



IBM Software Group

Managing a Mainframe SOA Environment

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



ON DEMAND BUSINESS™

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



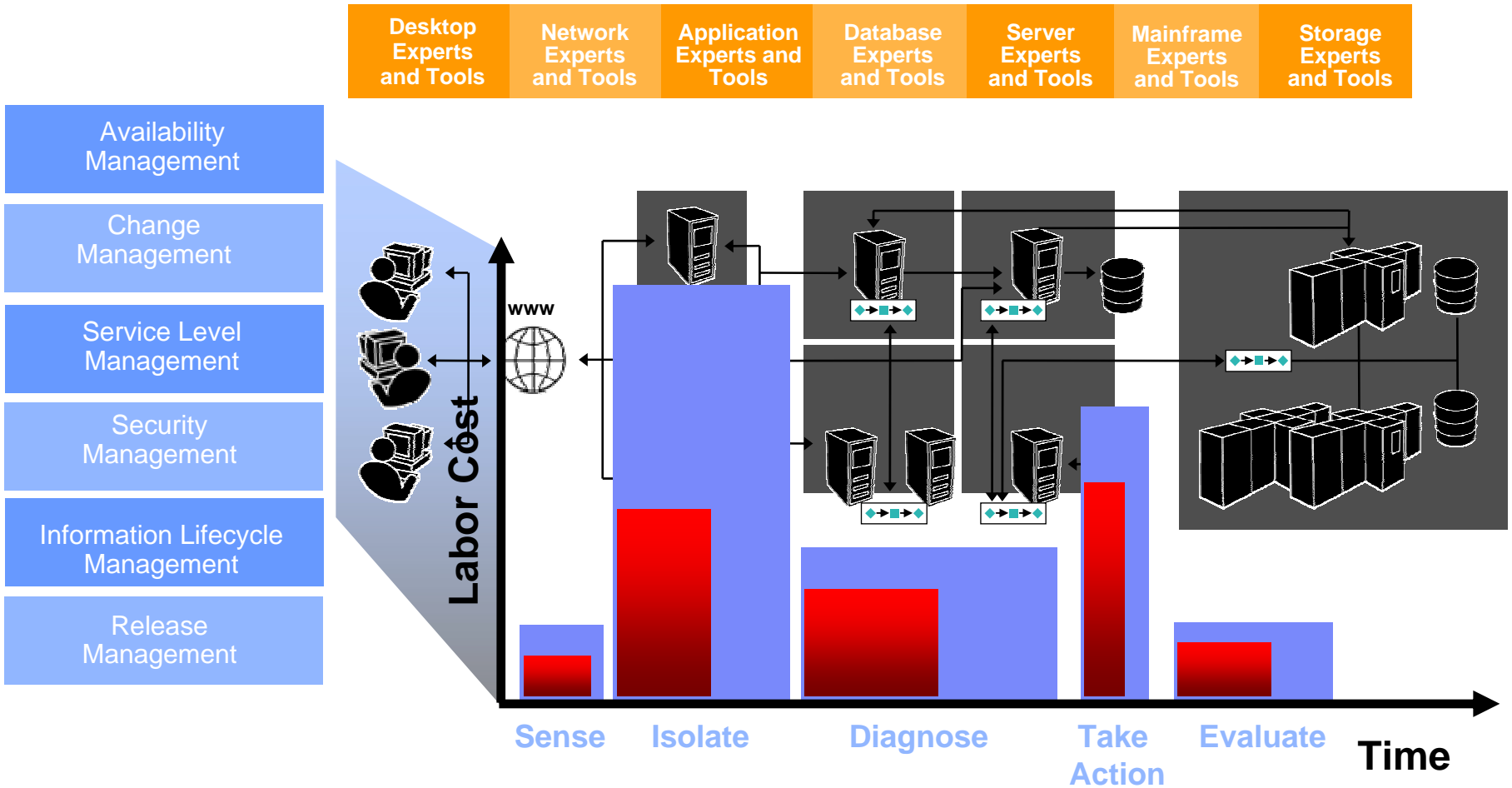
“We’re trying to resolve a huge morass of IT complexity, while demand for our services keeps going up. We’re getting hit from both sides. So what are we doing about it? We’re delivering an adaptive IT organization that provides services on demand to support the needs of the business.”

– George Surdu, Director, Global Information Technology Infrastructure, Ford Motor Company, September 2005

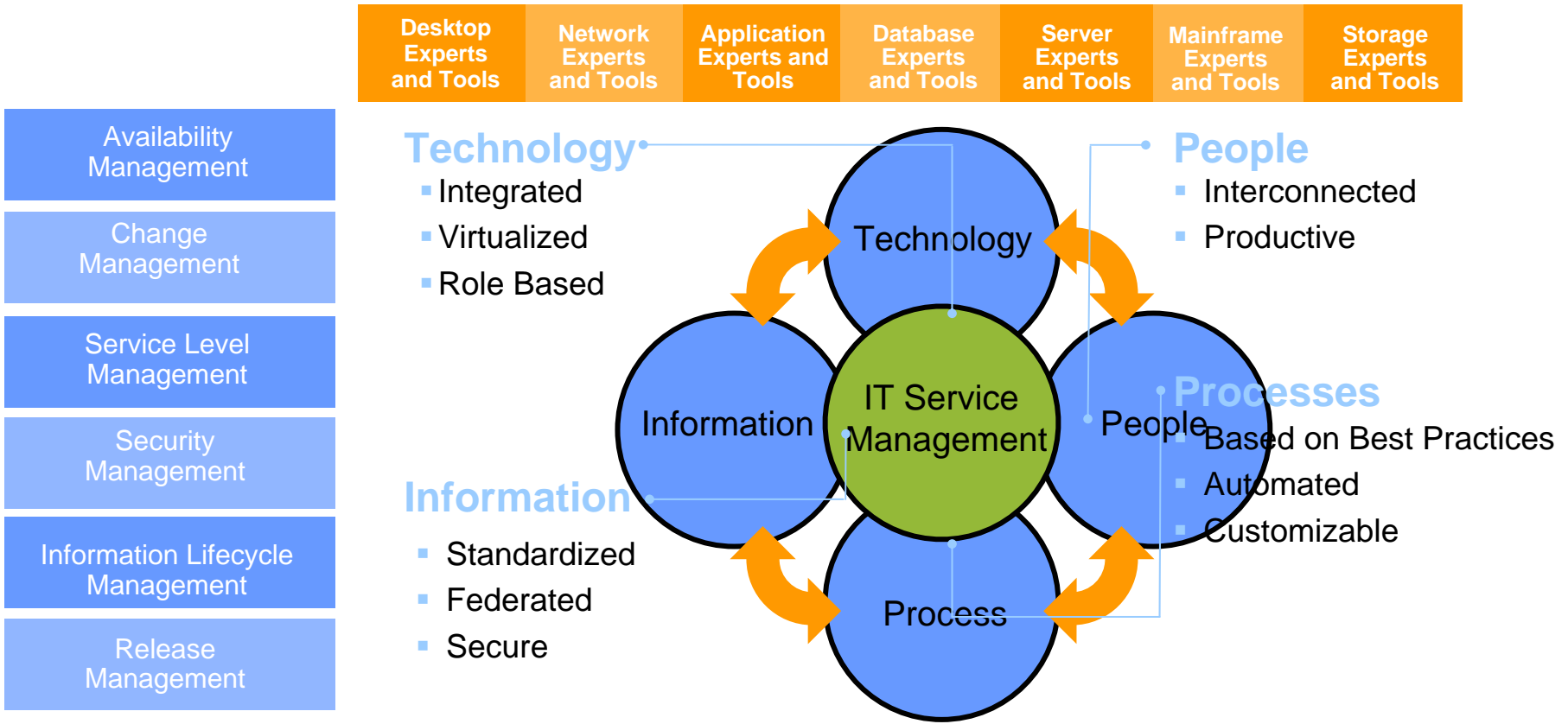


IT Dilemma: Managing Cost and Responsiveness Across IT Silos

Many Businesses Struggle to Manage Composite Applications



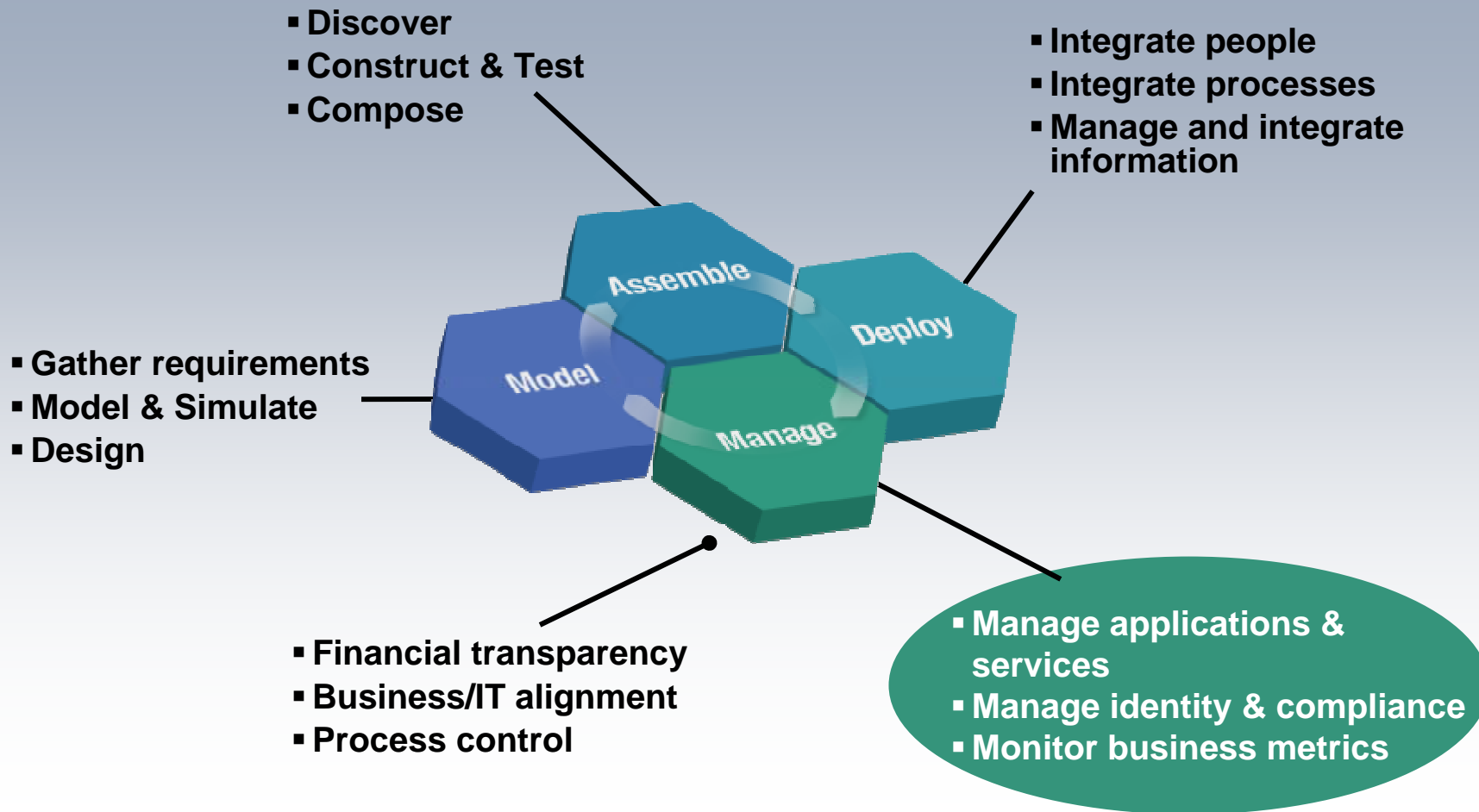
IT Service Management is the Optimal Intersection of People, Process, Information and Technology



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

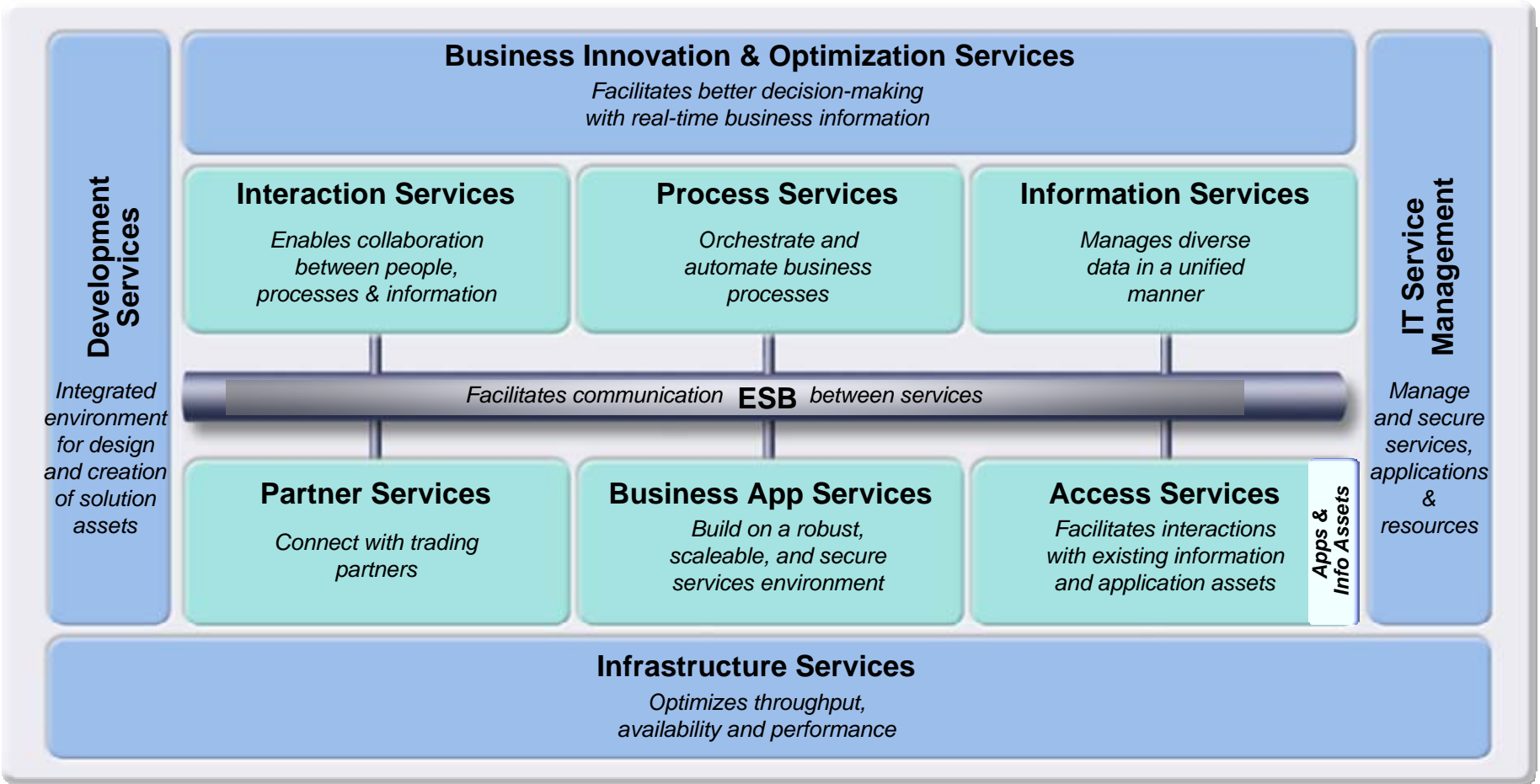


SOA Operating Environment for Composite Applications



SOA Reference Architecture

Supporting your SOA Lifecycle



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?”

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

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

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

“Does my new SOA application meet its performance goals?”

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

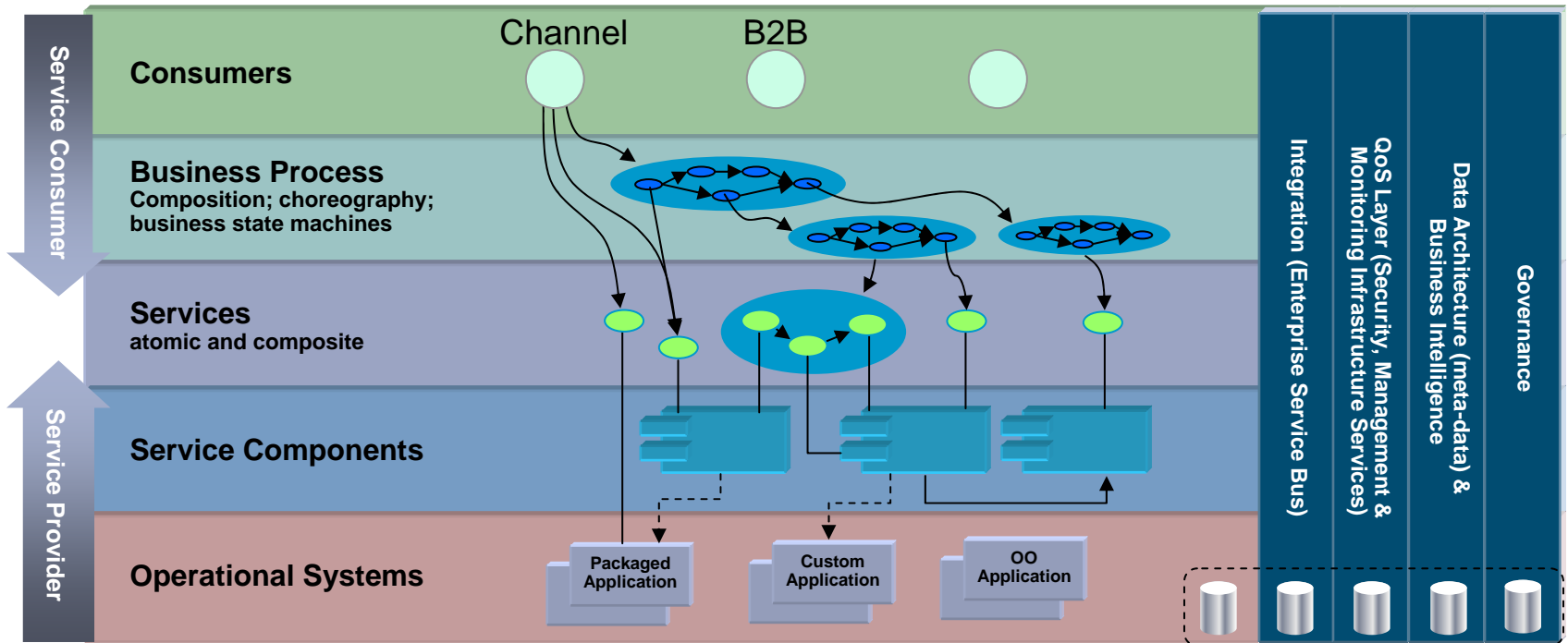
“Which part of the SOA infrastructure is causing this service problem? The app server or the messaging connections?”

“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



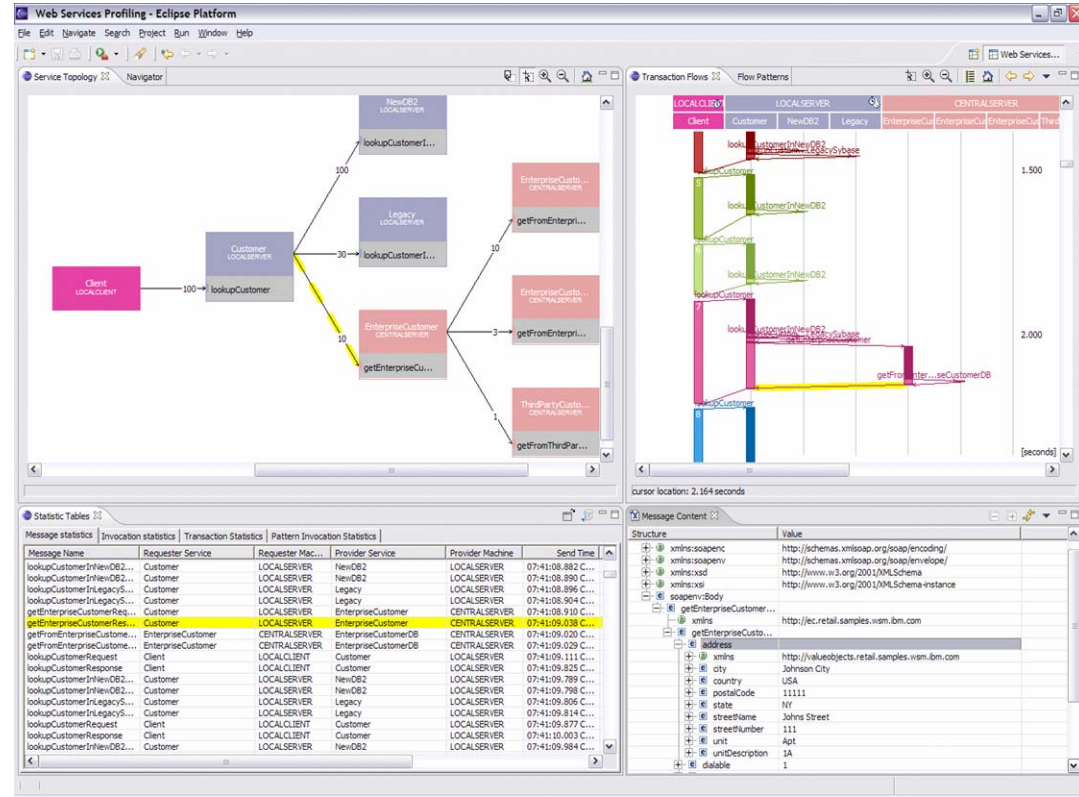
Improve Performance of WebSphere SOA Services on System z

Problem

- ITCAM for SOA shows that Web service response times occasionally exceed thresholds and some messages are exceptionally long.

Solution

- Further analysis with Web Services Navigator indicates one external user is sending over-length messages. ITCAM for SOA automation created to reject messages from the responsible user.



Value

- ITCAM for SOA enables users to protect their publicly accessible Web services from accidental or malicious misuse.



IBM Tivoli Composite Application Manager for SOA for System z

ITCAM for SOA Provides

▪ Automated service mediation

- ▶ Provide built-in and extensible alerts, situations and workflows. Users can create powerful automated mediation scenarios

▪ Service problem identification and resolution

- ▶ Provide content-rich views and inter-workspace linkages in the Tivoli Enterprise Portal, drill-down to IT resources enabling identification of Web service bottlenecks and failures

▪ Service flow diagnostics

- ▶ Use the Web Services Navigator to obtain understanding of service flows and relationships using operational data from the ITM Data Warehouse.

Highlights

- Automated Web service mediation
- Supports WebSphere Process Server
- Ships with Tivoli Enterprise Portal
- Drill-down into Rational tools to identify the cause of bottlenecks
- View Web service relationships, flows and patterns in Rational tools with the Web Services Navigator



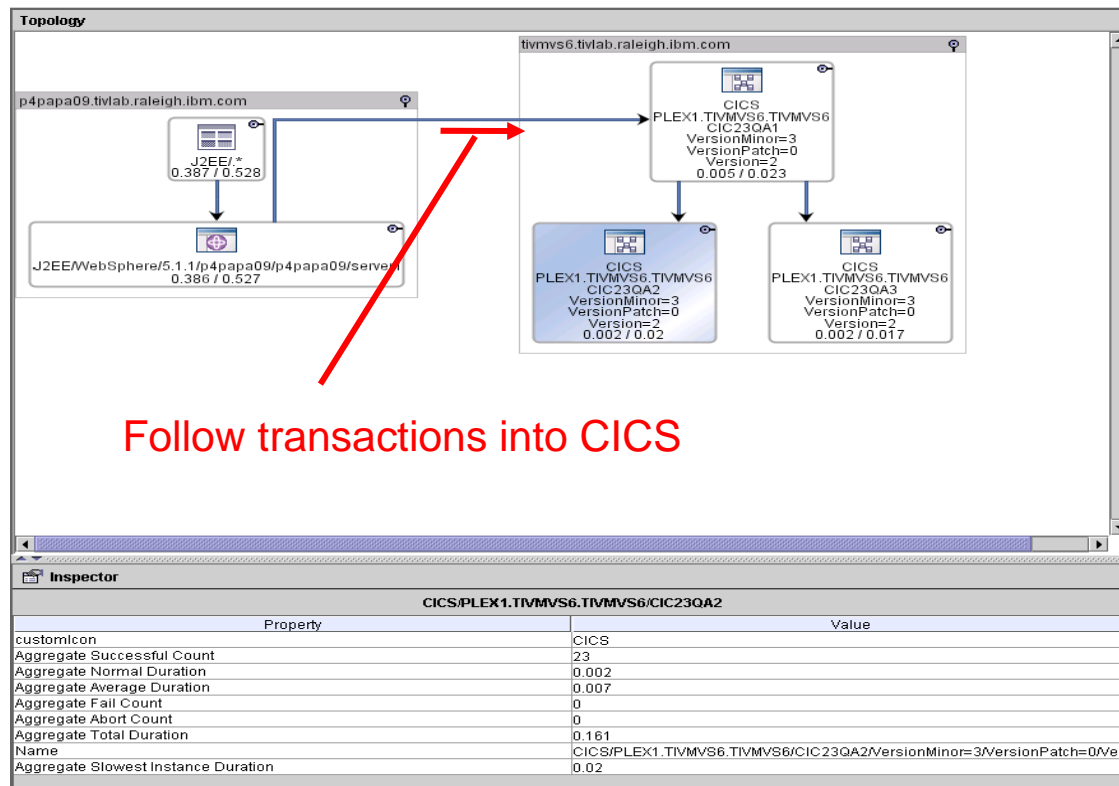
Track end-to-end Service Level Agreements thru System z

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



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.

MEMORY LEAK CANDIDATE FINDER REPORT
The Memory Leak Candidate Finder Report displays the heap comparison information for a selected server. Change the classes you monitor using the Classname Filter Options.

HEAP PROPERTIES

Property	Value	Property	Value
App Server	tiv0107.server1 (L1)	Heap 2 Snapshot	Jul 18, 2005 11:11:19 PM
Heap 1 Snapshot	Jul 18, 2005 10:54:37 PM	Size of Live Objects on Heap(MB)	67 (71071349 bytes)
Size of Live Objects on Heap(MB)	47 (49337628 bytes)	# of Objects in Heap	1135068
# of Objects in Heap	963699	GC	Yes
GC	Yes		

HEAP COMPARISON RESULTS TABLE

Class name	Original # of instances	Original Total size (kb)	Δ # of instances	Δ Total size (kb)
primitive[]	224200	31486	60449	19172
object[]	81514	4905	2268	331
com/candle/bestpractices/ro/OrderItem	0	0	330	10
com/candle/bestpractices/util/Memory	0	0	33	0
org/eclipse/emf/ecore/util/EOObjectContainmentWithInverseELis	967	26	3	0
org/eclipse/emf/ecore/util/EOObjectContainmentELis	2894	67	1	0
org/eclipse/emf/ecore/xmi/mpi/XMIResourceFactorympi	1	0	0	0

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



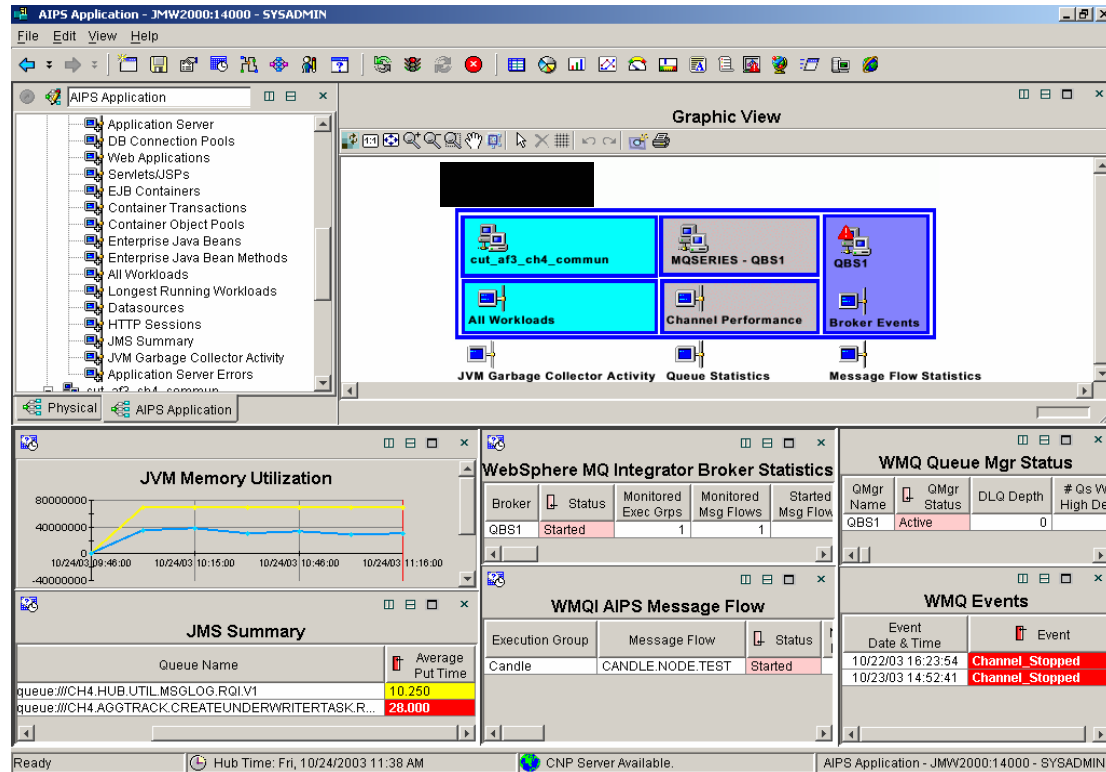
Resolve Messaging Issues on System z

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 Exchange
Windows	Oracle	.NET	IMS	IIS	
Linux	SQL	Citrix	WebSphere MQ	iPlanet	
Z/OS	Sybase	VMware	WebSphere MQ Integrator	Apache	
OS/400	Informix	Siebel eBusiness Applications		WebLogic	

IBM Monitoring Engine (s)



ITCAM: Integrated as part of a larger solution

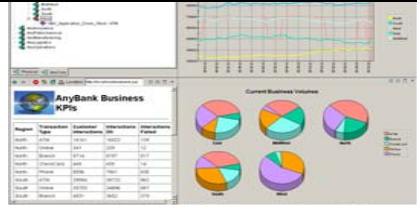
One view through one portal to monitor the overall health of the infrastructure.

The screenshot displays the Tivoli Enterprise Portal interface for 'AnyBank Business KPIs'. It features several components:

- Navigation Tree:** A tree view on the left showing a hierarchy from 'AnyCorp' down to 'AnyOperations'.
- Transaction History by Region:** A line chart showing transaction volume over time for five regions: North, South, West, East, and MidWest.
- AnyBank Business KPIs Table:** A table summarizing key performance indicators across different regions and transaction types.
- Current Business Volumes:** Five 3D pie charts showing the distribution of transaction types for each region.
- Physical View:** A section at the bottom left showing the physical infrastructure components.
- Background Diagrams:** On the left, a diagram shows 'Web Server' components. On the right, a diagram shows 'IBM Cryptographic Coprocessor' and 'UNIX Systems Services' connected to a database.

Region	Transaction Type	Customer Interactions	Interactions OK	Interactions Failed
North	ATM	16161	16022	139
North	Online	241	229	12
North	Branch	9714	8797	917
North	CheckCard	449	435	14
North	Phone	8596	7961	635
South	ATM	29584	28722	862
South	Online	25753	24896	857
South	Branch	4031	3652	379

Tivoli Enterprise Portal

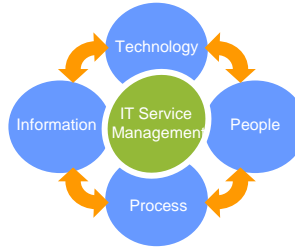


Our Answer To The Challenge

Leading-edge solutions to deliver high-performing SOA applications based upon a framework of best practices.

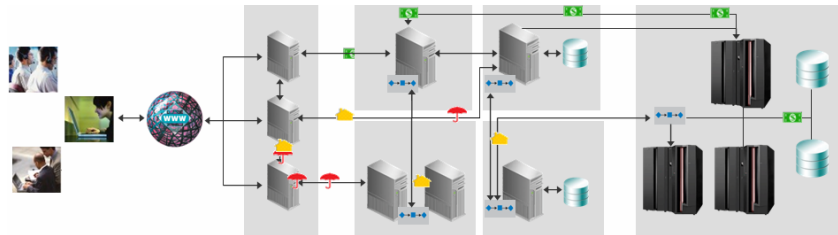
“Deliver Services Based Upon A Framework Of Best Practices”

ITSM
(Information Technology Services Management)



“Maintain High Performance and Availability In A Volatile Business Climate”

ITCAM
(IBM Tivoli Composite Application Management)



“Continuously Deliver New Functionality To Meet The Demands Of Business”

SWG Initiatives
(IT Lifecycle Management)
(SOA Foundation)

