

Mobile Application Performance Testing (Opera Mobile Browser Emulator) – IBM Rational Performance Tester

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Introduction

This article will demonstrate how you can performance test a web application accessed via the Opera Mobile Emulator using IBM Rational Performance Tester. It would also cover the basic configuration required to be set on the Opera Mobile Browser Emulator from IBM Rational Performance Tester perspective. You would also get to know the key parameters which need to be focused on, in order to capture the traffic via RPT's proxy port.

INTRODUCTION	2
OPERA MOBILE EMULATOR - BASICS	4
RPT RECORDING AND PLAYBACK FEATURES	6
CONFIGURATION OF OPERA MOBILE EMULATOR	7
REFERENCES	<u>16</u>



Opera Mobile Emulator Features

The ability to test web data in a multi configuration environment is accounting to be a costly affair and cannot be overlooked with respect to the business projects. Undoubtedly the Mobile Emulators have proven to be a useful tool right from the designers to developers and testers. These days most of the browser configurations also provide built-in emulator kind of functionality, Firefox browser being exceptional here, but allows it to be added as an external plugin.

Whatever may be the reason here, when competing the browsers against mobile/Desktop emulators, the key success solely depends on the rendering engine incorporated in these. Few browsers may use different rendering engines such as Blink (used by Chrome and Opera), Trident (Used by Internet Explorer), but the challenge remains about how consistently the data or rather the page elements/contents are getting displayed.

Well a lot depends on such factors when you are getting into performance testing such data. Emulators are pretty much exactly as their names suggest, they emulate how a browser would render a web page. The obvious benefit is the ability to test out your web pages under multiple browsers without having multiple installations of browser applications and versions installed on your computer.

In this section, we shall focus on the Opera Mobile Emulator which is basically gets installed as a native application and easy to install. Upon launching this, you would experience a selective list of various profiles which spawns different set of phone configurations as you see below

6 Opera Mobile Emulator				x
Profile				
Nokia N900 Maemo Samsung Galaxy Nexus Samsung Galaxy Note	*	Resolution	WVGA Portrait (480×800) Add Remove	•
Samsung Galaxy Note 10.1 Samsung Galaxy S Samsung Galaxy S II		Pixel Density	216 Add Remove	•
Samsung Galaxy S III Samsung Galaxy Tab Samsung Galaxy Tab 7 0 Plus	=	User Interface	Touch	•
Samsung Galaxy Tab 8.9 Samsung Galaxy Tab 10.1	-	Window Scale	100%	•
Save/save as Remove		Arguments Full browser reset on startup		
		Launch	Help Change lang	guage

Figure01: Profile Selector

These profiles are pre-configured with popular profile configurations. By selecting any of the given profile and clicking "Launch" button will help you invoke the respective Opera Mobile browser instance.

From IBM Rational performance Tester perspective, you should be able to record traffic which communicates or rather flows using the HTTP protocol over TCP/IP. However the traffic gets recorded by RPT only when the data is flown via RPT's proxy port which we shall discuss in later part of the section.

RPT – Record Playback Features

IBM Rational Performance Tester is generally a user load performance testing application and is based on Eclipse platform and monitoring framework Hyades. A versatile performance testing solutions are currently being addressed by RPT and can effectively help performance engineers to verify and validate the performance bottlenecks of the system under test.

The offerings include Eclipse based UI interface with various perspectives, Built-in report generation capabilities covering Transaction reports, Response time variation reports, Resource Monitoring data and so on.

On the other hand, it also provides customization options (Java Scripting) for advanced analysis and expert testers, and provides access to a wealth of test information.

IBM Rational® Performance Tester creates, executes, and analyzes tests to validate the reliability of complex e-business applications. Some of the features include:

- 1. Provides testing that requires no or very minimal programing knowledge.
- 2. Find and diagnoses the cause of performance problems.
- 3. Advanced data access and manipulation.
- 4. Automatic data correlation and synchronization of input parameters.
- 5. Verification points for content matching response code checking, response size checking, and page title checking.
- 6. Automatic ARM instrumentation for transactions to correlate with downstream applications and resources for problem isolation.
- 7. Improved scalability allows for higher playback rates and more concurrent playbacks on a single system, which limits costs of licenses and maintenance.
- 8. Network level statistics for DNS, SSL Connect time, Server Response Time and Delivery.
- 9. Rendered HTML view of web pages visited during test recording.

A performance test allows you to record sessions with an HTTP application, and generates tests from the recording. Creating a Performance test involves three steps :

- 1. Starting a recording
- 2. Starting an application
- 3. Starting a test generator

IBM[®] Rational[®] Performance Tester automates these steps for you with the help of user friendly user Interface Wizard. For more information on how to invoke the recording process and script the user actions performed on the Application under Test, you may refer the <u>IBM Knowledge Center</u>.

Opera Mobile Emulator Configuration

In-order to demonstrate how RPT records HTTP request data from the application browser launched in the Opera Mobile Emulator, you need to understand how to configure this Emulator with IBM Rational Performance Tester built-in proxy recorder

Rational Performance Tester supports browser configurations that connect directly to the Web Server as well as connection via a HTTP/HTTPS proxy server. The first thing to confirm is if you are using a supported configuration setting prior to attempting a recording.

For similar configurations related to any other browsers such as Internet Explorer or Mozilla Firefox and so on, you may refer this article <u>here</u>.

For configuring the Opera Mobile Emulator with the proxy settings provided from Rational Performance Tester perspective, you have to first launch the Opera Mobile Emulator as shown below and select the respective profiles under test



As soon as the emulator is launched you see the below dialog listing various profiles specific to different mobile devices. Using the profiles on the left side, you can launch one or more Opera Mobile instances with device-specific settings.



Sameung Galaxy Nexus	•	Resolution	HD Portrait (720×1280)
Samsung Galaxy Nete		Resolution	(12) For trait (720×1200)
Samsung Galaxy Note 10.1			Add Remove
Samsung Galaxy Note 10.1		51 I.S. 11	
Samsung Galaxy S		Pixel Density	306
Samsung Galaxy S II			Add Remove
Samsung Galaxy 5 m			
Samsung Galaxy Tab 7.0 Dlus		User Interface	Touch
Samsung Galaxy Tab 7.0 Plus	-	User Agent String	Android
Samsung Galaxy Tab 10.1	=	User Agent String	Android
Samsung Galaxy lab 10.1		Window Scale	50%
Sony Apena Ray	-	A	
		Arguments	
Save/save as Remove		Full browser reset on start	tup 📃

Upon clicking "Launch" button you are greeted with the below window frame. Navigate to **Opera:Config** to setup the proxy host and port values.

🏀 Opera Mobile - Samsung Galaxy S 🎞 📃 💻 🖛
Preferences Editor
opera:config 🖌 Google
Preferences Editor
Help
Show all
Q Quick find
Author Display Mode
CSS Generic Font Family
► Cache
► Colors
▼ Developer Tools
Proxy Auto Connect Default
Proxy Host
127.0.0.1
Default
Proxy Port
Default
$\bullet \rightarrow \circ \blacksquare (\bullet \bullet)$
Samsung Galaxy S III 720x1280 PPI: 306 🕞 50% 🗸

So in this section, configure the client (Opera Mobile Emulator) to use a HTTP proxy server at <*RPT_Host>*:1080

Note1: < *RPT_Host*> is the name of the computer on which you are running the recorder. Typically localhost (or 127.0.0.1) would work. In some cases you might be running the application to be recorded on a different computer than the recorder.

Once this configuration is completed, you may launch IBM Rational Performance Tester and create a new Performance Project as shown below. The project name can be user defined one.

New Project Description Descripti Descripti Description Description Descripti	
Create a Performance Test project	
Create a new Performance Test Project in the workspace or in an external location.	
Project name: Opera_Emulator	
✓ Use <u>d</u> efault location	
Location: C:\Users\IBM_ADMIN\IBM\rationalsdp\Opera_N	B <u>r</u> owse
(<u>Back</u>) <u> Next ></u> <u> Finish</u> [Cancel

Once the Performance Project is created, invoke the built-in recorder option by clicking on the **"New Test From Recording"** button visible on the top of the RPT application.

Performance Test - Rational Performance Tester								
<u>File Edit Navigate Search Project Run Window H</u> elp								
📑 🕶 🖪 🕼 🖻 🔜 🚳 🗏 🚳 🤞	📑 😒 🏖 🔝 🔤 🔤 📲							
	🕒 HTTP Test							
	👔 Services Test							
EQ Test Nav 🔀	E Socket Sample Test							
	🖳 Socket Test							
Opera_Emulator	TN3270 Test							

Select the "Socket Test" recorder option and Specify a Test name

New HTTP Test From Recording		x
Select Location Choose a location and a name for the test.	F	
·		
/Opera_Emulator		-
Opera_Emulator		
		=
Test name: Opera_01.testsuite		
Recording Encryption <u>L</u> evel: None		
Customize automatic data correlation Configure Works	nace Setting	nc 🔽
(?) < <u>Back</u> <u>Next</u> > <u>Finish</u>	Cance	el

Select "Managed Application" as the client Application type and click "Next".



Wew HTTP Test From Recording	
Select Client Application Launches an application and records its activity.	
 Apple Safari Attachmate EXTRA! X-treme Google Chrome IBM Personal Communication Managed Application Microsoft Internet Explorer Mozilla Firefox Opera SDK Example Application Unmanaged Application 	
? < <u>Back</u> <u>Next</u> > <u>Finish</u>	Cancel

Navigate to the "Launcher.exe" file as shown below. The "Launcher.exe" would ideally launch the window where you are greeted with multiple profile selector options. The location of the "Working Directory" could be any folder where you have the "Read/Write" Access.



🙆 New HTTP Test Fi	rom Recording	
Managed Applica Specify the applica	tion Options tion to launch.	
Program path:	C:\Program Files (x86)\Opera Mobile Emulator\Launcher.exe	▼ Browse
Working directory:	C:\Users\IBM_ADMIN	Browse
Arguments:		*
?	< <u>B</u> ack <u>N</u> ext > <u>Finish</u>	Cancel

Keep this option unchecked. Click "Next" >> "Finish" button.

New Socket Test From Recording		x
Socket I/O Recorder Secure Settings		
Specify the secure options for the Socket I/O Recorder.		
Enable recording of SSL/TLS encrypted communication		

As soon as you click on "Finish" button, you are greeted with a Profile selector window where you can select one of the mobile device profile and click "Launch" button. This would invoke the Opera Mobile browser and let's you specify or access any websites. The traffic flowing into the Opera Mobile browser would let the RPT's proxy port (1080) to be sniffed by the active running RPT instance. The Annotation bar on the top here reflects the packet size being captured.



<u>File Edit Navigate Search Project R</u> un	<u>W</u> indow <u>H</u> elp						
📑 🕶 🔛 🕤 🔜 🕼 🖷 🕹 🔶 🗛	1 📽 🕶 🖾 🔏 1 🗞	2 💈 🖻 🕶 🖗	Recording - Opera				
💐 Test Navigator 🐹 🛅 Test Data Sources		Gera_01.recsessio	n 🛛 89 packets	Test Annotations: 🐑 🚳 💈 🖌) de C		
🔺 🚔 Opera Emulator	= 🕏 <u> </u> 🖻	Opera_01.recse	ssion (Active)		C Opera Mo	obile - Samsung Galaxy S II	
🍯 Opera_01		89 packets (288 KB), 0	attachments (0 bytes)			Goo	gle
		Managed Applica i Current state: Ru	tion :: Running nning		www	.google.co.in/	🖈 Google
	C Opera Mobil	e Emulator				All Images	Sign in
	Profile						
	Motorola Xo Nokia N800 Nokia N9 Nokia N900 Samsung Ga	om A Maemo Iaxy Nexus	Resolution Pixel Density	WVGA Portrait (480×800) Add Remove 216 Add Demove			
	Samsung Ga Samsung Ga Samsung Ga Samsung Ga	laxy Note laxy Note 10.1 laxy S laxy S II	User Interface User Agent String	Touch Android			
	Samsung Ga Samsung Ga	laxy S III laxy Tab	Window Scale	100%			
Properties 🙁 📲 Performance Test Runs	Save/save as	Remove	Arguments Full browser reset on star	tup 📃			
Property Value		-	Laund	h Help Change lan		Google.co.in	offered in:

Upon completion of the use-case performed on the Opera browser here, you need to close this along with the Opera Mobile Emulator window. This would bring up the RPT instance active and you see that the use-case captured is incorporated in the generation of the Test scripts. Click "Open Test" button.

2 Test Navigator 🕴 🕕 Test Data Sources 🔗 🖻	Opera_01.recsession 33					° 0
Copera_Emulator Gopera_01 Conera_01	⁷ Opera_01.recsession (Terminated) 141 packets (495 KB), 0 attachments (0 bytes)					👻 🗮 🥐 🎕 Started on January 22, 2016 at 12:22:54 PM
ii Ahaa'ay	Managed Application :: Terminated i Current state: Terminated			Socket I/O Rec i A recorded pro	order = Terminated	0
				Annotation Rev Current state: 1	corder :: Terminated	500 E 60 5
	Statistics			Annotations		
	Type R Socket I/O Message	Packets 141	Size 495 KB	Category	Label	Time
		Test Generation				
	Encryption level: None Change Timeline	1 Test Genera	stion completed			
] Properties 22 ⁴ 급 Performance Test Runs 으 다 변화 및 대 전 Yoperty Value		+ Log				Socket VO Message
	0.399 11.97 23.94 35.91 47.88 59.85 7	1.8	Run in Backgrou	nd Open Test	Close 2	43.39 258.153 273.714

The RPT generated scripts would be seen as below:



EX Test Navigator 🔀 🕼 Test Data Sources		- E	3	G Opera_01.recsession 🛛 😫 Opera_01 🐹
✓ Øpera_Emulator ✓ Opera_01 ♥ Opera_01	□ \$		~	Test - Opera_01 Test Contents Enter filter text View
				 Opera_01 Test Resources Connection to google.co.in:80 Send to google.co.in:80 [GET / HTTP/1.1\r\nUser-Age] Connection to sitecheck.opera-mini.net:80 Send to sitecheck.opera-mini.net:80 [GET /?host=google.co.in8] Receive from google.co.in:80 [HTTP/1.1 301 Moved Perma], policy: exact size Receive from sitecheck.opera-mini.net:80 [HTTP/1.1 200 OK\r\nServer], policy: Send to sitecheck.opera-mini.net:80 [GET /?host=google.co] Send to sitecheck.opera-mini.net:80 [GET /?host=www.google.co] Send to sitecheck.opera-mini.net:80 [GET /?host=www.google.co] Send to sitecheck.opera-mini.net:80 [GET /?host=www.google.co] Send to www.google.co.in:80 [GET //host=www.google.co] Connection to www.google.co.in:80 [HTTP/1.1 200 OK\r\nContent], policy: exact Receive from www.google.co.in:80 [Wb9\xa5P\x9e=G\xf8K\x10\xe7X\xcd\x1a'\x1t Connection to www.google.co.in:80 #2 Connection to www.google.co.in:80 #3
Properties 🕱 📲 Performance Test Runs	⊡ ~	[,] - E		Send to www.google.co.in:80 #2 [GET /images/branding/pro] ♣ Send to www.google.co.in:80 #3 [GET /images/nav_logo229] ♥ Connection to www.google.co.in:80 #4
Common Name: Opera_01			•	 Receive from www.google.co.in:80 #2 [HTTP/1.1 403 Forbidden\r\n], policy: exa Receive from www.google.co.in:80 #3 [HTTP/1.1 403 Forbidden\r\n], policy: exa Close of www.google.co.in:80 Close of www.google.co.in:80 #2 Close of www.google.co.in:80 #3
Description:			A	< <u> </u>

The recorded script can be played back by clicking on the subscription the right top corner of the RPT screen.

G Opera_01.recsession 🔮 Opera_01 🕸				
Test - Opera_01				
Test Contents				Test Details
Enter filter text		View 🔻	Options 💌	Common Options 🔀 Client Program Security
 ^Q Opera_01 ^Q Test Resources ^Q Connection to google.co.in:80 ^Q Send to google.co.in:80 (GET / HTTP/1.1\n/nUser-Age] ^Q Receive from google.co.in:80 [HTTP/1.1 301 Moved Perma], policy: exact size ^Q Connection to sitecheck.opera-mini.net:80 ^Q Connection to sitecheck.opera-mini.net:80 #2 ^Q Send to sitecheck.opera-mini.net:80 [GET / host=google.co.in&] ^Q Send to sitecheck.opera-mini.net:80 #2 ^Q Send to sitecheck.opera-mini.net:80 #2 ^Q Send to sitecheck.opera-mini.net:80 #2 ^Q Receive from sitecheck.opera-mini.net:80 #2 ^Q Receive from sitecheck.opera-mini.net:80 #2 [GET /?host=google.co] ^Q Receive from sitecheck.opera-mini.net:80 #2 [GET /?host=www.google.co] ^Q Receive from www.google.co.in:80 [HTTP/1.1 200 OK\r/nServer], policy: exact size ^Q Receive from www.google.co.in:80 [Wdl\x80\x43\x43 \x43 \x43 \x43 \x43 \x43 \x43 \	 Launch Test Launching 99% 2/2 files 18545/1 Always run in bac 	18545 bytes :kground	Add Insert Select deployed	Datapools Name
 Send to www.google.co.in:80 [GET /images/branding/pro] ♥ Connection to www.google.co.in:80 #2 ✿ Receive from www.google.co.in:80 [HTTP/1.1 403 Forbidden\r\n], policy: exact size 		_	Run in Back	cground Cancel Details >>

Upon completion of the run, RPT generates a socket report as shown below.



	overall					
Opera_Emulator	Initializing Computer(s) Running		Performing Test Log data transfer	Complete		
Sic Compound Tests Compound Tests	Virtual Users Activity		Run Summary			
Locations	1175 T		Executed Test	Opera_01		
> Results	5		Active Users	0		
Dpera_01 (Jan 22, 2016, 12:36:23 PM)	8	1	Completed Users	1		
Schedules	E ar		Total Users	1		
🕞 Tests	30.3		Elapsed Time [H:M:5]	0:00:34		
Gopera_01	Ĭ		Run Status	Complete		
G Opera_01	58		Displaying Results for Computer:	All Hosts		
	Active Users Completed Users		Overall Socket Activity			
			Successful Connections	16		
			Successful Sends	24		
			Successful Receives	29		
			Successful Closes	16		
perties 22 To Performance Test Runs						
() () () () () () () () () () () () () (Test Health					
Value Value	Connection Success Recent Hos Runt	100				
	Sand Success Percent [for Run]	100				
	and an even a complete the stand	100				

For more detailed information about Socket Performance statistical report analysis, please visit the <u>IBM</u> <u>Knowledge Center</u>.



References:

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- 4. <u>https://www-</u> 01.ibm.com/support/knowledgecenter/SSMMM5_8.7.1/com.ibm.rational.test.lt.rt w.nav.doc/rpt_welcome.html