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Business Transaction Management

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Introduction

More and more, organizations are turning to composite applications to implement critical business activities. Common examples include:

- Cellular Provisioning and Activation
- Insurance Claims Processing
- B2B Procurement

Composite applications are difficult to manage. They do not respect the traditional boundaries between networks, middleware, and infrastructure. Instead, they span a variety of application components and networks to execute ‘business transactions’. Inherently brittle, composite applications are veritable black-boxes in an operational environment. Operations and Application Support staff responsible for these business systems face a variety of challenges, such as:

- Tracking transaction status and health
- Monitoring performance and SLAs
- Managing transaction errors and fallout

Neither IT nor business teams have traditionally had the visibility and control needed to efficiently manage composite applications. Business transactions can vanish at any point in their flow. IT and business staff usually first discover transaction issues through cryptic log entries or calls from vexed customers. Resource-intensive fire-drills follow, significantly increasing costs. **Business Transaction Management** alleviates these problems.

As a component of the Oracle Enterprise Manager Management Packs, Oracle BTM provides capability in three key areas:

- Transaction Visibility: Tracking individual transactions and visibility in to the business context of each transaction, including the consumer context and the business payload
- Performance & SLA Management: Monitoring, alerting and reporting on performance characteristics of end-to-end transactions in real-time
- Exception Management: Monitoring failures, and root-case analysis to rapidly locate performance bottlenecks, errors, and incomplete transactions

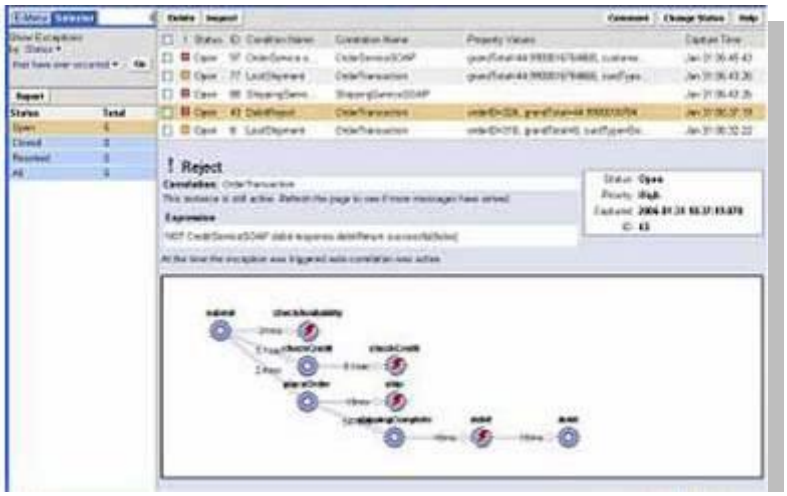
BTM benefits both the business and IT. Business benefits from the increased reliability offered by their business transactions. IT benefits from the reduction in total cost of ownership (TCO) of their composite applications.

Oracle BTM is an integral component of the following Oracle Enterprise Manager Management Packs:

- SOA Management Pack Enterprise Edition
- WebLogic Server Management Pack Enterprise Edition
- Management Pack for Non Oracle Middleware

Understanding Business Transactions

Business transactions are often executed by arranging, or "orchestrating," existing applications and infrastructure to implement business processes. They incorporate a wide variety of technologies, deployed across many platforms and organizational boundaries. Common technologies include intermediaries such as ESBs, Process Engines, middleware, legacy and packaged applications. Composite applications incorporate a range of shared components, such as SOAP services, packaged applications, EJBs, POJOs, ASP.NET, ESBs, databases and so on. However, despite the complexity of such processes, they must behave as single, seamless transactions to business users.



Oracle BTM provides sophisticated instrumentation for real-time detection and alerting of various types of unexpected conditions—such as failed transactions.

Finding a Bottleneck in a Haystack

One challenge for Operations trying to identify transaction bottlenecks is that the problem could be anywhere in the network—within a poorly coded application, in an inefficient database call, or stuck in a badly configured orchestration on a service bus. The slowdown could be attributable to components in the implementation layer of the service, or it might actually be located in one of many replicated services or in the infrastructure supporting the orchestrated services. Some business transactions are often long-running or asynchronous, involving human interaction and spanning multiple systems and

several days. Due to this weak-link effect, performance and capacity are key challenges for managing distributed transactions. A performance meltdown at any given point may be extremely difficult to track down, making it doubly difficult to meet expectations for performance and availability.

The Cost is the Customer

If such unexpected conditions aren't diagnosed in a timely fashion, they can directly impact business outcomes. Shopping carts are abandoned, accounts fail to be provisioned, orders are lost, and packages are never delivered. And while the IT team may be aware of only some components of the overall transaction, there's certainly one person who sees everything – the customer. From the customer's vantage point, the entire transaction has failed, and it doesn't matter where, how or why. Customer satisfaction is the biggest loss in this scenario.

Managing Business Transactions

While it's difficult to get a handle on the flow of messages through such systems, it can be doubly challenging for business stakeholders to find out how much business is flowing through a service, how much a single application fault costs in terms of lost sales, or how valuable one service is compared to another. But to be successful, transaction management requires awareness of the business-specific content of the message being exchanged. The business data flowing through a system is as important as the technical information. Without business information, it is virtually impossible for business users or IT personnel to optimize outcomes.

To prevent business transactions from turning into black-boxes, enterprises need more visibility into applications and end-to-end business processes. Visibility into just one application, or into only the service layer, no longer suffices for supporting enterprise-wide business transactions. Business Transaction Management solves these issues.

Oracle BTM offers industry's most comprehensive Business Transaction Management solution for managing the health of composite business applications. Spanning heterogeneous application environments, Oracle BTM is unique within the industry in its ability to leverage Business Context as part of the solution.

The following sections discuss the solution in detail.

Business Transaction Visibility

Effective Business Transaction Management begins with transaction tracking, which provides a baseline for management by delivering visibility into the flow of processes as they propagate across the network.

The challenge, however, is to track transactions without breaking them in the process. To do so, the transaction management system must be non-invasive. That is, it cannot modify the messages in order to view transaction flows. "Tagging" messages can have dire consequences—in regulated environments, additional logging may be required as messages are modified. Worse yet, adding

proprietary message tracers can break dependent applications. The challenge, then, is to track end-to-end transactions without modifying any of the messages involved.

To address these challenges, the Oracle BTM Business Transaction Management solution non-invasively tracks transactions across a wide range of application interactions, including those facilitated by SOAP and XML services, messaging systems such as JMS and MQ, database calls, RMI and EJB applications, and across various runtime infrastructures such as Enterprise Service Bus (ESBs), application servers and appliances.

Business Transaction Discovery

If you don't know what's deployed in your application environment, how applications are interconnected, and how business is flowing through the system, you lack the basic information required for management and governance. Oracle's business transaction management monitors service traffic to automatically discover the relationships between different services and the transactions flowing across them.

- Continuous discovery of service dependencies and relationships spanning distributed middleware
- Global dependency map across all services as well as local dependency map for individual services
- View aggregated dependences or drill-down to method-level interactions
- Support for a wide range of application components, including databases, JMS and MQ messaging systems, EJB-based applications, and ESBs

Visibility into Every Transaction Instance

Oracle's business transaction management capabilities enable monitoring of every single business transaction flowing through your applications.

- Monitor in-flight transactions in real-time to follow progress
- Gain insight into business context (payload) for each step of every transaction
- Extract key business properties from the payload for future analysis and searching

End-to-end Performance and Service Level Management

IT's primary task is to deliver business services. Behind every business service is a promise to the customer or business partner that a service will meet agreed-upon baselines for performance and availability. When those agreements are not met, the result is monetary in one form or another, whether it's direct fines, lost business or customer churn. Therefore, actively managing service levels and ensuring compliance with business goals is crucial to every IT organization's success.

Oracle BTM continuously monitors transaction traffic in real-time to keep users apprised of the operational behavior of each application component. To aid historical analysis, it provides a rich snapshot of vital runtime data—such as throughput, availability, response times and faults—across various time intervals, as well as built-in reporting capabilities.

Oracle BTM solutions bring predictability, visibility and control to applications by delivering comprehensive service level management for services, transactions and business processes across heterogeneous environments.

Monitoring Transaction Performance

Oracle BTM offers comprehensive insight into the health and performance of individual transactions and services as well aggregates metrics for business insight and dashboards. The list of metrics is comprehensive, including response times, fault counts, and availability of components.

All metrics gathering and measurement are performed without requiring any alteration to the application code, service logic or message traffic. This non-invasive approach enables users to customize measurements on-the-fly, without interrupting the running system or any existing applications that might be sensitive to proprietary modification of messages.

Performance for the Application Network

Oracle BTM generates a bird's-eye-view across your network of application components and middleware, making critical operational information available at a glance.

- Live, color-coded network graphs for rapid identification of operational issues
- Rich filtering on operational and business information to evaluate specific components of interest
- Drill-down into specific issues, alerts and faults

Measuring Service Level Agreements (SLAs)

With Oracle BTM, users can establish SLAs for different performance targets, for each business transaction type, and each end-user, to help IT measure the quality-of-service delivered to the end-users. For example, an insurance provider may be legally bound to process claims for its Gold customers within an hour. Coupled with home grown measures for managing traffic and network loads, IT can leverage SLAs to deliver the best quality-of-service to the highest priority customers.

- Early warnings and alerts to prevent SLA violations
- Customizable alert sensitivity and suppression
- SLA assignment based on business criteria (such as IP addresses, Customer IDs, SKU etc.)

Exception Management

Performance issues aren't the only source of operational headaches for IT. Composite applications are fraught with exceptions—seemingly harmless errors or glitches that might result in the loss of entire business transactions. Common annoyances such as lost packages, rejected orders, shopping carts failures and unpaid claims are all manifestations of exceptions. IT and business teams usually don't discover exceptions until they receive phone calls from vexed customers. These disrupted or failed

business transactions result in lower customer satisfaction, lost orders, lower revenue and erosion of the brand.

To avoid this fate, organizations need a mechanism that proactively traps application exceptions and facilitates resolution of exceptions before they become business issues.

Oracle BTM enables you to strategically instrument your service network to detect technical and business exceptions while maximizing performance and security. BTM makes it easy to monitor application traffic for any type of exceptional condition, and enables IT and business users to identify and plan for exceptions in advance.

Oracle BTMs exception management capabilities address a range of issues common in business transactions, such stalled transactions, missing steps, faults, and application exceptions, as well as low-level issues such as incorrect data values, boundary conditions, and so on. It does this flexibly, enabling users to define the conditions of interest. Oracle BTM then monitors all the traffic flowing across the system, waiting for the moment an exceptional event occurs.

In composite applications, such an exercise can be difficult. Usually, application teams must cull information from widely dispersed log files. With Oracle BTM, messages from all participating components within the transactions are collected and correlated, with exceptional conditions called out. Additionally, this real-time data makes it easy for Operations personnel to quickly locate the offending component. It provides application support teams with detailed information useful for debugging and repairing the problem, thus slashing the mean time to repair.

Handles Exceptions of Every Type

Oracle BTM detects exceptions across all tiers of composite applications:

- Application Level: Including data errors such as missing values, invalid parameters and anomalies
- Business Level: Including missing elements and non-compliance with regulations or business policies
- System Level: Including various application faults, transports and network-level errors

Real-time Detection and Alerting

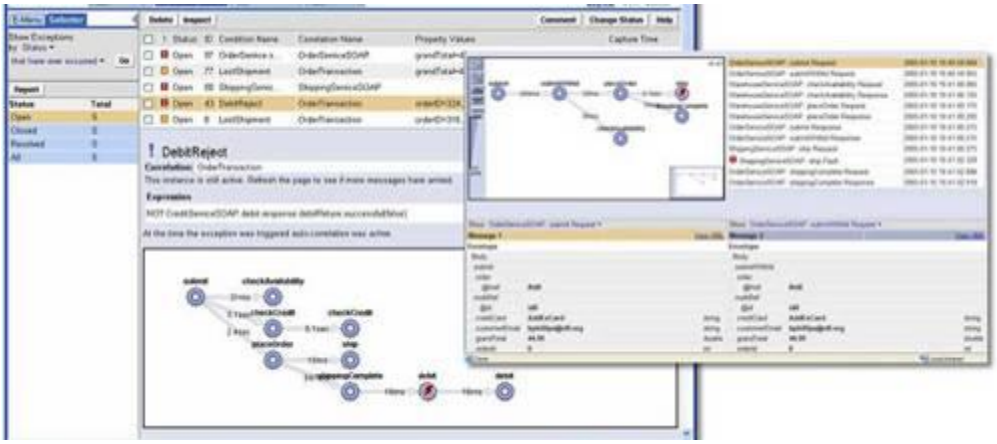
Oracle BTM watches transactions at every step in real-time, thereby detecting exceptions as they occur, and alerts appropriate personnel with the appropriate business context:

- Inspect transactions for exception conditions in real-time
- Leverage user-defined detection criteria for exceptional conditions
- Alert IT personnel, business managers or other systems

Sophisticated Exception Diagnostics

Oracle BTM captures deep business context for each business transaction as it executes. When an exception occurs, it is able to make this transaction and its entire context available to IT, slashing mean time to resolution (MTTR) from days to minutes.

- Direct access to symptomatic messages in a transaction to ease collaboration between customer support, IT and development
- Drill down from symptomatic messages to downstream or upstream messages in that transaction, to understand root cause
- Automatically pinpointed SOAP faults or user-defined faults, to ease the diagnostics process



Users can quickly drill down to find the root cause of transaction failures and other unexpected conditions—significantly reducing mean time to repair.

Transaction Business Context

Successful business transaction management requires actionable intelligence to help both IT and Business manage and remediate problem transactions. Simply monitoring for problems is insufficient!

Oracle BTM leverages the business payload available in the messages that form a transaction to build a Business Context for each transaction. This context enables the solution to deliver advanced capabilities for resolving business and IT issues associated with in-flight business transactions.

Ad-Hoc Transaction Analysis

Oracle BTM records transactions and indexes transaction payload to allow business-oriented search across the entire transaction database. With tools such as free text and regular-expression search, users can quickly locate transactions of interest (slow transactions, missing orders, claims from a particular partner etc.) using the available transaction metadata. Any customer or operational data may be used for searching through transactions, including:

- Transaction time (e.g. Time range, Day etc.)
- Transaction fields (e.g. OrderID, PO Number, Customer Email, Partner ID, SKU, Order Total etc.)
- Performance characteristics (e.g. Response time, Failure etc.)
- Error characteristics (e.g. SOAP Fault, HTTP Fault Code, Error Description etc.)

Usage Analysis

In business-to-business integrations, business transactions often hop across different enterprise clouds. Therefore, it becomes very important for both IT and Business to understand the usage, or transaction flow per customer or partner. IT wants to know who is using what, when and how much. The business wants to know which of these consumers are the most loyal and how well they have been served. Oracle BTM leverages Business Context to make this task simple and efficient.

- Continuously monitor live transactions for usage information including total transactions, response times, throughput and availability experienced by each user
- Track usage trends for each consumer across each business transaction they initiate or participate in
- Discover new users or unapproved consumers based on IP addresses, headers or other user identifiers available in the Business Context

Business Dashboards

Alongside metrics and alerts for IT, Oracle BTM also leverages the Business Context to deliver dashboards that allow Business to monitor the performance and activity of their business systems for different customers and partners. Armed with this visibility, Business can focus on its customers and let IT focus on the underlying technical issue.

- SLA Compliance metrics and trends, historical and real-time, specific to each external partner or customer, based on user-defined consumer segments
- Live insight into business metrics associated with the transaction flow, such as number of orders, total volume, dollar amounts etc.
- Relay information to BI solutions for deeper analysis

Conclusion

While composite applications and SOA have long promised the benefits of greater agility and reduced costs, the utility of these loosely coupled systems rests on their ability to reliably execute transactions across distributed, disparate application components. However, organizations did not previously have an overall view into the status of such transactions. With composite applications, every IT issue has the potential of turning into a business failure - loss of customers, revenue and brand equity. Yet pinpointing the cause of such problems can require labor-intensive fire drills and usually leads to acrimonious finger-pointing across departments and teams.

Business Transaction Management helps organization manage the risk associated with composite applications. Not unlike other forms of risk management that an enterprise undertakes to protect its investment, BTM offers a safety harness to IT in the brave new world of composites and SOA.

Oracle BTM tracks each business transaction across all SOA infrastructure and middleware, all the way to the backend database. Its unique approach does not involve modifying the messages or message headers, which can break dependent applications in the system. Oracle BTM brings real-time visibility

and reliability to business transactions. With Oracle, organizations can establish performance goals and service level agreements for end-to-end transactions, and then manage their systems to meet those goals. As the transactions progress, Oracle BTM automatically assembles message trails associated with each transaction instance. This enables organizations to identify and resolve transaction errors, failures and bottlenecks quickly or respond quickly to prevent an isolated problem from turning into a global outage.

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For more information about Oracle BTM, please contact your local sales representative or visit www.oracle.com.

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