

Private Cloud Development in West Java Cooperative and Entrepreneurship Education and Training Center

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Private Cloud Development in West Java Cooperative and Entrepreneurship Education and Training Center

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Abstract. The purpose of this research is to build a private cloud that is used as an FTP server and database server as well as an integrated data storage medium in the education and training center of cooperatives and entrepreneurs in West Java. The stages of research from the development of private cloud in the education and training center cooperatives and entrepreneurs in West Java adopted the method of the Network Development Life Cycle (NDLC). The stages in the network development life cycle consist of six stages including the analysis phase, the design phase, the simulation stage, the implementation phase, the monitoring phase, and the regulatory stage. The results of this study are the existence and availability of server virtualization that is used to provide data-based services at the West Java Education and Cooperative Education and Entrepreneurship Training Center and the availability of integrated data storage at the West Java Education and Cooperative Education and Entrepreneurship and Training Center. The impact of this research is to be able to minimize the cost of procuring servers using private cloud using virtualization technology at the education and training center of cooperatives and entrepreneurs in West Java.

1. Introduction

Training Center for Cooperatives and Micro, Small and Medium Enterprises (BALATKOP) is one of the regional technical implementation units (UPTD) under the auspices of the Office of Cooperatives and SMEs which acts as a business clinic in solving cooperative problems [1]. The Cooperative and Micro, Small and Medium Enterprises (BALATKOP) Training Center is currently supporting a new entrepreneurship printing program in West Java. The activity that is always carried out by the Training Center for Cooperatives and Micro, Small and Medium Enterprises (BALATKOP) is to provide regular training which is held every two weeks. In the training process employees of the Center for Cooperatives and Micro, Small and Medium Enterprises (BALATKOP) Workforce always make documentation of training activities. Documentation of training activities at the Training Center for Cooperatives and Micro, Small and Medium Enterprises (BALATKOP) in the form of a photo that will be collected in an external hard drive to be used as an archive for evaluation in the next training. An archive is a collection of data records and information collected and can be accessed and used and associated with a particular object [2]. Archive storage using external hard disk media is very susceptible to damage, because external hard drives at the Training Center for Cooperatives and Micro, Small and Medium Enterprises (BALATKOP) are always used for all employees. One method of evaluating records in a company using interview-based competency methods. The interview-based competency method is a structured interview technique, which is used to explore information in-depth about one's abilities and competencies [3].



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Data corruption and data loss by various disasters have become more dominant, accounting for over 60% [4,5]. It took an average of 55 hours to repair damage to the archive, for \$ 5,270 to the victim [6]. In addition to recovering data, processes such as keyword search, binary search, corrupted and file engraving, recovery of certain types of files using digital forensics tools [7,8]. In addition to data corruption, one that can be detrimental to company data is malware. malware is very dangerous, Once malicious Software gains access to a computer system, it takes various actions resulting in a variety of undesirable results depending on the type of malware [9]. Such malware attacks are capable of stealing data by sending user keystrokes or information stored on a user's computer back to a host, changing data or destroying data on personal computers and/or servers and/or other computerized devices, especially through the Internet. In the least, these items represent a nuisance that interferes with the Smooth operation of the computer system, and in the extreme, can lead to the unauthorized disclosure of confidential information stored on the computer system, significant degradation of computer system performance, or the complete collapse of computer system function [10,11].

The developments in information technology have a major impact on the sustainability of a company. Most of the activities in a company require information technology, information technology and communication roles, such as for communication, or administrative work [12]. The appropriate solution is with a centralized data storage system on the computer server. A centralized data storage system requires a network system that is supported by adequate hardware and software [13]. The Cooperative and Micro, Small and Medium Enterprises (BALATKOP) Training center has one server that is currently used for data collection applications. There is a technology that can be used, namely Cloud Storage technology. Cloud storage is several virtual systems that exist in one physical PC server and virtual server by running a variety of different server functions [14,15]. The development of private cloud in the Training center for Cooperatives and Micro, Small and Medium Enterprises is expected to overcome the existing problems.

2. Method

2.1. Data Collection Method

The method used in this study for data collection is to use descriptive research methods. The descriptive research method is a research method that provides an objective description of an existing problem [16]. According to Sujana and ibrahim descriptive research is research that describes a phenomenon, event, event that is happening at the present time [17]. Based on the definition of descriptive research from a reference, it can be concluded that descriptive research is research that describes a phenomenon, event, event and provides an objective picture of a problem that exists at the present time. Data collection methods in this study are divided into 3 parts, namely interviews, literature study and observation.

2.2. System Development Method

The method used in the construction of the Private Cloud at the Center for Education and Training of Cooperatives and Entrepreneurs in West Java is to use the Network Development Life Cycle method which consists of analysis, design, simulation prototyping, implementation, monitoring, and management. Model network development life cycle as shown in Figure 1.

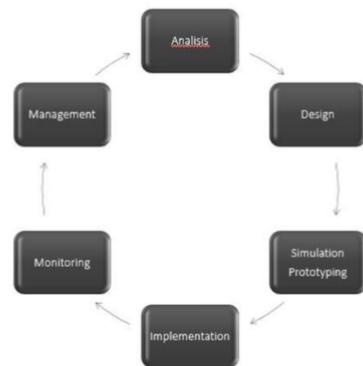


Figure 1. Model Network Development Life Cycle

3. Results and Discussion

3.1. Analysis of the proposed computer network

A computer network is a set of interconnections between two or more autonomous computers connected by a cable or wireless transmission media. Computer networks have become a very important thing to support various activities [2]. The following is a proposed computer network analysis. Analysis of the proposed computer network as shown in Figure 2.

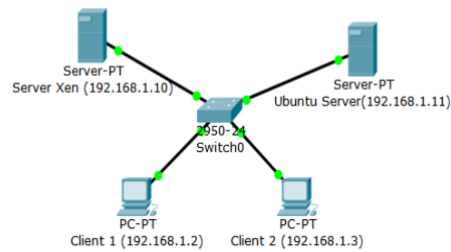


Figure 2. Analysis of the proposed computer network

Based on Figure 2, there are two servers including the XenServer and the Ubuntu server, the XenServer is used for a virtual operating system that will run the Ubuntu server as an integrated storage medium.

3.2. Server Price Analysis in Training Center for Cooperatives and Micro, Small and Medium Enterprises (BALATKOP)

The server is a central computer that handles data sets (databases) and provides services to client computers [18]. One of the optimal network supporters is the server [19]. The following is an

application server price analysis at the cooperative training center and micro, small and medium enterprises as shown in Table 1.

Table 1. Price of Servers in the Cooperative and Micro Small and Medium Enterprises Training Center

Hardware	Price
mobo intel des 1300	Rp. 800.000
Processor xeon 1225 v6	Rp. 3.800.000
RAM 8 giga	Rp. 1.500.000
Hdd 1 tb (ssd)	Rp. 2.168.000
Casing ATX	Rp. 1.425.000
PowerSupply 400w	Rp. 660.000
Sum	Rp. 10.353.000

3.3. Installing XenServer on a Virtual Machine

Citrix XenServer is a complete virtualization platform based on the hypervisor used in the Xen Project [20]. The following are the steps to install Xenserver on a virtual machine as shown in Figures 3 and 4.

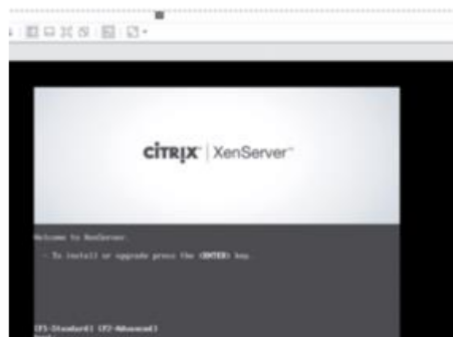


Figure 3. Start the XenServer Installation

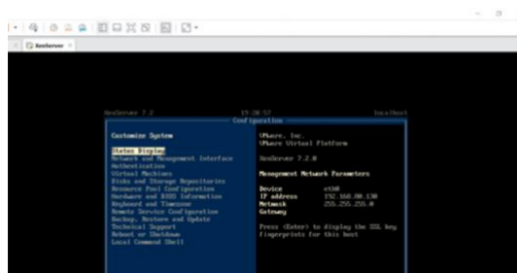


Figure 4. The XenServer Configuration Page on the Server

3.4. Operating System Configuration on XenServer

System configuration is a process carried out by the administrator to maximize the performance of a system. The following are the operating system configuration steps for Xenserver as shown in figure 5 and Figure 6.

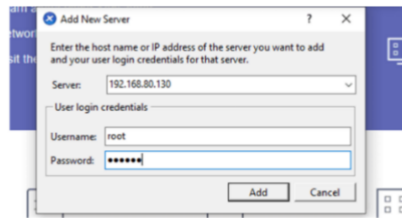


Figure 5. Login page on xenserver Client

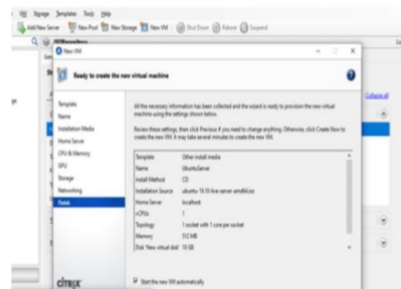


Figure 6. The page successfully created the ubuntu server configuration

3.5. Installing the Ubuntu Operating System on XenServer

The operating system functions as an interface between the application and hardware. In general, the operating system is the first layer of software that is placed in the computer's memory when the computer is turned on [21]. The following is an overview of the installation of the operating system in Ubuntu operations as shown in Figures 7 and 8.

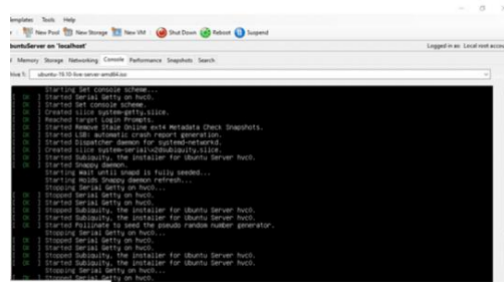


Figure 7. Start Page installing the Ubuntu operating system on the XenServer



Figure 8. The Installation page is complete on the Ubuntu operating system on the XenServer

3.6. Installing and testing an FTP server on an Ubuntu operating system

File transfer protocol is a protocol that functions to exchange files in a network that supports TCP / IP protocol. Each server is marked with an address called IP (internet protocol). This IP will distinguish the connections on the server from one another [22]. The following are the steps for installing an FTP server on the Ubuntu operating system as shown in Figures 9 and 10.

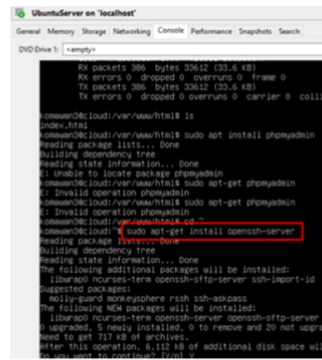


Figure 9. A page to install the sftp server

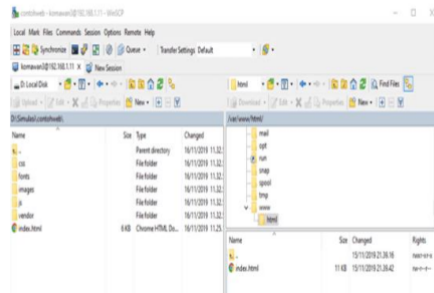


Figure 10. The page has been successfully accessed into the ubuntu directory.

3.7. Server Price Testing at the Center for Cooperative and Micro, Small and Medium Enterprises (BALATKOP)

Server testing is performed to determine price comparisons after using private cloud technology in West Java Cooperative and Entrepreneurship Education and Training Center. In testing, there is one physical server and two virtual servers that are used to store all activity documentation data at the Center for Cooperative and Micro, Small and Medium Enterprises. The following are the physical server unit prices if using two ftp servers as shown in Table 2 and the following are the virtual server unit prices if using two ftp servers as shown in Table 3.

Table 2. The physical server unit prices if using two ftp servers

Hardware	Unit Price	Items	Total Prices
mobo intel des 1300	Rp. 800.000	2	Rp. 1.600.000
Processor xeon 1225 v6	Rp. 3.800.000	2	Rp. 7.600.000
RAM 8 giga	Rp. 1.500.000	2	Rp. 3.000.000
Hdd 1 tb (ssd)	Rp. 2.168.000	2	Rp. 4.336.000
Casing ATX	Rp. 1.425.000	2	Rp. 2.850.000
PowerSupply 400w	Rp. 660.000	2	Rp. 1.320.000
			Rp. 20.706.000

Table 3. Virtual server unit prices if using two ftp server

Hardware	Price
mobo intel des 1300	Rp. 800.000
Processor xeon 1225 v6	Rp. 3.800.000
RAM 8 giga	Rp. 1.500.000
Hdd 1 tb (ssd)	Rp. 2.168.000
Casing ATX	Rp. 1.425.000
PowerSupply 400w	Rp. 660.000
Sum	Rp.10.353.000

4. Conclusion

Based on the results of implementation and testing, this research has been able to build a private cloud in the Cooperative and Micro Enterprise Training Center to exchange data and to minimize the cost of purchasing and maintaining the server. if using two physical servers, the total funds spent by the Cooperative and Micro Enterprise Training Center are twenty million seven hundred and six thousand rupiahs, whereas if using one physical server and two virtual servers, the total funds spent are ten million three hundred five thirty three rupiah. By using virtual server technology at the Cooperative and Micro Enterprise Training Center, it can be used more efficiently both for application servers, databases, and servers to store archives centrally.

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