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PROCEEDING

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Preface

Preface

It is our great honor and pleasure to introduce the Proceedings of the 2nd International Conference on Informatics, Engineering, Science, and Technology (INCITEST 2019). The second INCITEST was organized by Universitas Komputer Indonesia and was held in Bandung, Indonesia, on 18 July 2019. With the theme **"Building Competitive Advantage to Face Industry 4.0"**, the conference provides a platform to share ideas and current research in the areas of Informatics, Engineering, Science, and Technology with the participants from the scientist, engineers, researchers, practitioners, civil society and organization representative.

Following the success of the first INCITEST, the enthusiasm of second international conference INCITEST has increased. The high enthusiasm was reflected from high number of paper submission with more than 350 papers from the participants coming from several cities and countries. Therefore, it is allowed multinational and cultural exchange of ideas in facing the issue and challenges in Industry 4.0. In order to improve the quality of the papers and extend the publication, all papers have been carefully selected and peer-reviewed.

This conference can only succeed as a team effort. Our sincere thanks conveyed to the Rector of Universitas Komputer Indonesia for his support to the success of the event. We would also like to thank all participants for their contributions to the Conference program and for their contributions to these Proceedings. We also honored and grateful with the cooperation between the organizers of INCITEST 2019 with the international reputable publisher, Institute of Physics (IOP) for publishing the selected conference papers. We hope that the collection of the paper will be a valuable resource and will stimulate further research. Our highest appreciation also goes to the Reviewers, Editor and Advisory Boards who helped us maintain the high quality of manuscripts included in the Proceedings published by IOP. It is our pleasant duty to acknowledge the Directorate of Higher Education and Ministry of National Education for the budget support in INCITEST 2019.

We are looking forward to the third INCITEST next year that will be held on July, 2020 at the campus of Universitas Komputer Indonesia, Bandung, Indonesia.

Thank you,

Best Regards,

Dr.Lia Warlina

The Chief of the Conference

Peer review statement

IOP Conf. Series: Materials Science and Engineering **662** (2019) 011005 doi:10.1088/1757-899X/662/1/011005

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Quality Analysis of Mobile Web Server

IOP Conf. Series: Materials Science and Engineering **662** (2019) 022043 doi:10.1088/1757-899X/662/2/022043

Quality Analysis of Mobile Web Server

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Abstract. There are many mobile web servers that can be used, whether it is a mobile web server that is free or paid. This research aims to analyze the quality of three mobile web servers consisting of one paid mobile web server and two other web servers that are obtained free of charge. To measure the quality of a mobile web server in this study using Apache JMeter tools and Web Application Performance Testing (WAPT). Based on the results of testing, it was found that the quality of paid mobile web servers was better compared to the quality of free mobile web servers based on values obtained using Apache JMeter, paid mobile web server is faster looking from sample times, latency and connect time result. When tested using WAPT, paid mobile servers also have better results based on the value of successful hits and average response time. The results of this assessment will depend on the type of smartphone that uses in the implementation hardware, so the value of the test results can be different if implemented on a different smartphone.

1. Introduction

The quality of the mobile web server needs to be known to determine which webserver to use. Without having a good web server, a website cannot be adequately displayed [1]. The web server can be software that is on a server to provide services or services to the client. The web server will send a response from what the client has requested in the form of a website page [2], which is generally in the form of an Html document. A web server is different from the server. If the server is hardware, the webserver is software [3] [4].

Many web servers can be used, including Apache web server, Nginx, Microsoft IIS, and LiteSpeed webserver. The Apache web server can be optimized [5] to serve requests from users so that it can be superior to other web servers in terms of data transfer [6]. Some web servers are generally implemented on a server computer that has high specifications because the server must serve many requests from the client [7] [8]. Besides web servers based on desktop computers, currently, there are also several web servers based on mobile smartphones, both smartphones that use the Android operating system, and iOS. This research is focused on researching the Android smartphone mobile webserver because smartphones with the Android operating system still control the smartphone market in Indonesia with a 94% market share [9].

Currently, several web server applications are running on the Android mobile platform, both paid and free. However, from several available web server applications, it is still unknown which mobile web server application has the best quality. This research was conducted to find out which mobile server web application has the best quality using Apache Jmeter and Web Application Performance Testing (WAPT) tools so that it can provide recommendations when using a mobile web server.

2. Research Method

The mobile web server used in this research focused on smartphones running on the Android platform. Three web servers were used as research objects, namely BitWeb server, penguin PHP / MySQL server, and KickWeb server. Whereas to evaluate the three web servers using the Apache JMeter application and Web Application Performance Testing (WAPT). Some general characteristics of the three can be seen in table 1. The information presented in Table 1 is based on observations from Google Play on January 30, 2019.

Table 1. Characteristic for each webserver

Information	Web Server Mobile		
	Bit Web server	Penguin Web Server	KickWeb server
Rating	4,1	4,2	Not specified
Status Payment	paid	free	free
Minimum version	Android 4.0	Android 4.1	Android 2.3
Size	23 MB	15 MB	19 MB

Stages of this research can be seen in Figure 1.

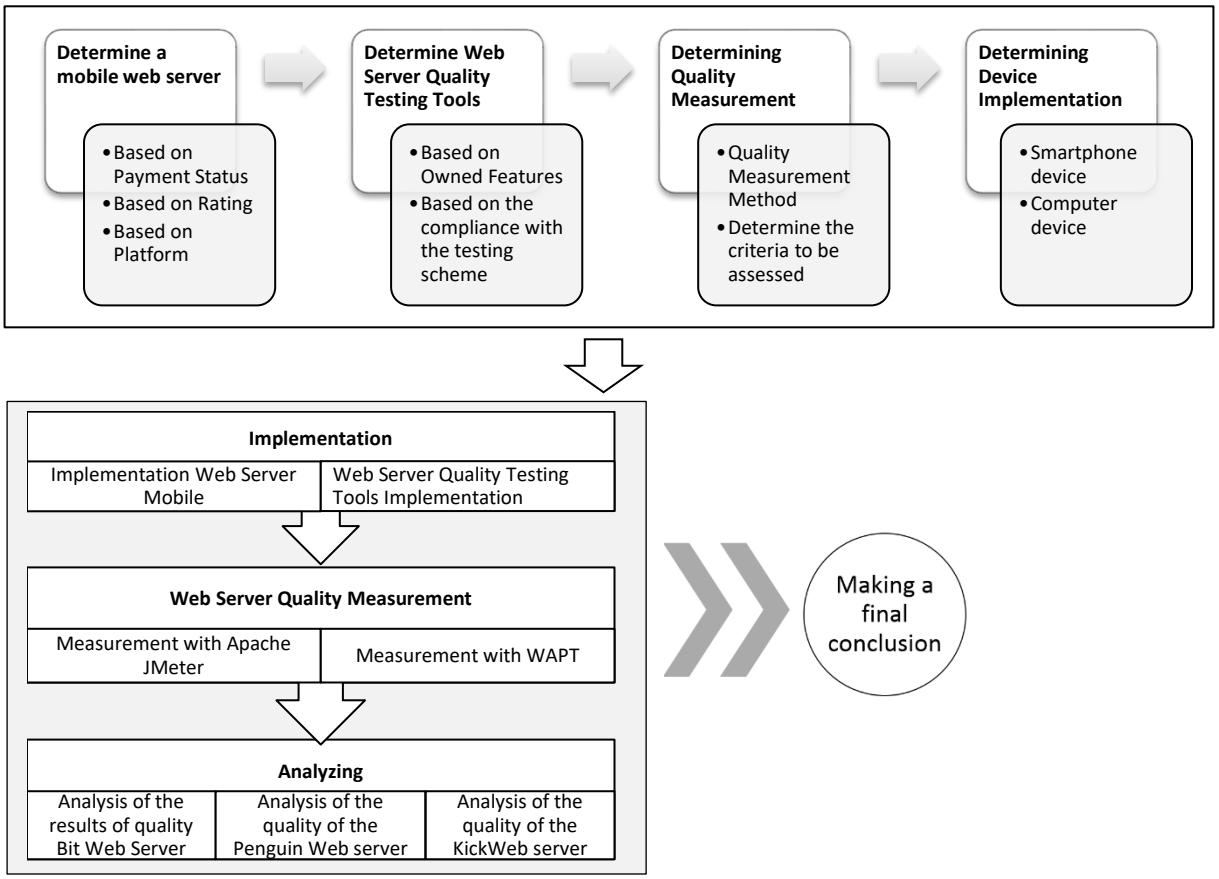


Figure 1. Stages of research conducted

2.1 Determining a Web Server Mobile as a Research Object

In this stage, which mobile web server will be determined first, which will be used as the object of research. The criteria used as the determination of the mobile web server used are based on the status of

payment whether free or paid, based on rating ratings of users who have used it and based on the minimum required the platform. Of the three criteria determined the mobile web server used in this study is the Bit Web server, Penguin server, KickWeb server.

Bit Web server is a web server application for android, including LIGHTTPD as a web server, PHP as a PHP server, MYSQL as a MySQL server, PHPMyAdmin as a MySQL Client, and MSMTP as an SMTP Client. It is all packed into one application called the Web Bit Server. This application is easy to run on an Android device, with just one click we can run web applications with PHP scripts and MySQL databases. Bit web server is a paid application.

Penguin Php / MySQL server, which in this research will be abbreviated as Penguin Web Server, is small and light enough to be used, so it will be easy to run and test our PHP scripts on a mobile smartphone, besides that it can also run PHPMyAdmin on our Android device offline. This application can be obtained by downloading it on the Google Play Store for free, but from some people who have tried this application, it states that it is still not optimal if it is run on an Android device version 8.0.

KickWeb Server is also one of the Android-based web server facilities that we can get for free by downloading it on the Google Play Store. The minimum requirements for us to be able to run the application on Android are that the internal memory must be available at least 50MB, and the minimum Android API 9 (Gingerbread).

2.2 Determine Web Server Quality Testing Tools

After the mobile web server is used, the next step is to determine what tools will be used to test the quality of the mobile web server. The determination criteria for selecting testing tools are seen from the features they have, as well as the suitability of the testing scheme carried out. Based on the results of the analysis, it is determined that the webserver quality testing tools to be used are Apache JMeter and Web Application Performance Testing (WAPT).

Apache JMeter is a performance measurement tool for client/server environments. Apache JMeter is a desktop application that runs on a Java VM that can measure system performance and load-test from client/server applications. What we can measure with Apache JMeter includes the performance of HTTP (web applications), FTP, JDBC, even EJB, SOAP or COBRA. With Apache Jmeter we can simulate a hefty workload on the client/server system that we are developing, including the server and its network. Although made with Java, Jmeter can test web applications written with all web programming languages such as JSP / Servlet, PHP, ASP, Cold Fusion, CGI, and Ruby.

Web Application Performance Testing (WAPT) is a software testing tool used to test stress levels on a web. This application is easy to use and cost-effective for testing websites, from personal business applications that are used for web portals, web servers, server applications, database storage. WAPT can make a load test in a few minutes.

2.3 Determining the Mobile Web Server Quality Measurement Method

The method used in measuring the quality of mobile web servers in this study is using five web pages as test material. The five web pages are stored on each mobile web server, namely the bit web server, penguin web server, and kick web server. Each page is then accessed through a web browser installed on the computer. Thus, the computer's web browser will access 15 pages. Criteria that become a reference in evaluating the quality of mobile web servers will be different between Apache JMeter and WAPT testing tools. The evaluation criteria of Apache JMeter are based on sample time, latency and connect time, while the assessment criteria from WAPT are based on success sessions, success pages and avg response time.

2.4 Implementation

Before the process of implementing the webserver and the testing tools, the smartphone device and the specifications of the computer devices to be used are used beforehand. The smartphone device used to implement the three mobile web servers is using the LG-G Flex D958 smartphone with a Qualcomm MSM8974 Snapdragon 800 Quad-core 2.26 GHz chipset. Computer devices used to access the web server using a web browser have an Intel Pentium Dual-Core 2.20 GHz processor specification.

2.5 Mobile Web Server Quality Measurement

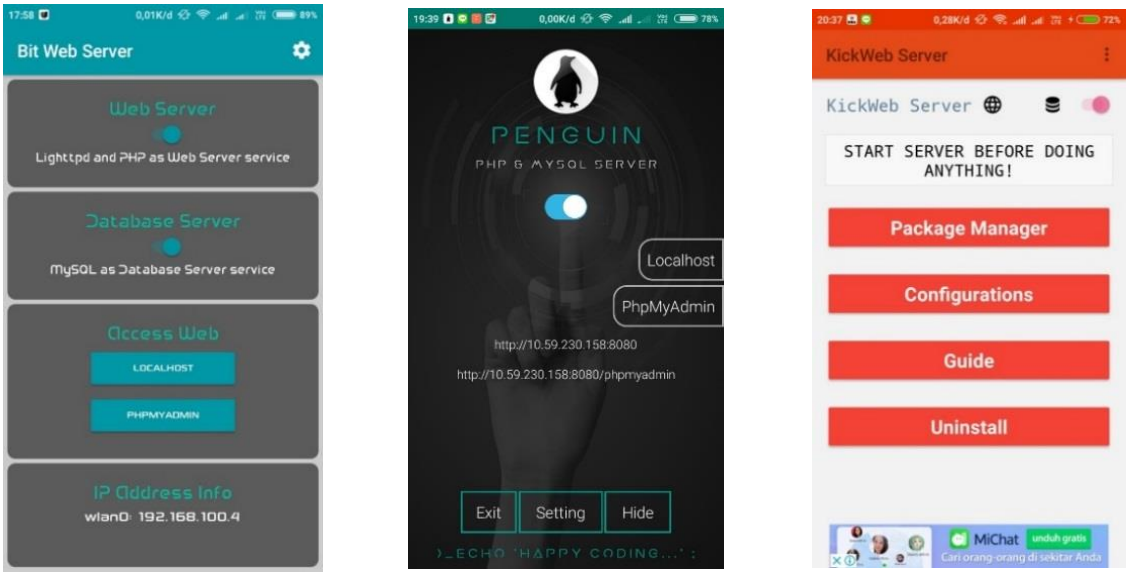
The quality measurements of the three mobile web servers in this study used Apache JMeter and WAPT tools, and their quality measurements were in accordance with the quality measurement method discussed in point 2.3.

2.6 Analysis of the results of quality measurements and determination of final conclusions

In this stage, analysis of the results of the quality measurements of web servers, penguin web servers, and kick web servers is carried out. From the three mobile web servers, it is seen which ones get the best results so that they can be used as the final conclusions in the form of web servers which have the best quality so they can be recommended for use.

3. Result and Discussion

The implementation of the installation process of the three mobile web servers can be seen in Figure 2.



(a) (b) (c)

Figure 2. Implementation of all three mobile web servers

After the installation process is complete, the next step is to compare the quality of the three android web servers using the Apache JMeter and WAPT testing tools. Comparison of test results using Apache JMeter can be seen in Table 2.

Table 2. Comparison of mobile web server testing results using Apache Jmter.

Thread Name	Testing Result								
	Sample Times (ms)			Latency (ms)			Connect Time (ms)		
	BitWeb	Penguin	KickWeb	BitWeb	Penguin	KickWeb	BitWeb	Penguin	KickWeb
Home 1-1	145	399	690	144	399	687	114	303	442
Home 1-2	30	206	531	30	206	528	11	112	282
Home 1-3	25	24	319	25	23	316	9	12	92
Home 1-4	217	21	133	179	18	130	70	7	5
Home 1-5	38	20	29	37	20	27	20	7	5

Graphically, the comparison of the results of the quality of the mobile web server tested using Apache JMeter can be seen in Figure 3. From the graph can be seen the comparison of each parameter value assessed for each mobile web server. The smaller the value obtained, the webserver has better quality.

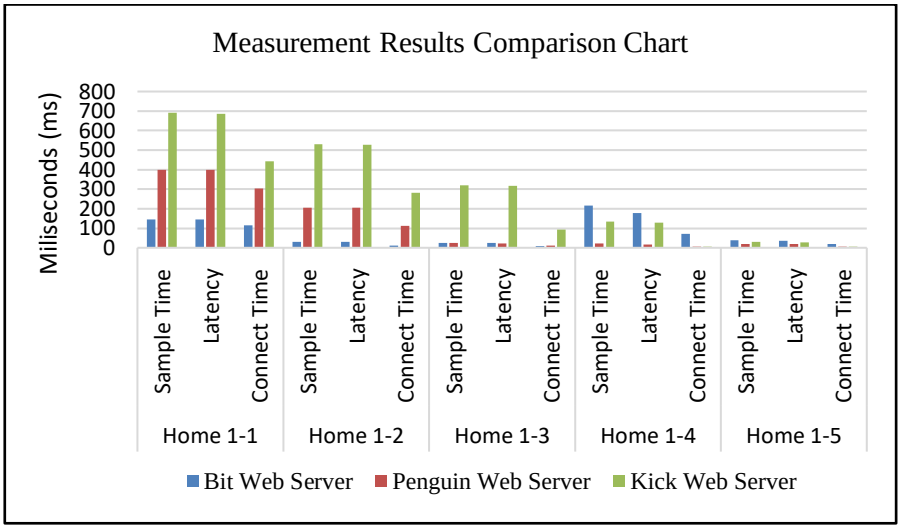


Figure 3. Comparison diagram with Apache Jmeter.

From the tests carried out using Apache JMeter shown in table 2 and figure 3, it was found that out of the 5 pages tested with a total of 45 test items, Bit Web Server generally had better quality than other mobile web servers. It is seen from several testing criteria Bit Web Server, which gets the least value, so it can be said to be faster in terms of sample time, latency and connect time.

Besides testing with Apache JMeter, it is also done with WAPT tools. Comparison of test results with WAPT tools can be seen in Table 3 below.

Table 3. Comparison of mobile web server testing results using WAPT tools.

Summary	Web Server Android		
	Bit Web Server	Penguin Server	KickWeb Server
Profile	Home	Home	Home
Successful sessions	220	211	138
Successful pages	224	216	143
Successful hits	6652	6415	4185
Total Kbytes sent	3238	3003	1955
Total Kbytes receive	921079	884733	576995
Avg response time	5,79	6,08	9,35
Result	Success	Success	Success

From the tests conducted with the WAPT test tool on the Web Server Bit, Penguin Php / MySQL Server and KickWeb Server, it can be concluded that the Bit Web Server is better than the other Web Servers, it can be seen from Successful hits that are higher that are equal to 6652 and have the Average response faster time which is equal to 5.79 seconds. Based on testing that has been done using Apache JMeter and WAPT, it can be seen that the application of the mobile web server Bit Web Server has better quality than the two other mobile web servers tested.

The test results depend on the hardware specifications of the smartphone used so that the parameters used in the test are also tailored to the needs. The parameters tested will be different from the assessment

of the webserver on the server computer [10]. However, the same latency assessment criteria are also used to determine the quality of a web server, both mobile and computer-based.

4. Conclusion

Based on the results of the testing, it was found that the quality of the Android mobile web server that was obtained paid from PlayStore, had a better quality when compared to other mobile web servers obtained for free.

Acknowledgments

We are wishing to acknowledge to UNIKOM and DRPM KEMENRISTEKDIKTI for support this research using grant Penelitian Terapan 2019.

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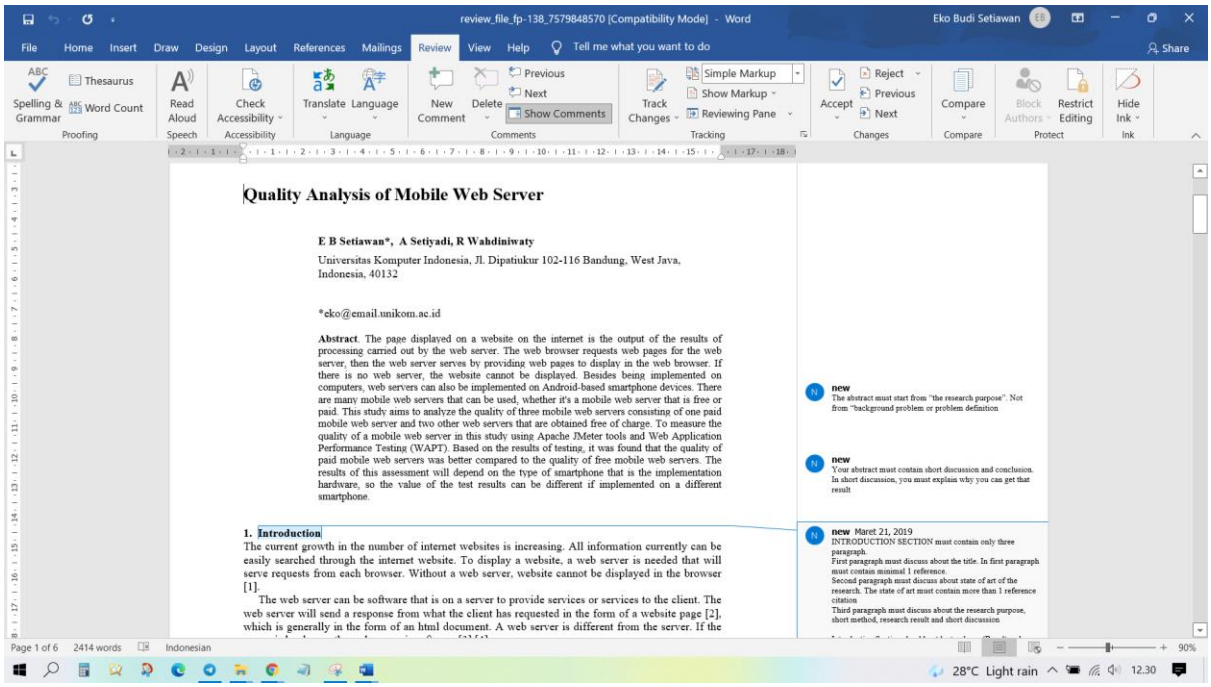

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Quality Analysis of Mobile Web Server

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Abstract. The page displayed on a website on the internet is the output of the results of processing carried out by the web server. The web browser requests web pages for the web server, then the web server serves by providing web pages to display in the web browser. If there is no web server, the website cannot be displayed. Besides being implemented on computers, web servers can also be implemented on Android-based smartphone devices. There are many mobile web servers that can be used, whether it's a mobile web server that is free or paid. This study aims to analyze the quality of three mobile web servers consisting of one paid mobile web server and two other web servers that are obtained free of charge. To measure the quality of a mobile web server in this study using Apache JMeter tools and Web Application Performance Testing (WAPT). Based on the results of testing, it was found that the quality of paid mobile web servers was better compared to the quality of free mobile web servers. The results of this assessment will depend on the type of smartphone that is the implementation hardware, so the value of the test results can be different if implemented on a different smartphone.

1. Introduction

The current growth in the number of internet websites is increasing. All information currently can be easily searched through the internet website. To display a website, a web server is needed that will serve requests from each browser. Without a web server, website cannot be displayed in the browser [1].

The web server can be software that is on a server to provide services or services to the client. The web server will send a response from what the client has requested in the form of a website page [2], which is generally in the form of an html document. A web server is different from the server. If the

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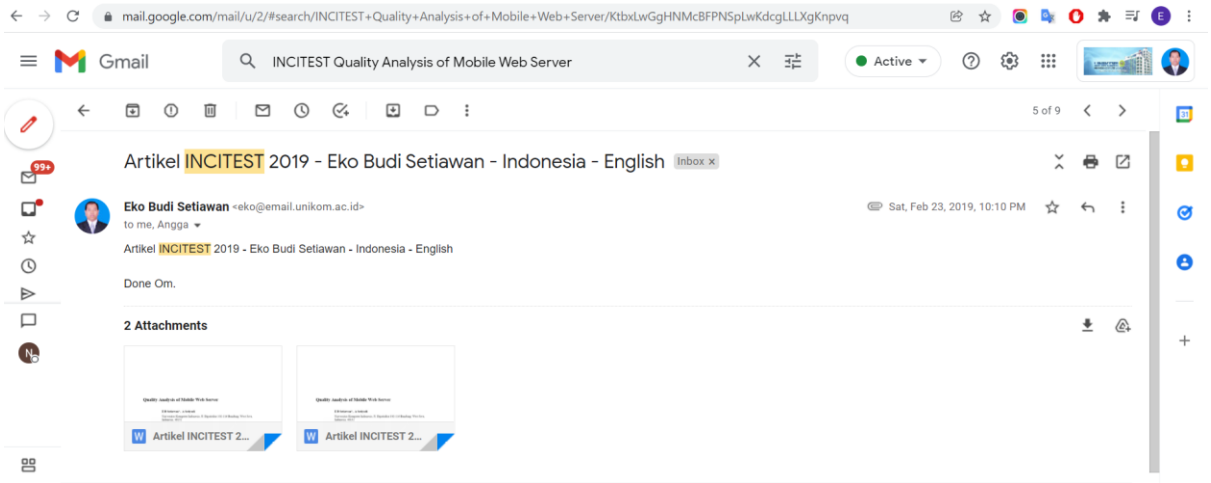

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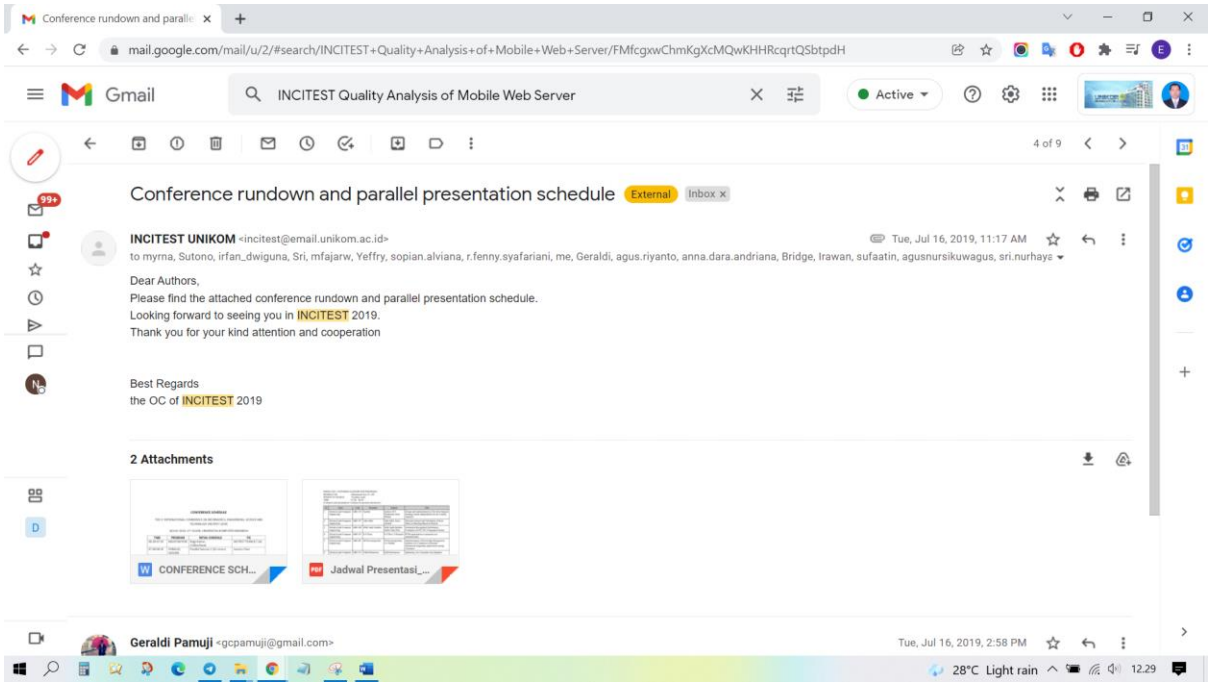
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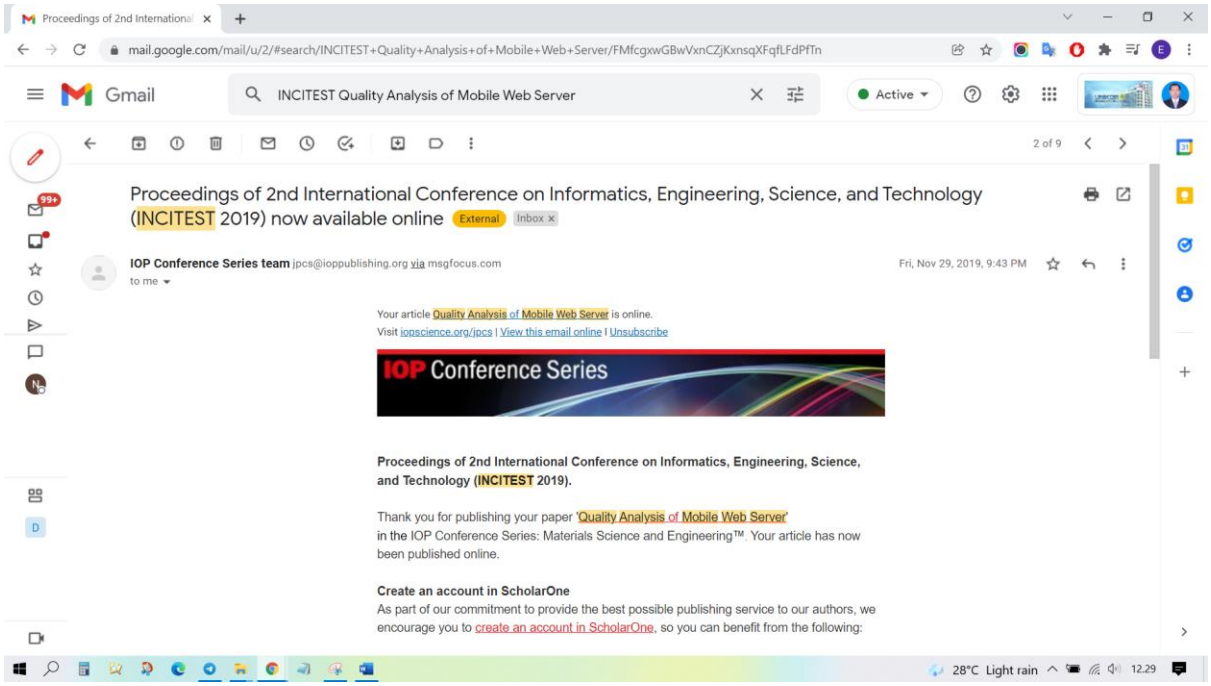
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