

Methodology of comparison of web sites

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Background

The aim of this benchmark is to measure the performance of public web sites that are representative of specific business sectors, and to rate these sites according to qualitative criteria, from best to worst, using an index calculated on the basis of availability and performance values.

The performances registered are representative of usual usages, those experienced by the web visitor. Nevertheless the values measured in the context of this benchmark cannot be considered absolutely representative of every user's experience of performance because each person's perception may be influenced by certain parameters, such as the average internet access (technology, internet access provider, network quality and capacity, etc.) or even the precise moment of connection to a web service (occasional audience-related degradation, very occasional saturation of server capacity, brief unavailability, etc.).

This benchmark is elaborated upon measurements of the performance of the web sites under study within similar contexts, under identical conditions, at a regular frequency, and within the same methodological context to ensure comparability.

Testing of each web site is done with ip-label's Datametrie tool, which connects to the home page of each web site under study via the Microsoft browser Internet Explorer, just like any web user except that the operation is automated, with robots implanted as close to operator backbones in order to limit the impact of any degraded performance related to a peripheral aspect of the internet, like the local loop that connects the subscriber to his/her ISP, and provide an overall view of the quality of service delivered by the web site within a usage context. The browser's caches are systematically purged prior to each test, so that the test is representative of real performance -- in other words, as it is experienced upon the first visit.

For this benchmark, testing is conducted from Geneva.

Representativeness

Computerworld.ch and its partner ip-label select a list of web sites that are representative of significant business sectors on the internet in Switzerland.

On 1 September 2014 there were 3 business sectors (electronic commerce, players indexed on the SIX stock market, websites with the highest audience levels, Finance, Industry, Travel sites, E-banking). From the same date, 91 web sites were monitored for this benchmark.

These lists are subject to change without warning, through the addition or removal of business sectors and/or web sites, and without causing any change to the present methodology, which remains applicable.

Metrics

Indicators are calculated each week on the basis of the values measured for each of the web sites under study over the course of the past 12 weeks.

Performance indicator (*PerformanceIndicator*)

A score is calculated on the basis of 100 points to represent performance. In the context of these measurements, performance means the time it takes to load the page in full (including all of its objects), without any major error.

The test scenario's overall execution time, **ExecutionTime**, is expressed in milliseconds and represented as a metric with a value of 0 to 100.

To calculate the **PerformanceIndicator** metric, a theoretical minimum time and a maximum acceptable time for the scenario to run have been defined:

- **MinTime**, 1000 ms
- **MaxTime**, 20,000 ms

If **ExecutionTime**, the average loading time of the site's homepage, is less than or equal to **MinTime**, the value of **PerformanceIndicator** is 100 points

If **ExecutionTime** is greater than or equal to **MaxTime**, the value of the **PerformanceIndicator** is 0 points.

Within these limits, the **PerformanceIndicator** is calculated as follows:

$$PerformanceIndicator = 100 \times \left(1 - \left(\frac{ExecutionTime - MinTime}{MaxTime - MinTime} \right) \right)$$

Availability indicator (*AvailabilityIndicator*)

A score is calculated on the basis of 100 points to represent availability. Expressed as a percentage, **AvailabilityRate** represents the ratio between the number of tests that are validated without encountering a major error (those that prevent the expected page from appearing in its entirety) and the total number of tests.

Taking into account **TotalTests**, the total number of tests performed during the period, and **FailedTests**, the number of those that failed, the **AvailabilityRate** metric is calculated as follows:

$$AvailabilityRate = \frac{(TotalTests - FailedTests) \times 100}{TotalTests}$$

To calculate the **AvailabilityIndicator** metric, a minimum acceptable availability rate and a maximum expected availability rate have been defined:

- **MinRate**, 80%
- **MaxRate**, 100%

If **AvailabilityRate**, the average availability recorded over the period, is less than or equal to **MinRate**, the value of the **AvailabilityIndicator** is 0 points.

If **AvailabilityRate** is equal to **MaxRate**, the value of the **AvailabilityIndicator** is 100 points.

Within these limits, the **AvailabilityIndicator** is calculated as follows:

$$\text{AvailabilityIndicator} = 100 \times \left(1 - \left(\frac{\text{MaxRate} - \text{AvailabilityRate}}{\text{MaxRate} - \text{MinRate}} \right) \right)$$

Overall quality indicator (**GlobalIndex**)

The web site's ranking is defined by calculating an overall quality index, **GlobalIndex**, on the basis of 100 points.

The overall quality index aggregates the two metrics calculated beforehand, which are weighted using these coefficients:

- **AvailabilityCoef**: the relative weight assigned to the availability metric, set at 2.
- **PerformanceCoef**: the relative weight assigned to the performance metric, set at 1.

The overall quality index is calculated as follows:

$$\text{GlobalIndex} = \frac{(\text{AvailabilityIndicator} \times \text{AvailabilityCoef}) + (\text{PerformanceIndicator} \times \text{PerformanceCoef})}{\text{AvailabilityCoef} + \text{PerformanceCoef}}$$

Display of results

The results of these comparative tests are published on the Computerworld.ch site in a set of tables:

- a synthesis showing the average performance and availability values for each of the business sectors represented, as well as the trend with respect to the previous rating;
- a detailed table for each of the business sectors presented, listing in descending order the overall quality index, from the best index to the lowest. Where there is a tie, the sites are listed in alphabetical order by URL.

In this second table, each site is represented by its main URL, its average performance value, its average availability, its overall quality index, and an indicator showing the trend with respect to the previous rating.

Above each table is noted the reference period, whose dates are inclusive.