THE STATE OF WEB READINESS 2012

A report on how robust sites are – based on 8,522 load tests executed in 132 countries

LOAD IMPACT

June 2012

GLOBAL OVERCONFIDENCE BEHIND THE UNRELIABLE WEB

When we analyzed the data from 8,522 load tests executed in 132 countries we found that the average site was load tested at up to 3.4 times the actual capacity. What does that mean? Well the short summary is that a large part of the websites in the world might not stand up to what site owners expect of them.

This is actual data from actual load tests conducted with our own cloud-based online load test tool and frankly, we were a bit concerned with the findings of our study.

Not that we are surprised that websites go down when we need them the most. Even though web sites have been a mainstream occurrence for over 15 years, we don't lift an eyebrow when Apple Store crashes when a new iPhone-model is released. And if even the largest company in the world isn't able to provide a premium sales channel that performs reliably, then who is, right? It almost seems unavoidable that websites go down. Like a natural disaster you can't prepare for.

Our analysis indicates something else. After going through 8,522 actual tests we believe that you can be prepared with the right knowledge. The analysis shows that an important factor in the unreliable web is simply overconfidence about how many visitors websites can really handle. If you haven't done the tests and you still think your website will continue to work unaffected during a hot product launch, a seasonal peak in interest or if you are luckily beeing "slashdotted", think again!

Load Impact Team

BRIEF

For the period January – March 2012, Load Impact examined 8,522 performance tests executed by 3,968 users of 132 different nationalities, and made the following findings:

- The average site was expected to handle a 3.4 times greater load than it actually could. This is what we call the "overconfidence factor".

- It was found that users from North America were the ones investing the most time and money in load testing, spending 18% more than the average and running 33% more tests. Users from Asia Pacific invested the least in load testing.

- Among the 100 largest sites tested, E-commerce sites perform more tests than the average website.

- 5.3% of sites tested were HTTPS sites. The .com domain was the dominant TLD, with over 21% of all tests.

Characteristics of the average load test

- Configured to ramp up to 204 concurrent users
- Only reached 60 concurrent users before response times were doubled
- Transferred 1.27 GB of data in 48,600 HTTP transactions

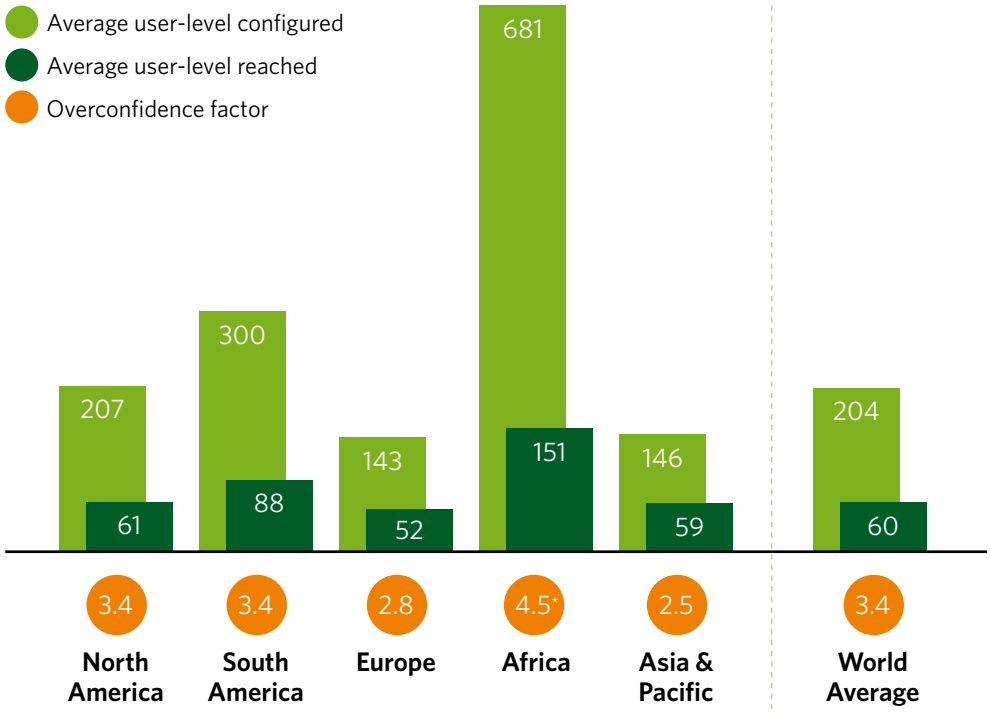
QUICK FACTS

Why is speed and capacity to handle load important?

- Google found that an extra 500 ms in latency cost them 20% of the search traffic.
- Amazon states that for every 100 ms of latency, they lose 1% of the sales. The average online shopper expects a page to load in two seconds, twice as fast as in 2006. (Forrester Consulting)

OVERCONFIDENCE

"Overconfidence" is, in simple terms, the difference between what load level a user expected his/her site to be able to handle, and the actual load level reached during the test. The overconfidence factor expresses how many times larger the site capacity was expected to be compared to what it actually was.



(*) Note that the sample points for Africa are quite few – only 81 active users and 153 tests executed during the period, which means that the figures for the region could be inaccurate.

TIP!

- A good starting point for optimization work is "Web Performance Best Practices" from Google. It can be found here: https://developers.google.com/speed/docs/best-practices/rules_intro

Overconfidence factor - definition and caveats

We introduce a term we call the "overconfidence factor", which is meant to measure how well the typical site measures up to performance expectations on it. An overconfidence factor of 3 means that the site was expected to perform 3 times better than it actually did during a load test.

For the purpose of calculating the overconfidence factor, we define the expected load level that the site was supposed to be able to handle to be the load level that the tester configured the load test to ramp up to.

It is difficult to say exactly when a site has received more traffic than it can "handle", so we decided to define that situation as when the server response time has doubled from what it was at the start of the test.

It is common for people to configure their load tests to exceed the load level that they expect their site to be able to handle comfortably. Many times, the point of running a load test (or a "stress test") is to see what happens when the load is greater than you expected, planned or built your site for.

This means that the tester's expectations on the site are most likely, on average, not quite as high as the highest load level configured for the test. We do not know exactly how big the "gap" between configured load level and expected performance is.

There is however also another factor that helps limit the size of the tests people run, and that is the cost of the test as people pay more for a large load test than for a small one, it means it is always in their best interest not to run unnecessarily large tests.

When it comes to the actual level the test is considered to have "reached", we consider a 100% increase in load time a serious performance degradation indeed, most of the time. That does not mean it is serious in every single case. For example, a site which has pages loading in 100 milliseconds might not consider it a serious performance degradation if pages instead load in 200 milliseconds, if all its competitors have pages that load in 1 second or more. It might not hurt their revenue, conversion rate, or similar key business indicators, so it might not be serious to them. In most cases, however, a 100% increase in load times is not desirable and something you would definitely want to avoid.

WORLD OVERVIEW

Regions

We have divided the world into five regions: North America, South America, Africa, Europe and Asia/Pacific. Since Load Impact users report what countries they are from when they register their user accounts, we have been able to compare how load testing varies between different world regions[1] . Note that there is some overlap where countries such as Russia are considered to belong both to "Europe" and to "Asia", this is why the total number of active users reported earlier (3,968) is lower than the sum total of the active users from the individual continents, reported below.

Testing activity

In the table below the "Users Active" column shows how many users were active (i.e. running tests) from each region during the period and the "Test Frequency" column shows how many individual load tests each active user ran, on average.

Region	Users Active	Test Frequency
North	860	2.8 tests/active user
South	166	2.2 tests/active user
Europe	1888	1.9 tests/active user
Africa	81	1.9 tests/active user
Asia	1450	1.7 tests/active user
World Average		*2.1 tests/active user*

[1]*We have used the continent definitions on Wikipedia (Asia/Pacific combines the continent Asia and the region Oceania) to determine what countries or territories are included in each region.*

SPENDING

We ranked how much premium users spent measured in dollars on their load tests.

(*) Note that the sample points for Africa are quite few – only 81 active users and 153 tests executed during the period, which means that the figures for the region could be inaccurate.

QUICK FACTS

Why is speed and capacity to handle load important?

- 88% of online consumers are less likely to return to a site after a bad experience. (Gomez)
- A 1 second page load delay causes, on average, a 16% decrease in customer satisfaction. (Aberdeen group)
- Google ranks webpages higher when they load fast.

SITE CATEGORIES

In order to get some idea about what type of sites are being tested the most, we found out what sites had been tested in the largest load tests run by our premium users. We extracted the 100 individual sites that had been targets for the largest load tests during the period, and which we could categorize. Then we divided the sites into four categories.

E-commerce sites tend to be more concerned about being able to handle traffic peaks than other websites. Among the top 100 sites surveyed, the largest e-retailers perform more tests than other categories of websites.

Site Category	Average Number of Tests Per Site
Campaign & Event	3.4
Corporate, Product & Interest	3.7
E-commerce	6.1
Media	4.2
Average	*4.1*

Media/online service sites

Defined as a site that delivers its goods/services directly across the Internet. Typical example are netflix.com, twitter.com, cnn.com.

E-commerce sites

Defined as a site that uses the Internet as its sales outlet, but where the actual goods or service is delivered some other way (e.g. physically). An example would be the amazon.com book store where people order books online that are then physically delivered. Another example would be a cinema that sells movie tickets online, but where the actual goods/service purchased is not delivered across the Internet (Netflix is an example of an "online service" as its service is delivered over the Internet).

Campaign/event sites

Defined as a site that is used to sell or promote some temporary or infrequently occurring event. Examples are earthhour.org (event) or barackobama.com (campaign site for Barack Obama for the 2012 US presidential election).

Corporate/product/interest

Defined as mainly informational sites that provide information about a specific organization, product or common interest. Examples are oracle.com (corporate) or www.abcirclepro.co.uk (product).

Relative size of site categories

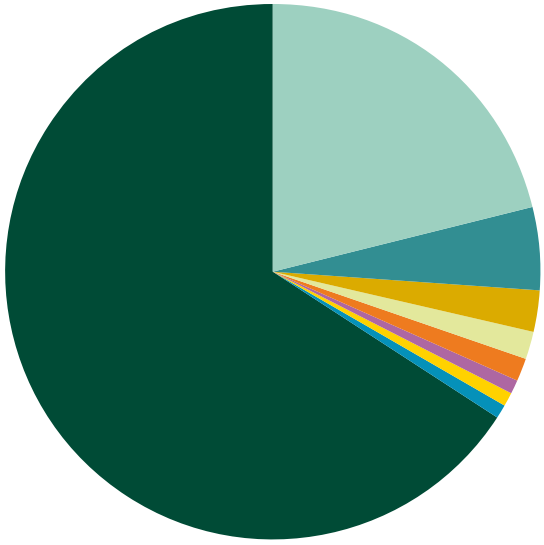
Sites were distributed as follows among the site categories:

Site Category	Number of Sites
Campaign & Event	21 (21%)
Corporate, Product & Interest	35 (35%)
E-commerce	13 (13%)
Media & Online Service	31 (31%)

SITES TESTED

TLD statistics – which domains did people test

Looking at all the sites tested, we see that the .com domain is the single, dominating top-level domain, appearing in over 21% of all tests. Other domains that are tested frequently include .ru (Russia), .net, .org and .uk (United Kingdom).



TLD	Share of Tests
.com	21.3
.ru	4.9
.net	2.5
.org	1.8
.uk	1.3
.br	0.9
.au	0.9
.de	0.8
Other	65.6

Download this and future reports at
loadimpact.com/readiness

ABOUT LOAD IMPACT

Load Impact is the world's largest cloud-based, on-demand tool for performance testing, with more than ***500,000*** executed load tests since the service was launched in ***2009***. Load Impact has earned the trust of over ***35,000*** users that continuously use the service to ensure the quality of their online presence. This allows each organization to incorporate the appropriate amount of infrastructure resources, and to spot potential performance problems before they become an issue, providing an accurate, scalable and proactively optimized service for the end user.

Load test your site at ***loadimpact.com***