



IBM Software Group

How to effectively manage an SOA architecture

Barry D. Lamkin
Consulting IT Specialist
blamkin@us.ibm.com

Tivoli software



@business on demand.

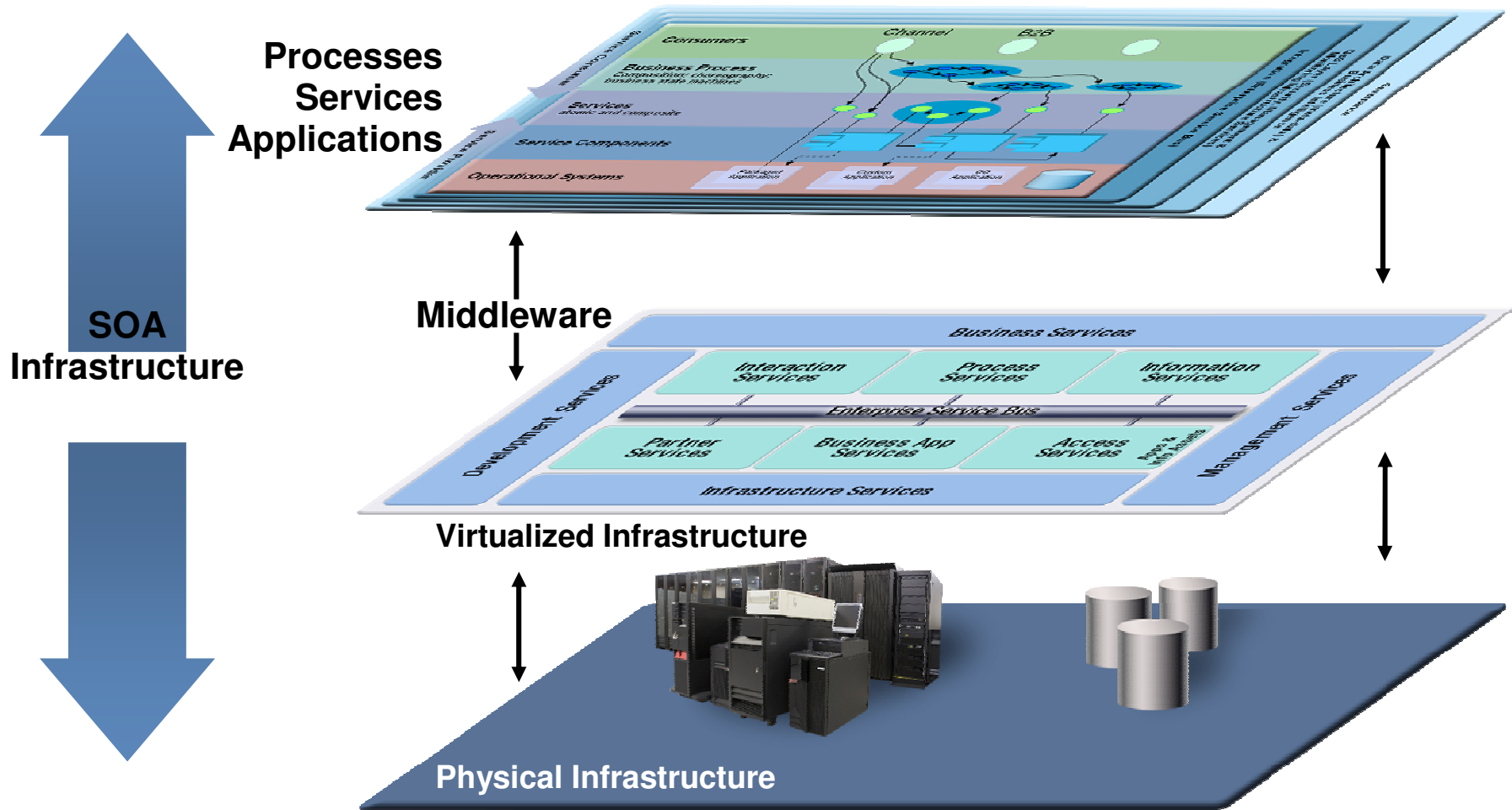
© 2008 IBM Corporation

Agenda

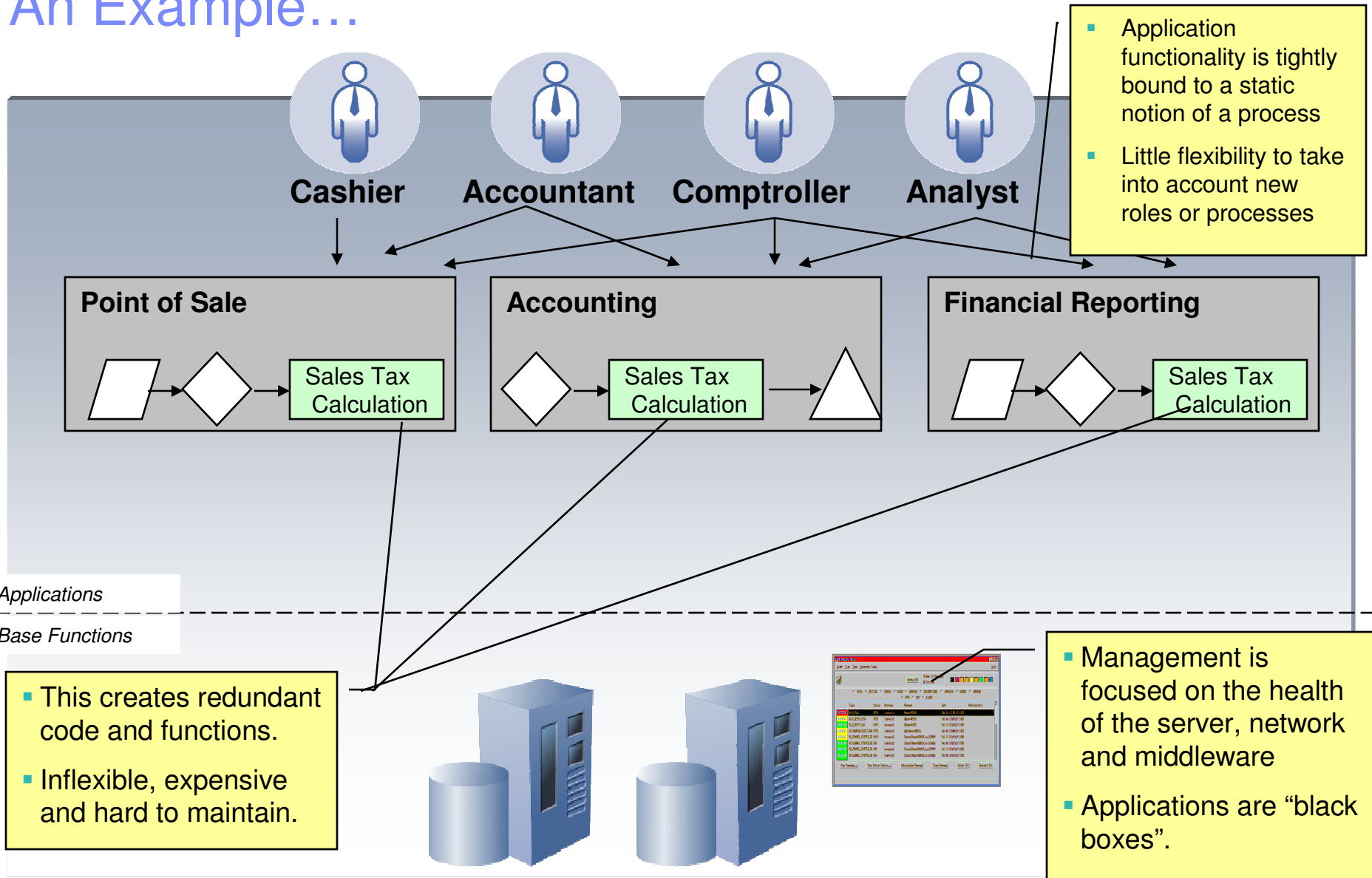
- SOA Management Challenge
- IBM Tivoli Composite Application Manager for SOA
 - ▶ Service problem identification & resolution
 - ▶ Service Management Automation
 - ▶ Heterogeneous SOA Platform Support
 - ▶ Integrated Console
 - ▶ Life-cycle Management
- Summary



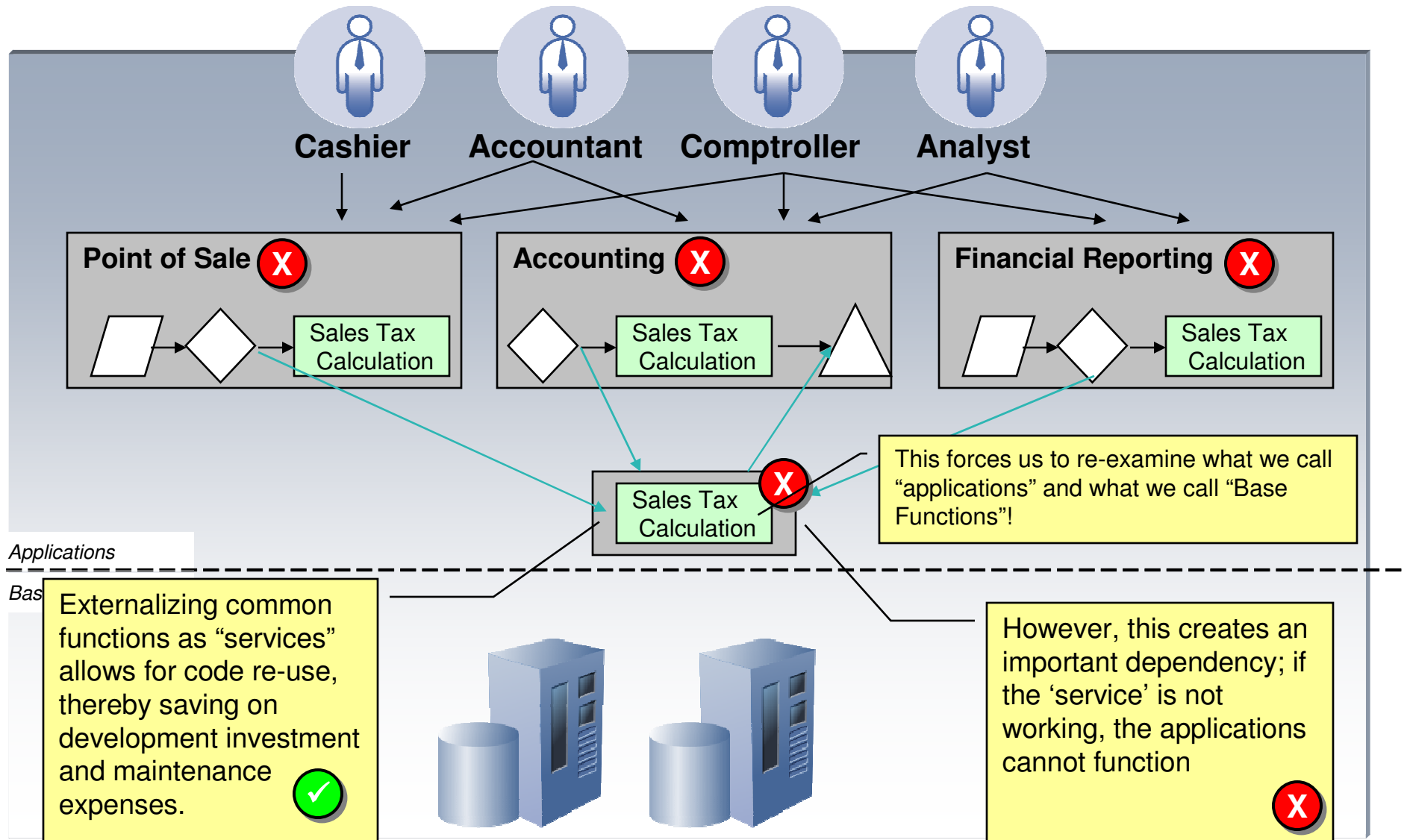
SOA and Layers of Abstraction



An Example...

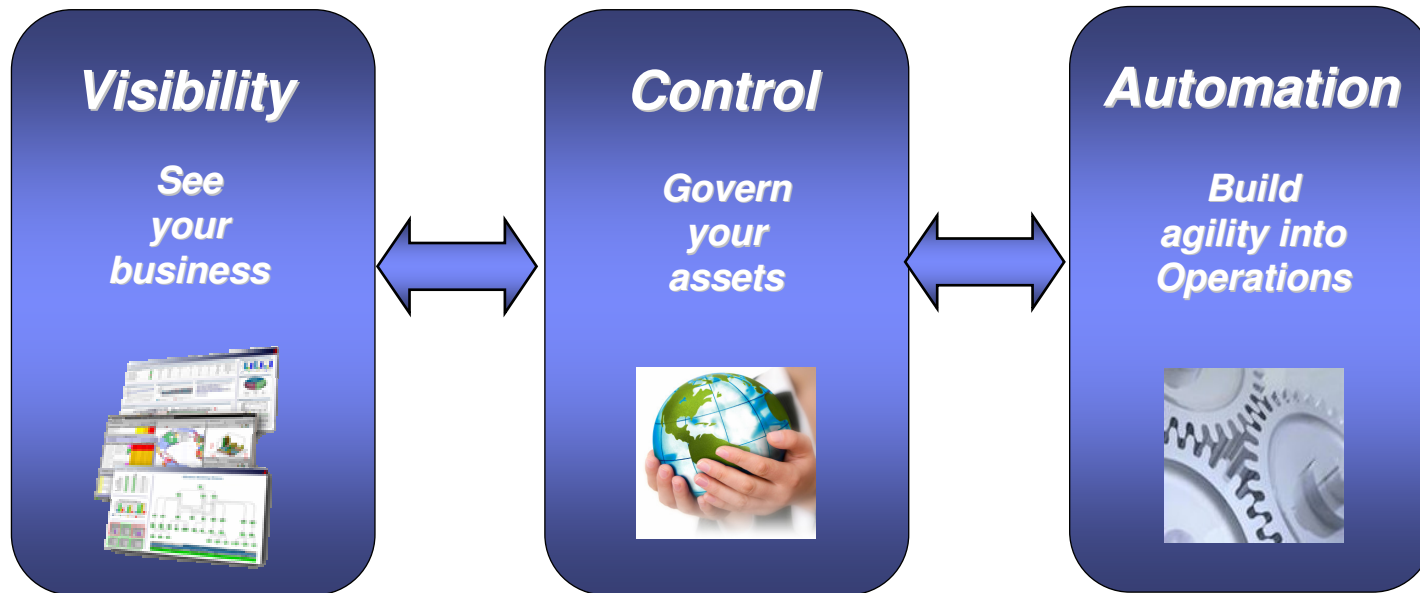


The New World: Composable Services



IBM Service Management (ISM)

An Integrated Approach to Getting Business Results



Only IBM delivers integrated visibility across Business & IT Audiences.

e.g. How is my business critical services doing?

Only IBM delivers integrated control across Business & IT Assets.

e.g. Control your service environment such as service providers, servers, infrastructure

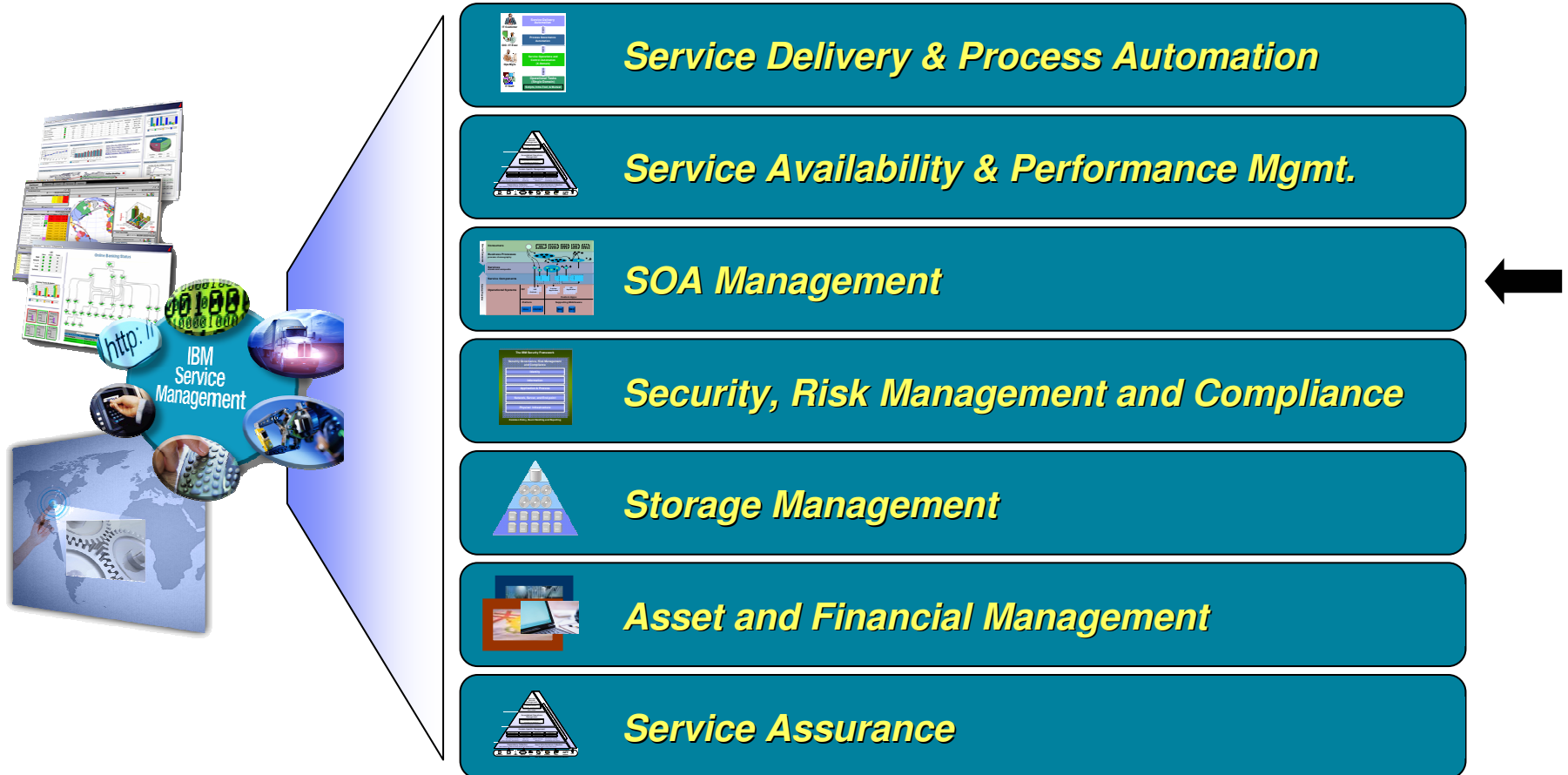
Only IBM delivers integrated automation across Business & IT Operations.

e.g. Monitor service environment, performance and take proactive actions

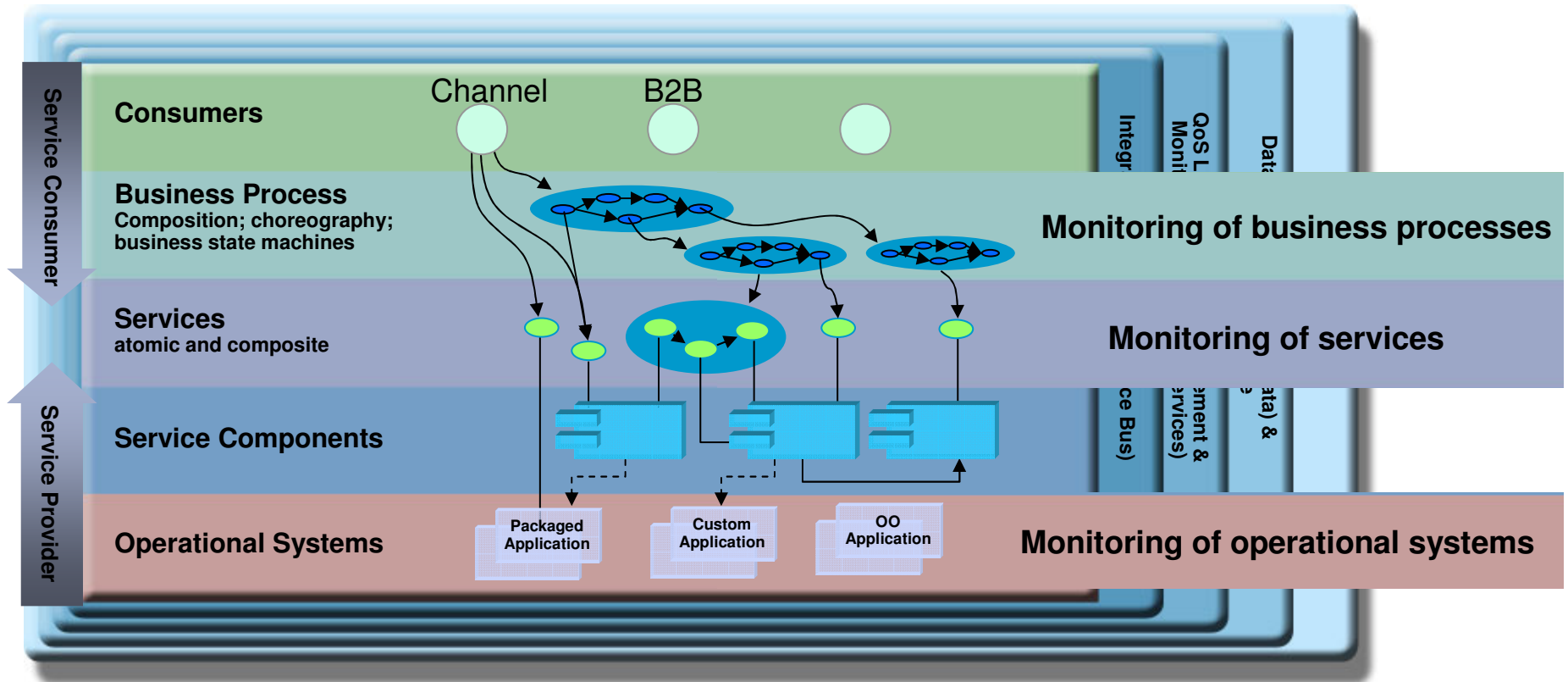


ISM - A Comprehensive Solution

- ISM is the industry's most comprehensive management solution, addressing all the critical needs of multiple audiences



The Challenges of Managing SOA

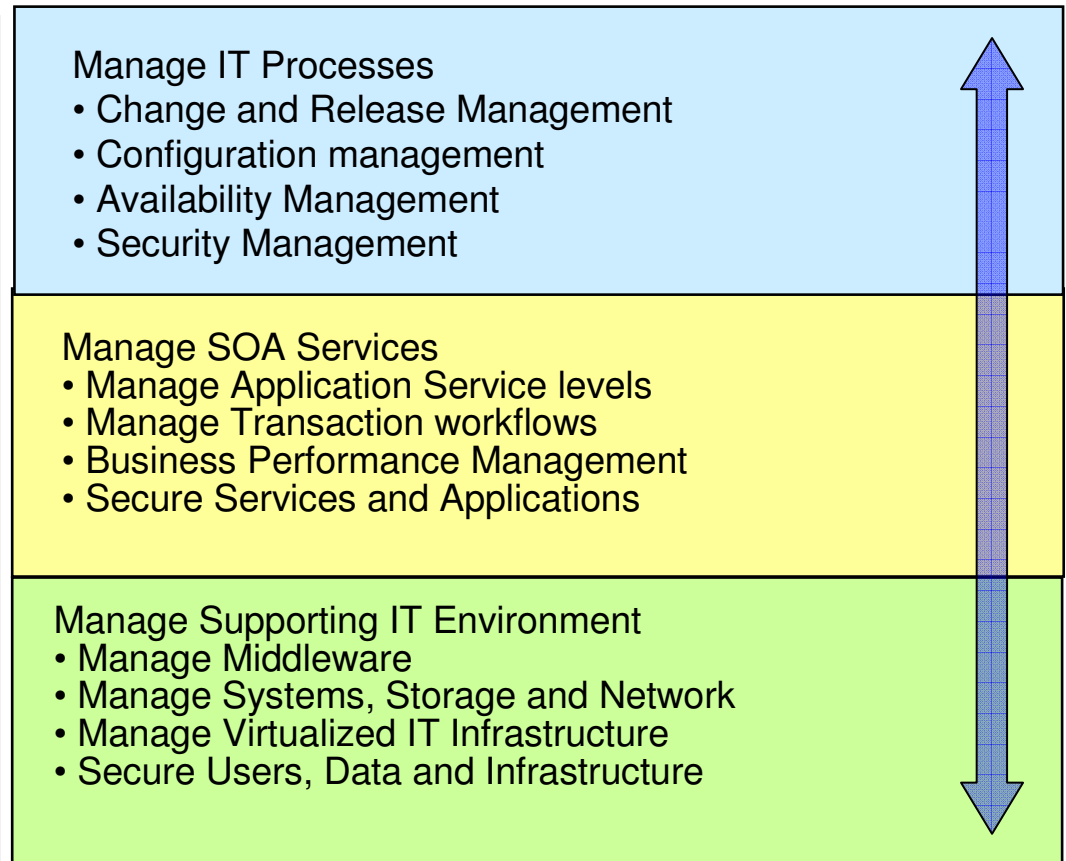


What is Management of SOA?

Common SOA Characteristics

- Applications reused in new dynamic ways
- Services combined from multiple sources
- Rapid deployment
- Services route to any available resource
- Distributed access

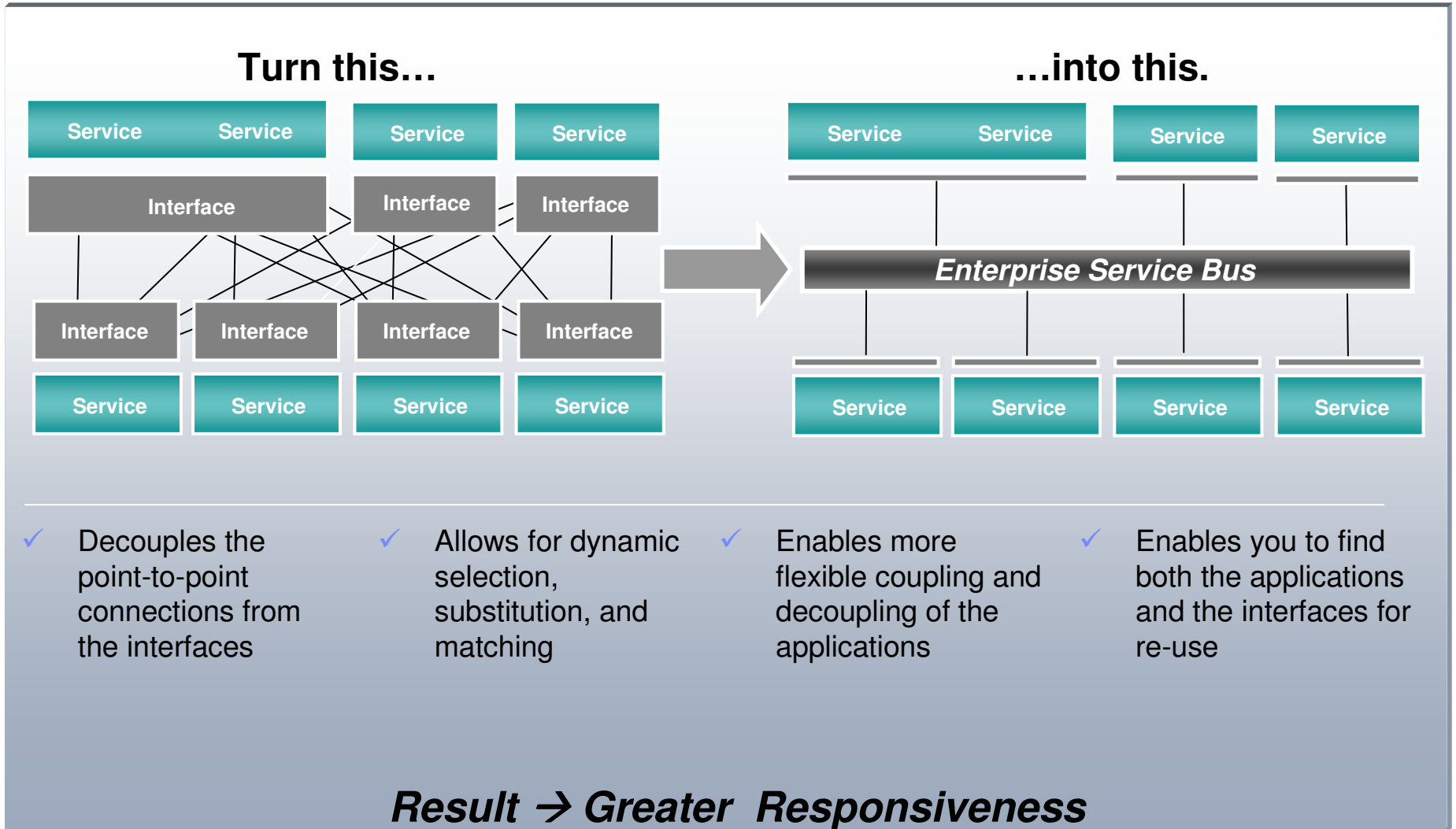
IBM Service Management of SOA



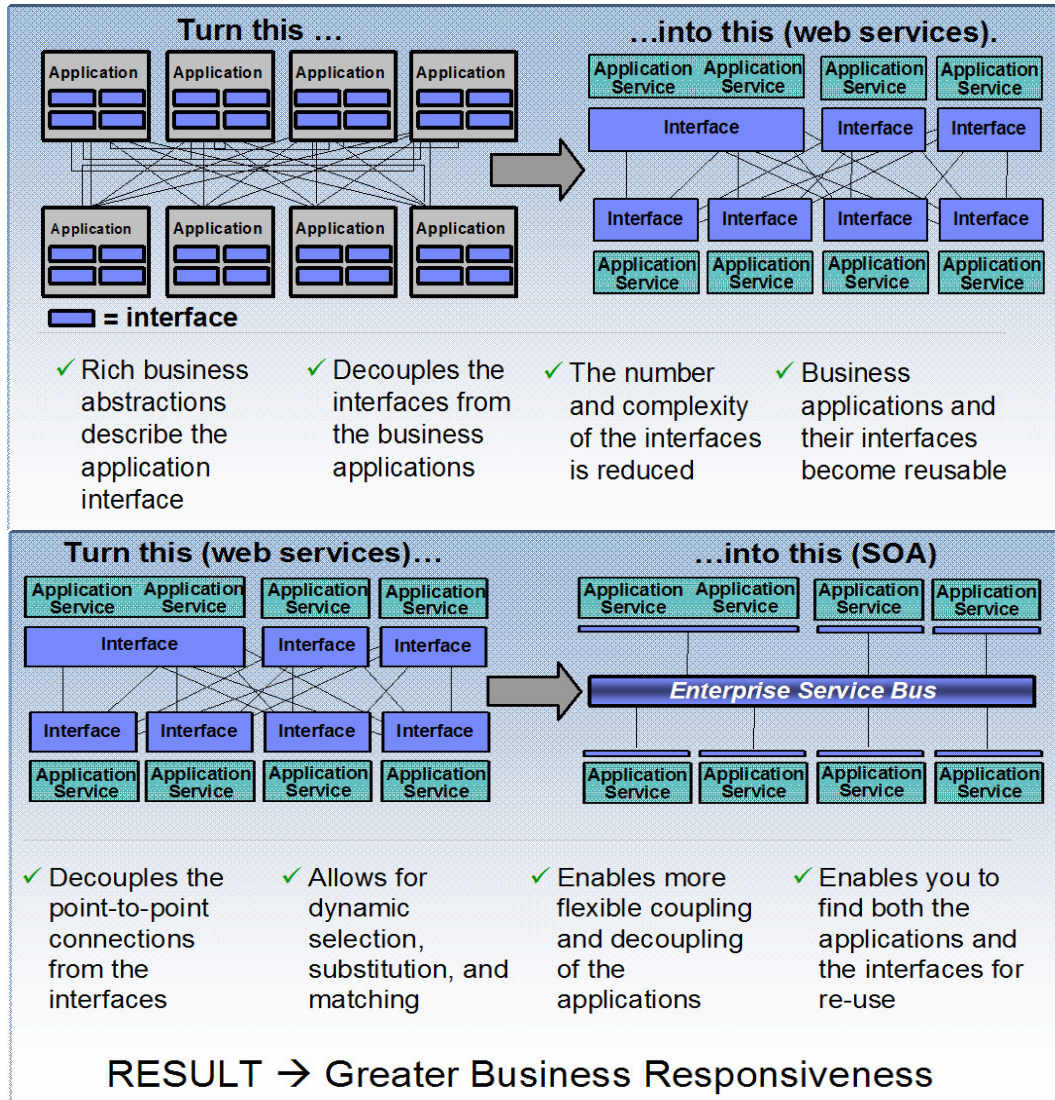
SOA Widens the Scope of Management



Loose Coupling is Enabled By an “ESB”



ESB and SOA Management



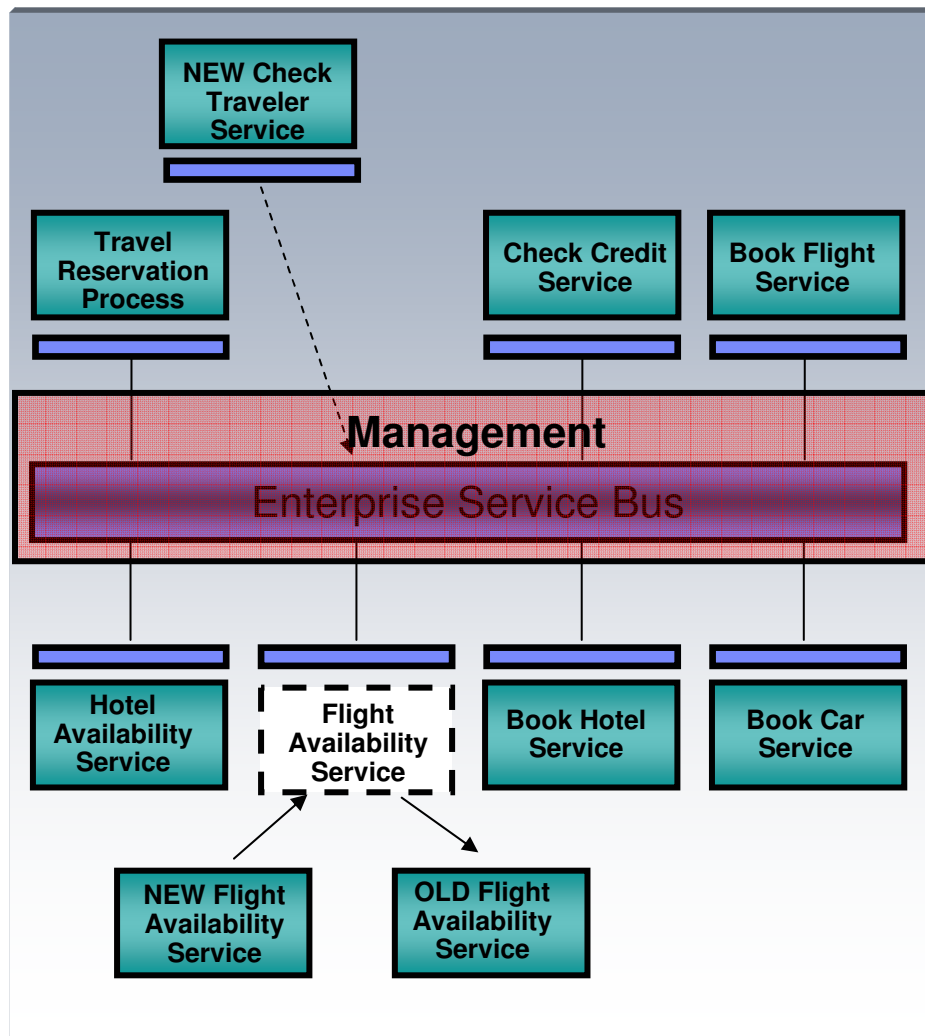
Phase 1: Use Web Services

- This is commonly referred to as JOBWS (just a bunch of web services)
- Many customers are at this stage
- Simple, developer-driven scenarios

Phase 2: Organize and control web services

- Next level of integration strategy
- Involvement of Enterprise Architecture
- More complex scenarios, involving development, architecture, Operations

ESB and SOA Management



Management tools naturally target ESBs as enforcement endpoints:

- To perform **ROUTING** of messages based on system capacity, Quality of Service, and SLAs
- Leverage **CONVERSION** and **TRANSFORMATION** capabilities to comply with policy
- Centralize **HANDLING** of IT events related to Services

Service Oriented Application Problems and Challenges

- **Typical application management problems**
 - ▶ My users are complaining – **Response / Performance**
 - ▶ My critical application is down - **Availability**
 - ▶ Spike in number of users - **Capacity / Resource Usage**
 - ▶ Slow or Hung application – **Need for Diagnostic Data – Real Time and Historical**
 - ▶ Increased involvement of SME/Development affect new product development? – **Problem Monitoring and Automation**
- **New application environment - New challenges**
 - ▶ I want to extend and leverage SOA – **SOA Management Challenges**
- **Application life cycle**
 - ▶ Lack of IT Operations and Development communications – **Bridging IT Operations and Development**
 - ▶ I want more control on how my application runs in production – **Build for manageability**



What to monitor in an application environment

- **Response Times**
 - ▶ End user and transaction times
 - ▶ Service response in an SOA
- **Resources** that affect performance
 - ▶ System resources
 - ▶ Application environment resources
 - ▶ Application resources
- On demand collection of **diagnostic data** when required
- **Historical** monitoring of data collection for trend analysis and reporting
- **Actionable** metrics for creating performance and availability management automation



What is ITCAM?

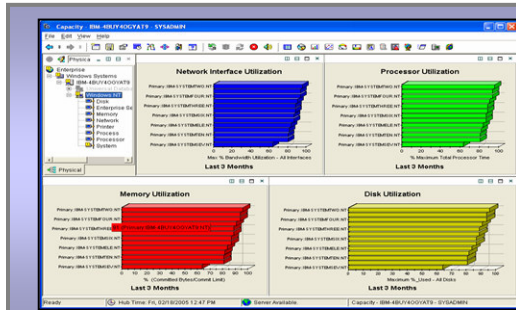
- ITCAM – **IBM Tivoli Composite Application Manager** family of products helps monitor and manage applications in various application environments on a wide variety of platforms – from distributed to zOS.

- ITCAM suite consists of
 - ▶ ITCAM for Response Time (RT) and Response Time Tracking (RTT)
 - ▶ ITCAM for SOA
 - ▶ ITCAM for WebSphere / J2EE / Web Resources
 - ▶ OMEGAMON XE for Messaging

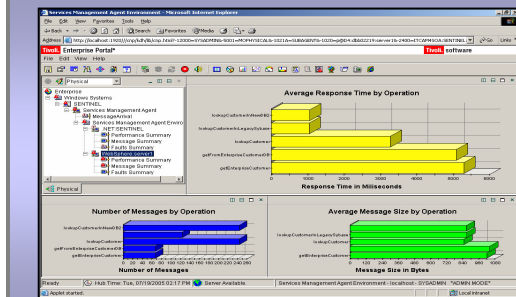
- They integrate seamlessly with the enterprise monitoring infrastructure - **IBM Tivoli Monitoring (ITM) / OMEGAMON / Tivoli Enterprise Portal (TEP)** which provides a single view across all enterprise managed systems and application environment



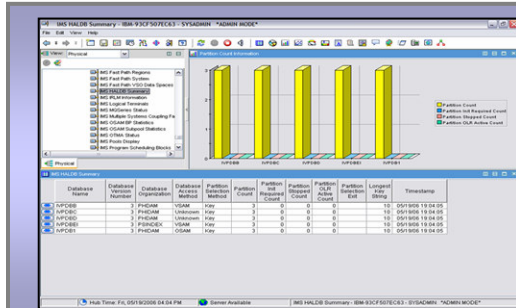
ITCAM – Application Management Family



ITM



ITCAM

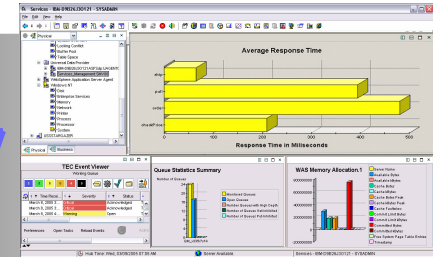
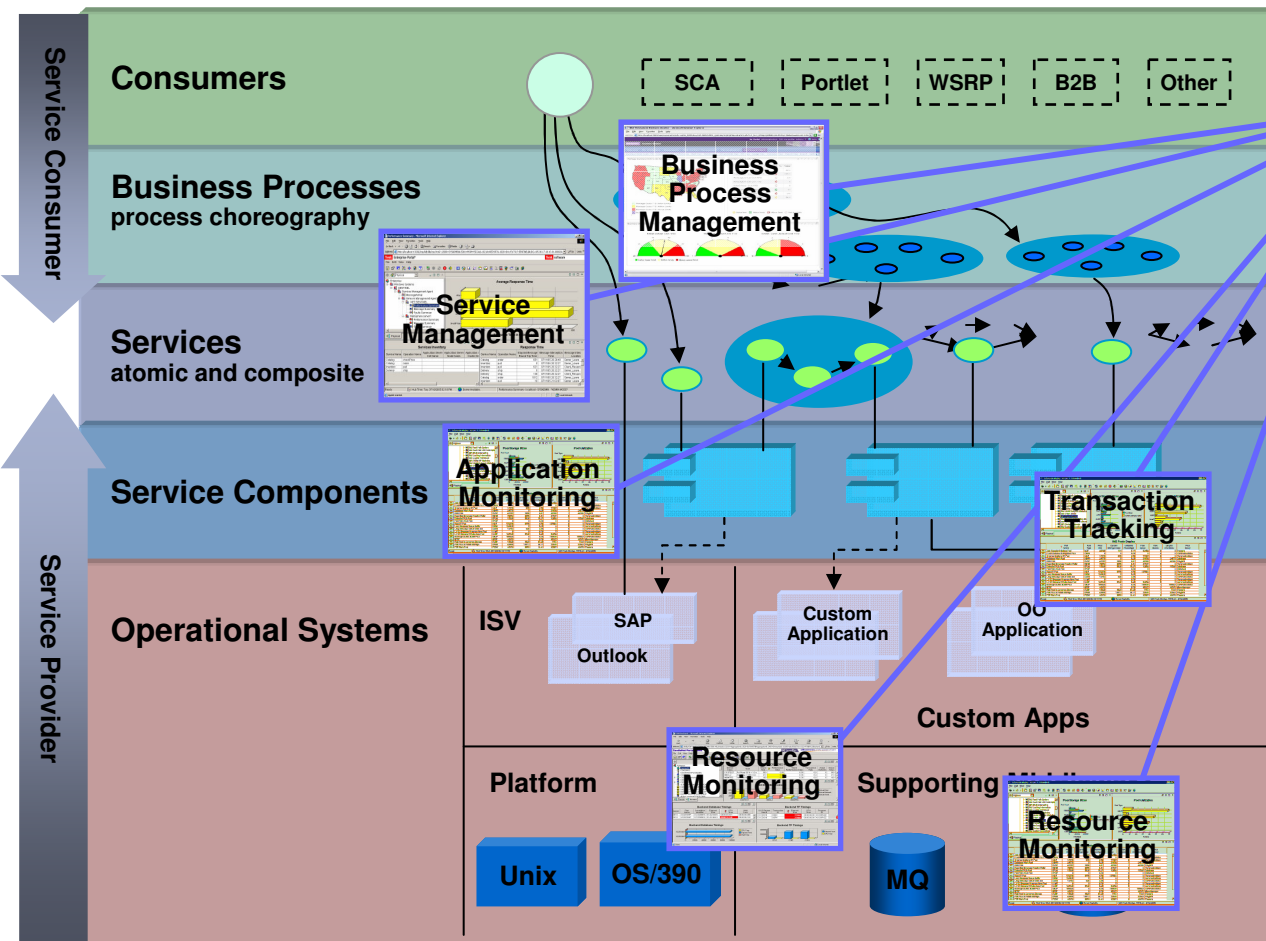


OMEGAMON

Tivoli Enterprise Portal (TEP)

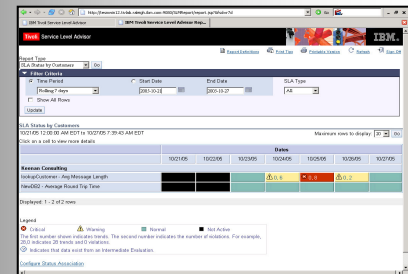


A Complete View Of SOA Management



Integrated Console

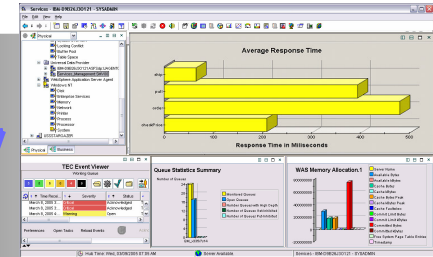
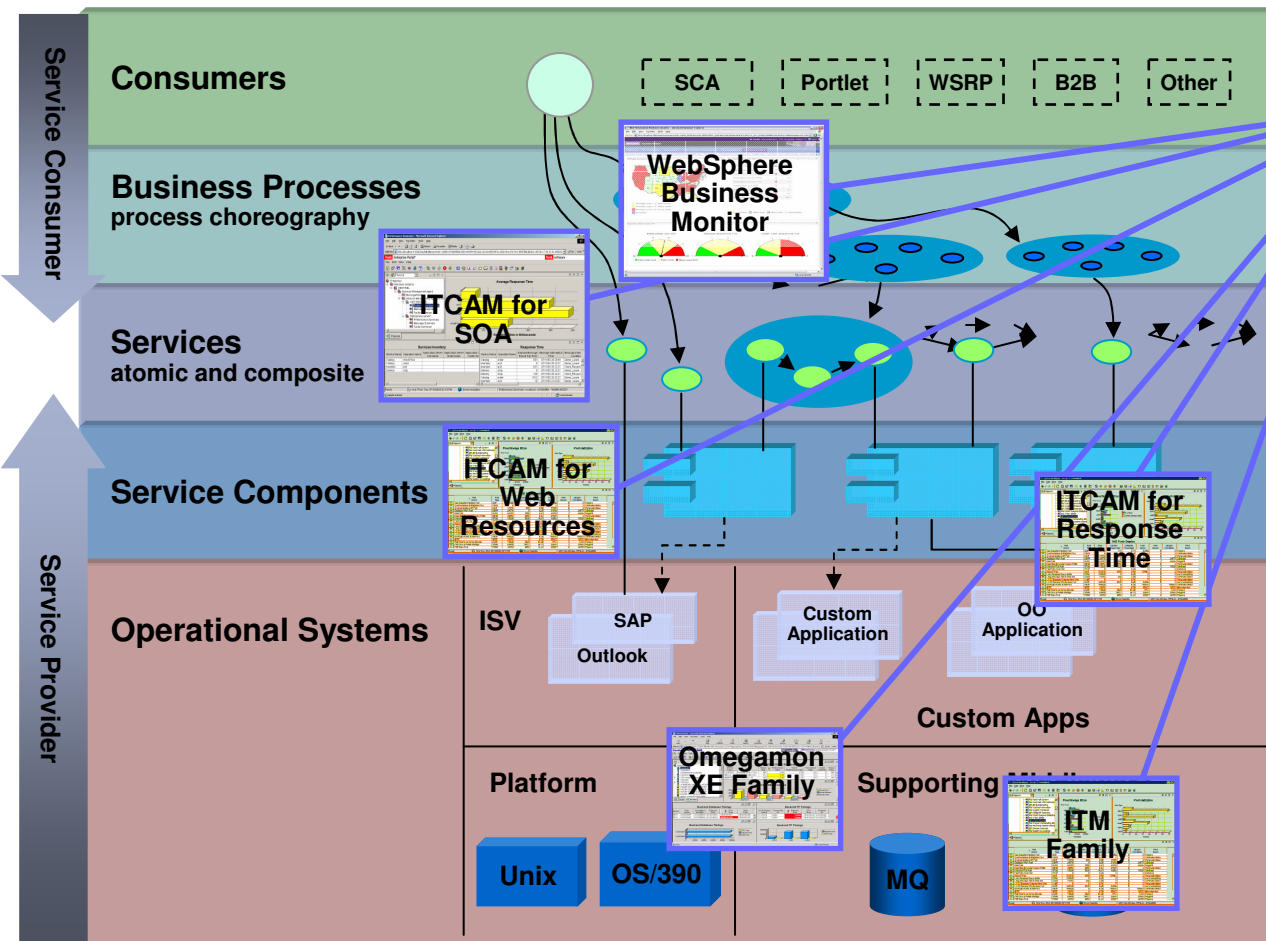
- Allow for seamless views across different layers of abstraction.



Integrated Reporting

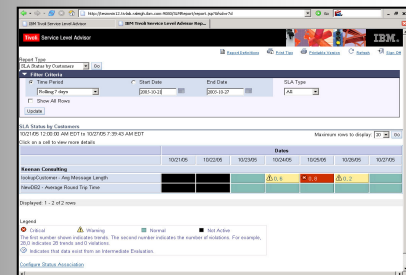
- Generate enterprise-wide service level reporting

A Complete View Of SOA Management



Integrated Console

- Allow for seamless views across different layers of abstraction.



Integrated Reporting

- Generate enterprise-wide service level reporting

IBM Tivoli Composite Application Manager for SOA

Service problem identification & resolution

- Content-rich views, topology 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, workflows enable powerful automation scenarios
- Managed mediation primitives for WebSphere ESB enable control of services

Heterogeneous SOA Platform Support

- SOA Platform support covers IBM WebSphere Application Server, WebSphere ESB, WebSphere Process Server, WebSphere DataPower, WebSphere Message Broker, Microsoft .NET, JBOSS, CICS, SAP and BEA WebLogic

Integrated Console

- Service views, alerts and automation included within Tivoli Enterprise Portal, the integration point for ITCAM, OMEGAMON, ITM and TBSM

Life-cycle Management

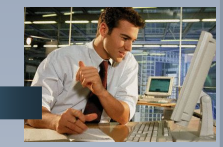
- Web Services Navigator provides deep understanding of service flows and relationships
- WebSphere Service Registry and Repository integration supports SOA Governance

Support for ISM strategy

- Discovery Library Adapters add discovered Service information to CCMDB
- Additional DLAs provided for BPEL and WSRR

The screenshots illustrate the Tivoli Enterprise Portal interface. The top left shows a tree view of the Service Management Agent environment. The top right displays a bar chart titled 'Average Response Time by Operation' with 'Response Time in Milliseconds' on the x-axis. Below it are two more charts: 'Number of Messages by Operation' and 'Average Message Size by Operation'. The middle right shows a complex service topology diagram with nodes and connecting lines. The bottom right shows a 'Web Services Explorer' window with a hierarchical tree of services and a detailed view of a service instance. At the bottom, a table lists service details.

Service Port	Operation	Service	Application Server	Computer S
hibo/hibo	hibo/hibo	hibo/hibo	hibo/hibo	hibo/hibo
Catalog	catalog	catalog	catalog	catalog
InventoryV380a	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380b	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380c	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380d	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380e	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380f	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380g	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380h	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380i	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380j	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380k	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380l	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380m	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380n	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380o	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380p	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380q	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380r	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380s	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380t	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380u	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380v	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380w	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380x	inventory	InventoryService	InventoryServer	host02.austin.ibm.com
InventoryV380y	inventory	InventoryService	InventoryServer	host03.austin.ibm.com
InventoryV380z	inventory	InventoryService	InventoryServer	host02.austin.ibm.com



IT Operations



Web Services Expert

Service problem identification and resolution

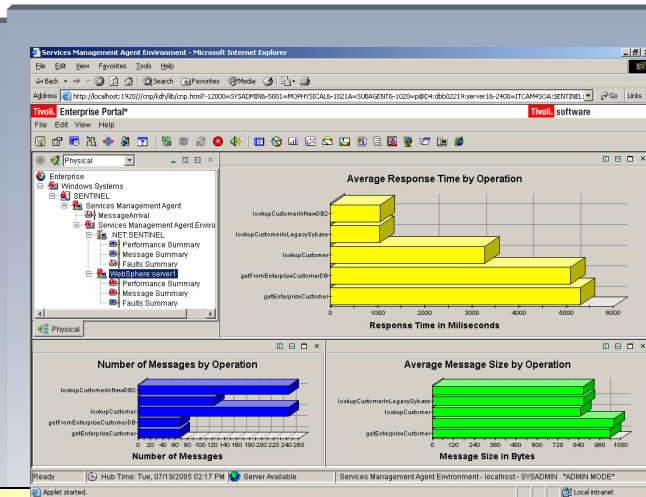
To ensure service levels conform to agreed upon specifications, you need:

- Views and analysis of Web service interactions for IT Operations to quickly identify source of errors, and take corrective action through situations, workflow and mediations
- Detailed views of operational SOAP/XML message content, flow patterns and topology for Web services experts and support teams
- Highly performing and flexible enforcement points



IT Operations

"Don't give me another console"



Response Time

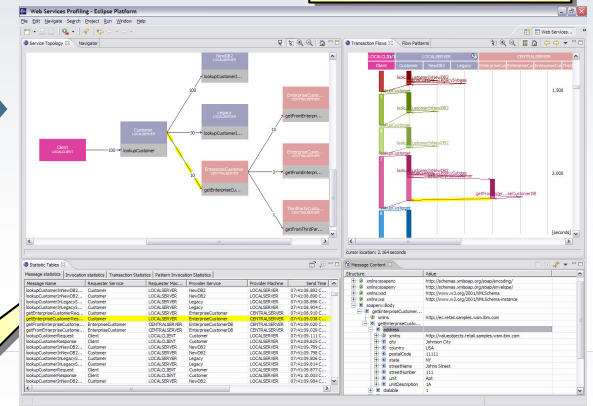
Message Count

Message Size



Web Services Expert

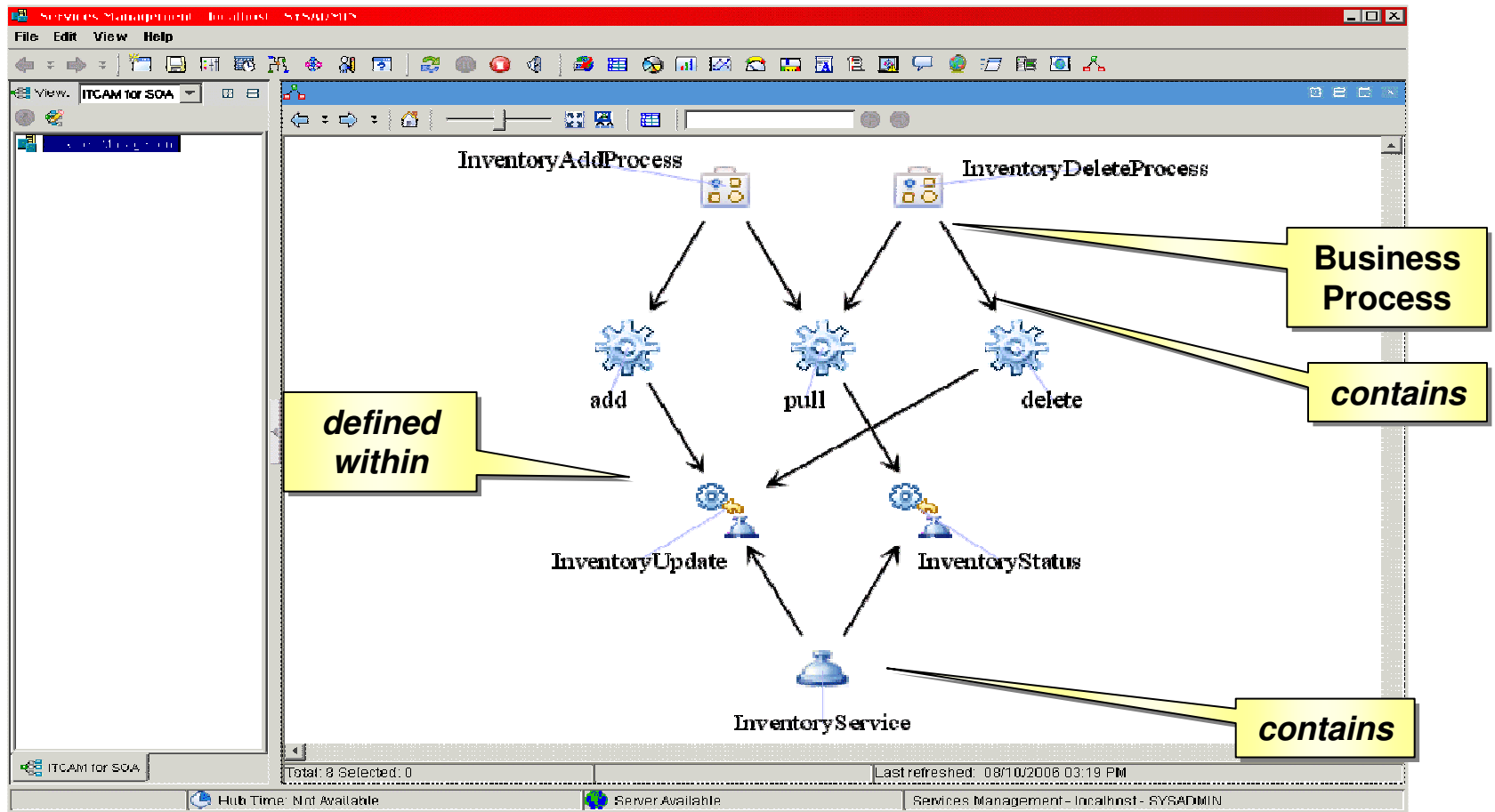
"Show me the service & flow details!"



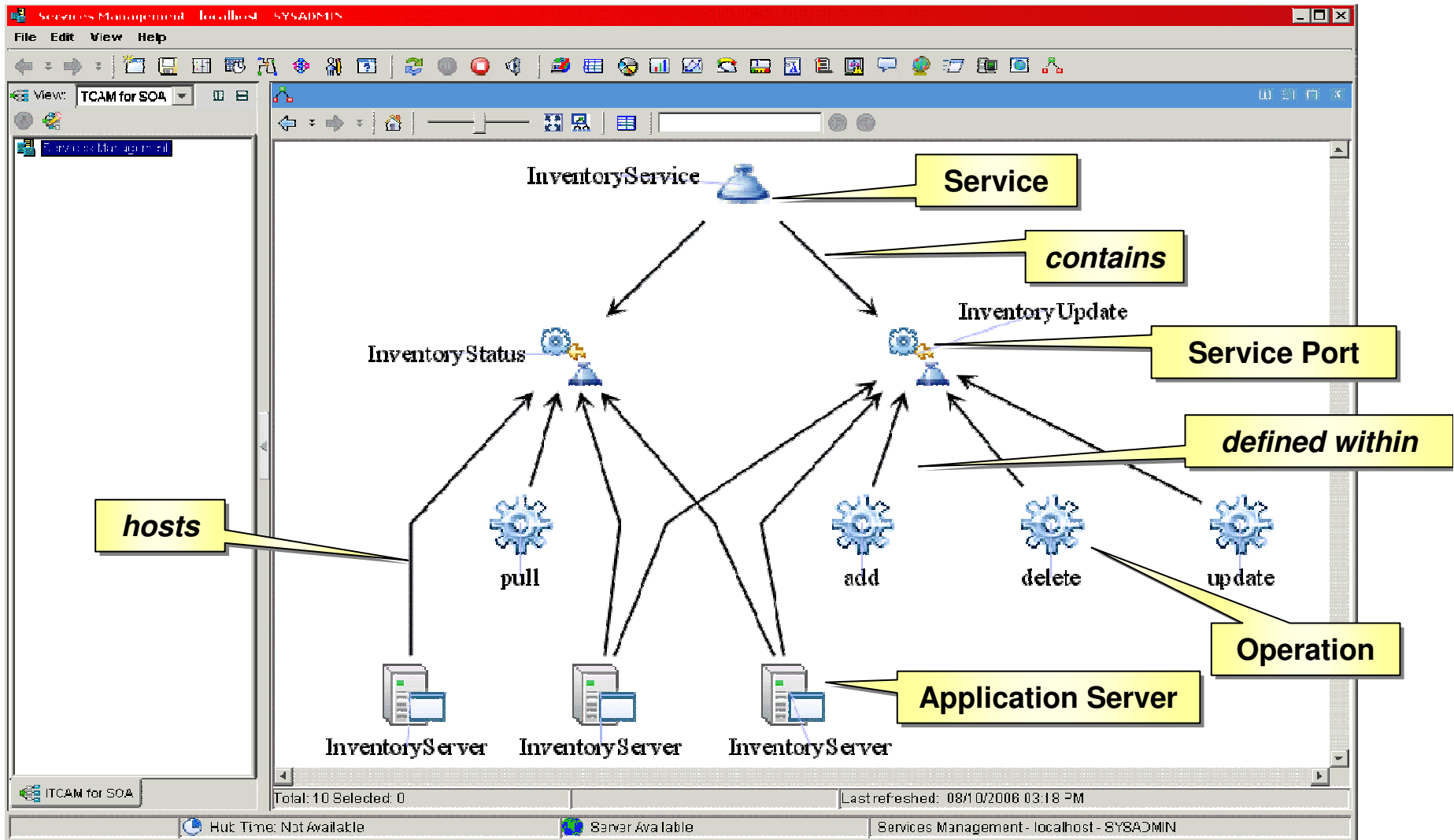
Web Services Navigator



Business Process Topology View



Service Details Topology View



Service Management Automation

Workspace chart for average response times

Summary Workspace

Situations are fired based on customizable thresholds

Clicking on links takes you to the problem area

Table-based view of specific response times

Performance Summary - Microsoft Internet Explorer
 Address: http://localhost:1920/cnp/kdh/lib/cnp.html?-12000=SYSADMIN&-5001=MOPHYSICAL&-1021A=REPORT&-1020=D4:cf3173c7:SENTINEL@UDC...
 Tivoli Enterprise Portal
 Average Response Time

CRITICAL

MessageSize	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35
ResponseTimeWarning	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35

WARNING

ResponseTimeWarning	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35
NT_Log_Space_Low	Primary: IBM-I08ELJUR9W3:NT	01/13/06 16:13:35
NT_Log_Space_Low	Primary: IBM-I08ELJUR9W3:NT	01/13/06 16:13:35
NT_Log_Space_Low	Primary: IBM-I08ELJUR9W3:NT	01/13/06 16:13:35

INFORMATIONAL

Fault	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35
MessageArrivalClearing	ITCAM4SOA: IBM-I08ELJUR9W3.austin	01/13/06 16:14:55

KFVMTM1021 Select workspace link button to view event results for: MessageSize

Delivery	ship	130	07/11/05 20:32:27	Client_Respons
Catalog	order	1012	07/11/05 20:32:27	Server_Leave
Inventor	pull	10	07/11/05 21:03:07	Server_Leave

Ready | Hub Time: Tue, 07/19/2005 02:18 PM | Server Available. | Performance Summary - localhost - SYSADMIN *ADMIN MODE*

Service Management Automation

Shows Initial values that triggered Situation

Message Length	Origin Node	Message Interception Location	Message Interception Time	Thread Identifier	Elapsed W Round Tr
1825	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:41	1750203661	
1825	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:41	1750203661	
1813	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:29	1750203661	
1813	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:29	1750203661	
1807	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:07:08	1750203661	
1807	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:07:08	1750203661	
1686	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:06:42	1750203661	
1686	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:06:42	1750203661	

Shows current threshold values

Message Length	Origin Node	Message Interception Location	Message Interception Time	Thread Identifier	Elapsed W Round Tr
1825	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:41	1750203661	
1825	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:41	1750203661	
1813	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:29	1750203661	
1813	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:08:29	1750203661	
1807	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:07:08	1750203661	
1807	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:07:08	1750203661	
1686	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:06:42	1750203661	
1686	D4:e28497c:claimswr01-server1	Server_Enter	01/13/06 22:06:42	1750203661	

Take an action, such as adding a filter control, to mitigate the problem

Shows Expert Help, which can be customized

The length of the message is above the monitored threshold. This might be caused by a problem with an application not sending the entire message (if this threshold is defined to check for message length less than the monitored threshold), or sending a message larger than expected. Examine the message being sent to determine if it is an acceptable length for your environment. If so, you should consider adjusting the threshold for this situation for your environment.

Take Action

Action Name: <Select Action>
 Command: <Select Action>
 Destination: SM-AddMntrCntrl

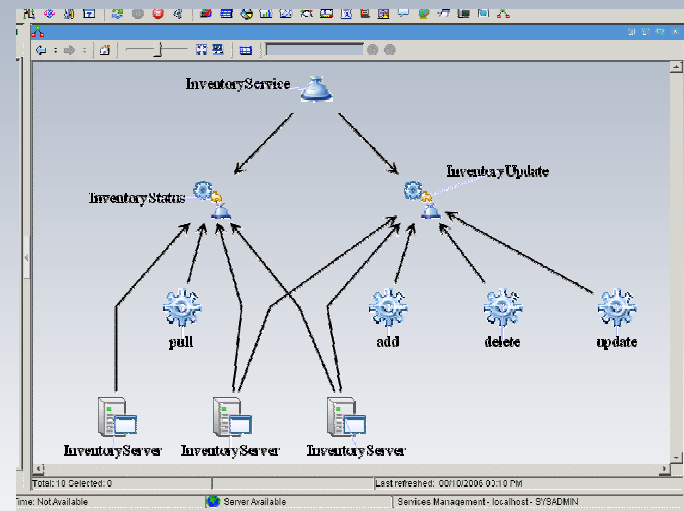
Hub Time: Fri, 01/13/2006 04:15 PM | Server Available through SSL connection | MessageSize - IBM-I08ELJUR9W3 - SYSADMIN

WebSphere Service Registry and Repository Integration

- Reconciliation of services registered in WSRR with those monitored in target systems by ITCAM for SOA
- Topology views show relationships between service operations and BPEL business processes for impact analysis
- Forwards status information to WSRR to allow selection of services based on performance and other metrics



Service Port	Operation	Service	Application Server	Computer System	Observed	Registered
<no filter>	<no filter>	<no filter>	<no filter>	<no filter>	<no filter>	<no filter>
Catalog	order	CatalogService				✓
Catalog	cancelOrder	CatalogService				✓
InventoryStatus	pull	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	InventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	InventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	InventoryServer	host3.austin.ibm.com	✓	✓



WebSphere Service Registry and Repository

Publish

Find

Enrich

Manage

Govern



Forwarding Service Status to WSRR

- ITCAM for SOA forwards service status to WSRR
 - Customizable using TEP situations driven by Response time and Availability
 - Integrated event routing and support for TEC or OMNibus
- Enables manual service composition based on 'best available' service

The screenshot shows the Tivoli Enterprise Portal interface. A window titled 'Performance Summary - Microsoft Internet Explorer' displays a table of performance metrics. A large blue arrow points from this window towards the WSRR console on the right.

Severity	Event Name	Source	Time	Category
CRITICAL	MessageSize	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35	
CRITICAL	ResponseTimeCritical	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35	
WARNING	ResponseTimeWarning	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35	
WARNING	NT_Log_Space_Low	Primary: IBM-I08ELJUR9W3:NT	01/13/06 16:13:35	System
WARNING	NT_Log_Space_Low	Primary: IBM-I08ELJUR9W3:NT	01/13/06 16:13:35	Security
WARNING	NT_Log_Space_Low	Primary: IBM-I08ELJUR9W3:NT	01/13/06 16:13:35	Application
INFORMATIONAL	Fault	D4:e2849f7c:claimsvr01-server1	01/13/06 16:13:35	
INFORMATIONAL	MessageArrivalClearing	ITCAM4SOA: IBM-I08ELJUR9W3.austin	01/13/06 16:14:55	

The screenshot shows the WebSphere Service Registry and Repository Console. The 'WSDL documents' section is active, displaying a list of WSDL documents with their names, descriptions, and namespaces.

Select	Name	Description	Namespace
<input type="checkbox"/>	EnterpriseCustomerDB.wsdl	EnterpriseCustomerDB.wsdl	http://ecdb.retail.samples.vsm.ibm.com
<input type="checkbox"/>	EnterpriseCustomer.wsdl	EnterpriseCustomer.wsdl	http://ecretail.samples.vsm.ibm.com
<input type="checkbox"/>	EnterpriseCustomerWarrantyDB.wsdl	EnterpriseCustomerWarrantyDB.wsdl	http://ecvdb.retail.samples.vsm.ibm.com
<input type="checkbox"/>	ThirdPartyCustomerInfoDB.wsdl	ThirdPartyCustomerInfoDB.wsdl	http://thirdpartydb.retail.samples.vsm.ibm.com
<input type="checkbox"/>	Legacy.wsdl	Legacy.wsdl	http://lgdb.retail.samples.vsm.ibm.com
<input type="checkbox"/>	NewDB2.wsdl	NewDB2.wsdl	http://nvdb2.retail.samples.vsm.ibm.com
<input type="checkbox"/>	Customer.wsdl	Customer.wsdl	http://lc.retail.samples.vsm.ibm.com
<input type="checkbox"/>	Catalog.wsdl	Catalog.wsdl	http://catalog.trinkets.com
<input type="checkbox"/>	Delivery.wsdl	delivery.wsdl	http://delivery.trinkets.com
<input type="checkbox"/>	Inventory.wsdl	Inventory.wsdl	http://inventory.trinkets.com

Compare Observed with WSRR-Registered Services

- ITCAM for SOA compares services it observes with those registered in WSRR
- Services observed but not registered
 - ▶ Why? Services not registered might be implemented again!
- Services registered but not observed
 - ▶ Why not? Common services not being utilized might imply poor decision making
- Services registered and observed
 - ▶ Good – helps understand common service reuse
- Understanding discrepancies enables better service governance

Service Port	Operation	Service	Application Server	Computer System	Observed	Registered
<no filter>	<no filter>	<no filter>	<no filter>	<no filter>	<no filter>	<no filter>
Catalog	order	CatalogService			✓	✓
Catalog	cancelOrder	CatalogService			✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	inventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	inventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	inventoryServer	host3.austin.ibm.com	✓	✓

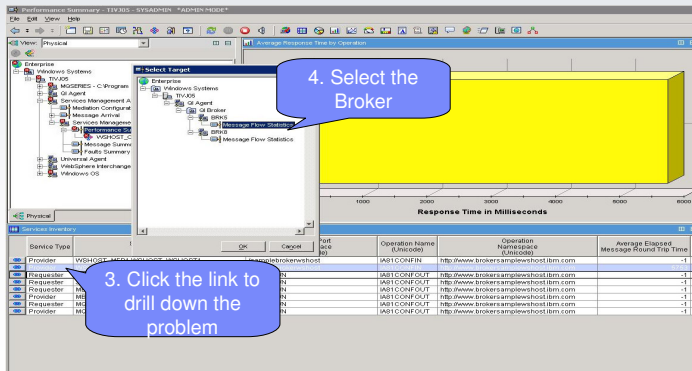
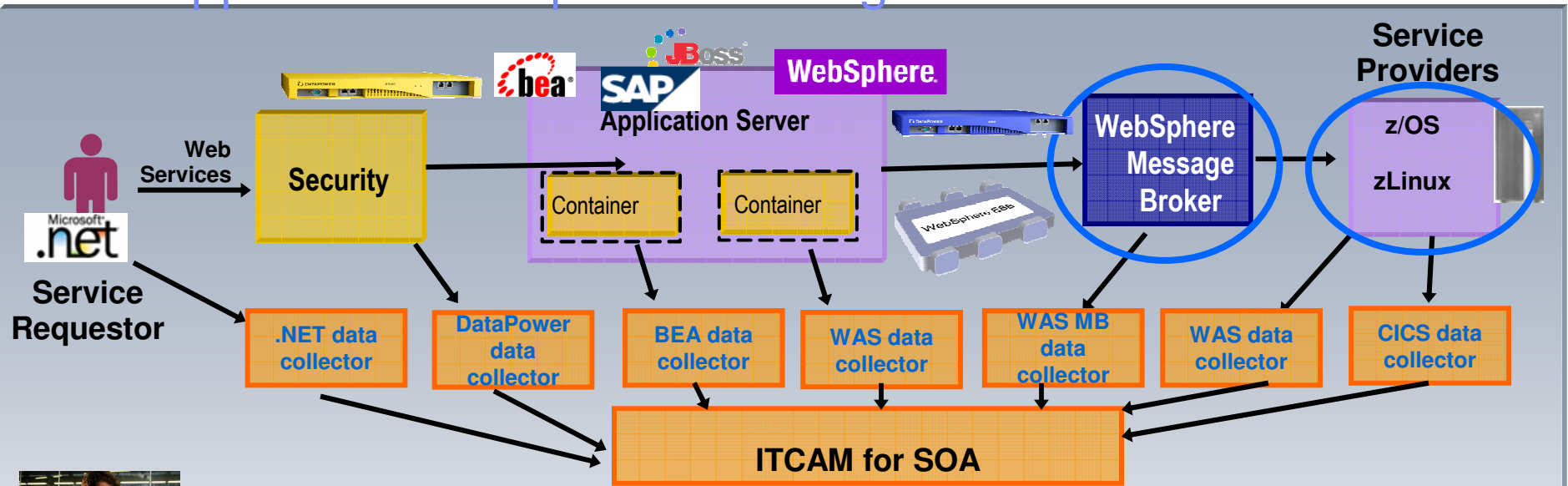
Observed and registered

Observed but not registered

Registered but not observed

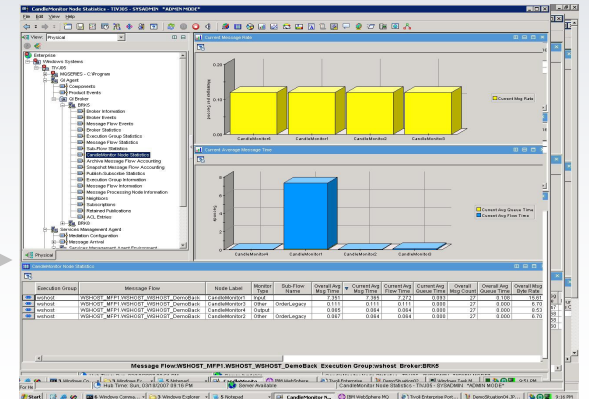
Service Port	Operation	Service	Application Server	Computer System	Observed	Registered
<no filter>	<no filter>	<no filter>	<no filter>	<no filter>	<no filter>	<no filter>
Catalog	order	CatalogService			✓	✓
Catalog	cancelOrder	CatalogService			✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryStatus	pull	InventoryService	InventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	update	InventoryService	inventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	delete	InventoryService	inventoryServer	host3.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	InventoryServer	host1.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	InventoryServer	host2.austin.ibm.com	✓	✓
InventoryUpdate	add	InventoryService	inventoryServer	host3.austin.ibm.com	✓	✓

ITCAM for SOA support includes zSeries - new support for WebSphere Message Broker



ITCAM for SOA

- Find and fix the problem quickly
- Monitor Web services inside WS Msg. Broker
- Launch in context from ITCAM for SOA to OMEGAMON XE for Messaging



OMEGAMON XE for Messaging

Better Integration with OMEGAMON

Launch in context from OM XE for Messaging to OMEGAMON for CICS

- Improve problem resolution time for message that use CICS

The screenshot displays the Transaction Analysis interface. The top window shows a 3D bar chart titled 'Transaction Processor Utilization' with 'Task Number' on the vertical axis and 'CPU Seconds' on the horizontal axis. The bottom window shows a table of transaction details.

System ID	CICS Region Name	CICS SYSIDNT	Transaction ID	User ID	Terminal ID	Task Number	Resource Type	Resource Name	Task State	Elapsed Time	CPU Time	Program ID	Ex
SYS_	CICSXX64	XX64	AMG6	CICSXX64	n/a	00469	DISPATCH	QR_TCB	Dispatbl	00:00:00.02	00:00:00	DKJMG1	No
SYS_	CICSXX64	XX64	AMG9	CICSXX64	n/a	00472	MQSeries	TASKSWCH	Suspend	00:00:00.01	00:00:00	DKJMG1	No
SYS_	CICSXX64	XX64	AMG7	n/a	n/a	00470	RUNNING	RUNNING	Running	00:00:00.00	00:00:00	n/a	No
SYS_	CICSXX64	XX64	AMG0	CICSXX64	M423	00220	ICWAIT	M423	Suspend	00:01:24.9	00:00:00.05	AMG00000	No
SYS_	CICSXX64	XX64	CKAM	CICSXX64	n/a	00139	n/a	n/a	Suspend	00:20:58.31	00:00:00	CSQCAMON	No
SYS_	CICSXX64	XX64	OSEC	CICSXX64	n/a	00057	USERWAIT	SRZWORK	Suspend	1 Day	00:00:00.57	KOCSR2ZZ	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00056	USERWAIT	SRVWORK	Suspend	1 Day	00:00:01.17	KOCSR2ZZ	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00031	ZC	DFHZNAC1	Suspend	1 Day	00:00:00.01	DFHZNAC	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00027	SHSYSTEM	DFHSHSY	Suspend	1 Day	00:00:00.01	DFHSHSY	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00025	USERWAIT	CDB2TIME	Suspend	1 Day	00:00:00.02	DFHDZK2	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00021	CSNC	MROQUEUE	Suspend	1 Day	00:00:00	DFHCRNP	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00020	FCCFQR	DFHFCQT	Suspend	1 Day	00:00:00	DFHFCQT	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00019	FCCFQS	DFHFCQT	Suspend	1 Day	00:00:00	DFHFCQT	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00008	TCP_NORM	DFHZDSP	Suspend	1 Day	00:00:03.08	DFHZCSTP	No
SYS_	CICSXX64	XX64	SRV	CICSXX64	n/a	00006	ICFPXIPY	DFHAPTIX	Suspend	1 Day	00:00:00.06	DFHAPATT	No

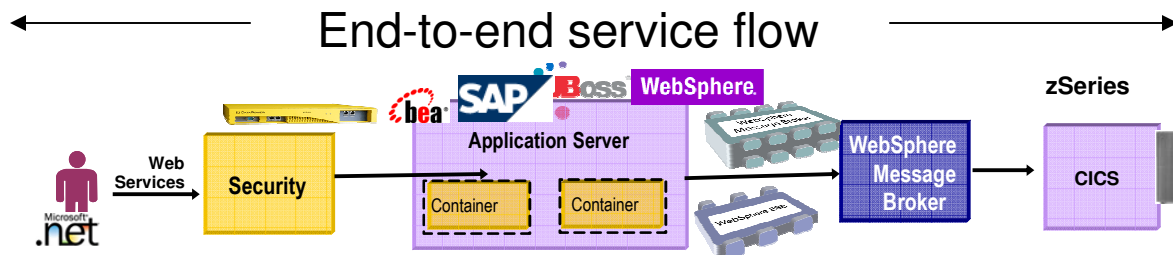
Visibility – See services flows

- ✓ Understand where services are flowing so problems can be quickly identified

The ability to graphically navigate the service topology and drill down into areas of interest speeds up the time to identify and resolves problems.

The screenshot shows a graphical user interface for monitoring service flows. On the left is a tree view with categories like 'Sub-Flow Statistics', 'Services Management Agent', and 'Performance Summary'. The main area displays a service topology with nodes represented by gears and arrows. One node is highlighted with a blue box. Below the topology is an 'Interaction Detail' window for the selected 'lookupCustomer' service, showing various attributes like 'Operation Namespace', 'Service Port', and 'Application Server'.

Service topology display makes it easy to see end to end flows



The screenshot displays the 'Operational Flow - ROHIT - SYSADMIN' application window. On the left, a tree view shows a hierarchy of components including 'Broker Events', 'Message Flow Events', and 'Services Management Agent'. The main area shows a message flow diagram with a gear icon representing a message flow. A context menu is open over this gear icon, listing various actions such as 'Link Wizard...', 'Operational Flow for Operation', 'Performance Summary', 'Requester Identities for Operation', 'Message Flow Statistics', and 'Windows OS'. A speech bubble points to the gear icon with the text: 'The operator decides to displays details about the WebSphere Message Broker message flow.' The status bar at the bottom indicates 'Total: 2 Selected', 'Timeframe: 10/03/07 11:50:00 - 10/03/07 11:55:00', and 'Last refreshed: 10/03/2007 12:00 PM'.

The screenshot shows the IBM Message Flow Statistics interface. A critical error is displayed in a central window:

CRITICAL
 QI_Broker_Not_Started BK1::KQIB 10/03/07 11:51:21

A speech bubble points to this error with the text: "Message Broker is not running."

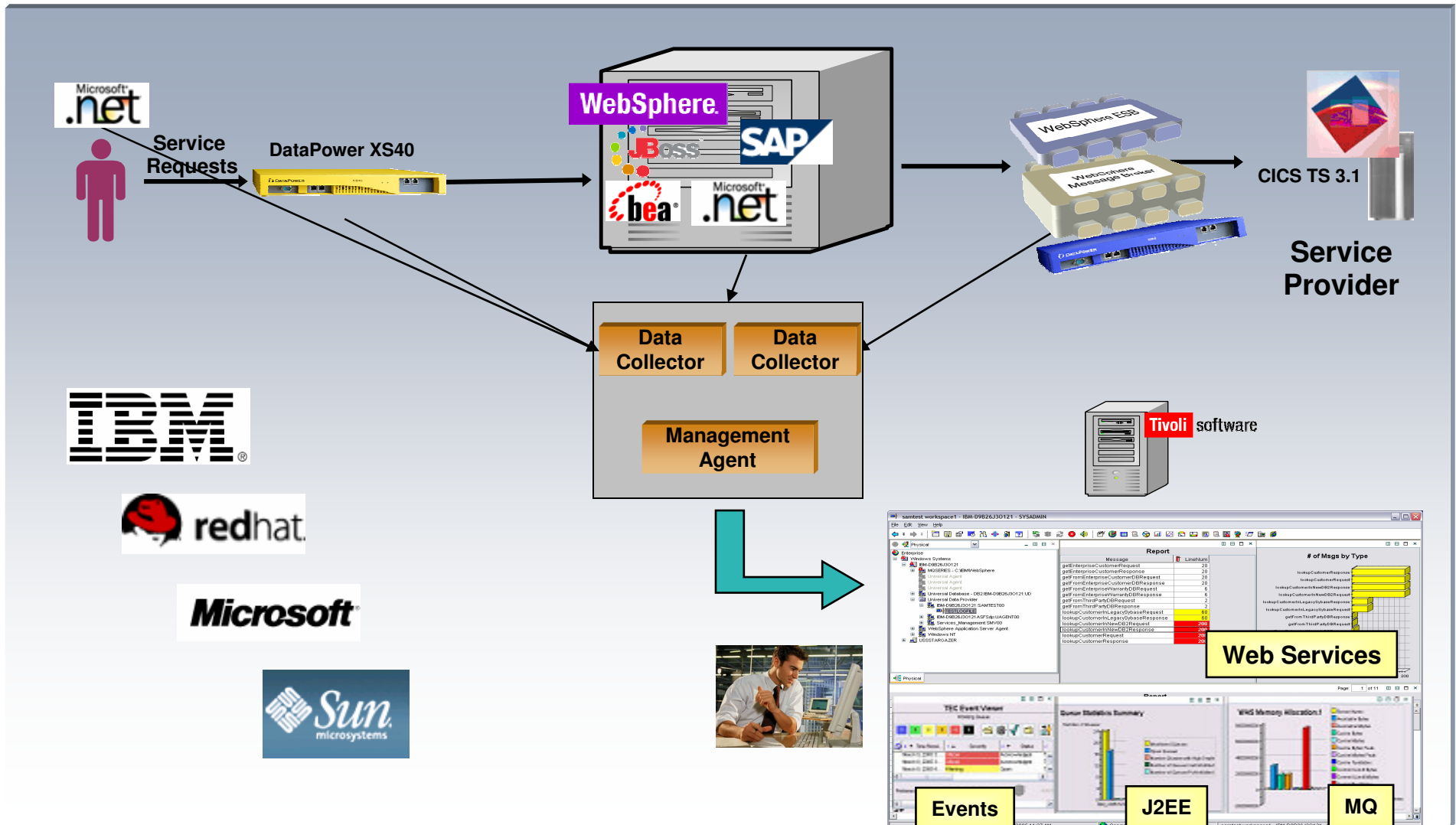
Below the error, a yellow tooltip reads: "KFWMTM102I Select workspace link button to view situation event results for: ThirdPartyMessages"

The interface includes several panels:

- Left Panel:** A tree view showing the hierarchy of components, including "Product Events", "QI Broker - BK1", "Snapshot Message Flow Account", "Publish-Subscribe Statistics", "Execution Group Information", "Message Flow Information", "Message Processing Node Information", "Neighbors", "Subscriptions", "Retained Publications", "ACL Entries", and "Services Management Agent".
- Top Right Panel:** "Current Message Rates" showing "Current Msg Input Rate" and "Current Msg Output Rate".
- Bottom Right Panel:** "Current Average Message Time" showing a graph with "Seconds" on the y-axis and a legend for "Current Avg Queue Time" and "Current Avg Flow Time".
- Bottom Panel:** A table with columns for various statistics and a filter set to "BK1::KQIB".

Execution Group	Message Flow	Status	Monitor Nodes	Current Msg Input Count	Current Msg Output Count	Current Msg Input Rate	Current Msg Byte Input Rate	Current Msg Output Rate	Current Msg Byte Output Rate	Current Avg Msg Time	Current Avg Queue Time	Current Avg Flow Time
BK1::KQIB												

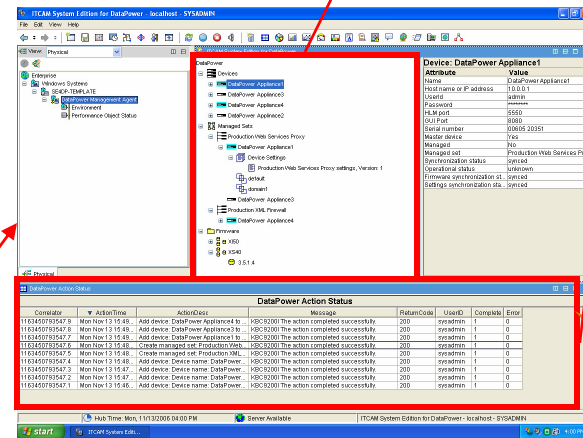
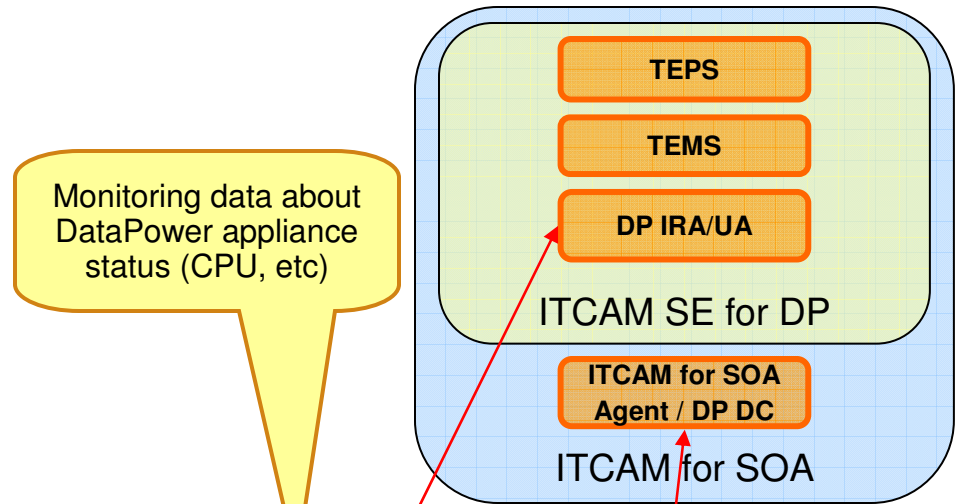
Heterogeneous SOA platform support



Tivoli Enterprise Portal (TEP)

Managing WebSphere DataPower SOA Appliances

- DataPower SOA Appliances
 - ▶ Purpose-built, easy-to-deploy network devices that simplify, help secure, and accelerate Web services deployments
- Multi-box management solution required to simplify management
- *ITCAM System Edition for WebSphere DataPower*
 - ▶ Manages groups of DataPower devices
 - ▶ Integrates with TEP and TMS
 - ▶ Included with DataPower appliances
- ITCAM SE monitors and manages DataPower device
- ITCAM for SOA monitors and manages service metrics, etc.
- Need both to manage complete environment



Emphasizing management early in the lifecycle

- ITCAM support of WebSphere Integration Developer (WID) provides the ability to place management control points (mediation) in ESB systems
- ITCAM for SOA includes workspace to configure these mediations once application is deployed
- Operators can take action to enable / disable managed mediations to support runtime changes to the management policy



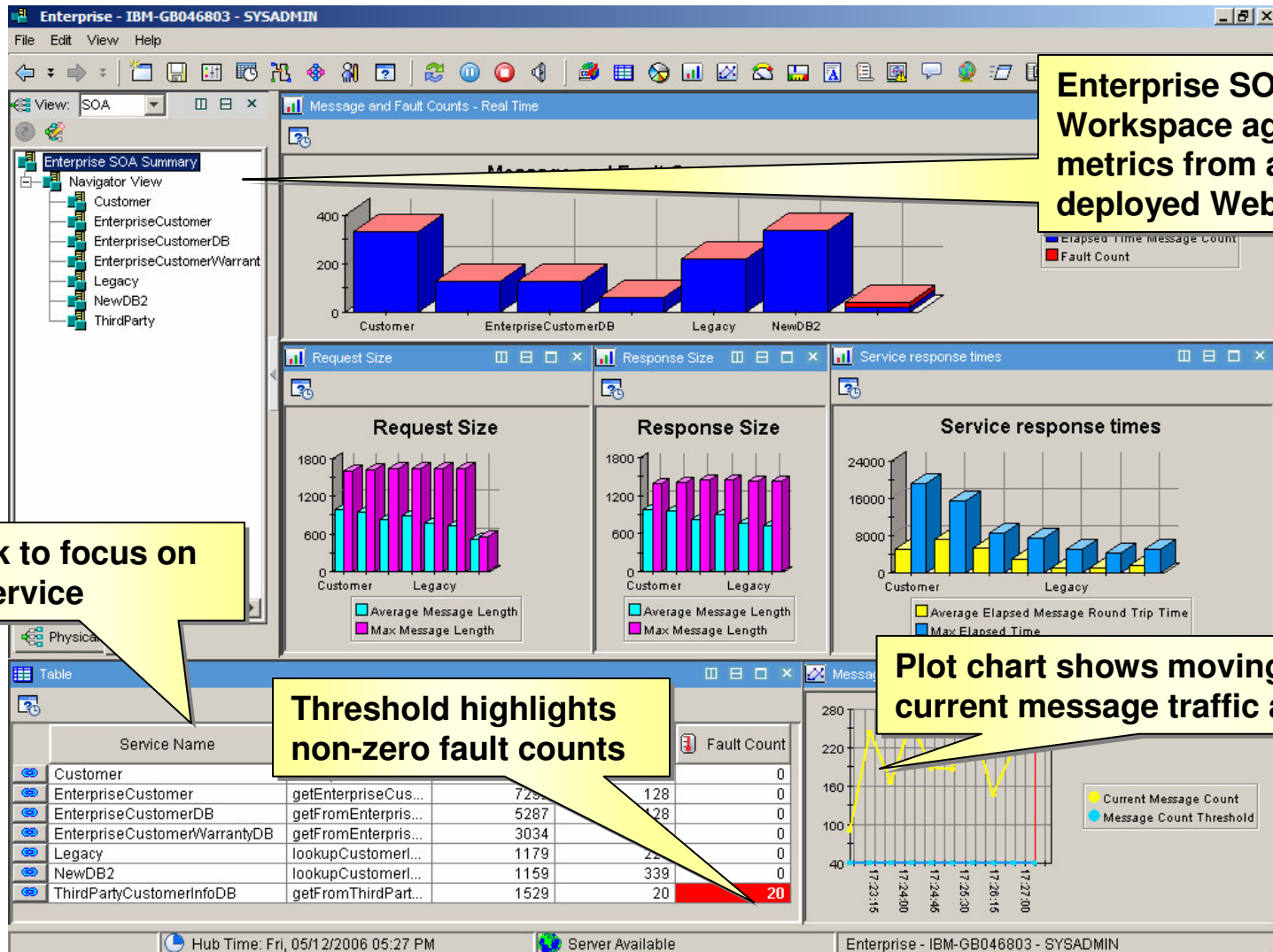
The screenshot displays the IBM WebSphere Integration Developer (WID) interface, illustrating the configuration and management of mediations in an ESB system. The top panel shows a mediation flow diagram with various components like 'Customer' and 'Order'. The middle panel shows a tree view of the 'Mediation Configuration' workspace. The bottom panel shows a table of configured mediations.

Application	Mediation Container	Mediation Container	Mediation Container	Mediation Type	Priority
Service_Component_Architecture	sew0647.NC0601	Cell:sew0647.NC0601	sew0647.NC0601	Managed	Managed
Service_Component_Architecture	sew0647.NC0601	Cell:sew0647.NC0601	sew0647.NC0601	Managed	Managed
Service_Component_Architecture	sew0647.NC0601	Cell:sew0647.NC0601	sew0647.NC0601	Managed	Managed
Service_Component_Architecture	sew0647.NC0601	Cell:sew0647.NC0601	sew0647.NC0601	Managed	Managed
Service_Component_Architecture	sew0647.NC0601	Cell:sew0647.NC0601	sew0647.NC0601	Managed	Managed
Service_Component_Architecture	sew0647.NC0601	Cell:sew0647.NC0601	sew0647.NC0601	Managed	Managed

The bottom panel also shows a 'Take Action' dialog box with a table of mediation actions:

Mediation	Name	Value
Mediation_Center_Table_SIBApplication_Servlet	Mediation_Center_Table_SIBApplication_Servlet	Enabled
Mediation_Center_Table_SIBApplication_Servlet	Mediation_Center_Table_SIBApplication_Servlet	Enabled
Mediation_Center_Table_SIBApplication_Servlet	Mediation_Center_Table_SIBApplication_Servlet	Enabled
Mediation_Center_Table_SIBApplication_Servlet	Mediation_Center_Table_SIBApplication_Servlet	Enabled
Mediation_Center_Table_SIBApplication_Servlet	Mediation_Center_Table_SIBApplication_Servlet	Enabled
Mediation_Center_Table_SIBApplication_Servlet	Mediation_Center_Table_SIBApplication_Servlet	Enabled

Integration with Tivoli Enterprise Portal



Click link to focus on single service

Threshold highlights non-zero fault counts

Plot chart shows moving graph of current message traffic and threshold

Enterprise SOA Workspace aggregates metrics from all deployed Web services

Customizable Workspaces

Navigator: Shows .Net and WebSphere resources

Dynamic Graphing: Displays service statistics

Catalog View: Displays discovered services

Threshold View: Displays service behavior against pre-set thresholds

Average Response Time by Service Operation

Service Operation	Average Response Time (ms)
reserve	~220
resFindCopies	~200
getPatronStatus	~210
getPatronId	~180
findCopies	~200
find	~160
checkout	~230

ServiceName	OperationName	AppServerEnv	LocalHostname	Local
Reservation Service	checkout	WAS	moria.middleearth.org	9.27.1
Card Catalog Service	find	NET	rivendell.middleearth.org	9.27.1
Book Finder Service	findCopies	WAS	rivendell.middleearth.org	9.27.1
Patron Service	getPatronId	NET	rivendell.middleearth.org	9.27.1
Patron Service	getPatronStatus	NET	rivendell.middleearth.org	9.27.1
Patron Service	resFindCopies	NET	rivendell.middleearth.org	9.27.1
Patron Service	reserve	NET	rivendell.middleearth.org	9.27.1

EventTime	ElapsedTime	ServiceName	OperationName	Fault
04/05/05 13:21:45	1016	Reservation Service	reserve	FALS
04/05/05 13:21:45	1016	Patron Service	getPatronId	FALS
04/05/05 13:21:45	1016	Reservation Service	reserve	FALS
04/05/05 13:21:45	1016	Reservation Service	checkout	FALS
04/05/05 13:21:45	507	Patron Service	getPatronStatus	FALS
04/05/05 13:17:45	507	Patron Service	getPatronId	FALS
04/05/05 13:17:45	507	Book Finder Service	findCopies	FALS
04/05/05 13:17:45	507	Patron Service	getPatronStatus	FALS
04/05/05 13:17:45	507	Patron Service	getPatronStatus	FALS
04/05/05 13:17:45	507	Reservation Service	checkout	FALS
04/05/05 13:17:45	507	Reservation Service	resFindCopies	FALS
04/05/05 13:17:45	507	Patron Service	getPatronStatus	FALS
04/05/05 13:21:45	486	Reservation Service	checkout	FALS
04/05/05 13:21:45	486	Reservation Service	reserve	FALS
04/05/05 13:21:45	486	Reservation Service	resFindCopies	FALS

Value: Quickly drill down into the performance of Web Services

Customizable Workspaces

Services Management Agent Environment - Microsoft Internet Explorer

Address: http://localhost:1920//cnp/kdh/lib/cnp.html?-12000=SYSADMIN&-5001=MOPHYSICAL&-1021A=SUBAGENT&-1020=p@D4:dbb02219:server1&-2400=ITC...

Tivoli Enterprise Portal®

File Edit View Help

Physical

Enterprise

- Windows Systems
 - SENTINEL
 - Services Management Agent
 - MessageArrival
 - Services Management Agent Enviro
 - .NET:SENTINEL
 - Performance Summary
 - Message Summary
 - Faults Summary
 - WebSphere:server1
 - Performance Summary
 - Message Summary
 - Faults Summary

Summary Workspace

Average Response Time by Operation

Operation	Average Response Time (ms)
lookupCustomerInNewDB2	~1200
lookupCustomerInLegacySybase	~1500
lookupCustomer	~3500
getFromEnterpriseCustomerDB	~5000
getEnterpriseCustomer	~5500

Message counts

Number of Messages by Operation

Operation	Number of Messages
lookupCustomerInNewDB2	~240
lookupCustomer	~140
getFromEnterpriseCustomerDB	~80
getEnterpriseCustomer	~80

Average Message Size by Operation

Operation	Average Message Size (bytes)
lookupCustomerInLegacySybase	~900
lookupCustomer	~900
getEnterpriseCustomer	~1000

Message sizes

Ready Hub Time: Tue, 07/19/2005 02:17 PM Server Available. Services Management Agent Environment - localhost - SYSADMIN *ADM

Applet started.

Make Production Data Available to Developers!

ITCAM for SOA – Web Services Navigator

Sequence Diagram:
Shows exact sequence of messages over time

Topology View:
aggregate interactions among services.

Statistics View:
A table view of the raw data collected by the monitoring agent at each interception point

Content View:
Shows content of a SOAP message

The screenshot displays the 'Web Services Profiling - Eclipse Platform' interface. It is divided into several panes:

- Topology View:** A hierarchical diagram showing service interactions. A 'Client LOCALCLIENT' calls 'lookupCustomer' on 'Customer LOCALSERVER' (100 calls). 'Customer LOCALSERVER' calls 'lookupCustomer1...' on 'NewDB2 LOCALSERVER' (100 calls) and 'Legacy LOCALSERVER' (30 calls). 'EnterpriseCustomer CENTRALSERVER' calls 'getEnterpriseCu...' on 'EnterpriseCusto... CENTRALSERVER' (10 calls) and 'ThirdPartyCusto... CENTRALSERVER' (1 call).
- Statistics View:** A table with columns: Message Name, Requester Service, Requester Mac..., Provider Service, Provider Machine, and Send Time. The table lists various messages like 'lookupCustomerInNewDB2...', 'getEnterpriseCustomerReq...', and 'getEnterpriseCustomerRes...'.
- Sequence Diagram:** A timeline diagram showing the sequence of messages between 'LOCALCLIENT', 'Customer', 'NewDB2', 'Legacy', 'EnterpriseCusto... CENTRALSERVER', and 'ThirdPartyCusto... CENTRALSERVER'. It includes message names like 'lookupCustomerInNewDB2...', 'lookupCustomer', and 'getFromEnterpriseCustomerDB'.
- Content View:** A tree structure showing the content of a SOAP message. The root is 'soapenv:Body', containing 'getEnterpriseCustomer...' and 'getEnterpriseCusto...'. The 'address' element contains fields like 'city', 'country', 'postalCode', 'state', 'streetName', 'streetNumber', 'unit', 'unitDescription', and 'dialable'.

Life cycle management

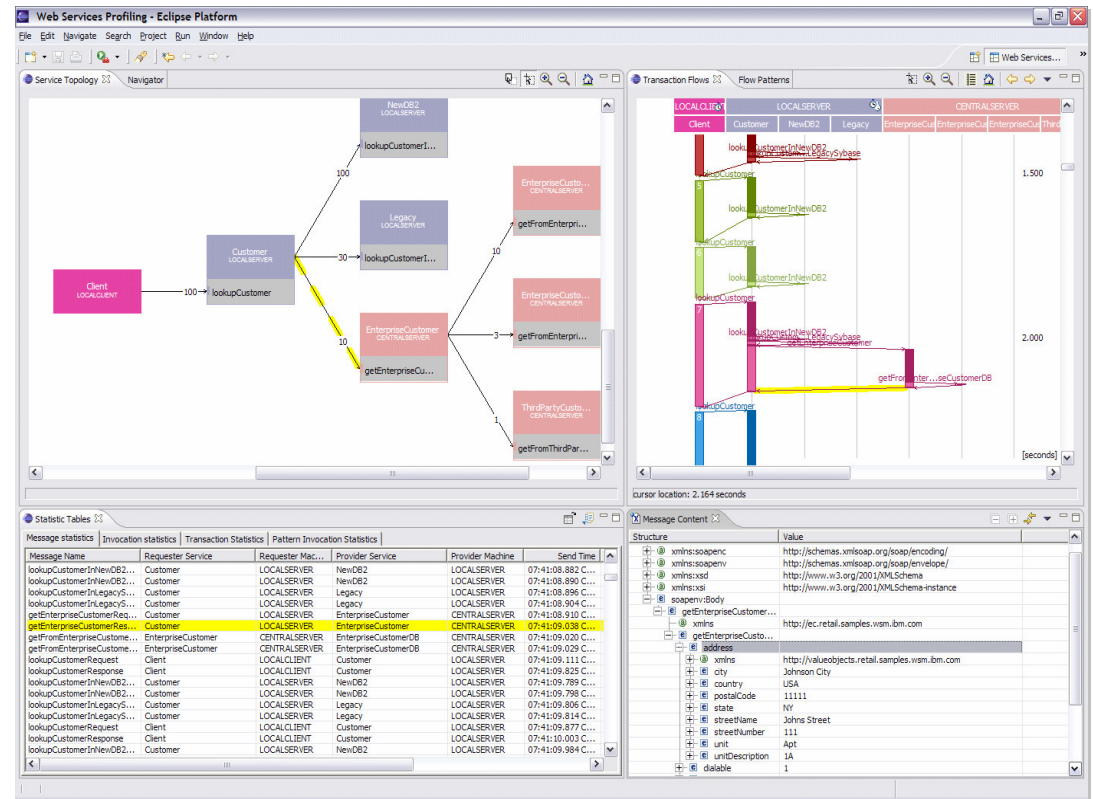
Bridging Operations and Development

Problem

- Web service response times are occasionally long

Solution

- Operations (using ITCAM for SOA) notice Web service response times occasionally exceed thresholds and some messages are exceptionally long
- Development uses Web Services Navigator to analyze and finds one external user is sending over-length messages
- Operations automate rejection of messages from the responsible user



Value

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

ITCAM for Response Time Highlights

Unified Infrastructure and User Interface

- Single infrastructure built on ITM
- Single, consolidated user interface built on Tivoli Enterprise Portal (TEP)

Improved Consumability to Enhance Ease of Use and Time to Value

- Fully customizable dashboard, reports and workspaces
- Simplified configuration, including default Situations
- Simplified installation
- Intelligent alerting based on ITM powerful situations editor
- Configurable data aggregation as low as every 5 minutes

Enhanced Response Time Monitoring

- Report & alert on any real time or historical response time metric
- Identify response time bottlenecks by Client, Network or Server times
- Identify, report & alert on individual clients or locations
- Discover, report & alert backend server resources
- Improved robotic monitoring w/ Rational Performance Tester (RPT)
- Immediate playback of robotic scripts
- Custom ARM application response time monitoring
- Improved CLI functions to edit configuration

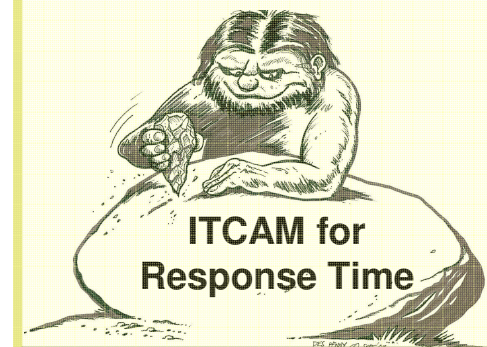
Deliver IBM Service Management Foundation Elements

- CCMDB discovery & real time status of Business Processes & Business Activities

**You can install
ITCAM for RT and
have it show real web
response time data
within minutes!
(Really!)**

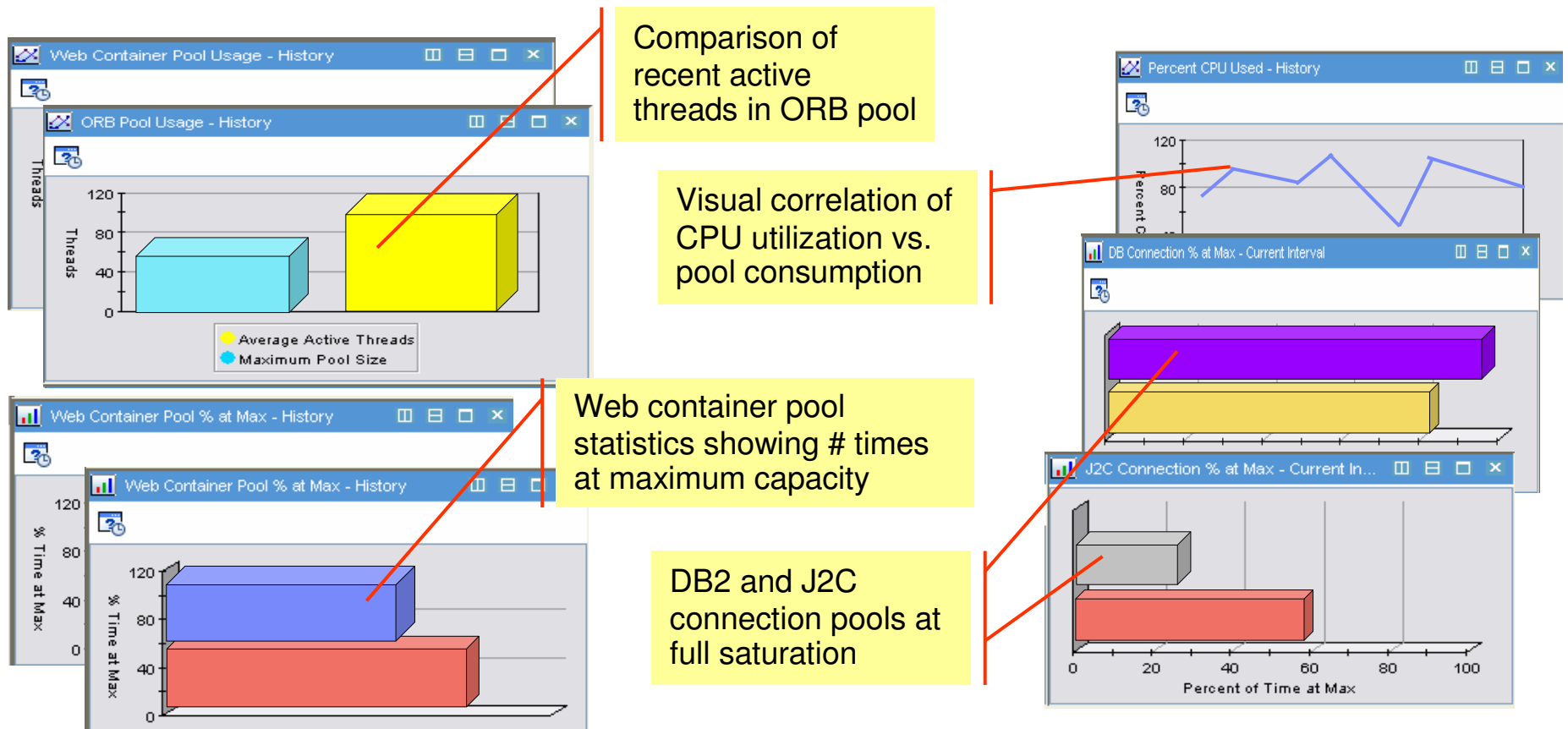
**ITCAM for RT is so
easy to run on top of
ITM that even a
(you guessed it)**

**A Neanderthal could
do it**



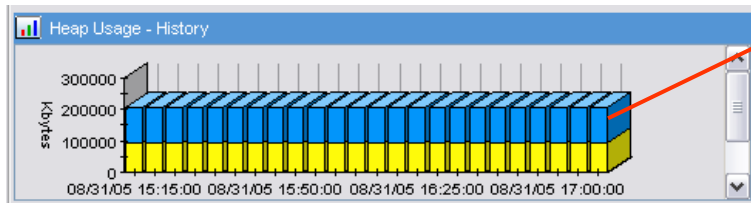
ITCAM for WS/J2EE/Web Resources – ITM/TEP Workspace

- J2EE resource pools are critical in terms of providing availability to commonly accessed services such as database access and other container pool types. This workspace enhances PMI data with configuration data to provide a comprehensive overview of requests flowing through WebSphere “funnel”.



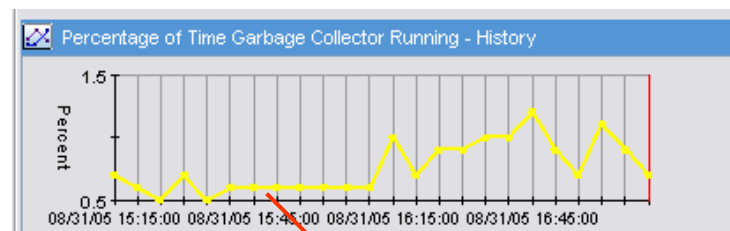
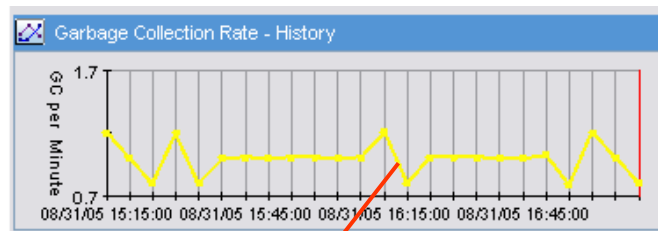
Garbage Collection Analysis

- Garbage Collection (GC) metrics such as frequency and time to complete can have a large effect on application server performance (during this time no other application processing can take place). This workspace shows a detailed breakdown of GC behavior and provides an complete analysis of GC performance metrics.



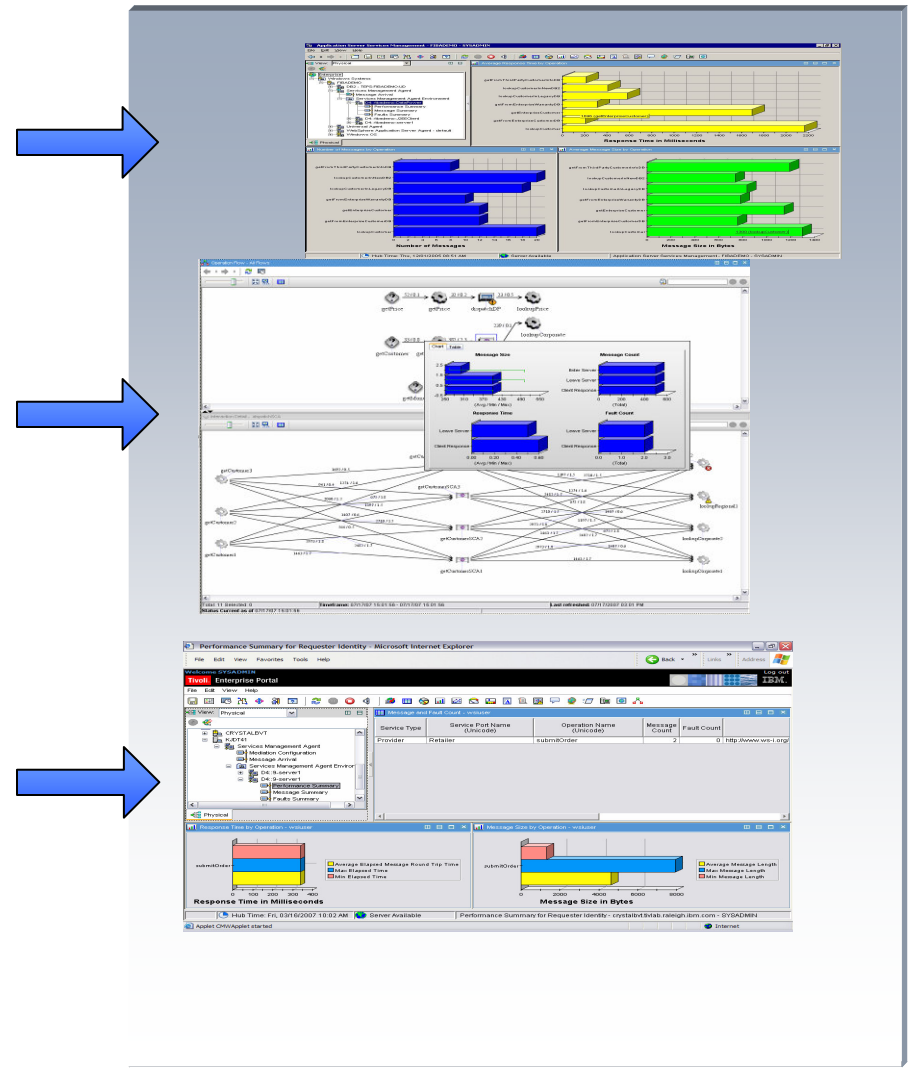
Detailed Analysis of Recent GC Performance

Sample Date and Time	Interval (sec)	Process ID	Times Run	Objects Freed	Objects Moved	Kbytes Total Freed by GC	Kbytes Used	Kbytes Used Delta	Kbytes Free	Real Time (ms)	Real Time (%)	GC Rate (per min)
08/31/05 17:14:00	59	78764	0	0	0	0	107339	15923	102440	0	0.0	0.000



ITCAM for SOA 7.1: “Simple, Straight-forward, Clear understanding of your SOA”

- **Enhanced Platform Support**
 - ▶ CICS TS 3.2, WebSphere Message Broker
- **Services To Services Topology Support**
 - ▶ New visuals and aesthetics for the services to services relationship
 - ▶ Aggregate metrics on the relationship
 - ▶ Status of the operation
 - ▶ Discovered operational flow
 - ▶ Support for all monitored containers
 - ▶ Cross product launch from the topology views to other products
- **Views Based on Service Requesters**
 - ▶ Track performance based on requesting client (user id or the remote IP address of the invoking client)
- **Easy Cross Product Linking**
 - ▶ Provides cross product launch capability to diagnose and resolve problems

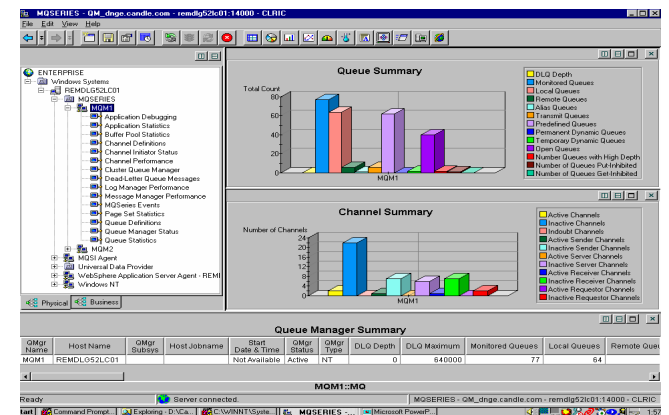


OMEGAMON XE for Messaging

- **Decrease WebSphere MQ and Message Broker Downtime**
 - ▶ Identifies common problems and automates corrective actions
 - ▶ Auto-discovery and immediate monitoring of complex environments
 - ▶ Drill-down to locate problem, identify root cause and resolve bottlenecks or outages

- **Proactively Prevent Problems**
 - ▶ Correctly configure and deploy your WebSphere MQ infrastructure
 - ▶ Detect and repair problems as they happen, or alert you to an imminent concern
 - ▶ Provides key MQ and Message Broker metrics for real-time and historical data analysis

- **Simplified Management with Single Tool**
 - ▶ Manages WebSphere MQ and Message Broker in distributed and mainframe environments
 - ▶ User-customized displays including business, platform and resource views



OMEGAMON XE for Messaging

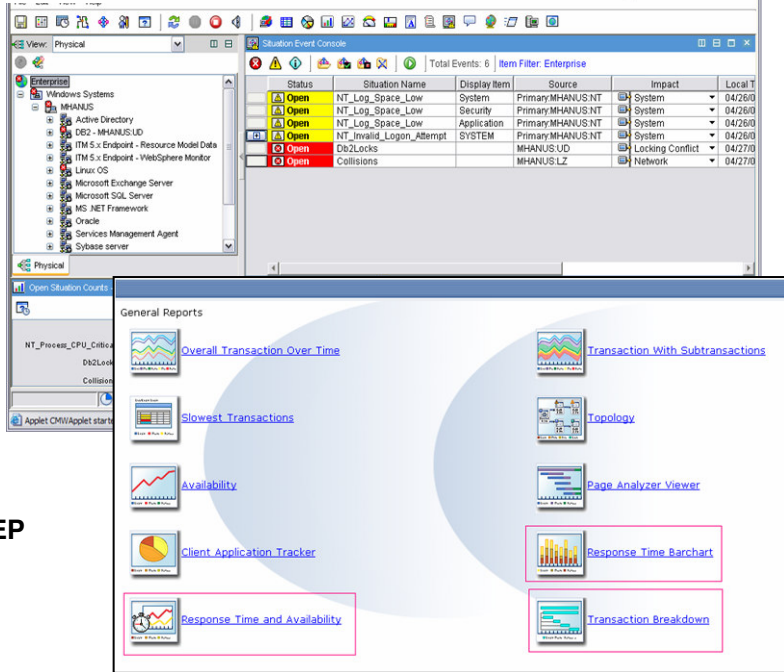
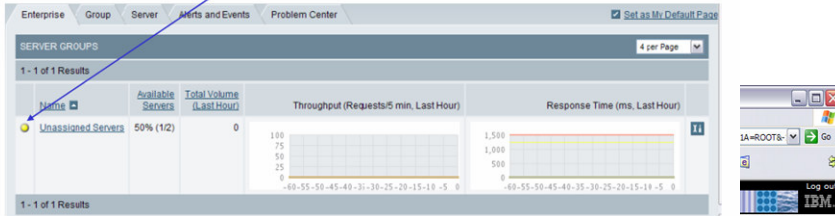
- **One Product to Manage WebSphere MQ and Message Broker**
 - ▶ Supports distributed and mainframe systems
 - ▶ Analyzes application performance and identifies slowdowns
 - ▶ Comprehensive monitoring of input/output message rates, brokers, message flows and sub-flows
 - ▶ End-to-end view across all systems
- **Expert Advice – Based on Industry Best Practices**
 - ▶ Detailed information about what triggered the alert plus Expert Advice suggesting possible solutions
 - ▶ Corrective resolutions can be implemented automatically, or select and apply manual actions
 - ▶ Real-time and historical data analysis



ITM and ITCAM Availability Dashboards

ITCAM for WS/J2EE

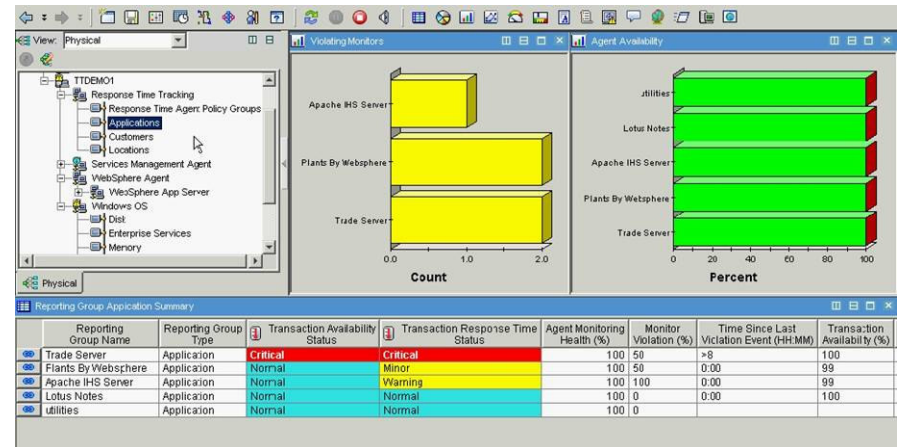
View availability information about managed application servers



ITM/TEP

ITCAM for RTT Reports

- Number of **visual indicators** to show availability of systems, application servers, applications, service etc.
- Automated **take actions** to mitigate critical situations ensure high availability
- Various Availability **Reports** available in ITCAM for WS/J2EE



ITCAM for RT/RTT workspaces in ITM/TEP

Create customized dashboards in Tivoli Enterprise Portal for Availability

Monitor using TEP **customized** graphical view for visual correlation across WebSphere/J2EE system and components

The screenshot displays the Tivoli Enterprise Portal interface for an 'On-Line Ordering System'. The top section shows a tree view of system components and a table of current problem status. The bottom section shows a detailed diagram of the WebSphere Application Server status, including its internal components and external connections.

Status	Situation Name	Source	Opened	Age	Loca
Open	EJB_Timeout_Failure	MQA.MQA.MQ	04/08/03 10:56:09	0 Minutes	04/08/03
Open	User_Response_SLA_Breach	MQA.MQA.MQ	04/08/03 10:56:09	0 Minutes	04/08/03
Open	Prod_MQ_Channel_Failure	MQA.MQA.MQ	04/08/03 10:56:08	0 Minutes	04/08/03
Open	JMS_Response_Failure	MQA.MQA.MQ	04/08/03 10:56:08	0 Minutes	04/08/03

The diagram below the table illustrates the 'WebSphere Application Server' architecture. It shows a 'Web Server' on the left connected to the 'WebSphere Application Server' box. Inside this box are components: 'Operating System', 'Servlets JSPs', 'Enterprise Beans', 'JDBC', 'Connectors', and 'JMS'. The 'JDBC' component is connected to a 'DB2 UDB' database. The 'Connectors' component is connected to 'CICS OS390' and 'DB2' systems. The 'JMS' component is connected to 'WebSphere MQ', which in turn is connected to a 'UNIX' system. All components have status indicators (green or yellow).

Integrated End to End Support for Heterogeneous Environments

Available with IBM Tivoli Monitoring 6.1, OMEGAMON & Composite Application Manager

IBM Tivoli monitoring spans the breadth of your IT environment

Platforms	Databases	Applications	Business Integration	Web Infrastructure	Messaging & Collaboration	Universal Agent
Unix	DB2 (Z & Distributed)	SAP	Web Services	WebSphere (Z & Distributed)	Lotus Domino	Agent-less Adapter URL, SNMP, File, Socket, UDB.... Agent Quick attach API
Windows		.NET (full suite of MS apps)	CICS			
Cluster(s)	Oracle		SOA	iPlanet		
Linux	SQL	Citrix	IMS			
z/VM	Sybase	Siebel	WebSphere MQ	Apache	Exchange	95+ Custom Packages available for modification
z/OS		Tuxedo	WebSphere MQ Broker			
VMWare	Informix					
OS/400						Netcool



Summary

- IBM Tivoli Composite Application Manager for SOA
 - ▶ Identifies service problems and speeds resolution
 - ▶ Automates service management and mediation
 - ▶ Supports heterogeneous SOA platforms
 - ▶ Integrates into Tivoli Enterprise Portal
 - ▶ Helps manage the SOA life-cycle
- Simplifies SOA application management
- Minimizes support and deployment costs

- Achieves a rapid return on investment

Tivoli: Delivering on SOA Management



QUESTIONS



THANK YOU