

Branding is one of the most critical, and intangible, aspects of your business. No matter how much effort you put into creating a brand that customers want to associate with, it can all go to waste if the experience you create online is inconsistent with your branding.

However, having brand consistency is not just about graphics, logos, and a streamlined web interface. Often the experience is dictated by things seemingly beyond your control: for example, how quickly pages load, how fast transactions can be completed, and how often your site is up. The speed at which your customers can find and process information on your site is often the primary driver of how they feel about using your site—which often translates into how they feel about your brand.

Imagine planning for a big promotion that drives customers to call your company for more information. Clearly, you would plan for additional staff to field phone calls and ensure no one is forced to hold the line for an unacceptable amount of time. When planning for an online promotion, planning for speed is even more crucial, since a customer's willingness to wait is limited and your competitor is just a click away. How do you ensure that your web site is optimized to deliver an enjoyable customer experience that is consistent with your brand image?

### ***The Benefits of External Load Testing***

Load testing is like having a “fire drill” prior to a promotion. High volumes of web transactions are simulated in short periods of time to ensure your site (and your staff) has the capacity and performance to exceed expectations, and that your customers don't get frustrated and click away to your competitor instead of waiting on hold.

That said, not all load testing is the same. Traditional load testing is internal, meaning tests are run from behind your company's firewall. Internal testing only allows you to see potential issues from within your own controlled environment, and does not test for the countless different scenarios in which a customer could be accessing your site. Further, it does not take into account different locations, various connection speeds or real-user experience.

Global load testing is the only solution for truly understanding and optimizing the customer experience. Global load testing provides an independent, third-party view of your site and uncovers information that isn't always available from an internal test. As the number of broadband connections increases across the globe, customer expectations for speed also increase. The faster your site, the more customers can access it, and the more your brand is exposed to potential customers. Of course, the opposite is also true: slow sites move less customers through and result in less exposure. Speed has never been as important as it is in today's global Internet-driven economy.

In addition, more sites are incorporating complex transactions and connections to other applications outside of their firewall, making the web a truly mission-critical application.

In this scenario, old rules of internal networking no longer apply – and load testing becomes even more crucial. Without Global load testing, it's nearly impossible to understand and solve all the potential technical problems that could keep your site from performing at its best during peak periods in different locations around the world.

## Ensuring a Positive Customer Experience

Competition is increasing every day – along with customer expectations for fast, error-free performance. No matter how superior your product, a customer's experience using your website will largely dictate whether or not they use your site again. If your site is difficult to access or transaction speeds are too slow, many customers will give up and find a faster competitor offering similar products.

An experienced load testing partner can help you improve customer experience by analyzing the various ways in which customers use your site – where they click, which paths are most often taken, and how long customers normally pause (also called “wait time”) between clicks. After these scenarios are developed, they can be tested with different numbers of users to provide greater insight into the following:

- Customer Experience
- Regional Variances
- Overall Site Performance

External load testing is the only way to gain real insight into customer experience, particularly in preparation for large numbers of users. Internal testing analyzes only your web application, but does not test the network and overall infrastructure that your customers could be using to access your site. Without this external viewpoint, you have no way of knowing how long your customers wait for pages to load and transactions to complete. Your application could be working fine, but other issues could be causing problems for customers without your knowledge, such as:

- Server errors (web server, application server, database server)
- Load balancing issues
- Bandwidth issues
- Server capacity issues
- Cache server issues
- Router/firewall issues

Understanding and pinpointing potential infrastructure problems is just one piece of the puzzle to improving customer experience. Once you know that customer experience is generally acceptable at normal levels of load, the next step is gaining an understanding of how many users your site can handle at various speeds. The key is in knowing the point at which slow speed leads to customer abandonment. External load testing should outline the following metrics:

- Number of users your site is capable of serving at excellent speeds
- Number of users your site is capable of handling at good speeds
- Number of users that begin to slow your site to unacceptable levels of performance

This way, you can create the equivalent of a “staffing” plan to ensure your site is capable of handling your anticipated levels of users at good to excellent speeds, protecting you from customer churn.

In addition to the number of users your site can support, external load testing can quantify the customer experience in terms of wait time and error rate. The average customer will not wait longer than six (6) seconds for a web page to load—a number which decreases with more competition.

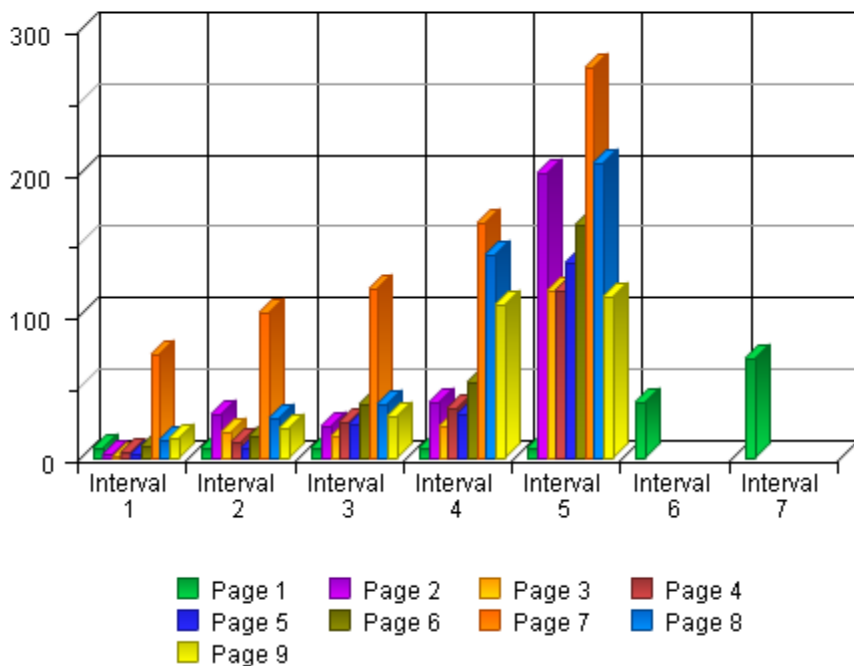
Load testing can provide insight into the length of time it takes for each page to load for different numbers of users, giving you the breaking point at which user experience begins to degrade.

**Example Page Load Time Graph: showing the number of seconds each page takes to load:**

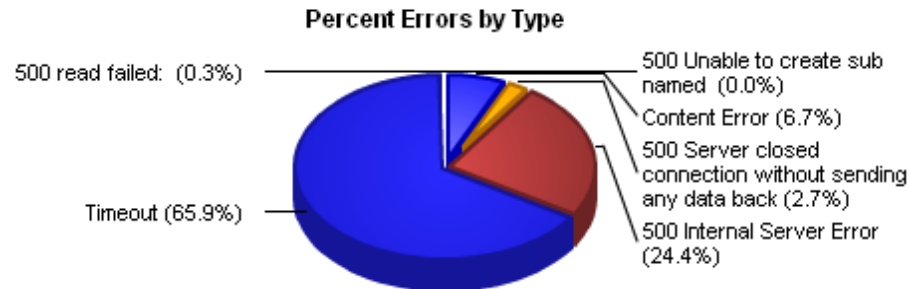
Page Load Time By Interval (in seconds)

Interval	1	2	3	4	5	6	7
<b>Users</b>	100	200	400	800	1200	1600	2000
<b>Page 1</b>	6.85	6.62	6.62	6.31	7.29	38.47	70.08
<b>Page 2</b>	2.11	31.38	22.11	38.85	199.43	0.00	0.00
<b>Page 3</b>	1.86	18.20	15.86	21.63	116.72	0.00	0.00
<b>Page 4</b>	4.83	11.32	24.70	35.08	116.70	0.00	0.00
<b>Page 5</b>	2.71	7.10	24.32	30.20	136.49	0.00	0.00
<b>Page 6</b>	8.86	15.22	37.05	52.34	163.03	0.00	0.00
<b>Page 7</b>	73.01	101.48	118.37	165.17	273.32	0.00	0.00
<b>Page 8</b>	12.64	27.23	37.26	142.58	207.04	0.00	0.00
<b>Page 9</b>	13.62	21.11	29.23	107.80	112.39	0.00	0.00

Page Load Time By Interval (in seconds)



**Error reports provide further insight into the customer experience by providing the number and types of errors experienced:**



The more you understand about your customer's experience, the better you can manage it and ensure it represents your brand well and creates a leadership position for your company.

## Identifying Regional Difficulties

For companies that sell across many regions, it's imperative to understand how your site is viewed in different locations – particularly those still using dial-up connections. External load testing can help identify regional problems caused by slow networks and provide ideas for how to optimize your site for users in these areas. Often, simple changes can make a huge impact on revenues and improve regional success.

## Preparing for “Black Friday” and Peak Periods

The holiday season is coming. You've added staff. You've scheduled enough cashiers, sales people and greeters on “Black Friday” and key weekends throughout the season to ensure check-out lines are kept short and customers are being helped thoroughly and efficiently. You have additional staff on-call, ready to start work if lines get too long. Most importantly, you'll be there to watch the traffic and quickly react if more help is needed. As the big “Day after Thanksgiving” sale approaches, you know your store is prepared to handle triple the number of customers and take in massive amounts of revenue.

Have you made the same preparations for your online store? Do you have the extra “staff” necessary, in terms of bandwidth and transaction speed? While the thought of long lines of customers may sound appealing, any smart retailer knows that making customers wait is not a good idea. It's even worse online, when customer willingness to wait decreases dramatically and your competitor is just a click away.

External load testing helps you ensure your website is prepared for your big sale, promotion or holiday in the same way that you prepare for in-store sales. The key is to plan ahead. Load testing is an iterative process that requires testing, analysis, adjustments, and re-testing until the desired objective is achieved. Leaving enough time to get this process accomplished before the peak period hits is crucial.

## Preparing for Site Redesigns

Sometimes redesigns intended to improve the look and feel of your site actually have a negative impact due to slowing down the site. Large images, Flash and other visually pleasing graphics often backfire—causing customers to either wait too long or only see part of your site. External load testing breaks down each transaction step and outlines load times and errors by page, allowing you to understand exactly where errors and slowdowns occur so you can quickly make adjustments.

**This graph shows the percent of all errors by page—in this example you can see that most errors occur during submission of payment information:**

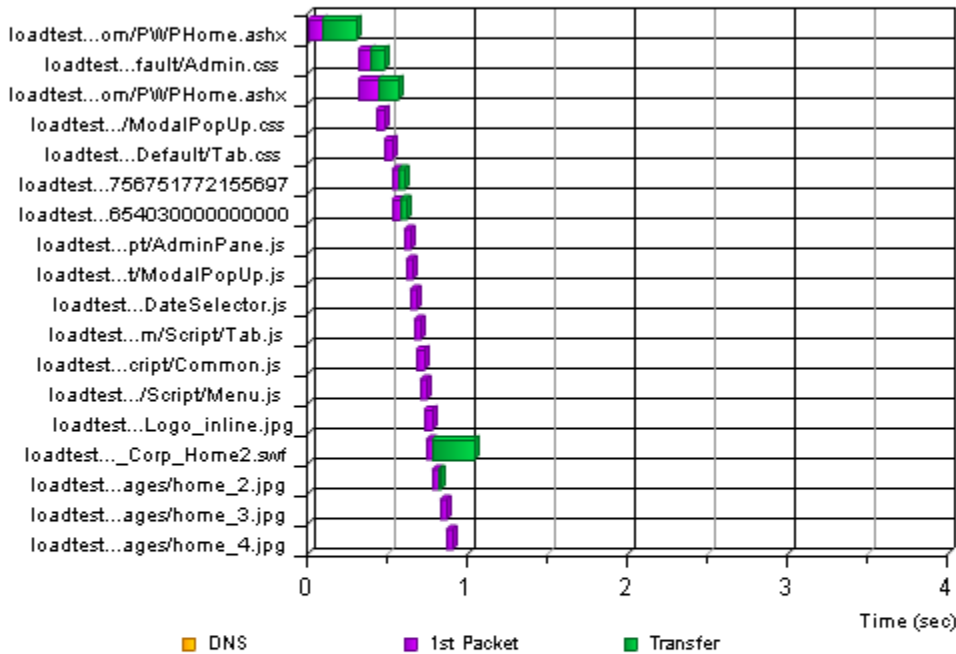
### Errors by Page

<b>Page 1</b> Homepage	338	6.9%
<b>Page 2</b> Click 'Register'	192	3.9%
<b>Page 3</b> Fill-in and Submit Registration form	403	8.2%
<b>Page 4</b> Go Back to Homepage	100	2.0%
<b>Page 5</b> Click 'Sign In'	90	1.8%
<b>Page 6</b> Sign In	296	6.0%
<b>Page 7</b> Click 'Games Catalog'	86	1.8%
<b>Page 8</b> Click 'Account'	154	3.1%
<b>Page 9</b> Click 'Edit Account'	133	2.7%
<b>Page 10</b> Modify Account and Click 'Save'	286	5.8%
<b>Page 11</b> Click 'Games Catalog'	75	1.5%
<b>Page 12</b> Purchase the test game	207	4.2%
<b>Page 13</b> Fill-in and submit payment information	2189	44.6%
<b>Page 14</b> Click on 'Reviews'	39	0.8%
<b>Page 15</b> Type keyword search and post to search.js	21	0.4%
<b>Page 16</b> Select 1st game in search autocomplete	17	0.3%
<b>Page 17</b> Enter text in 'Review Details' and submit a review	99	2.0%
<b>Page 18</b> Click 'Account'	18	0.4%
<b>Page 19</b> Download a small game	169	3.4%

In addition, each page can be broken down to show how long it takes each individual graphic to load, further pinpointing bottlenecks and making it easy to improve speed:

**Full Page Breakdown - Representative Sample of Page 1**  
**Total Load Time: 1.04 seconds**

loadtest...om/PWPHome.ashx

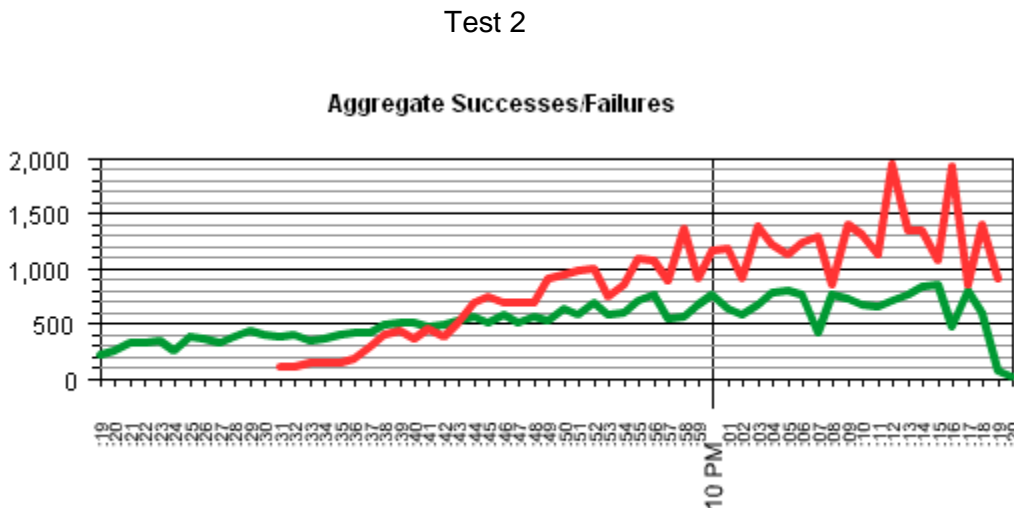
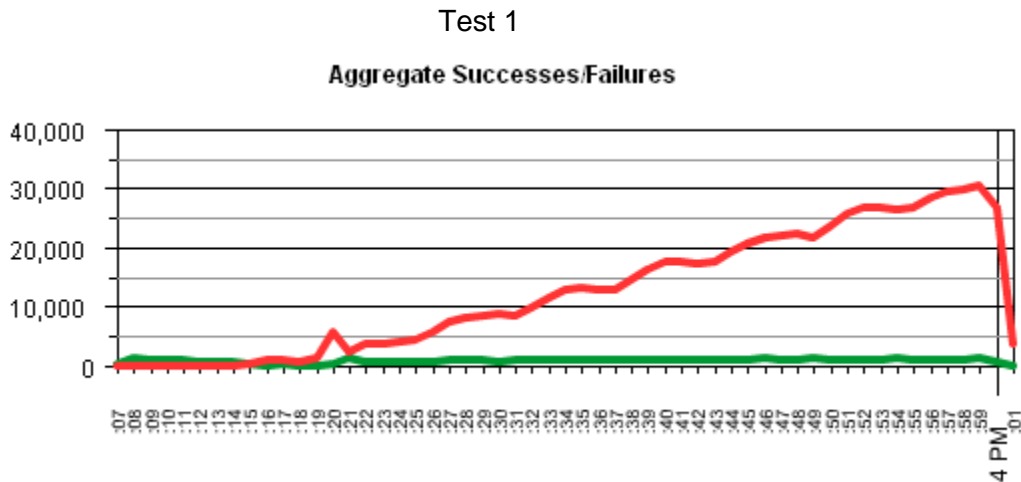


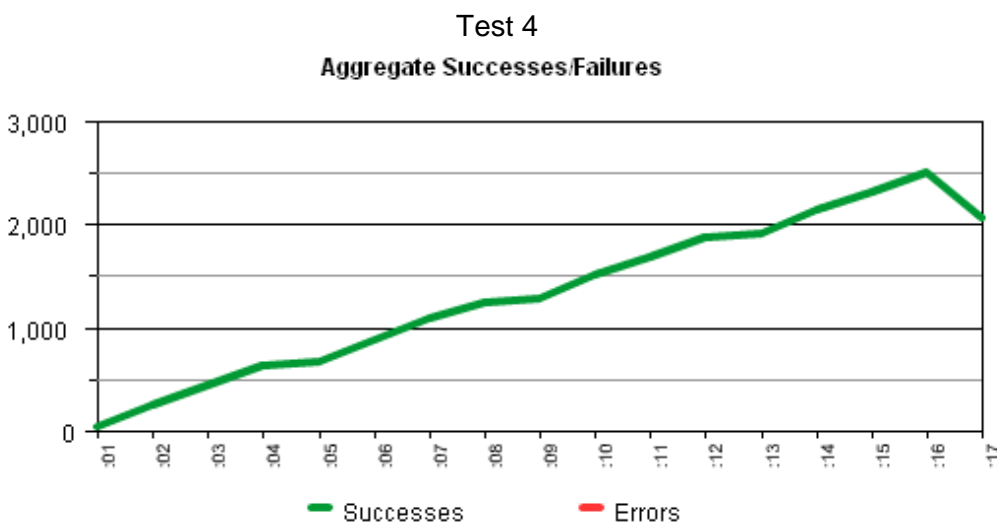
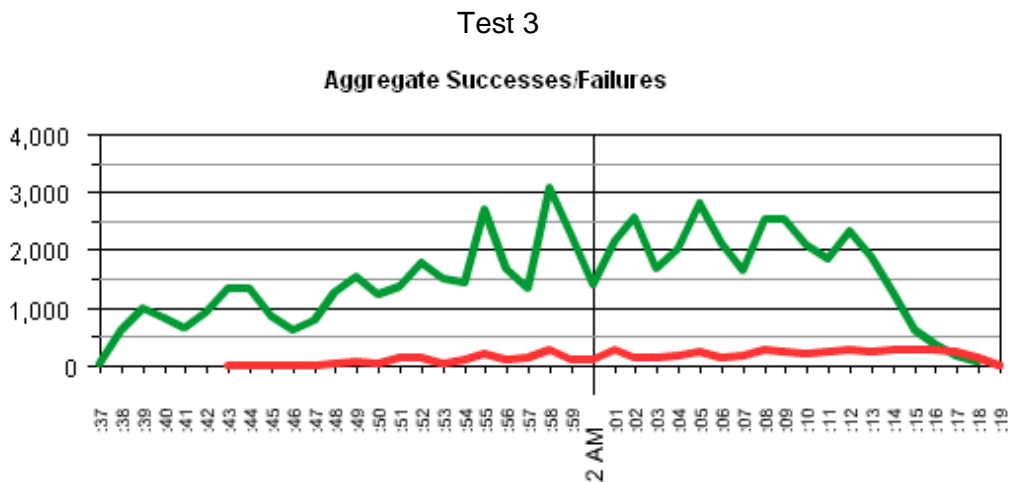
Item	URL	Load Time	Size	DNS	1st Packet	Transfer
1	loadtest...om/PWPHome.ashx	0.30	8.1 KB	0.00	0.09	0.21
2	loadtest...fault/Admin.css	0.16	7.1 KB	0.00	0.08	0.08
3	loadtest...om/PWPHome.ashx	0.25	8.1 KB	0.00	0.13	0.12
4	loadtest.../ModalPopUp.css	0.04	0.9 KB	0.00	0.04	0.00
5	loadtest...Default/Tab.css	0.05	1.2 KB	0.00	0.05	0.00
6	loadtest...756751772155697	0.08	20.3 KB	0.00	0.04	0.04
7	loadtest...6540300000000000	0.09	21.7 KB	0.00	0.05	0.04
8	loadtest...pt/AdminPane.js	0.04	2.9 KB	0.00	0.04	0.00
9	loadtest...t/ModalPopUp.js	0.04	2.3 KB	0.00	0.04	0.00
10	loadtest...DateSelector.js	0.04	19.0 KB	0.00	0.04	0.00
11	loadtest...m/Script/Tab.js	0.04	0.9 KB	0.00	0.04	0.00

## You've Identified All the Issues: Now What?

Load testing is an iterative, consultative process. In the beginning, it's all about identifying potential issues and noting errors. Once challenges are identified, a consultative process begins to solve each challenge and re-test until performance objectives are met. A comprehensive load testing engagement should provide a clear view of performance before and after testing.

**For example, the following four success/failure graphs summarize the successive performance improvements achieved across all four test iterations.**





The above series of graphs demonstrate how improvements implemented after each successive test iteration resulted in increased system capacity as well as delay of the “breaking point” (where the system begins to reject new connections and a large number of transactions start timing out.)

## Plan Ahead for Optimum Results

Next time you run a promotion or update your site design be sure you have also prepared for the best possible customer experience. External load testing can help you determine:

- Router/firewall issues
- Your system’s end-user performance at different levels of users
- Your system’s breaking point
- Bottlenecks and design faults that may hinder your performance
- Needed changes or improvements to increase performance
- Your hardware/software capabilities
- How you compare to competitors with similar applications and infrastructure

## About Webmetrics Load Testing Services

Neustar Webmetrics Load Testing services help you prevent site crashes and downtime by providing a clear understanding of where your bottlenecks lie and what load your applications can handle, as well as offering expert advice on how to scale further. Webmetrics Load Testing services are fully managed, which means we handle the details so you can focus on the big picture. A dedicated load testing engineer is assigned to help you gather requirements, define scenarios, run a series of tests and review/analyze the results. In addition to your own personal dedicated load testing engineer, Webmetrics Load Testing services include concise, clear reports and analysis, plus expert consultative advice and recommendations.

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**For further information about Webmetrics products and services, call 1-877-524-8299 or email [sales@webmetrics.com](mailto:sales@webmetrics.com).**

## About Neustar

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Neustar (NYSE: NSR) solves complex communications challenges by providing market-leading and innovative solutions and directory services that enable trusted communication across networks, applications and enterprises around the world. Neustar Webmetrics website testing and monitoring services are used by companies that want to ensure online performance, competitive advantage and a positive end-user experience. Visit Neustar online at [www.neustar.biz](http://www.neustar.biz) and [www.webmetrics.com](http://www.webmetrics.com).