

10 The Message Execution Time in Dependence on the Number of Clients on the UKZ2018 Server

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10.1 Abstract

Each application requires minimum hardware conditions that are required and that are necessary for execution on a PC. If these applications are deployed into a server which provides 24 hour services, the method to finding minimum hardware performance is even more complex. This is so because now the application execution will not only depend on the performance of the internal hardware components of the PC but also from other parameters such as bandwidth, number of users at the same time, load quantity, application generation that executed etc. Each of these areas has an impact on the execution time of server and server actions. In this case, the time of execution of the message delivery to a user group is dealt with using the Moodle 3.2. which is located on the server with IP 80.80.173.124. From the measurements made, the execution time increases with the increase in the number of end-user messages. These measurements are made by taking into account the conditions of the computer network to which the server is connected, the internal hardware components of the server, the software components, and the version of Moodle application itself. Measurements are made by making changes in increasing the number of users who receive the message at the same time from the server and by increasing the characters in the message. From the resulting data it turns out that increasing the number of participants and increasing the number of characters in the message increases the execution time. This finding comes out of the measurements made on the server established under these conditions at the Kadri Zeka University that currently provides e-Learning services and has 1604 users.

Keywords: execution time, Moodle, number of participants, server

10.2 Introduction

In this paper the message is an element for analysis, the message in Moodle. Time and code needed by the server to send a message depending on the size of the message, comparison. The time and code that the server needs to send a message depending on the increase in users, comparison. The data showing the execution time is obtained from the UKZ server.

10.3 Execution Time in Server

Each application has minimum hardware requirements for execution on a PC. Applications installed on the server as web applications will not only depend on the performance of internal PC hardware components, but also on bandwidth, number of users, load quantity, hosts. In this paper we have analyzed the execution time of sending the message using Moodle 3.2. which is on the server.

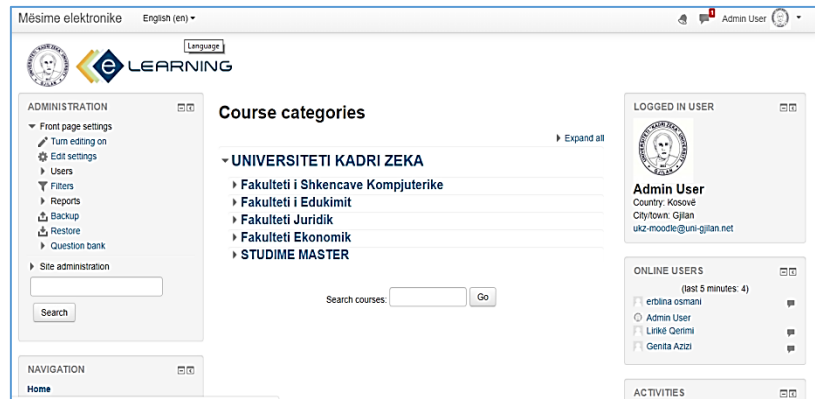


Figure 1: Platform Moodle ver.3.2

We have read the execution time in the generated code on the server which is shown in the following figure.

```
2019-04-26 22:03:54 CLIENT -> SERVER: --b1_142837b832d492f4a74a46660b3d64ce
2019-04-26 22:03:54 CLIENT -> SERVER: Content-Type: text/html; charset=UTF-8
2019-04-26 22:03:54 CLIENT -> SERVER: Content-Transfer-Encoding: quoted-print
able
2019-04-26 22:03:54 CLIENT -> SERVER:
2019-04-26 22:03:54 CLIENT -> SERVER:
0
-----
2019-04-26 22:03:54 CLIENT -> SERVER: -----
This is a copy of a message sent to you at "M=C3=ABsime=
2019-04-26 22:03:54 CLIENT -> SERVER: elektronike". Go to http://80.80.173.1
24/message/index.php?user=3D36&id=3D=
2019-04-26 22:03:54 CLIENT -> SERVER: 7 to reply.
2019-04-26 22:03:54 CLIENT -> SERVER:
2019-04-26 22:03:54 CLIENT -> SERVER:
```

Figure 2: Generated code for sending a message from Moodle

10.4 Performances of the Moodle 3.2 Server

An easier way to use this platform is to deploy it to a server. In the absence of a high-performance server that has a high cost, we can use an ordinary PC. Even a regular PC can be configured as a server to provide the same services. To configure Moodle on the server, these support applications must be installed: Windows Server R12 with IIS (CIS), C ++, PHP, MySQL or Maria DB. Finally Moodle ver 3.2 is installed and configured.

10.5 Material and Methods

The analysis material is received from the message generated by the Moodle at the moment the server sends this message to one or more users. Two situations were analyzed and measurements were made. One is when the message being sent increases the number of characters that this message sends and the run time is analyzed. In the message are set 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30 characters. From the data obtained it is seen that the execution time is not dependent on the size of the message.

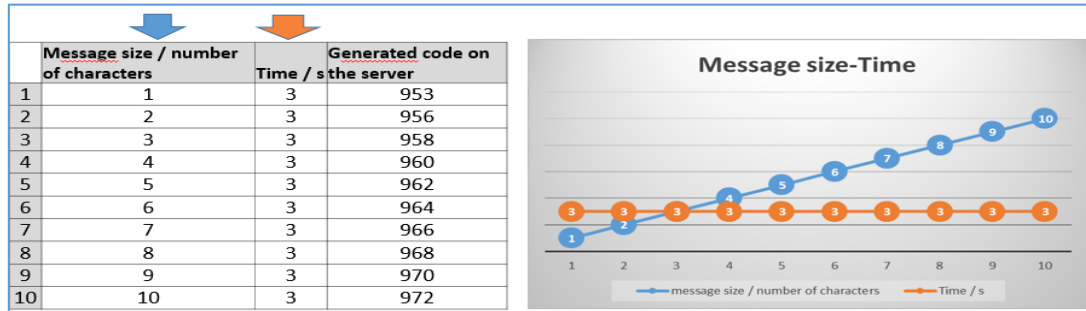


Figure 3: Time and code needed by the server to send a message depending on the size of the message, comparison.

The other situation is when an unchanged message is sent by 1, 5, 10, 15, 20, 30, 50, 150 users (email address). In this case the number of users has increased from 1 to 150 and for this number of users it will be seen that the execution time is increased. This is seen in the table and graph below. The method used has been empirically validated. There are two types of measurements:

- Increased the number of characters in messages sent to only one user by noticing the execution time
- The number of users has increased, noticing the execution time

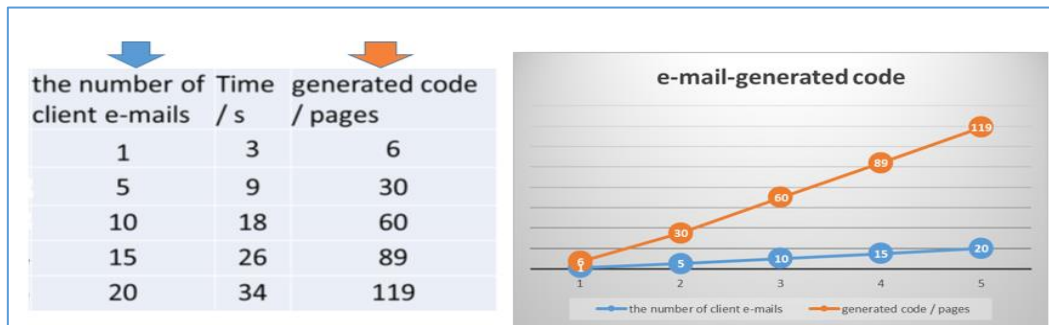


Figure 4: Time and the code that the server needs to send a message depending on the increase in users, comparison.

10.6 Conclusions

The increase in run time does not change if we increase the message size. The execution time increases proportionally with the increase of the number of users where the message is sent. This finding comes from measurements made on the server created under the conditions at Kadri Zeka University, which currently offers e-Learning services and has 1604 users.

10.7 References

- [P1] Judith V. Boettcher, Rita-Marie Conrad, The Online Teaching Survival Guide: Simple and Practical Pedagogical Tips (2nd Edition), Jossey-Bass, 2016
- [P2] Caroline Haythornthwaite, Richard Andrews, Jude Fransman and Eric M. Meyers "The SAGE Handbook of E-learning Research" (2nd edition), Sage Publications Ltd., 2016
- [P3] Ruth Colvin Clark • Richard E. Mayer, "e-Learning and the Science of Instruction", Published by Pfeiffer, San Francisco, 2011
- [P4] Basri Ahmedi, Xhevet Thaqi, Ekrem Alimi, The advantages of Creating a New Account in Moodle by Users Themselves and by the Administrations, IAFES Edition, Volume 6, Corfuz, 2018
- [P5] Ahmedi, B., Mitrevski, P., "On the Development of Methodology for Planning and Cost-Modeling of a Wide Area Network", International Journal of Computer Networks & Communications, Vol. 6, No. 3, pp. 1-20, 2014
- [F1] <http://80.80.173.124> (Access 2019)
- [F2] http://80.80.173.124/user/action_redir.php(Access 2019)
- [F3]<http://80.80.173.124/course/view.php?id=36> (Access 2019)
- [F4] <http://80.80.173.124/course/view.php?id=36> (Access 2019)