

WEB SITE TESTING FOR SUCCESSFUL WEB SITES

Objective

To build a successful Web site--or to check that your Web site has been properly built--you need to test it. There are three basic reasons to test your site:

1. To ensure your site displays properly and performs correctly when viewed with the most commonly used Web browsers;
2. To ensure that your page loading times meet the needs and expectations of your site's customers/target market(s); and
3. To ensure that your site is logically organized and easy to use for its intended audience.

The objective of this document is to provide an effective, professional-quality Web site testing procedure that anyone can use to check that their site meets acceptable standards in these three key areas. It includes:

- Specific performance standards your Web site should meet,
- Successful site testing preparation and procedures, and
- A ready-to-use document template you can use to perform and document your own site testing.

Only through rigorous testing of your site can you accurately gauge your site's performance and quality. Testing is therefore one of the most important tools a Web site developer, Webmaster, or owner/operator has, although it is all too commonly under-used. And the excuses of time-to-market pressures and developers already working death-march hours are no reason to cut corners on the only means of ensuring your Web site's functional integrity, whether your site is in development or already online.

The site test outlined in this document is probably the single most effective and inclusive test for your site, as it covers almost all the key elements that make or break a Web site. Other types of site tests such as load-testing, white-hat hacking, and process analyses may be performed by site developers, designers, marketers, or others to focus on specific areas of your Web site or platform architecture.

Successful Site Testing Standards

Before you perform any site testing, you should establish the standards that you expect your site to meet. While some details of the three main elements of successful Web site performance below can vary depending on your site's intended audience, there are certain near-universal standards that your site should meet:

1. **Browser Compatibility:** Your Web site should display properly in at least two to three versions of the two most commonly-used browsers, Internet Explorer™ and Netscape™. Proper display means that your site displays as intended in terms of the placement and appearance of all page elements.

Testing for browser compatibility is mainly a matter of having the browsers you need installed and functional on your testing PC. You should already have at least one commonly-used browser installed on your system. And most browsers are easy to find on the Internet, download and install. And most of them are free. Netscape provides an archive of previous versions of their browser at <http://home.netscape.com/download/archive/>. Microsoft, on the other hand, unfortunately provides only the latest versions of its browser—and the numerous critical security patches for it—on its site. At least Microsoft is kind enough to pester users of older versions of IE to upgrade so that fewer backward-compatibility issues exist with the browser.

WebGunForHire notes that although both AOL 5.0 and 6.0 use Internet Explorer as their browser 'base', they have been tweaked enough so that you should expressly test on at least one of those versions if you expect any sizable U.S. consumer traffic to your site. If necessary, you can install the free-trial version of AOL from one of their ubiquitous giveaway CDs, use it for testing, and cancel the service before you start to get the monthly bills (just remember AOL has been known to disable connections to other ISPs that you may have already installed).

Select at least two or three browser versions from the list below to test your site on:

- a. Internet Explorer™ 5.0 or 5.5
- b. Netscape Navigator/Communicator™ 4.x or 6.0
- c. MUST-TEST FOR B2C SITES: AOL™ 5.0 or 6.0
- d. FOR SITES FUNDED IN WHOLE OR IN PART BY FEDERAL FUNDING: New regulations require these Web sites be accessible to the blind by ensuring that ALT tags identify images so that TTD software can 'read' the pictures as well as the text on a web page. It's a design 'best practice' to accurately name your images in the ALT tag as well.
- e. OPTIONAL: Opera™ browser (free version now available, so easy to download and use for testing purposes)

Developer's Tip

Use a Netscape post-4.0 browser to test how your site displays while you build it. Netscape has in general always made more 'particular' browsers that are less forgiving of coding errors than Internet Explorer. Although Navigator 6.0 is the only popular fully 100% HTML 4.0/4.x-compatible Web browser available today, it's still a little buggy. Many testers therefore prefer testing their sites with Netscape 4.5 or 4.6 as they develop it.

The key point to remember is that whereas a Web site built to look good in Netscape will almost definitely look good in IE, the same is not true for sites built to look good in IE (which can be a problem if you've built your site in FrontPage. Netscape browser compatibility testing can therefore sometimes uncover code errors not apparent in IE. Note that some Netscape 4.0x browser versions, while particular, ignored Web standards almost as badly as Microsoft's recent browser versions and may therefore create additional coding requirements for proper site display.

2. **Page Load Time:** Your site pages should load in under 10 seconds per page on a typical dial-up Internet connection. The 'Eight Second Rule' reflects the page loading time that is most commonly referenced as optimal by most usability experts. However page load times have been steadily increasing somewhat even for the highest traffic consumer Web sites over the past few months (whether through recognition of the increasing penetration of broadband into the consumer market or lazy coding, I don't know).

The bottom line is that Web surfers are an impatient lot, and if your Web pages don't load in under 10 seconds, your site visitors may well click over to a competitor's site. And yes, the only standard to test by is based on a **first time visitor's** page loading time. If you speed-test a site you've visited previously without clearing your browser cache (this procedure is covered later), your results will be unfairly skewed because most of the image files for the site will be loading directly from your hard-drive, not off the Internet; that's the function of your disk cache.

Page loading times can be defined simply as the time required to load a Web page from initial click to the time the page is finished loading (usually as indicated in the Web browser progress monitor in the lower left-hand side, or the browser's moving 'activity' icon in the upper right). While it may be a little extreme to test on a 28.8K modem—thankfully they are certainly less common than they once were—you should still test along not-too-distant LCD (lowest common denominator) standards, which means using a dial-up connection on a 56K modem operating at sub-40Kbps connection speeds¹. While such low testing speeds may seem hard to swallow for T1-spoiled developers, these are the bandwidth speeds at which the majority of the consumer world still views the Web.

Page load times may be permitted to vary somewhat based on your site's intended audience:

- o Recommended standard Web site page load time: 8-10 seconds
- o Acceptable page download times for sites expecting visitors with higher-speed and/or broadband connections ('big boy' B2B sites, 'geeksites' like Slashdot.org, high-end finance sites, digital media sites, etc.): 30 seconds+

¹ Most ISPs display your active connection speed when you mouse-over or click on the dial-up connection icon in your system tray. You can also visit <http://easy-money.com/cgi-bin/throughput.pl> for a free connection speed test.

3. **Basic Usability Testing:** The metrics for usability are a little harder to define than browser compatibility or page loading time, as there are few hard-and-fast rules in this area. For some of the best usability guidelines, WebGunForHire highly recommends Jakob Nielsen's detailed report, "E-Commerce Design Guidelines", which is based on the kind of extensive end-user testing and analysis that few if any of us have the resources to perform. You can download the full report for just \$45 from <http://www.nngroup.com/reports/ecommerce/>.

There is however no single gospel for usability, and that's probably just as well: Flexibility in site design and execution is necessary to allow for the full range of motion offered by the creative potential of Web programming. Nevertheless there are a handful of broad rule-of-thumb standards that can guide you in your usability analysis:

- a. **Site navigation flows logically and consistently:** Your site visitors should be able to easily move through your site via established navigation paths that fulfill their intended function, whether that function is to provide information or sell a product. Start at your Home page, and then go through your site as your customer(s) would. Is it easy to find the products or information they would be looking for? If you have to use your Web browser's 'Back' button frequently to move through the site, something's wrong with your navigation scheme. Can you use the same navigation elements on every page so that it's quick and easy to learn how to get around your site?
- b. **All information provided—including error messages, directions, and text—is easy to read and comprehend:** Displaying information on a Web page requires different techniques than displaying information on the pages of a book, magazine, or PDA. Make sure your content is easy to read on-screen, and that no background graphics or color schemes are distracting or otherwise subvert readability. Remember, your site visitors won't be impressed by your company's logo tiled as a background on your Web pages if it means they have to struggle to read the information on the page.

To test error messages, purposefully omit information or submit incorrect information in the forms or other interactive elements on your site to read the resulting error messages. Are the error messages written in easy-to-understand human terms, or in the default technicalese of the application developers? If you can't understand it, neither can your customers. Ditto with directions on how to check out, perform a search, or execute any other specific task on the site: Step-by-step, easy-to-follow instructions should appear in scannable chunks of text that don't require the reader to take notes or refer to a dictionary. Bullets and numbered steps are good; long blocks of text with multiple steps that try to force the reader to remember the whole process in advance are bad.

- c. **Other usability considerations:** Other commonly-accepted standards for successful Web sites include:
 1. **'2 clicks to cart':** A shopper should require no more than two mouse-clicks to add a product to his or her shopping cart. While three clicks are more common and inevitable in some e-commerce applications, two clicks are preferable.
 2. **'No hurdles to task completion':** Your Web site visitors should not have to overcome any hurdles to find the information or the product they're looking for on your site. That includes unnecessary pop-ups, poorly-placed ads, and a confusing interface.
 3. **Font size & user preferences:** Don't force your readers to read text on your site in a small fixed-point size (2 or 1) unless you have a damn good reason to. Some users have their browsers set to display large fonts to account for visual impairment. Also, don't forget that in recent browsers users can easily set fonts set to 'default' in your site's HTML code to display in the font of their choice, which may be a font contrary to what your designers originally had in mind.

Test Preparation

You need to perform the following three steps before each and every testing session:

1. **Confirm/change display settings on test PC:** Depending on what monitor display resolution settings you use, you may or may not need to change these settings. In general, the LCD for screen display is 800 x 600. In other words, your site should 'fit' within a screen set for resolution 800 x 600 without requiring the user to scroll horizontally (no horizontal scroll bar should be necessary—users hate them). Your site can be designed for 'optimal' display at a different resolution, such as the next-higher and increasingly common setting of 1240 x 680 (higher resolutions are more common among computer aficionados and Web professionals), but at a minimum it should display well at 800 x 600. Since most developers build Web sites on PC's with higher screen settings, they may neglect to view the site at 800 x 600 to ensure proper display. You should therefore check your display settings to ensure that you will be viewing your site at the LCD setting of 800 x 600 while testing.

Here's how to check and change your screen settings in most versions of Windows™:

- 1) From the Start menu, select Settings > Control Panel.
- 2) In the Control Panel screen, click the Display icon. Click the Settings tab on the Display pop-up box. If the Settings/Screen Display/Resolution box shows '800 x 600', click Cancel and jump to Step 2 below. If your current display settings are higher, use your mouse to slide the selector down to 800 x 600 and click OK. Click OK on the message pop-up box and wait for your computer to re-display with the new settings. Depending on your PC, you may need to re-boot your computer for the new settings to 'take' (this procedure can confuse Windows).

DevTip: You should also see how your site looks on a PC set to display Large fonts as a system setting (i.e. in Control Panel). System settings can over-ride stylesheets and browser fonts and radically alter site display.

2. **Clear browser cache:** Any time you visit a Web site, that site loads images or other content into your browser's cache (memory) for faster retrieval. Since these images, once resident, can be loaded from the browser's cache and not from the Web server serving the actual Web site, they load much faster than they would for a first-time visitor. Before each test you must therefore clear your browser cache for any browser you're using to ensure that no cached images unfairly distort your test results.

Here's how to clear your browser cache in the two most popular browsers:

- o Internet Explorer Web browser:
 - 1) Select Tools > Internet Options from the main menu.
 - 2) In the Internet Options pop-up box, click the 'Delete Files...' button in the Temporary Internet Files section.
 - 3) On the file deletion confirmation pop-up box, click OK. You can also click the 'Delete all offline content' box. This will not delete cookies saved on your PC.
- o Netscape Web browser:
 - 1) Select Edit > Preferences from the main menu.
 - 2) In the Preferences pop-up box, click on the arrow next to Advanced to see the sub-menu. Select Cache from the sub-menu that appears under Advanced. Click the Clear Memory Cache button, click the Clear Disk Cache button, and click OK to close the pop-up. As in IE, this will not delete cookies saved on your PC, only cached content.

3. **Prepare stopwatch for testing page loading times:** A digital stopwatch or a digital watch with a timer function is the easiest to use and most accurate for testing. A watch or clock with a 'sweep' hand to display seconds elapsed is acceptable, but requires more work on the part of the tester to keep track of start and stop times for page loading.

Additionally, there is one more software tool that you'll need to install and use that is essential for successful site testing: A **screen capture program**. WebGunForHire uses and recommends TechSmith's SnagIt, available for \$39.95 at TechSmith.com. You can also find various freeware and shareware screen capture programs at http://softseek.zdnet.com/Graphics_and_Drawing/Screen_Capture/.

A good screen capture program allows you to select a specific part of the Web page you're testing, take a picture of it, and insert that picture into a document as proof of a specific problem area. While your Web developers will hate you if you complain about 'squiggly lines on the bottom of the Products page' and may say *they* can't see the problem, they'll find it much easier to understand (and more difficult to refute) pictures of those lines that you took when using whatever browser you were testing with. You can also use these pictures to compare with 'fixed' versions of the site to ensure that the initial problem was actually addressed.

Test Procedures & Methodology

Developing Your Test Methodology

In addition to preparing your PC and immediate test environment for testing, you also need to define what test procedures and methodology you will use for your test. You need to answer just one key question to establish your main testing methodology: **Who are your site's 'end users'?** In other words, who are the people you expect to visit your Web site? Shoppers? Business leaders? Info-tech professionals? Define the identity of the target market(s) for your site, and then take on the role of an individual in that market to test your site. **Identify your customer, and become them when you test your site.**

If you're testing a B2C (business to consumer) e-commerce Web site, for example, you would test the site by using it as an online shopper would. In fact, you can easily combine multiple shopper roles in a single round of testing in this case by both browsing for products as a 'window-shopping' customer might and performing specific product searches for specific items as other customers would. The 'universal' checkout process doesn't vary much—just be sure to represent your stupid customers as well by making mistakes and seeing what happens. Feel free to cancel your order(s) after you submit them if you're testing a live site, assuming it's your site or you otherwise have the right to place 'false' orders. CyberCash and other payment gateway providers allow testing on pre-live systems using the service, and in live systems transactions can generally be cancelled prior to actually having your credit card charged (if not, refunds are your next option).

Just remember to be your Web site's most critical customer: Not only are you using the site as a 'regular' customer would, you're also making it a point to look for common display and content problems such as errors in image alignment or spelling and punctuation errors and to fish for incomprehensible or unexpected error messages.

Document Everything

The only other thing to remember is to **document everything**. Write down every move you make through the site, note page download times with your stopwatch, record any display errors with your screen-capture program, and cut-and-paste confusing text or error messages you want changed into your document (with specific references to pages on which they were found).

This is especially important when you encounter 'unexpected errors' or bugs—the most important thing in this case is to immediately attempt to elicit the same error message again. You must prove that the error is valid and repeatable by repeating the steps immediately to validate the bug, and documenting the steps you took to reach that error so you or your coders can track it down. Also, screen-capture or cut-and-paste unexpected error messages, since they often contain the line number of the code in which the error occurred.

That's it! Now you're ready to test your Web site. Just don't rush the testing process—it takes at least two hours to properly test even a small site on at least two browsers on dial-up, and you don't want to rush it or you'll have less accurate results. Fill out the Test Template on the following pages with your findings and you'll be on your way to a Web site that 'works' better. The Template includes some data from an actual site test to help guide you.

Once you finish your testing, you need to use your results to answer the questions in the section on Evaluating Your Test Results, provided on the next page. You should skip the following section until AFTER you run your tests, however.

Evaluating Your Test Results

Use the results from your site testing to answer these questions as objectively and accurately as possible; general standards and benchmarks for most of these questions are provided in previous sections of this document.

1. **Are your page download times fast enough?** Which pages load slowly? Why? Are there too many images, or just one or two big ones? Can images on these pages be optimized, or do they require more extensive re-design? If the pages are being served up dynamically, have all server caching mechanisms and connections been optimized to provide the best performance possible?
2. **How egregious are your site's browser display inconsistencies?** Unfortunately it's the rare site 'in development'—if not live—that doesn't have some display problems on certain browsers. It's not even always the browser's fault, although sometimes, if a display problem is isolated to a specific browser version, it probably is.

You must make a judgment call as to what extent such browser compatibility problems are addressed. You could create separate versions of your site for certain browsers, or serve up browser-specific code, but do you really want to? Display fixes at this level generally require a damn good coder who knows how to tweak the code as necessary. These fixes require coding and viewing in the problem browser (back and forth), which can be more of a problem with dynamically-driven sites. If possible, you should have a development version of your site you or your coders can tweak mercilessly without affecting your live or back-up copy of your site until all tweaks have been tested.

If, after your rigorous testing, you find that your site displays well in all the browsers you tested, congratulations! Count yourself among the lucky. Then test your site on more browsers; in fact, test it on the Mac version of Netscape 4.7 before you start bragging about your site's universal browser compatibility.

3. **Does the site 'work'?** Be objective, in fact be brutal. Your customers are. If you were confused at any point during your visit, your other site visitors will be too, unless you're truly a 'Net newbie (another tip: Visit other Web sites and buy things online to find out what works and what you like and don't like). And remember that the point of site testing is to share your results with your site builders to work together to improve the site. This is still something of a new medium, after all, and we're all pretty much making this stuff up as we go along.

Finally, don't let anyone discount the value or validity of your quality assurance (QA) work. Rigorous testing is a central element in building and maintaining a successful Web site. While the best developers perform various tests throughout the site development process, the testing process is too easily overlooked in today's tight development timelines and market-driven launch dates. It's up to you to make sure your site is up to surviving on an increasingly competitive Internet.

Additional Info

Other common Web site tests include navigability (this test focuses solely on your site's navigation and is often used in early 'navigation dummy' prototypes of a Web site), white-hat hacking (purposeful attempts to achieve unauthorized penetration or control of the site to better defend it against hackers), end-to-end performance (order submission through receipt of order/information; can also be used to benchmark 'before and after' figures), as well as testing for accessibility by the visually impaired, HIPAA-mandated patient privacy and security compliance testing for medical Websites, and load-testing that simulates thousands or millions of visitors and/or transactions at a time to find the weak points in your site's architecture or applications.

Need more info? Need a WebGun to target your site's problems? WebGunForHire offers advanced site testing and analysis at reasonable rates. Visit <http://www.webgunforhire.com/services.htm> for details.

STANDARD SITE TEST TEMPLATE

HOW TO USE THIS TEMPLATE:

After following the simple test preparation procedures outlined previously, enter your information and findings in place of the *italicized* text in the spaces provided. Some example information from an actual site test has been left in place to help guide you.

Testing Location & Date:

--*Your Location, Date, & Time of Test*

Tester:

--*Your Name*

Connection to Web Site:

--Dial-up connection via *56K/28.8K* modem (modem monitor showed average connection speed of *36,400Kbps* during test)

Test Preparation:

4. Settings: Display resolution *800 x 600 / 1240 x 680 (800 x 600 recommended)*
5. Clear browser cache
6. Prepare stopwatch for testing page load times

Test Purpose(s):

1. Test overall page loading times and display on the following popular browsers: IE *5.0* and Netscape *Communicator 4.6*, at *800 x 600* screen resolution.
2. Test customer use of site, especially *registration and shopping-related procedures*, specifically:
 - A. *Product browsing (both 'window-shopping' browsing and specific product searches)*
 - B. *Customer registration (form completion and submission)*
 - C. *Product selection and related navigation (product search via drop-down menus)*
 - D. *Shopping process (from Add to Cart through Checkout and receipt of e-mailed order confirmation)*

Test Methodology:

1. *What did you do and why did you do it? Example: Used Website as a 'regular' shopper on both browsers, from customer registration through product search, selection, and checkout, including test credit card verification executed through CyberCash test connection.*
2. Page load time represents the time from initial navigation element execution (click) to subsequent completed page load ('Done' displayed in browser frame).

Key:

- > = 'to', used to indicate navigation course tester took through site
- 'display error' = apparent browser compatibility or other display error
- error = general error


Test Results: Internet Explorer 5.0

PAGE	LOAD TIME	COMMENTS
Home	1:20	Large image on top of page first to load; right-click on image to show Properties showed image heavy. Must optimize.
> Adidas brands page	:15	9 products on page
> 2 nd page of Adidas product listing	:10	7 products on page
> Back to Home	:07	
Search from Index on 'arcterix' > No Results page	:10	No 'near match' Search logic available to cover this. Further research showed installed search capability has no 'fuzzy logic' functionality.
Search from No Results page on 'arcteryx' > Search Results page	:15	9 products on page
Arcteryx Search Results page > 'Jump to Last' page	:15	
> Back to Home	:07	
> Trips	:10	Bus picture and resort icons last to load (:5 more than rest of page) = re-optimize images, check ASP caching mechanism set for best performance
> Thorlo Concept Shop intro page	:10	
> Thorlo Running	:10	
> Thorlo Next	:05	2 products
> Thorlo	:05	
> Thorlo tennis	:08	8 products
> Koflach page (via drop-down Brands menu)	:10	2 products
> Koflach Artis Expe	:11	
> Koflach Artis Expe close-up	:05	
> Add to Cart > Cart page	2:05	Top and side bars took longest to load; 'core' cart page in center loaded immediately
Purchase button click > New Shoppers page	:15	
Register button click > Registration page	:20	Accepted my phone number in 'non-standard' format (OK?); however, also accepted improper Zip (only 4 digits)—causes failure later in Checkout process = validate field on first input
> Checkout Step 1 of 3	:23	
> Checkout Step 2 of 3 (Shipping)	:20	
To correct problem: Had to go 2 pages back using Back button, back to Checkout Step 1	:05	Verify either 5 OR 10-11 numbers input for Zip immediately, or error message (validate field input as soon as submitted)
> Checkout Step 2	:15	
> Checkout Step 3	:17	
> Confirmation	:30	Confirmation message appeared within :15 seconds; remaining :15 in image loading (top element, etc.)

Test Results: Additional Errors, Recommended Changes, & Misc.

1. Thorlo Concept Shop intro page: reduce font on TMs
2. Add Full Instructions to Cart page—Update/Remove item, Continue, Purchase, etc.—Bullet list. See me for text.

Test Results: Netscape Navigator 4.08

PAGE	LOAD TIME	COMMENTS
Home	2:45	In Netscape, no part of page appears until majority of page loaded
> Marmot Concept Shop	:20	Product images last to load
Marmot Concept Shop page display error		
> Marmot Insulated Jackets	:14	
> Parbat Membrain product detail page	:08	
> Back to Home	:07	Images loaded into cache, thus quick re-load
Search: down jacket > Results page	:17	
Nuptse Jacket click Add to Cart button > Product Detail page	:13	
From Home: > Suunto Advisor product detail page	:10	
Click Add to Cart > Cart page	:20	See note—why secure connection started from this point on? (premature)
Click Purchase > New Shoppers/Return Shoppers page	:20	
> New Shoppers Registration page	:15	Text at top looks too 'bunched up': <div style="border: 1px solid red; padding: 5px; color: red; font-weight: bold;"> * We already have a registered account for the email address: tlatourette@systemarts.com. To create a n account, please enter a different email address. </div>
> Checkout Step 1 of 3	:16	
> Checkout Step 2 of 3	:17	
> Checkout Step 3 of 3	:20	
> Order Confirmation page	:30	Same as in IE—Order confirmation info in place long before remainder of top image & c.
> My Account	:20	

Test Results: Additional Errors, Recommended Changes, & Misc.

1. Rollover colors don't display in Netscape (can't change). Consider changing way links display to highlight more? (Discuss with designers)
2. Select "Bridgestone Sport" from Brands drop-down menu—Error message: "The parameter is incorrect." Repeated and verified error in this browser, but unable to duplicate in IE.