The Mobile
Load Testing
Starter Guide

RADVIEW

Introduction

Mobile is a significant factor when building an application. The number of mobile devices is already beyond the number of desktops. For this reason, mobile considerations are becoming more important during the development processes.

Consider how many times a day you use your mobile device to read the news, sports, check out your bank account - all on your mobile device. This means much more usage and more load over the websites. To get more interesting data trends, you can drill down into the following link:

www.smartinsights.com/mobile-marketing/mobile-marketing-analytics/mobile-marketing-statistics/

It means that over the past few years there is a significant change in the usage of web applications compared to several years ago:

- New device types reaching out for data.
- More users are reaching your site for data.
- These users are doing it more often.
- Mobile devices become bigger and are constantly improving, as is the network, so mobile pages become larger and more complex.

This causes changes to mobile application testing plans:
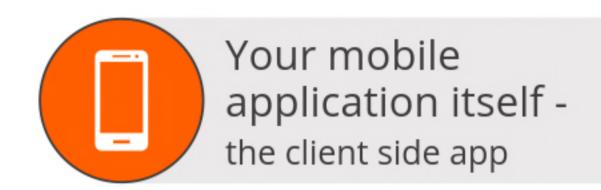
- More users than before.
- Different types of users - desktops/laptops and mobile devices.

How to Verify Your Mobile App is Perfect

Stability of your mobile application is affected by 3 major factors →

Your mobile application itself - the client side app

The server side

The network

Because issues may occur in all 3 places, we recommend that you test your application in stages:

☑ Using a mobile functional product such as Perfecto Mobile or Experitest.

☑ Combine both sides while simulating different server behaviors in order to understand how they affect the mobile application. For example, what happens to the mobile application if the server does not respond, or if it responds after 30 seconds?

☑ Directly test the services on your backend server that are used by the mobile application.

☑ Add load testing into the equation - can your infrastructure deliver acceptable response time while running at acceptable CPU and memory utilization?

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Mobile Applications
Characteristics

Mobile Application Types

In this section we will quickly go over the characteristics of mobile applications. We'll see how they are built, and how they are being used. The idea is not to teach you how to build your mobile app, rather to define the important considerations while you are designing these apps and testing their performance and stability.

In general, mobile applications are divided into three types. There are two major types, and a third type that is a hybrid of the first two:

Native App
An application developed to work on a specific device platform (iOS, Android) and is installed on the device.

Web App
An application that is based on the device's Web Browser. It is not installed on the device itself. These apps are mainly use web technologies such as HTML5, JavaScript and CSS.

Hybrid App
This is a mix of the two. For example embed HTML5 pages into your native app.

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Mobile Application Types

Because this is not a mobile app development document, I will not drill down here to the pros and cons for each type, but I will state that the communication between the device and the server is affected by the way you write your app:

When dealing with web apps, you mainly design regular web pages, but they have to suit the smaller size of the device.

When dealing the native apps, the interaction with the server is done via API/Services.

And of course when dealing with hybrid apps, you have both kinds of server interactions.

When you are looking into a testing solution, you need to look for one that can cover all application types and protocols.

Mobile Usage Characteristics

Let's take a look into the mobile app characteristics that will affect your test in order to verify your app and your server are working properly in all conditions:

Different devices

You should expect your users to reach your servers using many different vendors and devices.

Different location

Well, this is obvious of course.

Different networks

Each user may reach your server via a different mobile network such as 3G, 4G, GPRS, etc. Each of these types of networks means different connection speeds, different interruption rates, different failure rates, etc. When you test your server you may want to test it under the most realistic conditions that you can simulate.

When you are looking into a load testing solution, you need to look for a solution that can mimic different devices, different networks and can create load from different locations.

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Mobile User is **Not the Only One in this World**

When you deal with Web Apps, the web server supports both regular desktop/laptop users and mobile devices. In many applications, the exact same server supports both, and the server creates responses that suit the client. The client identifies its type to the server, and the server creates the appropriate response. In other applications, the web servers distribute the request to 2 different servers - one that answers the desktop and one that answers the mobile devices.

When testing these two application types, create a mix of desktops and mobile devices. Testing only one kind will not prove that your application is working correctly.

When you load test your infrastructure, you need to remember that both your mobile and desktop users can contribute to overload and are affected by this overload.

A user is a user, regardless of their working device.

Let's move on to the next section to learn what is the best way to create the desirable load testing environment.
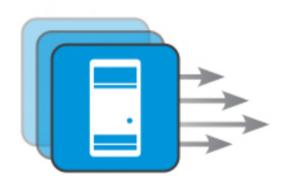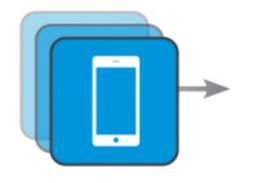
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The preferred load testing environment

Since it is not practical to create large infrastructure load using hundreds or thousands of machines, load testing tools create a large number of virtual users on many less load generator machines. The same thing is right for the mobile devices. It is not realistic to create load from thousands of real devices. This is why you need to work with a tool that simulates both mobile and desktop load from a single machine. But you should execute a few real devices in order to measure the actual application response in real life.

Take a look at the following **load testing architecture** image. It shows that you can combine simulated virtual users with real mobile devices and browsers from several locations:

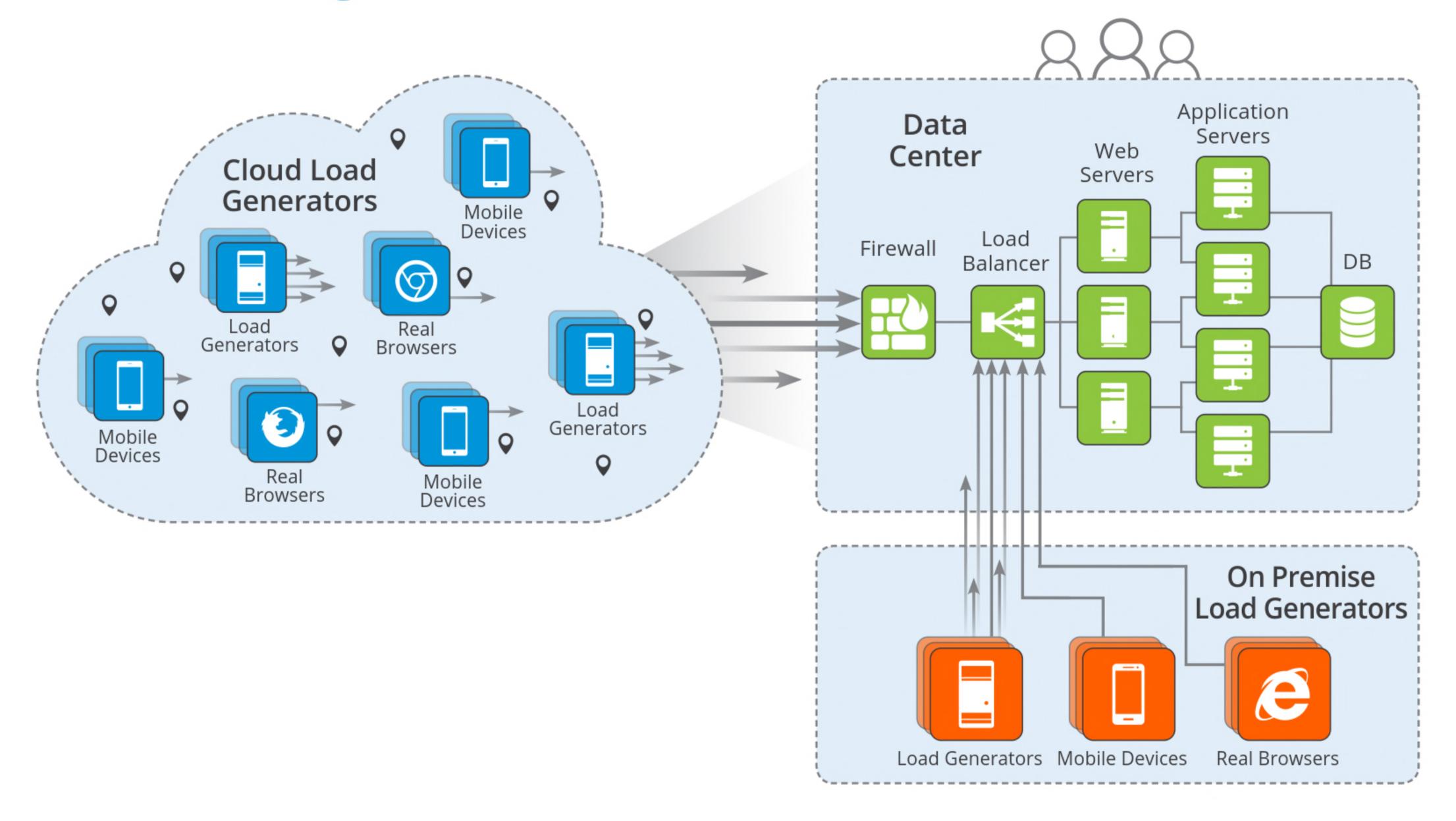## Create massive load
on one hand

Run and measure the real user experience on the other hand

Doing this you can create a load and collect performance measurements from both the simulators and the real devices and browsers.

You gain the best of both worlds.

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Load Testing **Architecture**

Cloud Load Generators

Mobile Devices

Load Generators

Real Browsers

Mobile Devices

Real Browsers

Mobile Devices

Load Generators

Data Center

Firewall

Load Balancer

Web Servers

Application Servers

DB

On Premise Load Generators
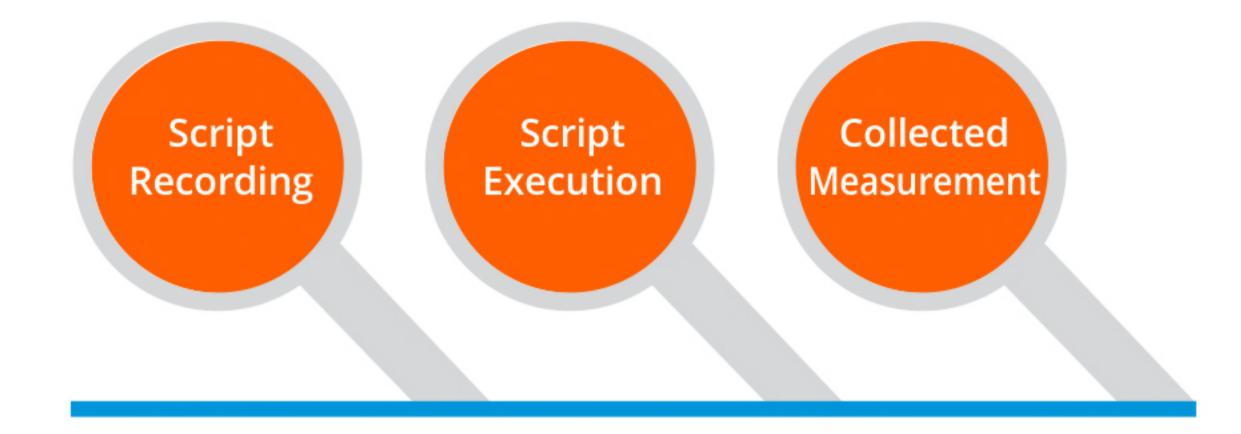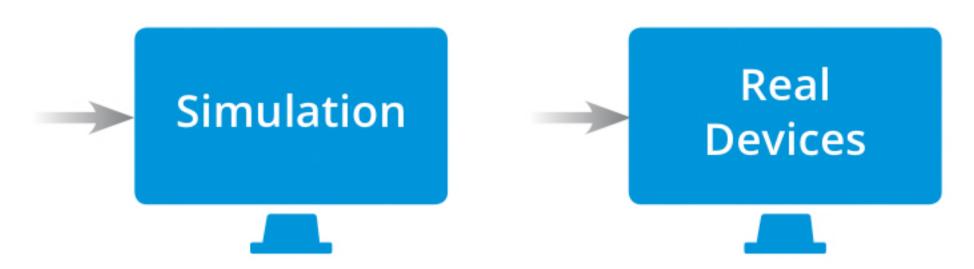
Load Generators

Mobile Devices

Real Browsers

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WebLOAD **for Mobile**

Now, after the brief overview of the mobile world, and after you understand the preferred architecture for load testing your mobile app, let's take a closer look into WebLOAD and how it can help you to deal with the new challenges in mobile load testing.

As always in load testing, you need to take a deeper look into 3 major areas:

Script Recording

Script Execution

Collected Measurement

In this case, we should look into these 3 subjects under **two different angles:**

Simulation
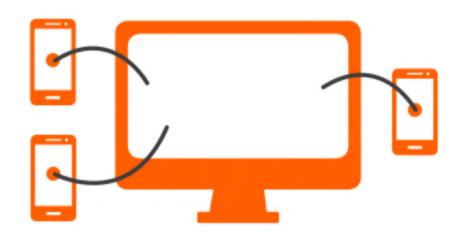
Real Devices

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Simulating virtual users in WebLOAD

As noted before, first you need to record a script. WebLOAD, with its proxy recorder, gives you the capability to record anything that is running anywhere:

Record your mobile activity from a mobile device

If you would like to record the script when you work with your mobile. WebLOAD lets you record ALL app types - Native app, Web app and Hybrid app.

Mobile emulation on a computer

Let's say you do not have the exact device that you would like to test, you can work with its emulation on your computer. It will do the same job as it is done on the real device - again, WebLOAD lets you record ALL app types - Native app, Web app and Hybrid app.

Using your desktop browser

You can record your Mobile Web App, using your desktop browser. WebLoad will make your desktop browser behave as if it was running inside your mobile device. This is done by setting the "identify as" checkbox to mimic the right mobile that suits you.

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Simulating virtual users in WebLOAD

During the execution phase, WebLOAD gives you everything that you need in order to simulate real world mobile load:

You can change the identification of the mobile device by changing the user-agent parameter. The server will identify the virtual user according to this parameter, and will react differently to different mobile devices.
You can also Parameterize the user-agent - meaning, create a list of hundreds of user-agents, representing hundreds of different mobile devices, define their distribution, etc.

WebLOAD gives you the option to use cloud load generators and simulate mobile machines reaching your sites from many different locations worldwide.

Simulating different networks - while the internet connections are very fast these days, the mobile networks are not as stable, suffer from lower speed connection, or bad reception. WebLOAD lets you simulate different kinds of mobile network speeds such as GPRS, 4G, 3G, etc.

Measurements are collected by WebLOAD as usual from the virtual clients that WebLOAD is simulating. So, you can get any performance measurement that you are used to getting from WebLOAD on regular web pages: DNS time, response time, server time, time to first byte, etc., and of course you can set your own transaction and measure the specific activity you are interested in.

As usual, as part of measuring the client side WebLOAD collects performance measurements on the server side, using its Performance Measurement Manager (PMM). Using PMM you will be able to collect statistics of your application server, DB, Firewall, etc. This lets you correlate issues you have seen during the simulation on the client side to the server side.
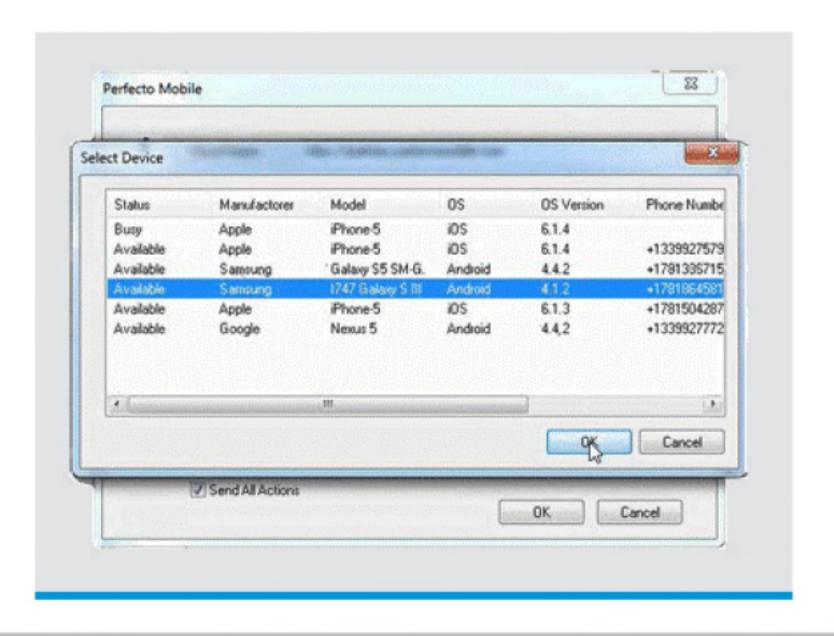
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Running real devices during load

WebLOAD also gives you the ability to execute scenarios (and functional tests) on real devices during the load test. WebLOAD's flexible solution let's you integrate with any mobile functional testing product that has a proper API to integrate with. In addition, we built an integration with Perfecto Mobile that has mobile device farms around the world. The integration with Perfecto Mobile gives you the ability to activate real devices and measure in your test the user experience the mobile devices sees on one hand, and load the server with many virtual users in WebLOAD on the other hand.

The recording phase is done solely in Perfecto Mobile. This is routine for any Perfecto Mobile customer. In Perfecto Mobile you record all your mobile activity and you can also define groups of activities to represent specific transactions that interest you.

In WebLOAD Mobile Wizard, you can select the Perfecto Mobile scripts, the devices and their locations.

Running real devices during load
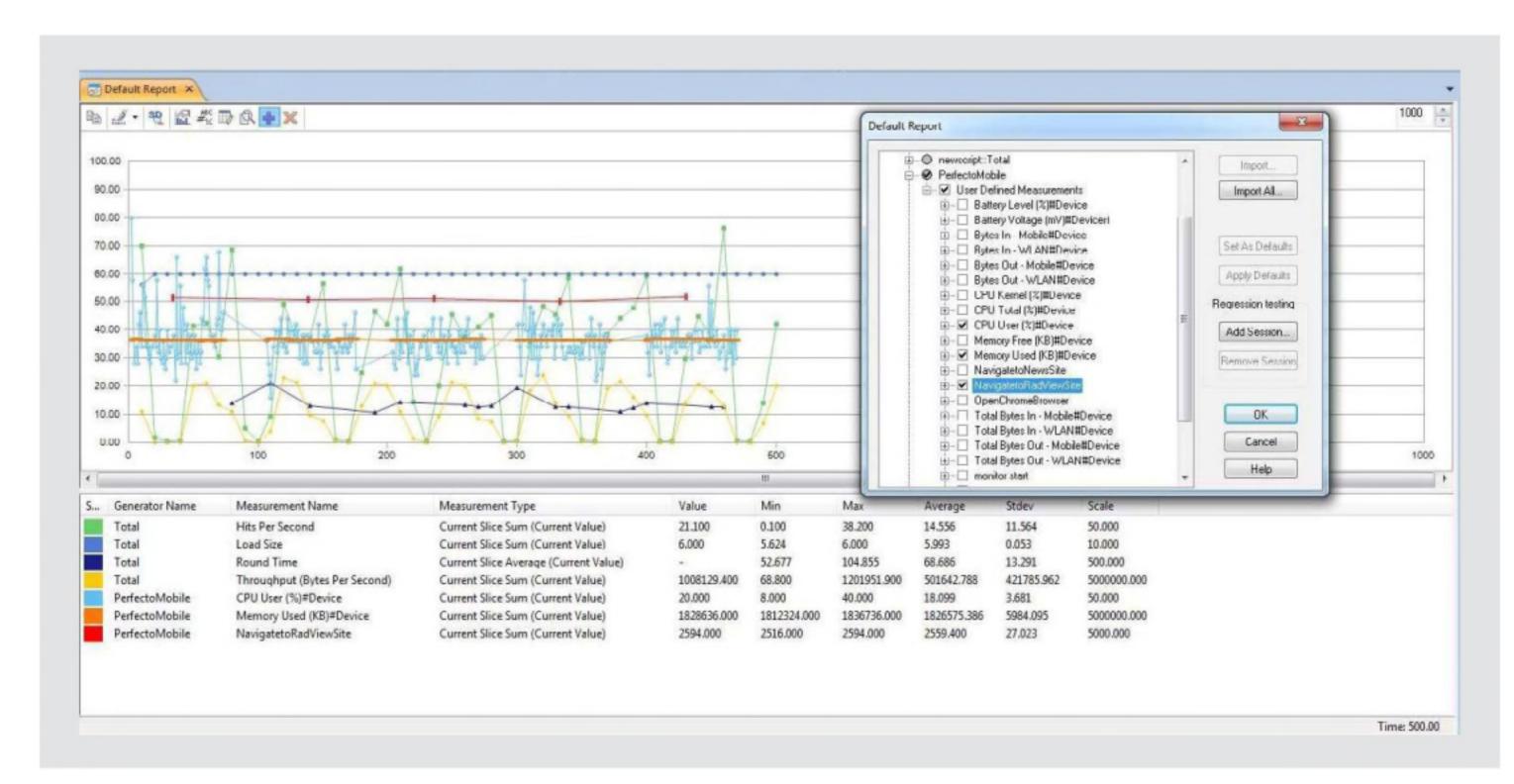
During the execution phase WebLOAD will execute both virtual users from load generators and real users from real mobile devices in the same test at the same time while **collecting performance measurements of the virtual users, the mobile devices and the servers.** You can analyze all the results together.

WebLOAD supports mobile testing the way that it should be done. Your application function and performance will be validated and you will know that your servers can support the expected workload while delivering the performance you require.

Why settle for less?

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Thank You!

WebLOAD is an enterprise scale load testing product that powers the most demanding performance experts in the world.

Experience WebLOAD for yourself with a <u>FREE TRIAL!</u>

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