THE DAY YOUR WEBSITE WENT DOWN

Five tips that can help you avoid a costly failure

Telerik
TEST STUDIO

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THE VERY PUBLIC COST OF WEBSITE FAILURES

It's your worst nightmare. Your company has invested millions to promote a new product that is available for purchase online. Within minutes of your first TV spot going live, though, your website crashes from the spike in traffic. Not only have you wasted your valuable marketing investment, but you've lost potential customers and damaged your company's brand image – issues that can take years to overcome.

A similar disappointing outcome can result when your website simply doesn't perform as expected. Perhaps your latest grassroots, "guerilla marketing" campaign has taken hold and folks begin to stream to your site to see what all the chatter is about. When they arrive, the video demonstrating your new product won't load properly. Even worse, your ecommerce function has developed a bug, frustrating potential customers who leave without placing an order. The lost opportunity costs are enormous.

Cyberspace is littered with dozens of sobering, real-world examples. The U.K. spent a reported £8.92 billion to host the 2012 London Olympics.
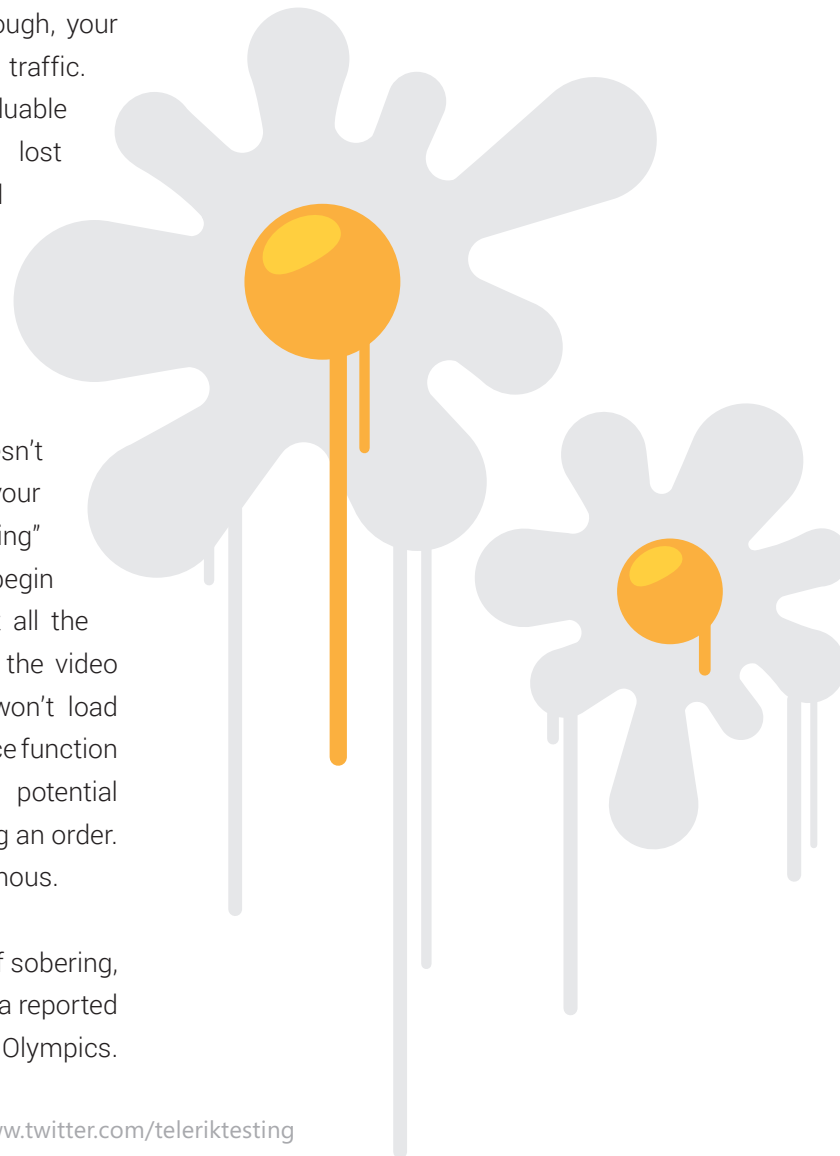
But the first day tickets became available for purchase, the event website crashed and requests couldn't be processed[1]. It was an Olympic-sized failure that angered fans and tarnished the reputation of the U.K. host committee.

The same experience has become a recurring phenomenon for companies buying costly Super Bowl ads – priced at about $4 million per 30-second spot. But year after year, companies aren't prepared for what happens in response. Beverage giant Coke launched an interactive commercial during the 2013 game that featured groups racing through the desert to capture a bottle of the company's soft drink. Viewers were encouraged to visit the company's website to cast a vote for the group they wanted to get there first. But the site quickly crashed under the deluge of traffic.[2]

Even tech-savvy Apple has had multiple website failures that have taken a bite out of its image. During almost every launch of a new iPhone model, customers have crashed the company's site by simply trying to place an order.

To assure your company doesn't meet a similar fate, follow the five tips outlined in this paper. They can help you proceed with greater confidence whether you are launching a new site, making changes to your existing site or introducing a new marketing promotion.

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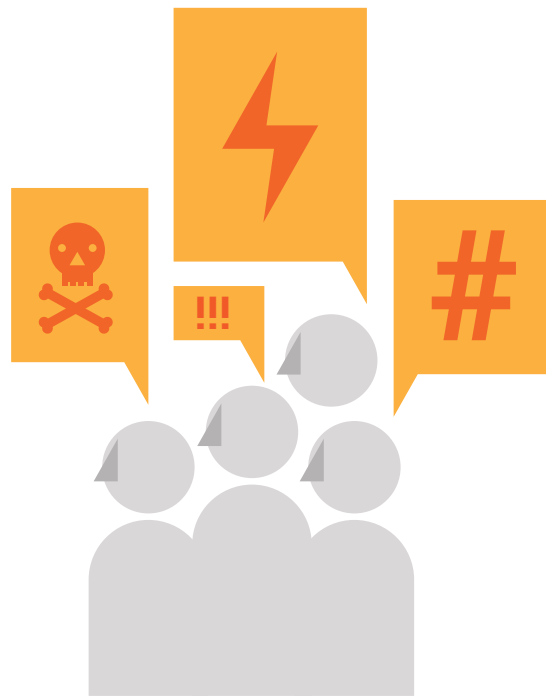
1   London Daily Mail, January 8, 2012.
2   The Huffington Post, February 4, 2013.
3   Digital Trends, September 19, 2013.
    CBS Miami, September 14, 2012.
    The Daily Caller, October 4, 2011.

TIP 1

LOOK AT THE NUMBERS.

There are three important categories of numbers that can guide your website preparedness strategy.

The first is the cost of lost opportunities. If you track basic statistics on the number of visitors to your site, how many convert to customers and the average purchase value of each customer, you can easily quantify your potential losses if your site crashes.
If you need to make a business decision on investing to extend your capabilities, you will have important facts to help you weigh the downside risk.
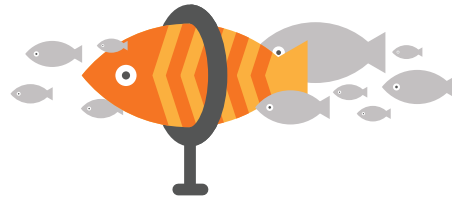
The second important category of numbers is your anticipated peak traffic. Hopefully you have a good handle on your traffic loads and have used the information to drive your application requirements. But for many organizations, evaluating peak traffic may instead involve a bit of crystal ball gazing. If you fall into the latter category, look at historical traffic levels, "pay per click" results, seasonal variations and other trends. Evaluate the response rate for a typical advertising campaign or promotion and take a close look at server utilization stats. None of this information will give you THE answer, but it can provide the guidance you need to make an educated guess about how many visitors might use your site at peak times.

The third important category of numbers involves quality of service. What are the response times you want any visitor to experience, regardless of the load at a given point in time? How quickly should pages load? How long should it take to confirm a credit card, complete a transaction and display a receipt?

Once you've taken a close look at the numbers in each of these three arenas, you will be better poised to evaluate whether your site is designed and built to deliver an optimal outcome and achieve your objectives.

TIP 2 — TEST INDIVIDUAL PERFORMANCE.

A performance test determines what each individual user will experience at varying traffic levels. How long will it take to load a product brochure, get the address of your local retail outlet or complete an online transaction?

By testing what the user experience is like, you will know whether the quality of service you are delivering meets your expectations and is helping you build a positive image of your brand. If the results are not what you'd like them to be, you'll have clear insights into the precise reason performance is degraded and what you can do to make improvements.

You should be able to test the performance of any application or function, regardless of the underlying technology. Does your web server render pages in the blink of an eye, or does it perform sluggishly? Is your application server successfully accessing your inventory database to confirm product availability, or are there unacceptable delays? Are third-party connections to banks and credit card companies, FedEx, UPS and other outside resources working seamlessly and at agreed-upon service levels? Testing will show where regression has crept into your system.

Run your first performance test as soon as your web development process permits, and repeat it routinely – daily if possible. Your initial test becomes a benchmark reference point that can show you whether your performance is improving, degrading or holding steady over time.

TIP 3 TEST LOAD PERFORMANCE.

Load testing is a measure of your website's scalability. It can help you determine what will happen when large numbers of visitors stream to your site and use it in various ways. Will it slow to a crawl and then crash as traffic builds? Or will it continue to operate smoothly?

Before the advent of testing software, companies often attempted to answer such pressing questions by performing what they called "pizza tests." They would order up pizza and have employees come in after hours or on weekends to interact with the site to see how it performed under load stresses.

If they determined they had load performance issues, the answer would typically be to add more servers to the server farm. But what rudimentary "pizza tests" were unable to show is that adding new hardware is often not the answer. Instead, you may have any of a wide variety of potential problems or bottlenecks – from too many database updates to inherent application code weaknesses.

With today's testing software, you can get a better, fact-based answer to your load capabilities and to the underlying root causes of any issues. You can determine:

How each aspect of your site responds under a various projected load levels.

The number of users your site can support before it crashes.

The stability of your site when large numbers of users visit over a sustained period (versus a peak burst).

Rather than use live web traffic, testing software allows you to put your site through its paces with virtual users. You can create and distribute these virtual agents geographically and program them to perform various tasks, just as real users would. They can be scripted to view pages, complete forms, download information, populate a shopping cart and complete purchase transactions. You can even build in "think time" delays that mimic how real users navigate.
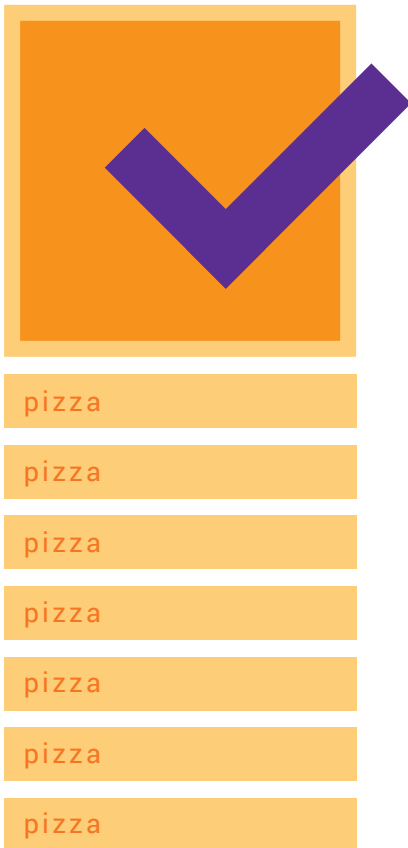
When a load test runs, you will see how a variety of channels and machines interrelate and perform under complex scenarios, including your web servers, application servers, web services, databases and data warehouses. Common load test parameters include: load balancing, speed by component, horizontal and vertical scaling in the cloud, memory use, bottlenecks, cache misses, workflow, server configuration, response time, resource usage and lost transactions. This detailed information can help you understand how your site will respond under a variety of real-world conditions.

DID MY SITE PASS THE TEST?

Though we all love a yes or no answer, ultimately a load test isn't something you pass or fail. Instead it is an indicator of how your site will perform under varying conditions, based on how it is currently constructed. Your team will need to make a strategic decision on the right balance point between the costs involved in achieving optimal performance at a given load, versus the cost to the company if the site fails at that same load.

A company using its website simply as an information resource to stimulate face-to-face transactions may have a very different tipping point than a company that relies on web sales for the bulk of its revenues. Use the information you gathered on the cost of lost opportunities to help you evaluate your next steps once you have your load test results in hand.

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TIP 4

MAKE OPTIMAL USE OF YOUR CONTENT MANAGEMENT PLATFORM.

If you are using a robust content management system (CMS) platform to support your website, you should be able to respond quickly to the insights your testing provides. Your CMS is largely responsible for the server side of your website architecture. That's where content is processed and rendered into HTML and where the resources used on your website are housed – from images and scripts to styles and fonts.

With robust CMS tools, you can quickly modify your site architecture, operation and workflow to respond to test results and improve your outcomes. Here are a few examples:

Make optimal use of caching.

A well-configured cache allows you to super-charge your site performance by storing recently retrieved information in temporary memory so it can be immediately served up without touching your underlying application. This can reduce the time it takes to render a page to milliseconds and can deliver a ten-fold increase in the number of requests your site can process per second.

Remember, though, that websites are not static beasts. These cached snapshots of pages stored in memory are replaced as new content and information is published. Your CMS tools can help you understand and manage this crucial relationship between publishing and caching so you maintain the performance gains you achieve.

Better manage digital assets and scripts.

Perhaps the load and performance tests you've conducted show one of your servers is routinely going into overdrive just to serve the images and scripts used by your website. The good news is that with very little investment, you can optimize your resources and make large performance and scalability gains.

To give your server a break, you can outsource the delivery of your digital assets and scripts to content delivery networks. Doing so can dramatically improve the load you can handle since no single server is overtaxed. You'll be helping your site perform at blazing-fast speeds and can deliver consistent performance to geographically dispersed users.

There is a PERFORMANCE GOLDEN RULE that encapsulates what developers have learned about website responsiveness. About 80 percent of website response time involves waiting for client-side resources to be retrieved and rendered. With caching, load balancing and better management of your digital assets and scripts, you can significantly improve responsiveness and boost your performance.

At a site template level, you can save bandwidth by using CMS tools to compress your code. You can also make bandwidth gains by using image sprites – a collection of small "thumbnail" images gathered into a single image in order to reduce the frequency of server requests. The thumbnails are simply resized as they are served up.

## Balance your load and leverage the cloud for scale.

Let's say you work for a football franchise and traffic to your website spikes dramatically on game weekends. You've optimized your caching and client-side resources to maximize the volume of traffic you can support. But load testing shows your server hardware still can't handle the anticipated demand.

There are additional steps you can take to make certain service isn't compromised. First, load-balance your architecture and then rerun your load test to ensure CPU usage meets acceptable thresholds. For further scalability, consider adopting a cloud-based architecture. By building cloud resources into your content delivery network, you can scale elastically to meet those traffic peaks – even when they soar sky-high – and then scale down when business is usual. It can be an economical alternative to adding new hardware to your server farm.

Test, fine-tune and continuously improve.

After you've used the results from your performance and load testing to help you get more out of both your client-side and server-side resources, it is important to test again to measure the impact of the changes you've made. You can evaluate and solidify your gains and continue to fine-tune and improve your site over time as part of a powerful continuous improvement process.
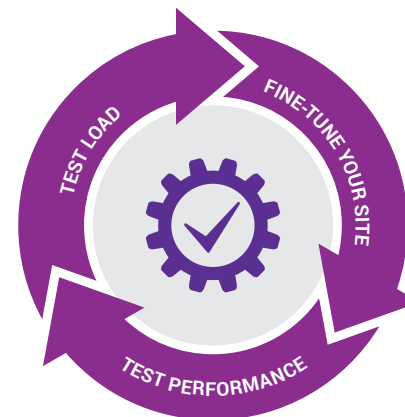
TIP 5 COLLABORATE TO ANTICIPATE AND RESOLVE ISSUES.
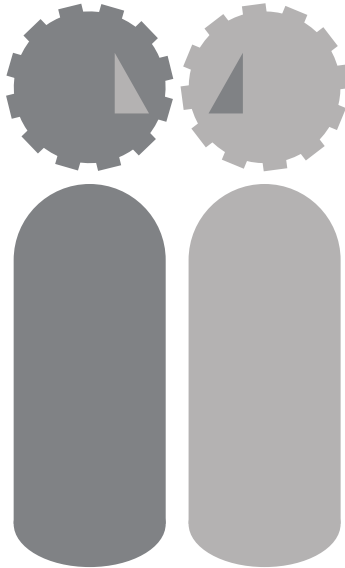
To optimize the success of any website under varying load conditions, it is vital that both your web development and marketing teams collaborate closely.

Marketers need to proactively reach across the aisle when planning an important campaign that might stress the underlying site infrastructure by driving increases in traffic. If you are launching a promotional email campaign to 20,000 prospects, even a small percentage of click-throughs to your site can create an unanticipated spike you may not be poised to handle.

On the flip side of the equation, the web development team needs to keep marketing informed of planned changes to the website and how it functions. Otherwise new features may be cut in at the same time that marketing is launching a new campaign – heightening the risk that something will fail to perform as planned during the "go live" process.

SUMMING IT UP

The tips described above are simple and require very little up-front investment. But they can deliver a powerful payoff. You will know whether your website is in good health, poised to handle peak demands and able to deliver a quality experience to each visitor. If testing shows you have issues, you will understand precisely where they reside and can determine the course corrections you need to make.

To aid your journey, select flexible testing and content management tools that make it easy for you to evaluate performance and make impactful changes. By detecting issues and intervening before they escalate, you will be able to keep site visitors engaged and won't have to worry about your own costly website crash.

SELECT TOOLS THAT CAN HELP YOU KEEP YOUR WEBSITE HEALTHY

THE RIGHT CONTENT MANAGEMENT TOOLS

+ Are based on a scalable, best practices-driven architecture.

+ Help you understand both caching and cache invalidation in a dynamic environment.

+ Give you both global and granular control over your enterprise caching structure.

+ Scale indefinitely in a load-balanced or cloud environment, while minimizing the impact on your overall costs.

+ Give you standards-based control over markup, styling and scripting.

+ Provide granular control over images — including size, resizing, thumbnails and storage.

+ Support outsourcing of your digital assets and scripts to content delivery networks.

+ Support deployment to Azure, Amazon S3 and other cloud-based resources.

THE RIGHT TESTING TOOLS

+ Allow you to use your browser of choice to conduct your tests.

+ Use multicore, hyper-threaded CPUs in order to minimize the system resources needed to generate a hefty user load and to test your website under stress conditions.

+ Run performance tests, load tests and other diagnostics in parallel so you can accomplish the job more quickly and get faster access to test outcomes.

+ Allow you to set goals and benchmarks and focus on specific metrics of interest, such as average response time or the total number of errors.

+ Allow you to set up tests simply and use powerful configuration options. You want to be able to create usage scenarios that are as complex as your site's actual usage patterns.

+ Analyze results from end to end — from your server and web client to HTTP traffic requests and the underlying application code.

+ Deliver comprehensive insights into the root causes of degraded performance.

+ Allow you to view current and historical test results side-by-side to evaluate trends and see where regressions are happening.

ONE EASY SOLUTION FOR ALL YOUR TESTING NEEDS:

Functional | Load | Performance | Mobile

WHAT'S TEST STUDIO ABOUT?

FUNCTIONAL

DEVELOPER

MANUAL

EXPLORATORY

MOBILE

PERFORMANCE

LOAD

Telerik test Studio will help you meet all your team's software testing needs regardless of its size and development model. Complex HTML5, XAML, and AJAX scenarios, client-side functionality, JavaScript calls, data-driven testing – we cover them all. Navigate, point and click is all it takes to generate even the most complex of your functional, performance and load tests. Radically more intuitive than anything you have tried, Test Studio offers a common platform for smooth collaboration between QAs and Developers.

HIGHLIGHTS:

- Web and desktop testing
- In-depth performance testing
- Intuitive load testing
- Exploratory testing
- Visual Studio plug-in
- Cross-browser test recording and execution
- Seamless QA-Developer collaboration
- Attractive pricing model

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