request Wait Time:** This is the time for which ASP requests have to wait on the server.
- **ASP Request Execution Time:** This is the time taken to execute ASP requests.
- **ASP Requests Queued:** This is the number of ASP requests that are queued.

**Note:** A number of dynamic attributes are also available.

## Ping Controller

A Ping Controller added to the monitor server shows the Ping Response Time attribute.

### Ping Response Time

You can monitor the ping response time for the various devices added as ping controllers. A chart shows the Ping Response Time for each controller. The time-interval is on the X-axis and the response-time in milliseconds is on the Y-axis.

## Mail Server Controller

AppPerfect Agentless Monitor Monitor Server can currently monitor MS Exchange 2003 Enterprise Edition server. MS Exchange uses the PDH (Performance Data Helper) library. All attributes available for monitoring through this library are available in **AppPerfect Monitor Console**.

### MS Exchange 2003 Enterprise Edition

#### Pre-Defined Attributes:

##### Database

**Database Cache Size:** Displays the amount of system memory the database cache manager uses to hold commonly used information from the database files in order to prevent file operations. If the database cache size seems to be too small for optimal performance and little memory is available on the system (see the Memory/Available Bytes counter), adding more memory to the system may increase performance. If a lot of memory is available on the system and the database cache size is not growing beyond a certain point, the database cache size may be capped at an artificially low limit. Increasing this limit may increase performance.

**Log Record Stalls/sec:** Displays the number of log records that cannot be added to the log buffers per second because they are full. If this counter is not zero most of the time, the log buffer size may be a bottleneck.

**Log Writes/sec:** Displays the number of times the log buffers are written to the log files per second. If this number approaches the maximum write rate for the media holding the log files, the log may be a bottleneck.

**Table Opens/sec:** Displays the number of database tables opened per second.

##### Epoxy

**Client Out Queue Length:** Displays the number of requests waiting to be processed by the Exchange store. Generally, this counter should be zero.

**Store Out Queue Length:** Displays the number of requests waiting to be picked up by the IIS protocol handlers. Generally, this counter should be zero.

##### MSExchangeIS

**Active Connection Count:** Displays the number of connections to the Exchange store that have shown activity in the last 10 minutes.

**Active User Count:** Displays the number of user connections that have shown activity in the last 10 minutes.

**Connection Count:** Displays the number of client processes connected to the Exchange store.

**RPC Averaged Latency:** Displays RPC latency in milliseconds averaged for the past 1024 packets. The counter is typically less than approximately 20 milliseconds in normal operations.

**RPC Operations/sec:** Displays the rate that RPC operations are occurring.

**RPC Requests:** Displays the number of client requests currently being processed by the Exchange store. This counter should typically be less than 10. If it is larger than 25, this is a likely indicator of a resource bottleneck. Only 100 requests can be handled at a time. If the RPC Requests reach 100, the client will experience refused connections.

**User Count:** Displays the actual count of users (not connections) currently using the Exchange store. Performance measurement must always be correlated with current user numbers when interpreting this counter.

##### MSExchangeIS Mailbox

**Active Client Logons:** Displays the number of clients that performed any action within the last 10-minute time interval.

**Message Opens/sec:** Displays the rate that requests to open messages are submitted to the Exchange store.

**Receive Queue Size:** Displays the number of messages in the mailbox store's receive queue. This counter should remain generally at zero during normal operations.

**Send Queue Size:** Displays the number of messages in the mailbox store's send queue. This counter should remain generally at zero during normal operations.

##### MSExchangeIS Public

**Folder opens/sec:** Displays the rate that requests to open folders are submitted to the Exchange store.

**Message Opens/sec:** Displays the rate that requests to open messages are submitted to the Exchange store.

**Receive Queue Size:** Displays the number of messages in the public store's receive queue. Generally, this counter should remain at zero during normal operations.

**Send Queue Size:** Displays the number of messages in the public store's send queue. Generally, this counter should remain at zero during normal operations.

**Categorizer Queue Length:** Indicates how well SMTP is processing LDAP lookups against global catalog servers. This should be at or around zero unless you are expanding distribution lists. This is an excellent counter that tells you how healthy your global catalogs are. If access to your global catalogs is slow, this counter can increase.

##### SMTP Server

**Local Queue Length:** Displays the number of messages in the local SMTP queue.

**Messages Delivered/sec:** Displays the rate that messages are being delivered to local mailboxes.

**Messages Received/sec:** Displays the rate that messages are being received.

**Messages Sent/sec:** Displays the rate that messages are being sent.

#### Dynamic Attributes:

**Database Object:** There will be no predefined attributes. It will be part of Dynamic Attributes only.

**Epoxy Object:** Total instance will be part of the predefined attributes. All other instances will be part of Dynamic Attributes.

**MSExchangeIS Object:** There will be no dynamic attributes in this case. Bcos there are no Instances for this object.

**MSExchangeIS Mailbox Object:** Total instance will be part of the predefined attributes. All other instances will be part of Dynamic Attributes.

**MSExchangeIS Public Object:** Total instance will be part of the predefined attributes. All other instances will be part of Dynamic Attributes.

**SMTP Server Object:** Total instance will be part of the predefined attributes. All other instances will be part of Dynamic Attributes.

## Monitor Status

The status view is shown in the display area when the **Status** tab is clicked. The **Status** tab when accessed displays a dashboard to view the current monitoring status. Each individual chart of an attribute can be accessed from the Controller tree. The status view provides you with information that can be reviewed with a quick glance and you can then zero in on any problems by viewing the chart through the Controller tree. You can also generate a report that would provide further information about the particular attribute that is being violated.

### Dashboard

The dash board comprises a row of colored cells. The number of rows in the dashboard will depend on the number of machines being monitored. The dashboard displays the startup time and the current time. It also shows the name of the controllers selected. The color of the cell indicates the status of the system at the given time. When an attribute violates a rule with the severity level set for **Warning**, the cell will be displayed in yellow color at the time the violation has taken place, if the severity level chosen for the violation is **Error**, the cell will be displayed in red color. If system has not reported any violation the dashboard cells will be displayed in green color.

Clicking on a cell in the row adjacent to a particular machine being monitored displays a consolidated group of charts which provide information about the controllers and their attributes being monitored for the specific machine. The time interval of the different cells in the dashboard will depend on the time interval selected for the charts.









### Controller Tree

The controller tree is provided so that you can access details of any of the controllers and the attributes being monitored, quickly and easily. Clicking on any node of the tree will display the information about that attribute in the display area. Initially if there are no machines that the user is granted privilege to monitor then the tree will be empty. The controllers that are available for monitoring are set by the Administrator.

There are four types of nodes that are present in the tree: Machines, Controllers, Attribute Groups and Attributes. Clicking on the attribute will show the chart or table of data received for that attribute. Clicking on a group will show a consolidated chart of all the chart-suitable attributes under it. If the data for the attributes cannot be consolidated into a single chart there will be multiple charts shown for representing the attributes being monitored. Similarly for agents and machines, they show the graphs for all the groups under them.

Icons used in the tree

There are different icons used in the tree to signify the state of the attributes being monitored.

Icon	Description
	This icon is used to indicate the machine that is being monitored.
	This icon indicates that some attribute that is being monitored on this machine has violated a rule and has gone into an alert condition.
	This icon identifies the controller being monitored.
	This icon indicates that some attribute that is being monitored by this controller has violated a rule and has gone into an alert condition.
	This icon indicates a group of attributes.
	This icon indicates that some attribute that belongs to this group has violated a rule and has gone into an alert condition.
	This icon indicates that data for this attribute is being received correctly.
	This icon indicates that data for this attribute is not being received correctly or that an alert has been triggered by the data received while monitoring this attribute.

### Charts

AppPerfect Monitor provides accurate information in the form of charts and tables. Listed below are the different ways in which charts show up:


1. **Selecting an attribute** in the controller tree displays a chart for the attribute in the display area.
2. **Selecting an attribute group** displays charts for all the attributes under that group.
3. **Selecting a controller** displays a group of charts of all the attributes being monitored for that particular controller.
4. **Selecting a machine** in the Controller tree or clicking on a cell in the dashboard corresponding to the machine name / IP address will display a group of charts of all the controllers and their attributes being monitored on that machine.

Please note the following points:

- On selecting an attribute or the controller the current display will be refreshed to show the requested chart.
- Clicking on any of the charts shows a single large view of that chart in the entire display area.
- You can select the time intervals for the charts being displayed, however these time intervals are session-specific. The time-interval also applies to the dash-board.

### Color Series

Color series are used to identify the status of the attribute in a chart and also to differentiate between multiple attributes and their status displayed in charts.

Color	Description
	The blue color is used to indicate that the data is within acceptable range and that there are no rules that have been violated.



The red color is used to indicate that the data received has violated a rule and that there is an alert raised.

## Alerts

An alert is used to highlight an event that needs to be examined. Simply defined : it is a condition which needs attention. Understanding where systems are slowing down, or about to break, is the only way to ensure that top performance levels are being maintained for your systems. Alerts inform you about the problems in real-time and to enable you to immediately locate and remedy those problems.

The list of alerts can be viewed by accessing the **Alerts** tab.

### Alert Details

The drop-down against **View alerts triggered during the past** allows you to see the alerts that were raised in the specified time period. If there was no alert raised in that specific period then a message indicating that will be shown.

The alert details show **Rule ID, Controller ID, Severity, Start Time** and **Reset Time**. The start time implies the time at which the alert was raised and the reset time indicates the time at which the application went into normal mode that is the condition that triggered the alert, passed and the application is performing within permissible bounds. All user alerts send out a notification as defined when the rule was created.

### SNMP Trap Details

SNMP provides the ability to send traps, or notifications, to notify an administration application when one or more conditions have been met. An SNMP trap is a special SNMP message that contains data relating to a component of the system sending the trap. Traps are generated when a certain alert or error condition is encountered by the SNMP device. The SNMP device then forms an SNMP packet and sends it. SNMP manager applications such as the AppPerfect Monitor are able to receive and interpret these messages.

An SNMP trap contains information as a message string and the AppPerfect Monitor receives this message and logs the contents to the database. You can view the details of the alert by viewing an SNMP Trap details report. No notifications are sent out in the case of SNMP Traps as these are not generated as a result of rules defined in the Monitor, where Notifications can be set.

The SNMP Trap details shown are: **SNMP Trap Type, Machine, RaisedAt** and **Trap Details**.

**Note:** Please make sure the SNMP trap port is free on the system where you are running the monitor server, polling for SNMP Traps. This port is generally used by SNMP trap service. If this port is not free, AppPerfect Monitor server's SNMP Trap Alerts will not work. For instance, on a Windows 2000 system, the SNMP trap port is 162. So if you have any other service running on this port, you should stop it to receive SNMP Trap Alerts from AppPerfect Monitor. The other alternative is to change the trap port number of the AppPerfect Monitor server along with changing the trap port number of the SNMP agent.

## Working with reports

AppPerfect Monitor provides an extensive data reporting facility for data analysis and resource/capacity planning. Theoretically, data shown in the Current Status view can be considered as a report. However, there are key differences between data used for Status view and data used for reports. In general, the reports are typically used for non-realtime data. The AppPerfect Monitor Console (with its Dashboard and various views) is used for realtime data. Another key difference between status data and report data is that status data can only show you data within the active database. Reports may, however, span active as well as archive database.

### Available Reports

There are two types of reports provided by AppPerfect Monitor

**Predefined reports** : AppPerfect Monitor provides several, detailed, predefined reports for extracting and analyzing the state of the systems being monitored. These reports are non-editable through the report designer. However, these reports may be used as templates to design customized user-defined reports.

**Custom reports** : AppPerfect Monitor recognizes the need for you to extract and analyze the monitored data in ways not addressed by the pre-defined reports. You can create reports and customize the content, layout and data specific to your needs. The next chapter provides details on how to create customized user-defined reports.

The list of all the reports currently available can be viewed by accessing the **Reports** tab. You can only see the reports that you have been granted access to, by the creator of the report or the administrator. For more information on this feature please see the chapter [Custom Reports](#).

### Generate and View Reports

To generate the report click the **Generate & View** link. You will be asked to click **OK** if you want to generate a new report or **Cancel** if you want to view existing reports. Click **OK** to generate a new report. You will now see a pop-up window asking you to enter parameters regarding the output format of the report (choose from PDF or HTML). You can also enter some description for your report as well as define a date time stamp for it. You can also select the start and end time for which you want to generate the report.

**Note:** The Start and End Time will only be available if you have selected the 'DataTimeStamp' column under the 'Filter' columns.

When you click the **Generate** button, AppPerfect Report Manager will get the required data from the database and arrange the data in the specified format.

Once the report is generated it immediately opens up in a view mode.

The fields to be filled in are summarised here:

1. **Output Format:** You can choose the format from one of these: html or pdf.
2. **Report Description:** You can type in a description for your report here. This is an optional field.
3. **Define Filter Values:** You can select the values of the filter columns that you have earlier selected in creating this report.

### Updating Reports

For updating a report's properties, you need to click that Report ID in the Reports list. A page similar to the one for [adding a new report](#) will show up. All the properties of the report can be modified from here. Click **Finish** in the wizard after updating the report. A message confirming the change will be shown at the top of the page.

### Scheduling Reports

For scheduling reports, you need to select the schedule link against the report name. You will be taken to a page that will allow you to specify the type of schedule: whether the report is to be generated daily, weekly, every fortnight or monthly and also allows you to specify the time at which report generation should begin. On clicking **Add**, the report is scheduled for execution at the appropriate time and will be executed once the scheduled time is reached.

The different fields you can see are:

- **Report Schedule ID:** This is a unique value by which your report will be identified.
- **Schedule Type:** Here you can select if you want a daily, weekly, fortnightly or monthly schedule.
- **Day of Week:** This field will be enabled only if you have selected a weekly or fortnightly type of schedule.
- **Date of Month:** This field will be enabled only if you have selected a monthly type of schedule.
- **Generation Time:** The time at which the report should be generated according to the schedule type, can be specified here.
- The rest of the fields are same as that at the time of [generation of the report](#).

### Deleting Reports

To delete a report, select the check box to the left of the report name and click the **Delete** button. In the delete confirmation dialog that comes up click **OK** and the report(s) will be deleted. If **Cancel** is clicked no action will be taken.

**Note:** Deleting a report cannot be undone.

## Custom reports

AppPerfect Monitor provides a report designer wizard to create highly customized reports. The user can select a pre-defined template to create a report or define the entire layout of the custom report.

To create a custom report, click the Reports tab in the AppPerfect Monitor UI and click the "Add" button. A wizard is displayed that will step you through the process of defining a custom report. Following is a summary of the various tabs in the wizard.

## General

Specify the following properties in the general tab of the report designer wizard

- **Report ID:** Give a unique Id to your report here.
- **Report Name:** Specify the name of the report.
- **Description:** Briefly describe your report here.
- **Default Output Format:** Specify whether you want your output in HTML or PDF format.
- **Column Orientation:** Choose from Horizontal or vertical.
- **Today's Date:**
  - **Show checkbox:** Select this if you want to include the current date in your output.
  - **Add to Section:** Specify whether you want the date displayed in the Report Header/Footer or in the Page Header/Footer.
  - **Format:** Choose from Long, Medium and Short.
  - **Properties button:** Click this button to access the text formatting options for the date.

## Page Settings

Here you can set the layout and select if you want to display the page border and page numbers in the report.

- **Paper Size:** Specify whether you want your report to match A4, Letter or Legal paper sizes.
- **Orientation:** Select Portrait or Landscape depending how you want the layout of your results page(s).
- **Page Width:** Specify the width of the page.
- **Page Height:** Specify the height of the page.
- **Top Margin:** Specify the distance you want between the top of the page and your report data.
- **Left Margin:** Specify the distance you want between the left edge of the page and your report data.
- **Bottom Margin:** Specify the distance you want between the bottom of the page and your report data.
- **Right Margin:** Specify the distance you want between the right edge of the page and your report data.
- **Page Border:**
  - **Show:** Select this check box if you want to show a border for the report.
  - **Size:** Select the border size from here.
  - **Color:** Select the color of the border from here.
- **Page Number:**
  - **Show checkbox:** Select this checkbox if you want to include page numbers in your output.
  - **Add to Section:** Specify whether you want the page numbers displayed in the Header or the Footer of the resulting page(s).
  - **Format:** Select from the three different formats of displaying page numbers.
  - **Properties button:** Click this button to access the text formatting options for page numbers.

## Headers & Footers

Here you can work on the headers and footers for the report.

**Add button:** Clicking this button will open a dialog box where you can enter the text you want to display and also specify where do you want it to appear.

The table below this button will show you the various attributes that have been set regarding the headers and footers. These are:

<b>Text</b>	The Text of the Header/Footer you have entered.
<b>Section</b>	The place where the header/footer will appear. The text you've entered is a header if you select the Header section here and is a Footer if you select the footer section here.
<b>Text Properties</b>	Click 'Change' to change the visual properties of the header/footer text.

**Remove:** Click 'Delete' to delete this header/footer.

## Columns

Specify the schema of the report that you want to create in the Select Columns tab of the New Report Wizard.

Select the columns that you want to include in your report from the list that is presented.

The database schema is shown here for your reference:

Table / Column Name	Description	Data Type
1. <b>USERS</b>	This table represents the User who is going to use Monitor	
USERID	Id representing the user. This is the primary key for the Table	VARCHAR(32) NOT NULL
FIRSTNAME	First Name of the User	VARCHAR(128)
LASTNAME	Last Name of the User	VARCHAR(128)
PHONENO	Phone No of the User	VARCHAR(64)
EMAIL	Email Id of the User. This is the email used for sending Email notifications to the User	VARCHAR(128)
MOBILENO	MobileNo of the User. This is the number used for sending Sms notifications to the User	VARCHAR(64)
YAHOOID	YahooId of the User. This is the id on which the Yahoo notifications will be sent to the User	VARCHAR(64)
ISADMINISTRATOR	Is the User having Administrator Priveleges or not.	BOOLEAN NOT NULL
AUTOREFRESHSTATUSPAGE	Should the Status Page be auto refreshed or manual refresh	BOOLEAN NOT NULL
PAGEREFRESHINTERVAL	If the Status Page refresh is set to auto then what should be the refresh interval of the page. Specify the same in seconds	INTEGER NOT NULL
DISPLAYEDDATAWINDOWPERIOD	What should be the default time period for which the dash board and charts be displayed for	VARCHAR (128) NOT NULL
ALLOWCHARTTIMEPERIODCHANGE	Should the User be allowed to change the period for which he is monitoring the charts	BOOLEAN NOT NULL
2. <b>GROUPS</b>	This table represents the Groups of Users.	
GROUPID	Id representing the group. This is the primary key for the Table	VARCHAR(32) NOT NULL
GROUPNAME	Group Name describing the group	VARCHAR(128)
3. <b>USERATTRIBUTES</b>	This table represents the Attributes which the User can view.	
ATTRIBUTENAME	This is foreign key to the ControllerAttributes Table	TEXT NOT NULL
CONTROLLERID	This is foreign key to the Controllers Table	VARCHAR(30) NOT NULL
USERID	This is foreign key to the Users Table	VARCHAR(30) NOT NULL
ISVISIBLE	Is the Attribute Visible to the User or Not	BOOLEAN NOT NULL
4. <b>CONTROLLERTYPES</b>	This table stores the controller types	
CONTROLLERTYPEID	This is the Controller Types Id. This is the primaryKey for the Table	VARCHAR(32) NOT NULL
DESCRIPTION	This is the description associated with the type of controller	VARCHAR(128) NOT NULL
5. <b>CONTROLLERS</b>	This table represents the Controller defined in Monitor	
CONTROLLERID	Id representing the controller. This is the primary key for the Table	VARCHAR(32) NOT NULL
CONTROLLERNAME	Controller Name describing the controller	VARCHAR(128) NOT NULL
MACHINENAME	Host Name of the Target Machine	VARCHAR(128)
MACHINEIP	IP Address of the Target Machine	VARCHAR(32)
CONTROLLERTYPE ID	This is foreign key to the ControllerTypes Table	VARCHAR(32) NOT NULL
DATAFETCHINTERVAL	Interval specified in seconds after which the data will be fetched by the Controller.	INTEGER NOT NULL
FAILUREVERIFYINTERVAL	Interval specified in seconds after which the Controller will be checked for availability after the Controller has gone in Polling.	INTEGER
VERIFYFAILURE	Should the Controller Verify the devices availability after it fails to retrieve the data once before actually going into polling state	BOOLEAN NOT NULL
ARCHIVEDATADURATIONINHOURS	Strategy to be followed for archiving	INTEGER NOT NULL
CONSOLIDATEDATADURATIONINMINUTES	Strategy to be followed for consolidation	INTEGER NOT NULL
ARCHIVEDATASTARTTIME	What hour of the day the archiving should be scheduled	INTEGER NOT NULL
ISPURGINGENABLED	Purging is enabled for the Controller or not	BOOLEAN NOT NULL
PURGEDATADURATIONINDAYS	Strategy to be followed for purging	INTEGER
PURGEDATASTARTTIME	What hour of the day the purging should be scheduled	INTEGER
ISSUSPENDED	Is the Controller is Suspended or Active mode	BOOLEAN NOT NULL
6. <b>CONTROLLERPROPERTY</b>	This table represents the Properties for each Controllers defined in Monitor	
PROPERTYNAME	Name of the Controllers Property	VARCHAR(128) NOT NULL
PROPERTYVALUE	Value of the Controllers Property	VARCHAR(255)
CONTROLLERID	This is foreign key to the Controllers Table	VARCHAR(32) NOT NULL
7. <b>CONTROLLERSTATE</b>	This table represents the State for each Controllers defined in Monitor for the time periods	
STATE	State of the Controller. Different states possible are &ndash; Ok, Suspended, Polling, Warning, Error	VARCHAR(64) NOT NULL
CONTROLLERID	This is foreign key to the Controllers Table	VARCHAR(32) NOT NULL
STARTTIME	Start time when the Controller went to the state	DATETIME NOT NULL
ENDTIME	End time when the Controller changed its state	DATETIME
8. <b>CONTROLLERATTRIBUTES</b>	This table stores all the attributes information which the Controller Monitors	
NAME	This is the fully qualified name of the Controllers Attribute that the Controller is monitoring. This is the primary key for the Table.	TEXT NOT NULL
CONTROLLERID	This is foreign key to the Controllers Table	VARCHAR(32) NOT NULL
SHORTNAME	ShortName of the Controllers Attribute	VARCHAR(128) NOT NULL
DISPLAYNAME	DisplayName of the Controllers Attribute	VARCHAR(128) NOT NULL
COLUMNNAME	ColumnName used in the Controllers Data Table for the Attribute	VARCHAR(32) NOT NULL
DATATYPE	Data Type of the ControllerAttribute	VARCHAR(32) NOT NULL
DATAUNIT	Data Unit. This value is used to show in the chart	VARCHAR(32)
MAXLENGTH	Max Length of the Attributes value. This is needed only for the Attributes of String dataType	INTEGER NOT NULL
TOBEMONITORED	Is the Attribute to be monitored or not.	BOOLEAN NOT NULL
9. <b>RULES</b>	This table represents the User Defined Rules	
RULEID	Id representing the rule. This is the primary key for the Table	VARCHAR(32) NOT NULL
RULENAME	Rule Name describing the rule	VARCHAR(128) NOT NULL
CONTROLLERID	This is foreign key to the Controllers Table	VARCHAR(32) NOT NULL
SEVERITY	Serverity of the Rule it can be either Warning or Error	VARCHAR(32) NOT NULL
NOTIFICATIONMESSAGE	This is the message that will be used to notify the user when the rule gets violated	VARCHAR(255) NOT NULL
10. <b>RULEEXPRESSIONS</b>	This table represents the expression which forms the rule	
RULEID	This is foreign key to the Rules Table	VARCHAR(32) NOT NULL
CONDITION	Conditions for the Expression, it can be either Over or Under	VARCHAR(16) NOT NULL
EXPVALUE	Threshold value of the Attribute	VARCHAR(32) NOT NULL
STARTTIME	Marks the Start Time of the period during which to consider the rule for violation	VARCHAR(64)
ENDTIME	Marks the End Time of the period during which to consider the rule for violation	VARCHAR(64)
DURATION	Duration for which the expression should evaluate to true after which the Rule should be considered violated	INTEGER
ATTRIBUTENAME	This is foreign key to the ControllerAttributes Table	TEXT NOT NULL
11. <b>ALERTS</b>	This table represents the violated rule	
RULEID	This is foreign key to the Rules Table	VARCHAR(32) NOT NULL
CONTROLLERID	This is foreign key to the Controllers Table	VARCHAR(32) NOT NULL
SEVERITY	Serverity of the Rule it can be either Warning or Error	VARCHAR(32) NOT NULL
STARTTIME	Time when the rule was violated	DATETIME NOT NULL
ENDTIME	Time when the rule was resetted	DATETIME
12. <b>SNMPTRAPS</b>	This table represents the traps received by various snmp Controllers	
SNMPTRAPID	Id representing the trap. This is the primary key for the Table	VARCHAR(32) NOT NULL
HOSTORIPADDRESS	This is the host Name or the IPAddress from where th trap has got generated	VARCHAR(128) NOT NULL
ALERTTYPE	Type of the Trap, Version 1 or Version2	VARCHAR(128) NOT NULL
RAISEDTIME	Time when the Trap was raised	DATETIME NOT NULL
MESSAGE	Message recd with the Trap	TEXT
DETAILS	Details of the Trap	TEXT

## Column Properties

The following properties for the columns you have selected in the previous section can be changed.

- **Show:** Select or clear the boxes on the left hand side of the column names to show or hide the respective columns.
- **Column Name:** This is the name of the column in the database.
- **Column Heading:** The Column Heading can be edited by double-clicking or by pressing F2 on the respective column heading and then typing into the field.
- **Section:** You can control where a particular column will feature by selecting Details against the particular column and then choosing from the drop-down menu.
- **Function:** You can select a function that has to be performed on this column. Choose from Count, Sum, Average, Lowest and Highest.
  - Note:** If you choose a function for any column, you will not be able to use the 'Group By' feature in Grouping and Sorting as the columns are then grouped by the requirement of the function.
- **Column Values:** You can see the values in the table columns by clicking here.
- **Display Properties:** You can change the display properties for the report here.
- **Heading Properties:** You can change the display properties for only the headings here.

## Grouping

In this tab, set the grouping and sorting preferences.

- **Group On Columns:** From the left hand side, select the column you want to include into the Group on Columns and then click the button marked with a >. Repeat this for all the columns you want to move to the right hand side list of Selected Columns.
- **Time based Grouping:** Time based grouping is available when any controller table is selected as they contain the datatimestamp column, which is required for time-based grouping.
- **Sort On Columns:** From the left hand side, select the column you want to include into the Sort on Columns and then click button marked with a >. Repeat this for all the columns you want to move to the right hand side list of Selected Columns.

**Note:** Grouping is mandatory if you want to add a summary column in your report.

## Filtering

AppPerfect Monitor report designer wizard provides filtering options to display selective information in the generated reports. Following are the details of the filtering criteria.

**Columns:** Select a column and click the Add button on the right hand side to Define a New Filter based on the column. In the following new row added for this filter, select the Filter Expression from the drop-down menu and provide a Value for the filter. If you want the user of the report to provide this value, then select the checkbox "Prompt User for Value".

Use the Remove button to delete filters added to the table.

## Column Summaries

From this tab, you can choose columns whose summaries you want to include in the report.

**Columns:** Select a column and click the Add button on the right hand side to define a new summary based on the column.

Let us look in detail at the table that shows the column you just added:

1. **Column Name:** The name of the column you have just added.
2. **Display Properties:** Click the Change button to edit the display properties of the Column, as you would like it to appear in the report. A new window opens up where you can set the **font, effects, color, alignment and size** for the column name.
3. **Function Name:** Here you have to provide the function that will be used on the summary value. Your options are: **Sum, Count, Average, Lowest, Highest or Nothing**. **Nothing** or no function is the default function selected. It will simply display the last value in the group for the column you have selected.
4. **Reset:** You can reset your report's summary value for every Report, Page, Column or Group.
5. **Group By:** Here you can select a column from the columns already set as 'Group by' columns for this report in the [Grouping & Sorting](#) step.
6. **Show Group Header:** Select this check box if you wish to display the Group Header. After each group's details, this header will be displayed in the report.
7. **Label:** This is the label for the summary that you have selected.
8. **Label Properties:** Click the Change...button to set the visual properties of the label. These include font, effects, color, alignment and size for the label.
9. **Remove:** Click on the Delete button to remove this column from the report.

**Note 1:** Grouping is mandatory if you want to add a summary column in your report.

**Note 2:** Summaries are only useful for numeric columns. Hence they are not provided for non-numeric columns.

## Charts

In the chart tab of the report designer wizard select the **Show Chart** check box if a chart is to be displayed in the generated report to customize the display properties of the chart click **Change**. The following display properties of a chart can be customized

- **Chart Name:** Specify a name for your chart.
- **Chart Title:** Provide a title for your chart.
- **Add to Section:** Use this drop-down menu to select where do you want your chart to appear in the report.
- **Width:** Specify the width in pixels
- **Height:** Specify the height in pixels
- **Show Legends checkbox:** Select this if you want to display the legend along with the chart.
- **Show Grids checkbox:** Select this if you want to display the gridlines in the chart.
- **Chart Type:** Select the type of chart you want from Line, Bar, Timeseries and Pie chart radio buttons.
- **X-Axis Label:** Provide a label for the X-axis.
- **Select Column:** Use this drop-down menu to select the column whose data you want to plot on the X-axis.
- **Y-Axis Label:** Provide a label for the Y-axis.
- **Columns:** Select the columns you want to plot on the Y-axis by selecting and moving them one by one from the left hand side list to the right hand side list.

## Security

The report designer wizard allows you to select the users and groups who can view the generated reports. The administrator can select which users are allowed to view the system reports from this tab. The creator of a report can also specify which users have the right to access their reports.

In the **Available** field select the users and click '>' similarly to remove user accesses to the generated reports in the **Selected** users field select the users and click '<'.

If an entire groups is to be allowed access to the generated report in the Available group field, select the groups and click '>' to add them to the selected groups. Similarly to remove the access of groups to the generated reports in the Selected group field select the groups and click '<'.









