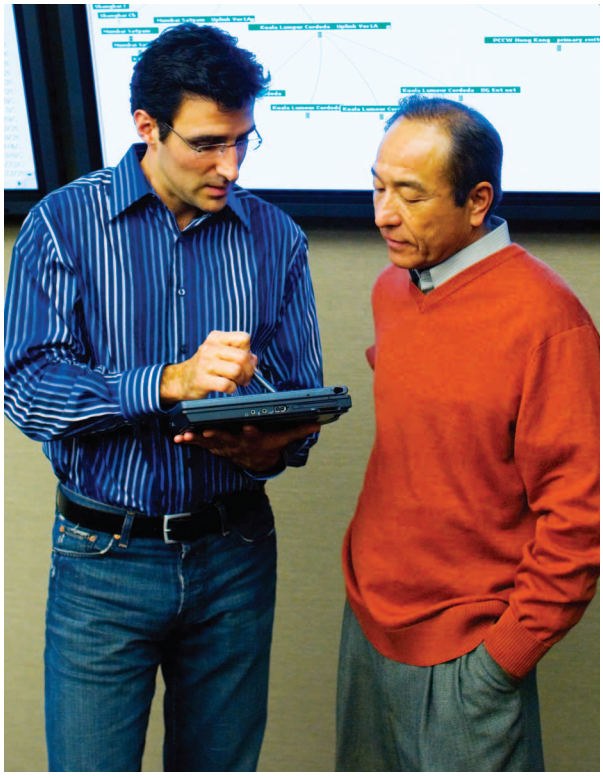
Going beyond simple infrastructure monitoring with HP SiteScope

White paper



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Executive overview

HP SiteScope software provides a wealth of functionality beyond simple systems monitoring. This paper will showcase many advanced capabilities of HP SiteScope software that can enable an enterprise to monitor more of its infrastructure, including Simple Network Management Protocol (SNMP) by management information bases (MIB), network bandwidth, script and enterprise application monitors. The paper will also review HP SiteScope solution templates—collections of standard and solution-specific monitors that consist of default metrics, default thresholds and proactive tests. The paper will conclude with information on several ways HP SiteScope can be complemented through the use of other HP products.

Going agentless

HP SiteScope software is well known for its industry-pioneering agentless monitoring capabilities. Thousands of companies have implemented HP SiteScope for monitoring hardware and operating systems across the IT enterprise, reaping huge benefits in reducing the total cost of ownership (TCO) for enterprise management.

HP SiteScope agentless monitoring is complementary to agent-based solutions. By combining both, IT organizations can achieve balance of depth and completeness of coverage.

Less known is the fact that HP SiteScope offers a wealth of powerful functionality beyond simple systems monitoring. HP estimates that the average HP SiteScope user is currently only taking advantage of a small set of the product's features and benefits. Most customers are very familiar with HP SiteScope for CPU and URL monitoring, but the product offers a veritable gold mine of additional features and functionality that can greatly enhance the enterprise's monitoring capabilities.

You can leverage HP SiteScope software in many ways, including expanding the range of devices and applications that can be monitored, managing service availability, and checking network health in real time. This white paper will help you understand how to extend your use of HP SiteScope beyond simple systems monitoring by learning how to:

- Use HP SiteScope SNMP by MIB to monitor a multitude of various devices in the enterprise.
- Monitor network devices and bandwidth.
- Become a power user by using the "Swiss Army Knife" of HP SiteScope—the script monitor.
- Deploy HP SiteScope solution templates for specific third-party applications or infrastructure software, including Microsoft® Exchange, Oracle® Database, leading application servers and many more.
- "Move up the stack" and monitor applications through the HP SiteScope MQ series, SAP and Siebel monitors.
- Combine other offerings from HP to enhance system availability management and incorporate the end-user experience.

HP SiteScope provides the ability to monitor availability and performance across your enterprise's entire IT infrastructure. It includes more than 75 standard monitor types that cover most mainstream hardware, operating systems, applications, application components and networking equipment.

The diversity of monitor types available in HP SiteScope offers you the ability to monitor not just a broad range of systems, but also systems at multiple levels. This allows you to monitor the availability of a web page, whether or not the web server is dropping too many requests, if required services are running on the server machine, whether proper ports are open, if the hard drive is full or not, and whether or not the server CPU is overloaded.

Available HP SiteScope monitors

HP SiteScope offers monitors in the following categories:

- **System monitors:** Provide everything necessary for basic system monitoring and system management, including coverage for operating system and hardware metrics.
- **Application monitors:** Provide monitoring for all types of applications throughout a distributed enterprise, including web servers, application servers, middleware, enterprise resource planning (ERP) and customer relationship management (CRM) applications.
- **Web/URL monitors:** Use specifically for monitoring website performance or web-related processes, including web services.
- **Network service monitors:** Use for monitoring network services and network-related processes or operations.

Some of the HP SiteScope monitors that are currently available include:

Network services	DHCP DNS Formula composite FTP	Mail MAPI Network bandwidth Ping	Port RTSP SNMP SNMP by MIB	SNMP trap Windows dial up
Web transaction	E-business transaction Link check	URL URL content	URL list URL sequence	Web script
Generic	Composite Directory	File JMX	Log file Script	Web service XML metrics
Stream	Real Media Player	Real Media Server	Windows Media Player	Windows Media Server
Application	Apache server ASP server BroadVision application server Check Point Cisco Works Citrix ColdFusion server COM+ server	Dynamo F5 IIS server iPlanet server News Oracle 9i application server Oracle10gAS Radius	SAP CCMS SAP CCMS alert SAP Java™ Web application server SAP performance SAP work processes Siebel application server Siebel log Siebel web server	SilverStream server SunONE web server Tuxedo UDDI server VMware monitor WebLogic application server WebSphere application server WebSphere MQ status WebSphere performance servlet
Server	CPU Disk space IPMI	Memory Service UNIX® resources	Web server Windows NT event log Windows NT performance counter	Windows resources Windows services state
Database	Database counter Database query	DB2 DB2 8.x	LDAP Oracle Database	SQL Server Sybase
Integration	HP OVO Event HP ServiceCenter	NetScout Event Technology Database Integration	Technology Log File Integration Technology SNMP Trap Integration	Technology Web Service Integration

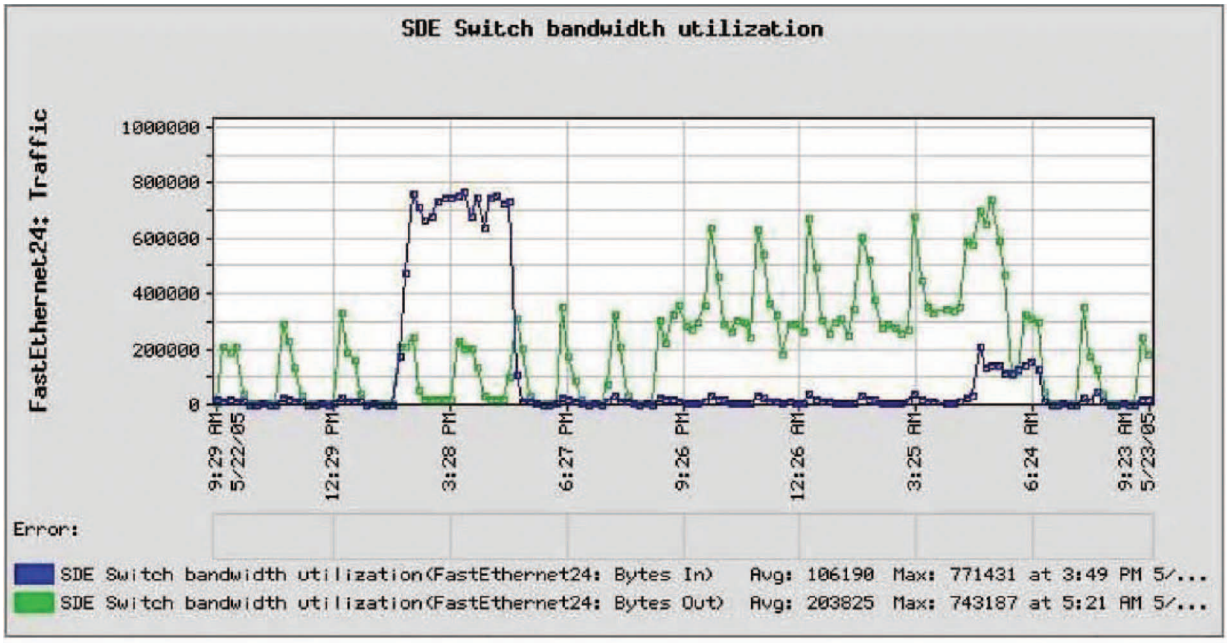
The following sections will review some of HP SiteScope's most powerful and flexible—yet sometimes little known—monitors.

SNMP by MIB monitor

HP SiteScope's SNMP by MIB monitor is one of the most flexible monitors available. Because so much IT infrastructure (and other equipment for that matter) has been instrumented via SNMP, HP SiteScope can literally monitor just about anything. Via SNMP by MIB monitoring, HP SiteScope can watch over anything instrumented via a MIB, including networking, mainframe, and even heating, ventilation and air conditioning (HVAC) devices. The SNMP by MIB monitor collects and monitors SNMP data from any network infrastructure component, including routers and switches. The type of data that can be provided by these network infrastructure components can help monitor the health of the entire network.

There are many potential applications for this technology. One HP customer is currently using SNMP by MIB to monitor the wind speed in a wind tunnel used for building Formula One race cars. HP is even using HP SiteScope SNMP by MIB to monitor the company's heating and cooling system at its Boulder, Colorado office.

Figure 1. HP SiteScope network bandwidth monitor displays real-time information for quick identification of bandwidth availability.



Bandwidth Metrics for 10.0.0.252
(information from 9.29 AM 5/22/05 to 9:23 Am 5/23/05)

Network bandwidth monitor

The HP SiteScope network bandwidth monitor is based on the same technology as the SNMP by MIB monitor, but adds additional functionality focused on networking devices. The network bandwidth monitor can monitor any network device that utilizes an Interfaces Group Management Information Base (IF-MIB), which includes about 90 percent of the routers, switches, load balancers and other devices on the market. By utilizing the network bandwidth monitor's built-in ability to read IF-MIB values, companies can easily troubleshoot basic networking issues with HP SiteScope's agentless technology.

The network bandwidth monitor watches each port of a networking device and has the capability to collect numerous metrics per port, including:

- Bytes in
- Bytes out
- Packets in
- Packets out
- Incoming discarded packets
- Outgoing discarded packets
- Incoming packets in error
- Outgoing packets in error
- Out queue length
- Percentage of bandwidth utilization

Script monitors

You can extend HP SiteScope through the use of scripting. HP SiteScope script monitors verify script execution. Scripts are generally used to retrieve information that is not readily available through other monitors. They also provide a common and well-appreciated approach for taking corrective action. The power of script monitors is the ability to leverage the creativity of the monitor administrator as they resolve difficult or multi-step requirements. For an example of script monitors in action, go to **www.sitescopedemo.co.uk/SiteScope/htdocs/DetailUptime.html**.

Here is an example of a script monitor to restart Internet Information Server (IIS) service:

```
'* File:  restartService.vbs
'* Created:  Jan 2001
'* Version:  1.0
'*
'* Main Function:  Restarts a service.
'*
'* Arguments <server> <service>
'*
'* Example:  To restart IIS on a server named "Server`"
'* cscript restartService My_Server IIS
'*
'*
'*
'* Warning: This script make use of WMI api if you want to run
'* script on an NT 4 machine you need to install WMI Core
'* Software Installation for NT 4.
'* See http://msdn.microsoft.com/downloads/sdks/wmi/download.asp
'*********************************************************
set args = Wscript.arguments

  ON ERROR RESUME NEXT

  dim strSever,strService,i

 'Change these two lines fro the desired server and service
 'Note: When calling this script from a SiteScope Script Alert arg 7 and arg 8 are the first two arguments pass to
 ' the script from the Parameters filed on the "Define Script Alert" window.
 ' Arg  7=Service
 ' Arg  8=Sever
strService = args (7)
strServer = args (8)


  Set ServiceSet = GetObject ("winmgmts:{impesonationLevel=impersonate}//" &
strServer) .ExecQuery ("select * from Win32_Service where Description= ' " & strService &" ' ")

 'Note do not enable the WScript.Echo stamens when using this script with SiteScope.
 'If you do the script will display a dialog window that SiteScope can not respond to and
 'will cause the script to hang.

i=0
for each Service in ServiceSet
i = i + 1
RetVal = Service.StopService()
if RetVal = 0 then
'WScript.Echo strService & " Service stopped"
elseif RetVal = 5 then
'WScript.Echo strService & " Service already stopped"
end it
RetVal = Service.StartService()
'WScript.Echo strService & " Service started"
next

if i = 0 then
'Wscript.Echo strService & " Service not found"
end if
```

One of the "latest power user trends" HP has seen is the ability to execute WMI scripts. HP SiteScope has the ability to utilize any of the hundreds of scripts provided by Microsoft or ones created by end users. The following example of a Windows Management Instrumentation (WMI) script (to retrieve the latest service pack) can provide useful diagnostic information when resolving server issues:

```
strComputer = "."
Set objWMIService = GetObject ("winmgmts:" _
  & "(impersonationLevel=impersonate}!\\" & strComputer & "\root\cimv2")
Set colOperatingSystems = objWMIService.ExecQuery _
  ("Select * from Win32_OperatingSystem")
For Each objOperatingSystem in colOpeatingSystems
  Wscript.Echo objOperatingSystem.ServicePackMajorVersion _
  & "." & objOperatingSystem.ServicePackMinorVersion
```

Enterprise application monitors

Many customers may not know that HP SiteScope can monitor most packaged applications (including enterprise applications) on the market today. HP SiteScope offers a wide array of monitors for all types of applications throughout a distributed enterprise including web servers, application servers, middleware, ERP, enterprise application integration (EAI) and CRM applications.

HP SiteScope is able to monitor SAP, Siebel, Oracle Databases, BEA WebLogic and IBM WebSphere. By connecting to a supplied application program interface (API) (such as CCMS for SAP, JMX, or WebLogic) significant metrics are available that can reveal the health, availability and performance of the application.

Get started quickly with solution templates.

One of the challenges in monitoring any infrastructure is knowing what about the infrastructure needs to be monitored. With such a vast array of devices, applications and technologies, being an expert on the entire infrastructure is a daunting—if not impossible—task. HP has recognized this fact and has created HP SiteScope solution templates in response.

HP SiteScope solution templates are collections of standard and solution-specific monitors that consist of default metrics, default thresholds and proactive tests. Each solution template also includes a best practices guide that explains the rationale behind the default metrics and thresholds, as well as a troubleshooting section that explains the next steps to take in solving performance problems. These solution templates enable IT staff to rapidly deploy multi-tiered, performance monitoring for the IT elements and applications supporting key business services—all without requiring IT administrators to be experts on the critical metrics for each target to be monitored.

	Individual monitors	Solution template
Default metrics	Sometimes	Always
Built-in thresholds	Rarely	Always
Best practices document	No	Yes
Deployment	Deploys a single monitor	Deploys a "solution set" of monitors all at once
Specific troubleshooting monitors	No	Most solution templates

Solution templates provide simple yet comprehensive monitoring without requiring users to be experts on the application. Some of the key benefits of pre-built solution templates include:

- Reduce the need for specialized domain expertise.
- Reduce the time to configure and deploy monitors.
- Reduce wasting monitoring points on lower-priority metrics.
- Help to identify and speed troubleshooting of both real-time performance bottlenecks and longer-term trends.
- Provide descriptions of all metrics, and in many cases, why the metrics are important.
- Provide "troubleshooting next steps" in a specialized best practices guide.

HP is constantly developing new HP SiteScope solution templates. The following solution templates are currently available:

- Microsoft Exchange Server 5.5, 2000, 2003
- Microsoft Active Directory
- BEA WebLogic Application Server
- IBM WebSphere Application Server
- Oracle Database
- Siebel Application, Gateway and Web Server
- SAP
- .NET
- Host/OS (Windows®, Solaris™, Linux, AIX)

Consolidate and extend your monitoring.

HP SiteScope can be expanded by using several different, complementary HP products and services, including:

HP SiteScope and HP System Availability Management software

It is common for mid-size to large deployments to make use of multiple HP SiteScope servers across the enterprise. For some of these deployments, it is desirable to control all HP SiteScope instances through a common management console, as well as to consolidate data between the various instances. HP System Availability Management software provides a common management console as well as consolidated data and reporting capabilities across multiple HP SiteScope instances. HP System Availability Management is part of the HP Business Availability Center product suite.

HP System Availability Management software connects to HP SiteScope (or existing Enterprise Management System (EMS) products) to collect and monitor system availability and performance data from across the entire enterprise using HP SiteScope as its data collection engine.

By using HP System Availability Management and HP SiteScope together, companies not only obtain the benefit of consolidating monitoring, but also gain a starting point with HP Business Availability Center software, which optimizes the availability, performance and effectiveness of your business services and applications.

HP SiteScope and HP Operations Center software

The majority of IT organizations use a combination of agent-based and agentless monitoring. Each has its advantages:

- Agent-based monitoring, such as HP Operations Center, provides the depth of monitoring to diagnose complex infrastructure problems in mission-critical servers.
- Agentless monitoring, such as HP SiteScope, provides the breadth of monitoring to allow fuller coverage of your IT infrastructure with lower management overhead and associated costs.

By combining HP SiteScope and Operations Center software, you have a balanced approach to infrastructure monitoring that achieves both the breadth and depth required.

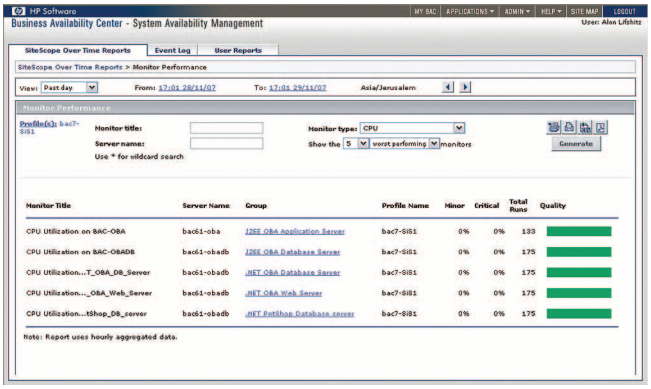
HP SiteScope and HP Software-as-a-Service (SaaS)

Another way to expand HP SiteScope monitoring is by adding transaction-oriented, "outside-looking-in" monitoring to HP SiteScope systems and application monitoring. HP SaaS for HP Business Availability Center provides customers with the ability to monitor the end-user experience of a company's external-facing applications from over 80 locations on major Internet service providers (ISPs) around the world.

HP SaaS uses business process monitors to emulate end users accessing ERP, CRM or custom applications. This information provides insight into transaction performance by capturing statistics such as round-trip response time and transaction breakdowns. This hosted monitoring capability complements HP SiteScope's internal view, thereby offering a complete picture of performance and aiding in problem resolution.

Integration with HP SaaS is simple. HP SiteScope can be configured to send its infrastructure performance data to the HP SaaS central repository. This data can then be combined with transaction performance data, offering a correlated view of the end-user experience and the performance of related hardware and applications. Trend reports and service-level management analysis are also available.

Figure 2. HP System Availability Management allows you to consolidate infrastructure management data from multiple HP SiteScope and third-party systems.



The HP SaaS team includes performance engineers, technical consultants, 24x7 support staff, system administrators, network administrators, database administrators and HP Business Availability Center administrators. The team takes care of all installation, configuration and setup requirements, including procurement of all hardware, software and storage needed. HP SaaS also assigns a named technical account manager to work with the customer's organization to understand unique business requirements and provide ongoing mentoring.

HP SaaS is a great way to take the next step from HP SiteScope to HP Business Availability Center without actually deploying HP Business Availability Center in the IT environment. HP SaaS delivers hosted end-user management, discovery and dependency mapping, service-level management and problem isolation applications—plus ongoing expertise. This hosted approach offers time to value in weeks or even days, reduces TCO, and can be transitioned to a full, in-house implementation of HP Business Availability Center at any time.

For more information

To learn more about how to monitor more of what matters with HP SiteScope or to implement complementary solutions, contact your HP representative or visit us online at **www.hp.com/software**.

Appendix: HP SiteScope supported monitors

System monitors

These monitors provide everything necessary for basic system monitoring and system management including coverage for operating system and hardware metrics.

Composite monitor
Monitor the status readings of multiple monitors or multiple groups of monitors. Create alerts based upon more than one status reading.

CPU utilization monitor
Report the percentage of CPU currently in use to verify that you know if the CPU is being overloaded.

Database monitor
Verify database queries.

DHCP monitor
Determine whether an IP address can be obtained from a Dynamic Host Configuration Protocol (DHCP) server.

Directory monitor
Monitor file count and size within a directory.

Disk space monitor
Report the percentage of disk space currently in use so that you can act before you run out of disk space.

File monitor
Monitor file system parameters such as the size, age and content of a file, and receive notification of any changes.

IPMI monitor
Monitor hardware parameters such as temperature, voltage, fan speed, etc. on Intelligent Platform Management Interface (IPMI)-enabled servers.

LDAP monitor
Verify that an Lightweight Directory Access Protocol (LDAP) server is working correctly by connecting to it and performing a simple authentication. Optionally, it can check the result for expected content.

Log file monitor
Generate warnings and errors based upon data in an application's log file. For example, many applications write error messages to a log file. This monitor can scan those log files, looking for error messages and generating alerts when it finds them.

Memory monitor
Measure virtual memory usage and receive proactive notification of problems.

News monitor
Connect to a Network News Transfer Protocol (NNTP) server and verify that groups can be retrieved.

Network monitor
Track network statistics for your server. Information provided by the network monitor can help you track down performance problems related to network interfaces on your servers.

NT dial-up monitor
Dial into an ISP or remote access server and confirm that a connection can be made. Once connected, it can execute user-defined commands and measure performance.

NT event log monitor
Watch one of the Windows NT® event logs (system, application or security) and trigger alerts when entries are added.

NT performance counter monitor
Retrieve the value of any Windows NT performance counter and send alert if this value is out of a specified range.

Radius monitor
Send an authentication request to a radius server.

Script monitor
Verify script execution.

Service monitor
Verify that specified processes are running, including web, mail, File Transfer Protocol (FTP), news, gopher, Telnet and domain name server (DNS).

Application monitors
The following monitors provide monitoring for all types of applications throughout a distributed enterprise including web servers, application servers, middleware, ERP and CRM applications.

Apache web server
Monitor Apache server statistics such as bytes per second, requests per second and CPU load.

ATG Dynamo application server
Monitor server statistics for ATG Dynamo application servers.

BEA Tuxedo
Monitor BEA Tuxedo server availability.

BEA WebLogic application server
Monitor server statistics for BEA WebLogic application servers.

BroadVision application server
Monitor server statistics for BroadVision application servers.

Check Point FireWall-1
Monitor Check Point firewall parameters such as fwEvent, fwRejected and fwLogged.

Cisco Works
Monitor Cisco Works server parameters.

Citrix MetaFrame
Monitor the Citrix MetaFrame server by measuring counters such as session average, data bandwidth and session compression.

COM+
Monitor performance metrics for COM+ applications.

IBM DB2
Monitor a DB2 database.

IBM WebSphere application server
Monitor performance statistics for IBM WebSphere application servers including JVM, EJB, JSP and other components.

IBM WebSphere MQ server
Monitor the status of WebSphere MQ channels, queues and events.

F5 Big-IP monitor
Monitor F5 Big-IP load-balancing server parameters.

MacroMedia ColdFusion server
Monitor ColdFusion statistics such as page hits per second, queued requests or average request time.

MAPI
Test Microsoft Exchange server by sending a message via messaging application programming interface (MAPI).

Application monitors

Monitor performance for most Microsoft applications including:

- Active Directory
- ASP
- Exchange
- IIS
- SQL
- .NET
- Windows Media Player and Server

Netscape Enterprise/iPlanet
Monitor key performance statistics for Netscape Enterprise/iPlanet web servers.

Novell SilverStream
Monitor SilverStream statistics such as current load, total sessions and average request process time.

Oracle9i application server
Monitor server statistics for Oracle9i application servers.

Oracle JDBC
Test an Oracle database by connecting to it and performing a query using JDBC.

Real One/Real Media player and server
Monitor server statistics on RealNetworks streaming media players and servers.

SAP CCMS
Monitor SAP performance metrics via SAP's standard CCMS interface.

SAP GUI
Monitor the availability and performance statistics of a SAP application server.

Siebel server manager and Siebel web server
Monitor key components for Siebel servers and web servers.

SunONE server
Use the latest Stats-XML performance metrics file to display counters for selection, including several derived counters that track utilization metrics.

Sybase database
Monitor Sybase database applications.

Web/URL monitors

These monitors are used specifically for monitoring website performance or web-related processes including web services.

E-business chain monitor
Verify that a complete chain of actions is completed as intended including front-end web servers, e-mail notifications, back-end databases and more.

Link check monitor
Monitor all internal and external website links for link integrity.

URL monitor
Verify availability and access time for specified URLs to verify that web pages are available within an acceptable time frame. On Windows NT, HP SiteScope takes advantage of the platform's integrated support to monitor HTTPS URLs with advanced security features in addition to HTTP URLs.

URL content monitor
Retrieve a selected URL, checking for multiple strings of text within the page.

URL list monitor
Monitor an entire list of URLs, rather than defining several separate URL monitors.

URL sequence monitor
Verify a session that includes multiple pages. An example of this would be entering an account name via a web form and checking an account status for the page that is returned.

Web server monitor
Report data recorded by the web server log such as hits, bytes, errors, hits per minute and bytes per minute.

- Netscape Enterprise
- Netscape FastTrac
- Microsoft IIS
- O'Reilly website

Web service monitor
Send SOAP requests to a web-service-enabled application to verify availability.

Network service monitors

The following monitors are used for monitoring network services and network-related processes/operations.

DNS monitor
Verify that the domain name server (DNS) is accepting requests. Verify that the address for a specific domain name can be found.

Formula (bandwidth) composite
Create a measurement based on an arithmetic calculation of the results from two other monitors.

FTP monitor
Verify that a file can be retrieved from a File Transfer Protocol (FTP) server.

Mail monitor
Verify that the mail server is accepting requests, and that messages can be sent and retrieved.

Ping monitor
Verify that specified hosts are available via the network to provide nearly continuous availability of critical connections.

Port monitor
Determine whether a service on a port can be connected to.

Real streaming monitor
Measure the availability and quality of a real stream from a client-side perspective.

Real Time Streaming Protocol (RTSP) monitor
Determine the availability of real-time media streams. Monitor real-time media streams.

SNMP monitor
Use industry-standard Simple Network Management Protocol (SNMP) to monitor network devices.

SNMP trap monitor
Search through SNMP traps for specific values. Together with HP SiteScope's native SNMP listener, this monitor lets HP SiteScope act as an SNMP management console.

To learn more, visit www.hp.com/software

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