Managing Business Applications Across Distributed and Mainframe Systems

Dr. David Ching
BMC Software
david_ching@bmc.com
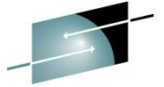
Thursday, August 5, 2010
3:00 – 4:00 PM
Session: 8116

SHARE in Boston

bmcsoftware

Agenda

- Introduction
- Business and IT Communication
- Information Users
- Information Focal Point
- Business Application Fundamentals
- Middleware and Transaction Management Fundamentals
- Information Domain Models
- Middleware and Transaction Management
- Conclusions

Introduction

Introduction

- Management
  - Organization and coordination of <u>activities</u> of an enterprise in accordance with certain <u>policies</u> and in achievement of clearly defined <u>objectives</u> (Wikipedia)
  - Management in all business areas and organization activities are the acts of getting people together to accomplish desired goals and objectives
  - The orchestration of people, process and <u>information</u> is how management is accomplished
  - Appropriate information is the key ingredient for successful management

Introduction

- 70% of mission-critical enterprise data resides on mainframes with new and modernized applications spanning distributed, mainframe, virtualized and cloud environments

- Existing high value business applications are hosted on both distributed and mainframe platforms because of the exploitation of mainframe legacy applications and modern technologies typically hosted on distributed systems

- Data collected from these environments must be specific to the user roles (specific semantics) but common to the virtual team (common semantics)

Introduction

- Business to IT alignment is a management initiative that attempts to align business objectives with IT services being delivered

- Synchronized IT and business information provides better decision making to the information users

- Information focused on appropriate business application information is required to assure that management initiatives and activities occur in a timely manner

- Business Service Management (BSM) provides a unified platform for consistent information sharing

Introduction

Business Service Management

- **Request & Support**
- **Provision and Configure**
- **Monitor & Operate**
- **Plan & Govern**
- **Integrate & Orchestrate**

Business Service Management is a structured methodology and platform to assure service delivery in support of overall business goals and objectives. Data collection and information transformation is the underpinning of the functions that support BSM in the enterprise.
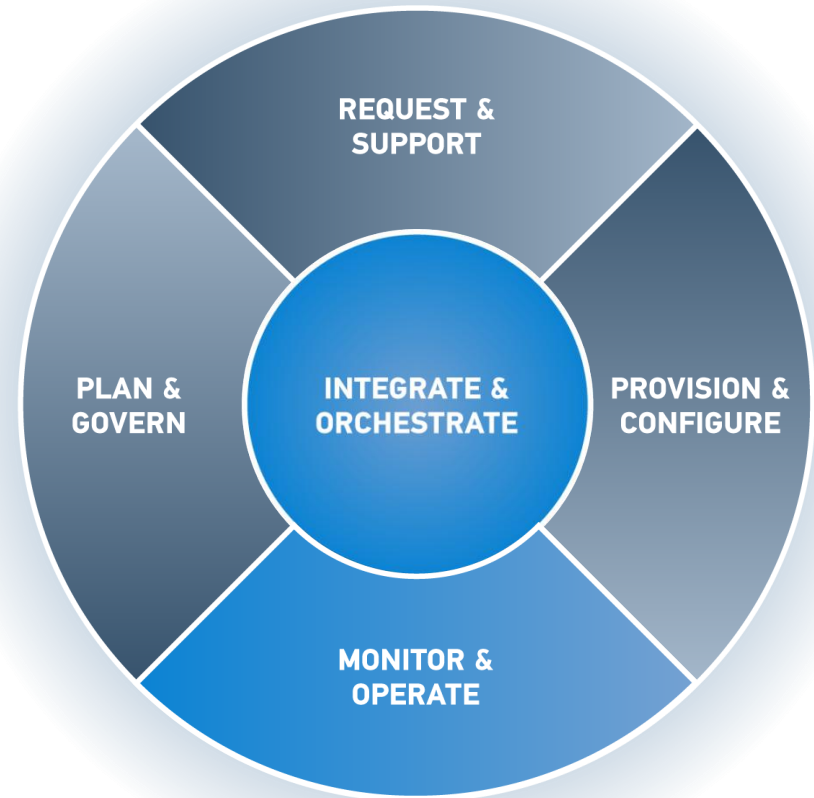
BUSINESS SERVICES
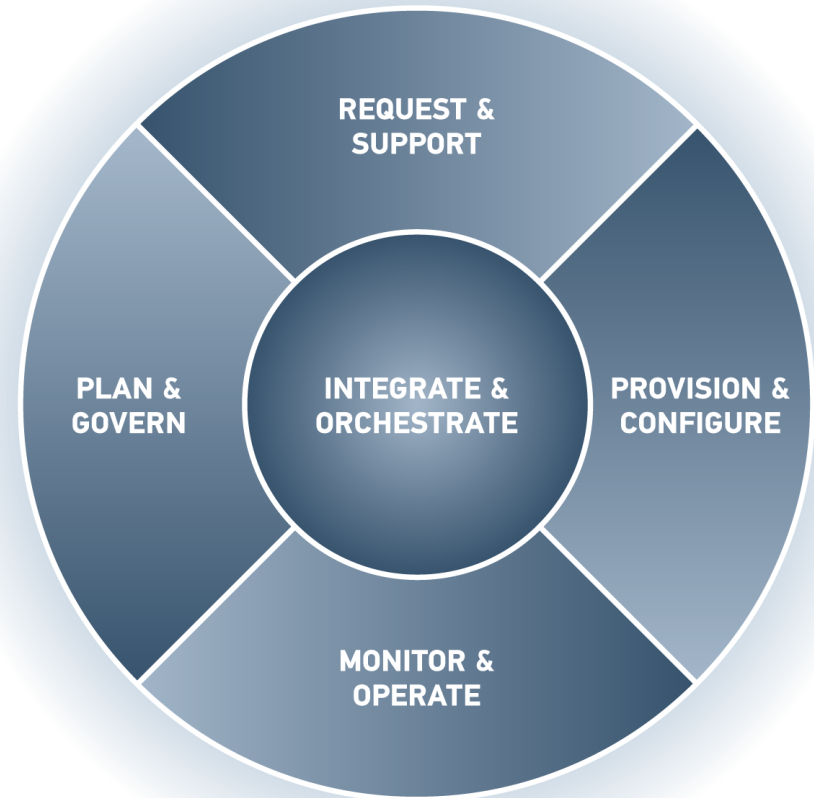
REQUEST & SUPPORT

PLAN & GOVERN

INTEGRATE & ORCHESTRATE

PROVISION & CONFIGURE

MONITOR & OPERATE

INFRASTRUCTURE

bmcsoftware

Introduction

- **Request & Support**
- **Provision and Configure**
- **Monitor & Operate**
- **Plan & Govern**
- **Integrate & Orchestrate**

Middleware and Transaction Management is an integral part of the BSM unified platform and is a single source of information for business, application and technology information associated with deployed business applications.
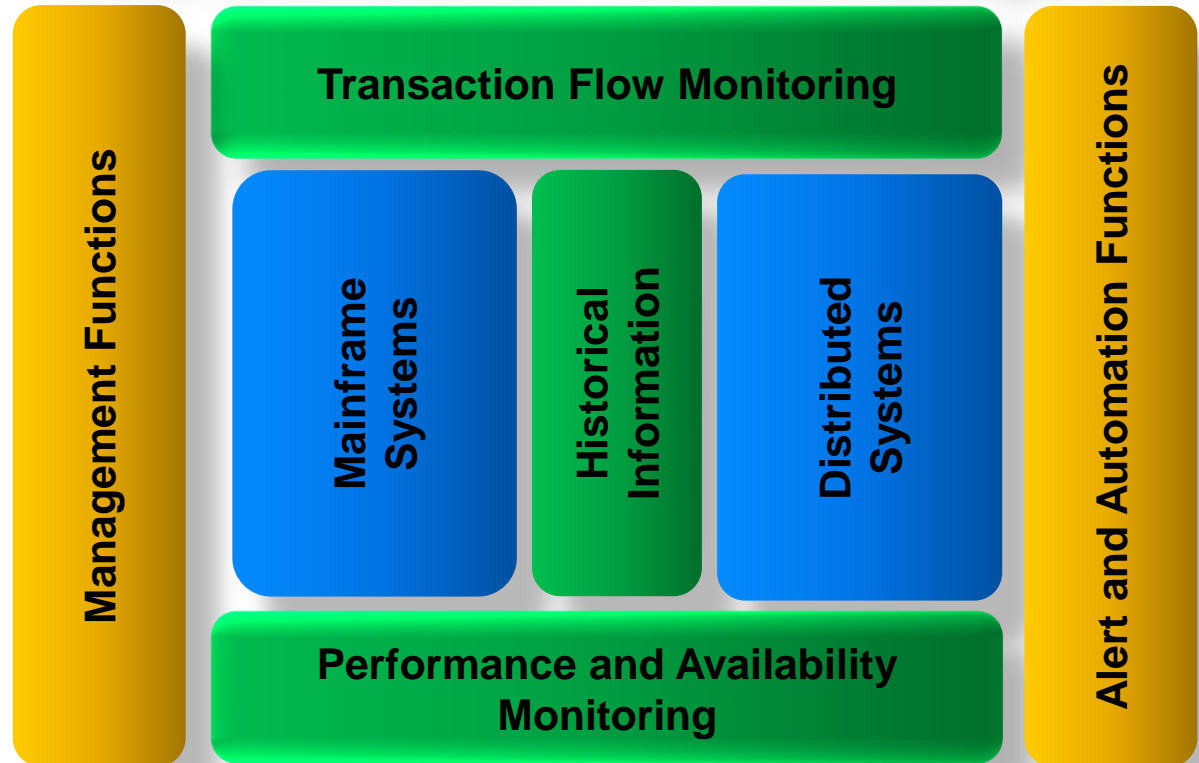
BUSINESS SERVICES

INFRASTRUCTURE

bmcsoftware

Introduction

- **Request & Support**
- **Provision and Configure**
- **Monitor & Operate**
- **Plan & Govern**
- **Integrate & Orchestrate**

BMC Middleware and Transaction Management

Management Functions

Transaction Flow Monitoring

Mainframe Systems

Historical Information

Distributed Systems

Performance and Availability Monitoring

Alert and Automation Functions

Middleware and Transaction Management is a framework for transforming data into information for business, application and technical users managing business applications.
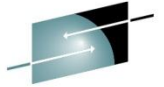
SHARE

bmcsoftware

Business and IT Communication

Business and IT Communication

- Business organizations rely on information to
  - Increase productivity
  - Optimize costs
  - Minimize risk
  - Align business and IT (from an operational perspective)
- Organizations have copious amounts of <u>data</u> collected through disparate tools, but they are <u>information</u> starved
- The effective <u>outcome</u> of decision making without appropriate information is directly related to the <u>quality</u> of information to make decisions

Business and IT Communication

- The information chasm – Business and IT have found it difficult to communicate
- Even IT has found it difficult to communicate within its domain

???

Lack of Common Semantics

Business

Business Semantics

IT

MW

???

??? Technology Semantics

DB

AS

???
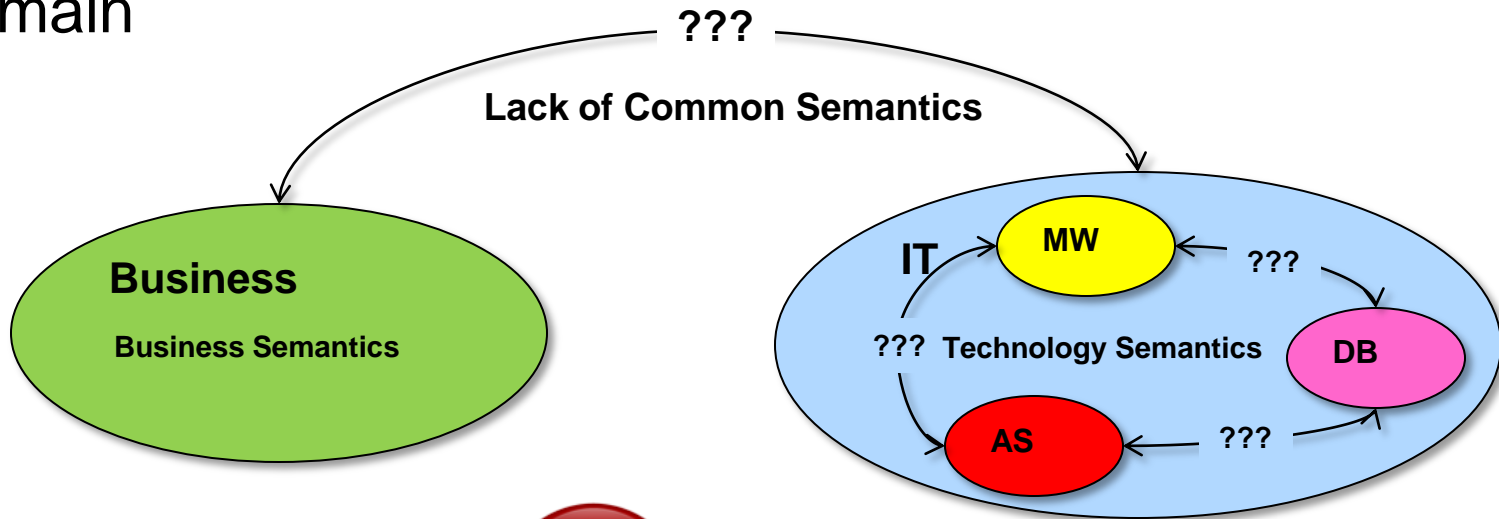
Business and IT aligned?

Business and IT Communication

- Common semantics are required for effective communication

- Information required for decision making must be appropriate, accurate and have a common context

- Business to IT alignment requires that the information transformed from data supports common semantics from appropriate team members (the information users)
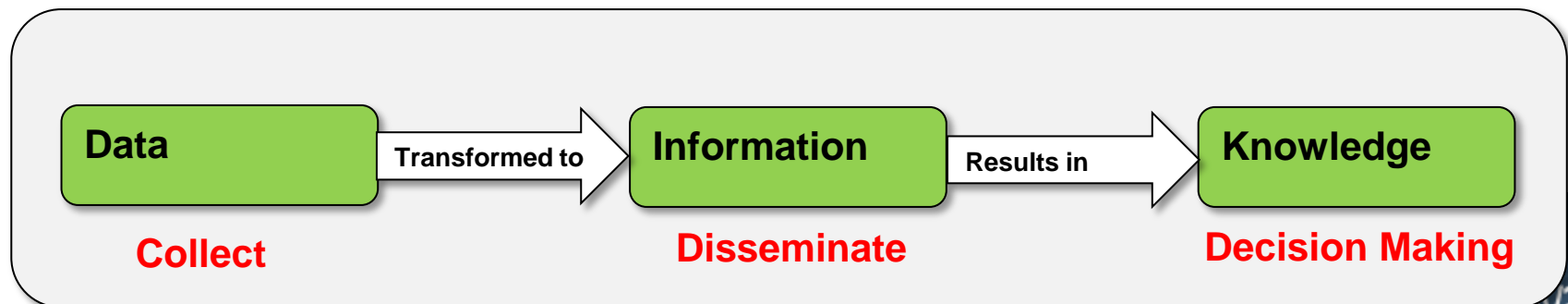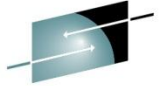
Data	Transformed to	Information	Results in	Knowledge
Collect		**Disseminate**		**Decision Making**

Information Users

Information Users

- Information is used by people in many different, interactive and collaborative ways
- Information must be provided common semantics in order to be used by a broad perspective of business and technical users (i.e., something that is understood by both)
- The information users are the "virtual team" members
- Virtual team members
  - CxO
  - LOB Managers
  - Application Owners
  - Functional Managers
  - Application Managers
  - Service Managers
  - Technical Managers
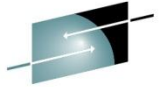
Information Focal Point

Information Focal Point

- Business applications provide the focal point for data collection and operational Business to IT alignment

- Data is transformed into appropriate information for the management functions required to effectively manage the business application

- Classical monitoring methodologies provide some context to information but is only useful to technology subject matter experts

- Measurement of transaction latency, value and state in business applications provides a common information source that is useful and understood by the virtual team

Information Focal Point

- Business application information generated is classified as business, application or technical
- <u>Transaction monitoring</u> provides synchronized business, technical and application information
- Cause – effect relationships are able to be tracked to a parent event that rules in or rules out business, application and technical issues
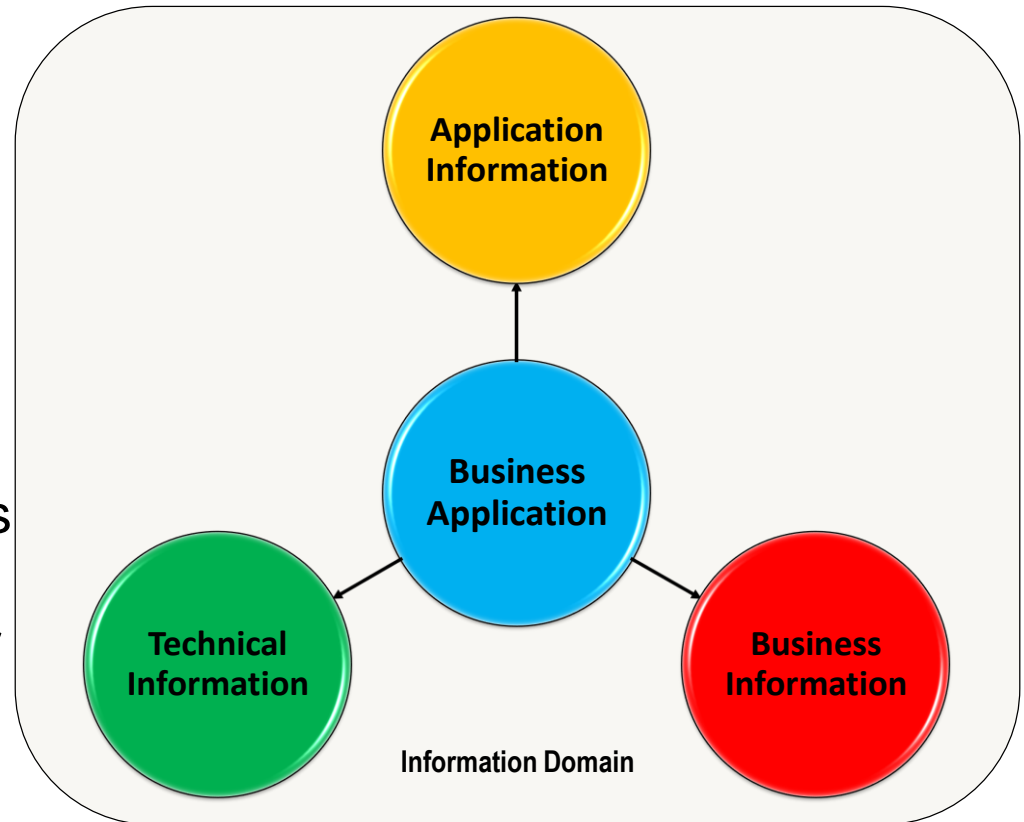
Information Focal Point

- Transaction monitoring – the common denominator for data collection and transformation

- Transaction <u>latency</u>, <u>value</u> and <u>state</u> provides common semantics for all virtual team members

- Management technology focuses on the business application

- Middleware and transaction management provides the appropriate platform for management
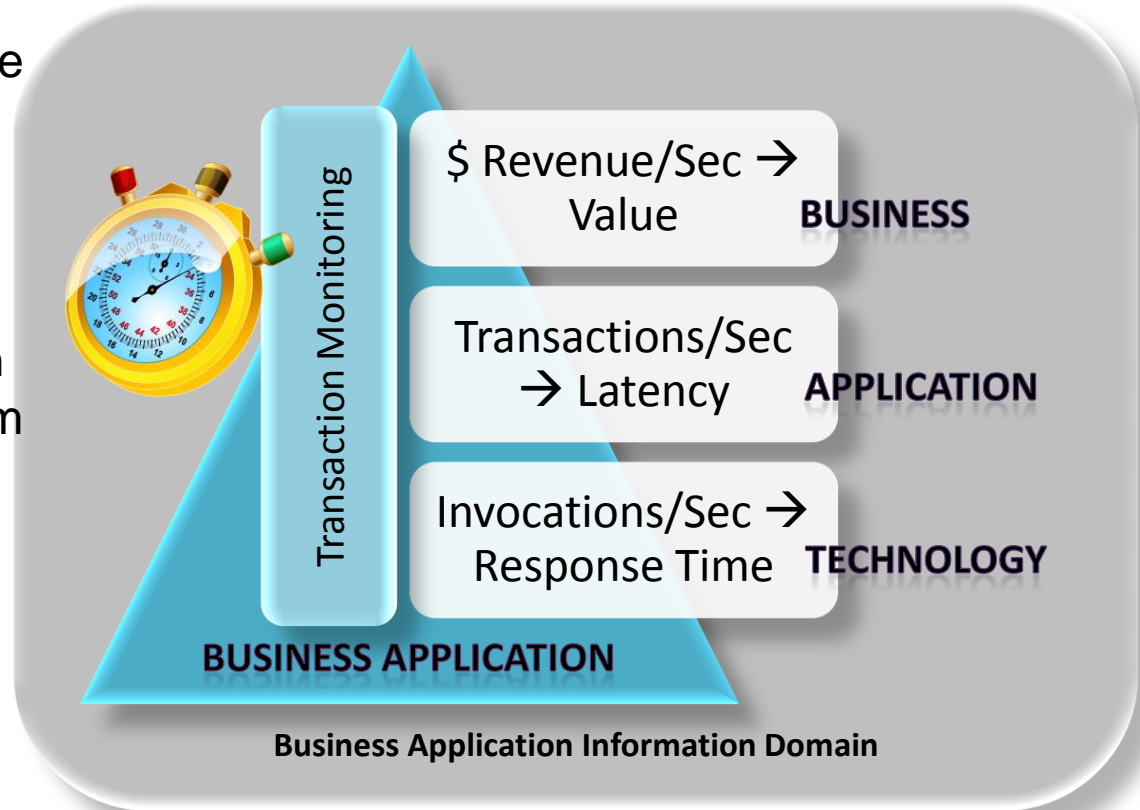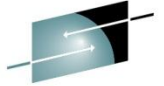
Transaction Monitoring

$ Revenue/Sec → Value **BUSINESS**

Transactions/Sec → Latency **APPLICATION**

Invocations/Sec → Response Time **TECHNOLOGY**

BUSINESS APPLICATION

Business Application Information Domain

Business Application Fundamentals

Business Application Fundamentals

Technical, Application and Business Information

Generates
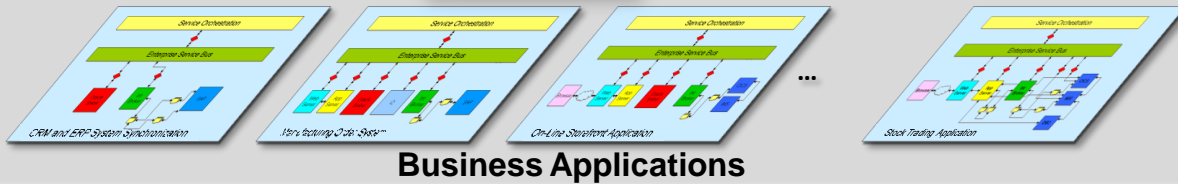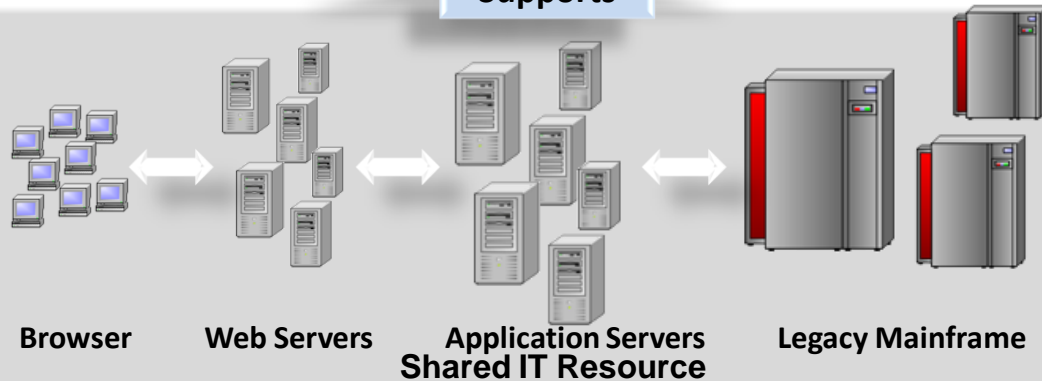
Business applications are deployed and executed on distributed and mainframe platforms

Business Applications

Supports

Browser   Web Servers   Application Servers   Legacy Mainframe
Shared IT Resource

Abstract view of infrastructure and business applications that execute on it

Business Application Fundamentals

Application visualization and resource mapping is required to understand the application components and their use of shared infrastructure resources.
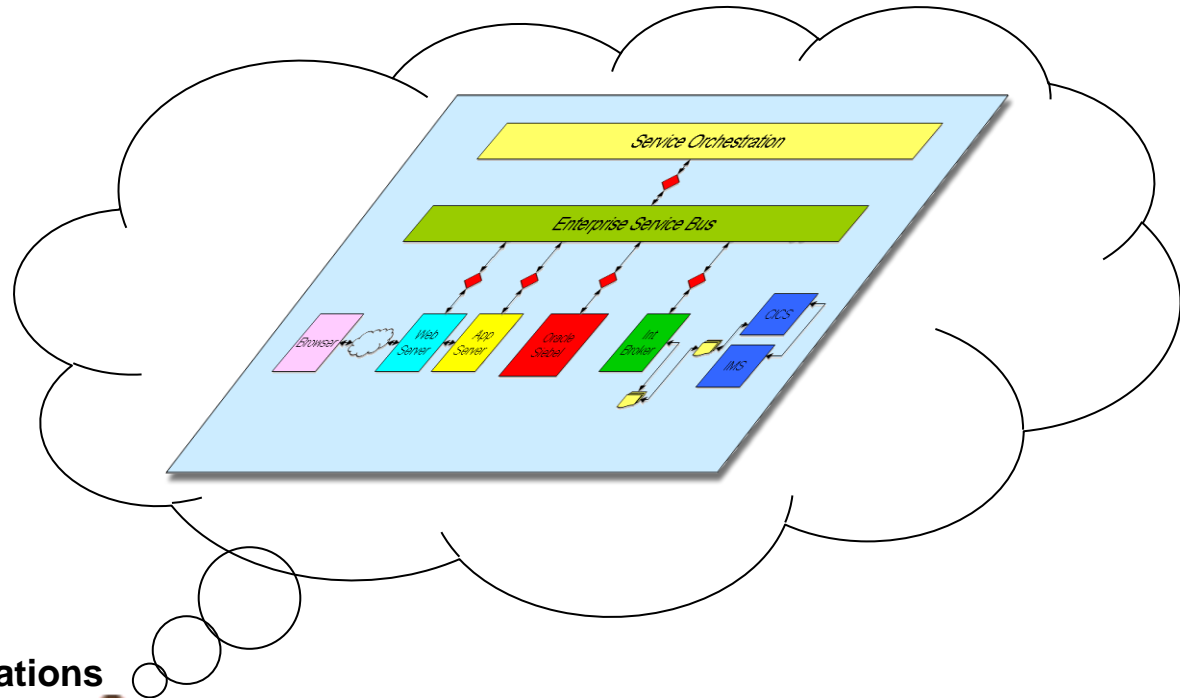
Application/IT Operations

If I only had a picture of it!
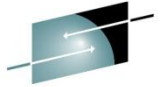
Business Application Fundamentals

Application Topology
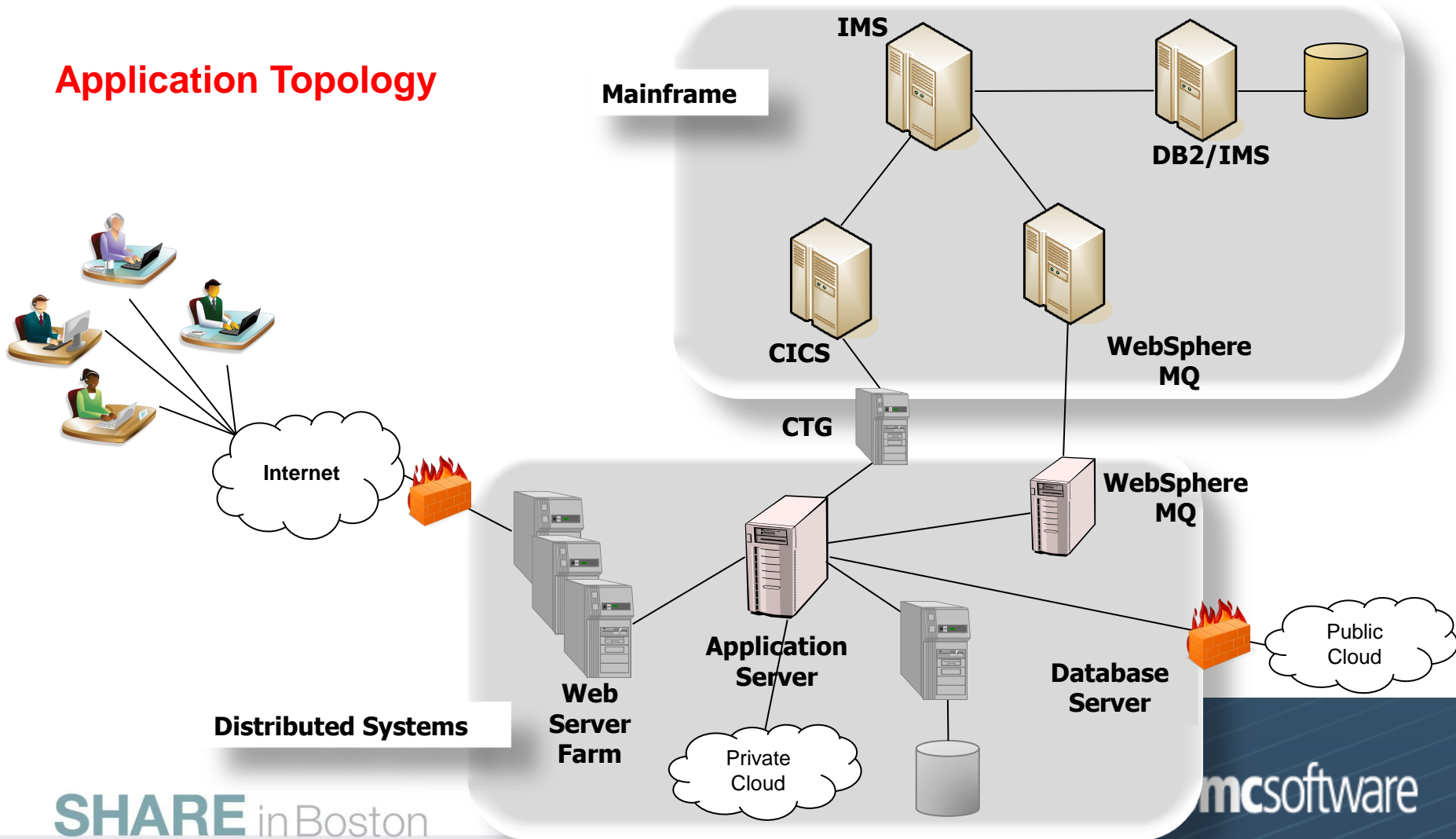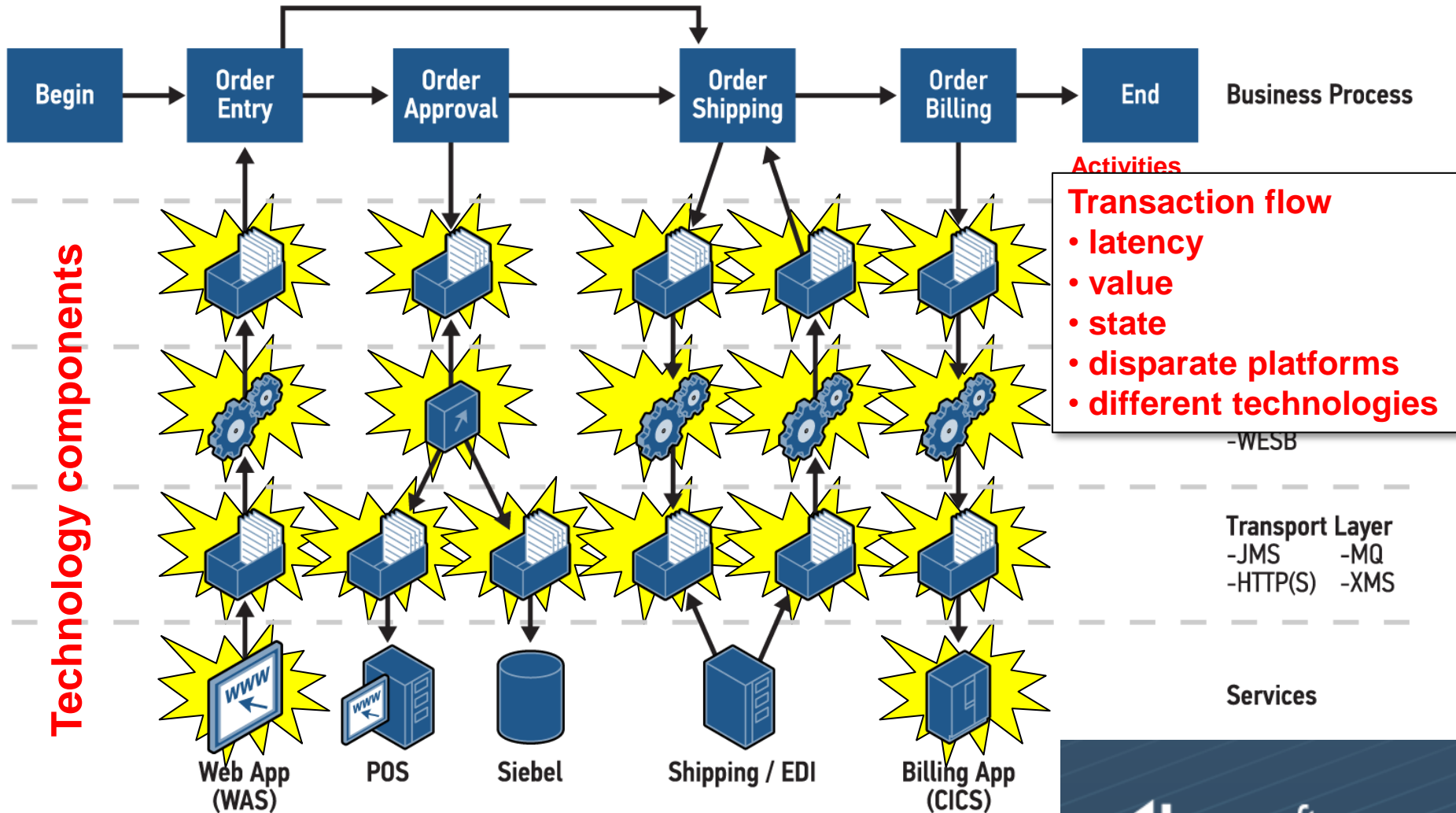
Mainframe
- IMS
- DB2/IMS
- CICS
- WebSphere MQ
- CTG

Distributed Systems
- Internet
- Web Server Farm
- Application Server
- WebSphere MQ
- Database Server
- Private Cloud
- Public Cloud

Business Application Fundamentals

Middleware and Transaction Management Fundamentals

Middleware and Transaction Management Fundamentals

- Mainframe and distributed systems must be supported
- Data collection is transformed into information
- Technical, application and business information is specific to the user (performance metrics) but common to the virtual team (transaction metrics)
- Role-based information
- Management functions should address
  - Business transaction management
  - Performance and availability management
  - Transaction payload management
  - Service level management
  - Alert and automation management
  - Root cause analysis management

Middleware and Transaction Management Fundamentals
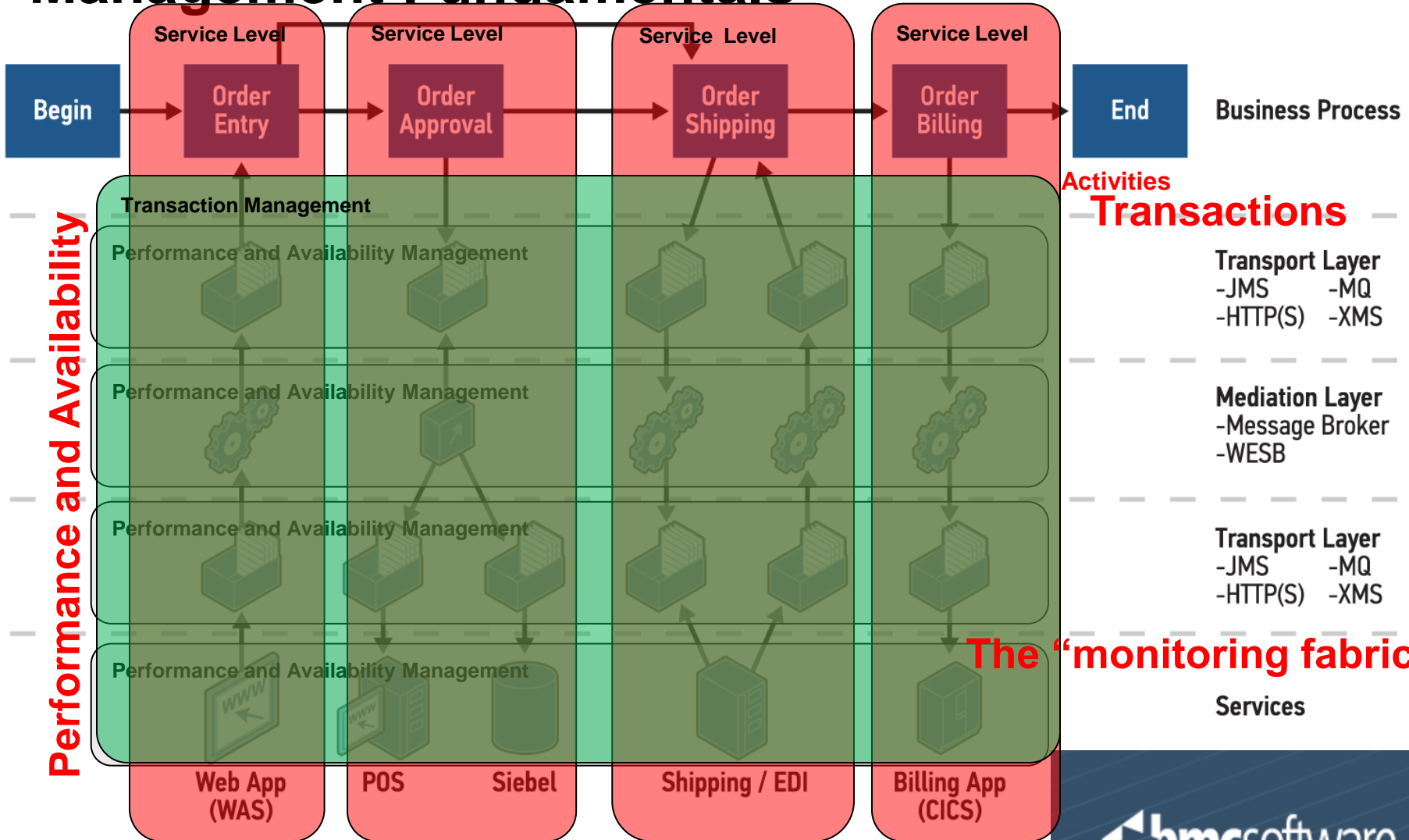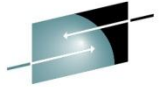
Business Process

Begin → Order Entry → Order Approval → Order Shipping → Order Billing → End

Service Level — Service Level — Service Level — Service Level

Activities

Transactions

Transaction Management

Performance and Availability Management (×4)

Transport Layer
- JMS   - MQ
- HTTP(S) - XMS

Mediation Layer
- Message Broker
- WESB

Transport Layer
- JMS   - MQ
- HTTP(S) - XMS

The "monitoring fabric"

Services

Performance and Availability

Web App (WAS) — POS Siebel — Shipping / EDI — Billing App (CICS)

Service Levels

Information Domain Models

Information Domain Models

- Information domain models need to change to support the need for real-time business

- The model needs to change the fundamental nature of data collection and information transformation from silo-oriented, decoupled monitoring

- The model needs to move from information that is old (in terms of transaction completion times), or "activity that <u>has taken</u> place" to a model paradigm of "activity that <u>is taking</u> place"

- The business needs to be proactive from an operational perspective at the technology, application and business level

Information Domain Models

End-to-end is not enough!
- application availability
- application performance
- coarse-grained service level monitoring

End-thru-end is the core of transaction monitoring!
- application availability
- application performance
- technology component availability
- technology component performance
- location of transaction issue
- transaction state (IT perspective)
- transaction value (business perspective)
- synchronizes key business and technical information
- fine-grained service level monitoring

Stock Trading Application

bmcsoftware
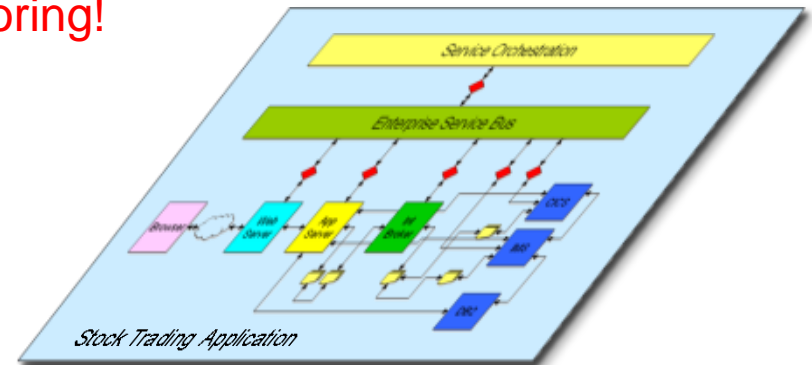
Information Domain Models

Classical information model – decoupled tools and information!

Decoupled Information Model
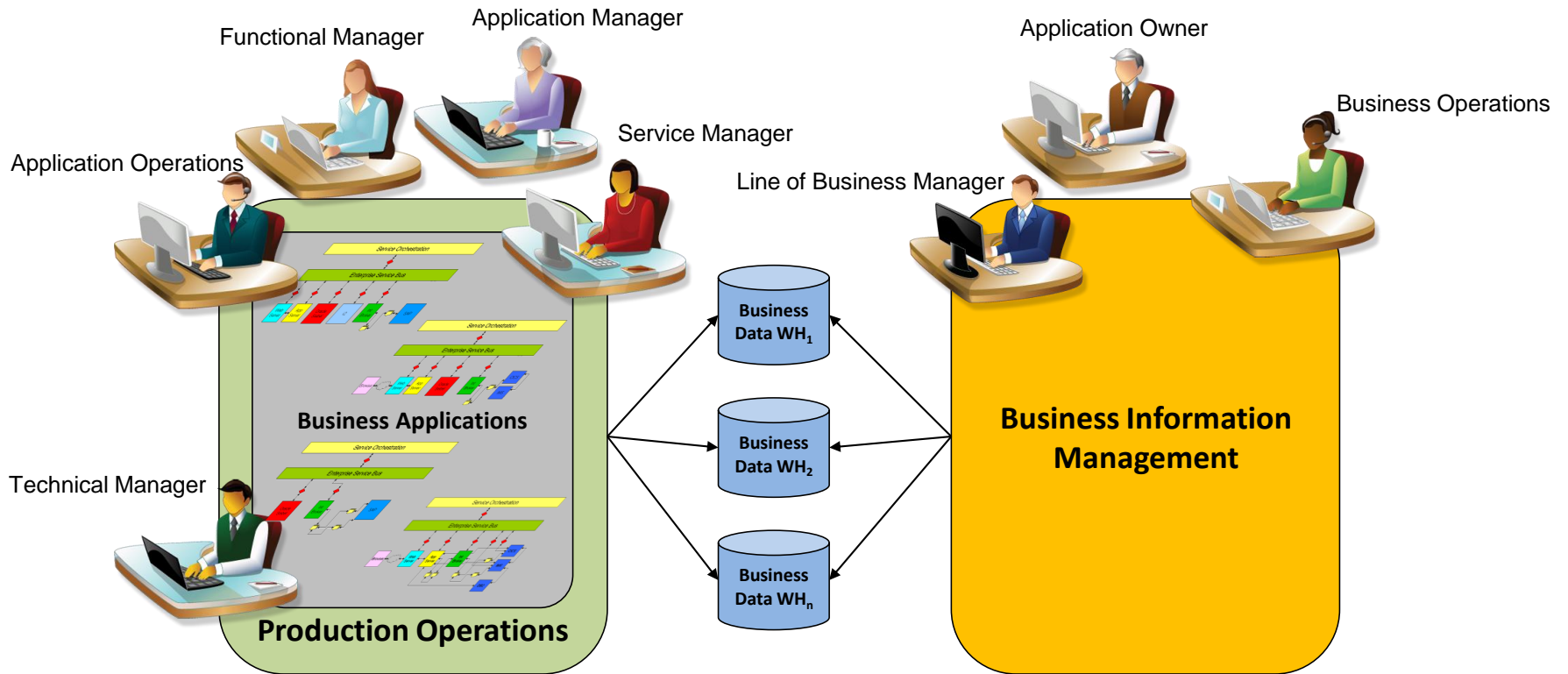
Activity that has already taken place

Virtual team members use individual tools providing different metrics using different semantics

Information Domain Models

Being proactive from a technical, application and business perspective!

Integrated Information Model

Application Owner

Functional Manager

Line of Business Manager

Application Manager

Application Operations

Technical Manager

Business Operations

Production Operations

Business Applications

Technical, Application and Business Information Management

Service Manager
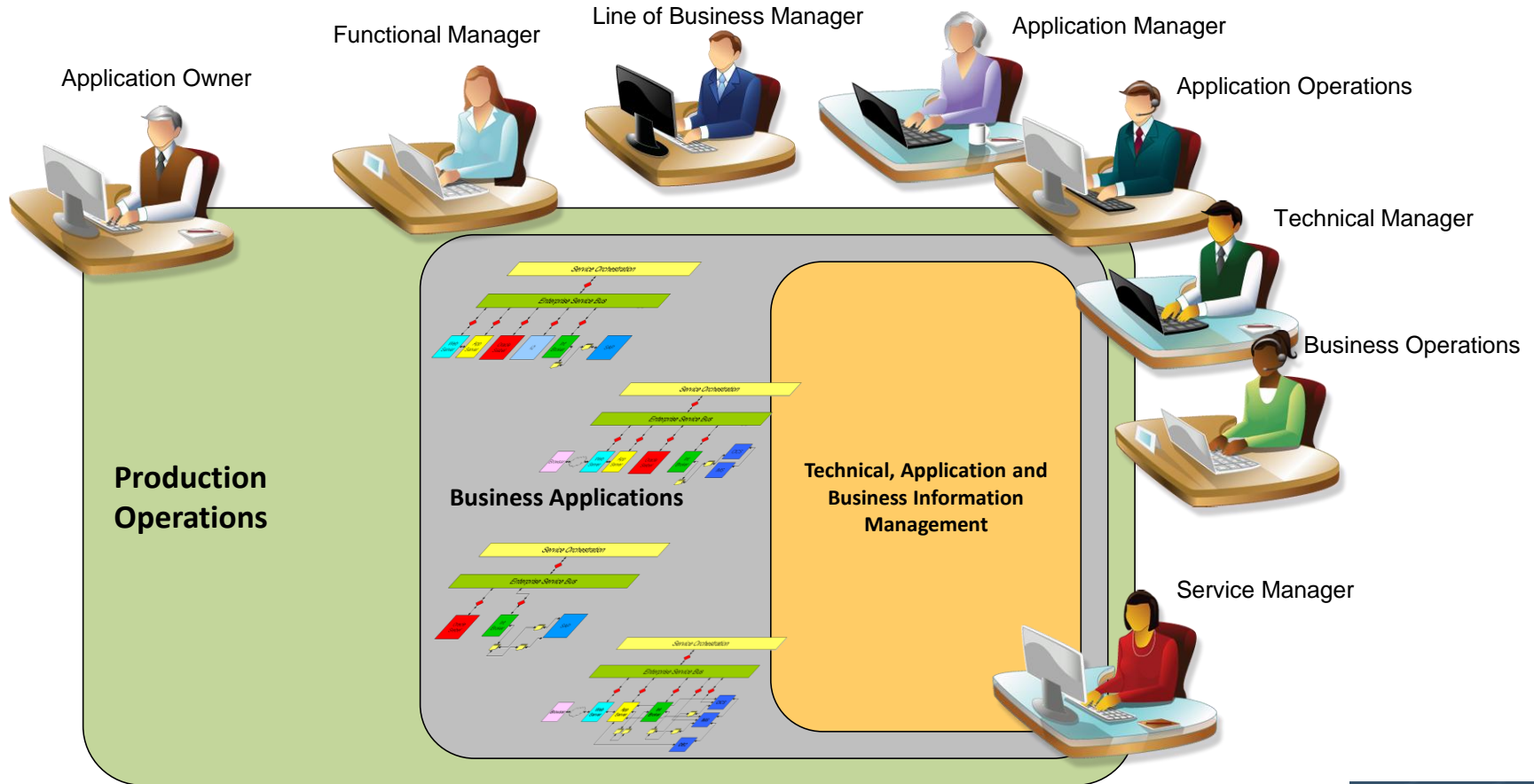
Activity that is taking place!

Virtual team members use an integrated management application providing the same metrics using common semantics

Middleware and Transaction Management

Middleware and Transaction Management

Proactively manage business applications supporting technical, application and business operations

- SUPPORT management functions for virtual team members

- SYNCHRONIZE business, application and technology information

- TRANSFORM data into appropriate information
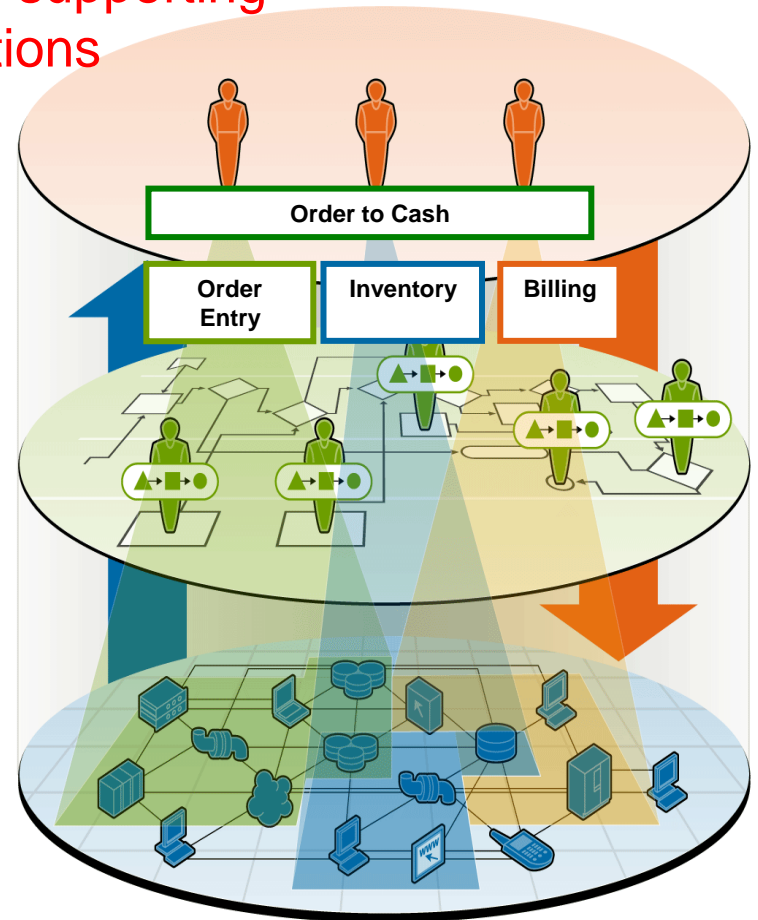
Information is generated from distributed and mainframe systems

Order to Cash

Order Entry | Inventory | Billing

Middleware and Transaction Management

Proactively manage business applications supporting technical, application and business operations

- DETECT business transaction problems

- ISOLATE the location of the problem

- DIAGNOSE the problem quickly and effectively

Order to Cash

Order Entry | Inventory | Billing

Information is generated from distributed and mainframe systems

bmcsoftware
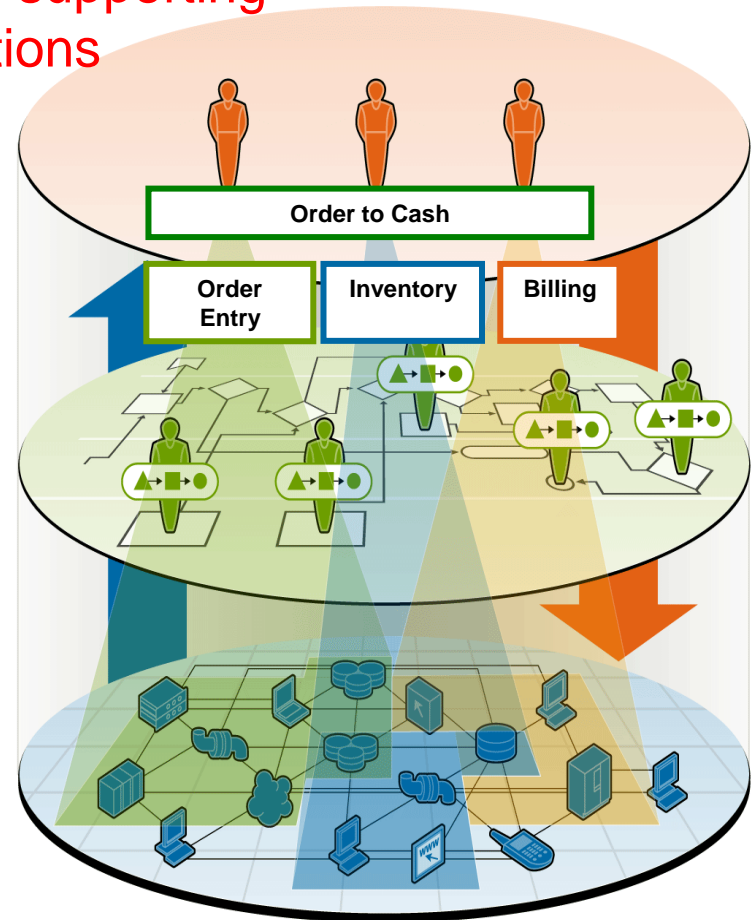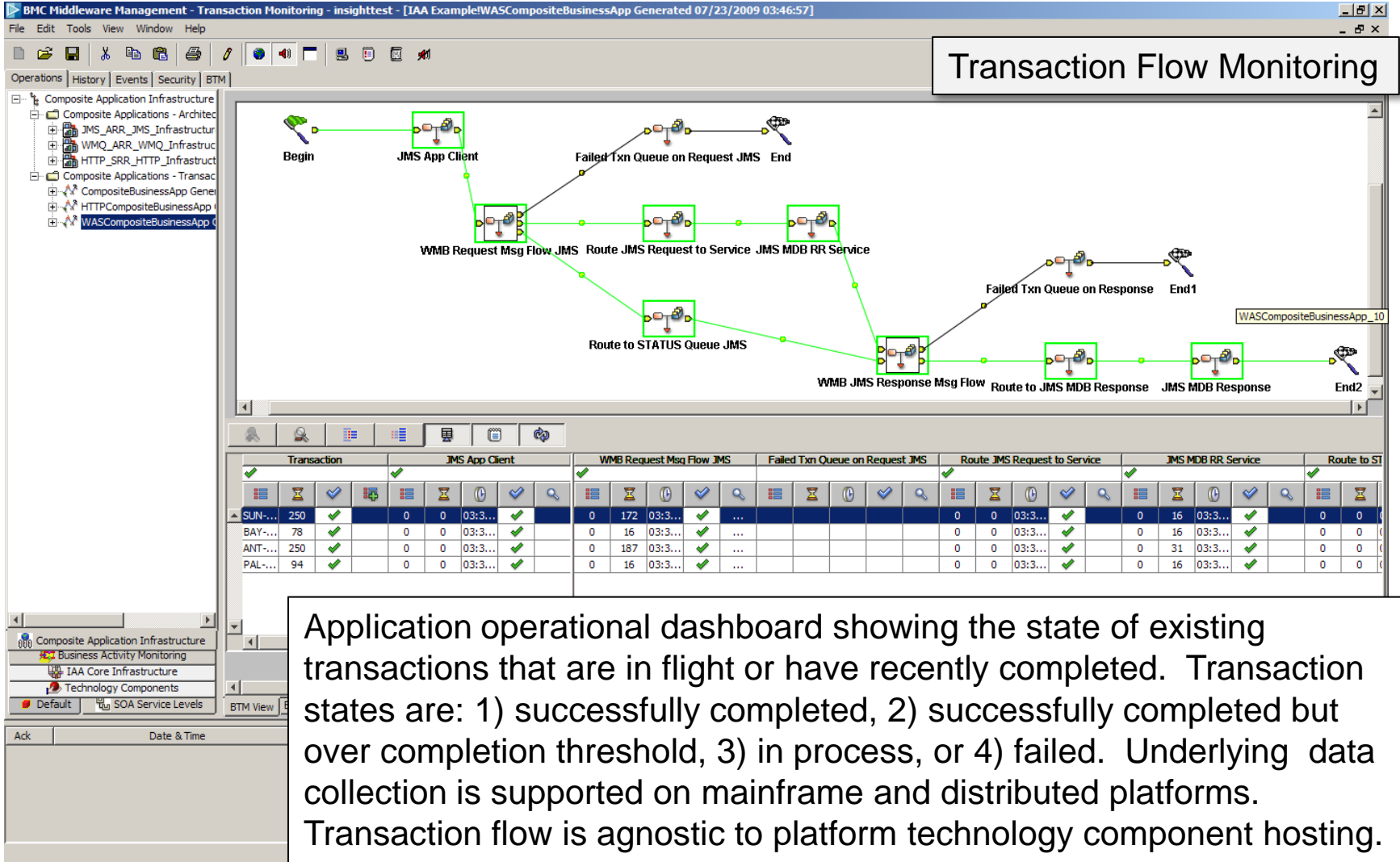
Middleware and Transaction Management

BMC Middleware and Transaction Management

Middleware and Transaction Management

Transaction Flow Monitoring

Application operational dashboard showing the state of existing transactions that are in flight or have recently completed. Transaction states are: 1) successfully completed, 2) successfully completed but over completion threshold, 3) in process, or 4) failed. Underlying data collection is supported on mainframe and distributed platforms. Transaction flow is agnostic to platform technology component hosting.

Middleware and Transaction Management

Performance and Availability Monitoring
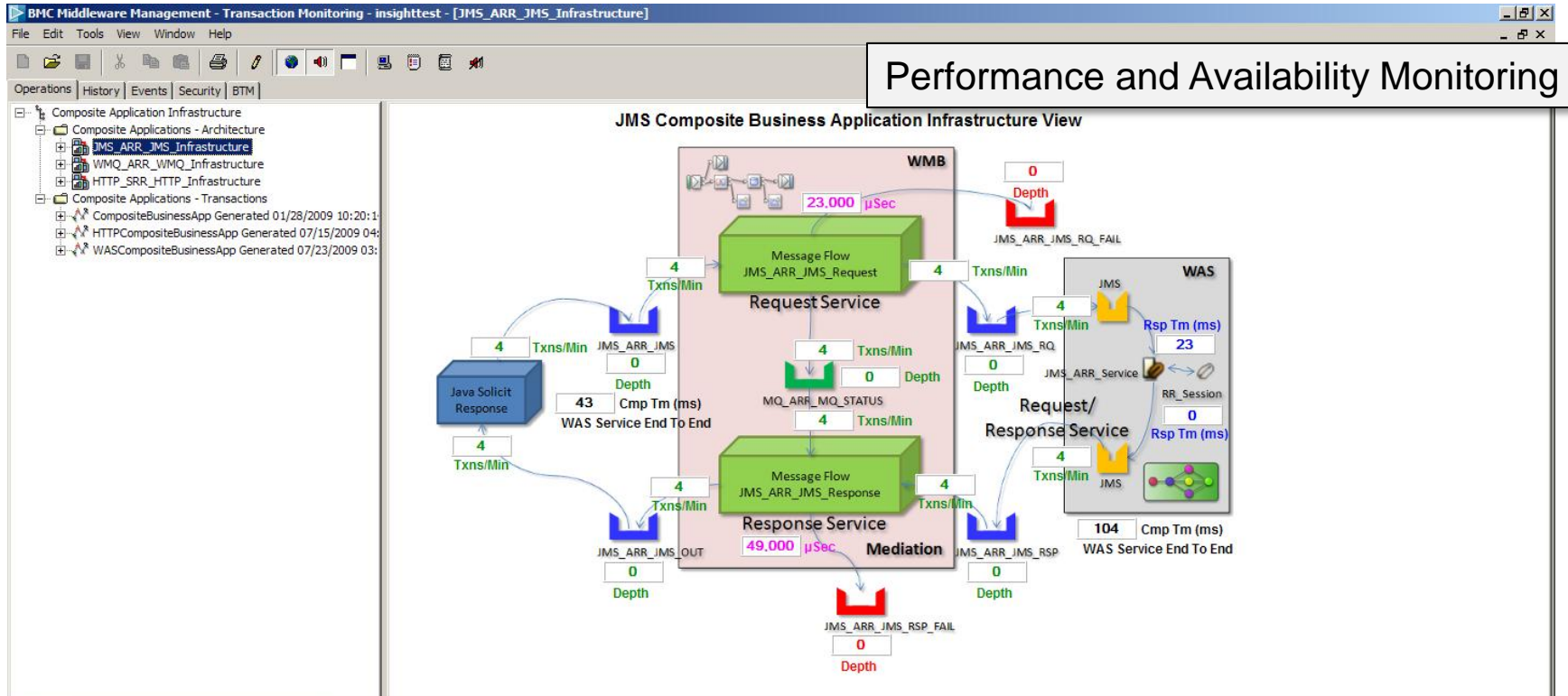
Components of the business application map to technology components hosted on technology silos. This view shows the relationship of the technology components to the end-to-end business application. Application and technical managers can use these types of component views (representing the data flow architecture) to troubleshoot application problems attributed to poor component performance. It also provides drill down capabilities to the underlying technology components.

Middleware and Transaction Management

Performance and Availability Monitoring

Technology performance and availability metrics provide technology drill down information. Example drill down page for WebSphere Message Broker.

Middleware and Transaction Management
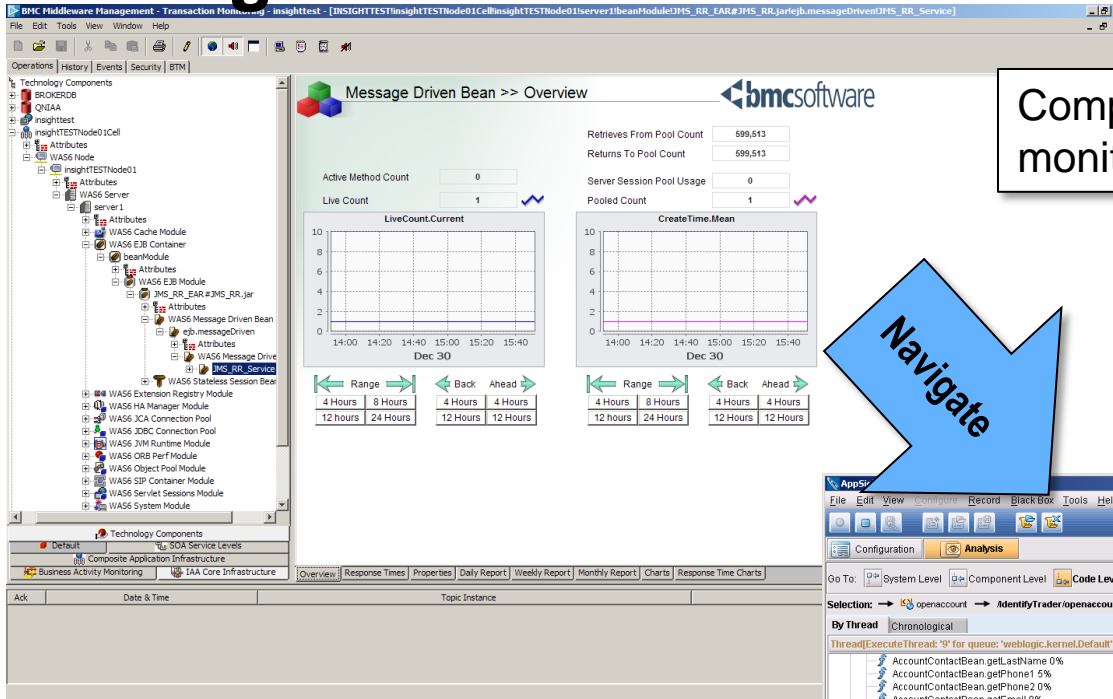
Component performance monitoring for JEE
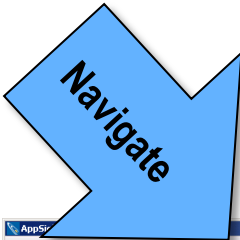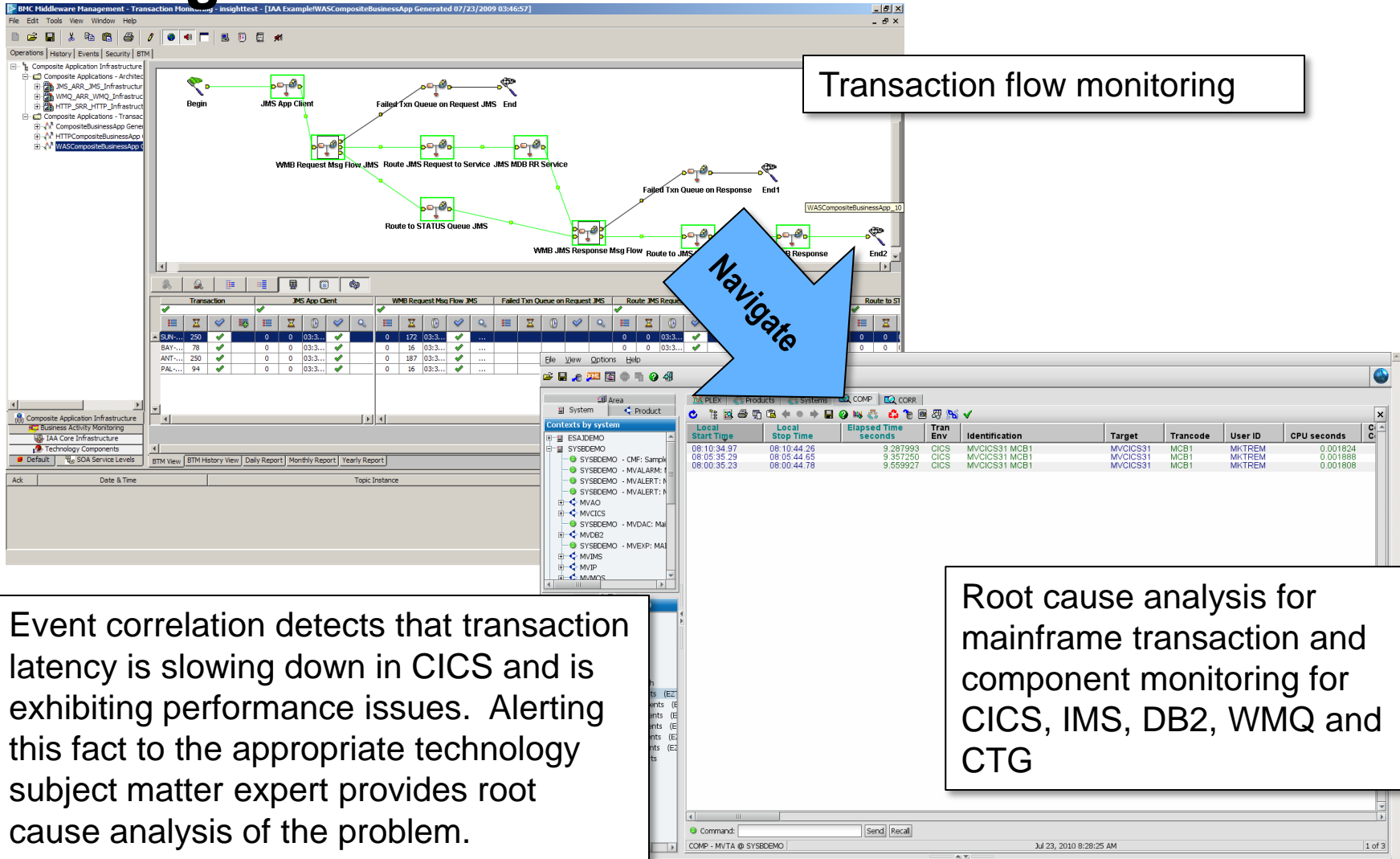
Root cause analysis for JEE

Event correlation detects that a technology component is exhibiting performance issues outside of a threshold. Alerting this fact to the appropriate technology subject matter expert provides root cause analysis of the problem.
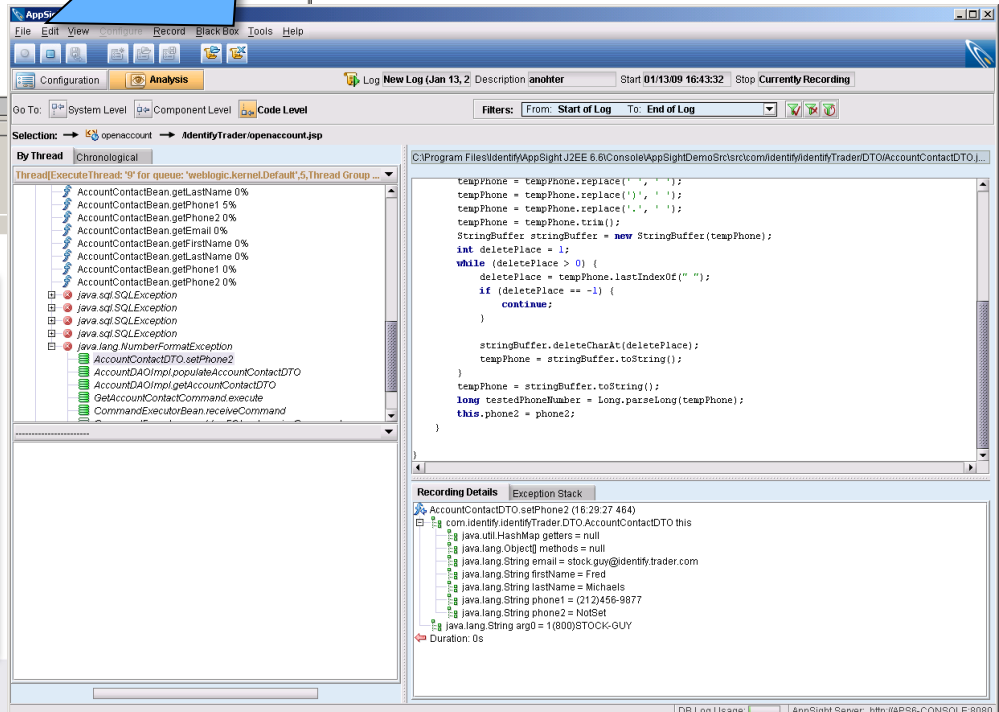
Middleware and Transaction Management

Transaction flow monitoring

Navigate
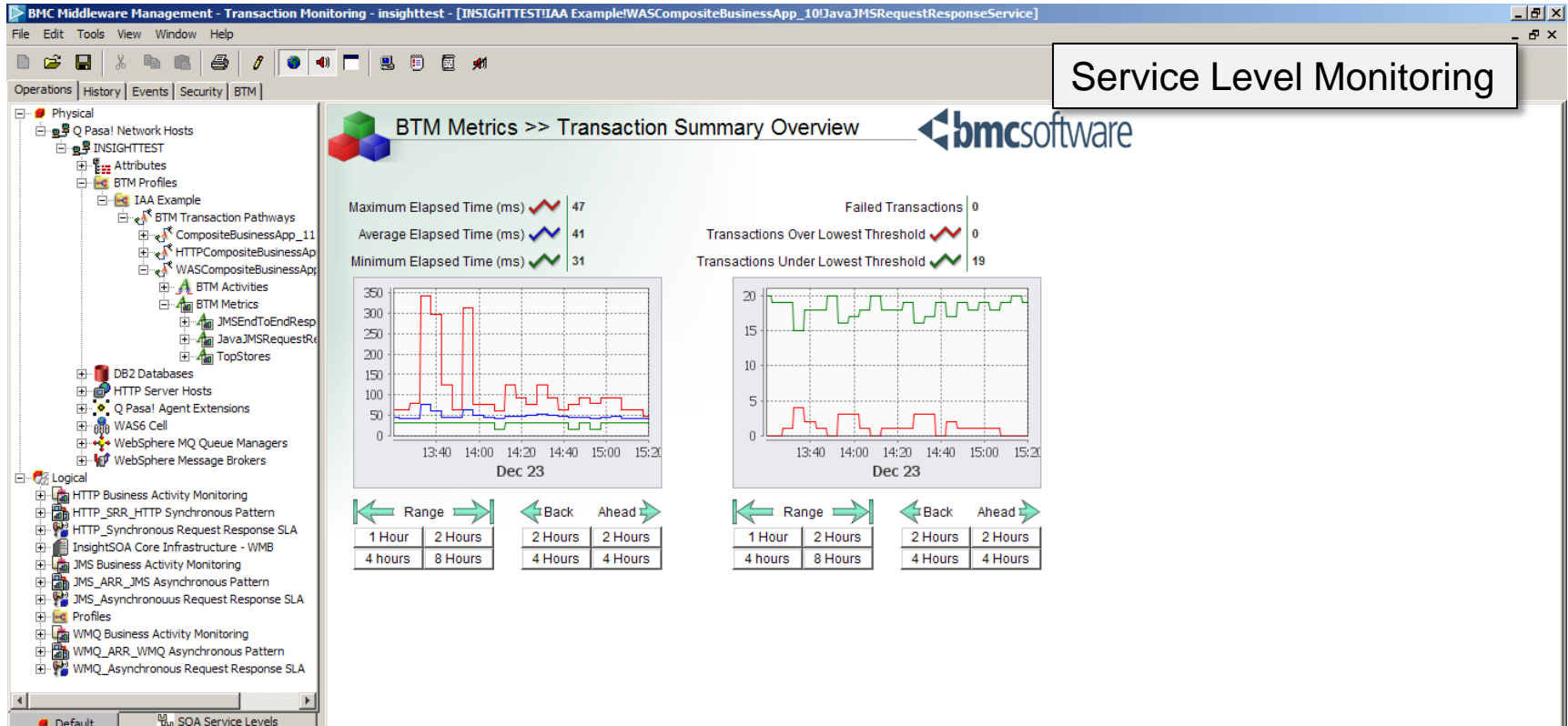
Event correlation detects that transaction latency is slowing down in CICS and is exhibiting performance issues. Alerting this fact to the appropriate technology subject matter expert provides root cause analysis of the problem.

Root cause analysis for mainframe transaction and component monitoring for CICS, IMS, DB2, WMQ and CTG

Middleware and Transaction Management

Service Level Monitoring

Service level monitoring can be defined by selecting the segments of a transaction pathway that aggregate metrics are to be determined for transaction instance monitoring. Useful for monitoring individual service component performance in composite business applications based on SOA as an example. History charts and reports are pre-configured for immediate information needs (or custom charts and reports can be configured).
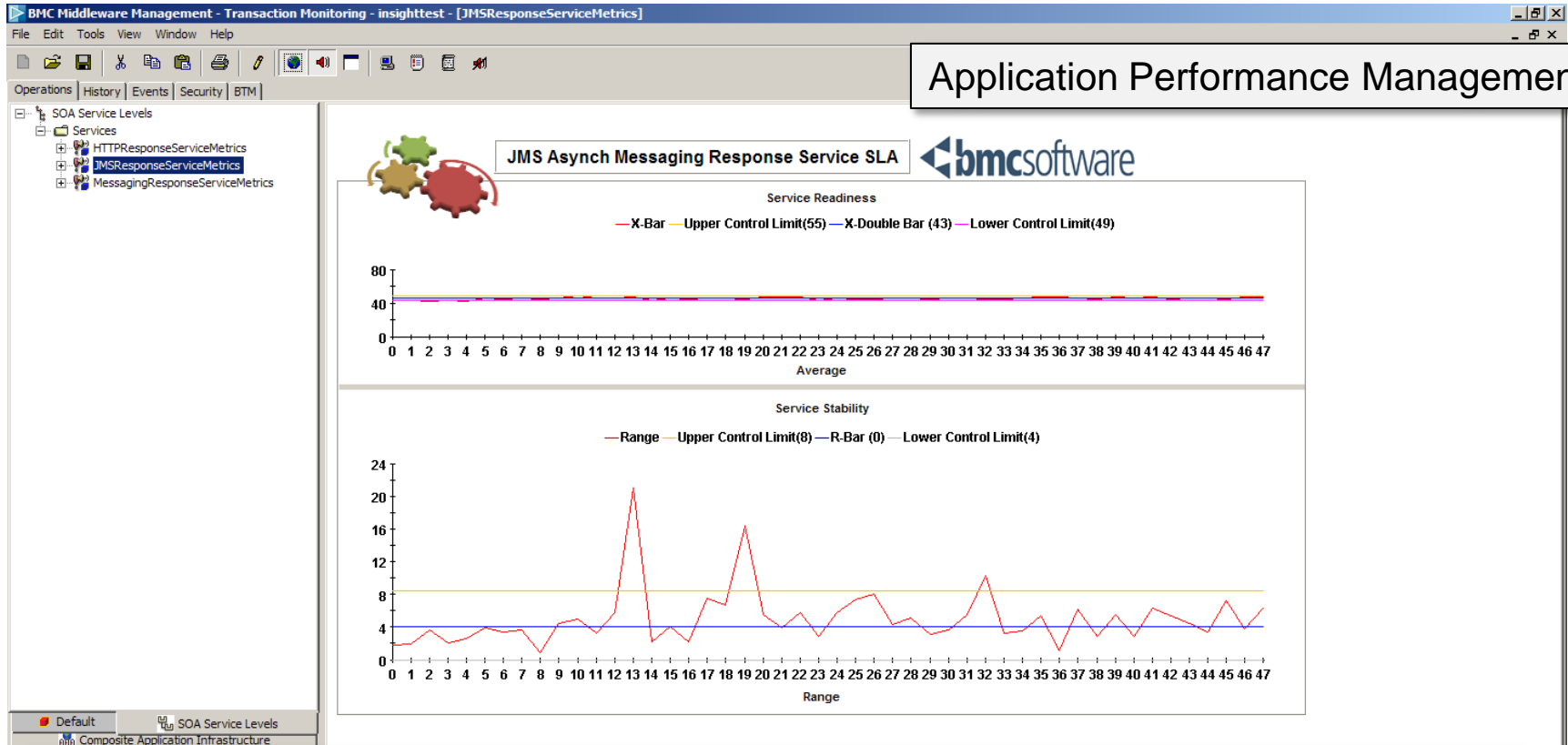
Middleware and Transaction Management

Transaction Payload Monitoring
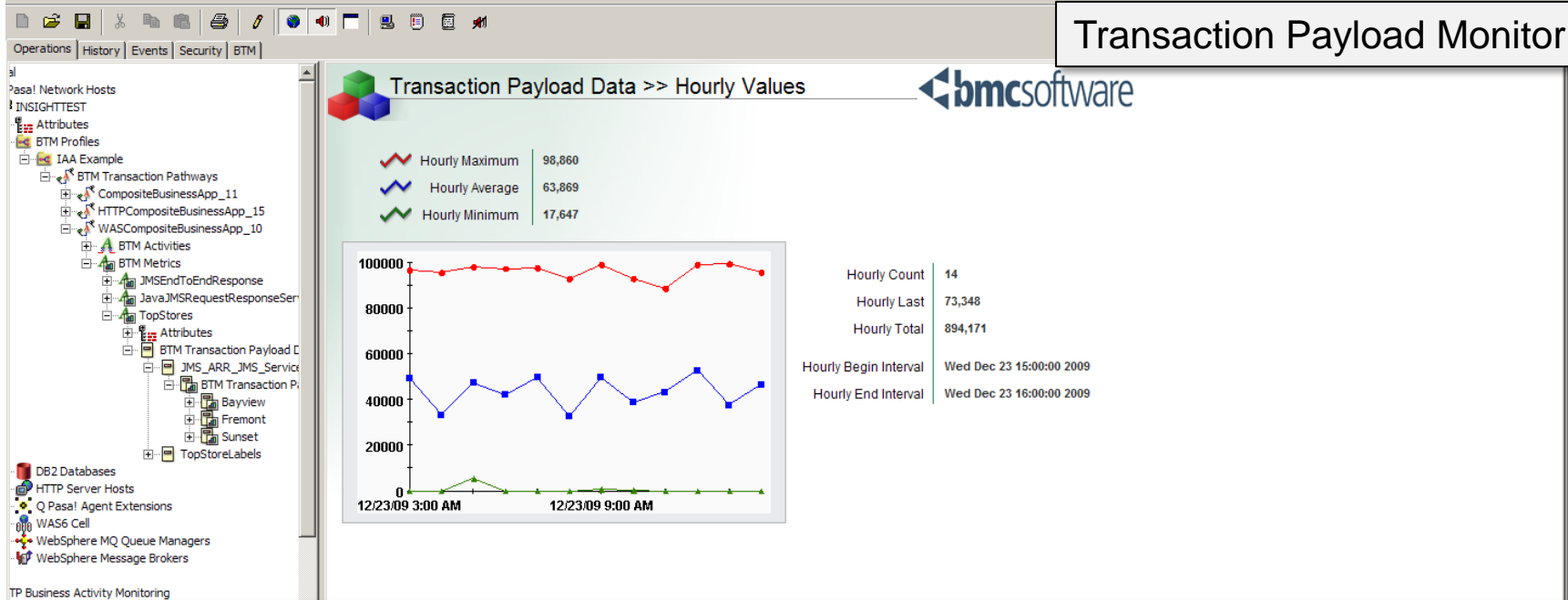
An example of a standard transaction payload monitoring dashboard that includes longer term history charts and reports on separate tabs. The user can define aggregation times for transaction payload monitoring that suit the information needs of various user roles. Payload monitoring provides the ability to monitor technical and business information contained within the transaction.
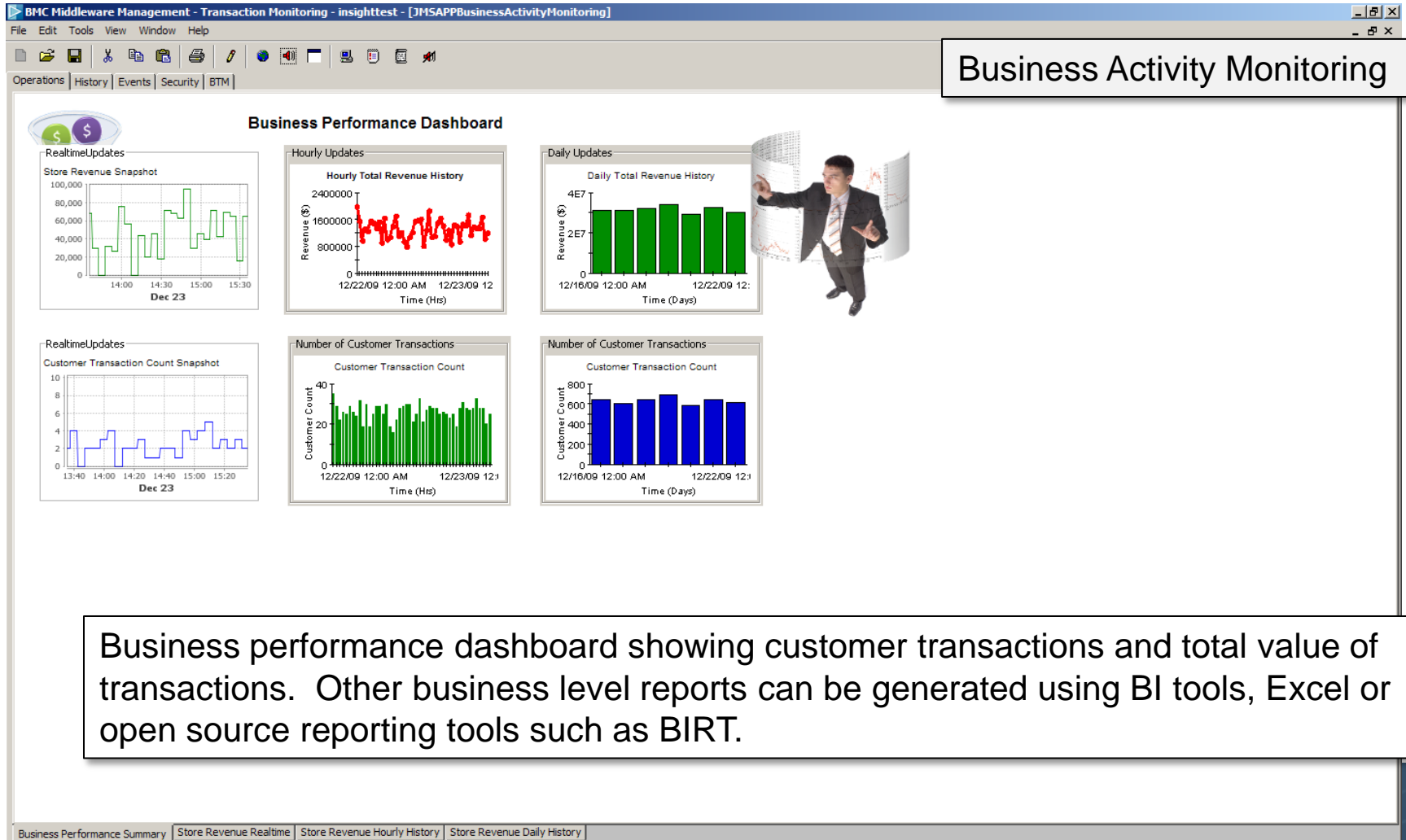
Middleware and Transaction Management
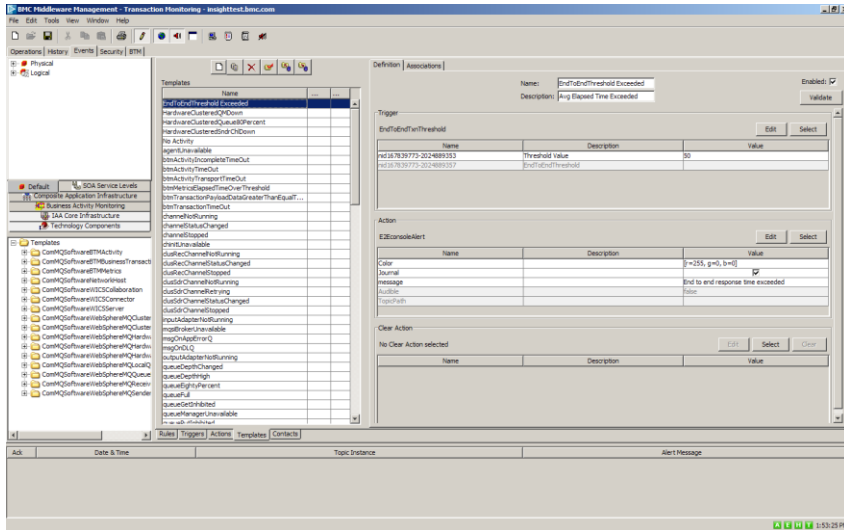

Application Performance Management
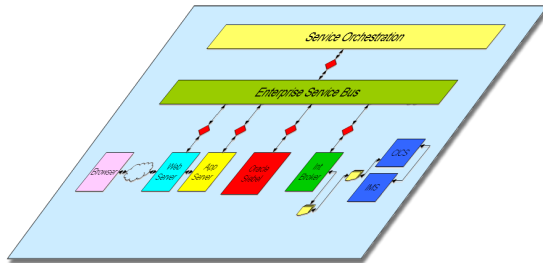
Statistical analysis can be employed to evaluate the stability and performance of a business application.

Middleware and Transaction Management

Business Activity Monitoring

Business performance dashboard showing customer transactions and total value of transactions. Other business level reports can be generated using BI tools, Excel or open source reporting tools such as BIRT.

Middleware and Transaction Management

Alert and Automation Management

Line of Business Manager

Application Manager

Functional Manager

Application Owner

Service Manager

Technical Manager

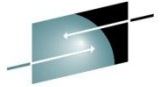**Virtual Team Members**

bmcsoftware
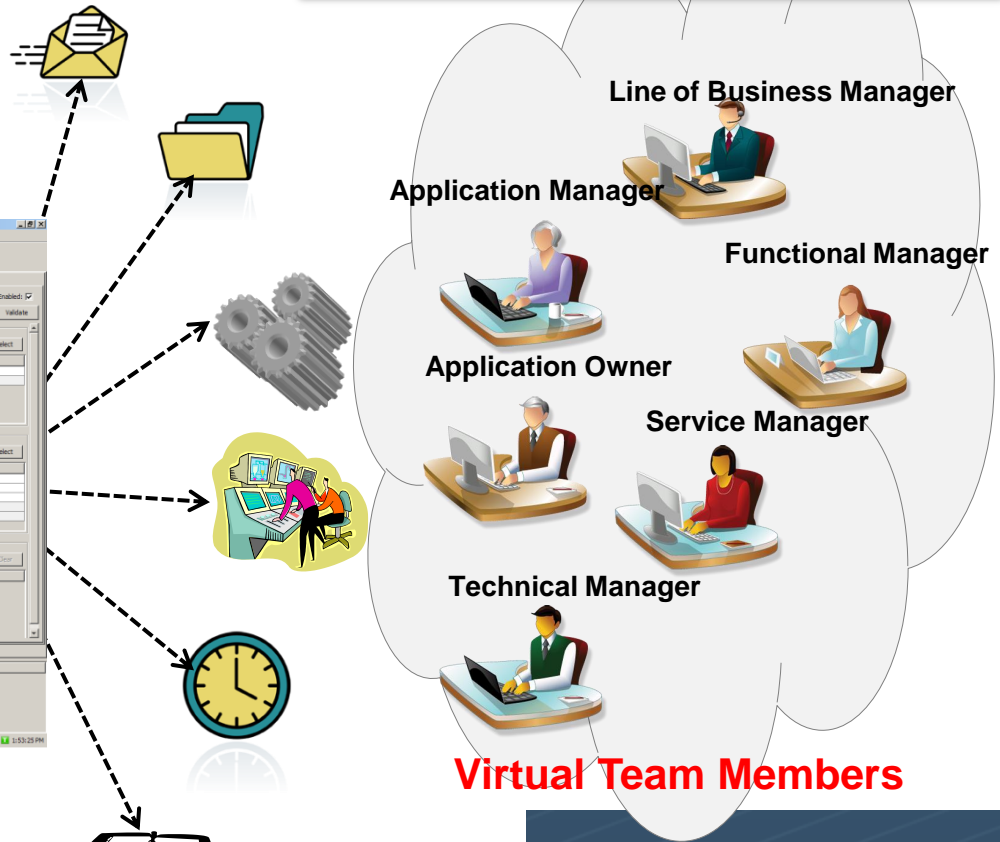
Conclusions

- Companies are awash in data but starved for information

- Middleware and transaction management provides an information model and perspective that supports the virtual team decision making process

- Transactions are the objects of interest in a business application and monitoring transaction state, latency and value provides the core information for middleware and transaction management

- With 70% of the world's mission-critical data residing on the mainframe, mainframe transaction monitoring must be an integral part of any business application monitoring initiative

Conclusions

- Decision making processes require integrated, synchronized information in order to assure business continuity and minimize business risk

- Information models need to be changed to provide better, faster access to critical business application performance information

- Mainframe and distributed technologies support business applications on shared infrastructure resources and are critical to building an entire picture of the performance of the business application

- Middleware and transaction management is a critical part of Business Service Management

Questions?