Elaboration of Several Ways of Web Technology Scaling on a Particular Case

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Abstract

Scaling the power of computation is a phenomenon of the last few decades. While that long, this topic is still current and with new and still evolving technologies, new insights has to be discovered to push the human demand for computing forward.

The main aim of this project is to measure and compare scalability of an algorithm implemented in diverse web technologies. This aim has been approached by reaching three objectives. The first part defines scalability and identifies measures suitable for web technology scaling. Number of factors are determined that has direct impact on the runtime performance and the appropriate variables are chosen that become the object of the measurement. Secondly, proper technologies and algorithm are selected enabling the experiment. The testing algorithm is implemented in those technologies and deployed to a testing environment. Finally, aggregated results are drawn from the measurement and the final discussion concludes the arising insights.

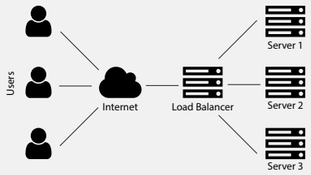
1. Identification of scaling performance influential factors

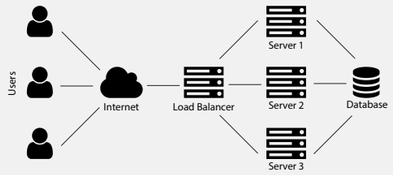
Before even trying to discover the right metrics for an application, there is an important step, and that is to discover what has an influence on the sub-ject, what is involved in its performance, which factors are pivotal to its us-ability. Based on these findings, there is resolved which factors are taken care of and what amount of them this project counts on. This task is insepa-rably related to the first objective of this thesis.

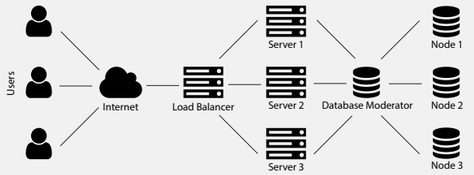
2. Measures

Based on the findings from the previous task, this task has to decide what is measurable and what is measured. Since all inde-pendent variables of the measurement are already placed, this task's aim is to find the dependent var-iables which will be used latter on throughout this experiment. When done, the first objec-tive of this thesis will be fulfilled.

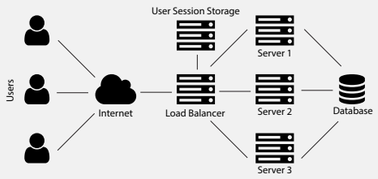
Scalability







- Administrative dimension
- Geographic (reliability) dimension
- System load dimension



- Horizontal scaling (scaling in/out)
- Vertical scaling (scaling up/down)

3. Suitable technology

To conduct the rest of the experiment, the right technology has to be identi-fied. Multiple factors will be taken into consideration like measurability ac-cording to the environment set, how well is the technology documented and how well is the technology suitable for its application in a business envi-ronment. This task covers the second objective of this thesis.

4. Testing algorithm

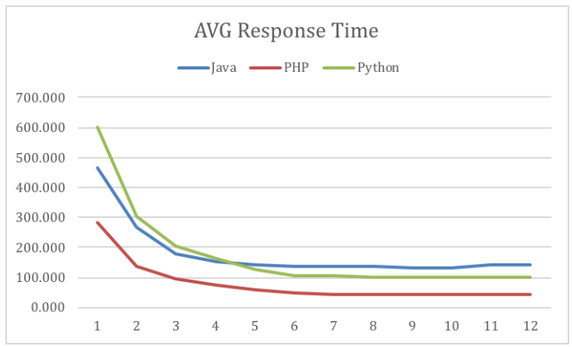
a testing algorithm has to be defined. It determines the character of the whole experiment as its results. There are two ways how to capture this ex-perience. At first, a deliberation will be lead which will result into a suitable type of algorithm. There will be presented presumptions and needs of the al-gorithm. Alongside with a theory of time complexity, there will be per-formed a detail pseudocode description of the algorithm as it serves like an image for the next task, the imple-mentation.

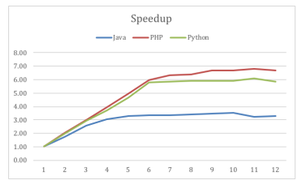
5. Implementation

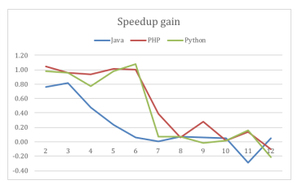
a testing algorithm defined in the previous task will be implemented in se-lected web technologies. A brief description of every technology specifics will be present-ed. There will be used an official documentation for every used web technology and its platform. Also, testing environment will be set that will enable the meas-urement in terms of the necessary software plat-forms support and the appropri-ate settings.

6. Measurements

Once the measurements are performed using the environment prepared in the previous task, the results might be compared side by side. To com-pare the results, numerous ways to capture the relationships among all the measured values will be engaged.







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