

Quality Management

Alberto Sardini – Senior Systems Specialist

alberto_sardini@it.ibm.com

Software and Systems Engineering | Rational



Agenda

•Development and Test Process

•Key Enabler for Model Based Test

•Rational Solution for System and Software Enginnering



Agenda

•Development and Test Process

•Key Enabler for Model Based Test

Rational Solution for System and Software Engineering



Development Process is Evolving...



MDT



Traditional testing methodologies are insufficient 80% of development costs are spent identifying and fixing defects



Defect cost derived in assuming it takes 8 hrs to find, fix and repair

a defect when found in code and unit test.

Defect FFR cost for other phases calculated by using the multiplier on a blended rate of \$80/hr



Current practices....

- Implement code from textual requirements
- Test only on target late in development cycle
 - -Defects introduced early but detected late during testing and validation
- Large part of development time spent manually testing
 - Difficult to communicate script/code tests to others and not traced to requirements



An optimal approach would be to fix errors as they are introduced, thereby helping to reduce your cost of development.



Quality by Design - "shift left" to identify and fix errors early The Benefits of Model Driven Development with Model Based Testing





Model Based Testing

- Visual test definition for improved collaboration
- Automated test execution, monitoring and test architecture creation
- Early validation of requirements during systems engineering
- Automate unit and regression testing helping improve software quality





Agenda

Development and Test Process

Key Enabler for Model Based Test

Rational Solution for System and Software Engineering



Key Enablers of Model Based Testing



Capture test cases with UML

- Based on OMG's standard UML Testing Profilie (www.omg.org)
- Specify test cases visually for better communication across teams
- Creating code tests cases or importing Cunit/Cpp unit tests also possible



visualize Test Cases

Automate Quality

- Automatically create test architecture
 - Creates a System Under Test (SUT), test components and test context
- Apply model based testing to external code
 - Code is developed outside of Rhapsody
 - Visualize code interfaces in Rhapsody and apply model based testing



Automate Festing Tasks

Model-Based Testing IBM Rational Rhapsody Test Conductor Add On

Automate Festing Tasks

- Visually capture test cases for better communication
 - Define test cases with sequence diagrams, statecharts, flowcharts or even code
 - Avoid manual programming
- Automate testing tasks
 - Create test architecture
 - Execute and monitor tests
 - Interactive for debugging,
 - Batch test suites for nightly regression
 - Include CUnit/CppUnit tests
- Traceability across lifecycle from requirements to integration
 - Integration with Rational lifecycle solution
- Host level and target based execution
 - White-box , black-box for design validation
 - "Offline testing" mode:–for testing on target
 - C++, C, Java, Ada Supported
- Definition and management of regression tests
- Reporting of results, coverage and traceability



Model Driven Test Generation

- Automates generation of test cases for complete model and code coverage
 - Export test cases for scenario-based testing using Test Conductor
 - Supported for C++
- Automatically generates test cases with high coverage of the design
 - Model coverage: Covers states, transitions, operations, event generation
 - Code coverage: Generates all relevant combinations of inputs for MC/DC

Rhapsody in C++ Automatic Test Genera	tion - Test Generation Configuration: Test	
File Edit Tools Help Test:ATG	General Interface Definition Settings Test Name: Test Test Case Generation Timeout (min) 0 Use ATG Compliation Environment 0 Delete existing SDs/Tests when exporting Export to: ATG::Test_ATG::Test Additional Include Paths: Additional Sources: Test Goal Coverage Total number of Test Goals: 16 Total number of Statements:	

Rhapsody in C++ Automatic Test Generation	n 💶 🗖 🔀
Test Generation Configuration: Test Generating Test Cases	
00:00:13	Timeout 00:01:00
Total Number of Test Goals	16
State Activation	4
4 (100%)	
Transition Firing	5
5 (100%)	
Operation Call	0
0 (0%)	
Event Generation	0
0 (0%)	
Code Coverage	7
4 (57%)	
Statement Coverage	88
60 (68%)	
Stop Hide Details	Close
E - San Test: 13/16	

Automate Testing Tasks





Code Verification with Rational Test RealTime integration

Automate Testing Tasks

Runtime Analysis:

Code Coverage

Performance Analysis

Memory Profiling



Integrated Design and Test Environment Manage test cases within Rational Rhapsody

ntegrated Design & Test Invironment



- **Common Browser for design and test information**
 - Syncs information to maintain consistency between design and
 - Apply model based testing to external code

🐳 to regression test()

💱 TCon_CashRegister_1.xml

- Visualize interfaces in Rhapsody



Test Execution Reports

Environment Info						
Test executed on machine:	NBOSC-21-1					
Test executed by user:	ubrockmeyer					
Used OS version:	Windows 2000 / Windows XP					
Used Rhapsody version:	Aries, build 799102					
Used TestConductor version:	2.0, build 530					

Tested Project					
Project:	CashRegister				
Active Component:	TCon_CashRegister_5				
Active Configuration:	DefaultConfig				

Test Context: TCon_CashRegister	Summary: PASSED
tc_code	PASSED
tc_activity_diagram	PASSED
tc_adding_removing_products	PASSED
tc_regression_test	PASSED
atg_tc_008	PASSED
atg_tc_009	PASSED
atg_tc_006	PASSED
atg_tc_002	PASSED
atg_tc_003	PASSED
atg_tc_004	PASSED

Model-Driven Development Model Based Test IBM Rational Rhapsody[®] with TestConductor

Integrated Design & Test Environment



Simulation for model level debugging

1BM Kational Knapsody Devi				7 Y						
Pile Edit Werr Code Layout To:										
🗅 🛩 🖬 👗 🐿 🚳 🖉 🖉	8 22	A 16 🖬 🗄	×	३, ९, १८ ९) 🖬 🖉 100% 🕞 🔗	2 - 2 H 2 0 % 2 2	74 Zi 🖯				
🕮 🔿 🚦 🟙 😘 PorGu		🛩 run GUI	application		🛛 🖈 🔸 🔸 📩 🛠					
				Sequence Diagram: TEST Monitor			A Test Scenario: Stu			
Entre Model View - 4 7				END/ callerTelephone	receivers included in Telepho		ENV Inco	uer Tolonho	moniums : Line	
PredefinedTypesCop (P	(EF)			Contract of Contra	economicane, rerelepito		LITY JUCC	ver. receptor.	Tecervery	-
Profiles										
Sequence Diagrams										
Test Package				ENV caller:Telepho	receiversLine: receiver:Tele	P	ENV re	ceiver:Telep	receiversLine:	
R 40 Test Context				ne	Line hone			hone	Line	
🖮 😰 Mainfolder				(/ = () = () = (= () = ()						
🕀 🐗 Coverage F	kesult.			· · · · · · · · · · · · · · · · · · ·	Section Decemptor values do es		Actin	ation		
Alintol	der_TestContextC	CoverageRepuits_	<u>۹</u>		Containing - Pranameter values do in	A INSCO	Con	Ition receiversLine-	>EventSent(receiver, evRin)	3
Real Action	s to assist inter-	sche debuccioni		- % I	evidigo		2 0)			
8 🚜 Co	verage Result		×	1 - manual and - m			1	1		
	MainfolderMoni	itora_to_essist_int	te	evolgionared(ordit-z)						
* H_ 501	instance			<i>%</i>			1/2			
	A Result	terre to everything but		<i>''</i>			// evOfHook()			
a No Repres	sion Test Tel 1 0	Caling Everybody		- %			1	7		
🛞 🎭 Stress	Test_Everybody_	Calling Busy Phot	ā III	- //			1,			
Au Telephy	one_1_Caling_Eve	rybody_Followed	с III	- %	i i		4.	1		
G G Test Result	des di bassi			<i>%</i>			1			
Tart Pan (t	del Torugai						1/2			
😑 😪 Result_0.html							~			
IN Ch. Tags										Geo 1
H C Tags				Result of TestContext Maxilla Fire				(× 10 11 1		
e 🚺 Thig Pex		a	, " 😕	Result of TestContext - Mozilla Fire	fox: IBM Edition		😫 Coverage Result	of TestCase - Mozi	IIIa Firefox: IBM Edition	
8 (5) Tegs 8 (6) TPK0_PEK		[a	, * e	Result of TestContext - Mozilla Fire Result of TestContext	fox: IBM Edition		Coverage Result	of TestCase - Mozi of TestCase	Illa Firefox: IBM Edition	
e in the trace		• • \$, " <mark>8</mark>	Result of TestContext - Mozilla Fire Result of TestContext TestCo	fox: IBM Edition *		Coverage Result	of TestCase - Mozi of TestCase	Illa Firefox: IBM Edition	
Name	Status	a the started and the started	- X - X - X	Result of TestContext - Mozilla Fire Result of TestContext TestCo	for: IBM Edition * ntext Result		Coverage Result	of TestCase - Mozi of TestCase	Illa Firefox: IBM Edition	
Name Name Namo Trage Name Namo Statest Inter	Status Status PALED		- X	Result of TestContext - Mozilla Fire Result of TestContext TestCo Test Con	fox: IBM Edition * mtext Result ntext: Mainfolder		Coverage Result	of TestCase - Mozi of TestCase	IIIa Firefox: IBM Edition	
Name Name Name	Status PALED PALED NOT ACTIVE	a a the	× * *	Result of TestContext - Mozilla Fire Result of TestContext TestCon Test Con Wednesday, Nov	fox: IBM Edition		Coverage Result	of TestCase - Mozi of TestCase	IIIa Firefox: IBM Edition	
Name - Brog. PRV - Brog. Prv Brog. P	Status PALED OF AALED NOT ACTIVE FALED	a e ** Pfe/Iteratio	- X	Result of TestContext - Mozilla Fire Result of TestContext TestCo Wednesday, Nov	for: IBM Edition		Coverage Result	of TestCase - Mozi of TestCase table Original Sector Conferences GaseConnection	IIIa Firefox: IBM Edition	
Name Name Name Name Name Name Name Name	Status PALED PALED NOT ACTIVE FALED NOT ACTIVE			Result of TestContext - Mozilla Fire Result of TestContext TestCon Test Con Wednesday, Nov Encore Test con offer on mether	fea: IBM Edition		Coverage Result	of TestCase - Mozil of TestCase	IIIa Firefox: IBM Edition	
Name Name Name Name Stanfolder Sp Monitori, ju, justice, Just	Status Status Status Not active Status Not active Status Status Not active Status St		× 8	Result of TestContext - Mozilla Fire Result of TestContext TestCon Test Con Test Con Test Con Test con Test executed on machine: Test executed on m	for: IBM Edition		Coverage Result	of TestCase - Mozi of TestCase table Grownage Surrow ScanConnector ConcOnnector Lotales Lotales Desconses NacOnt	IIIa Firefox: IBM Edition	
Norma Narra D Partfolder D	Stabus AILED AILED NOT ACTIVE ACTI	ia	× 🕹	Result of TestContext - Marilla Fire Result of TestContext	fee: IBM Edition		Coverage Result	of TestCase - Mozi of TestCase	Illa Firefox: IBM Edition	
Norman Strandski	Status PALED NOT ACTIVE STALED NOT ACTIVE STALED	3		Result of TestContext - Marilla Fire Result of TestContext Test Con Result Result of Result	for: IDA Edition Text Result ntext: Hainfolder ember 24, 2010 23:50:22 mod 24/000405097 potion Windows 2000 / Windows 399 7.3.5. Bdf 2005044		Coverage Result	of TestCase - Mozi of TestCase contractions contracted	IIIa Firefox: 18M Edition	
Not Topo Note: Name	Status PAILED NT ACTIVE PASSED PASSED PASSED PASSED PASSED PASSED	i Pile/Iteratio		Result of TestContext - Mozilla Fire assist of TestContext Test Con Wednesday, Nov Test Resounded by Joan Test Resounded	for: IBA Edition		Coverage Result	of TestCase - Mozi of TestCase context	IIIa Firefox: IBA Edition	
is 0, trappet is 0,	Status Status Status NoT ACTIVE Status PASSED PASSED PASSED PASSED PASSED PASSED PASSED PASSED	i Pile/Iteratio	× * *	Result of TestContext - Movilla Fire a test of TestContext	for: IDA Edition Text Result ntext: Hainfolder ember 24, 2010 23:50:22 ember 24, 2010 23:50:22 patien Vindema 2000 / Vindema 39 7.5.3, bald 20064 2.4.3, bald 2006		Coverage Result	of TestCase - Mozi of TestCase 2 Construction 2 Construction Construction 2 Construction 2 Const	IIIa Firefox: 18M Edition	
	Status AllED NOT ACTIVE STALED NOT ACTIVE STALED NOT ACTIVE STALED NOT ACTIVE STALED NOT ACTIVE STALED OF PASSED STALED PASSED STALED	i Pie/Iteratio	× *	Result of TestContext - Moville Fire a context - Movies	In: IIIAI fultion The second		Coverage Result	of TestCase - Mozi of TestCase TestCase Control Connector CaseConnector	Illa Firefox: IBA Edition	
	Status PAILED NOT ACTIVE S FAILED NOT ACTIVE S FAILED NOT ACTIVE S FASSED S FA			Result of TestContext - Moville Fire Testal of TestContext	An: IIIAN Faltion The Constraints of the faltion o		Coverage Result	of TestCase - Mazi of TestCase CashCaracia CashCashCaracia CashCashCaracia CashCashCashCashCashCashCashCashCashCash	Illa Firefox: IBA Edition	
	Status AllED AllED NOT ACTIVE ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED ASSED	i • • • ** • * •		Result of TestContext - Months Free) Result of TestContext	In: IBA (dition The second s		Coverage Result	of TestCase - Mozi of TestCase - Mozi of TestCase CastCaseation CastCastCaseation CastCaseation CastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCaseation CastCastCastCaseation CastCastCastCastCastCastCastCastCastCast	Illa Firefox: IBA Edition	
	Stabas Stabas Statuto Statu	1 1 1 1 1 1 2 2 2 3		Result of TredContext - Marchis Free) tests of Aracteristic Break	Ince title Faither The Constant of the Second Seco		Coverage Result	of TestCase - Mazi of TestCase Control of Control of Control Control of Control of Control of Control Control of Control of Contr	IIIa Firefox: IBM Edition	
Image: Section 1, and	Status Status Allitto Allitto Status Noti Active Status Posseti	A A A		React of TredContreet - exactlish three The State of TredControl The	Max: ItAlk fullow → → meters the Market of the Market o		Coverage Result	of TestCase - Mozi of TestCase TestCase CaseConstant Construction of the second Construction of the second Co	Illa Firefox: IBM Edition	
	Stabs PALED PALED FALED NOT ACTIVE PALED NOT ACTIVE PALED NOT ACTIVE PALED NACED PALED	() • • • • • • • • • • • • • • • • • • •		A service of the officient of the offici	Ins: IBA Fallens the Caracteristic of the second s		Coverage Result	of TestCase - Mazi of TestCase Control	IIIa Firefox: 18A Edition	
the second	Status PALED PALED NOT ACTIVE PASSED PASS	3 • • • • • • • • • • • • • • • • • • •		React of Productors - manufact free a start of Traditional Barrier Start Start Start Barrier Start St	tere: title Faithers The Constant of the State of the St	Summary:	Coverage Result	of TestCase - Mazi of TestCase TestCase Control Group (2016) Control Control (2016) Control Control (2016) Control Control (2016) Control Control (2016) Control (2016)	IIIa Firefox: 10M Edition	
Image: State	2Jaha PALED PALED NOT ACTIVE PALED NOT ACTIVE PALED PASED	() • • • • • • • • • • • • • • • • • • •		The sector of th	tax: title faithers	Summary: FAILD FAILD	Coverage Result	of TestCase - Mozi of TestCase - Construction - Con	Illa Firefox: IBM Edition	
Constraint of the second	Status PALIDO PALIDO NOTACTIVE PASED	3 • • • • • • • • • • • • • • • • • • •		Terrational and a second and a	An en elle California elle California Herricht Ca	a a a a a a a a a a a a a a a a a a a	Coverage Result	of TestCase - Mozi of TestCase Concellencedia Conce	Illa Firefoc: IbM Edition	
	21a1.a PALED PALED NOT ACTIVE PALED P	3		The second secon	Anar Edit Edition	Commany FALLO FALLO FALLO	Coverage Result	of TestCase - Mozi of TestCase TestCase TestCase Control Contr	Illa Firefox: IbM Edition in i in i in i in i	

Capabilities

- Requirements-driven analysis, design and test for systems engineering and embedded / real-time software applications
- Rapid design validation and verification with frequent simulation and testing
- Development and deployment of *complete* C, C++, Java and Ada applications targeting embedded device
- Model based testing with Rhapsody TestConductor Add On visualizes requirement and unit test cases

Benefits

- Build the right product through non-ambiguous communication and frequent collaboration
- Eliminate defects early and increase quality by continually testing the design
- Reduce development time by automatically generating applications and automating test execution and reporting
- Improve traceability cross link requirements, design, code and test cases and help maintain consistency

Specific, execute and monitor test cases with Rational Rhapsody TestConductor Add On

Requirements to Test Results Coverage



- Automated reporting of test results
 - Requirement to test coverage table
 - Test Coverage results
 - Complete test results in the reports

							₩ <u>₩,67070</u>		
⊨⊃ Ra	tional Ouality Ma	anager					👆 Code_tc_i	Name	Specification
							SD_tc_0	REQ1	A small stand-alone products that a Cus
Requirements	Home View Test Pla	ans 🔲 TestPlan_CashRegiste.	E TestCase_01_	SD_InitC	Execution Result			REQ10	After receiving a st display.
	Execution	Result ?						REQ2	When a product ha:
Planning	Command Line	e Result				1		REQ3	If the barcode canr will be displayed an
E			Test C	Case: SD_tc_0				REQ4	When all the select
Construction			10:20:31, M	onday, April 27, 20	^{o9} Nam	e			
	Actual Result:	Passed	Env Test executed on machine:	ironment Info JEKYLLSSLAVE		TCon_CashRegis	ster SD	tc O	4.html
Lab Management	Owner:	Jekylissiave Mary, Test Manager	Test executed by user: Used OS version: Used Rhapsody version:	Administrator Windows 2000 / V 7.5, build 1155117	Vindows XP	TCon_CashRegis	ster_atg	 _tc_0	- 107_7.html
Everation	Test Milestone: Test Case:	TestCase_01_SD_InitCashRe	Used TestConductor version:	2.4, build 1406 sted Project		TCon_CashRegis	steratg	_tc_0	06_9.html
CASCULOT	Test Script	SD_tc_0	Project: Active Component:	CppCashRegister_Cr TPkg_CashRegister_Cr	mp 😜	TCon_CashRegis	steratg	0	102_9.html
Reports	Test Data: Weight:	Unassigned 100	Active configuration:	s used in test		TCon_CashRegis	steratg	 tc0	
Result De	tails 🖓		Summary Info		Summary: passed	TCon_CashRegis	steratg	_tc_0	104_9.html
TCon_CashF TestConduct	RegisterSD_tc_0_0.html orAdapter20844.out		Total number of SDI used: Total number of SD instances in test: Total number of executed SD instance	es: 1	2	TCon_CashRegis	sterFC	_tc_0	_0.html
TestConduct TestLog2084	orAdapter20845.err I3.log		Total number of PASSED SD instance Total number of FAILED SD instances Total number of ACTIVE SD instances	s: 1 .: 0 s: 0	(100%) (0%)	TCon_CashRegis	ster_Co	de_tc	_0_0.html
			Total number of NOT ACTIVE SD inst	ances: 0	(0%)	TCon CashRegis	ster 7.ht	ml	



🐔 Failed

Model Based Test Spans the Development Lifecycle

- Integrated traceability from requirements to design to test cases
- Manage execution of test cases and results reports using Rational Quality Manager
- Mitigate project risks with continuous QA statistics





Unify Lifecycle Disciplines across Systems and Software Engineering

Best Practices, Tools and Services on an open platform



ollaboration

Requirements-driven testing

- Quick definition and execution of model and requirement-aware tests
 - Unit testing and regression testing
 - Reuse design scenarios as test cases
- Requirement change impact and analysis
 - Know which part of the model or which tests are affected by changing requirements

smarter plane

Fornal module "Sports utility vehicle 4/2/Regarements/User Regarements" current 2.1 (1998) - 00035 0 De Ist give poer jak gradenis Table Jods User Heo-TestPackages DAG IDPUV / TSELUA ずぎどち 田 いやモ ✓ TPkg_Stopwatch 20 * Woret * the ? ・そうマリ 公開 E Components the requirement for \$1.04 \$2 lineto lectros fiet in stat Deat Involo Tees ✓ ₩ TPkg_Stopwatch_Comp **3 Requirements** This section contains the user TestComponents re s'area ents 3.1 Capability Requirements TestContexts Pass/fail results can be 3.1.1 Carrying Capacity TCon Stopwatch 3.1.1.1 Number of People synchronized with RM tool Four energy size adults shall be SE-104 21410-1 from Garcta - Links able to travel in conduct for a period outlity rehicle. Full stars shall be created for two - Mariast Research of S hours. This level of conduct is defiCequirements@unctioned. passengers in both horit and back. Text Repuit Passed SUTS defined as bring equivalent to the Hequirements standard of condett provided by the The for shall be also to carry 4. Test Number 12 D.544 Test Context Diagrams Verify Number of Ferries top 40% of cars are buced in 1999. average size iduits in average There shall be state for a fifth comfort for a period of 3 hours. passenger in the safe that will not Third Unitested. - TestCases Last modified 11 Pobruary 1997 must be content requirement SD BlackBox 001() The top level of tars are taken in the juice range \$50,000 to \$40,000 at E SDInstances + 1960 within. Firs anarias are adulta thall be able TestObjectives Sighteres a training of lever to ixers. E Y TestResults Users shall have say entry and \$1 114 214 501 how objects Tet Norsher 6 B.67 unity whicle Verify support for A single interior light shall be TCon_Stopwatch__SD_BlackBox_001_0.html 4a26 squirements@ucrossed placed in the front of the vehicle. Ostores Requirements Test Result Universed TCon_Stopwatch__SD_BlackBox_001_0.xml The nor shall be able to D.91 Extlore ear node Joerstee PaulPaulind





Rational Quality Manager

Home

Requirement Planning E Construction

Lab

E

Execution

Result Details TCon CashRegister TestConductorAdapter2 TestConductorAdapter2 TestLog20843.log

Rational Rhapsody TestConductor integration with Rational Quality Manager

- Enables full execution control & management of model based Rhapsody **TestConductor test cases from RQM**
- **Execution status (passed/failed) and result reports (Execution Results, Coverage Results)** accessible through RQM
- RQM can utilize TestConductor execution results to continuously provide transparent & up to date QA statistics and QA reports

Command Line	Result ?	Test	t Case Res	ult	. 1		
		Te	est Case: SD_tc_0				
		10:20:31	, Monday, April 2	7,2009			"TestScoperies
shuel Deputh	Desard		Environment Info		SDTe	stScenario_0	«Testacenano»
tual Result	st Name: jekyllsslave		Test executed on machine: JEY/ILLSSLAVE Test executed by user: Administrator			-CLIT-	
ost Name:					«SUT»		
Owner: Mary, Test Manager	Mary, Test Manager	Used OS version:	version: Windows 2000 / Windows XP psody version: 7.5, build 1155117		TCor	_CashRegister.itsCa	TCon_CashRegister.itsTC_at
		Used Rhapsody version:			shRe	egister:CashRegister	hw of CashRegister:TC at
st Milestone:		Used TestConductor version: 2.4, build 1406		-	g	hw of CashRegister	
st Case:	TestCase_01_SD_InitCashRe		Tested Project				Int_or_ousintegrater
		Project:	CppCashRegister	r			
st Script:	SD_tc_0	Active Component:	TPkg_CashRegis	ter_Comp			evStart()
t Data:	Unassigned	Active Configuration:	DefaultConfig				eretaito
aht:	100					4	
ignic.	100	TEM CockRegistre (SDTextScore	SUS used in test				Death
?		n ng_oan nogota nao revoca	Na 10_0		-	snow(alvisg -	Ready)
		Summary .	Info	Summary: passed			
		Total number of SDs used:		1			
r_SD_tc_0_0.html		Total number of SD instances in	test:	1			
er20844.out		Total number of executed SD ine	stances:	1			evEnd()
ter20845.err		Total number of PASSED SD inst	tances:	1 (100%)			
		Total number of FAILED SD insta	inces:	0(0%)		1	
		Total number of ACTIVE SD inst	ances:	0 (0%)		<	



Integration with Rational Quality Manager

- Allows linking Tests and test results in RQM with model based tests in Rhapsody
- Test execution, test reporting, test statistics etc. from RQM for model based tests
- Enables quality driven development throughout the development cycle

Test Script	New - Rational Quality M	nport Test Script: Use local test resources		23	
Test Script		Step 3: Select Rhapsody TestConductor Test			
E Ratio	onal Quality Manager				
5-7		Load TestSpecifications from Rhapsody	Go		
	Dashboards Script			Adapter Type	
Requirements	Z TestCase0815 3			"Rhansody TestConductor"	
-	Test Script	Show All 👽 Items her hare	Previous 11-9 of 01	Knapsouy resternuctor	
E,		onowall v lients per page	T TOYIOUS		
Planning	Originator: admin Action: Select Action ▼ ⇒ St	Name 🔺	Full Path	Test Type	
	Type: Rhapsody TestConductor 🚽 Test Data: 1	atg_tc_002	TPkg_CashRegister::TCon_CashRegister.atg_tc_002()	TestCase	
E	Description: Simple demo test	atg_tc_003	TPkg_CashRegister::TCon_CashRegister.atg_tc_003()	–	
Construction	Phansody TestConductor Test Details 2	atg_tc_004	TPkg_CashRegister::TCon_CashRegister.atg_tc_0040	Interactive Test Case	
F .		atg_tc_006	TPkg_CashRegister::TCon_CashRegister.atg_tc_006()	interactive rest case	
	This will create a Test Script that references external test resc	atg_tc_008	TPkg_CashRegister::TCon_CashRegister_ety_it_ooog	Selection	
Lab Management	C Use test resources from a shared location 🖓	FC_tc_0	TO:cashRegister::TCon_CashRegister.FC_tc_0()		
	Choose test resources from a shared location. At execution time, the resources will be copied to the test may	SD_tc_0	TPkg_CashRegister::TCon_CashRegister.SD_tc_0()	TestCase	
		TCon_CashRegister	TPkg_CashRegister::TCon_CashRegister	TestContext	
Builds	Ose test resources that are local to a test machine ?	TPkg_CashRegister	TPkg_CashRegister	TestPackage	
	Choose test resources that are on a test machine already.		Previous 11-9 of 91 Nevt		٦
E	At execution time, the resources at the location you choose w			Buttons & List Boxes for	
Execution	Select Adapter		< Previou:		
	Project Path i:/Models/Project_1/Project_1.r)y		Test Execution Settings	
	Test Specification TPkg_class_1::TCon_class_1				
Reports	Rhapsody Language Default 🔽				
	Start Rhapsody in Silent Mode 🗌 🛛 🚽				
1	Grab only Results				
Defects	Hulid before Execute				
	Performance Cetting				
	CaptureAndLeaveOpen				
			Discard Changes Save		
			Contains Unsaved Changes		







Agenda

- Development and Test Process
- •Key Enabler for Model Based Test

•Rational Solution for System and Software Engineering



Rational Solutions for Systems and Software Engineering Built on a core product set

Use modeling to validate requirements, architecture and design throughout the development process





Build in Quality from Concept to Launch

- Visual test definition for improved collaboration
- Automated test execution, monitoring and test architecture creation
- Early validation of requirements during systems engineering
- Record simulations often to validate functionality and verify correctness
- Automate unit and regression testing to help improve software quality
- Link to requirements, model, code and test data for traceability
- Automatically create and execute tests from the design model or target platform







Ensure Success with Rational

Rational. software

smarter planet

Process and methodology

- Process framework
 workshops
- Rational Harmony family of Best Practices and Processes
- Process training

Implementation services

- Adoption quick starts
- Deployment support
- Project architecture workshops
- Project management
- Planning support
- Escalation/risk mitigation

Training and mentoring

- Product familiarity
- Product expertise and specialization
- Technology transfer
- Adoption mentoring
- e-Learning

Technical services

- Measured Capability Improvement Framework (MCIF)
- Product optimization
 and customization
- Tool configuration



What's next?

Track 15,45 – 16,30 Model-Driven Development e Model-Based Testing per codice Safety Critical

Track 16:30-17:15 Agile and RTC Adoption@Rome

Demo point 15,45 – 17,00 Collaborative Life-Cycle Management





Learn more at:

- IBM Rational software
- IBM Rational Software Delivery Platform
- Process and portfolio management
- Change and release management
- Quality management
- Architecture management

- Rational trial downloads
- Leading Innovation Web site
- developerWorks Rational
- IBM Rational TV
- IBM Business Partners
- IBM Rational Case Studies

© Copyright IBM Corporation 2010. All rights reserved. The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. Product release dates and/or capabilities referenced in these materials may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way. IBM, the IBM logo, Rational, the Rational logo, Telelogic, the Telelogic logo, and other IBM products and services are trademarks of the International Business Machines Comparison in the Linited States, other countries or both. Other company, product, or service names may be trademarks or service marks of others.