

Managing IT Performance and Availability from an End-User Perspective

Table of Contents

| | |
|---|----|
| Business Scenario | 5 |
| Monitoring the Distributed Infrastructure | 5 |
| Monitoring and Managing the Mainframe | 5 |
| Problem: End Users Report Performance Problems | 5 |
| Solution: Monitor End-User Transactions | 6 |
| Using BMC TM ART to Monitor Synthetic Transactions | 6 |
| Dynamic, Intelligent Thresholds Simplify Administration | 7 |
| Views that Help IT Diagnose Problems | 7 |
| Extensive Protocol Support that Enables Recording and Scripting | 8 |
| End-User Perspective that Complements Infrastructure Monitoring | 8 |
| Problem Detection, Isolation, and Resolution | 8 |
| Service Level-Compliance Measurement | 9 |
| Integrates with Help Desk | 10 |
| Using BMC MVTA to Monitor Mainframe Transactions | 10 |
| Improves Problem Detection and Isolation | 10 |
| Leverages System Monitoring | 10 |
| Improves End-User Experience | 10 |
| ITIL Support | 10 |
| Availability Management | 11 |
| Capacity Management | 11 |
| Conclusion | 11 |

Executive Summary

As companies mature their IT operations, they know more about the performance of their networks, applications, servers, databases, and mainframe systems. However, reliable information about end-user experience remains elusive. This information is vital to gauge how well IT is adding value to the business. Obtaining reliable information about the end-user experience is just the first step. To add measurable value to the business, companies need to detect the problems experienced by end users, isolate those problems, diagnose the root causes, and then fix the problems.

BMC Software provides solutions that enable companies to monitor end-user transactions, pinpoint the cause of failures, and then diagnose the problems, whether they originated in a distributed application, a database, a server, or a mainframe system. BMC[®] Transaction Management Application Response Time provides the synthetic transaction monitoring that helps companies understand the end-user experience, while BMC[®] Performance Manager enables in-depth monitoring and management of applications, databases, and servers. For mainframe systems, BMC[®] MAINVIEW[®] Transaction Analyzer uses data from other BMC MAINVIEW monitoring products to track and correlate the resources used by complex transactions across multiple mainframe systems. This paper describes how a fictitious manufacturing company that manufactures oil-field tubing and valves — called International Tubing — uses these BMC Software solutions to improve its ability to detect and resolve problems in its order-entry and customer management processes, which span both distributed and mainframe systems. These improvements help the company reduce downtime, increase customer satisfaction, and generate more repeat sales.

Business Scenario

To show the benefits of leveraging BMC infrastructure monitoring solutions with end-user transaction monitoring, this paper shows how a fictitious company, International Tubing, addresses the major transaction management issues faced by IT organizations.

International Tubing makes oil-field supplies. The company relies upon its field sales staff to visit customer sites in the oil field or at remote offices. The field sales staff assess the customers' needs and enter orders for oil-field parts, such as well tubing and valves. International Tubing also maintains an online store, where customers can enter orders directly.

The business environment is dynamic. Tubing and valves are in high demand. Customers who lack drilling supplies can lose a significant amount of money while oil-field workers wait for supplies.

International Tubing uses a real-time, Web-based, online parts-ordering application that is integrated with its inventory and customer management applications, which are supported by a legacy mainframe system. To complete a successful online order, International Tubing requires that many separate processes complete successfully. For example, the system must successfully check equipment availability, parts availability, and customer credit. It must also record order time and expected delivery time. These processes span multiple distributed and mainframe systems. If any of the processes fail, the order cannot be completed.

Monitoring the Distributed Infrastructure

To help the company manage its complex distributed infrastructure, the IT staff at International Tubing uses BMC Performance Manager for Siebel eBusiness Applications and BMC® Performance Manager for WebSphere Application Server to monitor Siebel applications that run on WebSphere Application Servers. These application servers generate the customer-facing Web pages for the company's online ordering applications and provide customer management functions.

International Tubing values the in-depth monitoring and management functionality provided by BMC Performance Manager. The mobile client and log file monitoring is especially useful, because the field sales staff use laptops or handheld computers to enter and track orders while at customer sites.

International Tubing uses SAP for procurement and inventory management. The company monitors the performance of its SAP applications using BMC® Performance Manager for SAP Solutions. It monitors overall availability and component availability, including the SAP Enterprise Portal landscape and connectivity to back-end systems.

By implementing the easy-to-use remote monitoring and the robust agent-based monitoring provided by BMC Performance Manager, International Tubing has been able to quickly detect and fix problems within its SAP, Siebel, and WebSphere servers, as well as its supporting applications and databases.

Monitoring and Managing the Mainframe

To help the company monitor the CICS environment that links its Web interface to its legacy mainframe inventory applications, it uses BMC® MAINVIEW for CICS TS and BMC® MAINVIEW for DB2.

BMC MAINVIEW for CICS TS monitors the overall performance of CICS and the transactions executing within CICS. It matches, in real time, the system environment to the actual workload being processed. It dynamically manages and tunes CICS system parameters and resources to address performance issues before they cause problems.

BMC MAINVIEW for DB2 monitors the performance of the legacy DB2 inventory database and the SQL statements executing against the inventory data.

By using BMC MAINVIEW to automate the management and monitoring of their mainframe systems, the CICS system programmers and DBAs have been able to spend more time on critical projects, and less on finding, diagnosing, and correcting problems.

Problem: End Users Report Performance Problems

Even when BMC Performance Manager and BMC MAINVIEW correctly show that the IT infrastructure is performing properly, the end users of International Tubing's online applications often report performance problems *before* IT has detected a problem. Thus, even though the individual IT components are functioning adequately, the system as a whole is not performing as expected.

Problems reported by end users have been difficult for IT to diagnose. Because the help desk usually can not isolate the problem to a specific server or even to an application, the IT operations manager must conduct expensive and time-consuming conference calls with the application, network, database, and mainframe administrators. Often, these conference calls become finger-pointing exercises.

Recently at International Tubing, performance and availability problems have decreased productivity among the sales staff and have hurt customer satisfaction in several key accounts. These problems also have led to friction in the IT department and between IT and the application developers.

Solution: Monitor End-User Transactions

Because of these problems, International Tubing recognized that it needed to improve the end-user experience. The company decided to establish end-user transaction monitoring, in addition to the infrastructure monitoring already in place for individual applications, databases, networks, servers, and mainframe systems. Transaction monitoring provides response-time data for analysis and review and enables the company to quickly detect service degradation. To implement enterprise-wide transaction monitoring, International Tubing chose BMC Transaction Management Application Response

Time (BMC TM ART) for its synthetic transaction monitoring and BMC MAINVIEW Transaction Analyzer (BMC MVTA) for detailed transaction analysis on its mainframe systems.

Using BMC TM ART to Monitor Synthetic Transactions

BMC TM ART enables companies to measure the performance of business applications by executing business transactions and monitoring response times. With BMC TM ART, International Tubing determined high-level application transaction response times and the time for individual steps within a transaction. BMC TM ART uses robotic transactions to gather this application-level data. Using this data, International Tubing correlated the technical viewpoint to end-user perception and the business impact.

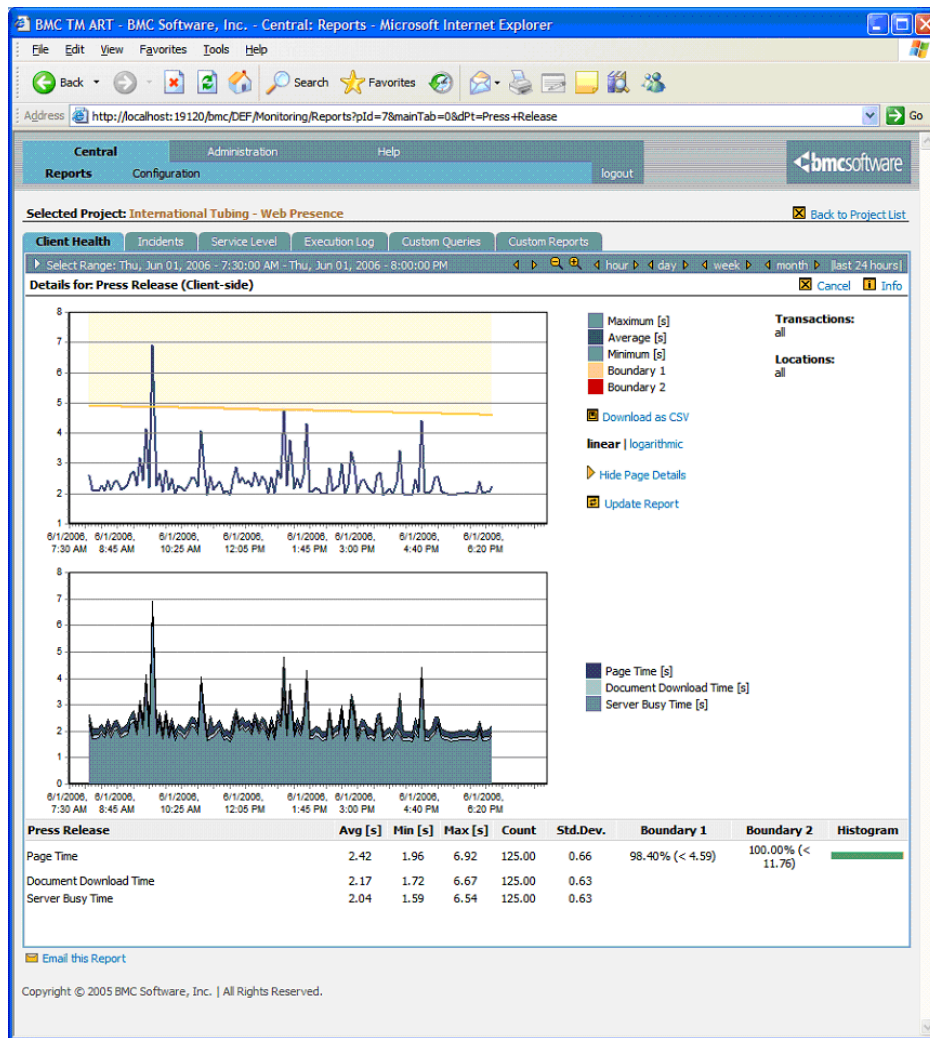


Figure 1: Using BMC TM ART to Monitor a Transaction

International Tubing believed that combining synthetic transaction response-time data with the local data it already collected through BMC Performance Manager provided a complete picture of its distributed IT operations. The company could monitor *within* silos using BMC Performance Manager and *across* silos using BMC TM ART.

Example: Monitoring a Transaction

Figure 1 on page 6 shows a transaction, named *Press Release*, that International Tubing monitors using BMC TM ART. The first graph in Figure 1 shows that the transaction response time breached the threshold at approximately 9:30 a.m. The second graph in Figure 1, which shows the response time for the individual components that contribute to the overall response time, shows that server busy time contributed the largest share of the overall response time. Using this information, IT concluded that the problem was probably associated with the application server, not the client or the network. To diagnose the problem further, they used BMC Performance Manager to analyze the application server in detail and discovered a memory leak.

Thus, by using BMC TM ART to monitor *across* silos, they detected a problem with a business transaction. Then, by using BMC Performance Manager to monitor *within* a silo (the application server), they resolved the problem.

Some of the features of BMC TM ART are as follows:

- > Provides response-time data to support Service Level Management (SLM) objectives
- > Supports common applications such as SAP, Siebel, and PeopleSoft
- > Supports Windows-based client/server, Citrix, 3270, and rich-client applications
- > Monitors Web applications including portals, CRM, e-mail, and custom applications

The features that International Tubing found particularly valuable are described in the following sections.

Dynamic, Intelligent Thresholds Simplify Administration

BMC TM ART optionally provides dynamic, intelligent thresholds that save time and effort by eliminating the need to set hundreds of thresholds manually. BMC TM ART sets the thresholds based on historical trends and dynamically adjusts them as it captures more data.

Dynamic thresholds helped International Tubing implement service level objectives (SLOs). Because the company did not know its normal, baseline response times, it could not set realistic service level objectives (SLOs) or identify the areas that needed improvement. The dynamic threshold functionality of BMC TM ART calculates the normal response time and sets dynamic boundaries at the second and third standard deviations from the normal transaction response time. BMC TM ART creates these boundaries for both the complete business transaction and for each step within the transaction. With these boundaries defined, the IT staff at International Tubing could have discussions with their business managers about realistic SLOs and set static boundaries to manage the agreed-upon service levels.

Dynamic boundaries also allowed the company to identify slow steps within a transaction and resolve the problem before it affected the overall transaction response time. To resolve the problems that BMC TM ART detected, International Tubing made investments in its architecture, which had an immediate, positive effect on performance.

Views that Help IT Diagnose Problems

Before International Tubing implemented BMC TM ART, it could not easily detect and resolve problems. Conference calls to diagnose problems often erupted into finger-pointing exercises in which each IT functional area would produce charts that showed that their performance was acceptable.

A lack of information contributed to the confusion. End users who reported problems to the help desk often did not provide an adequate description of the symptoms largely because they failed to write down the error messages that they observed. With the TrueLog error messages provided by BMC TM ART, IT had access to the actual error message that the end user saw, which helped IT diagnose problems faster.

BMC TM ART also provides summary reports that show the overall status of business transactions. Figure 2 on page 8 shows the status of the business transactions at International Tubing. This report shows that the online store experienced an incident that affected availability at approximately 11:15 a.m.

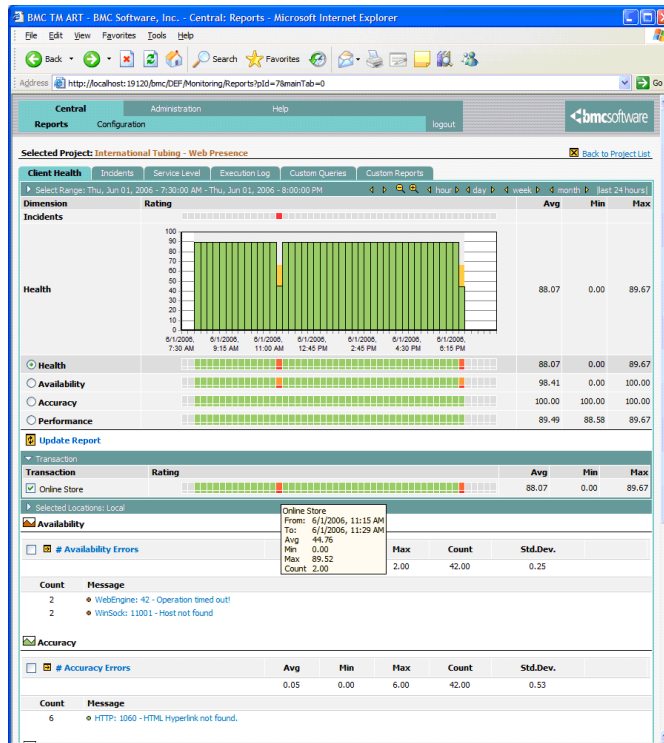


Figure 2: BMC TM ART Report that Summarizes Overall Business Transaction Status

Extensive Protocol Support that Enables Recording and Scripting

Because International Tubing uses a variety of packaged and custom applications to support the business, it needed a synthetic transaction monitoring solution with which it could easily record transactions into scripts for a variety of applications. BMC TM ART supports a wide range of protocols, including those for the Web, internet, Web services, middleware, databases, open interfaces, and CRM/ERP applications. This protocol support enables companies to record and edit transaction scripts for all of their applications, including Web, mainframe, thick client, thin client, packaged and custom.

Because International Tubing uses a mix of distributed and mainframe systems to support its critical business applications, the ability to develop transaction scripts for the mainframe is an important advantage. Using BMC TM ART, the company can capture and run mainframe-based transactions using the 3270 user interface.

International Tubing also uses several homegrown applications to support its online store. Even though these applications do not use standard protocols, the company can monitor them with SilkTest for BMC TM ART by Segue Software. This add-on product to BMC TM ART provides a powerful scripting language that

enabled International Tubing to capture transactions from its custom Windows-based applications and easily simulate end-user transactions at the GUI level.

End-User Perspective that Complements Infrastructure Monitoring

For International Tubing, the integration between the BMC transaction-monitoring and infrastructure-monitoring solutions is a significant benefit because these solutions complement one another and add additional value when used together.

BMC TM ART and BMC MVTA enable International Tubing to monitor from the perspective of the end user. This perspective complements and builds upon the IT-component perspective provided by BMC Performance Manager and BMC MAINVIEW.

Problem Detection, Isolation, and Resolution

BMC Performance Manager and BMC MAINVIEW also help the company with problem detection, isolation, and resolution.

Problem Detection

To detect problems quickly, International Tubing leveraged BMC Performance Manager and BMC MAINVIEW custom views, which enabled them to create meaningful views for both distributed and mainframe environments that associated transaction performance with the underlying infrastructure. For example, they created one view that showed:

- > Overall transaction response time
- > Response time of several key steps within the transaction
- > State of the infrastructure elements that support the transaction

When a step in a transaction is slow or fails to play back successfully, BMC TM ART raises an alarm. Like any alarm in BMC Performance Manager, you can use this event to page an administrator, send e-mail, or perform a corrective action. Rapid notification is

critical because a BMC TM ART alarm is often an early warning of business-service degradation that occurs before service model components, such as servers or databases, have gone into alarm.

Problem Isolation and Resolution

The custom views also help dramatically reduce the time spent on problem isolation and resolution because the likely problem area is paired with the underlying infrastructure elements that supports the transaction. The administrator can drill down into the infrastructure, diagnose the problem, and initiate a resolution.

By using synthetic transactions to measure application performance, International Tubing can detect problems earlier and isolate them faster, before users experience service degradation. After IT detects a problem, they can use BMC Performance Manager or BMC MAINVIEW to isolate the root cause and significantly reduce the mean time to repair (MTTR).

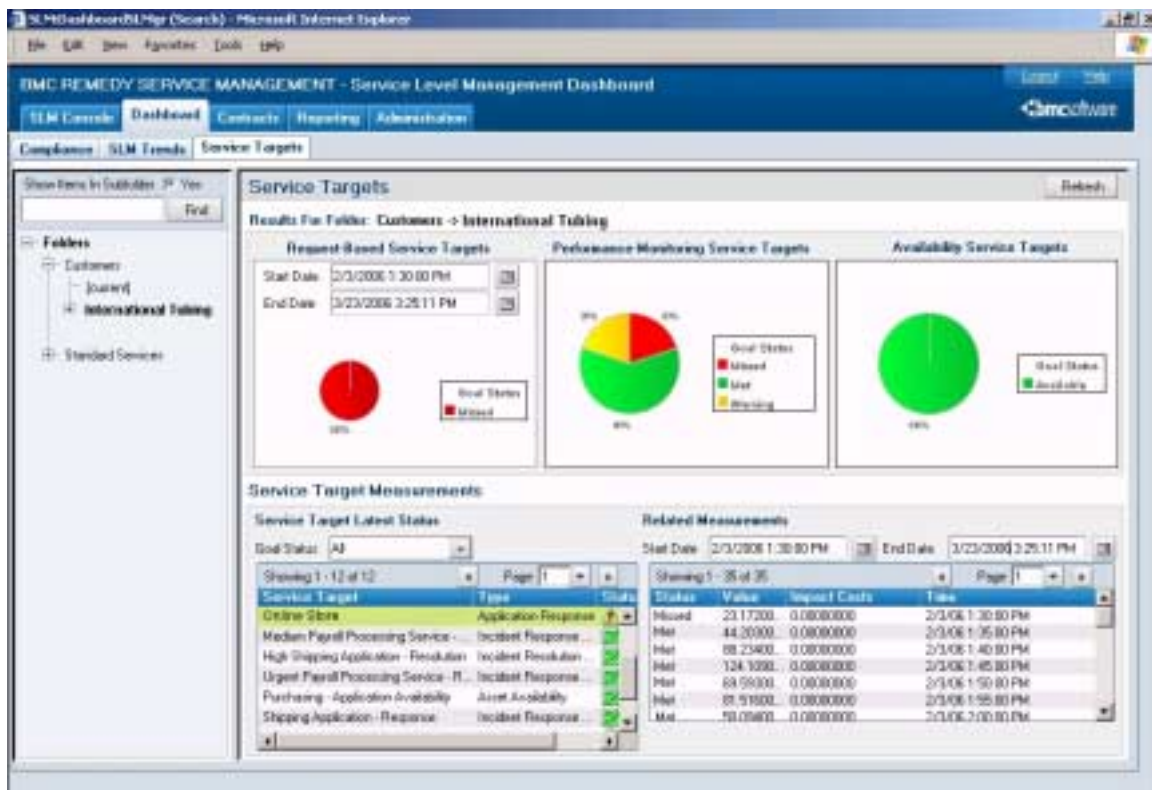


Figure 3: Service Level Targets in BMC SLM

Service Level-Compliance Measurement

Because BMC TM ART makes transaction response-time data available to BMC® Service Level Management (BMC SLM), International Tubing used this data to define service level agreements (SLAs),

monitor compliance, analyze performance, address problems, and refine business services.

The company defined SLAs for its online store transactions and used the data from BMC TM ART to determine whether the company is meeting those SLAs. Figure 3 on page 9 shows International Tubing service level targets, as displayed in BMC SLM. Figure 3 shows that the service level target for the online store application response time has been breached.

Used in conjunction with BMC TM ART, BMC SLM helps International Tubing ensure SLA compliance by triggering workflows that notify support, escalate resolution urgency, or initiate corrective actions before problems impact the business.

The company minimizes or avoids costly service level breaches by identifying potential problems before they occur. When service level targets are breached, the company tracks the impact cost and uses that information to justify investing in process and technology improvements.

Integrates with Help Desk

Automating the creation of help desk tickets also helps reduce the MTTR. BMC TM ART, BMC Performance Manager, and BMC MAINVIEW can all forward event information to BMC® Service Impact Manager (BMC SIM), which can perform impact analysis and then, if needed, open a help desk ticket. When you automate the help ticket creation process in this fashion, you can also enrich the help ticket with specific information about the problem, such as the error message text from the BMC TM ART transaction. This detailed information helps the administrators diagnose the problem faster.

Using BMC MVTA to Monitor Mainframe Transactions

BMC TM ART can also be configured to raise an alarm when a transaction that requires mainframe processing is slow to return from the mainframe back end. When this type of alarm occurs, IT can use BMC MVTA to measure, within one or two seconds of real time, the performance of business transaction components that execute on mainframe systems. BMC MVTA uses native APIs to communicate with BMC MAINVIEW products and gather data on the monitored subsystems, which can include CICS, DB2, and IMS (future BMC MVTA releases will support WebSphere MQ and WebSphere Application Server). After it gathers this data, BMC MVTA analyses and correlates it and then presents a user-friendly, logical view of the transaction performance, which includes details on each of the executions generating a synch point.

Improves Problem Detection and Isolation

BMC MVTA helps z/OS system programmers detect and isolate problems quickly because it tracks business transactions as they progress through the various z/OS subsystems and databases (CICS, IMS, and DB2) and shows each unit of work in the logical order that it executes. It also shows transaction flows and any delays, along with transaction component metrics, such as CPU time and elapsed time.

The BMC MVTA interface summarizes the complex transactions and enables systems programmers to easily drill down and access transaction details. They can hyperlink to a BMC MAINVIEW monitoring product for detailed analysis by pressing the ENTER key on a highlighted field. For any component within a complex transaction, they can find all the related components, and identify the cause of the transaction performance problem.

The ease of use of BMC MVTA is valuable to International Tubing because many of its mainframe programmers and administrators recently retired. Because the junior staff is less skilled at troubleshooting transactions that cross multiple subsystems, they rely on BMC MVTA to track the transactions and show them the data that they need to diagnose problems quickly.

Leverages System Monitoring

Because International Tubing uses BMC MAINVIEW to manage and monitor its mainframe systems, BMC MVTA helped it get even more value out of the data that it collected, while requiring minimal additional overhead.

Improves End-User Experience

BMC MVTA helped the company improve the end-user experience because not only does it monitor mainframe subsystems—it also monitors the real-time business transactions running on those subsystems. When a customer orders valves through the online store, BMC MVTA monitors all of the units of work that comprise the transaction, including the DB2 stored procedure calls, the CICS transaction requests for data from IMS, the IMS retrieval and formatting of the data, and return of the data to the web-based interface.

ITIL Support

Using BMC TM ART, BMC MAINVIEW and BMC SIM helps International Tubing address the important ITIL objectives.

Availability Management

BMC TM ART, BMC MVTA and BMC SIM reduce the duration of incidents that impact IT availability, which is an important ITIL Availability Management objective.

BMC TM ART and BMC MVTA also help optimize the availability of IT with regard to the business services they support, which is another important ITIL objective. The servers at International Tubing may achieve 99.999% availability, but this achievement is meaningless if slow response times prevent customers from entering valve orders.

To optimize the availability of business services, International Tubing combined the meaningful IT component monitoring and measurements provided by BMC Performance Manager and BMC MAINVIEW with the ability to monitor the end-user transactions using BMC TM ART and BMC MVTA.

To get even more value from the BMC infrastructure monitoring solutions, the company used BMC SIM to link both the transactions and the monitored components to the business services that they support so that when problems occur with a server or a transaction, they know the business impact.

For International Tubing, knowing the business impact of IT incidents has two benefits. First, it helps them prioritize incidents. For example, given a choice between addressing an online store problem or an employee time sheet problem, they fix the online store problem first. Second, it helps them provide the business justification for spending money on system changes, such as upgrades or the addition of load-balancing tools.

Capacity Management

BMC TM ART supports the ITIL Capacity Management objective. Continuous monitoring of the infrastructure, including transactions, helps companies ensure that they

- > Are using hardware and software resources optimally
- > Can achieve agreed-upon service levels

According to the ITIL *Service Delivery* book, "Many SLAs have user response times as one of the targets to be measured, but equally many organisations have great difficulty in supporting this requirement."¹ One way to measure user response times is by using "robotic scripted systems" that provide

"representative response times particularly for multi-phase transactions or complex interactions."² BMC TM ART provides this ability to monitor transactions in complex environments from the end-user perspective.

Conclusion

BMC Performance Manager and BMC MAINVIEW provide significant value. As the International Tubing example shows, when companies use them together with a transaction-monitoring solution that covers both distributed and mainframe systems, these solutions can dramatically increase a company's ability to detect, isolate and resolve problems. Because they help IT resolve problems before end users are affected, these solutions are an integral part of a proactive, business-focused IT infrastructure.

1. Office of Government Commerce, *Service Delivery* IT Infrastructure Library Series, May 2001.

2. Ibid.

Helping you maintain advantage

BMC Software Education Services offers a strategic investment for your business, maximizing the value for your employees and Business Service Management initiatives. Education ensures successful product implementation, promoting mastery of all product capabilities and highest productivity with your BMC Software solutions. To explore our education offerings, visit our web page at <http://www.bmc.com/bmceducation>, or contact BMC Software Education Services by telephone or e-mail:

- > North America
Telephone: 800 574 4262
E-mail: education@bmc.com
- > Asia Pacific
Telephone: +61 3 9657 4404
E-mail: ap_education@bmc.com
- > Europe, Middle East, and Africa (EMEA)
Telephone: 00800 26233822
E-mail: emea_education@bmc.com



ACTIVATE BUSINESS WITH THE POWER OF IT.™

About BMC Software

BMC Software helps IT organizations drive greater business value through better management of technology. Our industry-leading Business Service Management solutions share BMC Atrium™ technologies to enable IT to manage across the complexity of diverse systems and processes — from mainframe to distributed, databases to applications, service to security. Founded in 1980, BMC Software has offices worldwide and fiscal 2005 revenues of more than \$1.46 billion. BMC Software. Activate your business with the power of IT. www.bmc.com.

