

Keynote[®] Service Level Rankings™



Keynote Service Level Rankings for Online Retailers

Spring 2005

Retail Study Overview

Keynote conducts benchmarking studies for the retail industry on an ongoing basis, examining the online experiences of customers over time. Keynote Service Level Rankings are a cost-effective way for companies to assess their end-user experience with key applications, relative to competitors, and implement enhancements to improve their competitive positioning.

Many brick-and-mortar retailers today rely heavily on the online channel as a key source of revenue. In 2004 holiday season alone, e-tailers rang up \$23.2 billion in revenue, a 25% increase relative to 2003. Moreover, online channels offer effective cross-channel marketing and help e-tailers maintain the consistency and quality of the brands they have worked so hard to build in offline stores. However, what if these same online services become unavailable or perform sporadically? Years spent building a company's brand can be negated by just a few hours of degraded transaction performance, and can result in lost customers and revenue. After all, your competitor sites are just a click away! How can you keep a pulse on your competitor's online stores and stay one step ahead by delivering convenient functionality, reliable transactions and a consistently better site to your online shoppers?

To help companies understand how they stack up against key competitors, Keynote Service Level (SL) Rankings provide a customer's perspective on the various components of site performance. The study findings also contain actionable insights into how to improve these site performance components including transaction responsiveness, consistency, geographic uniformity, reliability, scalability, page design, and Internet connectivity.

The study report not only ranks the best and worst Web sites by various performance factors, but also provides specific detail about why the sites ranked where they did. Because the rankings are based on

quantifiable metrics, site owners can use Keynote's findings to improve their overall customer/site experience. Keynotes Service Level Rankings also provide valuable industry-wide insights. They identify the best sites, highlight areas for improvement, help industry analysts keep abreast of how ever-changing Web technology is being applied, and help site owners set service level goals that are appropriate for their own industry. Armed with this intelligence, e-business and Operations Managers can make informed decisions that improve site performance relative to competitors, maximize returns on site content and design investments, and ultimately build stronger relationships with existing and new customers.

Study Participants

The following sites were evaluated as part of this competitive benchmarking study:

- Amazon
- Barnes and Noble
- Best Buy
- Buy.com
- Crate & Barrel
- Costco
- Circuit City
- Dell
- Eddie Bauer
- The Gap
- Macys
- Nordstrom
- Office Depot
- Overstock
- Staples
- Sears
- Williams-Sonoma
- Wal-Mart

Overall Service Level Ranking

The Overall Service Level Ranking is based on an aggregate score for site performance that is derived from all the measurements taken by Keynote during the study. This high-level ranking illustrates which sites are providing the best overall service levels.

The Keynote study found that following sites ranked highest in the Overall Service Level Ranking.

Keynote Service Level Rankings

Rank	Online Retail Web Sites
1	Williams-Sonoma
2	Wal-Mart
3	Eddie Bauer
4	Staples
4	Circuit City
5	Best Buy

Key Performance Factors

To obtain the Overall Service Level Ranking, Keynote first evaluates and compares the sites using 40 detailed service level metrics. Key Performance Factors are then derived by ranking the sites based on related sets of these underlying metrics. The 10 Key Performance Factors are:

- Average T1 Response
- Average DSL Response
- Average Dial-up Response
- Response Consistency
- Geographic Uniformity
- Load Handling
- Page Design
- Network Connectivity
- Reliability
- Outage Hours.

Each Key Performance Factor represents a distinct aspect of site performance; as is illustrated by the selection of results presented below. It is rare for a single site to excel in all ten aspects. Keynote's Service Level Ranking Report presents detailed analysis and results for each aspect separately.

The full report provides detailed answers to questions like:

- Which sites offer the quickest transactions (fewest steps, fastest pages)?
- Which sites are the most stable, offering consistent levels of service?
- Which sites offer well-designed web pages?
- Which sites provide the best service for dial-up or broadband users?
- Which sites are the most reliable; which have fewest outages?

The following sections summarize the findings for four performance factors: Average T1 Response, Geographic Uniformity, Load Handling, and Reliability.

Average T1 Response

The Average T1 Response factor represents a customer's experience of site responsiveness when using a high speed Internet connection. This factor is derived from the following seven measures of site responsiveness, recorded when each site is measured over a T1 connection:

- Overall Transaction Response Time
- Average Page Download Time
- Home Page Download Time
- Search Results Page Download Time
- Product Details Page Download Time
- Checkout Process Response Time
- Average Checkout Page Download Time

Of the retail sites in the study, Office Depot was the most responsive over a high speed Internet connection, followed by Staples.

Average T1 Response

Rank	Online Retail Web Sites
1	Office Depot
2	Staples

Geographic Uniformity

The performance of some Web sites varies according to where in the US a customer is located. The Geographic Uniformity factor represents the degree to which a site delivers consistent performance, independent of geography or Internet backbone. This factor is derived by computing the variation among measurements taken by the 10 Keynote measurement agents.

Keynote's research shows that the Sears site delivers the most uniform service levels across the US, followed by Williams-Sonoma and Buy.com.

Geographic Uniformity

Rank	Online Retail Web Sites
1	Sears
2	Williams-Sonoma
3	Buy.com

Average Dial-Up Response

The Average Dial-Up Response factor represents a customer's experience of site responsiveness when using a 56KBps Internet connection. Given that almost 50% of the consumer population is still accessing the Internet over a dial-up connection, response time over dial is critical for all sites. The same underlying metrics were used for this factor that were used for T1 Response.

Staples, Office Depot and Costco scored best at Average Dial-Up, proving the best service to its user on narrow band connections.

Average Dial-Up Response

Rank	Online Retail Web Sites
1	Staples
2	Office Depot
3	Costco

Reliability

The Reliability factor represents a customer's experience of overall site availability. This factor is derived from the following six measures of site reliability:

- Overall Transaction Reliability (Peak)
- Overall Transaction Reliability (24X7)
- Home Page Reliability (Peak)
- Search Results Reliability (Peak)
- Product Details Reliability (Peak)
- Application Process Reliability (Peak)

Of the sites in the study, Eddie Bauer was the most reliable, followed by Barnes and Noble and Staples.

Reliability

Rank	Online Retail Web Sites
1	Eddie Bauer
2	Barnes and Noble
3	Staples

Study Results

The study results are delivered via:

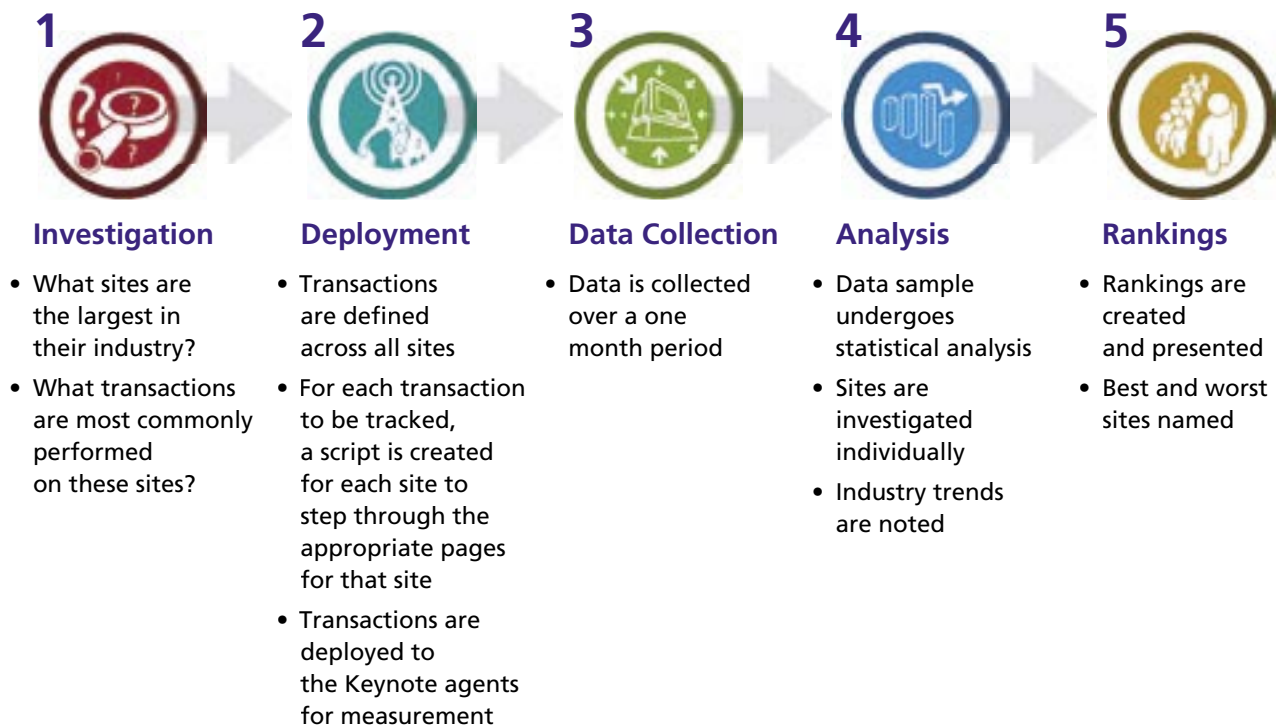
- An executive presentation, which highlights general industry trends and ranks each participating retail company on each of the ten performance factors. The insight gained helps executives identify general areas of site improvement that have the maximum impact on the online customer's experience.
- An in-depth presentation that analyzes each of the 40 diagnostic metrics that constitutes the ten site performance factors. Furthermore, Keynote's consultants analyze the performance characteristics of the customer's site and provide actionable recommendations to improve desired performance factors (T1 Response, Load Handling Ability etc.).

Armed with this intelligence, IT Managers can tune specific site elements to improve the performance delivered to customers relative to what key competitors offer.

Study Methodology

Keynote used Transaction Perspective agents—the industry's most accurate web application monitoring technology based on the IE 6.0 browser. For this study, we placed Transaction Perspective agents in ten major US cities. These agents performed multi-page transactions against 19 leading retail Web sites, collecting over 6,000 detailed measurements of the responsiveness and reliability of each site. The overall methodology is illustrated in the figure below.

Overall Methodology



Transaction Measured

Keynote compared the process of searching for a product and checking out on each of the retailer's sites. Each transaction began at the sites Home Page, emulated a user searching for a product and displaying the product details before beginning the checkout process. The transaction ended on each site with the page in the checkout process that required the customer's billing information. The number of pages (or clicks) included in each transaction varied between sites, as each has a unique navigational path.

While Keynote measured only a single transaction, that transaction exercises various portions of the site and many general site conclusions can be drawn from it. The results obtained apply both to infrastructure that delivers the "marketing" portion of a site and to that supporting "backend" checkout processes.

Measurement Frequency

Transactions were run against each site hourly from each of Keynote's US10 agents, and from single Dial-Up and DSL agents. Thus, each site was measured 288 times daily. Data was collected from May 7 through June 3, 2005.

Peak and Off-Peak Periods

When computing many of the metrics evaluated, Keynote used a peak period, defined as every day, 8 am to Midnight EST. Limiting the analysis to a peak period is especially important when calculating reliability, since many sites schedule routine maintenance at night. Including data collected during off-peak periods could affect the rankings adversely.

Transaction Perspective Agent

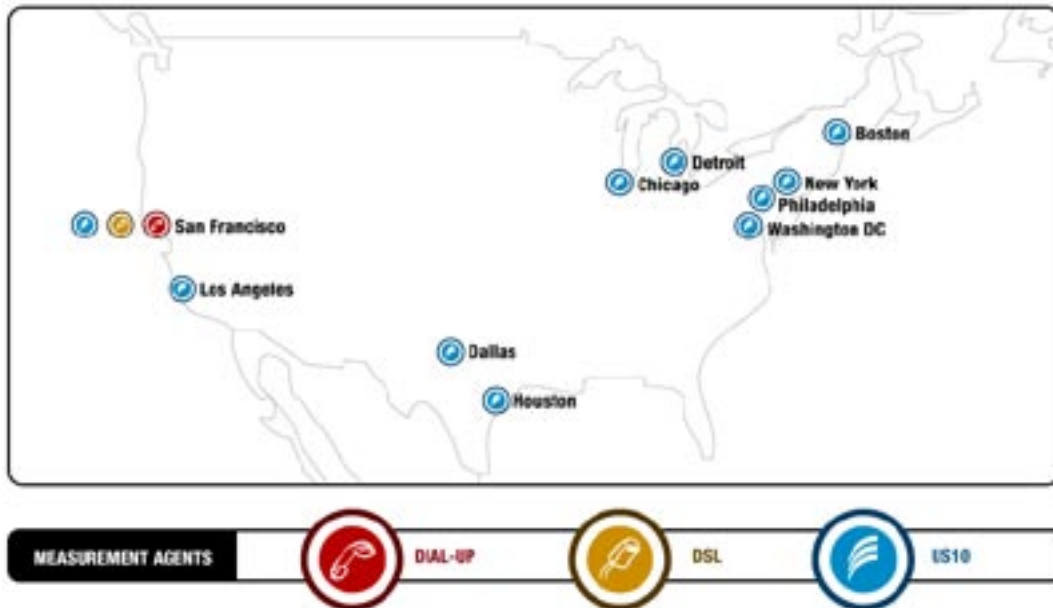
The Service Level Rankings study is based on Keynote's highly accurate and realistic Transaction Perspective® measurement service. This service uses measurement computers ("agents") that mimic a series of actions by a consumer interacting with a Web site using the Internet Explorer browser, taking detailed measurements of the entire process.

Keynote's Transaction Perspective measurement computer ("agent") is the most accurate and high fidelity measurement technology available. The Agent uses the IE 6.0 browser to ensure measurement accuracy. Just like a user, the agent uses two concurrent threads to fetch page components and allows the use of persistent connections. This browser also handles SSL, JavaScript, Flash, ActiveX, and other interactive languages that can have a significant impact on both performance and availability. Measurement data includes rendering time of all components to ensure that the data gathered represents the complete customer experience.

Agent Locations

To represent the experience of real customers, Keynote's agents are located on major Internet backbones and in principal population centers.

Agent Locations



Ranking Methodology

Ranking is performed as follows: Keynote first ranks the sites for each metric underlying the key factors. Each underlying metric ranking is based upon the statistic calculated from the large sample of measurements collected during the study. For example, to obtain the underlying metric Average T1 Response, Keynote calculated the geometric mean of the total transaction response time; this is a good measure of the response time a majority of users would experience. Keynote then ranks the sites by their geometric means. Since the sample size is very large, Keynote assumes that any difference greater than a certain measurement precision is statistically significant. Based on the rankings within each key metric, scores are assigned sequentially from top to bottom; the highest possible score is 10.

After all the underlying metrics within each key factor are scored, an average score is calculated for each key factor for each site. For example, the score of the key

factor Average T1 Response is the simple average of its seven underlying metric scores. Once the scores of all the key factors are calculated, summing the key factor scores produces the overall ranking score for each site. Since the overall ranking score is computed from 10 key factors, the maximum potential score for a site's overall performance is 100 points. Keynote considers any difference in the overall score of greater than or equal to one point to be significant.

Longitudinal Comparisons

Keynote Rankings provide a solid base for longitudinal comparisons and benchmarking. Studies are repeated at least annually. Each iteration of a study uses a similar study design, and the analysis is based upon standard Keynote metrics, resulting in data that can be easily benchmarked and compared over time.

Keynote plans to release the next wave of Service Level Rankings for Retailers in Spring 2006.

About Keynote Systems

Keynote Systems, The Internet Performance Authority®, is the worldwide leader in e-business performance management services. Over 2,100 corporate IT departments and 19,000 individual subscribers rely on Keynote's growing range of measurement and monitoring, service level and customer experience management services to improve e-business performance by reducing costs, improving customer satisfaction and increasing profitability.

Keynote Service Level Management (SLM) solutions provide enterprises with the tools to align IT and e-business goals. Keynote's SLM solution suites offer comprehensive approach to the problem of managing e-business service levels effectively for IT, application deployment and support personnel and e-business executives. To learn more about Keynote's Service Level Rankings study, visit:

[http:// http://www.keynote.com/solutions/slm_service_level_rankings.html](http://http://www.keynote.com/solutions/slm_service_level_rankings.html), or contact us at sales@keynote.com.