

A technical discussion of performance and availability

December 2002



Tivoli software

**IBM Tivoli Monitoring
solutions for performance
and availability**

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Achieve proactive performance and availability monitoring across your business enterprise

IT environments are becoming increasingly complex. In support of critical business initiatives, enterprises are expanding multitier deployments of host systems with client-server deployments and Web environments. The result is a heterogeneous set of operating systems, databases, hardware systems, middleware technologies and applications that all must work together for a business to be successful.

Now, more than ever, these increasingly complex environments are mission-critical to the business objectives of the enterprise as corporations focus on revenue and profit targets, customer satisfaction scores, and overall growth objectives. More companies are automating their sales, service, marketing and supplier network systems and creating increased reliance on the IT infrastructure.

This high degree of IT complexity, combined with the mission-critical nature of IT, increases the importance of monitoring vital IT resources. Monitoring systems are frequently required to go beyond simply displaying the health of deployed resources—networks, databases, operating systems, middleware solutions, hardware systems and software applications—to identifying specific failure points and initiating automated corrective actions as well. An effective IT monitoring solution helps you quickly identify outages, bottlenecks and degradations in system performance without overwhelming you with raw data.

IBM® Tivoli® Monitoring solutions are well-positioned to meet today's enterprise challenges by delivering valuable new capabilities, including automatic correction of many component-level problems before they occur, monitoring of persistent problems and input of operating metrics to event correlation and business impact management applications.

This advanced functionality sets Tivoli Monitoring solutions apart from monitoring tools and application monitoring functions that provide considerable data even when monitored resources are operating perfectly. As a result, administrators with Tivoli Monitoring solutions need not spend valuable time reviewing data only to determine that no problem exists.

Highlights

Correlate symptoms to resolve problems

Tivoli Monitoring solutions provide administrators with productive information, rather than mere data. The difference is illustrated when an operator considers the alerts that are generated when a Microsoft® Windows® machine begins to run out of paging space. Many monitoring tools would highlight three bottlenecks:

- *Physical memory is 100 percent utilized.*
- *Logical disks have application queuing and are probably performing poorly.*
- *Excessive paging is occurring on all paging spaces.*

Leverage resource models and Proactive Analysis Components

After these alerts are generated, the administrator must probe more deeply to diagnose the actual problem on the troubled machine. Tivoli Monitoring provides a targeted solution because it correlates these three symptoms to identify and resolve the real problem. Tivoli Monitoring solutions provide this capability by leveraging a variety of innovative technologies, including resource models and Proactive Analysis Components (PACs).

Tivoli Monitoring software

Tivoli Monitoring solutions offer a broad range of proven software for monitoring systems and applications and measuring performance from the end-user perspective. These products include powerful monitors for many essential middleware resources, including Web infrastructure and applications, databases and connectors.

Deploy a single monitoring resource for virtually all resources

The core product in the Tivoli Monitoring suite, Tivoli Monitoring, is a versatile, robust engine that combines the functionality of two previously available products: IBM Tivoli Distributed Monitoring and IBM Tivoli Web Component Manager. Tivoli Monitoring allows you to deploy a single monitoring solution for almost all the resources monitored in your environment. Your system monitors can now share a common reporting mechanism and graphical user interface. In addition, these monitors can send historical data to a common data repository, the Tivoli Enterprise™ Data Warehouse.

The Tivoli product range also provides superior monitoring for essential middleware resources. Each system in the Tivoli Monitoring family of products offers comprehensive monitoring for applications and resources

across similar functional roles. The following five middleware monitoring solution sets are available:

- *IBM Tivoli Monitoring for Databases*
- *IBM Tivoli Monitoring for Applications*
- *IBM Tivoli Monitoring for Messaging and Collaboration*
- *IBM Tivoli Monitoring for Business Integration*
- *IBM Tivoli Monitoring for Web Infrastructure*

In addition, IBM Tivoli Monitoring for Transaction Performance provides monitoring for your Web-based e-business processes or applications. This software combines the functionality of two previously available products, Tivoli Web Services Manager and Tivoli Application Performance Management, and measures the performance of your e-business resources from an end-user perspective.

Using resource models to leverage your systems management expertise

Tivoli Monitoring software allows you to model complex problems, such as memory bottlenecks, without relying on administrator expertise to evaluate operating data. When problems are detected, Tivoli software can fix the problems automatically at the local level while alerting higher-level management applications such as the IBM Tivoli Business Systems Manager. These higher-level applications can then identify the potential impact of the outage on a particular business process or line of business.

Tivoli Monitoring software uses resource models to manage system resources with minimal administrative intervention. Resource models are used to model business-relevant “logical objects” from the perspective of common problems that can affect those objects. Examples of frequently used resource models include “machine memory” and “machine connectivity.”

Each resource model has two components: a dynamic model and a reference model. The dynamic model uses Common Information Model classes to describe the logical object as an aggregation of actual, physical resources.

Highlights

Manage systems reactively or proactively

The reference model component provides built-in intelligence, a set of embedded best-practices data that:

- *Interprets the quality of an logical object against a defined baseline*
- *Discovers the root cause of the quality reduction*
- *Logs performance data related to the business object*
- *Proactively manages the application through a predefined collection of problem signatures*

The resource models provided by Tivoli Monitoring deliver a powerful set of automated management capabilities, including:

- *Asynchronous information about the status of a logical object (for example, memory bottleneck detected on machine X)*
- *Health, measured as a percentage required to detect a problem (for example, machine X has 30 percent of the health due to a detected memory bottleneck)*
- *Performance metrics (for example, memory available on machine X, or memory used by process Y on machine X)*

Use resource models for adaptive management

This resource model capability can be used in a number of ways. First, you can manage systems and resources reactively, allowing you to escalate the status change of a resource. You also can adopt a proactive management strategy, using resource models to automatically diagnose and fix problems at the local level. Additionally, resource models can be used for predictive management tasks, allowing the utilization of data mining tools to analyze performance metrics and predict abnormal behavior. Or you can use resource models for adaptive management, automatically tuning model baselines based on historical trends of performance data collected by the model itself.

Coordinate a centralized environment easily

An extensive set of resource models is included with Tivoli Monitoring, and the Tivoli Monitoring family of products, allowing you to centralize your environmental management without time-consuming programming. Tivoli Monitoring also includes a WorkBench tool that helps you adjust standard resource models and build customized ones to meet the specific needs of your environment.

Built-in intelligence can add substantial value to an application monitor

Some application management software products claim a long list of available monitors, even though many of the monitors provide only single metric support, leaving the network operator unable to effectively determine the true health of the IT environment.

Ideally, application management tools should deliver capabilities beyond simple monitoring or retrieval of basic application metrics, adding functionality and intelligence at the local level, and automating routine management tasks without impacting the overall application performance.

Consider how a monitoring solution that provides this functionality can help manage certain applications or resources more effectively:

- **Multiple source data capture**—Allows you to process data from industry-standard application program interfaces (APIs) and from any custom data interfaces that a particular application uses.
- **Local persistence checking**—Links corrective actions or responses to the repeated occurrence of a problem condition, so that a single point-in-time threshold exception does not immediately trigger a costly and unnecessary troubleshooting response.
- **Local intelligent correlation**—Recognizes a number of metrics in combination as a “problem signature,” allowing you to quickly identify root causes and respond to problems rather than symptoms.
- **Local data store and reporting**—Provides a realtime “heart monitor” that determines whether the application environment and individual applications are functioning properly.

Best-practices PACs augment functionality

Tivoli software addresses your need for increased functionality and built-in intelligence by incorporating PACs. The PACs included with the Tivoli Monitoring family of products are based on best practices developed by industry leading experts for a given application environment.

These best practices include the identification of a number of common problem signatures that recognize when key metrics occur in combination. Resource models identify the problem signature and perform a diagnostic or corrective action. The PAC best practices are implemented by combining

Highlights

Leverage “Identify-Notify-Cure” functionality

resource models with the rules you have set in IBM Tivoli Enterprise Console® and through integration with other Tivoli products such as Tivoli Business Systems Manager. This capability enables the software to do more than send an alarm—in many cases the software can provide true “Identify-Notify-Cure” functionality. This innovative technology is included in all five middleware products of the Tivoli Monitoring family.

Simplify predictive management activities

The new Tivoli Monitoring solutions integrate tightly with other IBM Tivoli Performance and Availability solutions. For example, many Tivoli Monitoring solutions incorporate rules that allow you to identify, correlate and automatically fix problems across multiple systems or domains. These solutions also simplify predictive management activities by automatically sending operating data into the Tivoli Enterprise Data Warehouse, where it can be accessed by Tivoli Business Systems Manager and other Tivoli Business Impact Management solutions.

Handling changes to your e-business environment

Constant change is a fact of life in most corporate computing environments. Resources are added, new systems are introduced, and outdated technologies are removed on an ongoing basis. Ideally monitoring solutions should be highly adaptable and require minimal intervention from expert administrators.

Automate inventory application instances

Tivoli Monitoring solutions address these needs by automating a wide range of common administrative tasks, including:

- ***Automatic inventory capability***—Automatically inventories application instances in your environment and the monitors deployed for those instances.
- ***New application instance identification***—Offers an auto-discovery function to identify new instances of an application and an autodeploy function to automatically extend monitoring capabilities to those new instances.
- ***Deleted instance identification***—Keeps your management environment updated by automatically revising the central application monitoring data repository to remove monitoring software when an application instance has been deleted.
- ***Addition of new application monitors***—Helps create, test, certify and deploy new monitors into your test and production environments.
- ***Identification of rebuilds***—Verifies that rebuilt application instances are automatically configured to meet your corporate policies.

Implementing a multilayer approach to measuring transaction performance

If you depend on Web-based processes or applications in your business, you face an important management challenge of correlating events across the multiple systems required for completing a typical e-business transaction.

Several different techniques are available for measuring the performance of Web-based applications, all of which monitor transaction availability and response time. Tivoli Monitoring for Transaction Performance offers four methods of measuring the availability of e-business resources, which can be used individually or in combination:

Passive monitoring—Quality of Service monitor: The Tivoli Quality of Service monitor enables you to measure the response times experienced by your actual customers, without the installation of desktop code. This monitor provides three key metrics for Web-based transactions: backend processing time (the time it takes your Web infrastructure to respond to a Web page request), browser render time (the time required for a page to render within the client's browser) and total roundtrip time (the time required to complete the transaction). These metrics can be extremely useful when quantifying the level of service experienced by customers on your Web site. Lengthy page-render times may suggest that your Web pages are too graphics-intensive for dial-up users. In contrast, long backend processing times may indicate that your Web servers or Web application servers should be tuned or upgraded to handle their processing loads. If lengthy roundtrip time indicates problems in the quality of service you'd like to deliver, other metrics can be used to evaluate whether the problem is internal or external to your environment.

Synthetic Transactions: While the Quality of Service monitor focuses on Web performance monitoring, the Synthetic Transaction measurement method focuses on availability and performance. By recording complex transactions that can be replayed from any number of endpoints at regular intervals, synthetic transactions help determine whether customers can complete critical business transactions such as making online purchases or checking e-mail server availability. Each synthetic transaction can include a complicated series of steps, such as logging in, selecting a product, adding it to your shopping cart, specifying shipping and making payment.

Highlights

Application Response: The Application Response approach for measuring application performance focuses on the instrumentation of the application's source code. This approach modifies the application source code to include periodic calls to the Application Response Measurement (ARM) API. Established by a number of prominent application vendors, this ARM API is a set of standard API calls that allows an application-centric focus on performance.

Client Capture: The Client Capture approach measures performance by deploying sensors on end-user desktops. These sensors can observe activities within a system or application as it interfaces with the desktop machine. Events relating to the application are analyzed to determine which type of transaction was executed and the response time that the end user received.

Report on quality of customer experience without compromising security

Optimizing and enhancing the performance of your e-business infrastructure

A comprehensive performance management solution such as Tivoli Monitoring for Transaction Performance provides many of the tools needed to optimize the performance of your e-business infrastructure. You can report on the quality of the actual customer experience in a nonintrusive way, as well as collect and analyze e-business information without compromising firewall security. System availability and performance metrics can be measured independently from those of your Internet Service Provider. Additionally, transaction performance data can be aggregated into a single business view.

Reduce training and development time

A key benefit of deploying the integrated family of Tivoli software is efficiency in managing your total business IT environment. Tivoli Monitoring products provide management solutions for a broad range of widely used applications and resources. Because Tivoli products share a common architecture, monitoring engine and user interface, you may better leverage your investment in training and development. Technical support staffers can manage your enterprise from common ground because there's no need to learn vastly different management software. Tivoli products also allow you to mine data flowing from your monitoring tools to gain new insights and improve overall infrastructure management.

Tivoli Monitoring products are designed to integrate with Tivoli management products such as Tivoli Enterprise Console and Tivoli Business Systems Manager. Integration across the Tivoli product suite can provide benefits such as:

- **Advanced correlation**—Gather and correlate information from various applications, operating systems and network segments deployed in your environment to help speed problem determination and resolution.
- **Reusable data**—Write to and retrieve data from a common data repository for predictive management tasks and comprehensive enterprise system reporting.
- **Business impact management**—Use application-specific data for higher-level management tasks, such as setting and tracking service-level agreements and managing resource sets in the context of the specific line of business or business process it supports.

Summary

The new generation of Tivoli Monitoring solutions helps you address the need for a comprehensive approach to monitoring the performance and availability of a complex computing environment.

Tivoli Monitoring software provides outstanding functionality for analyzing the health of individual resources. By incorporating innovative technologies, such as resource models and PACs, Tivoli software from IBM can help you manage system resources and solve component-level problems with minimal administrative intervention. Because Tivoli products share a common architecture and interface, your staff can manage complex computing environments simply and effectively.

IBM software integrated solutions

Tivoli management software products support a wealth of other offerings from IBM software. IBM software solutions can give you the power to achieve your priority business and IT goals.

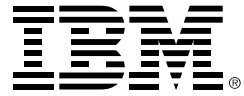
- *DB2® software helps you leverage information with solutions for data enablement, data management and data distribution.*
- *Lotus® software helps your staff be productive with solutions for authoring, managing, communicating and sharing knowledge.*
- *Tivoli software helps you manage the technology that runs your e-business infrastructure.*
- *WebSphere® software helps you extend your existing business-critical processes to the Web.*

To learn more

For information on Tivoli management software and integrated solutions from IBM, contact your IBM sales representative or visit info.tivoli.com/availability

Tivoli software from IBM

An integral part of the comprehensive IBM e-business infrastructure solution, Tivoli technology management software helps traditional enterprises, emerging e-businesses and Internet businesses worldwide maximize their existing and future technology investments. Backed by world-class IBM services, support and research, Tivoli software provides a seamlessly integrated and flexible e-business infrastructure management solution that uses robust security to connect employees, business partners and customers.



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12-02
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