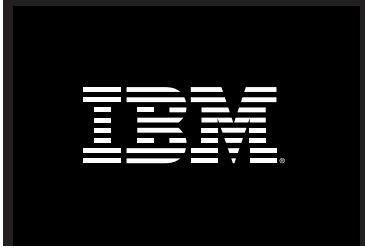
Monitoring solutions
White paper

Tivoli software



IBM Tivoli Monitoring for Transaction Performance helps you maximize performance of your applications.

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Contents

2 *Overview*
3 *Today's administrators face a complex process when solving transaction problems*
4 *Implement transaction-based management*
5 *Use software designed especially for transaction analysis*
9 *Adopt end-user view with both active and passive monitoring*
13 *Leverage leading monitoring and measurement capabilities*
15 *Summary*
16 *IBM software integrated solutions*
16 *For more information*
16 *Tivoli software from IBM*

Overview

Imagine being able to see key business transactions as they flow through your IT environment. To dynamically discover what systems your key business transactions use and obtain detailed response times for each step. What if the software that provided this information could also learn what normal response times are for each step of a transaction and automatically alert you when a problem occurs?

IBM Tivoli® Monitoring for Transaction Performance can provide all these capabilities and more, today. When you view business transactions as they execute inside your enterprise, troubleshooting becomes a much simpler process. Rather than assemble teams of people to determine the cause of poor application performance, leverage an easy-to-use transaction topology that highlights the root cause. Instead of guessing which systems a particular transaction uses, identify and display the relevant systems with precision. This level of detailed transaction information not only helps you minimize IT support costs, it enables you to quickly address application performance problems to optimize customer satisfaction.

This paper briefly summarizes the capabilities of Tivoli Monitoring for Transaction Performance and the benefits it can provide. The paper then includes a more detailed discussion of how you can use the product to monitor an IT infrastructure from a "transactional," end-user standpoint. Key product features provide capabilities such as transaction simulation, transaction decomposition and application response measurement (ARM) to offer additional benefits and unmatched customer value.

Today's administrators face a complex process when solving transaction problems

Your help desk receives a customer or user complaint about a slow response time for a particular transaction. The call usually routes to the operations center, which begins its analysis by looking at network resources for problems. If none are found, the operations team in the network operations center calls the system administrators or senior technicians – senior personnel responsible for applications and resources in production. A number of pagers go off – the exact number usually depends on the severity of the service level agreement (SLA) or the importance of the customer involved.

Customer pain – isolating a problem today

Step 1	Step 2	Step 3	Step 4	Step 5
Check operations center	**Call applications support**	**Bridge call with problem response team**	**Check everything**	**Locate source of problem**
Network problems: • Alerts • Health monitors • Excessive traffic • Pings and collisions System problems: • System alerts	• Check change records • Roll back application to old level		Monitoring tools: • Hardware • OS • Applications > Log files • Databases > Run Test SQL	• Finger pointing: > "It's the network guys' fault." • Re-creating the problem is difficult • Solutions by chance

Today's problem-determination process is slow and error-prone.

If the problem is serious, a response team of highly skilled people assembles to solve the problem. System administrators check to see if anything has changed in the past day to help identify the cause. If possible, the application rolls back to a previous version to see if that fixes the problem. If nothing changes, system administrators typically have a list of resources to check, actions to take and tools to use to troubleshoot the problem. Typical tasks include:

- *Using hardware, operating system and application monitoring tools to locate the resource causing the performance problem.*

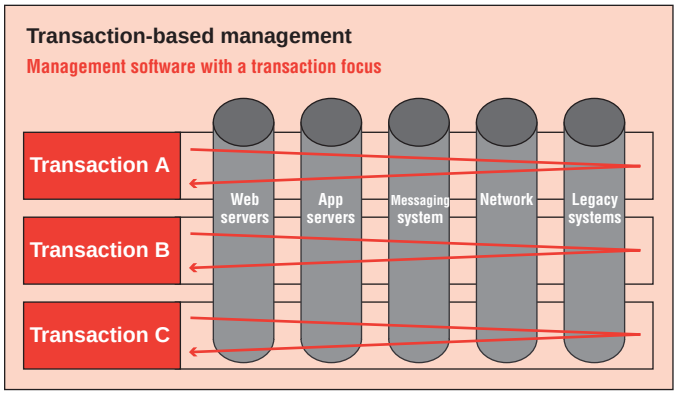
- *Looking at the packet data – number of collisions, loss between connections and so on – to find the offending resource.*
- *Going through log files from the application, middleware and elsewhere to identify the problem.*
- *Having database administrators check databases from the command line to view response times.*
- *Contacting other areas that may be related (for example, host-based applications or application developers that maintain the application).*

Unfortunately, locating and solving the problem can be very difficult and expensive. As time goes by and the problem remains unsolved, the level of tension in the organization and within the response team often increases. Sometimes this tension leads to unproductive "finger pointing" and assigning of blame. In the meantime, the customer's level of dissatisfaction grows.

Fortunately, you can help avoid this outcome with Tivoli Monitoring for Transaction Performance.

Implement transaction-based management

While it is important to understand how individual resources perform, it is even more important to understand what the end user, or customer, experiences.



Transaction-based management overview

Highlights

A customer's opinion of the level of service a company delivers will often be determined by the amount of time needed to complete a transaction. Typical examples of customer-facing business transactions include checking a bank balance, buying a book or enrolling in a healthcare plan online. For internal customers within an enterprise, transactions can consist of activities such as executing an SAP query to check the status of an internal process or running an application to check a customer's order status. If a transaction is slow or unavailable, the IT provider is viewed as not delivering the service needed.

An IT organization needs a transaction view to accurately assess the end user's experience and view of the company

Without a transactional view, an IT organization cannot accurately assess the true end-user experience and the end user's view of the company. As a result, the company's financials can suffer. Unfortunately, some enterprises today monitor only resource availability. They can tell whether a database is available, whether the Web server is up or whether back-end systems are running. However, with only a resource view, these enterprises may not be able to take the appropriate corrective action to improve and maximize the end-user experience.

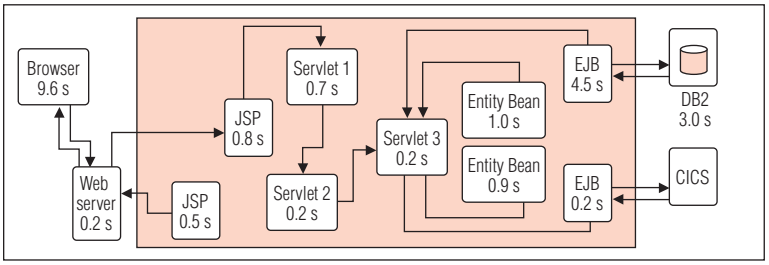
To align IT with strategic business objectives, an organization must first align itself with the end-user experience and with the business processes that support the company. As the complexity of the distributed environment increases, the importance of the transactional view becomes even more critical. Monitoring from a transactional perspective is the first step in understanding true performance from the user's point of view.

Use software designed especially for transaction analysis

Tivoli Monitoring for Transaction Performance enables IT staff to follow the transaction execution path and see exactly where problems occur so that corrective action can be taken quickly. Tivoli Monitoring for Transaction Performance is one of the first products built from the ground up specifically for this type of analysis.

The product's transaction decomposition capability allows an IT department to follow a transaction as it flows through the environment – end to end – and to understand performance response times at each step. To reduce the complexity of discovering the transaction flows, the discovery process is performed dynamically and does not rely on static definitions. The starting point for the discovery process can be a particular URL, a J2EE™ component, a synthetic transaction or a Web services request.

You can also have Tivoli Monitoring for Transaction Performance set baselines for transaction response time automatically as the system learns the transaction flows and analyzes the response-time characteristics of your environment. In a dynamic, On Demand Business setting, it is critical that you implement a system that can learn where transactions are executing and how they perform in a live environment.



Typology view of transaction decomposition flow

From the topology view, an operator can quickly determine the root cause of a problem, eliminating the lengthy problem-determination cycle described on pages 3 and 4.

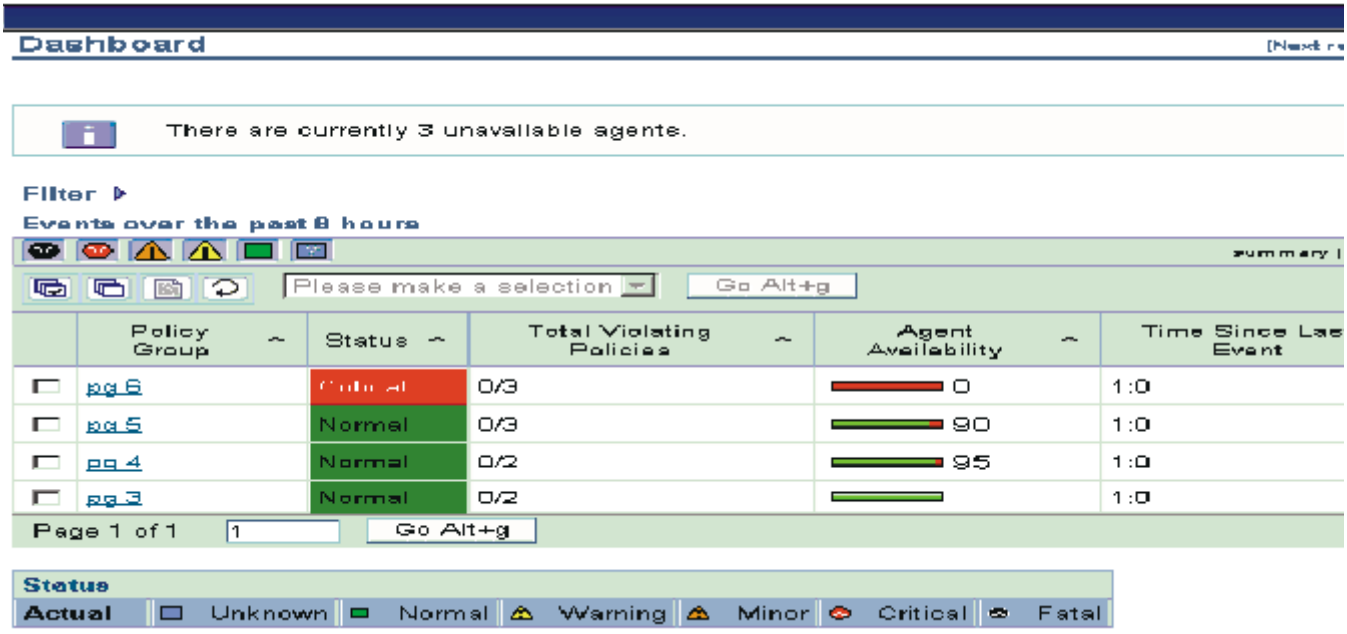
Highlights

A critical goal of Tivoli Monitoring for Transaction Performance has been to continually expand the topology view so that you can obtain a complete view of transaction flows. In Tivoli Monitoring for Transaction Performance, Version 5.3, the topology has been expanded so that you can view:

- Web services – *Track how transactions that originate as Web services flow through the IBM WebSphere® environment.*
- IBM CICS®, IBM IMS™, IBM DB2® and SAP – *Enjoy expanded visibility into back-end services and enable your support personnel to quickly isolate performance problems and improve time to resolution. Leverage the Java™ Connection Architecture (JCA) support in Tivoli Monitoring for Transaction Performance to view the overall response time for CICS, IMS and SAP calls made using JCA – and also information about the back-end server that was called. With the native DB2, Version 8.2, ARM instrumentation, you can follow calls made from WebSphere into the DB2 server to achieve a highly accurate view of database response times.*
- Web servers – *Track transactions through Web servers with plug-in support for the leading Web servers such as Apache, IBM HTTP Server, Microsoft® IIS, IBM Lotus® Domino®, iPlanet and SunOne server.*
- Network – *Highlight potential network delays between ARM-instrumented nodes. This enables support staff to quickly identify potential network-related response time problems and quickly engage the network support group to speed resolution of performance problems.*

Tivoli Monitoring for Transaction Performance provides intuitive interfaces to help users quickly and easily identify root causes of problems and take corrective action

Tivoli Monitoring for Transaction Performance was designed for use as an operational tool and provides intuitive interfaces that help users quickly and easily identify the root causes of performance problems and take corrective action.



Tivoli Monitoring for Transaction Performance, Version 5.3, dashboard

Furthermore, a high-level dashboard view has been added to help users see transaction and agent status at a glance. With Tivoli Monitoring for Transaction Performance, Version 5.3, you can group individual transactions into a set of higher-level policy groups – improving usability in large environments where hundreds of transactions may be defined. The agent status indicator shows the status of agents that are running a particular policy group – and quickly identifies problems caused by an unavailable agent.

The detailed transaction performance information from Tivoli Monitoring for Transaction Performance can enable you to enhance the automation capabilities of IBM Tivoli Monitoring and the Tivoli orchestration solution.

When you integrate these solutions, you enable your systems to heal themselves, which in turn helps you:

- *Reduce the cost of problem determination.*
- *Minimize downtime.*
- *Optimize performance.*
- *Ultimately deliver high levels of satisfaction among end users and customers.*

Self-healing is an automation capability that demonstrates how you can use IBM solutions as part of your efforts to become an On Demand Business.

Adopt end-user view with both active and passive monitoring

Tivoli Monitoring for Transaction Performance uses two basic methods to capture the end-user view of transactions – active monitoring, which monitors and measures performance with recording and playback of simulated transactions, and passive monitoring, which monitors the performance of actual end-user traffic.

Active monitoring

As its name implies, active monitoring involves proactively executing simulated business transactions to check performance and availability. By using the combined Tivoli Monitoring for Transaction Performance synthetic transaction investigator and IBM Rational® Robot function, you can record both Web and Microsoft Windows®-based transactions and then play back these recorded scripts from various end points located throughout the enterprise, DMZ or Internet.

Highlights

The recording process involves stepping through the business process (for example, buying a book, checking a bank balance or running an SAP query) as an end user would. The simulation script of a business process is typically composed of several individual transactions or steps. This recorded transaction is then captured as a script that can be deployed to clients who play back scripts on a regular schedule and report on both performance and availability. Playing scripts back every 10 minutes, for example, provides an excellent early-warning system for performance problems on key business transactions. Scripts can also be used to alert operations staff to availability problems if transactions are not completed.

With the Rational Robot capability, you can extend Tivoli Monitoring for Transaction Performance to include Windows-based transactions and advanced Web applications involving Java applets and complex JavaScript™. Companies that use Rational Robot in their test environments can reuse their test scripts for production monitoring through Tivoli Monitoring for Transaction Performance. This allows test scripts written by the development team – which usually has the best understanding of the application logic – to be used in production. New scripts can be written using existing skills.

Tivoli Monitoring for Transaction Performance, Version 5.3, allows you to check the availability of a large number of servers in a very short time

A new capability in Tivoli Monitoring for Transaction Performance, Version 5.3, lets you quickly check the availability of a large number of servers in a very short period of time. Leverage this availability information to provide an early warning about server outages before calls start coming in to the help desk. The Rational Robot virtual user (VU) scripting capability performs a quick protocol-level check and also links directly to the topology view, allowing you to isolate problems rapidly.

Passive monitoring
With passive monitoring, you measure the response time of real, rather than simulated, end users as they execute transactions. Each step of a process is reported as an individual transaction (for example, in a book-buying process, signing in, searching the catalog, putting the selection in the shopping cart, checking out and so on are each measured individually). Because passive monitoring reports on individual user requests, you cannot see the response time in an overall business process context as you can with simulated transactions.

Tivoli Monitoring for Transaction Performance includes both the quality-of-service (QoS) monitor for Web transactions and ARM instrumentation so you can implement passive monitoring.

QoS monitoring
The QoS monitor measures actual customers' response times, without requiring them to install code on their desktops. Use QoS to measure three key metrics for Web-based transactions:

- Back-end processing time – *the amount of time it takes for the Web infrastructure to respond to the Web page request.*
- Browser-render time – *the length of time it takes the page to render inside of the customer's browser, from first pixel to last.*
- Total round-trip time – *the amount of time needed to go from start to finish.*

These metrics are extremely useful when you seek to quantify the level of service experienced by customers on a Web site.

Highlights

ARM monitoring

The ARM standard is defined by The Open Group and agreed upon by a number of prominent IT companies. It enables you to monitor an application's performance and have an application-centric view of performance. There are two ways of utilizing ARM to collect application-level performance information – instrument application source code and run applications on instrumented middleware.

Custom applications can be natively ARM instrumented to provide very detailed performance information. Additionally, IBM is working to natively instrument its key middleware so that native application instrumentation is not required. In fact, with ARM-instrumented middleware, the entire instrumentation process will be transparent to the application and no code changes will be required.

IBM WebSphere Application Server, Version 5 and later, instruments with ARM. You can also instrument J2EE applications without any source code modifications by using the Just-in-Time Instrumentation (JITI) function. JITI injects the ARM call into J2EE applications at run time and supports earlier versions of WebSphere and the BEA WebLogic platform.

You can use Tivoli Monitoring for Transaction Performance to collect performance information from any ARM-enabled application. Tivoli Monitoring for Transaction Performance, Version 5.3, expands support for ARM data collection from J2EE environments to include any application that supports ARM. Now you can monitor ARM data generated by third parties and any applications with custom ARM instrumentation.

Siebel Systems has instrumented their latest release with ARM

The implementation of ARM calls in Siebel 7.7 provides an example of how a company can use Tivoli Monitoring for Transaction Performance to follow transactions as they execute inside an ARM-instrumented application. The instrumentation and collection of data are completely transparent to Siebel

Highlights

users. Using Tivoli Monitoring for Transaction Performance and the ARM data generated by Siebel, detailed topologies of the internal Siebel application can be generated that can quickly isolate performance problems. These Tivoli Monitoring for Transaction Performance topologies for Siebel show the exact response times for individual Siebel components and highlight ones exceeding thresholds. The Tivoli Monitoring for Transaction Performance discovery process can be used with Siebel to automatically define thresholds – enabling rapid deployment and quick time to value.

Leverage leading monitoring and measurement capabilities

Tivoli Monitoring for Transaction Performance has the ability to monitor performance levels and send an alert when predetermined threshold values are exceeded. It also enables you to report on end-user response times.

Using Tivoli Monitoring for Transaction Performance, you can monitor transactions, obtain a topology view of the transaction flow and view performance data

Tivoli Monitoring for Transaction Performance is exceptional in its ability to enable you to comprehensively monitor transactions and obtain a topology view of the transaction flow. With Tivoli Monitoring for Transaction Performance, you can monitor a customer or employee transaction on a step-by-step basis as it works its way through the business systems of the enterprise. With the software's easy-to-use browser interface, IT personnel can view performance data that shows the amount of transaction processing at each step along the way. This data allows IT staff to rapidly identify performance bottlenecks along the transaction's path. You can also configure Tivoli Monitoring for Transaction Performance to issue an alert, page, e-mail or other type of notification to initiate quick corrective action.

The Rational Robot transaction simulation capability of Tivoli Monitoring for Transaction Performance allows you to create end-user transactions of almost any type and measure their response times. Furthermore, this feature allows

you to record actual customer transactions from your Web site and schedule them to rerun at regularly scheduled intervals to provide performance data. Use the Rational Robot VU scripting capability to perform rapid protocol-level checking of Web site performance and deliver a very high-scale simulation capability. Finally, for a real-time look at Web performance, utilize the QoS component to report on an actual end user's response time.

The ultimate goal is to automate problem resolution so that problems automatically correct before the end user is impacted. You can also leverage the data from Tivoli Monitoring for Transaction Performance (stored in IBM Tivoli Data Warehouse) in conjunction with products such as IBM Tivoli Service Level Advisor to construct SLAs and IBM Tivoli Business Systems Manager to drive improved awareness of a problem and its business impact.

With the acquisition of Cyanea, IBM provides a robust set of deep-dive analysis capabilities for J2EE environments that help you troubleshoot specific J2EE problems. Additionally, the IBM acquisition of Candle Corporation provides both response-time tools such as ETEWatch® that enable you to monitor client/server applications and other tools for Web performance monitoring that complement Tivoli offerings. IBM combines the Cyanea, Candle, Rational and Tivoli products so that you can implement a highly robust set of monitoring and analysis capabilities.

Tivoli Monitoring for Transaction Performance works with IBM middleware products (such as WebSphere and DB2) and non-IBM products. It fully integrates with Tivoli systems management offerings such as IBM Tivoli Web Site Analyzer, Tivoli Data Warehouse, IBM Tivoli Enterprise Console®, Tivoli Business Systems Manager and Tivoli Service Level Advisor. This high level of compatibility and integration allows you to use the resource and transaction performance data generated by Tivoli Monitoring for Transaction Performance

in other Tivoli systems management products to manage and further optimize an IT environment.

Summary

Tivoli Monitoring for Transaction Performance is a comprehensive, integrated IBM solution that you can use to help manage and maximize the performance of a Web and enterprise IT infrastructure. With it, you can pinpoint, isolate and automate the correction of performance problems before they significantly impact customers, employees and other end users.

Tivoli Monitoring for Transaction Performance enables you to:

- *Reorient the systems management function around a transactional view to closely align IT objectives with those of the business.*
- *Employ both active and passive monitoring to understand the end-user experience from a transactional perspective, instead of just a resource perspective.*
- *Locate sources of performance problems quickly and speed the time between the identification of a real or potential performance problem and corrective action, by leveraging the software's strengths in analyzing total and detailed transaction flows.*

With Tivoli Monitoring for Transaction Performance, you can build a complete transaction-based performance and availability solution. Just as importantly, you can leverage this solution along with other key Tivoli products to help maximize customer satisfaction, minimize costs and satisfy the challenging requirements of today's On Demand Business environment.

IBM software integrated solutions

Tivoli management software supports 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*
  Gives you the most advanced self-managing database in the world
- *Lotus*
  Offers the instant collaboration and communication capabilities for the on demand world
- *Rational*
  Provides best practices and tools for developing new software and customizing existing applications
- *Tivoli*
  Helps you manage the complexity of an integrated, on demand operating environment
- *WebSphere*
  Provides the must-have, open-standards architecture for the on demand era

For more information

To learn more about Tivoli management software and integrated solutions from IBM, contact your IBM sales representative or visit **ibm.com**/tivoli

Tivoli software from IBM

An integral part of the comprehensive IBM on demand infrastructure solution, Tivoli technology management software helps traditional enterprises, emerging on demand 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 on demand business infrastructure management solution that uses robust security to connect employees, business partners and customers.

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