ITCAM for Transactions

April, 2009

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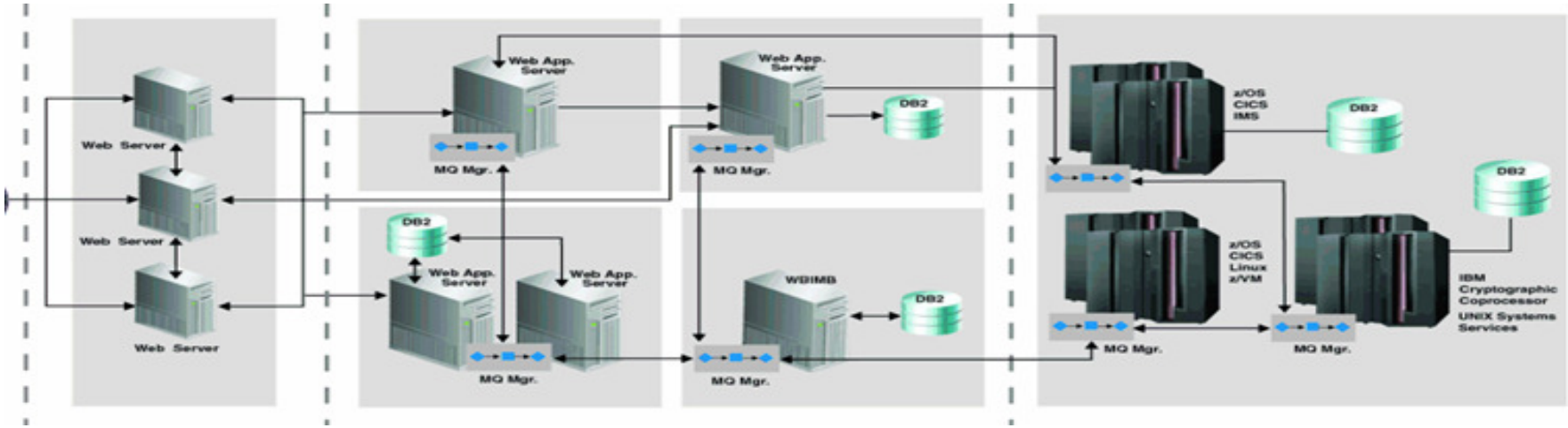
Workflow for Resolving Composite Application Problems

Sense → **Isolate** → **Diagnose** → **Repair**

Sense	Isolate	Diagnose	Repair
Detect that a threshold has been breached and that a problem occurred, or is about to happen	Pinpoint the problem to a specific part of the environment and hand-off to the appropriate specialist	Drill down into the details and get to the root cause of the problem	Fix the faulty component, validate the fix and roll back into production



ITCAM for Transactions

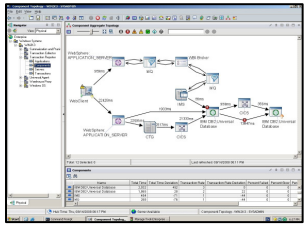
Deep-dive tools

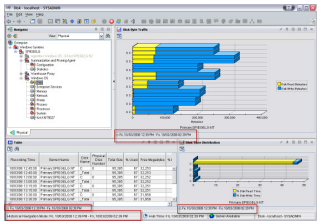
- ITM
- ITCAM for Applications
- ITCAM for SOA
- OMEGAMON

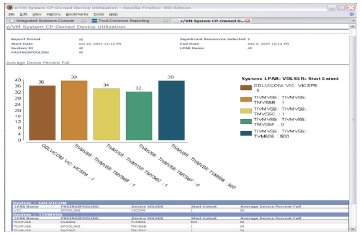
Composite Application Management and Resource Monitoring

- Monitor application response to ensure business expectations are met
- Understand transaction flows over complex topologies
- Monitor infrastructure performance and availability
- Diagnose application performance issues
- Increase application availability and customer satisfaction
- Reduce MTTR and MTBF

IT Staff

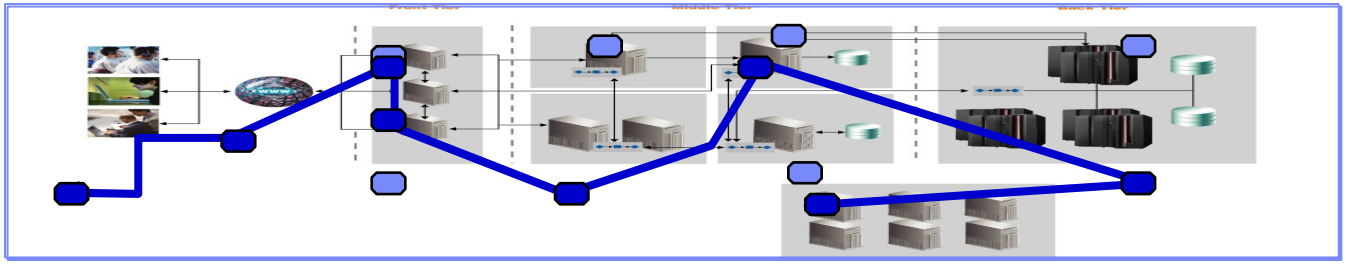






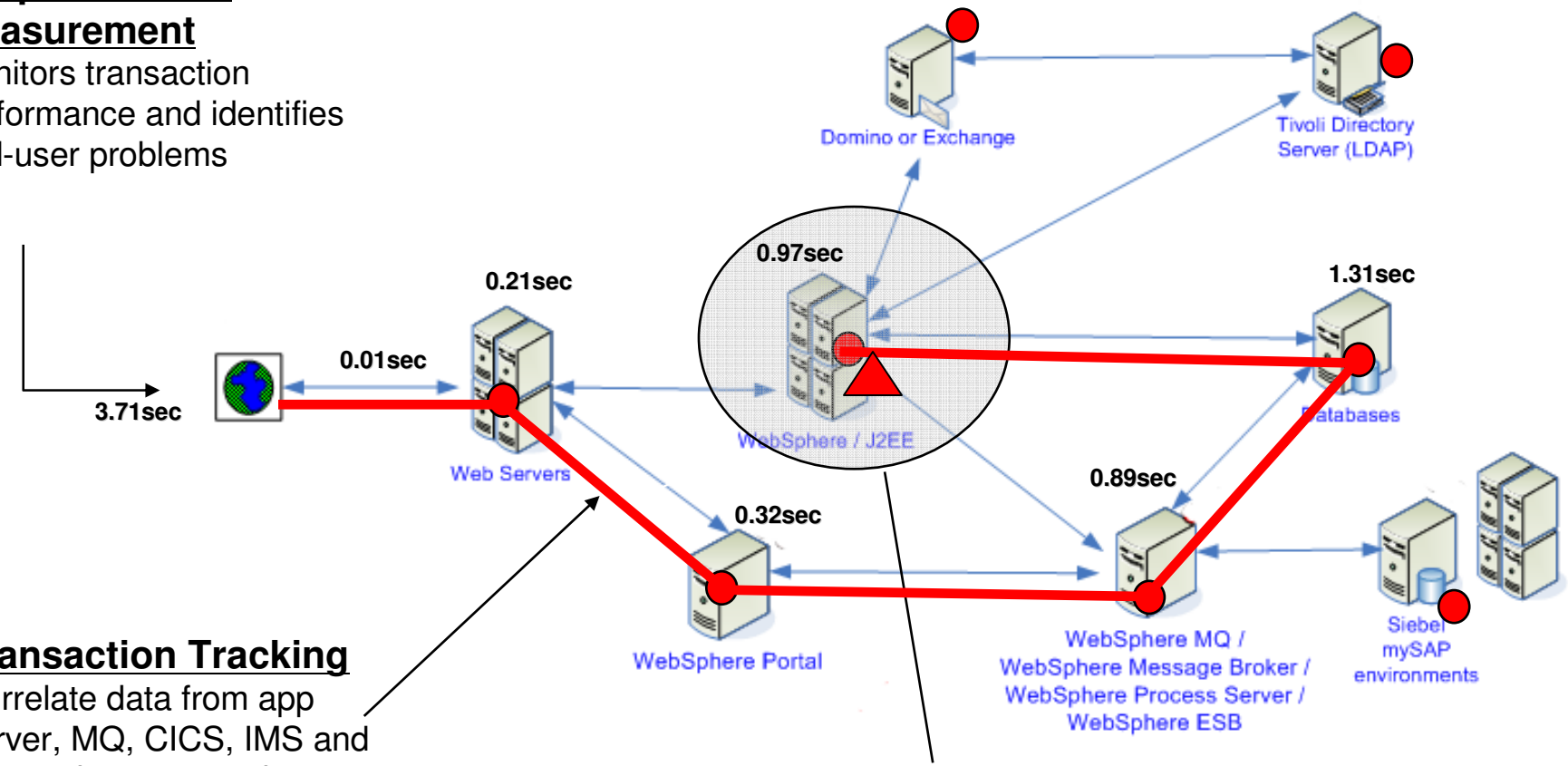
Transactions | Applications | Servers

IT Customer



End-to-End Monitoring, Tracking and Diagnosis

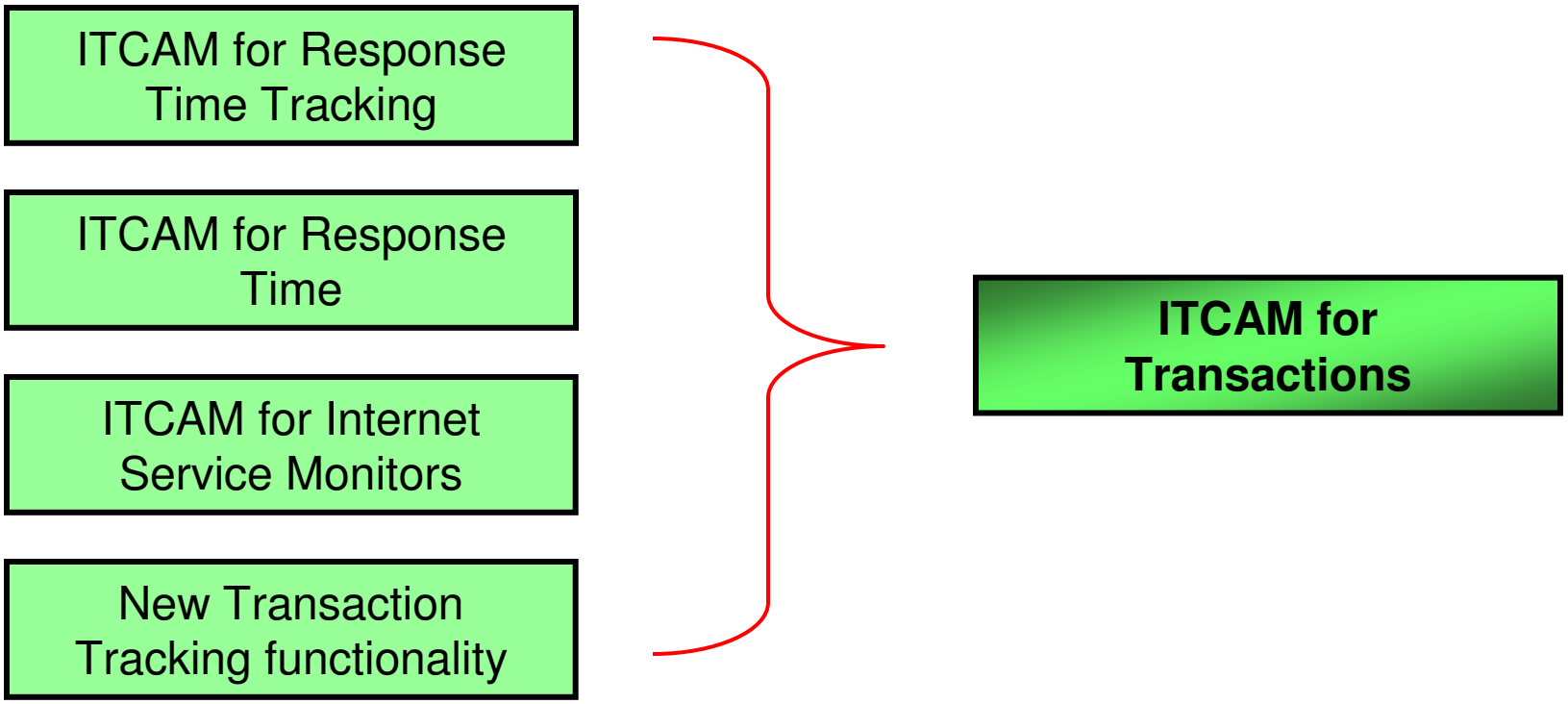
Response Time Measurement
Monitors transaction performance and identifies end-user problems



Transaction Tracking
Correlate data from app server, MQ, CICS, IMS and custom instrumentation to show topology and isolate problems

Deep Dive diagnostics
Launch in context to SME capabilities including SME level tracking within specific domain

Portfolio Consolidation

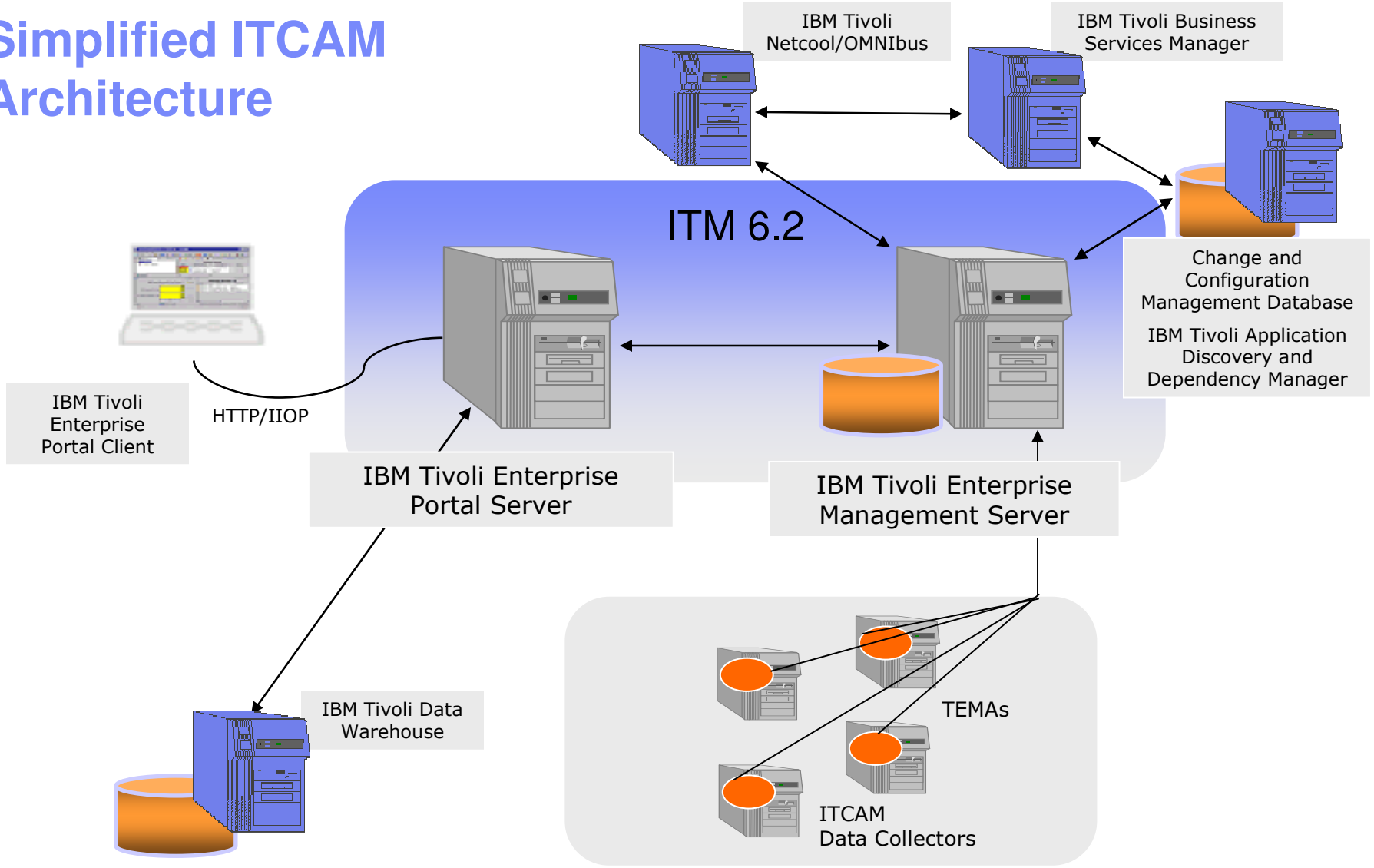


✓1 UI ✓1 Infrastructure ✓1 Data Warehouse

✓Common Reporting ✓Launch in Context

✓Simplified Pricing

Simplified ITCAM Architecture



IBM Tivoli Resource Monitoring

A Common Portal, Information and Automation Infrastructure

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Tivoli Enterprise Portal (TEP)

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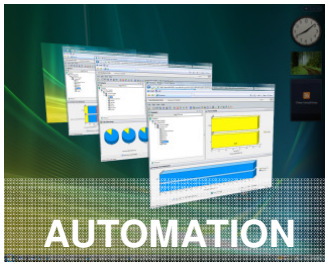
Tivoli Data Warehouse (TDW) and Situations



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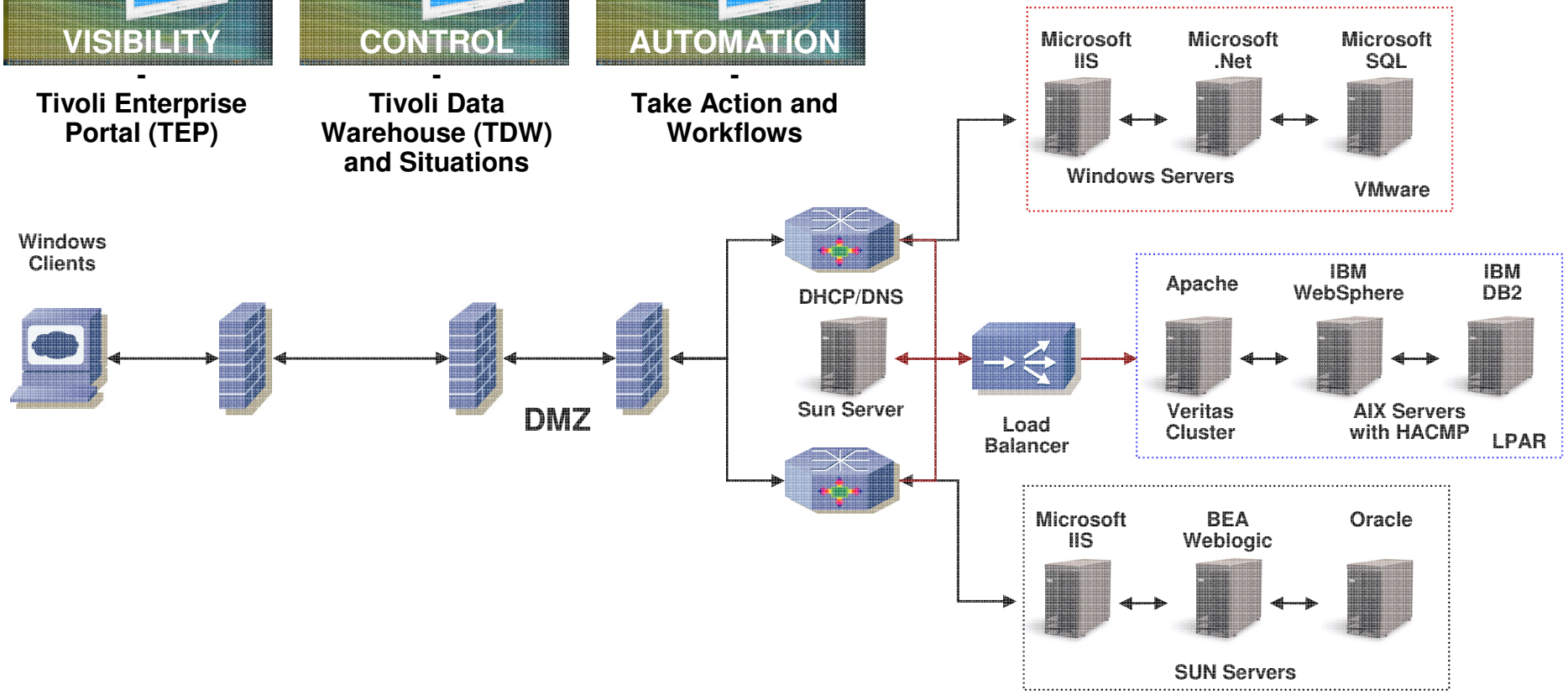
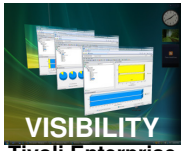
Take Action and Workflows



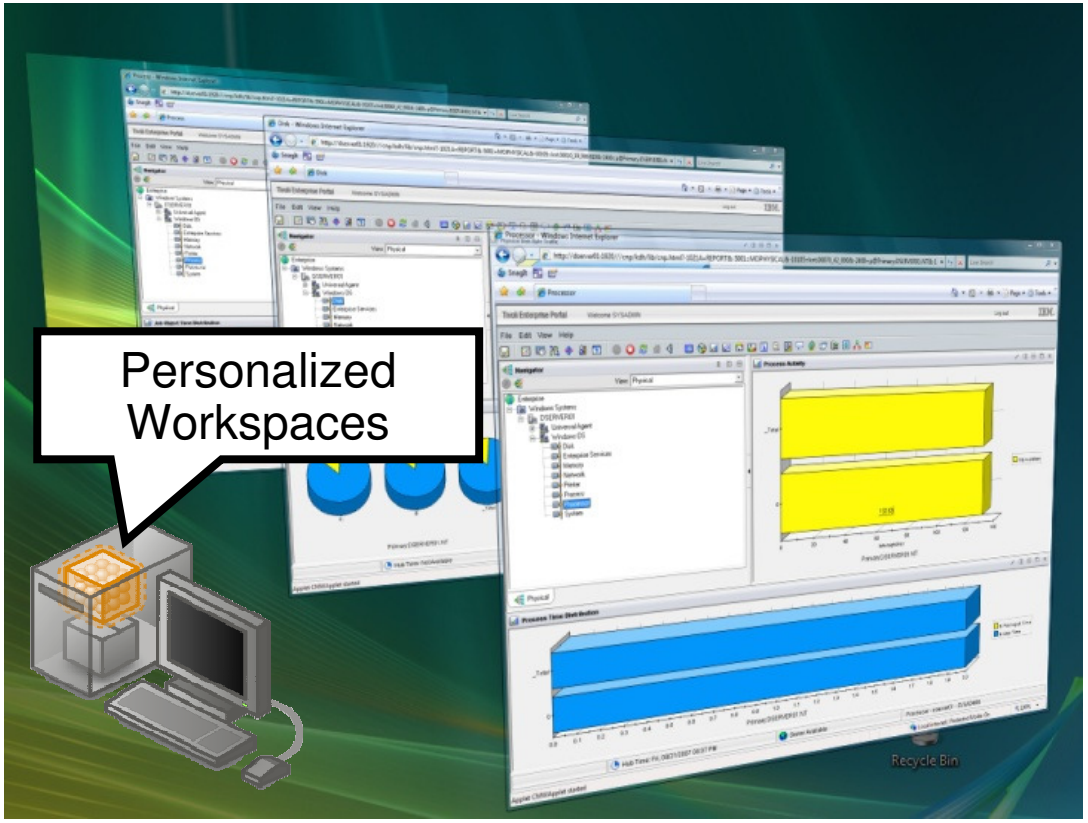
IBM Tivoli Monitoring - Visibility

IBM Tivoli Enterprise Portal (TEP)



The Tivoli Enterprise Portal (TEP) is the central location to view and act on contextualized information provided by the system monitors

- **Consolidated** view and **contextual** information can significantly reduce mean time to recovery by aiding in **"root cause"** analysis
- **Centralized** visualization of real-time and historical data can help with "intermittent" problems
- **Personalized** views based on the user roles and scope
- **Visualization of resource utilization** can highlight areas to reduce costs
- Anything visualized in the TEP is available **in the Data Warehouse**



Transaction Tracking

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Customer Pain – Sensing and Isolating a Problem Today

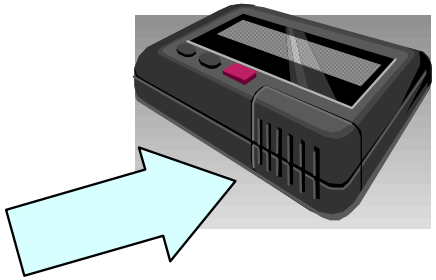
Response time is terrible; more than one minute.

Check all resources

- System Alerts
- Health Monitors
- OS Statistics
- Network traffic
- Application log files
- Database metrics

Everything looks normal … but performance is still bad

Bridge Call with Tiger Team



Locate Source of Problem … maybe …

- Finger-pointing: "It's the network guy's fault"
- Recreating the problem is difficult
- Isolating the cause can take hours or days
- Solutions by chance

Customer Value – Demonstrating ROI

Money wasted isolating problems

Sev 1 outages/slowdowns per year	12
Average time to isolate (hrs)	8
SME's involved in isolation	15
Avg. loaded hourly rate (/hr)	$75
Total direct costs	$108,000

Revenue lost during outages

Lost revenue / hr	$10,000
SLA penalties / hr	$5,000
Hours downtime / yr	96
Total indirect costs	$1,440,000

Total costs of poor problem isolation capability

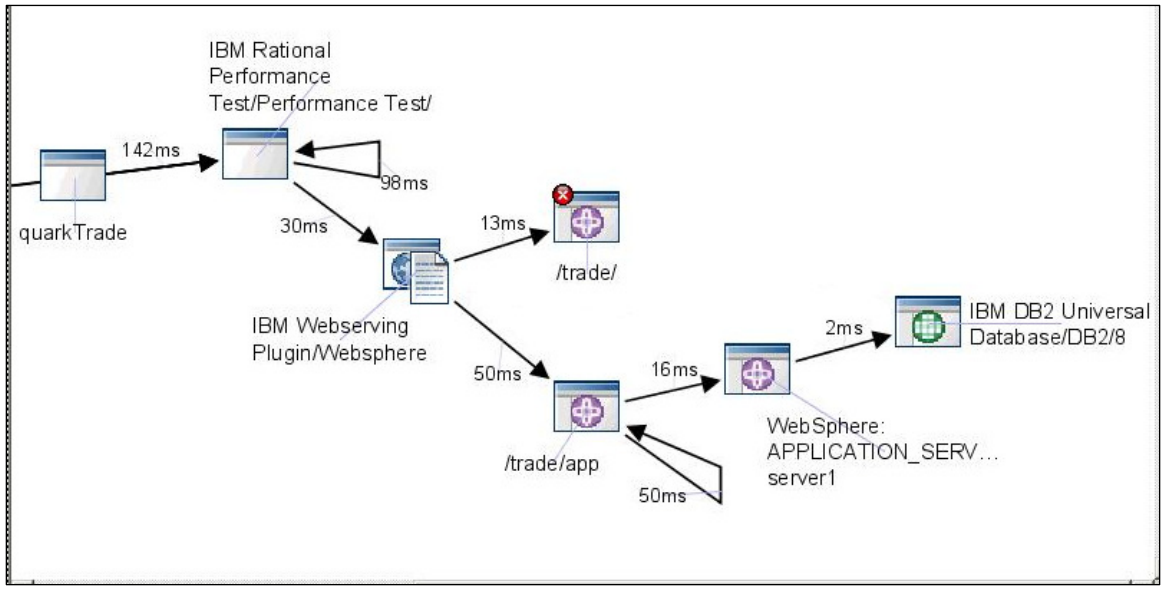
Total lost / yr	**$1,548,000**

Every customer case will be different …

*…what do **you** lose each year due to poor performance?*

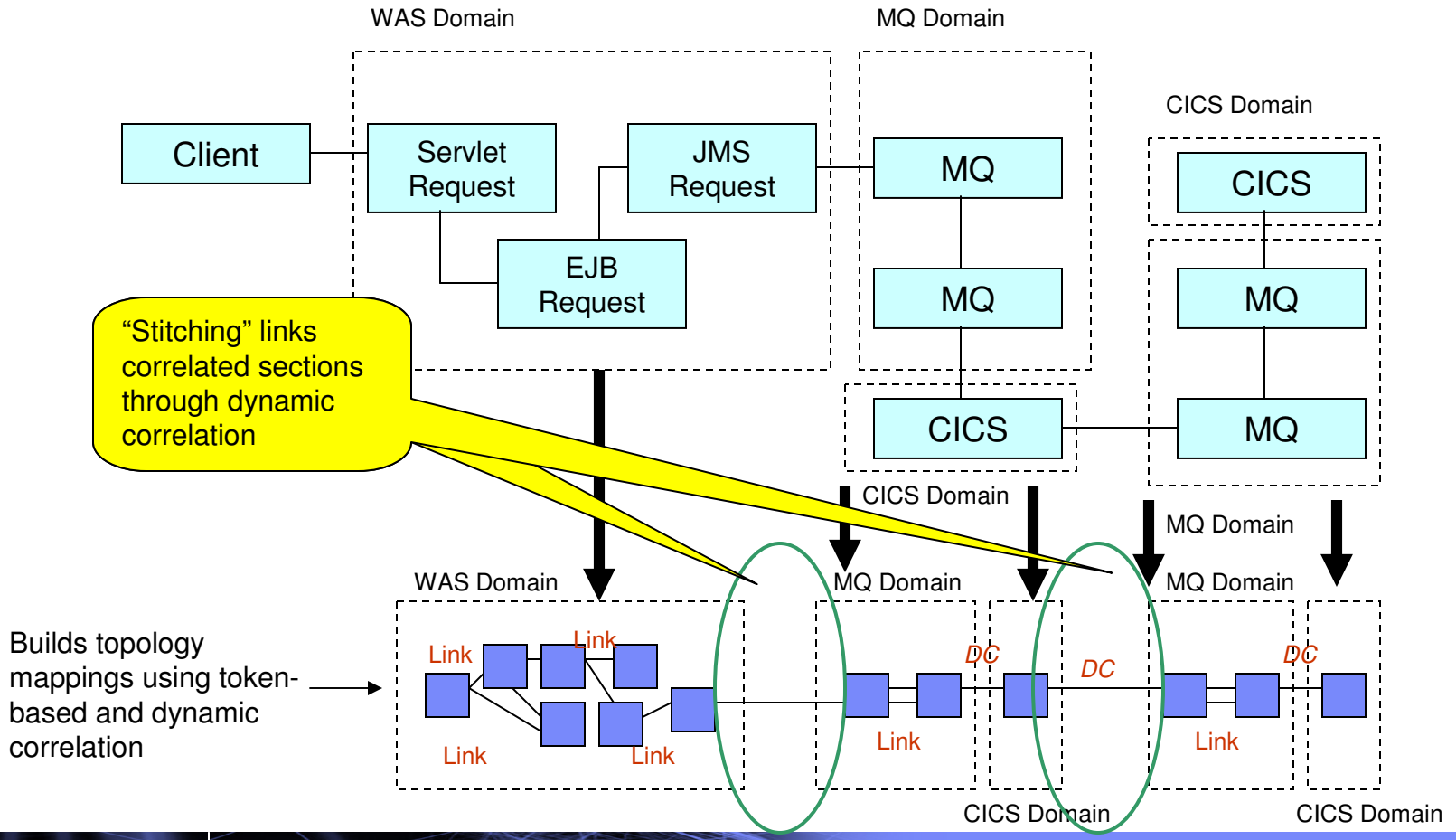
Transaction Tracking Overview

- Unified, end-to-end transaction tracking across heterogeneous environments - fully integrated across distributed and zSeries
- Domain-thru-domain tracking capability via dynamic correlation – token passing not required
- Support for existing ARM instrumentation, plus introduction of a much simpler transaction tracking API (“ARM lite”)
- Makes token-based based tracking more consumable, less dependent on how systems are connected
- Support for asynchronous transactions
- Extensible, modular framework
- Integrated response time and transaction tracking



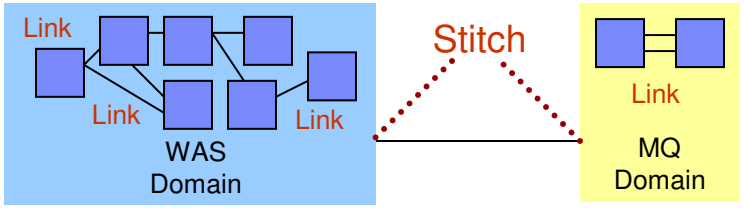
Enterprise-Wide Tracking

- Track inside domains with correlated techniques
- Track between domains through stitching



Dynamic Correlation

- Dynamic correlation is a technique for enabling transaction tracking from one application domain to another. A domain here refers to a section of a transaction that utilizes a similar tracking technology, E.g. WAS, or MQ, or a native customer application.
- "Stitching" is the term we use to define the way we apply the dynamic correlation technique within the tracking product to track an individual transaction between two domains.



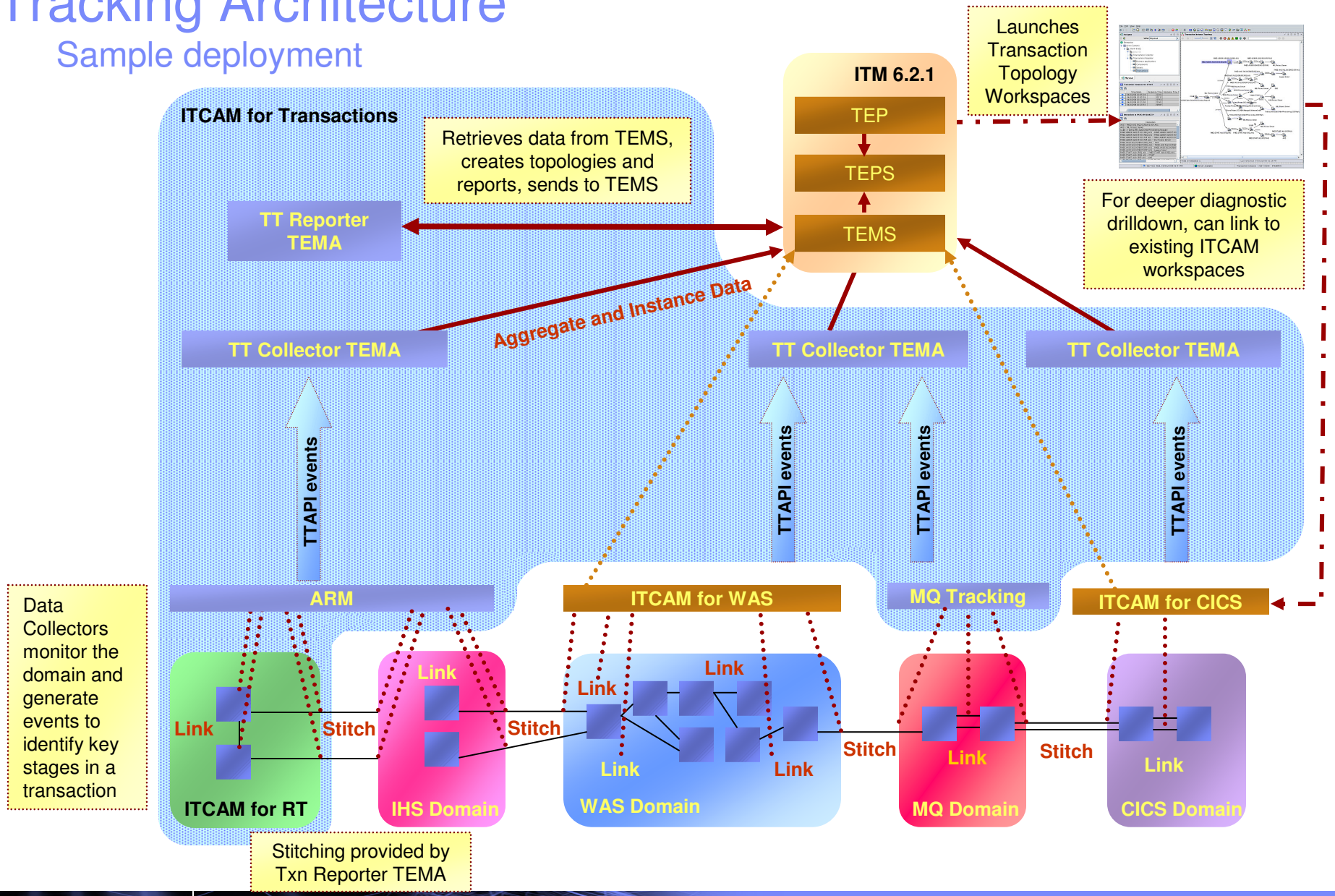
- The dynamic correlation will match configured attributes from each side of the domain boundary to create a "stitch". For example, the set of common attributes between WAS and MQ may be of this form:

Outgoing WAS transaction attributes	Incoming MQ transaction attributes
Application Name	
Source Host	**Connecting Server name**
Thread ID	
Destination Queue Manager	**Connected Queue Manager**
Destination Queue	**Opened Queue**
	Message ID
etc.	etc.

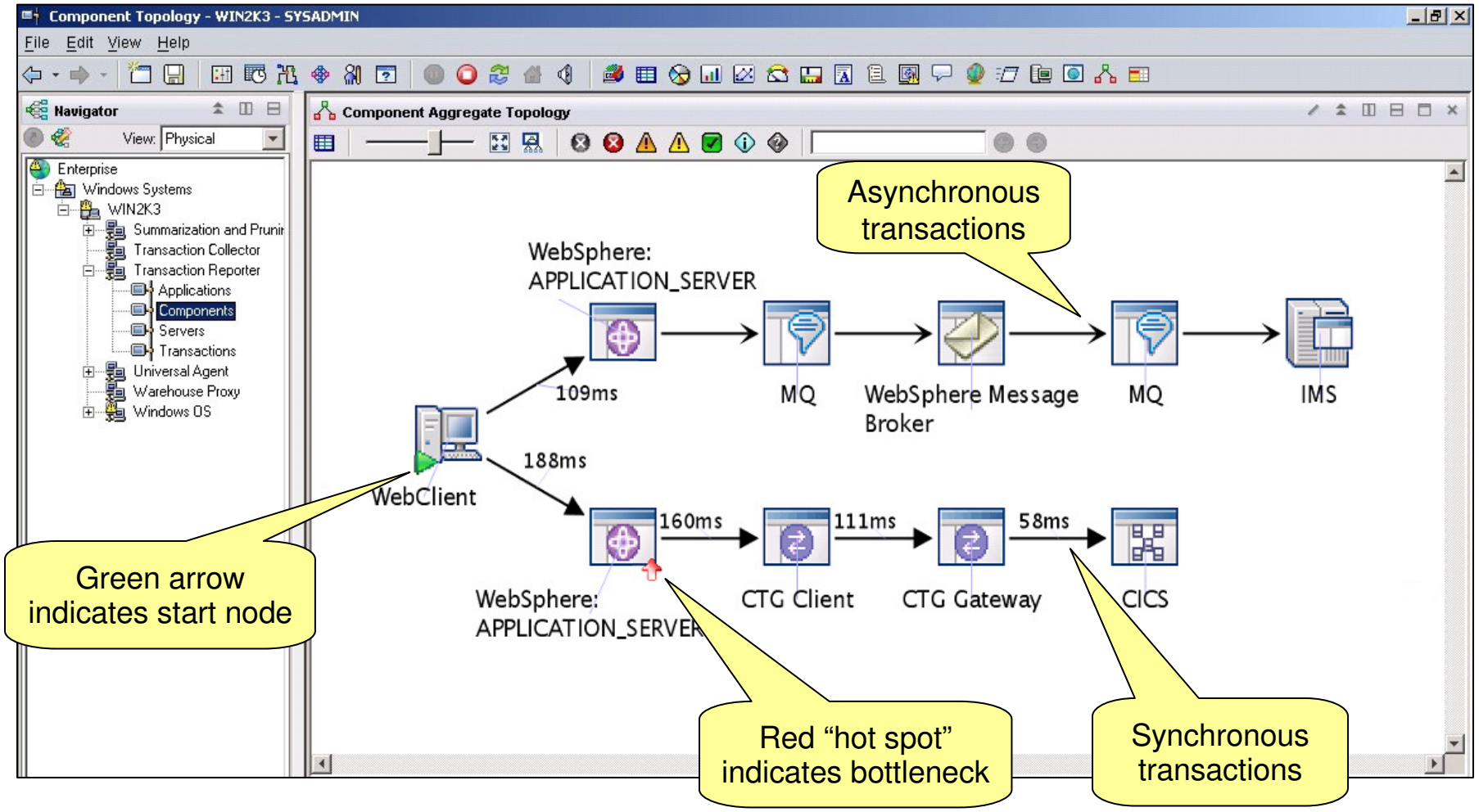
Attributes in **red** show the common set of attributes that define a unique transaction instance.

Tracking Architecture

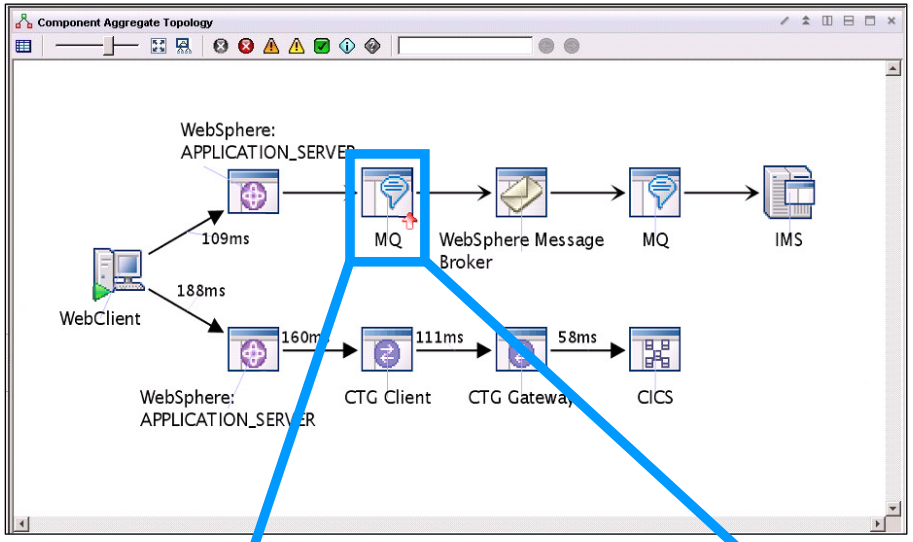
Sample deployment



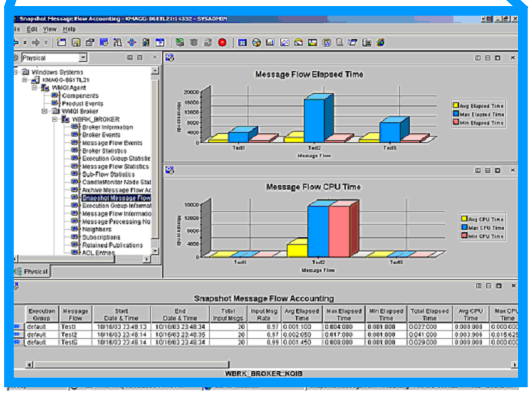
Transaction Tracking Topology



Deep-dive drill down



ITCAM for Transactions



OMEGAMON XE for Messaging

- Uses Dynamic Workspace Links to launch in context into appropriate SME tool.
- Launch destinations depend on type on data source. E.g:
  - MQ -> OMEGAMON XE for MSG
  - WAS -> ITCAM for WAS
  - CICS -> OMEGAMON for CICS
  - IMS ->OMEGAMON for IMS
- Where appropriate, will drill down to specific workspace (ie. In MQ, Queue Manager drilldown links to the Queue Manager Status Workspace for the specific Queue Manager).

End-User Response Monitoring

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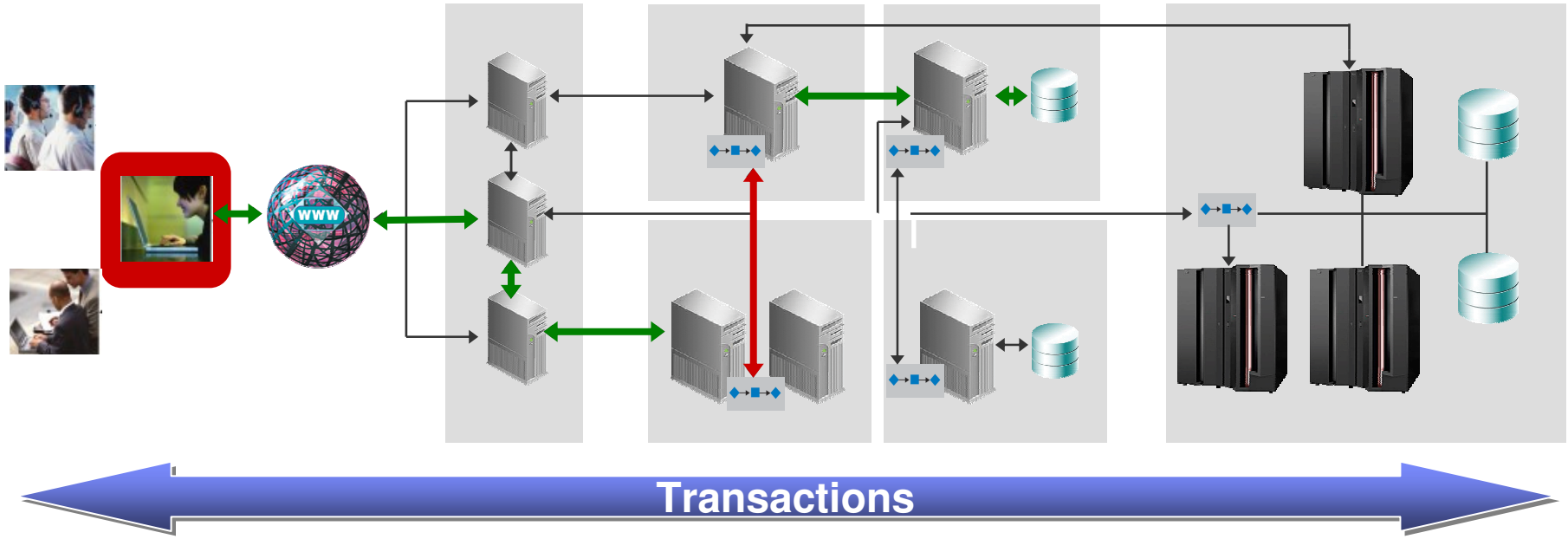
Why Monitor End-User Response?



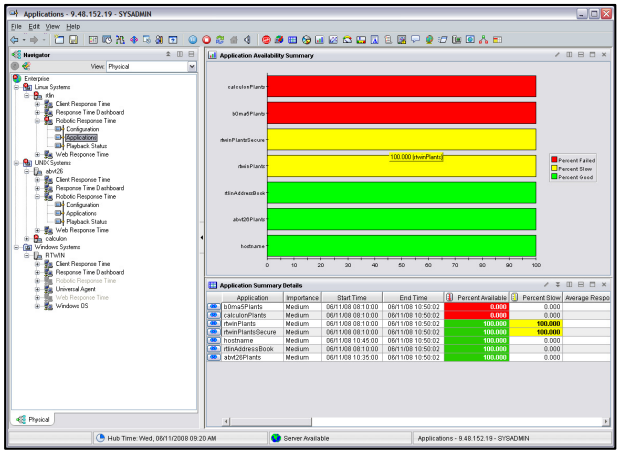
- See what your users are experiencing
- Validate production system performance
- Identify problems before they affect SLA's
- **If you have a problem, find out about it *before* the customers start complaining**

A majority of IT problems are still being **identified by customer complaints**

Two Approaches to Response Time Monitoring

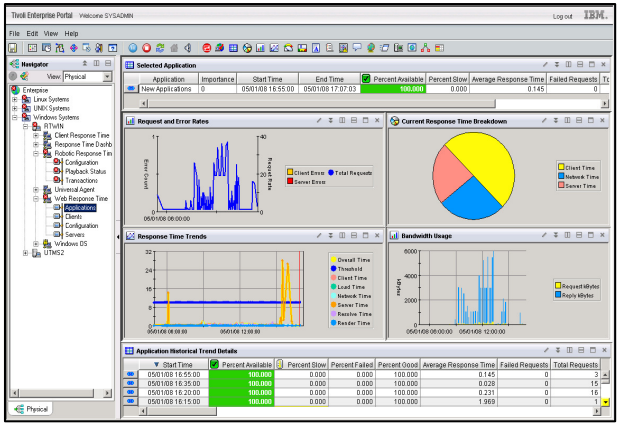
Real End User Transactions

- **Web Response Time Monitoring**
  - Reports end user experience for web applications
  - Appliance mode eliminates overhead at the server
- **Client Response Time Monitoring**
  - Monitors real user client desktop Windows applications and transactions



Robotic Transactions

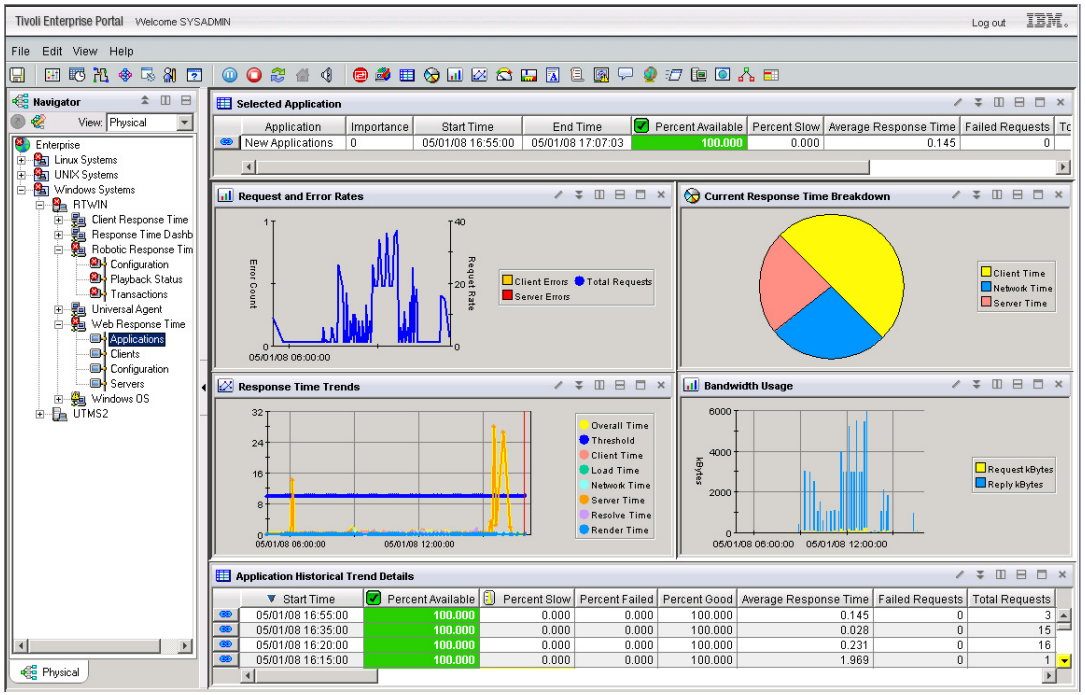
- **Robotic Response Time Monitoring**
  - Periodic testing of business transactions
  - Record and execute a set of user defined steps
- **Internet Service Monitoring**
  - Periodic testing of service availability
  - Simple and lightweight



Real User Monitoring

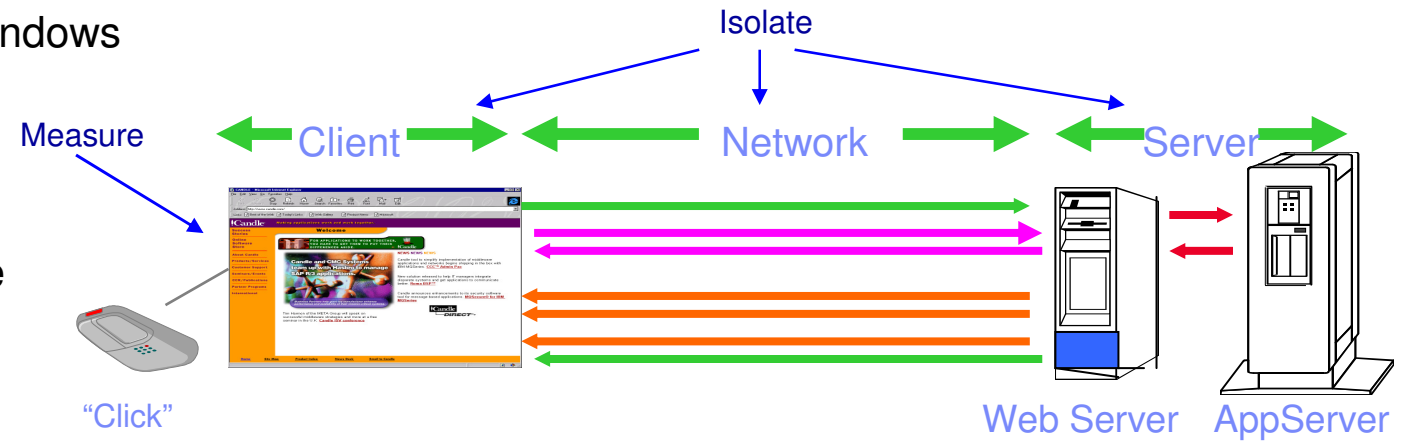
Web Applications

- Captures performance and availability data of actual users for SLA reporting
- Completely non-invasive, agentless monitoring
- Monitors network traffic for HTTP(S) requests to the web server



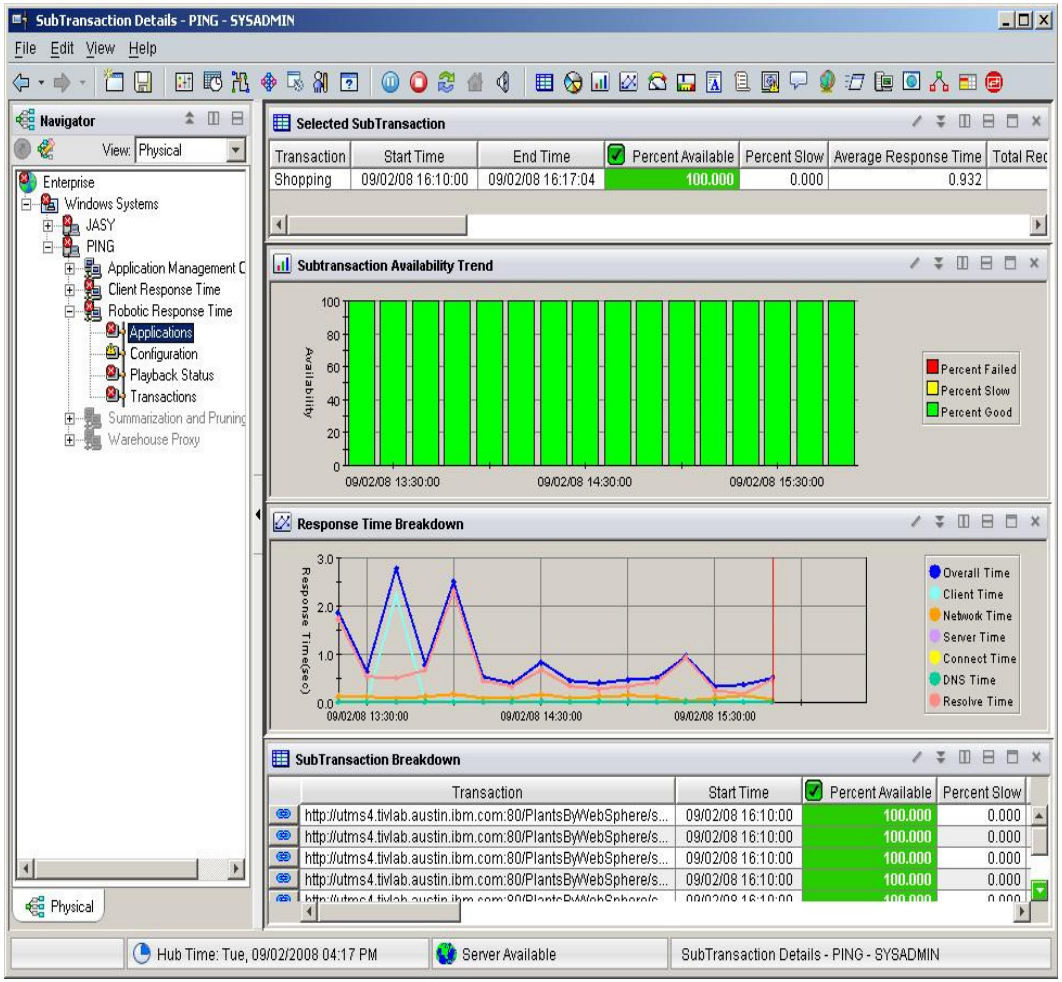
Windows Applications

- Monitors selected Windows applications
- Agent on client workstation provides details response time analysis



Robotic Monitoring

- Verification Points for content matching and response code checking
- HTTP transactions correlate with downstream instrumentation for problem isolation
- Improved scalability for more concurrent playbacks on a single agent
- Support for a growing list of protocols: HTTP(S), Siebel, Citrix, web services



Internet Service Monitors

Agentless protocol-level availability monitoring

ITCAM for ISM provides

- **Comprehensive service monitoring**
  - Measure availability, performance and content accuracy of services via 25 protocols
  - Simulates clients of services
  - Periodic testing
    - Measure against defined SLA - % availability
    - Identify long term trends with historical reporting
  - Broad application / service coverage

- **Assures service availability for business critical applications**
  - Is my service/application working now?
  - Why is it failing?
  - Is the performance degrading?
  - Is it meeting my SLA?

Highlights

- Full ITM and TEP integration:
  - Native TEMA support for the Databridge
  - TEP Swing UI for ISM configuration
  - Predefined Workspaces and Situations
- New monitors: **SIP** and **SOAP**
- Added Currency: SNMPv3, HTTP 1.1

ITCAM for ISM supports 25 protocols and complements the robotic and real user response time monitoring functions of ITCAM for Response Time. Together they form Tivoli's comprehensive solution for application response time monitoring.

Internet Service Monitors - Protocols Monitored

- DHCP - Dynamic Host Configuration Protocol (RFC 2131)
- DIAL - Dial up Service
- DNS - Domain Name Service (RFC 1035)
- FTP - File Transport Protocol (RFC 959)
- HTTP - Hypertext Transport Protocol (RFC 1945)
- HTTPS - HTTP Secure Socket Layer (RFC 1945)
- ICMP - Internet Control Message Protocol (RFC 792)
- IMAP4 - Internet Message Access Protocol (RFC 2060 & 822)
- LDAP - Lightweight Directory Access Protocol (RFC 2251)
- NNTP - Network News Transport Protocol (RFC 977 & 850)
- NTP - Network Time Protocol (RFC 2030)
- POP3 - Post Office Protocol (E-mail) (RFC 1081 and 822)
- RADIUS - Remote Authentication Dial-In User Service (RFC 2138 and 2139)
- RPING - Remote Ping for Cisco and Juniper Routers
- RTSP – Real-time Streaming Protocol (RFC 2326)
- SAA – Cisco Service Assurance Agent
- SNMP - Simple Network Management Protocol (RFC 1441-1452, 1901-1908 & 275)
- SMTP - Simple Mail Transport Protocol (RFC 821 & 822)
- TCP PORT - Transmission Control Protocol
- TFTP – Trivia File Transport Protocol (RFC1350)
- TRANSX - Transaction Monitor
- WMS – Microsoft Windows Media Server

Recent additions:

- SIP – Session Initiated Protocol (RFC 3261)
- SOAP
- SNMP v3

What's New For End-User Response

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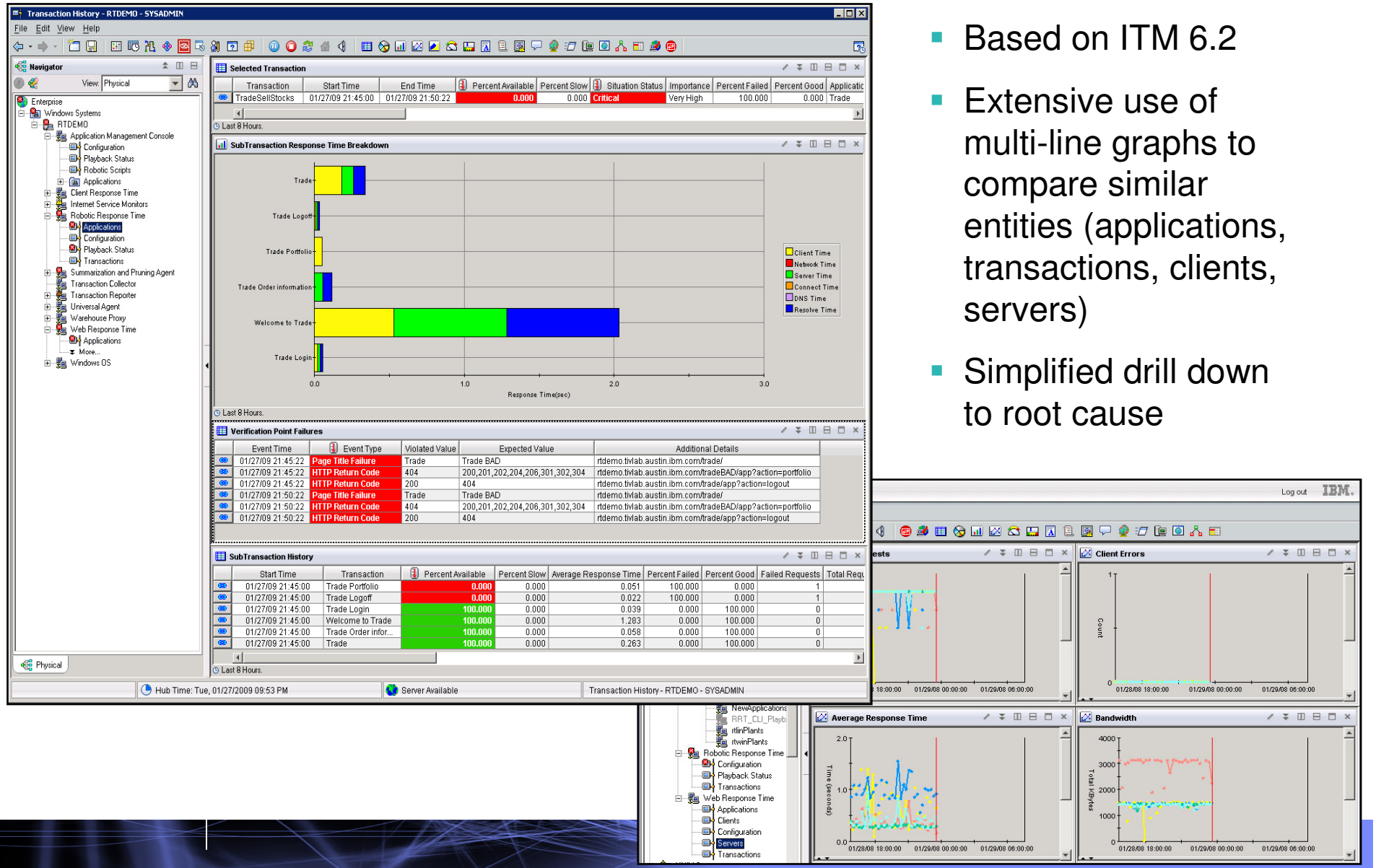
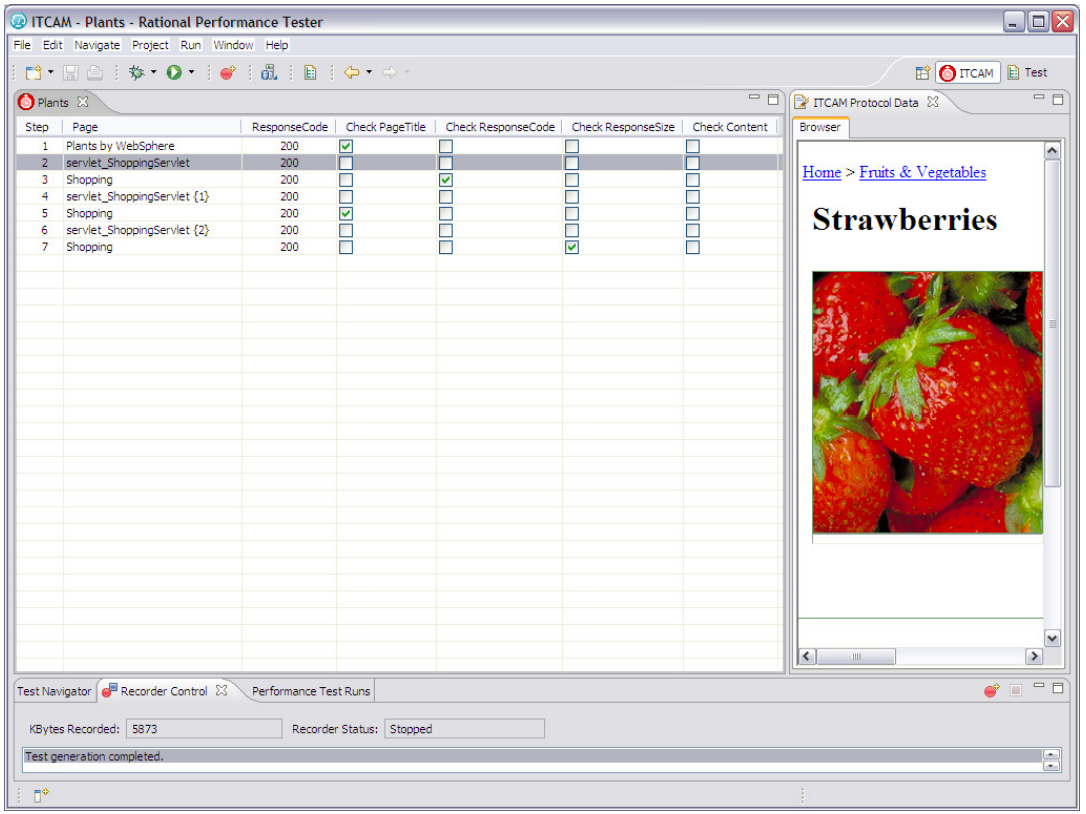
Improved Agent Workspaces



- Based on ITM 6.2
- Extensive use of multi-line graphs to compare similar entities (applications, transactions, clients, servers)
- Simplified drill down to root cause

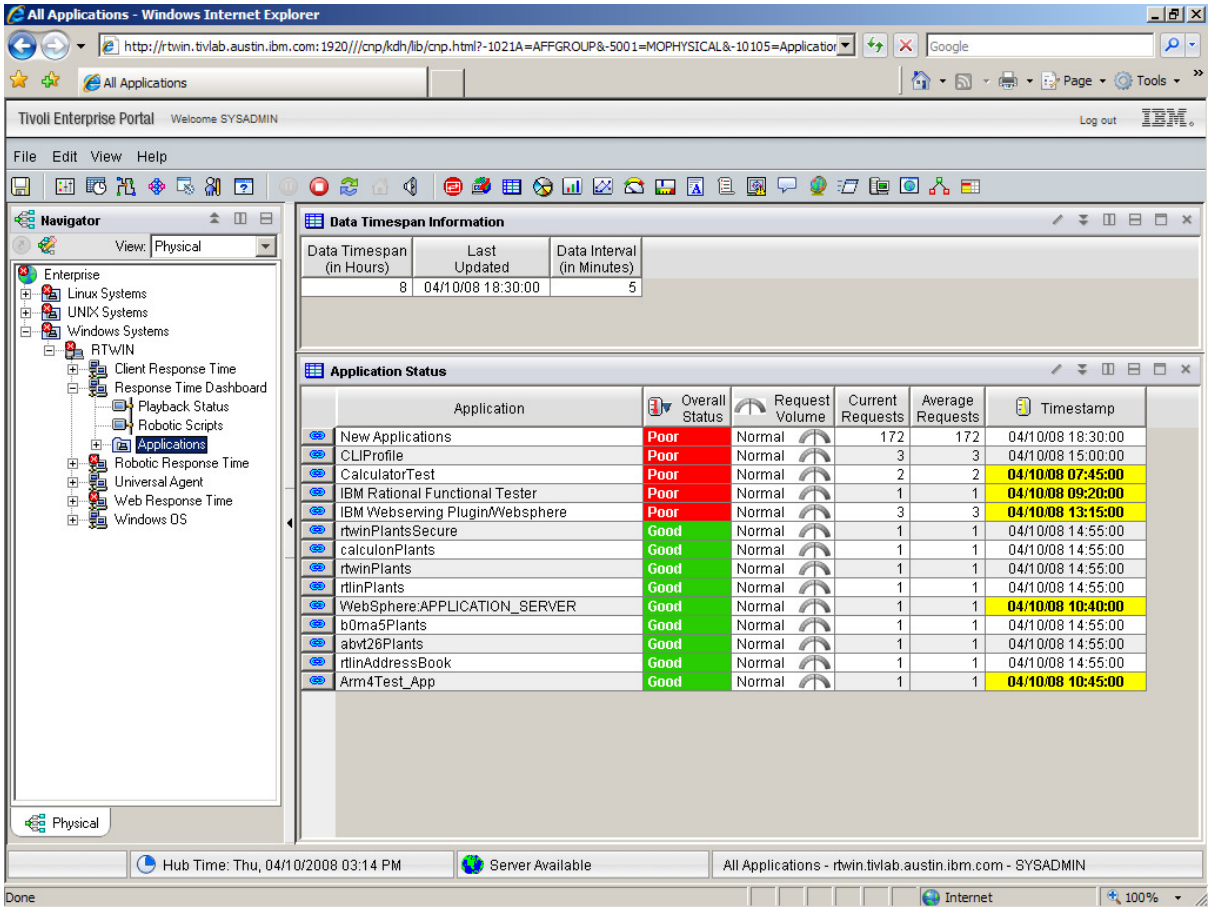
Simplified Rational Performance Tester Editor

- New recording interface for creating and uploading RPT scripts
- Automatically sets default verification points for use with robotic playback
- Browser view for easy reference
- Ability to switch to “Advanced” view (original RPT workbench)



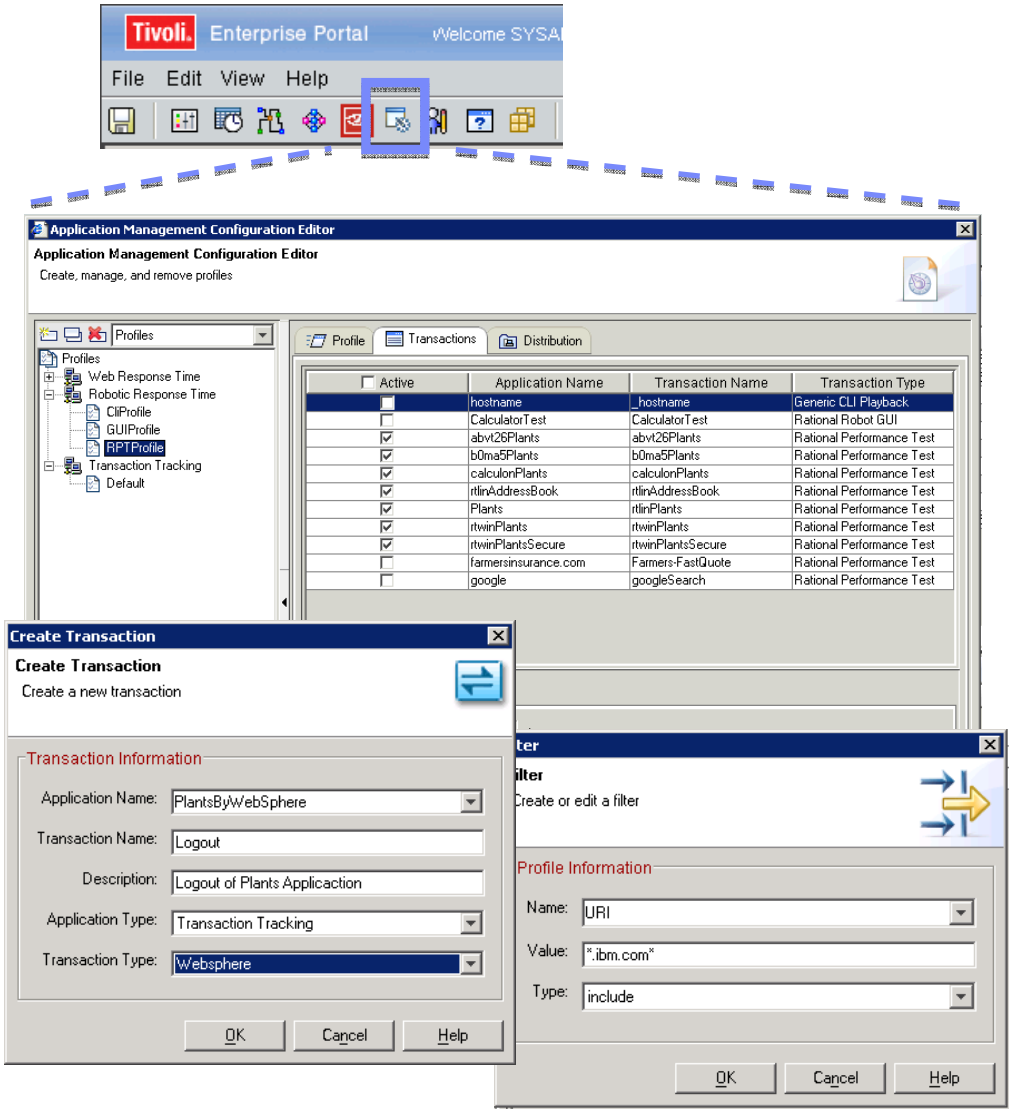
Application Management Console

- Successor to Response Time Dashboard
- Queries agents for data (not TDW)
- Out-of-the-box logical view showing the operational status of applications and monitored servers, with links to agent workspaces
- Consolidated view of applications



Application Management Configuration Editor

- Configuration editor in the TEP to define Application and Transactions to monitor
- NEW simplified editor that replaces the use of Situations for configuration
- Flexible reporting controls to customize how data is collected & reported
- Improved support for large scale environments
  - Apply common Profile configurations across the environment
- XML file based central repository (depot) for easy editing outside the TEP or from the command line



Backup – ITM

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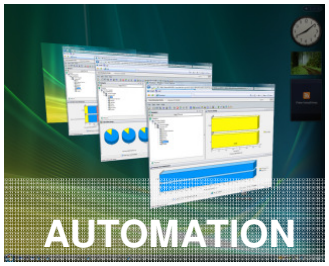
Introduction to IBM Tivoli Resource Monitoring

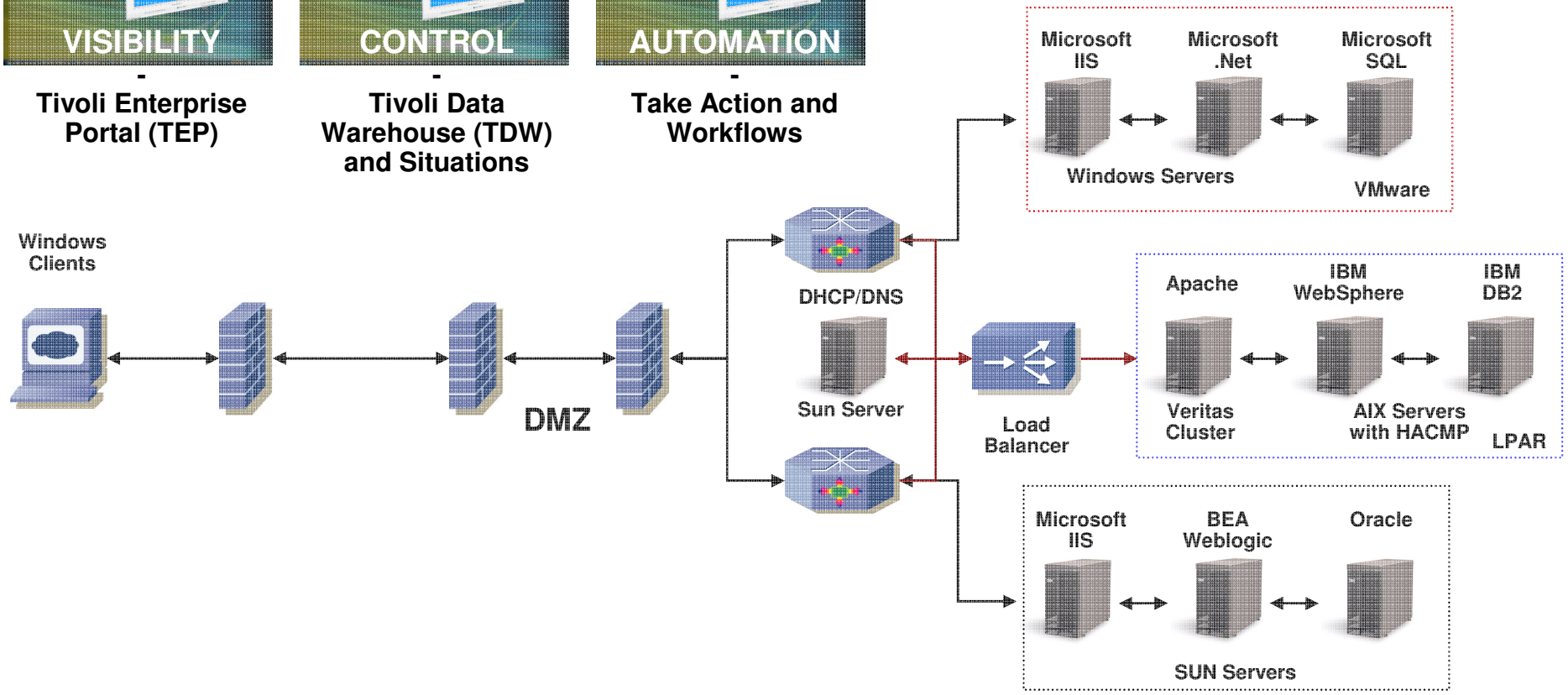
A Common Portal, Information and Automation Infrastructure

Tivoli Enterprise Portal (TEP)

Tivoli Data Warehouse (TDW) and Situations

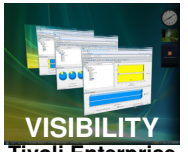


Take Action and Workflows



IBM Tivoli Monitoring - Visibility

IBM Tivoli Enterprise Portal (TEP)



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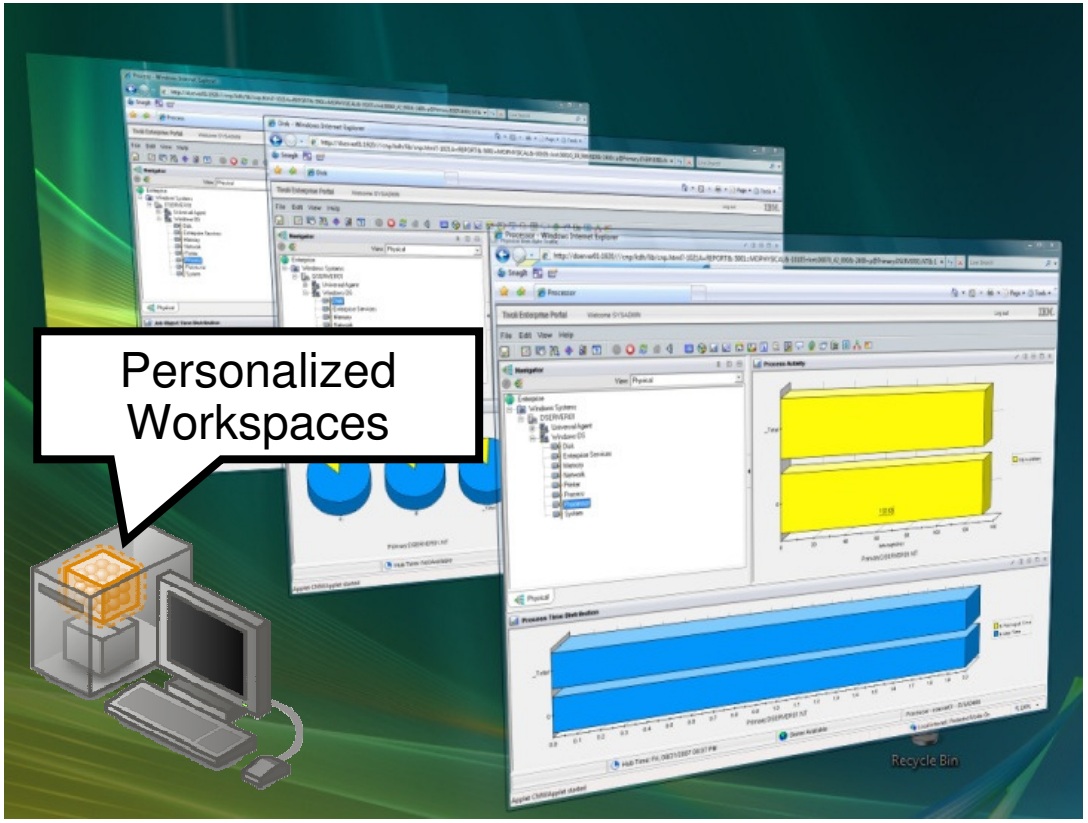


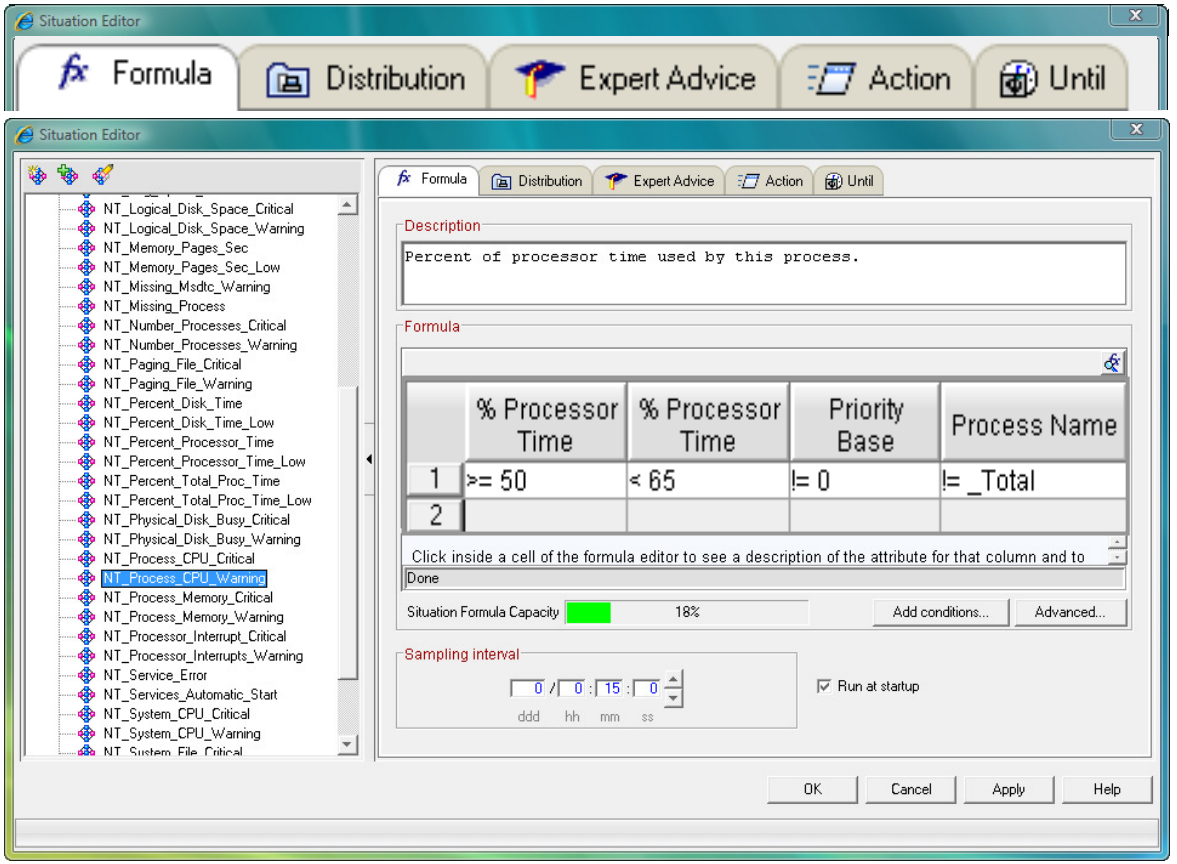
IBM Tivoli Monitoring - Control

Alerting through Situations

Tivoli Data Warehouse and Situations

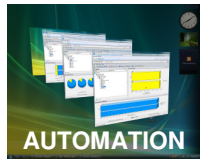
Situations allow operators to quickly define, distribute and take a reflex action to a set of defined conditions in any monitored resource

- Pre-defined **out-of-the-box** situations provide immediate return on investment and fast time to value
  - **Extended** situations reduce false alerts and raise confidence of operators that alerts are real
- Easy **distribution** to a set of targets
- **Expert Advice** imbeds run book automation
- **Tight integration** into root cause analysis and correlation tools improve mean time to recovery



IBM Tivoli Monitoring - Automation

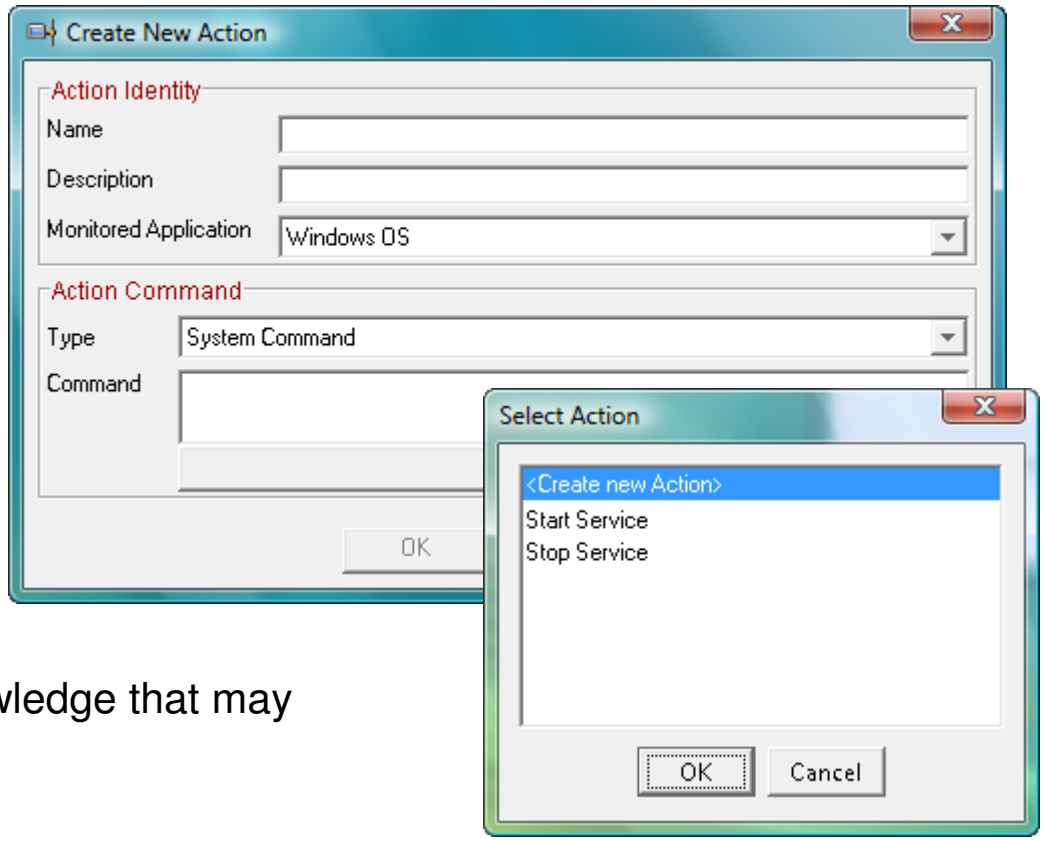
Capture and Replay Best Practices by Take Action



Take Action and Workflows

Take Action allows for entry of individual commands and either manual or automated processes to be executed in response to an individual situation

- **Out-of-the-box** take actions provide immediate return on investment and fast time to value
- **Reflex Action** allows the return of a server to a specified state even though disconnected
- **Personalized** take actions can capture a local best practice for unique situations and execute it preemptively
- **User-defined** text can also imbed knowledge that may be unique to a particular situation



Backup – TCR

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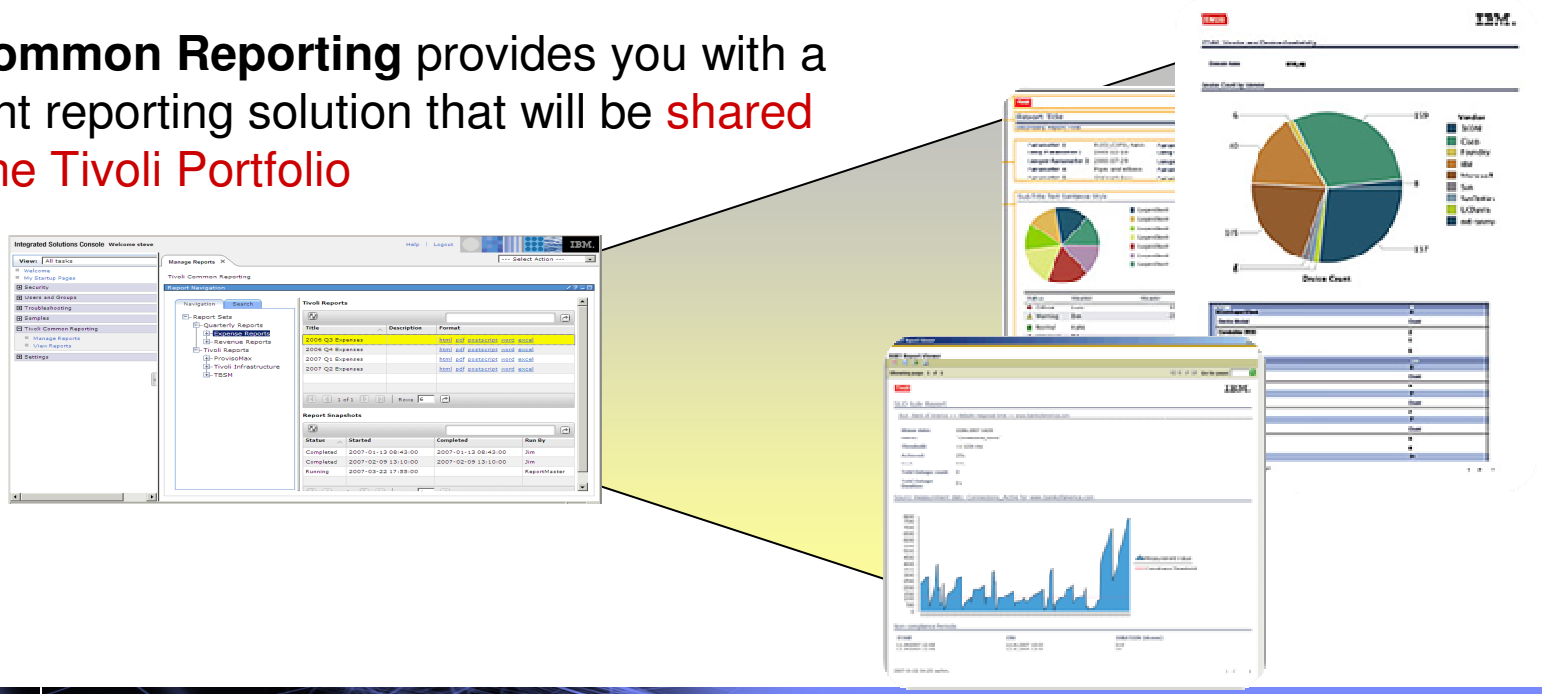
Tivoli Common Reporting

Tivoli Common Reporting adds value to your Tivoli based solutions by simplifying how information is

- Visualized
- Delivered and shared

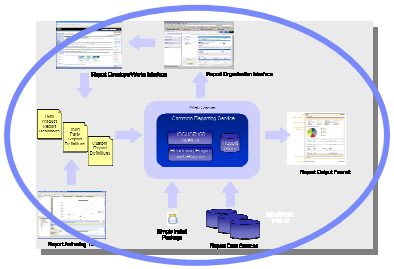
Tivoli Common Reporting provides you with a consistent reporting solution that will be shared across the Tivoli Portfolio



Tivoli Common Reporting
The value it provides…

1. Converge around an **incredibly simple launch point** for reports, where users can see what is available and use it with no training.
2. Provide an **effective way to deliver and share reports** and reporting ideas, and find the set of content that gives the greatest value.
3. Focus the individual reports on **quality of information and value**, not on the quantity of reports available.
4. Provide **consistency of the content and enable linkage between reports** for best analysis flow, even if they cross individual product boundaries.
5. **Integrate reporting and dashboard** displays such that users see consistent information and appearance, and can move easily between them.

Tivoli Common Reporting Architecture…*open and simple*



Open:

An open architecture at every boundary point to encourage creativity and produce a report marketplace

Portal-based GUI to allow customization of the browser page

Complete API and CLI function support for creating different solutions

Leverages Eclipse-based open source, plug-in interfaces to allow new chart types and output formats

Open source Report Design file definition, which enables import/export compatibility

Simple:

Small installation footprint, less than 400MB including embedded web server and data store, with little configuration

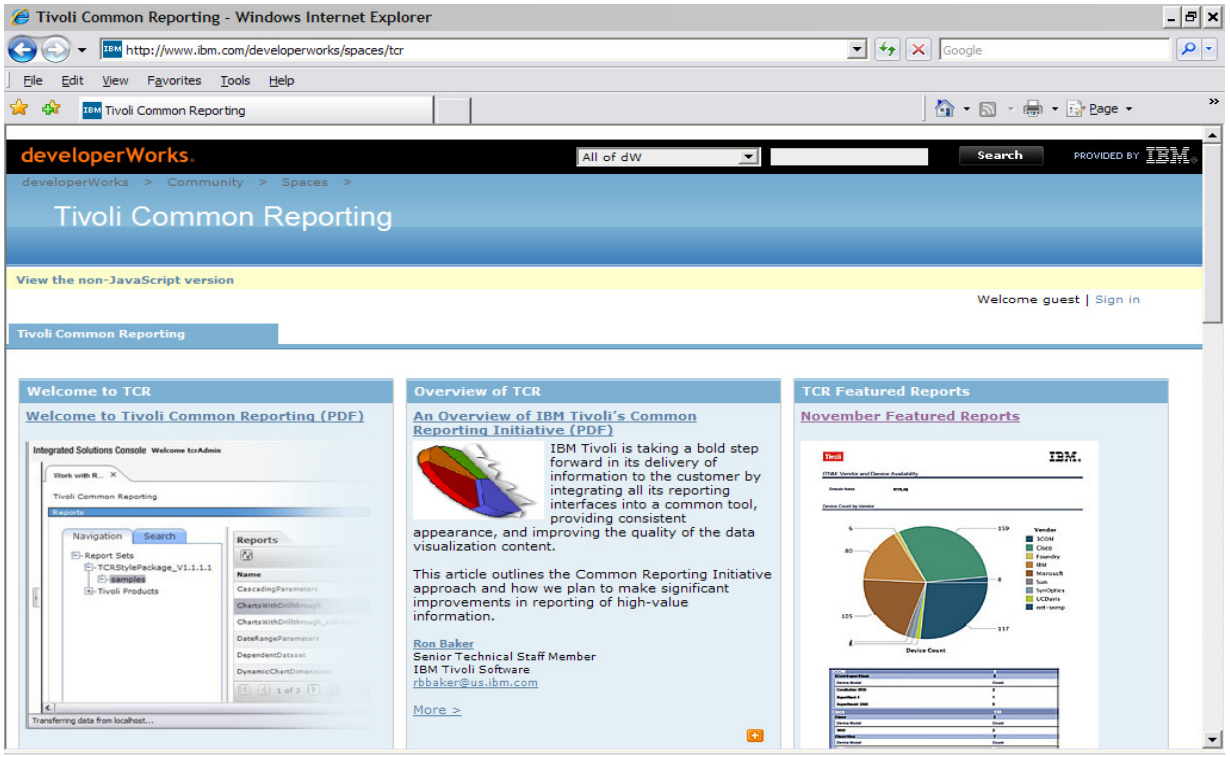
Small administration, no DBA or specialized skills required

The primary interface is usable with NO training to find, share, organize, launch, schedule, protect, or distribute reports

Tivoli Common Reporting
The Report DeveloperWorks Interface

- On-line features that are an integrated part of the overall reporting experience
- Documentation, training, video, pod casts for tutoring or advanced topics
- New report announcements, events, new report ideas to get feedback on
- Forums for getting information from other users and the Tivoli development teams
- A Reporting Exchange, where Tivoli and Business Partner reports can be viewed, and downloaded for import.

- TCR web page on DeveloperWorks (articles, forums)
  - http://www.ibm.com/developerworks/spaces/tcr



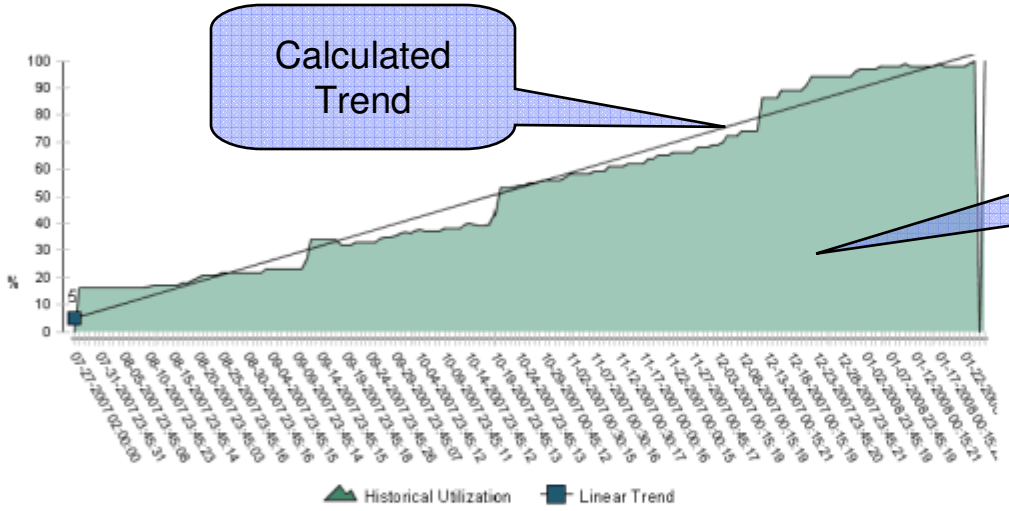
Tivoli Common Reporting - Forecast report layout – OS Disk Utilization - example

Tivoli Performance Analyzer v6.1.1 IBM.

Disk Utilization Detailed Forecast

System name Primary:NC046088:NT **Disk name** _Total

Trend Chart



Current Forecast

Forecast Overview

System name	Disk name	Timestamp	Confidence	Strength	Number of samples	Time to critical threshold (days)	Time to warning threshold (days)
Primary:NC046088:NT	_Total	Jan 25, 2008 12:20 PM	97	3	183	0	0

Forecast Details

Forecast timestamp	Used disk space (%)
2008-02-01 12:20	107
2008-02-24 12:20	119
2008-04-24 14:20	152

Projected Forecast

This report presents the forecast details of used disk space (in %) for the monitored item outlined at the top of this report. The chart depicts the current trend inclination (blue line), and historical data (green line). The first table (Forecast Overview) displays the general trend information, for example 'Number of samples' on which the trend is calculated, 'Confidence' showing how certain the outcome is, or 'Time to critical/warning threshold' that indicates when a particular limit will be exceeded. Forecast Details table presents the values for 7, 30 and 90 day forecast.

ITPA – ITCAM for Transactions forecast based on Robotic Response Time data

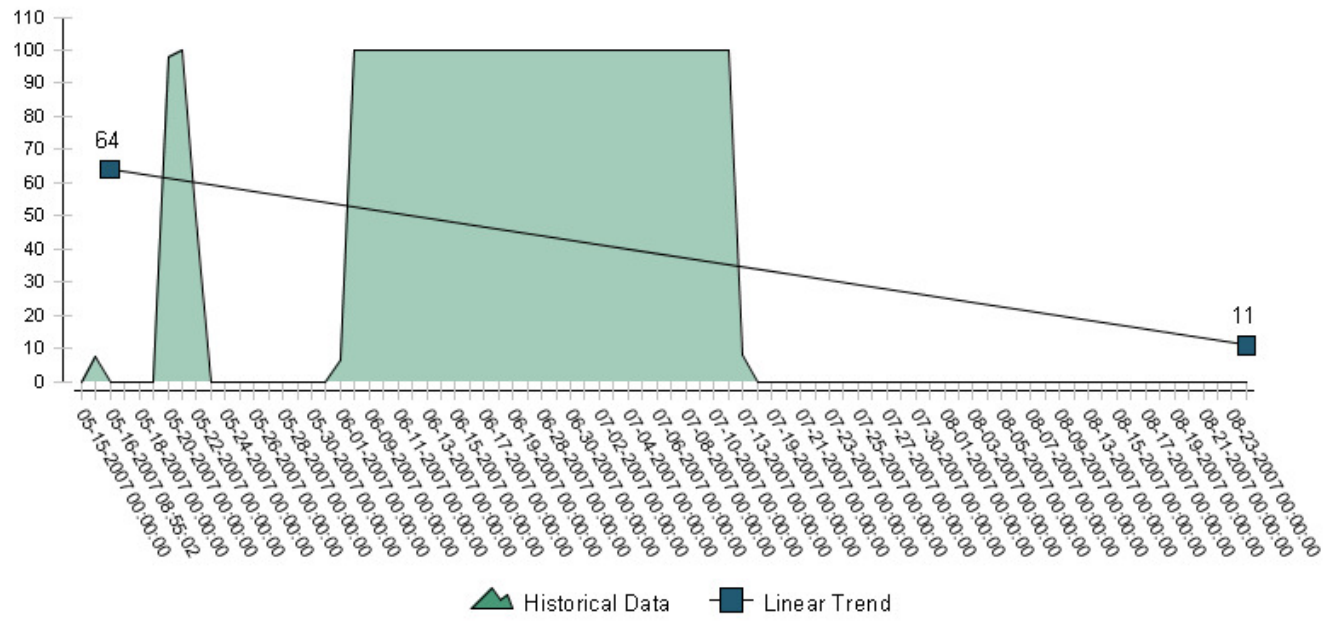
Tivoli Performance Analyzer v6.1.1

IBM

ITCAM Robotic Response Time Forecast Details

Trend attribute	Average Percent of Failures	**Transaction origin node**	rtdemo1:T6
Server	rtdemo1	**Client**	rtdemo1
Application	PlantsByWebSphere	**Transaction**	PlantsByWebSphere

Trend Chart



Forecast Overview