

10 BEST PRACTICES FOR BENCHMARKING WEB AND MOBILE SITE PERFORMANCE

Web and mobile performance problems are not just an IT issue. Poor performance impacts your customers' experience, resulting in increased page abandonment, a loss of revenue and customer loyalty, and driving those customers to more expensive channels. While web and mobile sites have evolved over the last few years with the latest technology to engage customers or drive sales, the fundamentals of providing fast and reliable site performance are becoming increasingly more difficult to manage.

The first step in determining whether your site performance is supporting your business goals is to benchmark industry leaders and your competition. Is your site as fast and available as the response time, availability and consistency averages for your industry? How do your site's metrics compare to the leaders? Are you able to track your site's performance change over time?

Web performance benchmarking can help you answer these questions and provide context. If your company's web site downloads at five seconds on average, are you doing well? What if the site recently went through some hardware upgrades and used to download in seven seconds on average? You would likely feel good about your improvement. But, what if you benchmark against your competitors' sites and find that their sites downloaded in three seconds on average? You would likely feel differently about your improvement with the knowledge that other sites are creating increased performance expectations for your site's visitors.

In general, benchmarking, the process of comparing performance to the best performers in your industry and/or evaluating best practices from other industries, provides a basis for decision making and prioritization. By benchmarking web and mobile performance, you have insight into how Internet leaders and your competition are performing and how your site compares to others in your industry. This comparative measurement approach can help you gauge consumer expectations in your industry and make better decisions about investments in optimization projects.

Based on the benchmark practices of some of the leading web and mobile performers, we've compiled a list of best practices for benchmarking your web and mobile site performance.

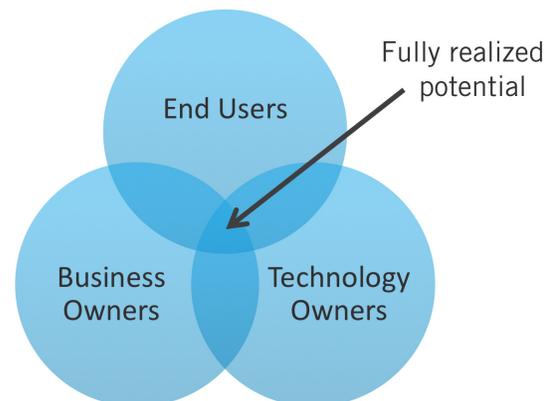
1. DEVELOP A CULTURE OF PERFORMANCE EXCELLENCE FOCUSED ON OPTIMIZING THE END-USER EXPERIENCE.

This culture of performance excellence goes beyond data and metrics, to people and processes. All stakeholders of your web and mobile channels — marketing and IT — must be aligned across key business objectives in order to deliver a superior customer experience. At the highest level, those goals typically include revenue and profitability.

While marketing has additional goals around customer experience, loyalty and satisfaction, IT must focus on minimizing cost and maintaining service levels. These goals are sometimes at odds when marketing wants to add the newest widget to the web site or improve site design, but hasn't considered the impact of these additions to the performance of the site. Or, vice versa, when IT is driving for a fast site that is easy to manage but doesn't properly guide marketing on the selection of the right technology to support a rich and efficient experience.

Web performance metrics can bring those sometimes competing goals into alignment. Web and mobile performance metrics — site response time and availability — provide a quantitative measure of performance for both groups. Marketing and IT can identify companies to benchmark against, whether they are industry leaders, competitors, or both, and set improvement goals. The key to success is building performance goals into your business plan, building a structured business process for reviewing performance data, and incrementally measuring your progress against those goals.

ESTABLISH SHARED GOALS, METRICS AND ACTIONS



2. ANALYZE PERFORMANCE AGAINST THE COMPETITION AND INDUSTRY LEADERS.

Benchmarking at its core is the process of assessing performance against another party, whether it is a competitor or a leader in another industry. It is important to have an understanding of the average performance metrics for your industry. If your site is not within that range, you know that you are pushing customers away to the competition and losing revenue.

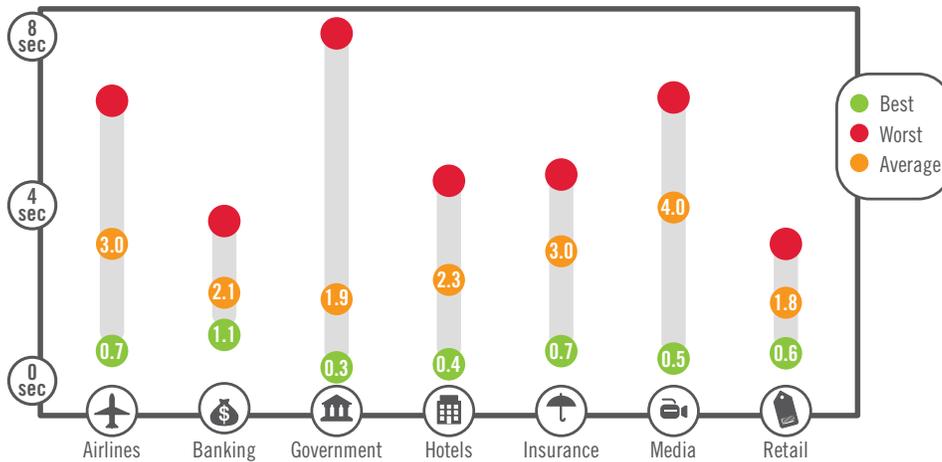
Internet leaders like Google, eBay and Amazon set the standard for driving business online and overall end-user expectations. It is valuable to benchmark these and other leaders, even if they are outside your industry. Brokerage is one industry where speed

is paramount. Whether or not you are in the brokerage industry, benchmarking against a top Brokerage Generate Order Business process performer such as eTrade can help you understand how the company streamlines its key transaction process to improve customer experience.

You should also be benchmarking your sites and pages against each other. Does the new home page of your boutique within your store perform as well as the home page of your site overall? How does the performance of each of your media properties compare? If you have one property that is performing better than the others, you can identify performance best practices and share those findings across your businesses.

RESPONSE TIME

Home Page Performance Across Industries



You should compare how fast your site loads to the average for your industry and industry leaders as the first step in developing your performance optimization plan. (Data Source: Gomez Benchmarks, May 2011.)

RESPONSE TIME

Best Performers on Key Transactions Across Industries



Response time for key business transactions across industries varies based upon the criticality and the complexity of the user task. You can find areas for improvement by benchmarking the best in another industry. (Data Source: Gomez Benchmarks, May 2011.)

3. EVALUATE THE PERFORMANCE OF BOTH THE HOME PAGE AND KEY BUSINESS TRANSACTIONS ON YOUR WEB SITE.

It is important to evaluate the performance of your key web pages and business process transactions. You need to understand how well your home page performs — it is the front door to your site. If your customers have to wait too long for the page to load, they likely will not enter your site at all.

Once your customers access your site, they are there to do something – whether to trade a stock, buy a product or check their bank accounts. These are your most important transactions and they must perform optimally for your customers. The home page and business transaction are the most important components of your site to include in any benchmark analysis against leading companies. Over time, there may be other pages you want to evaluate. Whether you are launching a new boutique store within your flagship brand, launching a customer community or ensuring the rich content on your product pages is performing well, all of these web pages can be assessed against the leaders’ pages to identify opportunities for improvement.

4. BASELINE YOUR OWN PERFORMANCE AND CONTINUALLY ASSESS IT OVER TIME.

Your performance will change over time even if you don’t want it to. With marketing tasked with improving the customer experience on the site to sell more products or drive more page views, performance will be impacted. Even if the objective is to streamline a transaction on the site, you could end up with the opposite result. It is critical that marketing, IT operations and QA track site performance as these changes are made and identify problems before your customers do.

The performance impact of major events such as application implementations, infrastructure upgrades and site redesigns must also be tracked. And, even if you make no changes, your customers’ expectations for your performance will change based upon their experience with your competitors’ sites. You should identify a baseline for your performance and then assess performance over time as you implement changes and as outside factors affect your site.

5. ASSESS YOUR WEB-SITE AVAILABILITY OVER TIME.

If your site is not available for any small percentage of time, it is not open for business and you are losing revenue. As a best practice, many of the leading performers sample site performance with at least 10 tests per hour across the regions where their customers are located. Availability percentage measures the number of successful tests out of the total tests for that period. Less than 100 percent availability of your home page is an indication that you may have more serious performance problems beyond the front door, with your more complex business process transactions.

6. ASSESS YOUR WEB-SITE RESPONSE TIME OVER TIME.

Research by Forrester Research provides insight into how fast your web site should be. Forrester Research found that consumers expect pages to load in two seconds or less and after three seconds, up to 40 percent will abandon your site. Benchmarking your web site’s response time and comparing your metrics to Internet leaders and your competition provides insight into how fast your web site should be.

Response time measurements should include the start-to-finish time it takes the page or business process to load all content including HTML, third-party content, JavaScript and CSS. After your average response time and benchmark rank is evaluated comparatively, it is important to also trend your response time over time. Your site may perform well in aggregate and be a top performer in your industry, but you may have a performance problem at a point in time that may have a substantial impact on your customers’ experience. The best practice of the top performers is to sample performance with at least 10 tests per hour and then at a minimum, analyze the average performance of those tests on an hourly basis to ensure that they are providing a consistent experience to customers throughout the day.

WEB-SITE PERFORMANCE BENCHMARK REPORT

| Response Time Rank | | Success Rank | |
|--------------------|---------------------|-------------------|------------------|
| Site | Response Time (sec) | Site | Success Rate (%) |
| Benchmark URL 1 | 9.20 | Benchmark URL 2 | 100.0 |
| Benchmark URL 3 | 10.27 | My Website | 100.0 |
| Average | 11.06 | Average | 99.34 |
| Benchmark URL 4 | 11.54 | Benchmark URL 1 | 99.0 |
| My Website | 12.07 | Benchmark URL 4 | 99.0 |
| Benchmark URL 2 | 12.24 | Benchmark URL 3 | 98.7 |

Evaluate both the response time and rank in aggregate for a period of time, and your response time over time.

7. ENSURE THAT YOUR SITE IS FAST, CONSISTENTLY.

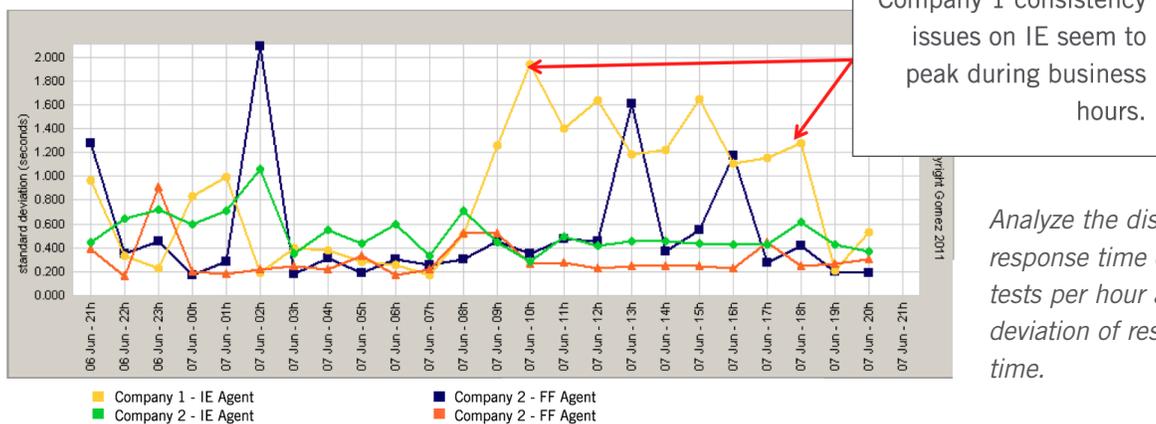
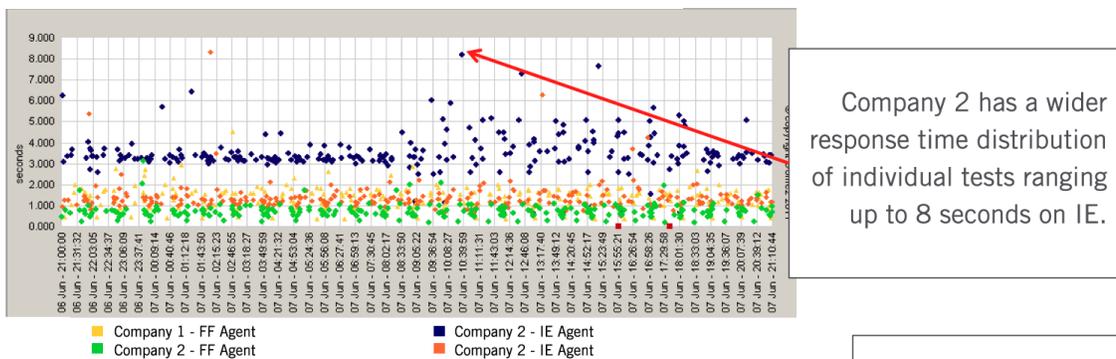
Response time should be consistent over time across your customers' locations. Your site may have a relatively good average response time but have poor consistency. Consistency measures the standard deviation of the response times of successful tests. If you recall your statistics class in high school, a sample that is consistently the same has a low standard deviation. A high consistency metric (standard deviation of response time) indicates performance is inconsistent, which is not a good thing for your customers — or your business.

The cause of consistency issues range from poor performance in particular geographies due to local ISPs or an under-powered site infrastructure that cannot support periods of peak traffic.

Leading performers measure consistency by analyzing performance tests over time. A time scatter chart provides a good indication of where the outliers are. By analyzing the standard deviation of response time trend over time, you are able to determine if there are regular periods of inconsistent performance. You should note when these periods occur. Are they affecting a large number of users? Is it at 3 a.m. when most of your users are offline? Performance consistency should also be evaluated across the geographies where your customers are located. If your data center is on the East Coast, how is performance for your customers on the West Coast?

Benchmarking the response time distribution of industry leaders and the average for your industry will provide you with good visibility into what customers are expecting.

CONSISTENCY OF WEB-SITE PERFORMANCE



Analyze the distribution of response time over multiple tests per hour and the standard deviation of response time over time.

8. DON'T JUST MEASURE SPEED, MEASURE EFFICIENCY.

While web-site speed is fundamental to customer experience, consumers also want a rich experience. That means good images, video and the ability to interact, but this can come at a cost to performance. A best practice approach to finding the right balance of rich content and speed is to know how efficient your site design is compared to your competitors' sites. An efficient site has a high level of rich and engaging content that provides a great experience to users but does not impact the page load time.

To drill down into your site's efficiency, you should compare the number of bytes to response time. Deeper component analysis into the site structure — including number of objects, hosts and connections compared to response time — can also tell you how efficiently the page content is delivered.

9. EVALUATE THE COMPATIBILITY OF YOUR SITE ACROSS BROWSERS AND DEVICES.

Web sites do not perform the same across all browsers and devices. Most organizations try to optimize their sites for the operating systems, browsers and devices their customers use.

BROWSER PERFORMANCE

Sixty percent of overall processing time is spent within the browsers. In an independent study of almost half a million pages views, Compuware found that the variation in browser performance can be as large as eight seconds. Your customers use a range of browsers and they all perform differently from the way they process JavaScript and CSS, how they load source code, images and third-party objects, the number of parallel network connections they open and how they render pages.

Benchmarking industry leaders' performance across browsers can help you gain insight into browser differences. Focus first on the browsers with the largest market share — Internet Explorer and Firefox — and compare their performance to that of your site. Where does your site's response time and availability rank across browsers? How does your performance trend over time?

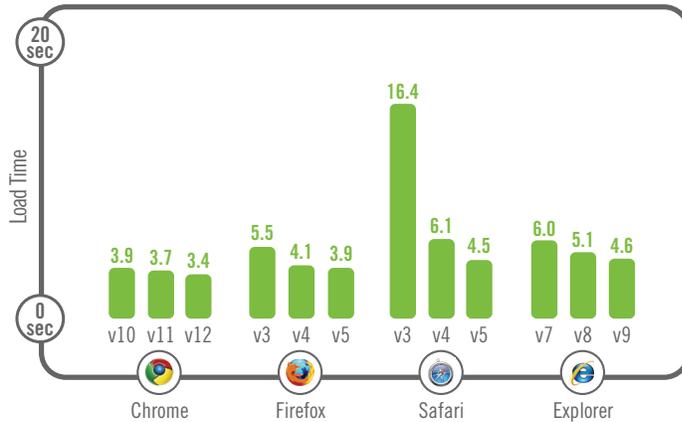
Once you have compared your performance against your competition over time and baselined your current performance, identify problem areas that need further investigation and set goals for performance improvements. Once your site is live, you should continue to regularly review your web and mobile site's performance across browsers as marketing initiatives or infrastructure investments drive changes that could impact performance.

DEVICE PERFORMANCE

Morgan Stanley predicts that mobile users will outnumber desktop Internet users worldwide by 2014. This means your web site must perform well on your customers' mobile devices. The complex set of services for delivering applications — the application delivery chain — is even more complex for mobile devices than it is for web sites. Your customers are using many kinds of devices and accessing a range of carrier networks across geographies. Adding to the complexity is the increase in expectations of consumers that mobile sites load just as fast as web sites — or faster, as in the time it takes to wait in line or wait for the bus.

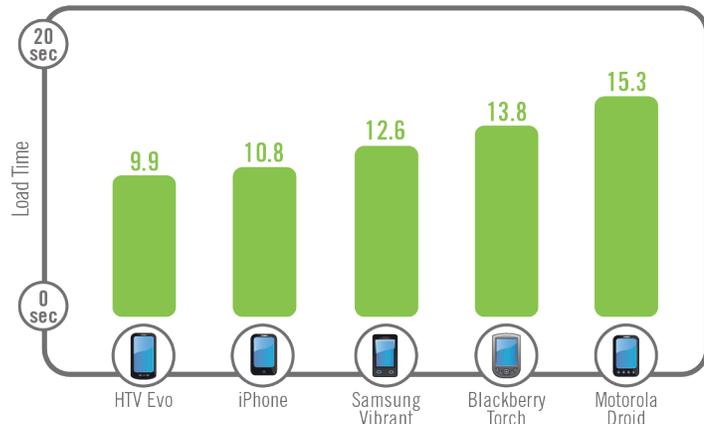
Armed with the knowledge of your customers' expectations, benchmark data can help you determine if, and when, you should invest in optimization projects. You should compare your performance to industry leaders and your competition taking into account how your customers actually experience your site across carriers and devices, and track trends over time.

Performance Differences Across Browsers



Source: Gomez Real-User Monitoring
 • 1.86 billion page measurements • 200+ web sites • Broadband connections only • U.S. Only

Performance Differences Across Smartphones



Source: Gomez Real-User Monitoring
 • 200+ million mobile measurements

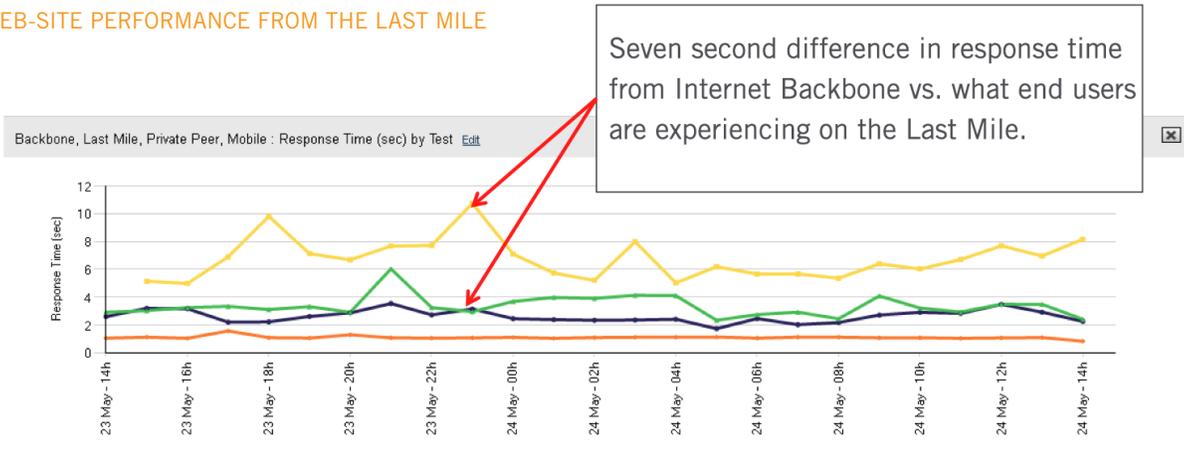
Compuware found that there is as much as eight seconds variation of load time across web browsers.

10. IDENTIFY PERFORMANCE PROBLEMS FROM THE LAST MILE.

Assessing web-site performance is not complete until you review how your site performs from the Last Mile, at the end user's device. Web-site performance on the Last Mile is often quite different from performance tested on the Internet backbone. From the Internet backbone to the end user, performance is impacted by bandwidth, content delivery networks, local ISPs and wireless carriers and third-party technology providers.

The average performance of even the leaders degrades as you move closer to the end user. With a benchmark assessment, you can compare your web site's performance on the Internet backbone to performance from the Last Mile and evaluate that performance against the leaders to identify areas for improvement.

WEB-SITE PERFORMANCE FROM THE LAST MILE



IMPROVING WEB AND MOBILE PERFORMANCE WITH BENCHMARKING

Benchmarking web and mobile performance can help you identify opportunities to improve your own business. By providing the framework for prioritizing performance optimization investments, you can direct resources where they're needed most — optimizing your page or business process design, application infrastructure, or the use of third-party technologies including CDNs.

| BELOW ARE KEY QUESTIONS TO ASK WHEN BENCHMARKING WEB AND MOBILE PERFORMANCE | | |
|---|---|---|
| <p>Track performance against Internet industry leaders and your competition.</p> <p>Where does our site rank?</p> <p>How does it compare?</p> <p>What are others doing better?</p> | <p>Baseline your own performance and track it over time.</p> <p>How are new marketing initiatives affecting performance?</p> <p>Did the infrastructure upgrade improve performance?</p> <p>Are we keeping up with the competition?</p> | <p>Align IT and Marketing on prioritized performance optimization investment.</p> <p>Where do we want to be?</p> <p>When?</p> <p>How much should we invest in performance improvement initiatives?</p> |

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