

# Software Quality for Enterprise Business Applications

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IBM Rational Software Development Conference 2008

WHERE TEAMS ARE **R-HEROES**



# Agenda

- Introduction
- Automated Functional Testing
- Manual Functional Testing
- Automated Performance Testing
- Summary



# Agenda

- **Introduction**
- Automated Functional Testing
- Manual Functional Testing
- Automated Performance Testing
- Summary



## Introduction

- How can I test my Enterprise applications
  - *Some will stay terminal-based*
    - I need to test after each modification
  - *Some are migrating*
    - I need to test the new versus the old

***I'd like to use single set of tools to test both type of application***



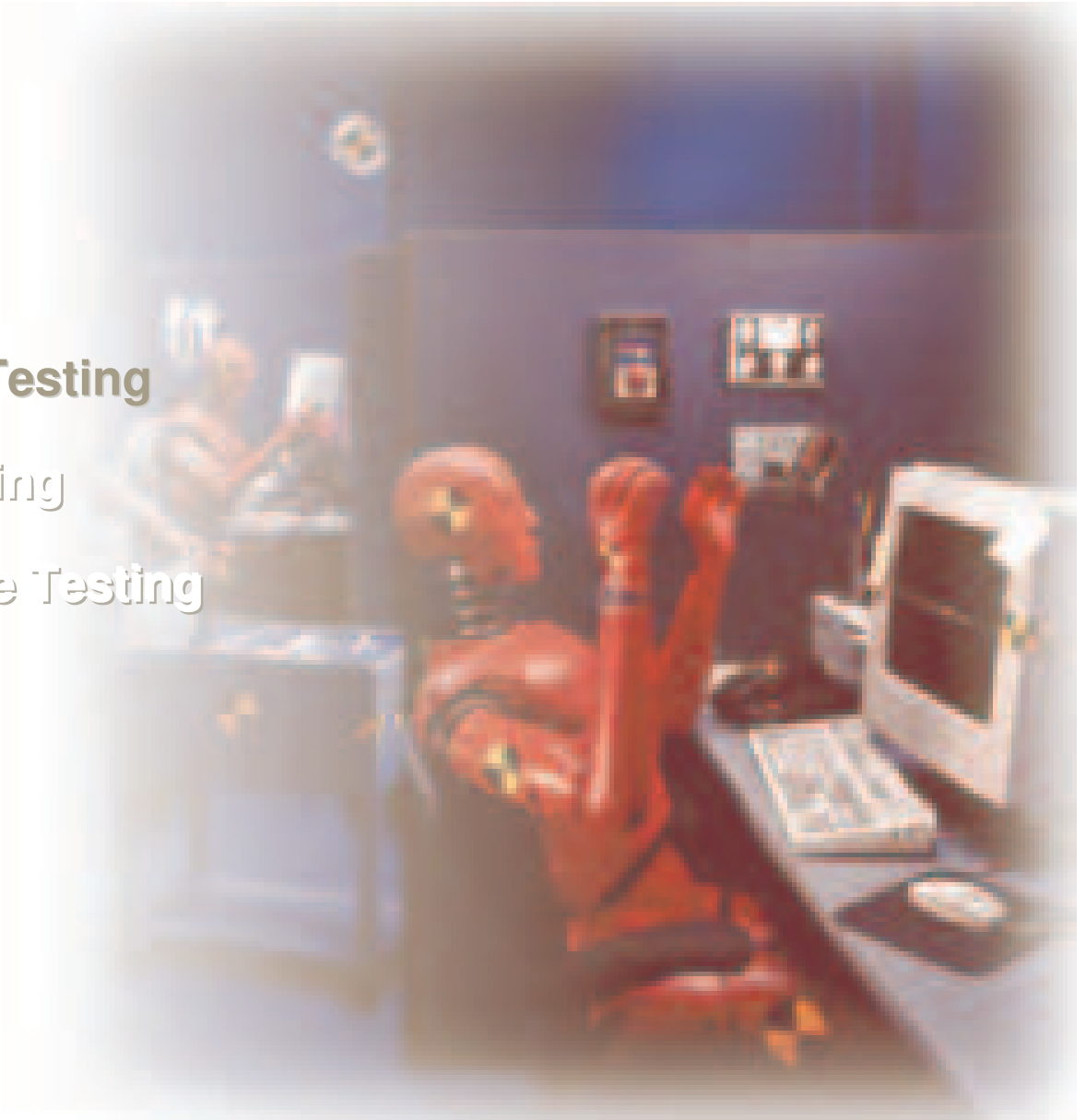
## The Tools

- IBM Rational Functional Tester (aka RFT)
  - Extension for Terminal Based Applications (FTE)
- IBM Rational Manual Tester (aka RMT)
- IBM Rational Performance Tester (aka RPT)
- IBM Workload Simulator (WSim)



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- Introduction
- **Automated Functional Testing**
- Manual Functional Testing
- Automated Performance Testing
- Summary

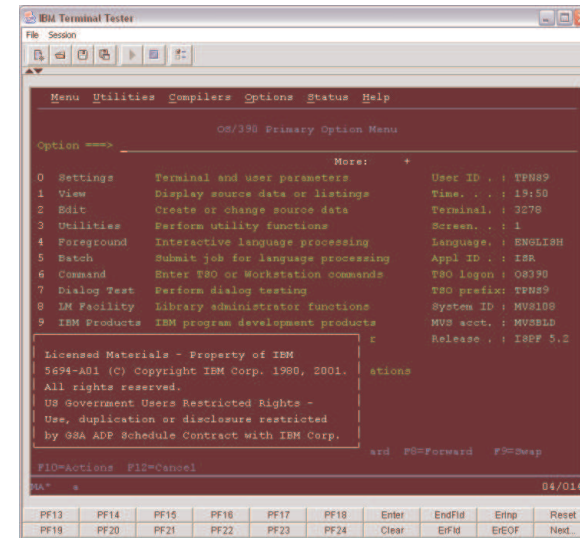
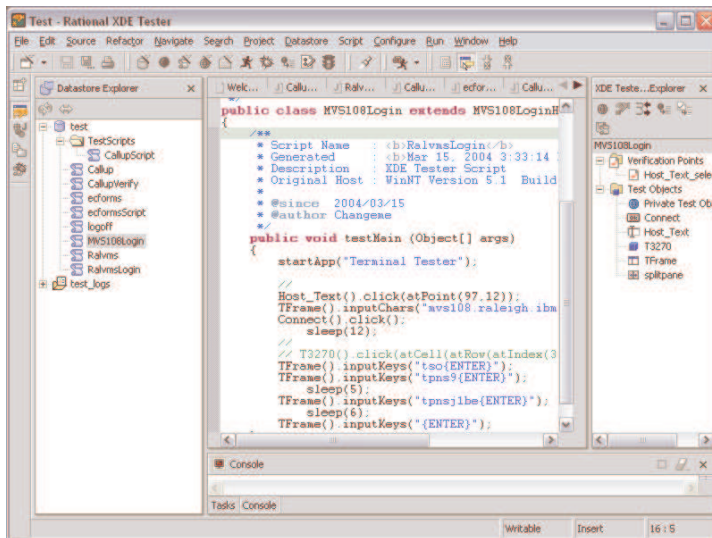


# Functional Testing

- What is Functional Testing?
  - *Testing that ignores the internal mechanism of a system or component and focuses solely on the outputs generated in response to selected inputs and execution conditions. Synonym: black-box testing [IEEE 90].*
  - *Testing conducted from the users viewpoint.*
- In functional testing, we think of the program as a collection of functions
  - *We test it in terms of its inputs and outputs.*
- How can this be automated
  - *Rational Functional Tester*
  - *IBM Workload Simulator*

# IBM Rational Functional Tester for Terminal-based Applications

*IBM Rational Functional Tester Extension for Terminal based Applications lets you test your System z and System i terminal based applications with the same tool – IBM Rational Functional Tester – used to test your Java, .NET and Web-based client server applications*





# IBM Rational Functional Tester for Terminal-based Applications

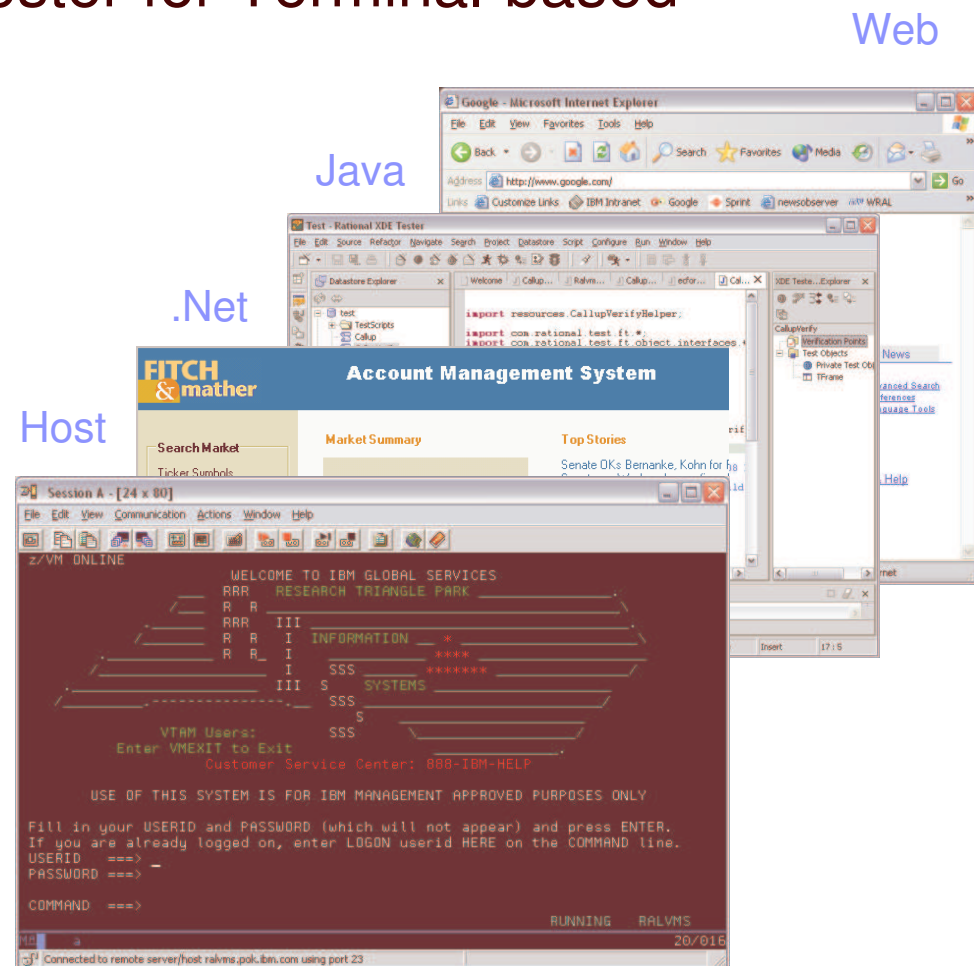
- Optional extension to Rational Functional Tester supports the testing of terminal-based applications.

3270 (System z™)

5250 (System i™)

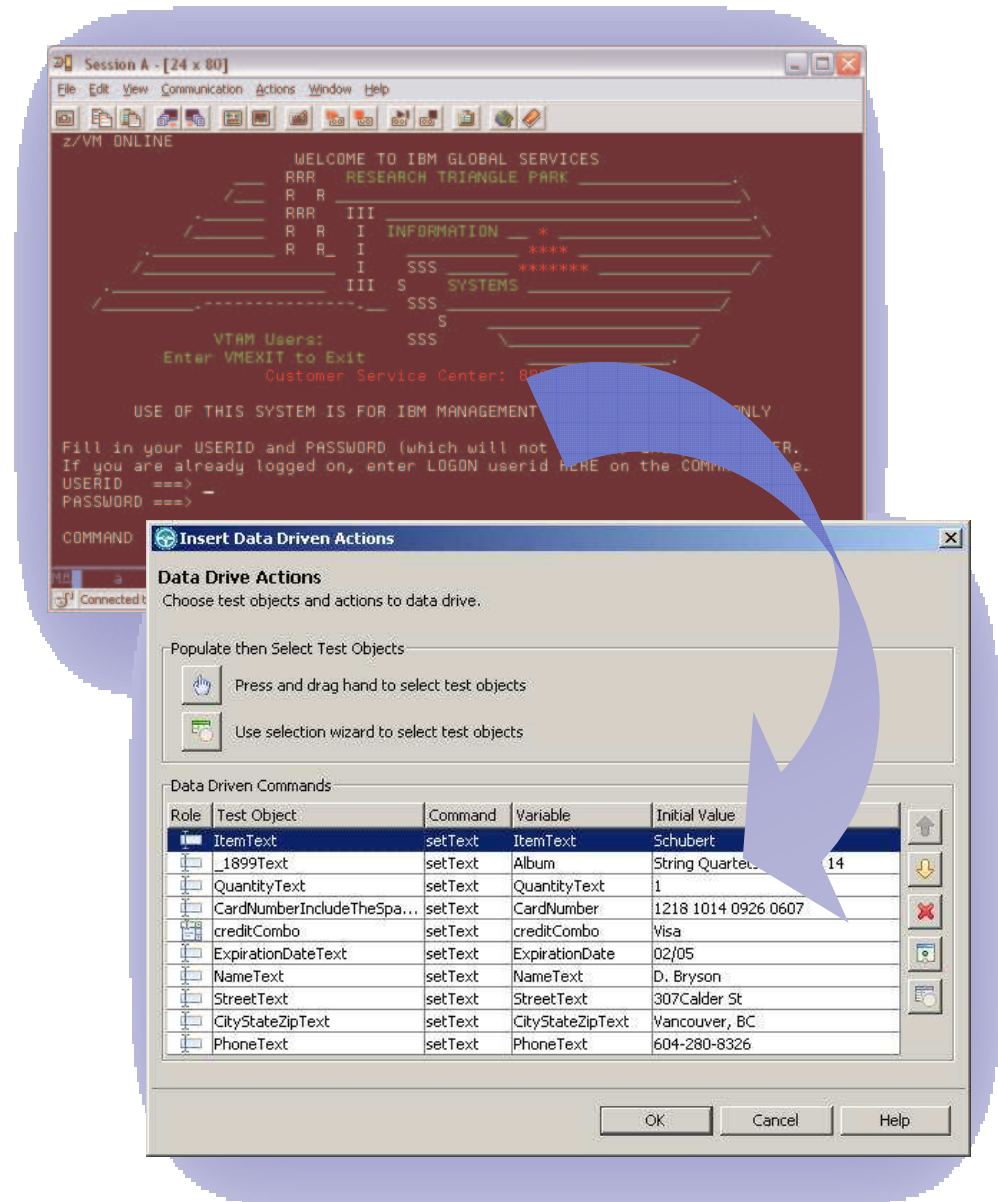
VT100 (UNIX)

- Same tooling for automated testing solution for legacy **and** modernized apps



# Recording Scripts

- **Data Driven Testing**
  - Separates test data from test script
  - Enables a single script to run multiple tests by using multiple data sets
  
- **Wizard driven process**
  - No programming involved
  - Import data from external sources



# Investigate Your Terminal-based Application

- **Automated Validation**

- Verify any message or data on the screen
- Verify any field attribute properties – including ones you can't see yourself

Functional Tester Sees Data

Request Completed OK

```

Share Trading Demonstration                                     TRADER.T004
Share Trading Manager: Real-Time Quote

User Name:           JAN
Company Name:        Casey_Import_Export

Share Values:
NOW:                 00079.00
1 week ago:         00059.00
6 days ago:         00063.00
5 days ago:         00065.00
4 days ago:         00070.00
3 days ago:         00072.00
2 days ago:         00078.00
1 day ago:          00077.00

Commission Cost:
for Selling:         007
for Buying:          010

Number of Shares Held: 0100
Value of Shares Held: 000007900.00

Request Completed OK

-----
PF3=Return                                     PF12=Exit
MA* a                                          01/001
    
```

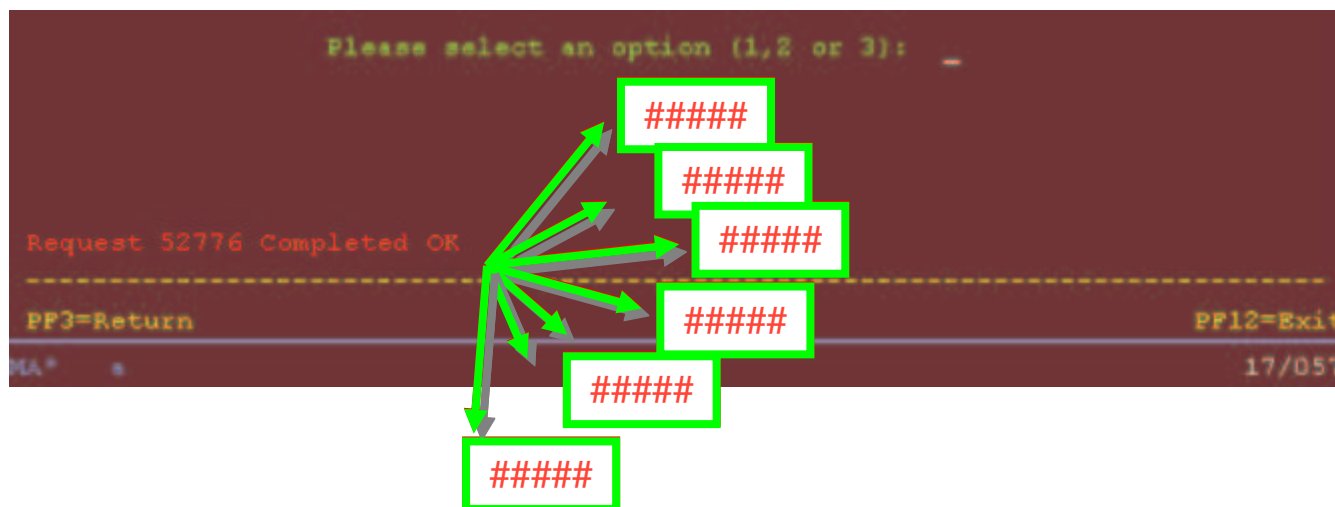
Functional Tester Sees Properties

Property	Value
<input checked="" type="checkbox"/> background	BLANK
<input checked="" type="checkbox"/> blink	false
<input checked="" type="checkbox"/> foreground	GREEN
<input checked="" type="checkbox"/> hidden	false
<input checked="" type="checkbox"/> highIntensity	false
<input checked="" type="checkbox"/> modified	false
<input checked="" type="checkbox"/> numeric	true
<input checked="" type="checkbox"/> protected	true
<input checked="" type="checkbox"/> reverse	false
<input checked="" type="checkbox"/> text	000007900.00
<input checked="" type="checkbox"/> underline	false

You See...

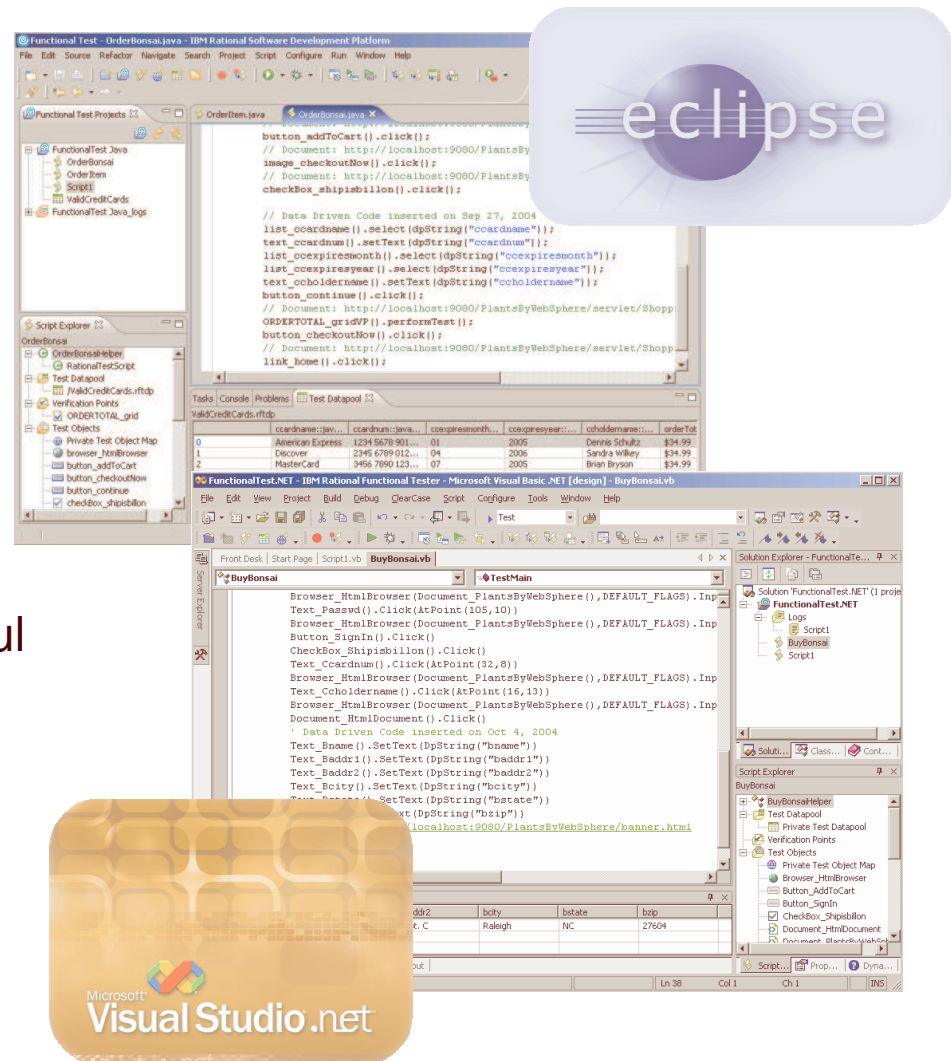
## Validating Dynamic Data Without Coding

- Dynamic Data/Content Matching
  - Use pattern matching technique to verify dynamic data and create robust tests (ie. validate “Order ID ###” and not “Order ID 230”)
  - Accommodate a wide variety of acceptable responses as well as restrict acceptable responses to validate the application’s behavior
  - Build flexibility into your tests



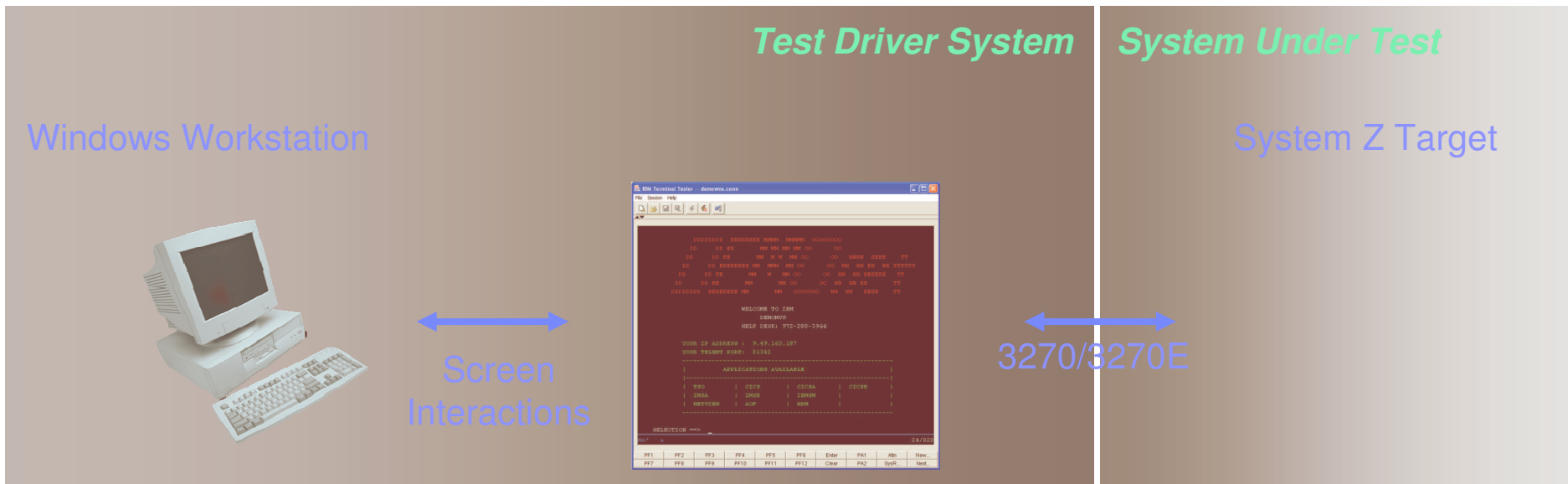
# Enhancing Scripts

- Functional Tester offers two development environments
  - Eclipse based IBM Software Development Platform
  - Visual Studio .NET
  
- Both environments offering powerful debugging features
  - Code assist editors
  - Step debugging
  - Variable watches
  - More...



# IBM Rational Functional Tester for Terminal-based Applications

- Windows-based
- Java-based terminal emulator
- Nothing installed on the target





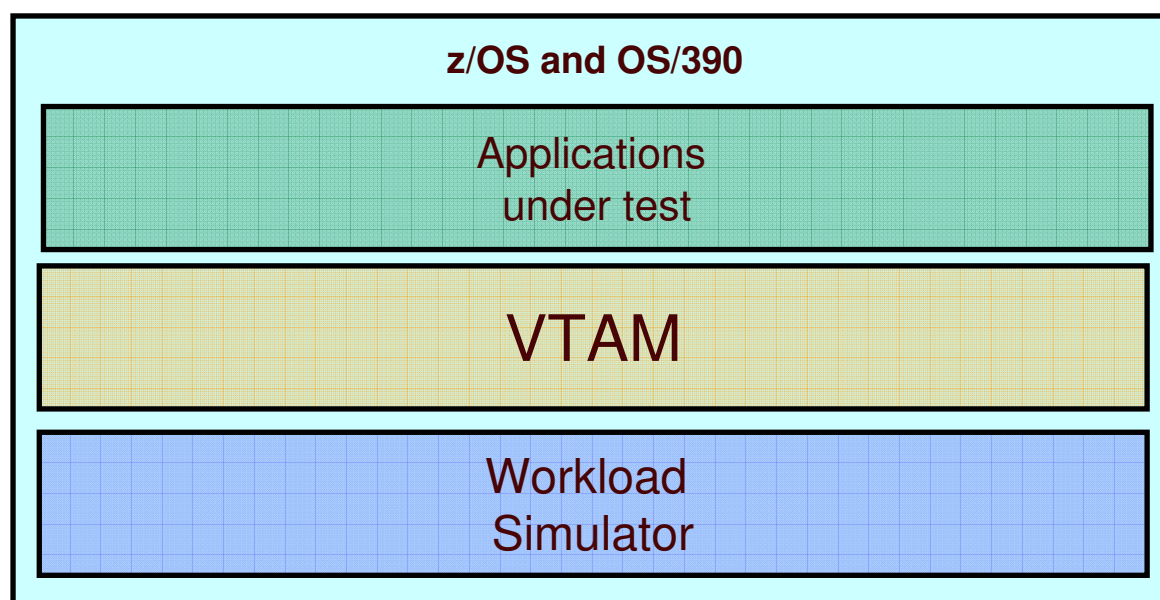
# Demo

***What You'll See:***

Functional Testing with IBM Rational Functional Tester Extension  
for Terminal Based Applications

## IBM Workload Simulator

- Conducts Reliable Stress, Performance, Regression, Function And Capacity Planning Tests
- All test execution and storage of test assets on System Z
  - Projects
  - Resources
  - Schedules
  - Test Criteria
  - Test Cases





## IBM Workload Simulator Features

- Auto Generation Of Scripts
- Auto Generation Of Networks
- Controls Resource During Runs
- Simulates Different Terminals, Terminal Features And Terminal Operator Actions
- Executes Independently Of The System Under Test
- Provides utilities for post-test analysis
- REXX-like scripting language
- Conducts Reliable Stress, Performance, Regression, Function And Capacity Planning Tests
- Consistent Across Protocols
  - SNA, CPI-C, TCP/IP
- Consistent Across Operating Systems
  - z/OS & OS/390, MVS/ESA, VM/ESA

***IBM Workload Simulator functional tests are simply performance tests with only one virtual user***

## Agenda

- Introduction
- Automated Functional Testing
- **Manual Functional Testing**
- Automated Performance Testing
- Summary



## Manual Testing with Rational Manual Tester

- Support analysts, subject-matter experts and professional testers
- Minimize test maintenance and ensure test consistency
- Reduce human error during data entry and data verification
- Develop detailed, easy to follow manual tests
- Support diverse usage models and processes

Analysts



Technical & non-technical Testers



## Create Robust, Easy to Follow Tests

- Provides a rich text editing to document clear, easy to understand tests
- Allows embedding of images or attach files to add clarity and detail
- Uses granular and broad verification points to capture both detailed observations and higher level test results

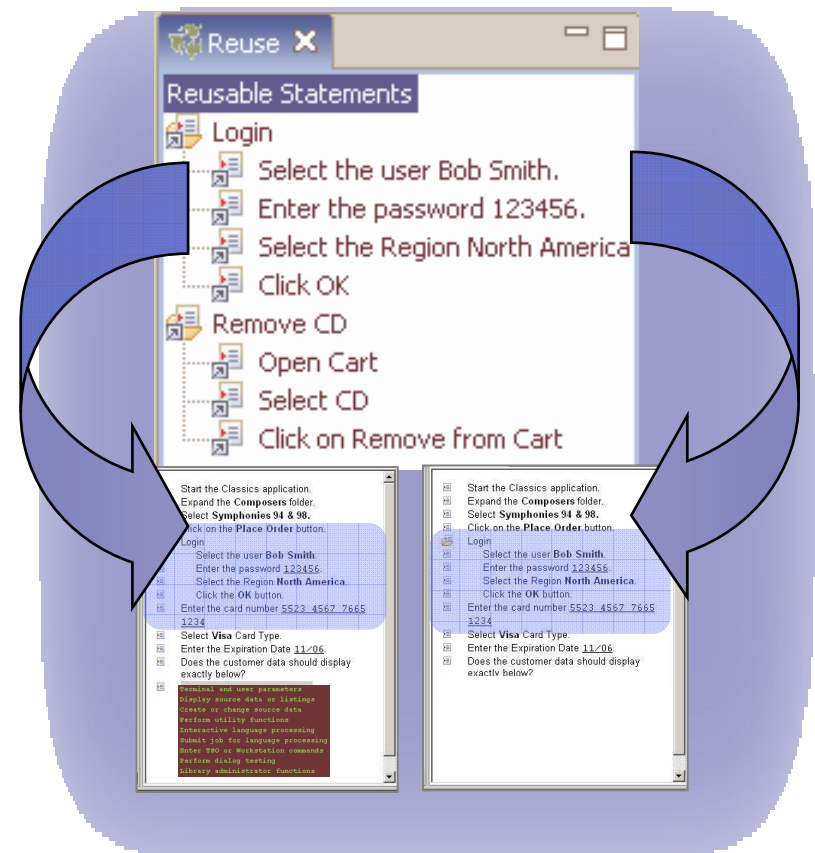
**Manual Test document**

OrderCD.rmt

- Start the Classics application.
- Expand the Composers folder.
- Select **Symphonies 94 & 98.**
- Click on the **Place Order** button.
- Login
  - Select the user **Bob Smith.**
  - Enter the password **123456.**
  - Select the Region **North America.**
  - Click the **OK** button.
- Enter the card number **5523 4567 7665**
- 334
- Visa Card Type.
- Expiration Date **11/06.**
- Does the right data appear?
- Terminal and user parameters
- Display source data or listings
- Create or change source data
- Perform utility functions
- Interactive language processing
- Submit job for language processing
- Enter TSO or Workstation commands
- Perform dialog testing
- Library administrator functions

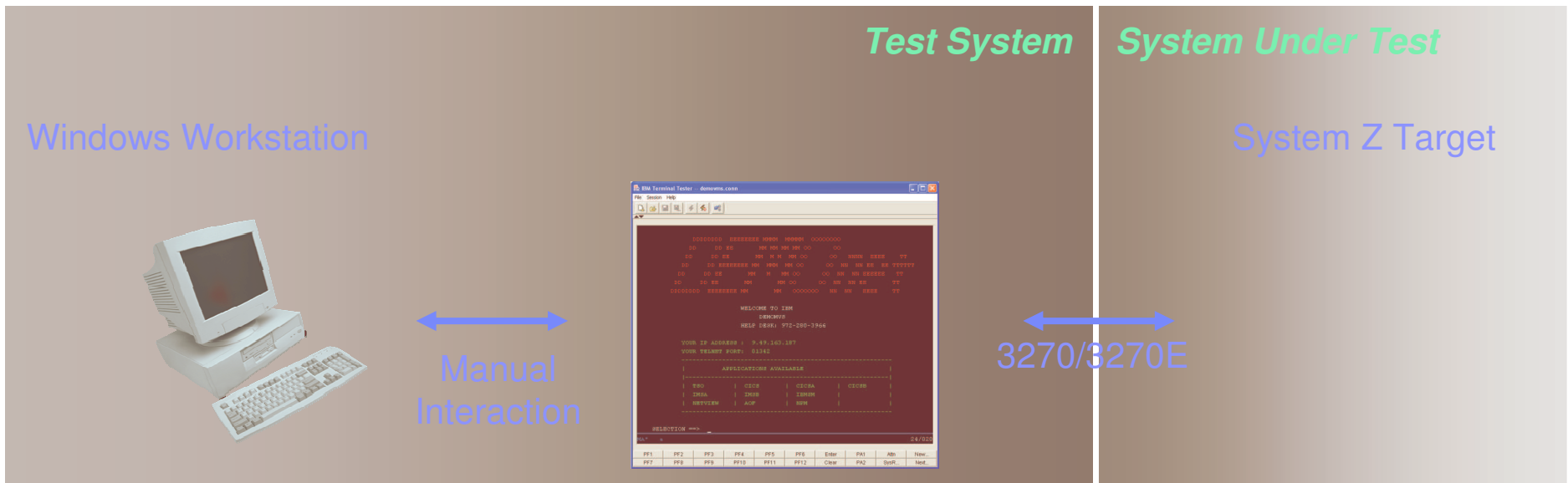
## Enables Shared Content Across Scripts

- Create commonly used test statements once
- Reuse statements across multiple tests through simple drag and drop
- Maintenance of shared content is efficient with single-point updating of shared content
- Ensures consistency and reduces test maintenance



# IBM Rational Manual Tester

- Windows-based
- Same log format as Rational Functional Tester
- Nothing installs on the target





# Demo

***What You'll See:***

Manual Testing with IBM Rational Manual Tester

## Agenda

- Introduction
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# Performance Testing

- What is Performance testing?
  - Testing conducted to evaluate the compliance of a system or component with specified performance requirements [*IEEE 90*].
- How can load be generated?
  - Rational Performance Tester for z/OS
  - WebSphere Studio Workload Simulator
  - IBM Workload Simulator



## Rational Performance Tester for z/OS

*Leverage your System z hardware investment  
to test n-tier applications*

### **Built for Day 1 Productivity**

Create code free tests

Mask complexity to get the job done

### **Advanced Data Access & Manipulation**

Create code free schedules

Automated data variation and synchronization

### **Lower Cost of Performance Testing**

Low resource requirements

Re-use existing Java code in tests



# No Code Tests



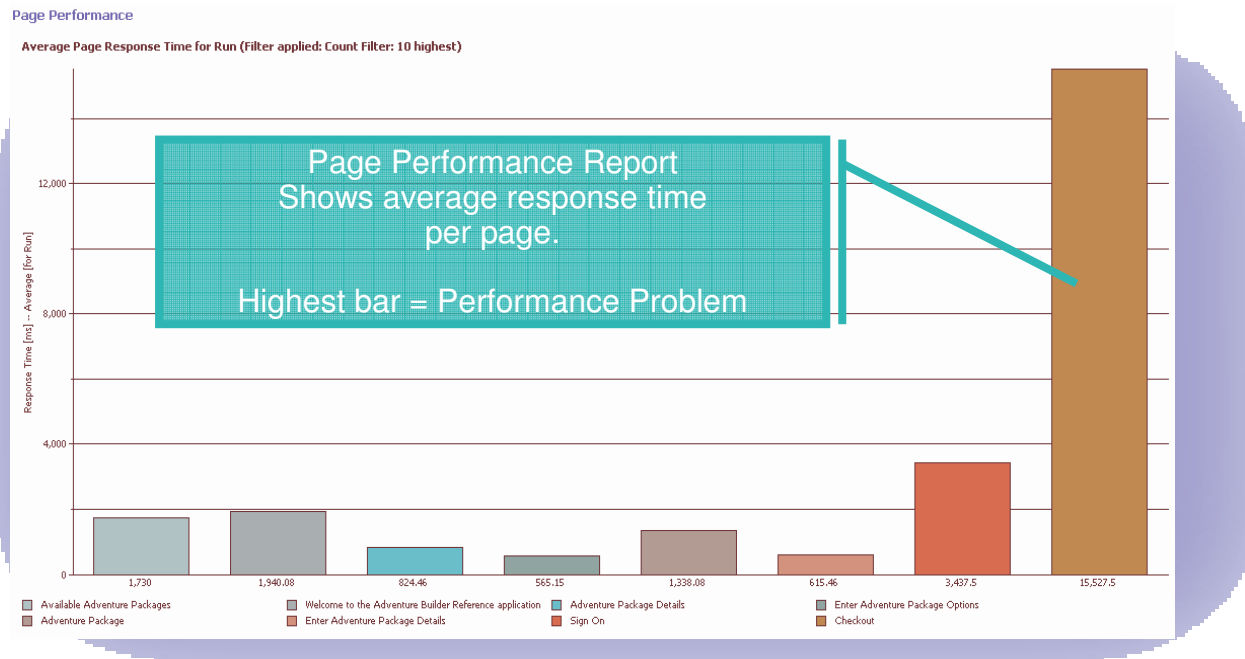
Tests are represented in a tree view as a list of web pages and their elements, such as images.

No programming necessary to create a test

Underlying detail is accessible but hidden to simplify test creation and maintenance



# Performance Problem Identification During Test

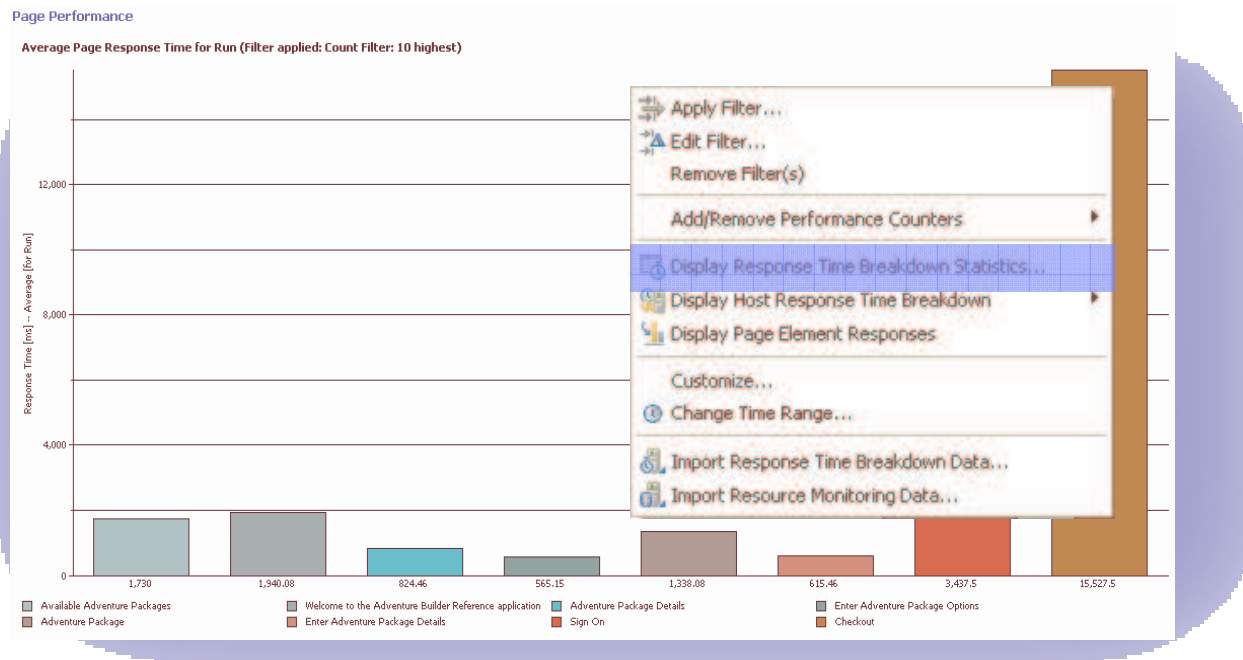


Rational Performance Tester easily identifies bottlenecks

Next logical question is **Why?**

Root Cause Analysis provides to tools to answer this question

# Performance Problem Identification During Test



Rational Performance Tester easily identifies bottlenecks

Next logical question is **Why?**

Root Cause Analysis provides tools to answer this question

# Response Time Breakdown

Page Performance > Response Time Breakdown Statistics

demo:9080/ab/checkout.do

Component	Base Time (seconds)	Average Base Time...	Cumulative Time ...	Calls
[-] CASPIAN	311.512	77.878	470.908	12
[-] IBM Rational Performance Test	311.512	77.878	470.908	12
[+] Delivery Time	26.500	6.625	26.500	4
[+] Response time	208.748	52.187	208.748	4
[+] text/html;charset=ISO-8859-1	76.264	19.066	235.660	4
[-] demo	2,109.879	179.492	3,488.143	186
[-] J2EE/WebSphere/6.0.0.1/demoNode01	2,109.879	179.492	3,488.143	186
[+] Filter	39.632	9.908	570.228	4
[+] JDBC	1,673.199	70.982	1,783.055	126
[+] JSP	33.572	8.393	373.776	28
[+] RMI-IIOP	5.280	0.660	5.280	8
[+] Servlet	26.112	6.528	261.788	8
[+] Session EJB	160.628	40.157	161.280	4
[+] Web Services Provider	2.840	0.710	164.120	4
[+] Web Services Requestor	168.616	42.154	168.616	4

## Response Time Breakdown:

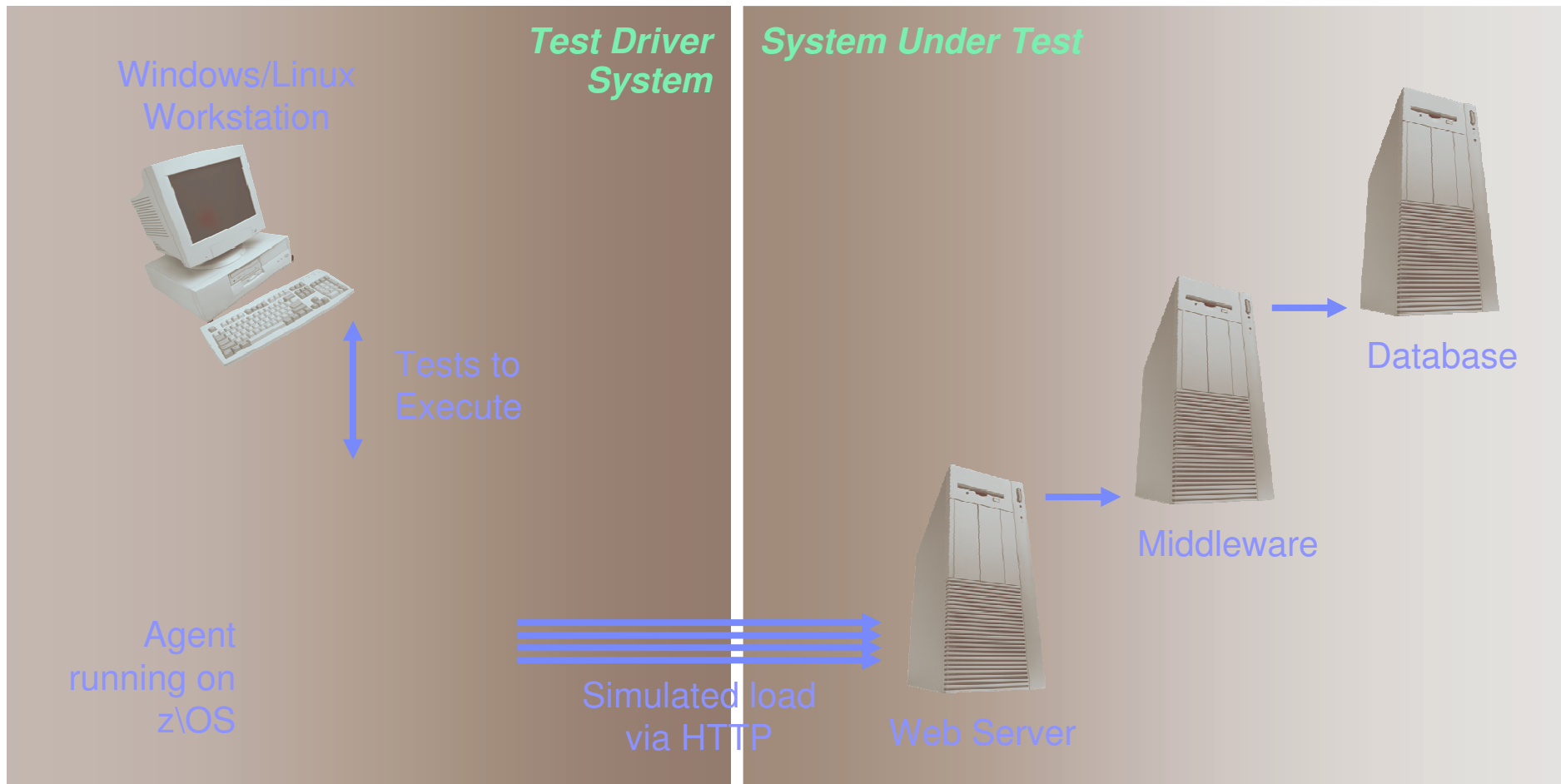
Breakdown page response times into composite element response time

## Provides:

Breakdown data drills down to highlight slowest components of a given page.

Breakdown into tiers and components is a unique feature of Rational Performance Tester .

# Rational Performance Tester for z/OS



## WebSphere Studio Workload Simulator

- IBM Rational Performance Tester for z/OS is a replacement for WebSphere Studio Workload Simulator (WSWS)
  - RPT for z/OS fulfills the HTTP load test use case provided by WSWS
- WSWS users should migrate to IBM Rational Performance Tester for z/OS
  - Contact your IBM Rational sales professional
  - No automated script migration is provided from WSWS to RPT for z/OS
    - You may use both products concurrently during the migration period
      - Use WSWS for old test scripts; use RPT on new projects
      - As old test scripts become outdated, record new scripts with RPT

**Note:** *WebSphere Studio Workload Simulator is a different product from IBM Workload Simulator*





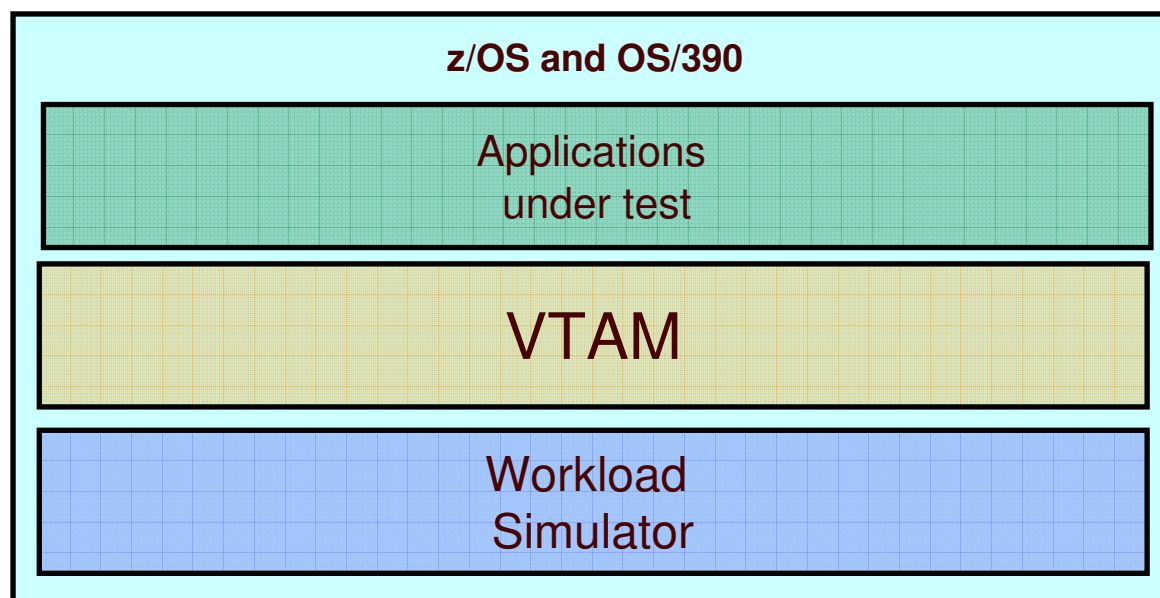
# Demo

***What You'll See:***

Root Cause Analysis with IBM Rational Performance Tester

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  - Resources
  - Schedules
  - Test Criteria
  - Test Cases



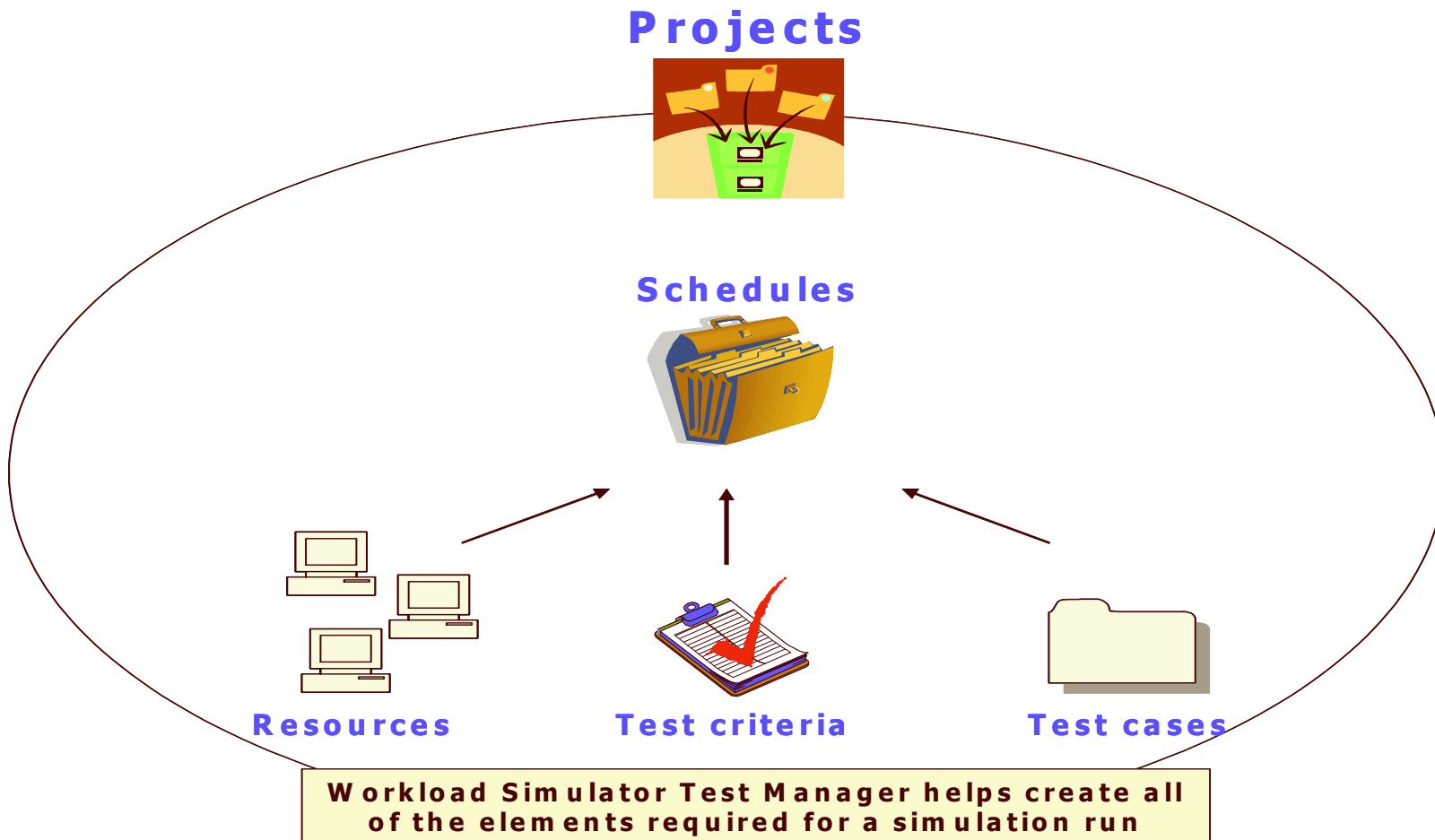
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  - z/OS & OS/390, MVS/ESA, VM/ESA

## IBM Workload Simulator Benefits

- Provides a systematic approach to performance testing
- Simulates real-world conditions to determine operational boundaries of the product
- Used for:
  - Load-testing
  - Stress-testing
  - Regression Testing
  - QA Testing

# Workload Simulator's Test Manager



## A User Friendly ISPF Interface

```

WSim Test Manager

Select one of the following. Then press Enter.

  Command  Action
E 1. CASE   Create and Process Testcases
  2. GROUP  Create and Process Testgroups
  3. CYCLE   Create and Process Testcycles
  4. RUN     Create WSim networks and Schedule WSim Simulation Runs
D. DOC      Create Test Documentation
P. PROJECT  Add/Change Project or Alternate HLI
U. UTIL     Run WSim Test Manager Utilities
W. WII      Invoke WSim/ISPF Interface

Project:                Alternate HLI:

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Command ==>
F1=Help   F2=Split   F3=End     F4=        F5=        F6=
F7=Up     F8=Down    F9=Swap    F10=Left   F11=Right  F12=Retrieve

MA  c 22/015

```

## Group Test Cases and Schedules into Projects

```
Process Projects
Add New Project

Type Project Name, Description and High Level Index. Then press Enter.

Project Name      : trader
Description       : Test the TRADER application
High Level Index : dnet074.wtm.trader █
```

## Test Cases are Created in One of 6 Ways

```
Process Testcases
Add New Testcase

Enter required field
Type Testcase Name, Description and Source. Then press Enter.

Testcase Name: testrun
Description   : Log on, Buy stock, Get quote, Log off
Source       : 1
              1. Add a 3270 testcase using IDC
              2. Add a 3270 testcase using an SNA trace
              3. Add a 3270 testcase using a WSim or IDC log
              4. Add a testcase using the WSim STL models
              5. Add a testcase using an STL skeleton
              6. Add a CPI-C testcase using an LU 6.2 SNA trace
```



## 3 Ways to Capture Test Cases with IDC

```
IDCMAIN          WSim Interactive Data Capture (IDC) Utility

Select one of the following, then press Enter.

1 1. Start a session with a host application and capture data
   2. Generate an STL program from captured data
   3. Generate a message generation deck from captured data
   4. End the IDC utility program

WSim Version 1 Release 1.0.0  Program Number 5655-I39

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5655-I39 (C) Copyright IBM Corporation 1976, 2002. All Rights Reserved.
US Government Users Restricted Rights - Use, duplication or disclosure
restricted by GSA ADP Schedule Contract with IBM Corporation.
F1=Help  F3=Exit  F12=Cancel

MA  c 05/004
```

## Capture Data from Different Address Space Types

```

IDCSSP          WSim IDC:  Start Session with Host Application

Type information, then press Enter.

Session Data
Host application name . . . . . cicsacb2
Logon mode name . . . . . LSX32703 (Optional)
Logon user data . . . . . _____ (Optional)

IDC log data set name . . . . . DNET074.WTMUSER.IDCLOG (TESTRUN)
If data set already exists, specify R      (R=Replace or A=Append)

Start capturing data immediately? . . Y      (Y=Yes or N=No)

IDC Escape key . . . . . PA1      (PAn, PFnn, CLEAR, or ATTN)

F1=Help  F3=Exit  F5=Refresh  F11=Save  F12=Cancel

```

## Interactive Data Capture Example

```
Signon to CICS                                     APPLID CICSACB2  
  
WELCOME TO CICS  
  
Type your userid and password, then press ENTER:  
  
  Userid . . . . dnet074      Groupid . . . . _____  
  Password . . . . _____  
  Language . . . . _____  
  
  New Password . . . . _____  
  
DFHCE3520 Please type your userid.  
F3=Exit
```

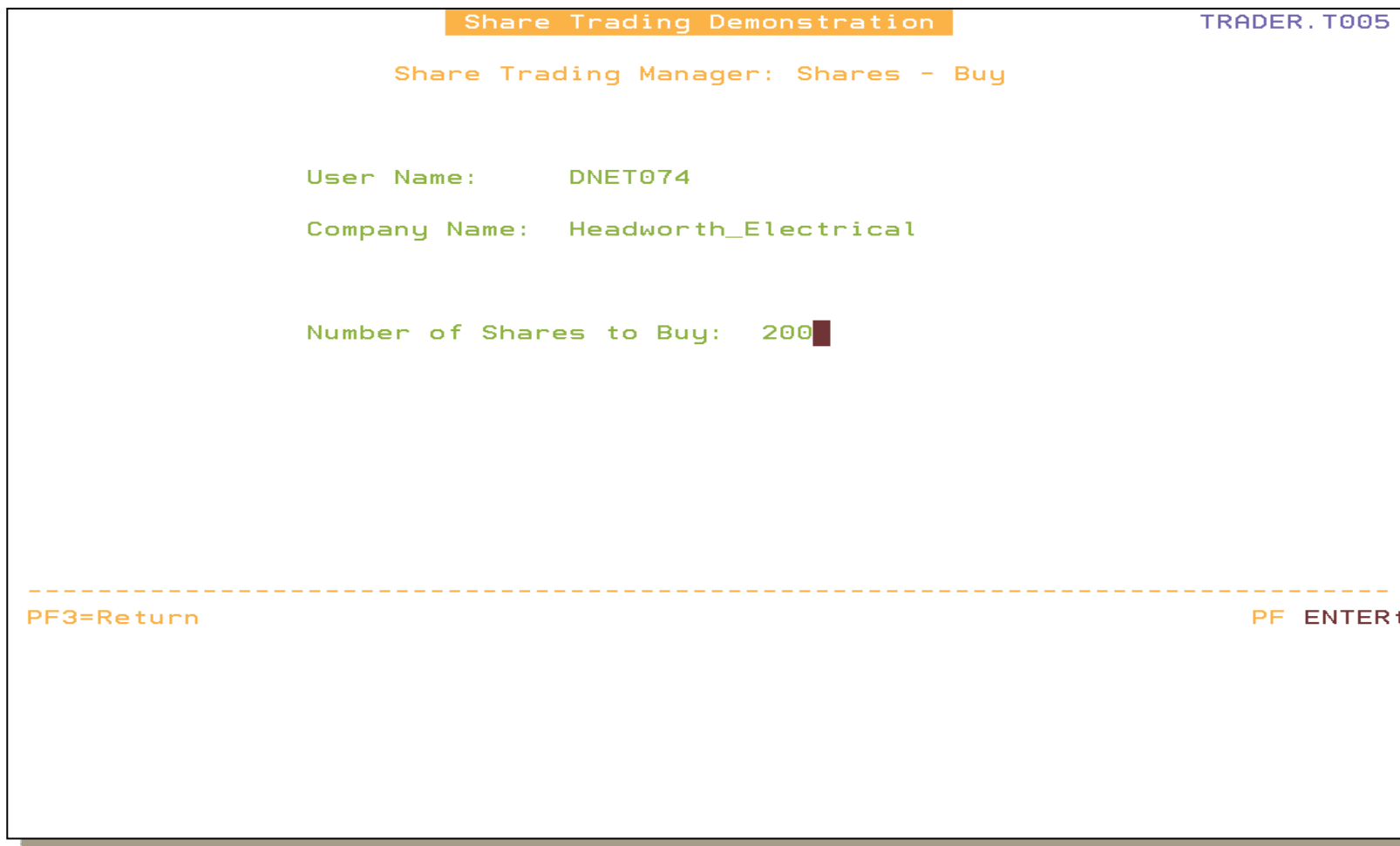
## Captured Screens are Viewable by Panel or STL

```

Resource Display Index                                     Row 1 to 18 of 18
Command==>
Line commands: V to view panel, S to edit STL, D to delete.  Press PF3 to end.

Timestamp AID      Testcase Panel
_ 13513804          TESTRUN          Signon to CIC
_ 13513804  ENTER  TESTRUN          Signon to CIC
_ 13514194          TESTRUN
_ 13514194  ENTER  TESTRUN  dstd
_ 13514476          TESTRUN          Share Trading D
_ 13514476  ENTER  TESTRUN          Share Trading D
_ 13514716          TESTRUN          Share Trading D
_ 13514716  ENTER  TESTRUN          Share Trading D
_ 13514993          TESTRUN          Share Trading D
v 13514993  ENTER  TESTRUN          Share Trading D
_ 13515168          TESTRUN          Share Trading D
_ 13515168  ENTER  TESTRUN          Share Trading D
_ 13515896          TESTRUN          Share Trading D
_ 13515896  PF12   TESTRUN          Share Trading D
_ 13520093          TESTRUN  Trader: Session Over  Share Trading D
_ 13520093  CLEAR  TESTRUN
_ 13520936          TESTRUN
_ 13520936  ENTER  TESTRUN  cesf logoff
***** Bottom of data *****
    
```

## View of Captured Screen



## Generated Script

```

File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW          DNET074.WTM.TRADER.STL (TESTRUN) - 01.01          Columns 00001 00072
Command ==>
000028 found = off
000029 initself('CICSACB2','LSX32703')
000030 do while found = off          /* wait for onin0001 data received */
000031   wait until onin
000032 end
000033 deact onin0001
000034
000035 /* 13:51:26.26 ITP1507I SESSION STARTED WITH APPLICATION CICSACB2 */
000036
000037 /*----- 13513804 00001 */
000038 WTM_panel_ID = 'PNL00001'
000039 log 'WTM_panel_ID' WTM_panel_ID
000040 cursor(10,26)
000041 ereof
000042 charset 'field'
000043 type 'dnet074'
000044 cursor(11,26)
000045 ereof
000046 type 'dontlook'
000047 cursor(10,29)
000048 transmit using enter
000049
000050 /*----- 13514194 00003 */
000051 WTM_panel_ID = 'PNL00002'
000052 log 'WTM_panel_ID' WTM_panel_ID
000053 cursor(24,48)
000054 ereof
000055 cursor(1,1)

```

## Test Cases are Replayed Through Schedules

```
Process WSim Schedules
----- Add New Test Schedule -----

Type Schedule Name, Description and Schedule Type. Then press Enter.

Schedule Name: trad1
Description   : test simple trad session
Schedule Type: v  (V=VTAMAPPL, T=TCP/IP, C=CPI-C)
```

## Assign Test Cases and # of Executions to a Schedule

```

Resource List for Schedule TRADLOAD Row 1 to 1 of 1
Specify Order for Resource LU1 under WSIM001 Row 1 of 11

Command==>
Enter order or summary. Press PF3 to end.

Order Name Test... Type Description
BUY Case V buy stock
ENDTRAD Case V End the trader application
INITRAD Case V start the trader applicati
LOGOFF Case V Log off CICS
LOGON Case V log on to cics
QUOTE Case V Get a stock quote
RETMENU Case V Return to the Trader main
SELCOMP Case V Select a company code from
SELL Case V Sell stock
TESTRUN Case V Log on, Buy stock, Get quo
1 2 3 TRADALL Group V Execute a complete Trader
***** Bottom of data *****

F1=Help F2=Split F3=End F4= F5= F6=Summary
F7=Up F8=Down F9=Swap F10=Left F11=Right

F1=Help F2=Split F3=End F4= F5= F6=Summary
F7=Up F8=Down F9=Swap F10=Left F11=Right F12=Retrieve
    
```



# Simulate Playback on Many Terminals via Schedules

```

Resource List for Schedule TRADLOAD                               Row 1 of 15
Command==>
Enter command sort to sort by VTAMname.                        Press PF3 to end.
Line commands: S Select, I Insert, R Repeat, D Delete.

  VTAMname  WSIMname  Test...  Name          Description
_ WSIM001   LU1           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
█ WSIM002   LU2           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
_ WSIM003   LU3           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
_ WSIM004   LU4           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
_ WSIM005   LU5           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
  "         "           GROUP    TRADALL       EXECUTE A COMPLETE TRADER APPLICATION
***** Bottom of data *****

F1=Help      F2=Split    F3=End      F4=          F5=Sort     F6=
F7=Up        F8=Down     F9=Swap     F10=Left    F11=Right   F12=Retrieve
    
```

## Specify Acceptance Criteria for Test Cases

```
Completion Report Response Time Thresholds
Command==>
Update this panel, then press Enter.  Press PF3 to end.

Response Time:                               Percentiles:
Mean < .5 seconds                            95 % < _____ seconds
Median < _____ "                        90 % < 1 _____ "
Mode < _____ "                          80 % < _____ "
High < _____ "                           70 % < _____ "
```

Acceptance criteria is shown in Response Time Report

# Schedules can be executed interactively...

```

Process WSim Schedules                                     Row 1 to 1 of 1
Command==>
Enter a line command or add to create a new Schedule.      Press PF3 to end.
Line commands: D Delete, N Notes, O Output, P Preprocess, R Resources,
                S Testcases, U UTBLs, W NTWRK, X Execute.

  Name      Type Notes Description          UTBLs   Last Run
x | TRAD1    V      test simple trad session
***** Bottom of data *****
    
```

## ...or executed as Batch Jobs

```
WSim: Submit a Batch Job

Type information. Then press Enter.

JCL JOB Statement
//DNET074W JOB ,CLASS=A,NOTIFY=&SYSUID,MSGCLASS=H,MSGLEVEL=(1,1)
//*
//*
//*

JCL OUTPUT Statement(s)
_____
_____
_____

Data set to save JCL in 'dnet074.adlab.data(wsimgcl)' █

Select one or more message routing codes by typing a '/' or 'S'.
_ 1    _ 2    _ 3    _ 4    _ 5    _ 6    _ 7    / 8
_ 9    _ 10   _ 11   _ 12   _ 13   _ 14   _ 15   _ 16

F1=Help  F2=Split  F5=Refresh  F9=Swap  F11=Save  F12=Cancel
```

## Utilities and Reports for Analysis Purposes

```
Reports for schedule TRAD1

Select one of the following. Then press Enter.

  Command  Action                                     More:  +
 1. TLOG    View loglist report from the latest WSim run
 2. TRESP   View response time report from the latest WSim run
 3. TDM     Log display monitor for the latest WSim run
 4. TSP     View SYSPRINT from the latest WSim run

 5. MLOG    View baseline loglist report
 6. MRESP   View baseline response time report
 7. MDM     Log display monitor for the baseline log

 8. COMP    View screen compare report
 9. CDM     Log display comparator
10. RTCOMP  Edit response time compare report

11. COMPREP Edit completion reports

Command==> _____
```

# Response Time Analysis Report Example

```

File Edit Edit_Settings Menu Utilities Compilers Test Help
VIEW          DNET074.WTM.SYSPRINT          Columns 00001 00072
Command ==>          Scroll ==> CSR
000115 1WSim RESPONSE TIME REPORT
000116 RUN TIME 14.05.55, NOVEMBER 25, 2003 VERSION 1 RELEASE 1.0.0
000117 0-----
000118 SUMMARY REPORT NETWORK ALL NETWORKS PROCESS SYSTEM TIME
000119 EXIT STAR
000120 TERMTYPE END
000121 -----
000122 -RESPONSE TIME COUNT RESPONSE TIME COUNT RESPONSE TIME COUN
000123 0 0.00 5 0.10 5
000124 -MEAN RESPONSE 0.05 MESSAGES SENT 11 NUMB
000125 MEDIAN RESPONSE 0.05 AVERAGE LENGTH 20
000126 MODE RESPONSE -- RESP
000127 LOW RESPONSE 0.00 MESSAGES RECEIVED 12 VARI
000128 HIGH RESPONSE 0.10 AVERAGE LENGTH 303 95 P
000129 AVERAGE QUEUE TIME 0.01
000130 -PERCENTILE RESPONSE TIME AVERAGE
000131 0 10 0.00 0.00
000132 20 0.00 0.00
000133 30 0.00 0.00
000134 40 0.00 0.00
000135 50 0.00 0.00
000136 60 0.10 0.01
000137 70 0.10 0.02
000138 80 0.10 0.03
000139 90 0.10 0.04
000140 95 0.10 0.05
000141 1WSim RESPONSE TIME REPORT
000142 RUN TIME 14.05.55, NOVEMBER 25, 2003 VERSION 1 RELEASE 1.0.0

```

# Screen Compare Report Example

```

Differences Report          (continued)
Master: NETWORK   SAMPNET          Test: NETWORK   SAMPNET
VTAMAPPL   Workload Simulator1    VTAMAPPL   Workload Simulator2
DEV/LU     VAPPL13-00001           DEV/LU     VAPPL23-00001
-----
MASTER Screen Image      MASTER Sequence Number 6   TEST Sequence Number 6   Location of Difference (15,46)
      1      2      3      4      5      6      7      8
123456789012345678901234567890123456789012345678901234567890
-----
1|                                     Set B| 1
2|           Log Compare Screen          | 2
3|                                     | 3
4|           Mask mmmmm                  | 4
5|                                     | 5
6|           Lower / Uppercase Example    | 6
7|                                     | 7
8|                                     | 8
9|                                     | 9
10|                                    | 10
11|                                    | 11
12|                                    | 12
13|                                    | 13
14|                                    | 14
15|           This is data field one: Hello | 15
16|                                    | 16
17|                                    | 17
18|           This is data field two: aaaaa | 18
19|                                    | 19
20|                                    | 20
21|                                    | 21
22|                                    | 22
23|                                    | 23
24|                                    | 24
-----
123456789012345678901234567890123456789012345678901234567890
      1      2      3      4      5      6      7      8
CURSOR: ROW( 18) COLUMN( 46)  AID: ENTER KEY          WHEN LOGGED: END OF MSG GEN
DIMENSIONS: ( 24, 8)
    
```

# Agenda

- Introduction
- Automated Functional Testing
- Manual Functional Testing
- Automated Performance Testing
- **Summary**





## Summary

- Rational Functional Tester Extension for Terminal-Based Applications
  - Extend the benefits of Rational Functional Tester to System Z and System I applications
- Rational Manual Tester
  - Manage and organize testing of any system - even hardware
- Rational Performance Tester for z/OS
  - Leverage the power of System z hardware to scale performance testing
  - Replaces WebSphere Workload Simulator
- IBM Workload Simulator
  - Host all your testing artifacts on System z
  - Perform all your test activities on System z





# THANK YOU

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