Cloud Media Server for Smart Security System

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Abstract— The server is a media that has an important role to provide various services for its users. So that the network can be used optimally, a server is needed. This study aims to design server virtualization in the area with the aim of building a server infrastructure that facilitates service on an efficient, flexible camera security system and optimizes resource use, so that it can be adjusted to the workload so that hardware resources are optimally , This research conducted a solution using the concept of virtualization items, namely the use of proxmox to design virtual servers that can run virtual servers with different resources. Server usage consists of a web server and a media server. The results Obtained from the design of the system in the form of server virtualization by utilizing proxmox

Keywords— virtualization ; media server ; cctv, security

1. INTRODUCTION

Virtualization technology, particularly server virtualization will continue to grow in the future, following the widespread use [1] .In simple, virtualization can form multiple operating systems to run simultaneously in multiple computers / virtual machines on a single physical computer, which dynamically separate and divide the physical resources such as CPU, RAM, disk and other hardware. Virtualization technology is aimed at efficiency, both in terms of cost efficiency, resource, energy, or even risk.

Virtualization is a software engineering technique for hiding the physical characteristics of the resource a system in order to simplify other systems, other applications, or the user to interact with the system resources [2]. Server virtualization is the use of software that allows the hardware to run multiple operating systems and services at the same time, while the virtual server is the use of software that allows a lot of hardware to run the system in an integrated manner.

This research was conducted using the method of virtualization on the server computer from a variety of servers, so that a variety of existing servers can be linked together to efficiently use maintenance time proxmox. Proxmox is an operating system as a virtual machine dedicated engine system that utilize virtualization host and virtual machine virtualization that allows the container to management systems. Proxmox has centralized maintenance capabilities and performance for virtualized container. Server administrator uses a software application to divide one physical server into multiple isolated virtual environments. Virtual environment which is sometimes called a virtual private server [3].

Proxmox existence, then all the servers can be connected in a network becomes a constant basis so as to time efficiency. In addition proxmox has a web console that can be used for various purposes in virtualization and server maintenance. In the security system using the media server gerbera. Gerbera is a UPnP Media Server. This allows you to stream your digital media through your home network and listen / watch them in a wide range of devices compatible with UPnP [9].

Smart cameras are used to monitor crime prone places. Security surveillance using IP CCTV installed in the corner - a certain angle to an area of crime. At every CCTV security system can be accessed directly by the local networks and the use of the media stream to access the CCTV footage. With the main objective of this security system is to detect people who want to commit crimes.

Proxmox is a virtualisation Linux distribution based on Debian (64 bit) that carries OpenVZ and KVM. Proxmox allows for centralized management of many physical servers. A Proxmox consists of at least one master and several nodes (at least one master and one node) [11].]Based on this background, it takes a server to be accommodating service - service to the security system. Which will be virtualized server on smart security system, ie webserver and media server.

2. METHODOLOGY

2.1 System Design

In designing the system uses a server virtualization system, so that a physical server can run server functions miraculous. the concept of virtualization is to divide the native server resources into multiple computers simultaneously or called virtual computers

or virtual machines (vm). The stand-alone virtual computer without affecting other virtual computers even if they're the first native server. even though the virtual server is located in one of native server but its use of resources such as CPU, RAM, and hard drive can be configured so that the obtained results in more efficient use of resources at each service.

In this study, explained that the virtualization server using Proxmox Virtual Environtment value of overhead and linearity lower than server virtualization VMware ESXi and OpenStack, this is due to the Proxmox Virtual Environtment using the Virtual Machine (VM) with OpenVZ or container-based virtualization, while VMware and OpenStack uses KVM (Kernel-based Virtual Machine) that can run any operating system including Windows.

Figure 1 shows that the authors make system installation, installation of the OS installation to stream video player.
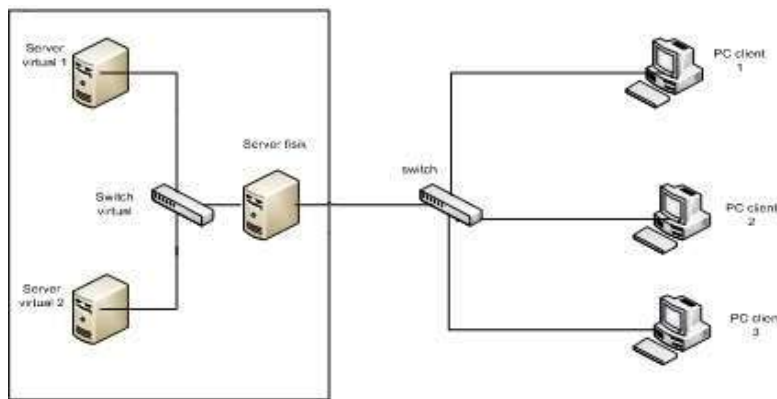

Figure 1: System Installation

In this scheme is designed *flow chart* (Flow diagram) of Proxmox VE on the server machine that is made to identify the flow passage and delivery system of CCTV video to other devices. This flowchart will describe the process of users accessing services on Proxmox VE. So the server machine being used into a special device to make the process of service providers.

In Figure 2 by using the available server machine, system design implemented server virtualization will run on machines using VM server virtualized Proxmox. With hypervisor technology can trick the OS running on the server machine into thinking that the OS running on actual hardware. Above there are two VM virtualization layer, which includes the server hardware, the guest OS, and application servers.

At Proxmox VM contained 2 Virtual Machine, where each Virtual Machine installed Guset OS. The first Virtual Machine will provide web services server and Virtual Machine both provide security services to the media server. Design of Virtual Machine can be seen in Figure 3.
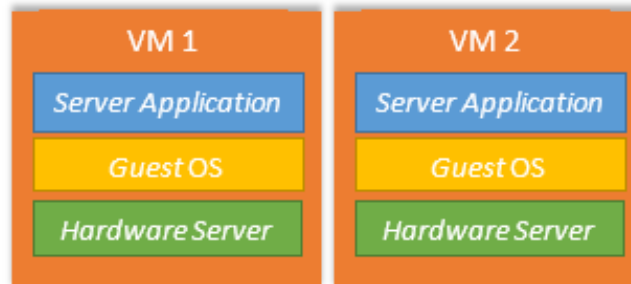

Figure 2: Virtual Machine Design

On each virtual machine having a virtual hardware that will be seen as a physical hardware to the guest operating system and applications. This guest operating system is the operating system that will be installed on a virtual machine.

2.2 Infrastructure

In this scheme is designed Proxmox VE on the server machine that is made to identify the flow passage and delivery system of CCTV video to other devices. This flowchart will describe the process of users accessing services on Proxmox VE. So the server machine being used into a special device to make the process of service providers. In the flowchart goes Proxmox VE server using the machine, starting with preparing device server machine will be used to ensure sufficient power supply to power the server machine. When the device is on, then by itself Proxmox VE already invested in server machines

After successfully running the program, make sure the HTTP Server can run and CCTV cameras can be detected by Streaming Video program. If either condition is not implemented (HTTP Server is not running / CCTV camera is not detected), the program will close on its own and will stop the process of streaming video system.

Having ascertained HTTP Server and the camera is detected, if there are users who want to make a request to access the Streaming Video program, the user must be connected to a local network that is used by the device server machine. Once the user has successfully connected to the local network, CCTV cameras are used will start taking video. Streaming Video Program will directly send the video data to a local network that is used and the user will be able to access the streaming video service.

To access the media server, gerbera must run first. Users must access the media server on the same local network with the server machine. Once the user is connected to the local network, the service of the media server will be accessible by the user.

3. RESULT

This implementation will also be used to determine whether a system that has been made is in accordance with the design of the previous chapter. And discuss about whether a Virtual Machine system test is made to run or not, as well as testing through Virtual Machine Resource utilities

Simulation tests performed by using the tools Apache Jmeter is a way to simulate client access to the webserver, with the type of test RAMP for 10 seconds with the number of 50 simultaneous users and time click the "per URL". RAMP test mode to simulate access to a web server with a certain length of time but with increasing loading capacity between users reached 80% of the time of the test, during the last 20% of the number of active users. In testing the service performance parameters to be compared are the Sample Time (ms), Status, and Latency.

3.1 Performance

Testing for Web servers running Apache Jmeter done in accordance with the Test Plan. Display the result will be a table taken from the sample Test Plan. The results of the testing Web Server before the process is run can be seen in Table 1.

Table 1: Results of Testing Web Services Server with 50 users

No.	Trial	Sample Time (ms)	Latency (ms)	Status
1.	1	24	23	succeed
2.	2	13	12	succeed
3.	3	12	11	succeed
4.	4	12	11	succeed
5.	5	12	11	succeed
6.	6	11	10	succeed
7.	7	10	9	succeed
8.	8	13	12	succeed
9.	9	14	13	succeed
10.	10	14	13	succeed

In Table 1 it can be seen that, the maximum sample testing time media server with 50 users is 24 ms and the minimum is 10 ms with the average - average time of 10 experimental sample time is 14 ms. With 50 users, the maximum latency testing of media servers is 13 ms and 11 ms minimum is testing done with up to 50 users, requests that do everything in successful status.

Testing for the Media Server is done by running Apache Jmeter accordance with the Test Plan. Display the result will be a table taken from the sample Test Plan. Results of testing Media Server before the process is run can be seen in Table 2.

Table 2: Results of Testing Services Media Server with 50 users

No.	Trial	Sample Time (ms)	Latency (ms)	Status

1.	1	16	11	succeed
2.	2	15	12	succeed
3.	3	16	13	succeed
4.	4	14	11	succeed
5.	5	15	11	succeed
6.	6	14	12	succeed
7.	7	14	11	succeed
8.	8	14	11	succeed
9.	9	14	11	succeed
10.	10	14	11	succeed

In Table 2 it can be seen that, the maximum sample testing time media server with 50 users is 16 ms and the minimum is 14 ms with the average - average time of 10 experimental sample time is 15 ms. With 50 users, the maximum latency testing of media servers is 13ms and the minimum is 11ms. With the tests performed on the 50 users, requests that do everything in successful status.

3.2 Utilization

Having in mind the results of testing the service performance of each server, the next test is to determine the level of utilization of server virtualization. At Proxmox visible resource status on a virtual machine. Resource status will display the CPU usage and memory usage. In the figure 11. The initial conditions of the Web Server as follows. The process of taking the report carried utilization rate of once every 2 hours for 10 hours.

Report the utilization rate of web server at the time of testing the performance of services in Table 3.

Table 3: Report the utilization rate Web Server

No.	Trial	CPU (%)	Memory (%)
1.	1	85.15	94.20
2.	2	91.48	94.21
3.	3	99.07	94.22
4.	4	99.69	94.23
5.	5	98.7	94.32
Average		94.818	94.236

From the table above, it is known that the utilization rate at the time of testing the service performance is 94.18% of the CPU and 94.236% at the memory. CPU utilization rate increased by 93.758% of the initial conditions of the original 1.06% to 94.18%. While the utilization rate of the memory increased by 77.496% of the initial condition of 34.96% to 94.236%.

Report the utilization rate at the time of testing the performance of services in Table 4.

Table 4: Report the utilization rate Media Server

No.	Trial	CPU (%)	Memory (%)
1.	1	5:03	92
2.	2	4:49	93.5
3.	3	4:49	93.5
4.	4	4.5	94
5.	5	4:48	94
Average		4:59	93.4

From the table above, it is known that the utilization rate at the time of testing the performance of the service is 4:59% at 93.4% on the CPU and memory. CPU utilization rate increased by 0.54% from the initial conditions that originally 4.05% to 93.4%. While the utilization rate of the memory increased by 58.44% from 34.96% initial conditions be 93.4%.

4. CONCLUSION

The service of Media Server and Web Server can be accessed by multiple users with requests that do everything in successful status. With the division of the resource on the Media Server and Web Server, Virtual Machine can run. A client device / user can receive services from Virtual Server as long as it is connected and can communicate with the network where the server machines are connected. Programs on the Web Server can display as many as three cameras streaming video..

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