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# MICROSERVER PERFORMANCE ANALYSIS FOR HANDLING TRAFFIC AS A DEDICATED SERVER IN LOCAL NETWORKS

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**ABSTRACT**

Currently, many agencies or companies use computers to work in the office. MicroServer is a tiny piece of hardware to help smooth system operations. MicroServer has an essential function in computers, to limit local networks and internet networks. Proliant HPE is an alternative MicroServer to use servers easily and quickly. In this analysis design, the author uses a descriptive qualitative analysis research method in which the author sees and tests the speed of data transfer on a ProLiant HPE microserver. As for the analysis results, the author has the ambition to create a backup plan if he feels the network and cloud server is unsafe to focus on physical products such as servers or microservers. The resulting speed is considered feasible enough if using a local/internal network using a LAN, as for testing with servers and microservers,

***Keywords:****Micro Server, Traffic, Iperf3, JMeter, Proliant HPE*

## Introduction

Currently, many agencies or companies use computers as a means of working in the office. Computers are very useful in today's era. Because the computer can do everything, whether it's from input goods or output goods without having to do it manually through writing. Every agency or company must have LAN facilities. LAN is a network in a computer where the network coverage is in a small and limited area or scale. LAN (Local Area Network) has a range of 1 kilometer to 10 kilometers. LAN (Local Area Network) is very important for any agency or company and to maximize the use of internet lines and servers can also be maximized by using a microserver(Solikin, 2017). Micro Server is a very small piece of hardware to help smooth system operations. Telecommunication is very fast due to the advancement of technology and assistance from science and also the need for every human being for the internet itself which in the activities of each individual requires technological advances in the internet. The internet is a collection of computer networks where computer a and computer b are connected to each other without the help of human contact or physical contact who have the ability to examine communication protocols filtered in the OSI layer standardization. A simple but detailed explanation of how computer a and computer b exchange information without having to be complicated, but every computer must have problems with the small processor, the server.(Kumar & Jasuja, 2017).Micro Server has a very important function in computers, to limit local networks and internet networks. The micro server will handle the problems that exist on the server, namely a special server. A special server is an example of a hosting where the hosting offers a server in full control to users in one account who will rent, some websites use a special server as web hosting but if the website is growing and the use of traffic lanes is getting higher then requires handling of higher operating systems, namely rebian and debian(Basinger et al, 2018). Proliant HPE is an alternative Micro Server to use servers easily and quickly. Proliant HPE can make users without having to wait long because Proliant HPE can increase RAM speed calculation capacity, manage server management so that it doesn't take a long process to access servers, networks that allow software to control storage throughout the company through multiple networks and Proliant HPE can make own operating system through the operating system linux or windows or rasbian and others. Because the operating system created by Proliant HPE has absolutely no bottlenecks and no network traffic and the network remains stable(Dwiyatno & Nugraheni, 2019).Based on the background written by the author, that errors often occur in server speed so that sometimes the server data speed connection does not arrive and errors,

therefore the author writes in this study, namely an analysis of the characteristics of attacks that occur on the server. In this research, the author hopes that it can help in using the server to handle the speed of sending data to the server which often occurs on the server. There are various formulations of the problem which the authors conclude as follows:

1. How to find out the effectiveness of the currently used Micro Server.
2. How to know that the Micro Server that is currently in use is really guaranteed server security.

The research objectives of the topic "Analysis of microserver performance to handle traffic as a dedicated server on a local network" are as follows:

1. To determine the effectiveness and speed of a computer using a microserver
2. As one of the writer's obligations as a student to obtain a bachelor's degree at Batam International University (UIB)
3. To prove the author's expertise as an expert in the field of computers, especially in the field of overcoming server traffic

There are benefits from this analysis, namely by knowing the activity of the micro server that is used with a comparison seen from the analysis of the speed and use of network traffic from this micro server.

**Literature review**

In the analysis entitled "Analysis of Microserver Performance for Handling Traffic as a Dedicated Server on a Local Network" is based on several studies examined in previous studies which the authors summarize and will describe in tabular form and the following explanation:From(Kumar & Jasuja, 2017)about the analysis of the Internet of Things air quality monitoring system using Proliant HPE. This study aims to reduce air pollution that causes adverse effects on human health, climate and weather. Due to the emission of particulate vapors that emit harmful gases, monitoring of air quality in an area is very necessary because of the emission of carbon monoxide gas by particulates covering a very large area. The Internet of Things in today's era is very much needed and is often needed by the times, and cloud computing air checks, sensors, data management are transferred to Proliant HPE because Proliant HPE has a mini computer feature in its system.

Research from(Dwiyatno & Nugraheni, 2019)about Voice Over Internet Protocol (VOIP) services using Proliant HPE. This study aims to ensure the stability of the server to communicate. VOIP is a kind of technology that uses digital and analog signals that will allow humans to communicate directly, with examples such as their smart phones, which can work online or offline which essentially uses a Micro server operating system with a Linux basis so that it can facilitate communication between cellphones. very clear and even able to provide voice feedback and the results obtained are very clear the voice can even be issued. Proliant HPE is very efficient and helps in working on servers, signals,Research from(Basinger et al, 2018)about Low Latency Remote Direct Memory Access For Microservers to Dedicated Traffic LAN using a micro server. This study aims to determine the function of the micro server that the micro server is very useful for dealing with various things such as remote control and the micro server can handle direct memory access remotely and the second micro server has computing in its micro server chassis. Research from(Solikin, 2017)on the application of the PPDIOO method (Prepare, Plan, Design, Implement, Operate, and Optimize) in LAN and WLAN Development. This study aims to identify that every company or agency requires a LAN, WLAN, MAN network and so on. Especially in institutions or schools, they definitely need LAN and wireless LAN networks because today's schools require the internet to access and seek additional knowledge. Sometimes Wireless LANs have disturbances such as network interference on the internet and the range of wireless LANs is not wide enough, only in the range of 1-10 meters. How to overcome Wireless lan so as not to be disturbed is to use PPDIOO LAN and WLAN techniques. Or you can use a micro server in addition to reducing interference on LAN and WLAN. Research from(Afriansyah & Ardhy, 2021)about JWireless Lan Network and Bandwidth Management Using the Simple Queue Method which aims for WLANs built in the future to be able to integrate with a collection of information that can be accessed and realized in the

future. Central access and standardization can already be considered with cheaper costs and configurations compared to non-centralized data storage and management and is also efficient when there are times when there is a threat that requires countering changes and storing data in timely delivery and estimated processing time. By designing a Wireless Local Area Network network, it is very useful for service providers and internet customers in the Gunung Meraksa Pekon Office area.Research from(Ramli et al., 2021)on the Speed of Local Area Network Data Traffic Using Graphical Network Simulator 3 (GNS-3). This study uses a GUI-based GNS3 network capacity test and uses a tree-based network topology which is very commonly used in various local universities. The method used in this research is NDLC, namely Network Development Life Cycle.Research from(Haeruddin, 2021)about Mikrotik Router Security System from Winbox Exploitation, Brute-Force, DoS Attacks. This research is an applied research which will be implemented directly to the object of research in order to be able to solve problems that are being and/or faced in the future. This study reveals that the object of setting access rights (administration) on the proxy router in several access services on the router such as ssh, website, winbox is able and able to limit access to these services within the range of the IP address and/or network address registered on the mikrotik router. Furthermore, research from(Jufri & Heryanto, 2021)about Wireless Outdoor Connection Using UniFi AC Mesh. the network becomes a RT/RW net network service using a wireless network device with a controller as the controller. The research method used is the NDLC (Network Development Life Cycle) method which consists of Analysis, Design, Prototype Simulation, Implementation, Monitoring, and Management). The results of the study are that the quality of the network becomes more efficient and increases user mobility on the wireless network and makes the bandwidth on the network constant in accordance with the limitations given to each user. Further research from(Setya & Sudaryanto, 2021)about IPSEC Network Connectivity And OpenVPN On Dynamic IP-Based Network The system used in this method uses two connected router devices in real terms. These two routers are each connected to an Indihome ISP router device in two different locations. However both routers get a local IP assigned by the router ISP by default, whereas in order for the VPN to work it needs a Public IP. Based on the tests that have been carried out to compare the connectivity between the use of IPSEC and the use of OPENVPN, the results show that both using IPSEC and using OPENVPN, both produce good connectivity.Recent research from(Handika et al., 2021)about dynamic routing with ospf (open shortest path first) technique on local area network. Static routing problems are so complex that the routing information entered into the routing table is manually set by the network administrator. From the results of this study, it is concluded that for testing to achieve convergence if there is a topology change or network change based on the test scenario, it takes at least 55 seconds for the network to return to normal up to 5 minutes.

Table 2.1 Conclusion of Literature Review

| Year | Writer's name | Conclusion |
|---|---|---|
| 2017 | Imam Solikin | This study discusses the implementation of a combination of LAN and WLAN networks using PPDIOO and micro server techniques |
| 2018 | Kim Basinger | This study discusses being able to access direct memory remotely using a micro server. |
| 2017 | Somans Kumar, Ashnis Jasuja | This research discusses about reducing air pollution through control of a microserver using Proliant HPE. |
| 2019 | Saleh Dwiyatno | This study discusses about stabilizing the server network to communicate VOIP (Voice Over Internet Protocol) using Proliant HPE. |

| | | |
|---|---|---|
| 2021 | Dodi Afriansyah and Ferly Ardhy | This study discusses how to design and build a network system using the simple queue technique |
| 2021 | Ayyub Ramli, Sriyono and Harry Ramza | This study discusses the speed of LAN traffic using the GSN application |
| 2021 | Haeruddin | This study analyzes the Mikrotik router security system from bruteforce attacks, ddos and winbox exploits |
| 2021 | Muhammad Jufri, Heryanto | This study uses Wireless LAN in an outdoor area using the AC Mesh method at PT Bandar Abadi |
| 2021 | As' Ari Setya, Aris Sudaryanto | This study analyzes dynamic-based ipsec and openvpn network connectivity |
| 2021 | Marezi Handika, Herwin, Dwi Haryono, Rometdo Muzawi | This research is an applied research which implements LAN with OSPF method |

Based on these studies, the author will carry out his research, namely implementing a combination of LAN and WLAN networks using a microserver as done by(Solikin, 2017). Accessing live memory remotely using micro server(Basinger et al, 2018). Implementing reducing air pollution for the world by using a micro server(Kumar & Jasuja, 2017)stabilize the server network so that it is clear without any interference to communicate VOIP (Voice Over Internet Protocol) using a microserver(Dwiyatno & Nugraheni, 2019). Thus, the conclusions obtained will be the main basis of the author in analyzing the performance of the microserver to handle dedicated server traffic on the local network.

**Methodology**

The research flow of this thesis report entitled "Analysis of Microserver Performance to Handle Traffic as a Dedicated Server on a Local Network" is visualized in a method drawing as follows:

Figure 3.1Research Flow

1. Start
   At the starting stage, the author collects intentions and prayers so that it will be easier for the business to work on this microserver analysis.
2. Background Writing
   The design of the micro server begins with writing the background of the problem being faced so that readers know the urgency and need for a network system used by certain parties.
3. Writing theoretical foundation
   At this stage, the author summarizes the sources of knowledge that will be applied and the basic statements in the design of this micro server.
4. Micro Server Planning
   The steps taken by the author at this stage are planning a work schedule based on the main features that will be covered by the system on this server micro network.
5. Server Micro Design and Testing
   At this stage, the design of the network topology that will be used is carried out, so that the direction of the system becomes clear. After that, the author began to plan the system work schedule by applying the Network Development Life Cycle system development methodology.
6. Server Micro Analysis
   At this stage, the author performs the system work according to the design and schedule that has been set in the previous stage. The author performs a series of iterative processes as part of the NDLC, namely: Analysis, design, prototype simulation, implementation, monitoring, management and returning to analysis if there are errors.
7. Final Report Writing
   After the system is confirmed to be running well, the author implements the system by uploading the entire system database along with the source code to the web hosting

service. In addition to implementation, the documentation step is the stage where the author summarizes all the workflows and features of the system. The author summarizes all the steps that have been taken along with system documentation.

8. Done
   At the final stage, the writer needs a long rest time so that the writer's mind and body can recover so that nothing bad happens to the writer.


Figure 3.2Analysis Flow

1. Start
   At the starting stage, the author makes a management scheme for the analysis design until the conclusions have been analyzed.
2. Analysis Design
   At the analysis design stage, the author will prepare a big picture of the network topology used to test the speed of the microserver.
3. Micro Server Setup
   The micro server used is a step that is carried out after the analysis design, while the micro server used is Proliant HPE.
4. Test
   In the testing phase, the author uses the help of the Iperf and Jmeter applications to analyze the speed generated by the microserver.
5. Data collection
   At the data collection stage, the authors noted the important parts or things that were needed in writing this thesis report.
6. Performance Analysis
   The performance analysis carried out in this study is in the form of: bandwidth speed sent and received in this microserver.
7. Conclusion
   At the conclusion stage, the author concludes the things that have been recorded in the data collection to the results of the analysis carried out in order to apply the ideal prospect.
8. Done
   At the stage of completion, the author completes the conclusion and proceeds to the stage of completing the thesis report.

**Results and Discussion**

Server Micro Analysis Design

Before testing and analyzing the micro server used, the author prepares the micro server analysis design described in this study, starting from the comparison test of the micro server speed, the specifications analyzed, the performance speed of the micro server.

The HPE ProLiant is a print server computer originally developed and marketed by Compaq and marketed this century by Hewlett Packard Enterprise. After Compaq stocked up with Hewlett-Packard (HP), HP froze its NetServer prints in favor of ProLiant prints. HP ProLiant systems defended the x86 server market in unit cases and commissions during the first quarter of 2010. HP ProLiant servers offer a wealth of advanced server features such as redundant effect distribution, Out-of-band settings using iLO or Lights-out 100, Hot-swap components , and came the 8-Socket case.

Figure 4.3HPE DL380

Enclosure based BL server model. They are made private for use inside the kemunca go-bang and cannot be used without it. Blade systems expect maximum consistency and manageability across limited customer service. There are two blade enclosure mirrors: HPE BladeSystem c3000 enclosure (8 Bay for Blade) and HPE BladeSystem c7000 enclosure (16 Bay for Blade).One benefit of HP/HPE Blade Enclosures over competitors (such as IBM Blade Systems) is that the predictive time tier enclosure supports the new tier BL server solely in addition to updating the firmware for OA in the enclosure (Onboard Administrator). However, the enhancement of the cosmic front end of the enclosure in the new tier of enclosures is expected to allow for faster I/O capabilities (such as 10 Gbit/s Ethernet adapters and switches from Infiniband).The body design of the enclosure has not changed since the first format (other than the LCD fabric which is more strategic on the side than the first-tier enclosure, and finally a new plastic copying the HPE screen printing on the front of the 3rd generation enclosure). Now the HPE ProLiant MicroServer is an entry-level, low-power, compact and affordable server for small business, home office or edge computing. They offer user-upgradeable components and easy access to hard drives. There is an option to purchase a server with ClearOS installed for users to activate the application via an easy-to-use web-GUI with minimal effort.

Figure 4.4HPE DL 380

ProLiant servers are separated into four main product lines - ML, DL, BL, SY, and Apollo - which generally represent form factors. The ProLiant ML line consists of tower-based (rack-mountable) servers with capacity for internal disk expansion and interconnection, while the DL line consists of general-purpose rack-mount servers. The BL line consists of HP BladeSystem compliant blade servers, the SY line consists of Blade Synergy, and the Apollo line consists of servers for Scale-out and High-Performance Computing environments. The Micro-Server product line addresses small and home businesses.

ProLiant servers are also divided into series, which indicate the configuration of the processor. The 100, 200, 300, and 400 series consist of single and dual socket-capable systems, the 500 and 600 series consist of quad-socket-capable systems, and the 700 and 900 series consist of eight-socket-capable systems. The 900 Series supports up to 80 CPU cores and 4 TB RAM. Models with '0' in the last digit use Intel processors, while models with '5' in the last digit use AMD processors.

ProLiant is part of the HP Converged System, which uses a typical Converged Infrastructure architecture for server, storage, and networking products. Designed to support 50 to 300 virtual machines, the HP ConvergedSystem 300 is configured with ProLiant servers. System administrators can manage ProLiant servers using HP OneView for converged infrastructure management.

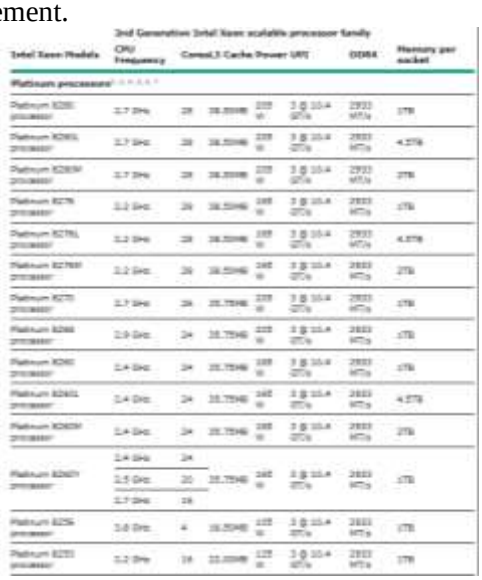

Figure 4.52nd Generation Intel Xeon (Platinum)

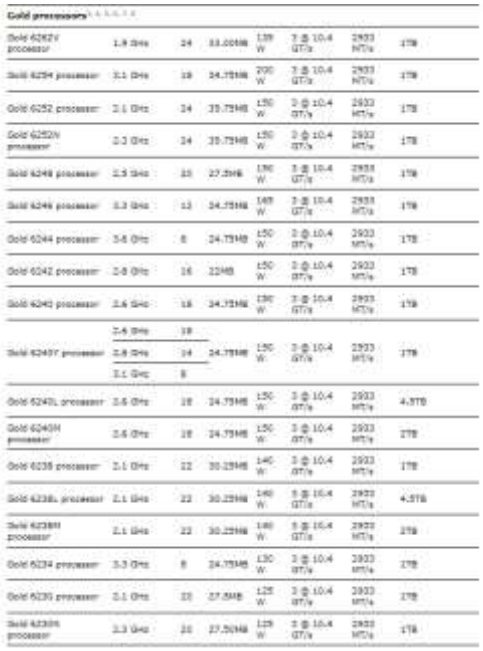

Figure 4.62nd Generation Intel Xeon (Gold)

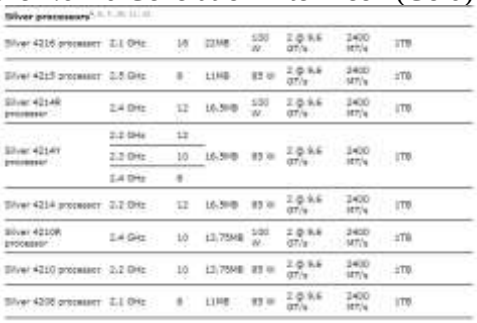

Figure 4.72nd Generation Intel Xeon (Silver)

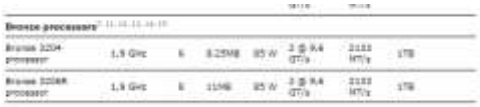

Figure 4.82nd Generation Intel Xeon (Bronze)

HP also provides driver software for managing servers such as the Management Component Pack, which includes the hp online configuration utility (hponcfg), Agentless Management Service amsd, Smart Storage Administrator (SSA) SSA, Smart Storage Administrator (SSA) CLI ssacli, and Smart Storage Administrator. Diagnostic Utility (SSADU) CLI ssaducli. The models and products of the ProLiant generation that have been created are as follows:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| DL20 | | | | | | | | | x | x |
| DL60 | | | | | | | | | x | |
| DL80 | | | | | | | | | x | |
| DL100 | | x | | | | | | | | |
| DL120 | | | | | x | x | x | | x | |
| DL140 | x | x | x | | | | | | | |
| DL145 | x | x | x | | | x | | | | |
| DL160 | | | | | x | x | | x | x | x[4] |
| DL165 | | | x | | x | x | x | | | |
| DL180 | x | | | | x | x | | | x | x |
| DL185 | x | x | | | x | | | | | |
| DL320 | x | x | x | x | x | x | | x | | |
| DL325 | | | | | | | | | | x |
| DL360 | x | x | x | x | x | x | x | x | x | x[5] |
| DL365 | x | | | | x | | | | | |
| DL370 | | | | | | x | | | | |
| DL380 | x | x | x | x | x | x | x | x | x | x[6] |
| DL385 | x | x | | | x | x | x | x | | x |
| DL560 | x | | | | | | | x | x | x[7] |
| DL580 | x | x | x | x | x | | x | x | x | x |
| DL585 | x | x | | | x | x | x | | | |
| DL740 | x | | | | | | | | | |
| DL760 | x | x | | | | | | | | |
| DL785 | | | | | x | x | | | | |
| DL980 | | | x | | | | x | | | |
| DL1000 | x | | | | | x | | | | |
| DL2000 | | | | | x | | x | | x | |

Figure 4.9ProLiant Product Generation

Intel is proclaiming 58 scalable Xeon processors that fall apart into the interior of the Xeon Bronze, Xeon Silver, Xeon Gold, and Xeon Platinum. Of course, opposite generations of processors contained different bounties. Xeon Bronze is positioned as the lowest, while the Xeon Platinum is positioned as the highest. Xeon Bronze is aimed at Intel ahead of light processing needs, and is buried deep in 6 and 8 core arrangements, devoid of features as Hyper Threading and Turbo Boost.Xeon Silver is intended for medium use 4, 8, 10, and 12 cores equipped with Hyper Threading and Turbo Boost. Xeon Gold is aimed at the need for extended period processing by eliminating or removing 4 processors in one system, using each processor running a range of 4 ~ 22 cores, using

Hyper Threading and Turbo Boost. While the Xeon Platinum is geared towards the highest processing requirements, use the forbiddance shade, 4, or 8 internal processors in one system, use the 4~28 range core budget, which is also equipped with Hyper Threading and Turbo Boost.This Scalable Xeon processor based on Skylake-SP is called Intel for the highest 10-day increase in appearances that the relationship is trying to deliver. When compared to using Xeon in the past 2007, the Xeon Scalable gives an original appearance of 41 times. While compared to the previous tier Xeon E5 and Xeon E7, this processor boasts 1.65x ~ 2.2x the original talent. All of these Xeon Scalable processors are designed for 14 nm fabrication, in line with Skylake's other kintil, the new stand-up twine, LGA3647.

**Micro Server Setup**

As for the preparation of the micro server in the depiction using the Cisco packet tracer application to describe the network topology used to analyze the server to be used, it is shown below:

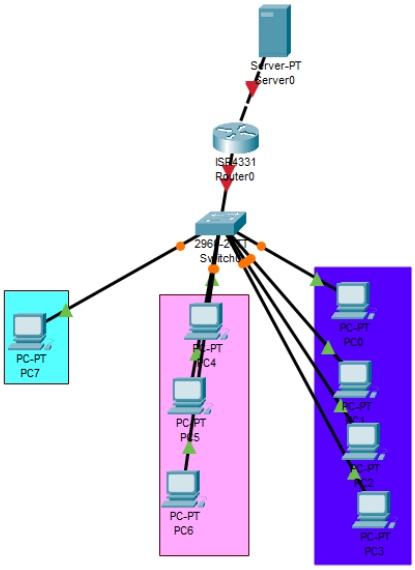


Figure 4.10Micro Server Topology used

The micro server preparation carried out by the author was based on several micro server services provided by proliant, among which the author collected several comparisons from the highest generation to see a comparison test from the specifications used to the power performance strength given as follows:

### 4.2.1 HPE DL380 4114 1P


Figure 4.11HPE DL 380 4114

The specifications published on the HPE web such as the processor used is an Intel Xeon Silver 4210 with 10 cores with a speed of 2.2 GHz with an electric power of 85 Watts. The memory used is 32 Gb RDIMM with a speed of @2933MT/s, the internet port used is 1gb ethernet x 4 port 366FLR adapter with controller. There are eight storage compartments that can be added up to 24 slots with three PCI slots, while the power source required is 500W platinum hug plow with four fans with a three star energy star certification ratio.

### 4.2.2 HPE DL380 5118 1P


Figure 4.12HPE DL 380 5118

The details published on the HPE website as to the processor used is the Intel Xeon Silver 4210 using 10 cores at 2.2GHz using 85Watt of electrical power. The memory used is 32 Gb RDIMM using @2933MT/s tempo, the internet port used is 1gb ethernet x 4 port 366FLR adapter using a controller. The collection area is eight which can be added to 24 slots using a PCI slot of three ends, as for the electrical consequences required is a 500W hug plow fan using a four-end fan, such as a three-star rating.

### 4.2.3 HPE ML 350


Figure 4.13HPE ML 350

The part published on the HPE website with the processor used is an Intel Xeon Silver 4210 with 10 cores at 2.2GHz with a beam of 85Watt. The memory used is 32 Gb RDIMM with a time of @2933MT/s, the internet port used is 1gb

ethernet x 4 port 366FLR adapter with controller. The eight-channel agglomeration area is plus 24 slots with three-way PCI slots, while the light bulbs required are 500W platinum hug plow with four-way multi-channel fans with three-star energy star certification tips.

#### 4.2.4 HPE DL 385


Figure 4.14HPE DL 385

Hewlett Packard Enterprise extends the world's most common carrier server [1] to tie up the HPE ProLiant DL385 Gen10 server, using the AMD EPYC 7000 Series processor. The platform is supposedly designed to add the security we need and the flexibility we need to support the workload of demanding companies. With up to 64 cores, 32 DIMMs, or 4 TB history capabilities and 24 NVMe drive display protection, the HPE ProLiant DL385 Gen10 server features a low-cost virtual motor (VM) plus unprecedented security.

#### 4.2.5 HPE DL360


Figure 4.15HPE DL 360

The HPE ProLiant DL360 Gen10 server delivers uncompromised security, agility, and flexibility. The HPE ProLiant DL360 Gen10 Server features the Intel Xeon Scalable Processor Family with 28 cores, plus 2933 MT/s HPE DDR4 SmartMemory with 3.0 TB max. With the extra power brought by HPE Persistent Memory and 10 NVMe, the HPE ProLiant DL360 Gen10 means business. Apply this antecedent policy to a wide variety of content roles in penalized countries and maintain an easy-to-use interface that automates the most important server-side operations using HPE OneView and HPE iLO

**Server Micro Test**

JMeter

The Test Plan object has a checkbox called "Functional Testing". If selected, JMeter will embroider the evidence returned from the server to each sample. If we ignore the file in our research listener, this proof will be written to a file. This can be useful if we Doing a pinch goes to confirm that JMeter is configured to match and our server is rewarding the expected reward. The consequence is that files will multiply, and JMeter's capabilities will decrease. This option should be turned off if we are stress-testing (by default). If we don't embroider proof to file, this preference makes no difference.we can also use the Configure audience listener button to reveal what country to save.

Figure 4.16Test Name Creation

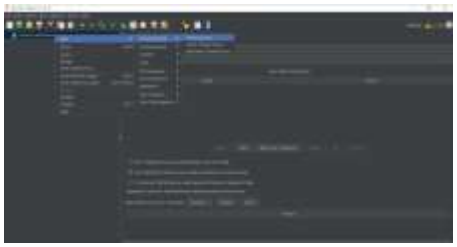

Figure 4.17Layer Creation

Figure 4.18Thread Data Input Display

Figure 4.19Additional FTP Request

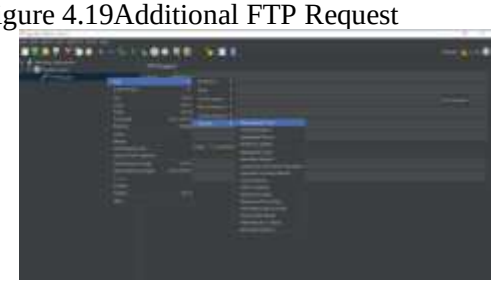

Figure 4.20Display of Added Listener Results

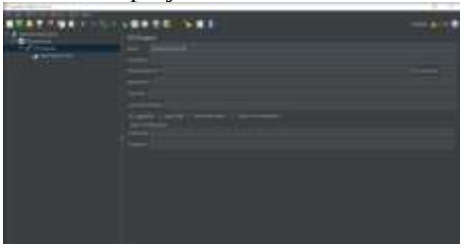

Figure 4.21Change FTP Name To Download File

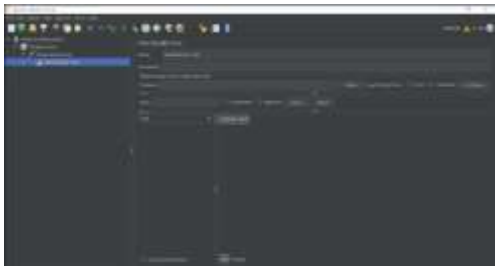

Figure 4.22FTP Name Changed

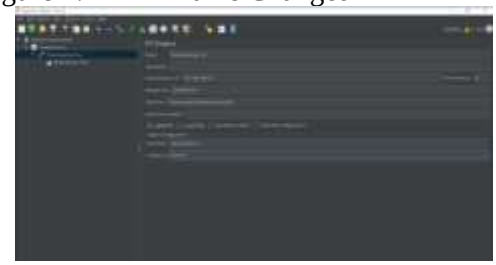

Figure 4.23Entering Username and Password

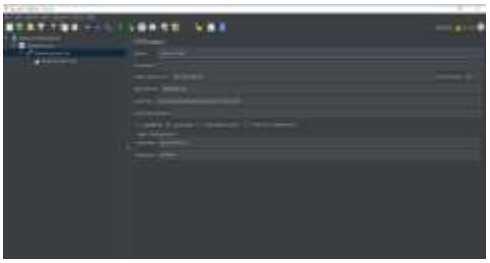

Figure 4.24Change FTP Name to Upload File

Figure 4.25FTP Becomes File Upload on the Left Table

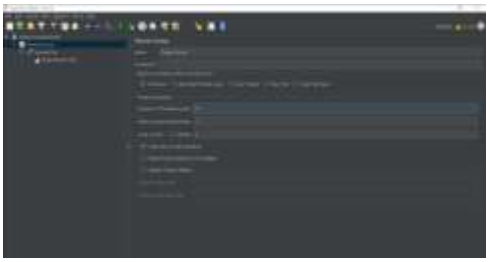

Figure 4.26User Thread Input

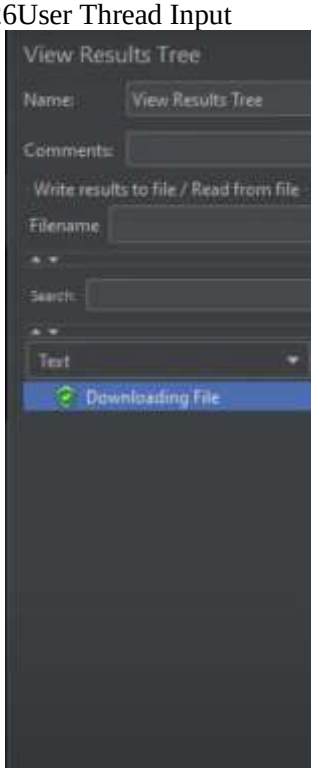


Figure 4.27Upload Separate Files

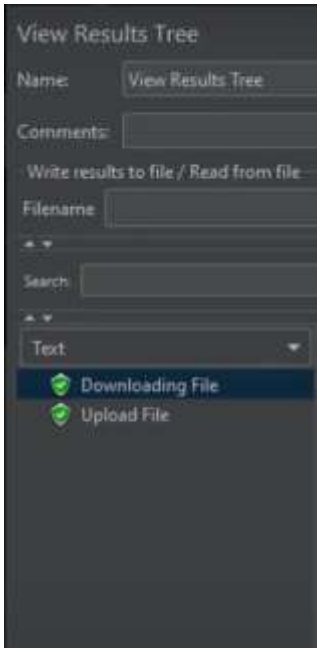


Figure 4.28File Download Request

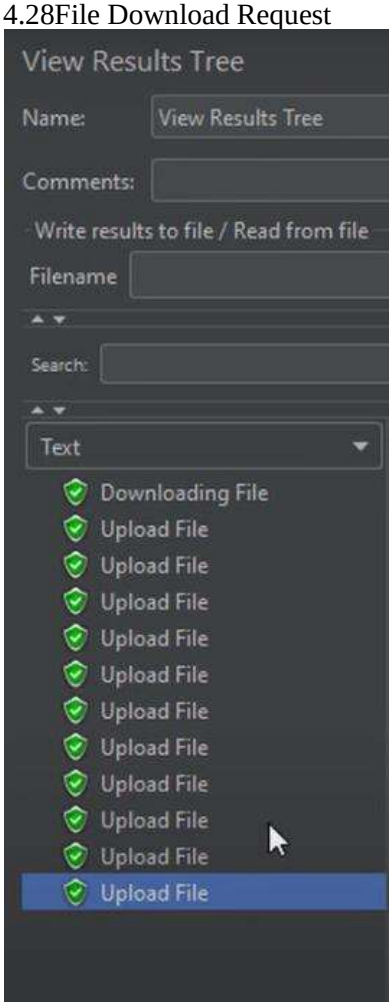


Figure 4.29File Upload Request Successful

Iperf3

Figure 4.30Ipconfig on Iperf

Figure 4.31File directory selection

Figure 4.32iperf application opening

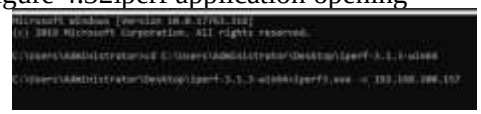

Figure 4.33Listening IP address 192.168.100.157

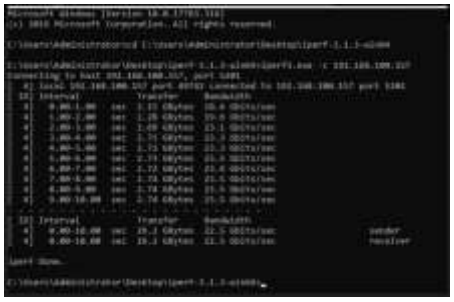

Figure 4.34Port 5201 . packet delivery results

**Server Micro Analysis**

The results of the server test that the author did on the analysis of micro server testing using the Iperf and JMeter applications in sending band-width packets to test the packets sent and the size of the files sent will be dissected below as follows:

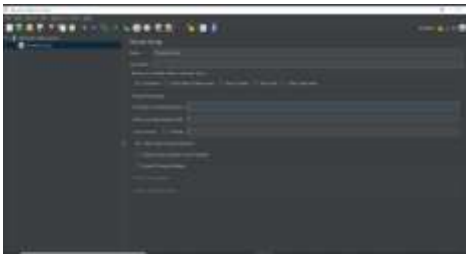

Figure 4.35Added Thread Count

The test is carried out using the Jmeter application as a calculation of the analysis carried out, using the user number multiplied by the required time period. The usage count is determined by looping inputted in the application, each loop request will result in a user (user) with the time (seconds) specified by the author as the tester.In the node settings, the author adds information to name the file to be analyzed at this stage, such as selecting an analysis test using FTP (File Transfer Protocol), after the FTP selection step, the author selects recording using the results from a stacked tree (View Result Tree). which will arrange the results vertically, this will help the author to find out which order of packets sent which part was successful or not by looking at the results of packets sent using the JMeter application.

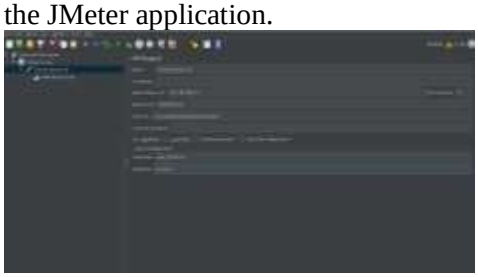

Figure 4.36Entering FTP Username And Password

Before starting the analysis, the reason the author chose the use of FTP as part of this analysis was due to the discontinuity in the analysis carried out, due to the ease of testing using FTP as a means to determine the resulting upload speed limit, while the options used in the upload speed test include RETR, STOR , BINARY, and Response.

i. Server Name or IP: FTP server endpoint, basically the FTP server IP address or host name (in some cases it may be a load balancer).
ii. Port Number: FTP server port listens for incoming connections. The default FTP port 21 will be used unless a different configuration is provided.
iii. Remote File: the path to the file on the FTP server, which will be downloaded or used as the destination path for file uploads.
iv. Local Files: paths to files on the local file system (where JMeter is running), which will be uploaded to an FTP server or to where remote files are stored locally.
v. Local File Content: if there is a file upload request, the content of the source file can be provided via this input field (can be used instead of "Local File", in place of "Local File" input).
vi. get(RETR) - indicates the file will be downloaded from the FTP server.
vii. put(STOR) - indicates the file will be uploaded to the FTP server.
viii. Use Binary mode - whether to use "binary" mode for file transfer. If you are uploading/downloading plain text files - uncheck this box, in all other cases leave this checked.
ix. Save File in Response: if this box is checked (in the case of a "get(RETR)" request) the contents of the retrieved file will be saved as FTP Request sampler Response Data (so they can be visualized and used in PostProcessors and Assertions).
x. Login Configuration: if the FTP server requires credentials, they can be provided via this control.

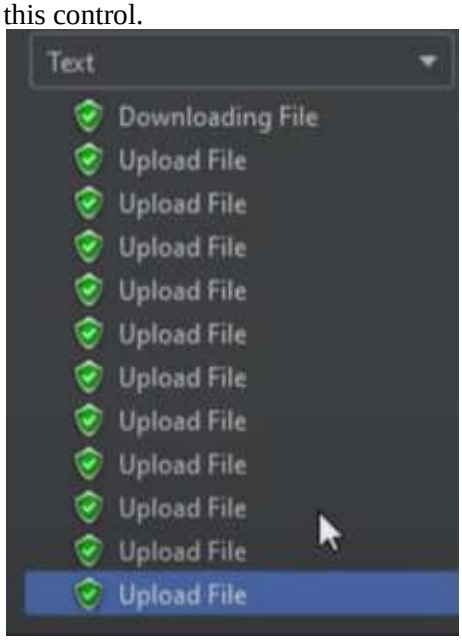


Figure 4.37Successful Data/File Delivery

In the prospect of this analysis, the author uses STOR with the username epiz_28538714 with the same password in accordance with the results generated by the HPE proliant microserver with ten data transmission tests with each data sent of 1 megabyte per data/file. Every successful data is ensured from the sending computer to the server it is received, which greatly affects the reduction given by the unit weight of the

file. Furthermore, the results of the analysis using the Iperf3 application Iperf is a source tool that is used before extracting the tempo, tempo, throughput and types of network links. This tool designates the TCP and UDP protocols. TCP is used for checking tempo and link throughput, UDP is used for checking jitter (contrast from order to order) and Packet Loss. By using IP 192.168.100.157 as the computer network address and 255.255.255.0 as the network address of the subnet mask, 192.168.100.1 as the network portal and 192.168.100.6 as the address of the DCHP server, there are two DNS addresses used, namely 8.8.8.8 and 8.8.4.

This protocol cannot be done alone, because indeed this host is in the color of a stretcher (protocol suite). This protocol also held the most widely used host of this period. The data listed is implemented part in the quiet equipment pattern (software) in orderly operation. The term given to this RESTful fixture is the TCP/IP stack.When doing the analysis, the author as a tester will run the iperf3 application to start the analysis test by recording the server at 5201 to see how fast the micro server resistance will survive by starting the test on the IP 192.168.100.157 and the following results are obtained:

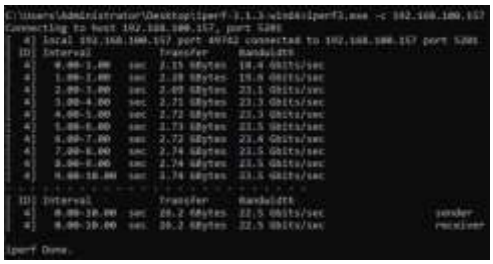

Figure 4.38Speed test results on port 5201/4742

It can be seen that the test results received packets starting from the first second as much as 2.15 Gigabytes with a transfer speed of 18.4 Gbits/second and in the next second the transfer speed rose to 19.6 Gbits/second and in the third second, the transfer speed increased sharply to 23.1 Gbits/sec. becomes an average speed that ranges from the fourth to the seventh second and when it hits the eighth second or process, the transfer speed hits the limit to 23.5 Gbits/s by dividing the bandwidth to 22.5 Gbits/s at the sender and 22.5 Gbits/s at the receiver.

**Conclusions and suggestions**

The conclusions that the author can draw conclusions based on the analysis carried out are as follows:

1. From the results of the analytical tests carried out, the author has the ambition to create a backup plan if he feels the network and/or cloud server is not safe so that it focuses on physical products such as servers or micro servers.
2. The resulting speed is considered feasible enough to use a local/internal network using a LAN, as for testing with servers and micro servers, more costs are required.
3. Basically, using a virtual PC by using a network from a server / micro server reduces latency time to avoid saying lag or the like.

If it is necessary to design the use of CCTV in a room, micro servers are very efficient for use in small areas and/or scopes such as offices with 10-20 employees and also schools.

The micro server that the author designed has several suggestions to increase the benefits of this micro server, namely:

1. The micro server is very small and does not need a special room to place this item, unlike computer servers in general, which must be in a cold room. Silicon root of trust. What is a silicon root of trust? Silicon Root of Trust from Hewlett Packard Enterprise (HPE) has been designated as the Cyber Catalyst 2019 cybersecurity solution. It protects against firmware attacks, detects previously undetected firmware or malware, and helps restore servers quickly if they occur. attack.
2. For server users in general, it is for corporations or companies that are already large and companies that provide example services such as WA, Telegram, telephone, all of which require a server because they require a server to be connected. In contrast to micro servers, micro servers can be used for all groups because micro servers are biased for data storage and streaming media, not only for servers. For MSMEs this microserver is still suitable for using micro servers such as schools that require CCTV and CCTV data is transferred to the microserver so that the computer is not heavy for the CCTV recording files.

3. The uniqueness of this micro server is that it has 4 ports so that it can be made into a router, NAS and others, and it doesn't require a lot of power. The power used for the micro server itself only consumes a power range of 180 watts and 180 watts is already the maximum for microserver power.

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