Managing a Mainframe SOA Environment

How Tivoli and IT Service Management can help optimize and improve your composite applications

The Challenge: IT Organizations Are Under Tremendous Pressure

- **Change:** Market demands, workloads, service levels

- **Compliance:** Regulations, security, audit capabilities

- **Complexity:** Heterogeneous resources, silos, composite applications

- **Cost:** Management and administration

"We're trying to resolve a huge morass of IT complexity, while demand for our services keeps going up. We're getting hit from both sides. So what are we doing about it? We're delivering an adaptive IT organization that provides services on demand to support the needs of the business."
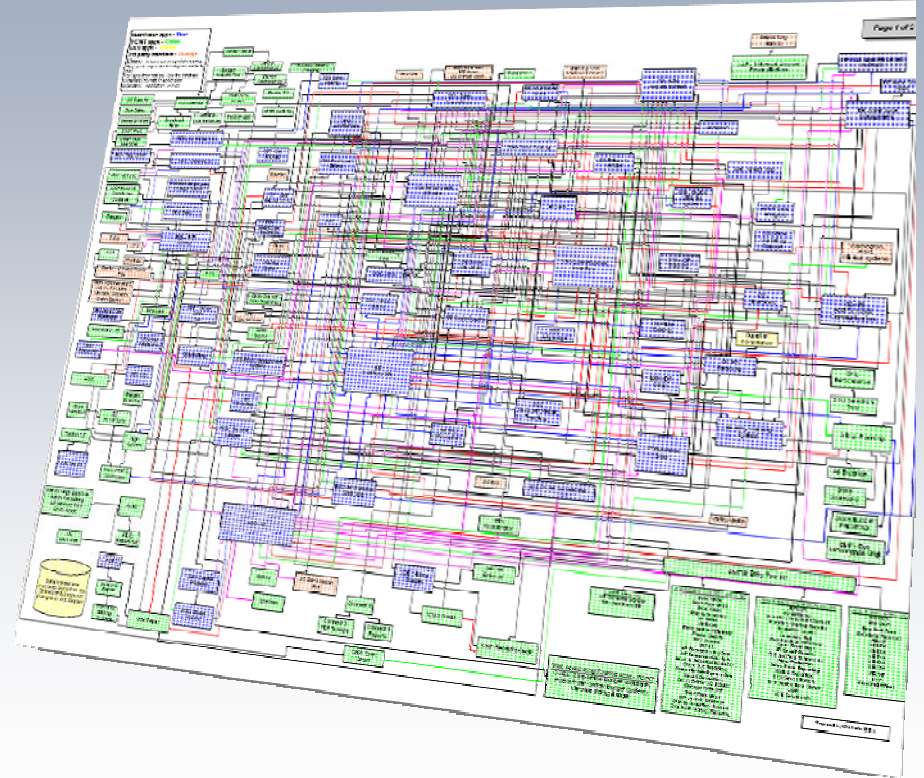
– *George Surdu, Director, Global Information Technology Infrastructure, Ford Motor Company, September 2005*

Current State of IT Management

More than 70% of
IT budgets are
currently devoted to
the maintenance
and operations of
existing applications
and systems.

*The Yankee Group,
3/05*

Current State of IT Management

Today's complex IT architecture reduces efficiency and effectiveness, and makes management a daunting task ...

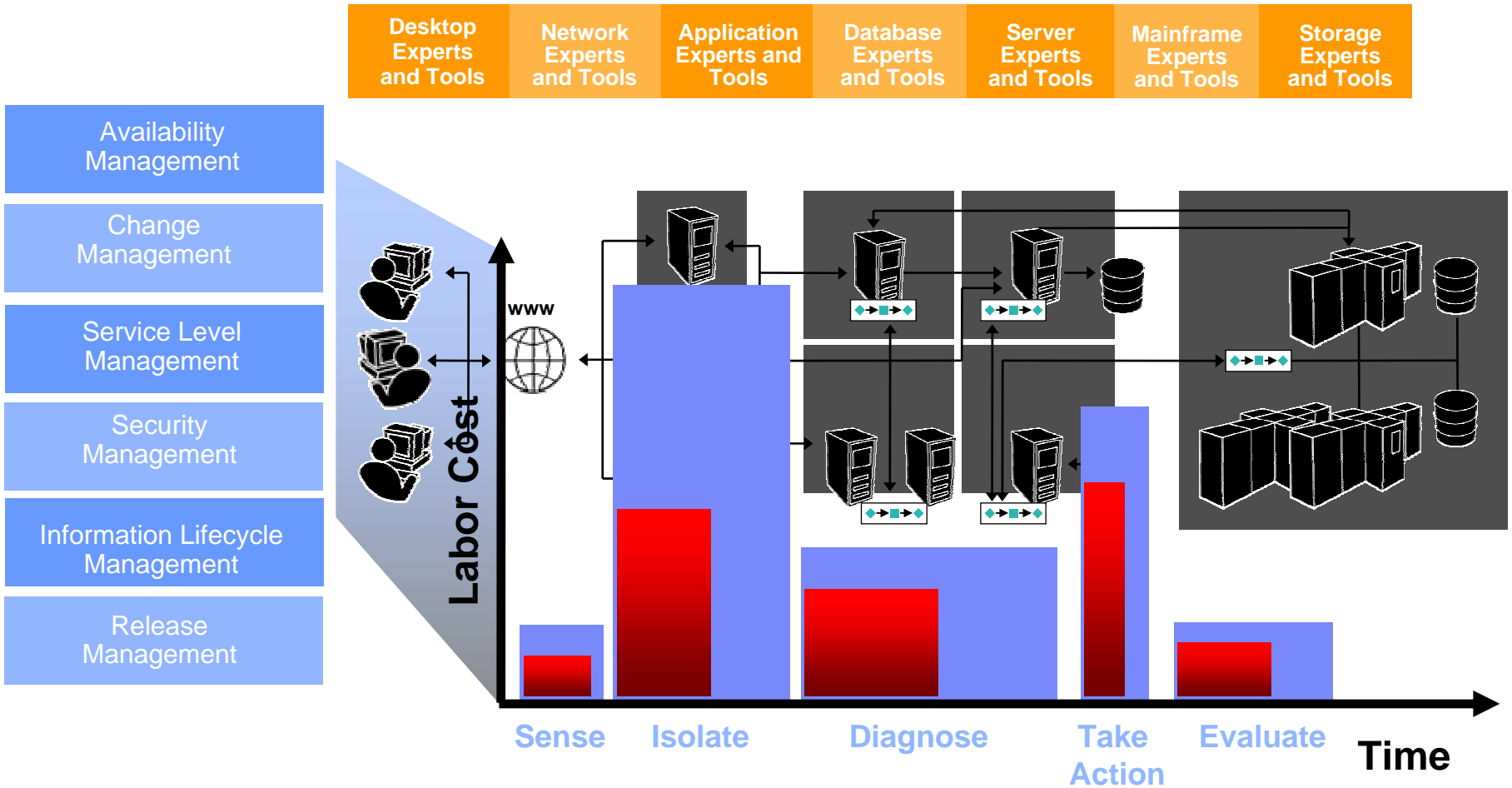**... Service Oriented Architecture (SOA) aims to simplify by establishing re-usable, standards-based services ...**

Case Study: Customer Order & Fulfillment

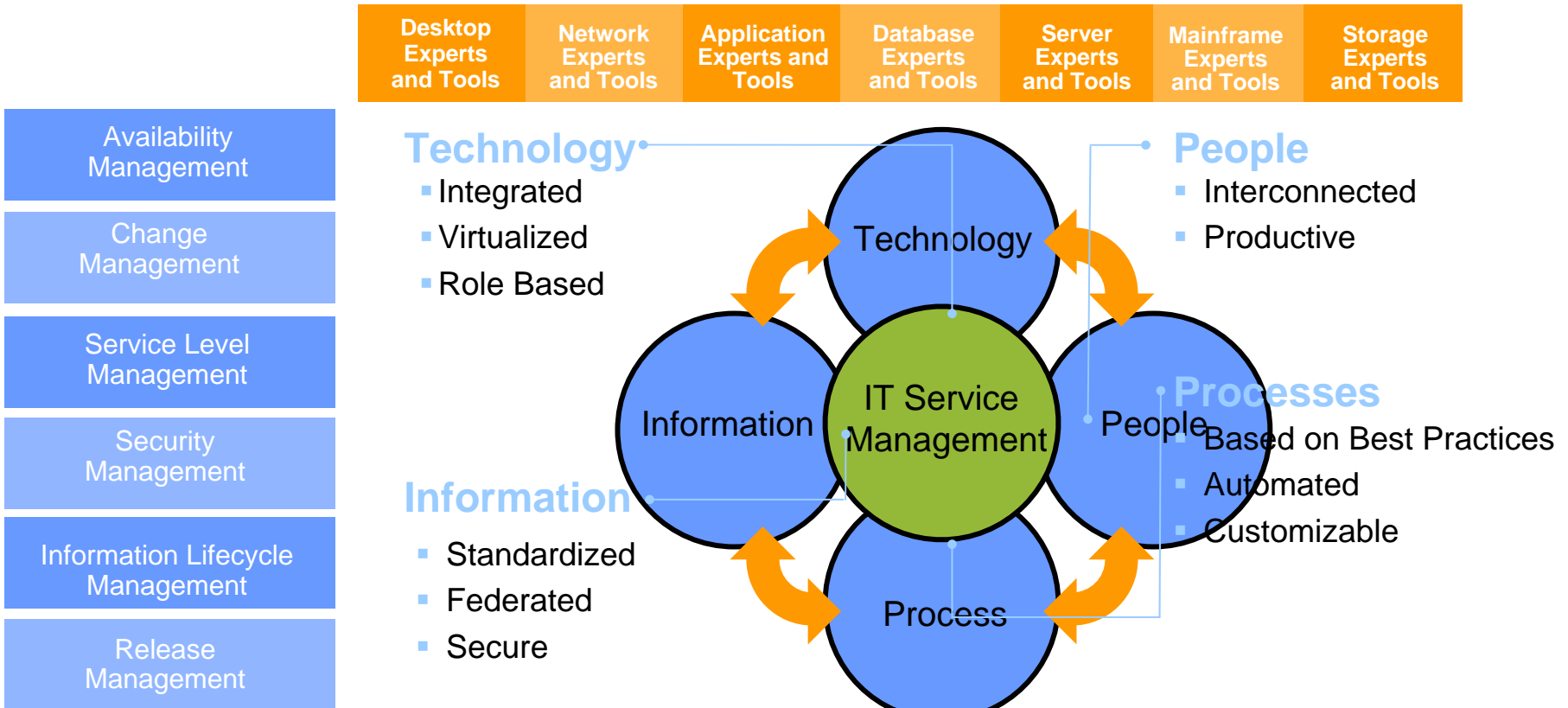**... which require an integrated and comprehensive approach for IT Service Management.**
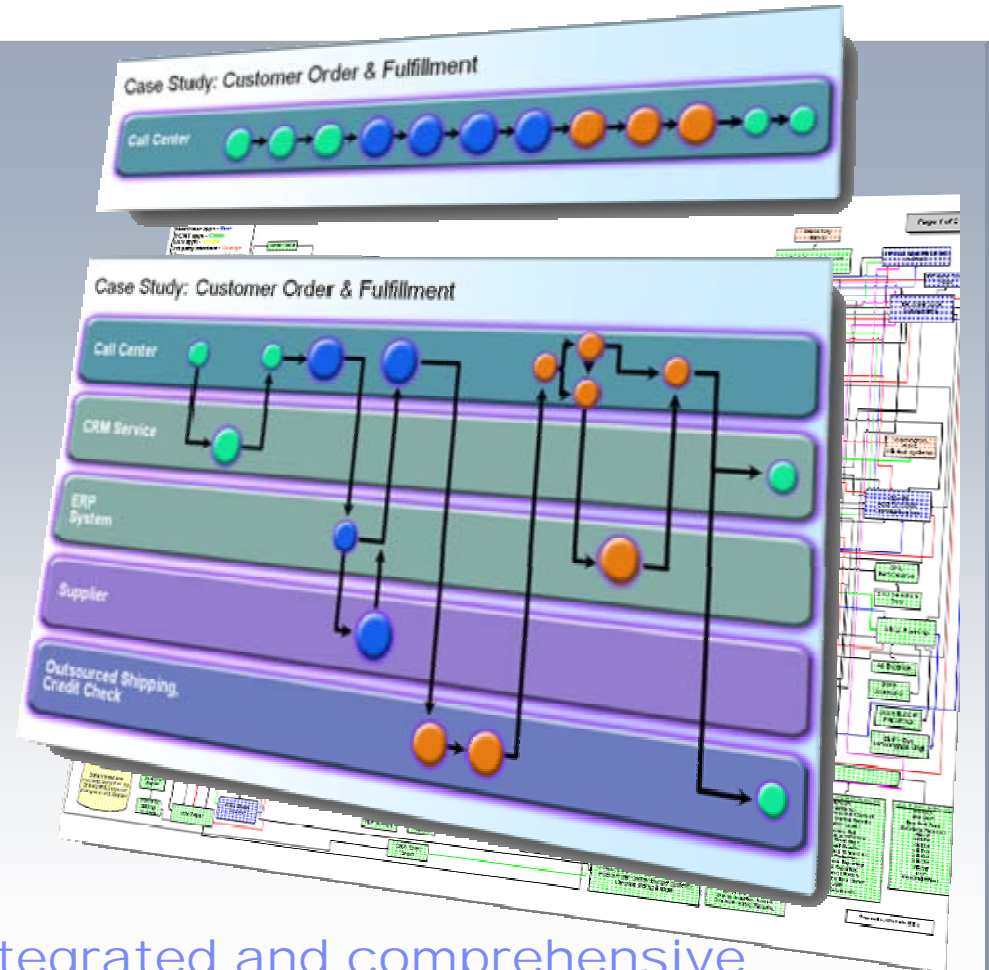
IT Dilemma: Managing Cost and Responsiveness Across IT Silos

Many Businesses Struggle to Manage Composite Applications

| Desktop Experts and Tools | Network Experts and Tools | Application Experts and Tools | Database Experts and Tools | Server Experts and Tools | Mainframe Experts and Tools | Storage Experts and Tools |

Availability Management

Change Management

Service Level Management

Security Management

Information Lifecycle Management

Release Management

Labor Cost

www

Sense   **Isolate**   **Diagnose**   **Take Action**   **Evaluate**   **Time**

IT Service Management is the Optimal Intersection of People, Process, Information and Technology

Desktop Experts and Tools	Network Experts and Tools	Application Experts and Tools	Database Experts and Tools	Server Experts and Tools	Mainframe Experts and Tools	Storage Experts and Tools

Management topics (left column)

- Availability Management
- Change Management
- Service Level Management
- Security Management
- Information Lifecycle Management
- Release Management

Technology
- Integrated
- Virtualized
- Role Based

People
- Interconnected
- Productive

Information
- Standardized
- Federated
- Secure

Processes
- Based on Best Practices
- Automated
- Customizable

Diagram center: IT Service Management — surrounded by Technology, People, Process, Information

Effective and Efficient Delivery of IT Services in Support of Business Goals

Defining Service Oriented Architecture
Different Things to Different People

Roles

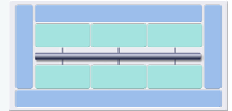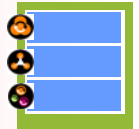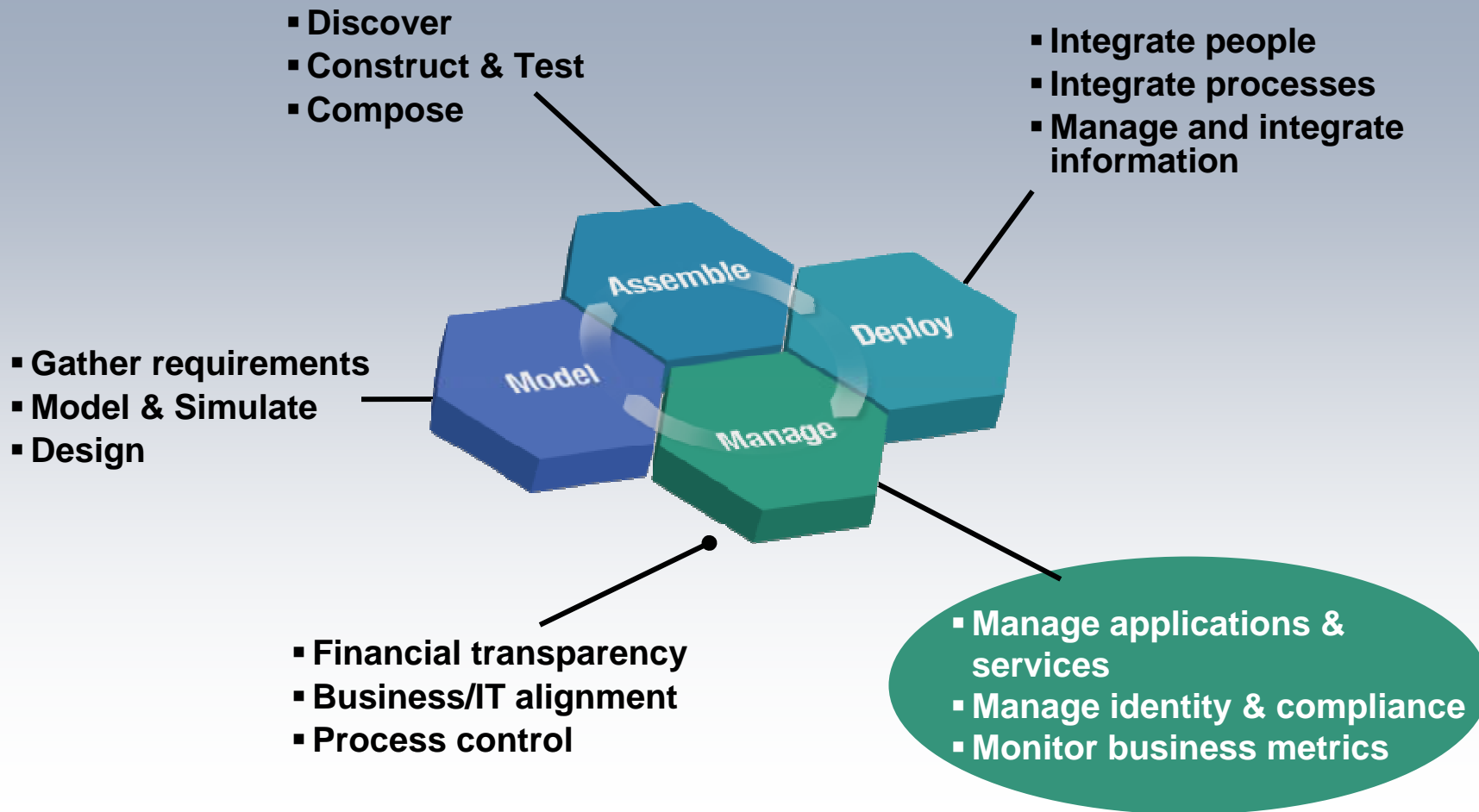|	
A *model of the business* that is based on services as the base functional component	**Business**
An *architectural style* which requires a service provider, requestor and a service description. It addresses characteristics such as loose coupling, reuse and simple and composite implementations.	**Architecture**
A *programming model* complete with standards, tools, methods and technologies such as Web services	**Implementation**
A *set of agreements* that specify quality of service and drive key business and IT metrics.	**Operations**

SOA Operating Environment for Composite Applications

- **Discover**
- **Construct & Test**
- **Compose**

- **Integrate people**
- **Integrate processes**
- **Manage and integrate information**

- **Gather requirements**
- **Model & Simulate**
- **Design**

Assemble

Deploy

Model

Manage

- **Financial transparency**
- **Business/IT alignment**
- **Process control**

- **Manage applications & services**
- **Manage identity & compliance**
- **Monitor business metrics**

The SOA Management Challenge:
Treat Services as Managed Resources

- A Service Oriented Architecture (SOA) is an architectural style of building applications based on Services

- Treat each Service endpoint (instance) as a manageable resource
    - It has a status and has performance characteristics (KPIs)
    - It has a Service Level associated with it
    - It can be deployed and configured
    - It can be versioned and deprecated
    - It can be monitored and managed
    - It can be secured

- Recognize "service" as a higher-level of abstraction than typical system resources
    - Demonstrate the relationships services have to the business process AND to the underlying IT infrastructure

- Need to manage the messages and their flow, as well as the IT infrastructure that is supporting the flow
    - Create, deploy and manage mediations based on policy (Operations, Business, Compliance)

SOA Exposes New Management Pains in Application Lifecycle

Model	Assemble	Deploy	Manage

"I need a service - what are its characteristics?"

"Some of our services are used by our partners? How can I be sure they are meeting their SLAs?"

"How can I debug my production application without reproducing the problem?"

"Before I deploy it in production, how can I be sure that the service flow matches the design?"

"Which part of the SOA infrastructure is causing this service problem? The app server or the messaging connections?"

"I now have to write a service – how do I make sure it works securely with other services I'm dependent on?"

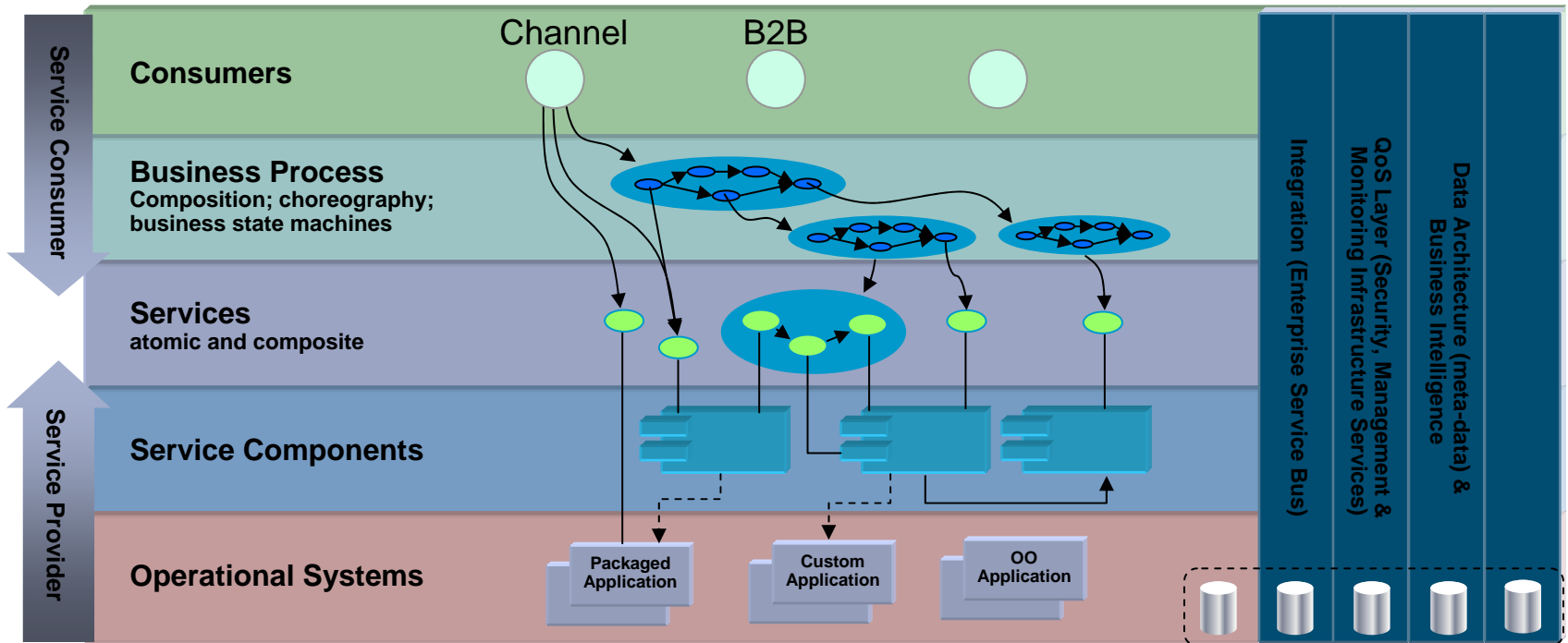"Does my new SOA application meet it performance goals?"

"What's the root-cause of this service problem – the BPEL service flow or the application?"
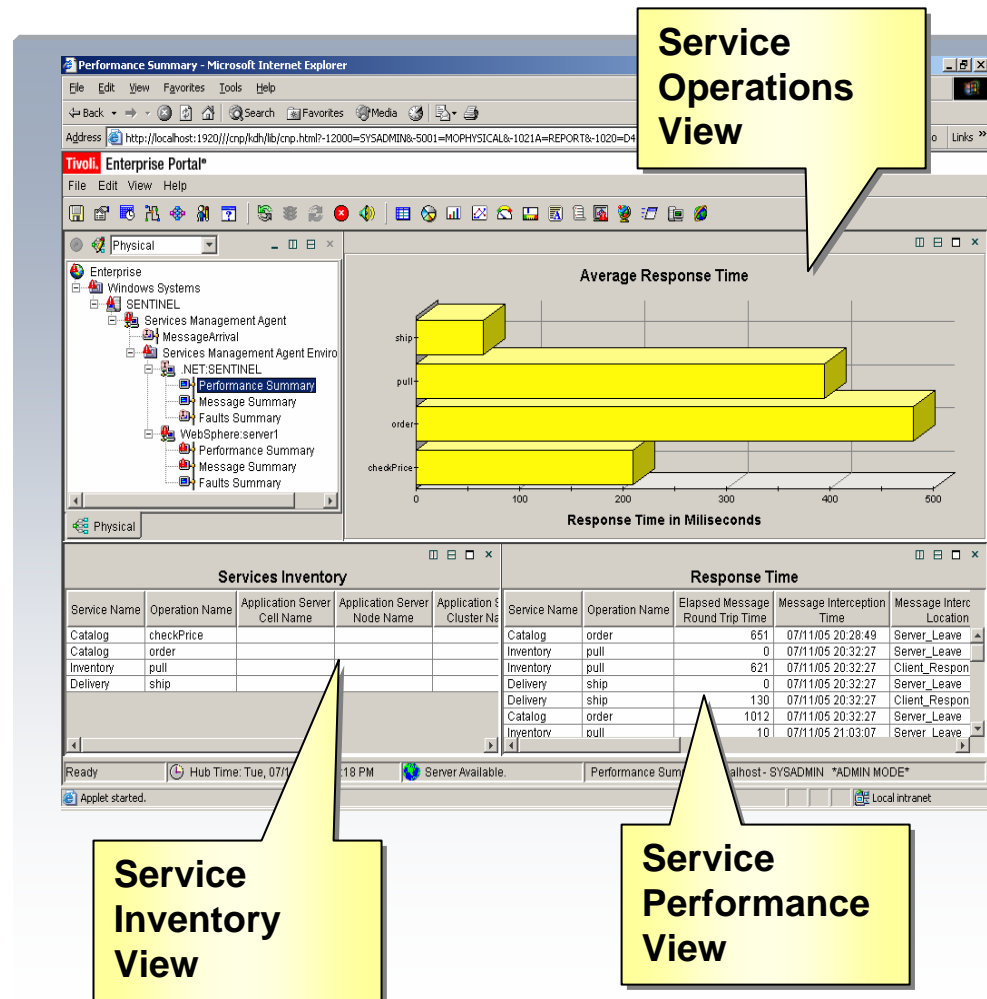
SOA Solution Abstraction Layering
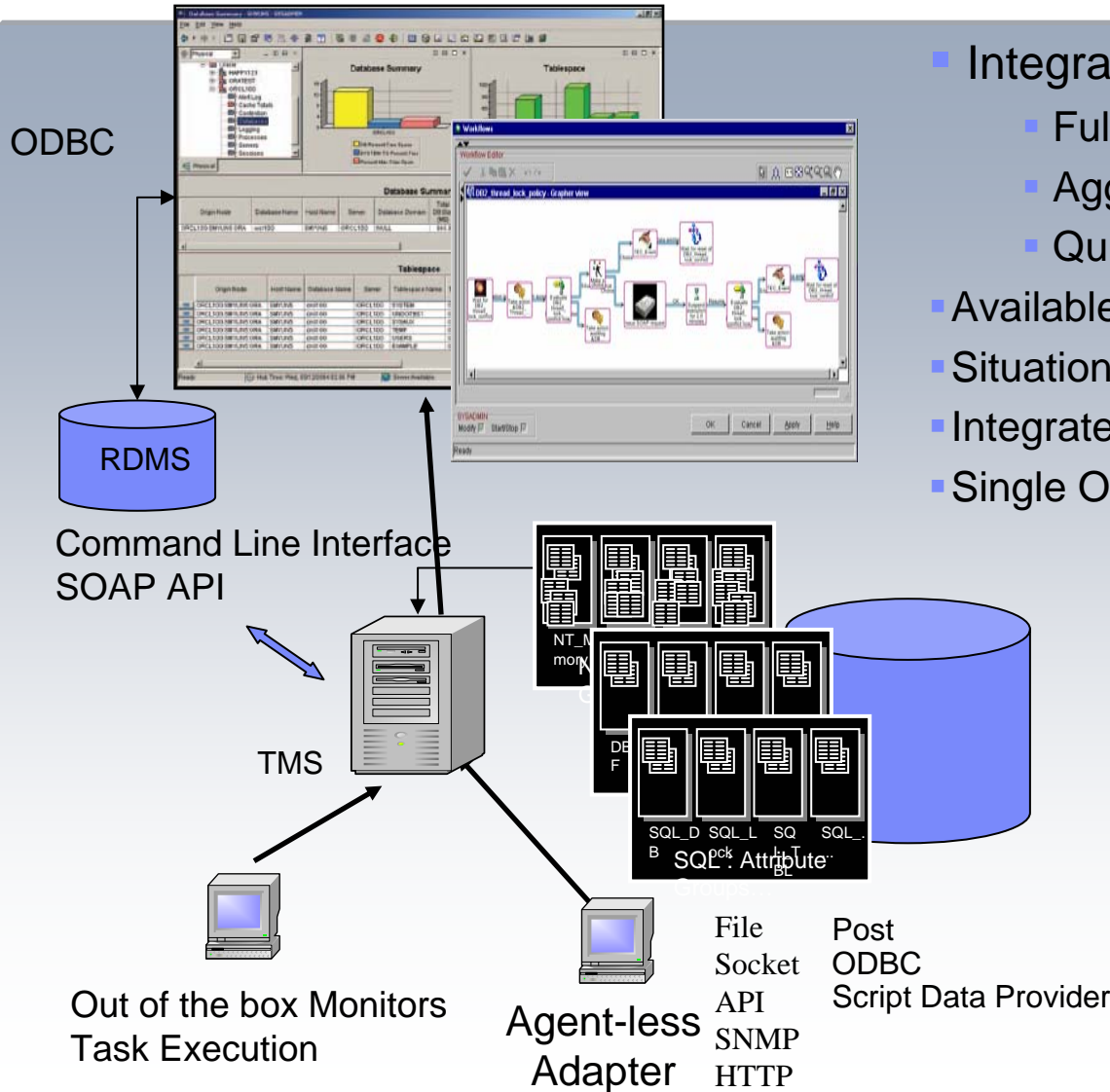## *Leveraging the SOA Reference Architecture*

ITCAM for SOA 6.0

- **Service problem identification and resolution**
  - ▸ Content-rich views and cross-workspace linkages enable drill-down from services to application components and IT resources to identify the source of bottleneck or failure

- **Service Management Automation**
  - ▸ Built-in and extensible alerts, situations and workflows enable powerful automation scenarios

- **Heterogeneous SOA Platform Support**
  - ▸ SOA Platform support covers IBM WebSphere family (including zSeries), WebSphere DataPower, WebSphere ESB and Process Server , Microsoft .NET and BEA WebLogic

- **Integrated Console**
  - ▸ Service views, alerts and automation included within Tivoli Enterprise Portal, the integration point for CAM, OMEGAMON and ITM

- **Life-cycle Management**
  - ▸ Web Services Navigator provides deep understanding of service flows and relationships to developers and architects using operational data from Tivoli Data Warehouse

Service Operations View

Service Inventory View

Service Performance View

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Tivoli Enterprise Portal – More than Visualization

ODBC

RDMS

Command Line Interface
SOAP API

TMS

Out of the box Monitors
Task Execution

Agent-less
Adapter

File
Socket
API
SNMP
HTTP

Post
ODBC
Script Data Provider

SQL : Attribute
Groups…

- Integrated Warehouse
  - Full Operational Data
  - Aggregation and Pruning
  - Quick Setup
- Available Data Management:
- Situations, Workflows, Policies
- Integrated Run-book with Expert Advise
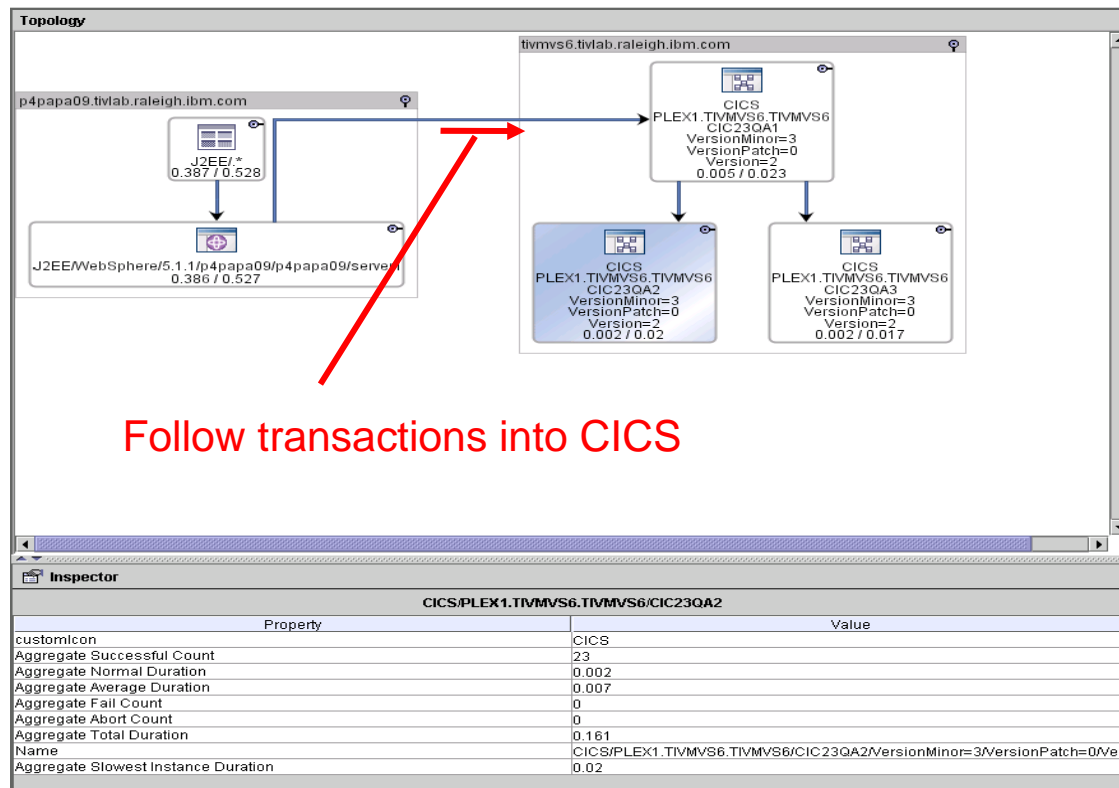- Single Operations Console with Workflow
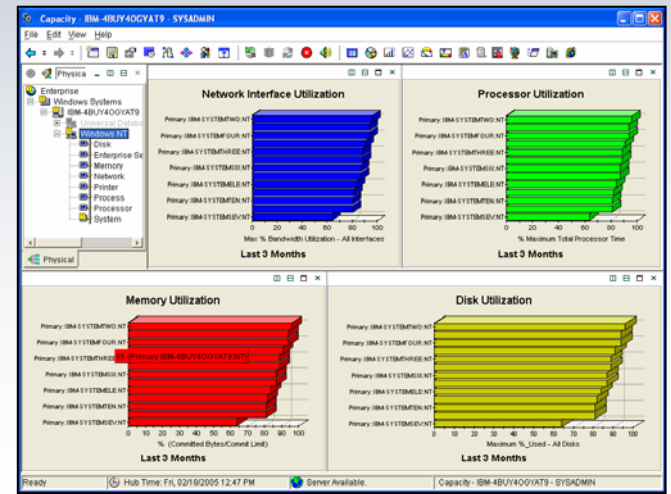
Track end-to-end Service Level Agreements thru System z

Problem

- "Customers are calling to complain about the response time for our online banking application and I can't find the cause of the problem"

Solution

- ITCAM for Response Time Tracking alerts you to ALL response time problems before customers call and isolates the problem automatically

Follow transactions into CICS

Property	Value
customIcon	CICS
Aggregate Successful Count	23
Aggregate Normal Duration	0.002
Aggregate Average Duration	0.007
Aggregate Fail Count	0
Aggregate Abort Count	0
Aggregate Total Duration	0.161
Name	CICS/PLEX1.TIVMVS6.TIVMVS6/CIC23QA2/VersionMinor=3/VersionPatch=0/Ver
Aggregate Slowest Instance Duration	0.02

Value

- ITCAM for Response Time Tracking enables you to meet service level commitments by alerting you to problems before SLAs are violated and quickly isolating problems to minimize outages

ITCAM for Response Time Tracking for System z

ITCAM for Response Time Tracking Provides

- **Awareness of customers response time experience**
  - ▸ Alert triggered when end user performance is degraded
  - ▸ Continually verifies that transactions are available and performing by comparing to response time threshold

- **Ability to see transaction paths to speed problem isolation**
  - ▸ Visualize the transaction as it crosses the enterprise
  - ▸ Automatically pinpoint source of bottlenecks

- **Time to value improvement through automated learning**
  - ▸ Auto discovery of transaction flows
  - ▸ Auto base-lining by learning production response times

- **Validation of end user service level delivery**
  - ▸ Consistently test services and measure their response
  - ▸ Report results against committed service levels

Highlights

- CICS and IMS transaction tracking

- Client Application Tracker (CAT)

- "Rich Context" Events based on Root Cause Analysis

- Extensive TEP workspaces

- Rational Performance Test and RAD Integration

- Role-based security

- Continuous/High Availability with WebSphere cluster support

Quickly Analyze WebSphere Problems on System z

Problem

- "The billing application slows down and then hangs intermittently. I don't know where to begin to look at what cause the problem!"

Solution

- ITCAM for WebSphere provides comprehensive in-flight transaction display and can tell you the name of the hung class/method.

Value

- ITCAM for WebSphere can significantly improve the performance and availability of your web application by reducing problem identification and resolution time

IBM Tivoli Composite Application Manager for WebSphere for System z

ITCAM for WebSphere Provides

- **Root cause analysis to reduce application downtime / slow down**
  - ▸ Quick problem resolution across Portal, J2EE, CICS, and IMS
  - ▸ Highlights performance health and recent trends for WorkLoad Manager clients and servers
- **Automate IT processes such as alerting, reporting, and capacity planning**
  - ▸ Provide First Failure Data Capture using traps based upon correlating multiple metrics across resources
  - ▸ Automated reporting functions that trend, decompose, compare and correlate transaction data
- **Improve IT Operation Efficiency via scalability and extensive integration**
  - ▸ Manage hundreds of JVM on a single mgt. server
  - ▸ Contextually integrate with ITCAM for RTT
  - ▸ Deliver run-time performance data to Rational Performance Tester

Highlights

- Tivoli Enterprise Portal (TEP) integration
- Pre-configured workspaces
- Rational integration to provide application trace data to developers
- Role-based GUI's for multiple IT personae
- New metrics and reporting for WebSphere Portal Server
- Automatic deployment of UDB DB2 and WebSphere infrastructure components

Resolve Messaging Issues on System z

Problem

- "I have MQ Channels that are supposed to be active 24X7. Occasionally, these channels go down and I don't know when and why this happens."

Solution

- IBM Tivoli OMEGAMON XE for WBI will detect when the channel goes down and alert an operator. The operator can then restart the channel. In most cases, this channel restart can be performed automatically, informing the operator that there was a problem and it has been resolved.
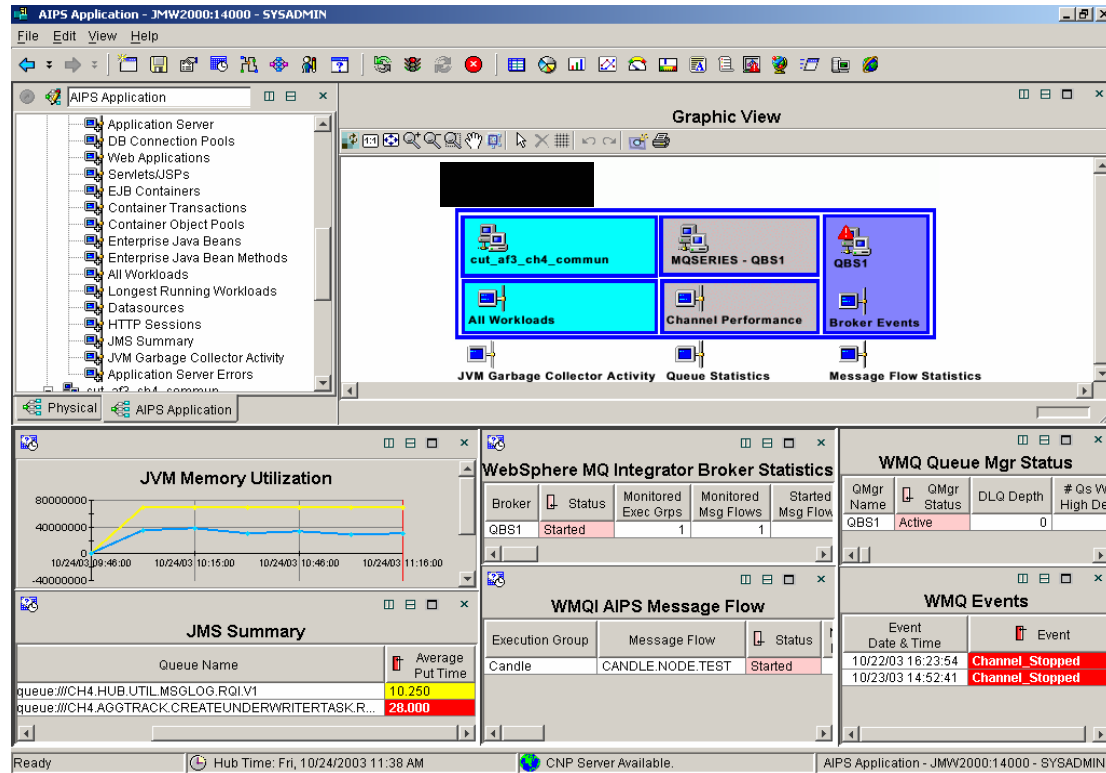
Value

- IBM Tivoli OMEGAMON XE for WBI will detect and repair a transactions problem before it impacts your business applications

IBM Tivoli OMEGAMON XE for WebSphere Business Integration

IBM Tivoli OMEGAMON XE for WBI provides

- **Ensuring the reliability and availability of WebSphere MQ, Message Broker and InterChange Server**
  - Identify common problems and automating corrective actions
  - Auto-discovery and immediate monitoring
  - Allow the subject matter expert to drill-down to locate problem, identify root cause and resolve bottlenecks

- **Proactive Prevention of MQ Problems**
  - Verify All WebSphere MQ object definitions and configurations prior to deployment
  - Detect and repair WMQ, Message Broker and WICS problems as they happen
  - Provide key WebSphere MQ and Message Broker metrics for real-time and historical data analysis

- **Management and Configuration using the Tivoli Enterprise Portal**
  - Single console management across MQ components
  - Create user-customized, role based displays including business views, platform views and resource views

Highlights

- One single product to manage WebSphere MQ, Message Broker and InterChange Server environments

- Expert Advice in an Alert - based on industry best practices or customizable to customer requirements

- Supports newest releases of WebSphere MQ V6.0 and InterChange Server V4.3

IBM Tivoli Monitored Components
Ability to span your environment

Platforms	Databases	Applications	Business Integration	Web Infrastructure	Messaging & Collaboration
Unix	DB2	SAP MySAP.com	CICS	WebSphere (Z & Distributed)	Lotus Domino
Windows	Oracle	.NET	IMS	IIS	
Linux	SQL	**Citrix**	WebSphere MQ	iPlanet	
		VMware			Exchange
Z/OS	Sybase	Siebel eBusiness Applications	WebSphere MQ Integrator	Apache	
OS/400	Informix			WebLogic	

IBM Monitoring Engine (s)

A Comprehensive View of SOA Resources

Integrated Console
Seamless views across different layers of abstraction

Integrated Reporting
Enterprise-wide service level reporting