

# Building Virtual Private Server In Net-Centric Computing Laboratory

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## ABSTRACT

*The use of server computers in an institution is managed according to required needs and functions. But as time goes on the server needs to increase. The NCC Laboratory as a research laboratory requires a server management mechanism for utilities that have a private server space to support each of its research. Server researchers, currently running on the computer's respective physical server so that the emergence of limitations of the availability of physical server computers to new researchers, while the utility computer server researchers who have already run in the taste still the operating system. Therefore the purpose of this research is to build a VPS (Virtual Private Server) system in one computer for the personal space of researchers to manage the research content in the form of Web-based applications. The methods used in this study were experiments with stages of analysis, design, implementation, and testing. The operating system used is Linux Proxmox as virtual Manager, Ubuntu and CentOS as VPS. The result of this research VPS can be applied to support the needs of researchers using Linux operating system Ubuntu server and CentOS-based virtual manager Proxmox.*

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## 1. Introduction

The use of computer servers in an agency carried out according to the needs and functions required, but over time the need for the server will be more and more, in accordance with the purposes and functions of each server that is used [1]. With the virtual private server or VPS, the service offers complete control of the users so that they can control what services are available at the server from the operating system. VPS are available in various types of services based on the amount of memory storage resources, network and processing capabilities [2].

Administration server is an act of governance to optimize service rendered computer network [3], to users so they can run effectively. Administration related to the DNS Server, Web Server, Mail Server, DHCP, Security / Firewall, Remote Access and Monitoring [4].

UIKA campus (University Ibn Khaldun) has several services like Web Server, Database Server, Storage Area Network, Hosting, internet access, proxy and others. With a student population of approximately 8000 active students, has seven faculties, namely the Faculty of Teacher Training and Education (Guidance and Counseling), Faculty of Islamic Studies (FAI), Faculty of Law (FH), Faculty of Economics, Faculty of Engineering (FT), Faculty of Health masyarakat (Fikes) and the Faculty of Graduate. Each service that is up and running today on the campus of UIKA there are problems such as hardware resources are not maximized, costs for server investment is high, power consumption is quite high, and the complexity of administrative management server [5].

Net-centric computing laboratory at the University of Ibn Khaldun Bogor offers services such as web servers, radio server, mail server, VoIP server and others. With the four researchers who use the web server which examines the prototype Information Systems Sort Maturity strawberries Based on RGB Color Assisted Arduino Uno Web Based, Application of Magnetic Lock with Automatic



light by Using Microcontroller In Laboratory Prodi, Application Equipment Coffee Makers Automatic With Monitoring System Based on Web and Implementation of Automatic Parking System Availability of Slot perbantuan Microcontroller Using Arduino Uno R3.

Services running today no room private servers that provide services to each web server, there is also that host them on a dedicated server, and run in localhost so that the buildup of a web server in the lab or the hoarding of physical servers that takes place on net-centric computing laboratory in the absence of a special place to provide such services. The use of virtual machine-based application that is installed on the host computer, it has not fully describe the topology of the network infrastructure needs of the actual client server [6].

Based on the above problems it is necessary to provide a special server mengola website investigators that each has a private room, and can run on a local network in order to facilitate researchers who will use the server research, and there is no hoarding of computer servers on an operating system, and does not take room at the laboratory will be given a special room because for each web server and operating system to use it proxmox using ubuntu server and CentOS. therefore it will be carried out a study with the title "Building a Virtual Private Server In Laboratory Net-Centric Computing".

## 2. Method

Experimental laboratory research method used, starting with the search for references of previous studies or collectively, the study of literature [7]. The method used in this study are shown in Figure 1.



Fig 1. Methods

### 2.1 Analysis

The first phase began with the phase of analysis or analysis is the process of analyzing and establishing what is needed, in the process of establishing a virtual private server operating system ubuntu server, and CentOS.

### 2.2. Design

At this stage it will be discussed overview of topology is used to facilitate and understand the concept of virtualization on the server machine, the stage system, and the server's IP address table to make it easier to understand the system server.

### 2.3. Implementation

Implementation apply all that has been planned and tested in the previous process. In this phase includes the installation and configuration. The thing to do is install the server, operating system Ubuntu and CentOS server along with configuration with a web server or network.

### 2.4. Examination

In this stage testing that has been implemented in the previous stage. This stage is done by testing the remote access VPS each researcher using SSH, and access to application services that run on VPS researcher researchers each in the form of a web application server.

## 3. Result And Discussio

### 3.1 Analysis

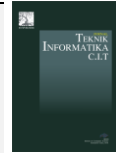
The analysis includes verification of the hardware inventory and estimate the resource usage of hardware and software, namely:

### 3.2. Hardware

Research conducted in need of hardware needed to Build Virtual Private Server In Net-Centric Computing Laboratories. Shown in Table 1.

Table 1.  
Server hardware

Device	amount	Specification
PC	1 Unit	3.60GHz Intel Core i7-7700 CPU x 4 RAM: 8 GB, HDD: 1 TB



keyboard	1 Unit	Zyrex
Mouse	1 Unit	Zyrex

### 3.3. Software

Research conducted in need software for Building a Virtual Private Server In Net-Centric Computing Laboratories as follows:

- Proxmox, is the operating system for virtualization manager.
- Ubuntu server, operating system is run in a VPS.
- CentOS, is an operating system that is run in a VPS.
- PuTTY, is the remote access software to experiment VPS.

### 3.4. Design

In the physical network topology design stage, the stage of building a VPS system and a description of it proxmox Linux-based VPS researchers. Physical network topology shown in Figure 2.

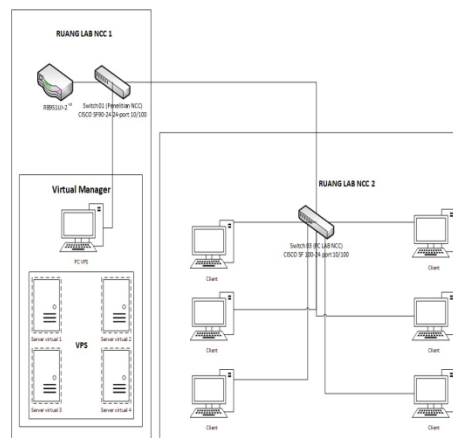


Fig 2. Physical network topology.

Based on Figure 2, that the physical network topology describes the design of the structure following the VPS system with communication connectivity on a LAN (Local Area Network). The router is connected to the switch 01 (Research NCC) Cisco SF90-24 - 24-port 10/100 using UTP cabling cat 6, then connected to a PC VPS using Cat 6 UTP cable 11/100 ports which are diruang lab NCC 1 and connects also to switch 03 (PC LAB NCC) Cisco SF90-24-port 05/100 switch is connected from the NCC 1 space lab using paint 6 UTP cable, then the client PC is connected to the PC Lab NCC switch using UTP cable 6 which are in the paint lab space NCC 2 . Stages of Building Systems VPS, as shown in Figure 3.

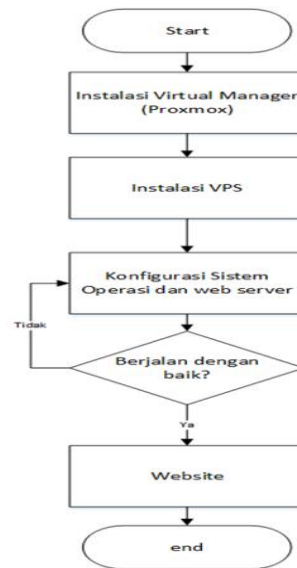


Fig 3. The process of building a VPS system

Stages of building a VPS system describes the flow of a work process that is done to build a server, the first is a virtual machine installation process manager using Proxmox. The second is to install ubuntu server and VPS using CentOS that will be used as a server researchers. Third implementation researchers server web services, and the last test if the configuration is already well underway.

### 3.5. Description VPS Researcher

The researchers describe the description VPS server that will be built and the following IP addressing storage, RAM, and operating system that goes with that recorded properly gateway can be seen in Table 2.

**Table 2.**  
VPS peneliti on proxmox

VPS Researcher	Hard drive	RAM	OS
door Lock	35 GB	1 GB	Ubuntu
Coffee	35 GB	1 GB	Centos
stoberi	35 GB	1 GB	Ubuntu
Parking	35 GB	1 GB	Centos

### 3.6. Implementation

At this stage do the implementation of the draft have been made. Operating System installation Proxmox form. Installation results shown in Figure 4.

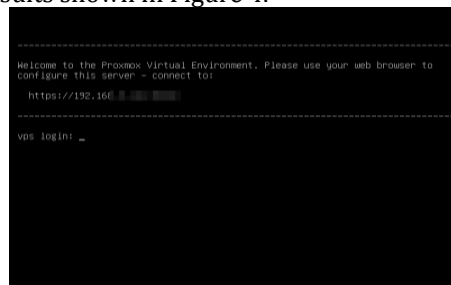
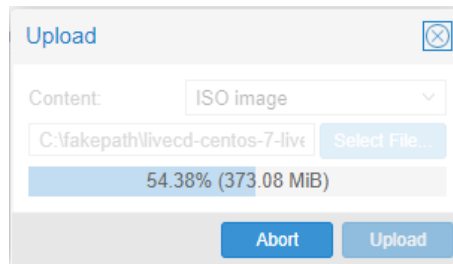
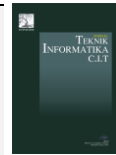


Fig 4. Proxmox Virtual Display Manager

### 3.7. VPS configuration

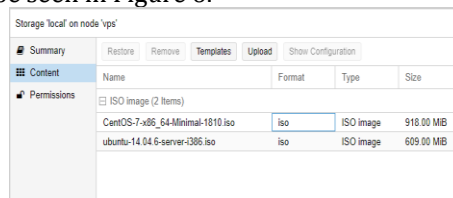
Author configure the virtual machine to build 4 proxmox server to the operating system so it can run as expected configuration process can be seen as follows:

- Upload the operating system is the process of inserting the operating system image that will be installed on a virtual machine, can be seen in Figure 5.



**Fig 5.** Upload image server operating system

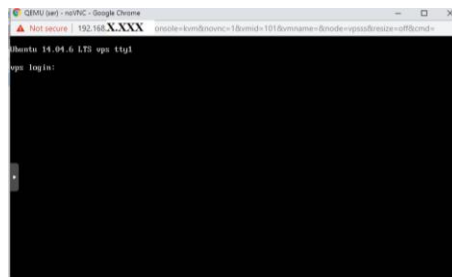
- b) Image operating system that successfully put on the virtual manager proxmox and will be installed as VPS can be seen in Figure 6.



**Fig 6.** VPS operating system image

### 3.8. Researchers VPS Operating System Installation

14:04 Ubuntu Linux operating system and VPS CentOS is provided to the researchers, is shown in Figure 7.



**Fig 7.** VPS Ubuntu Server

### 3.9. Researchers Server Installation Service Web Servers

Service applications such as web servers that researchers need to install apache, mysql, php and phpmyadmin which will be used in the research process.

#### 3.11. Pengujian

The first test is done by testing blackbox VPS researchers tried to account if it is appropriate to access his VPS each VPS space without disturbing other researchers, using a remote SSH. Shown in Table 3.

**Table 3.**  
Researchers testing VPS access

Researchers NamaVPS	SSH access
door Lock	succeed
Coffee	succeed
stoberi	succeed
Parking	succeed

The second test is done by accessing the web service application to the researchers if it is appropriate can be accessed over a network, using a web browser on the HTTP protocol. Are shown in Table 4.

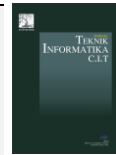
**Table 4.**  
Researchers testing VPS access

Researchers VPS name	SSH access
door Lock	succeed
Coffee	succeed
stoberi	succeed

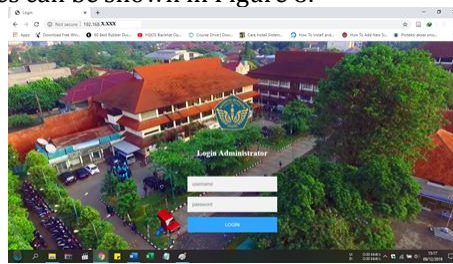


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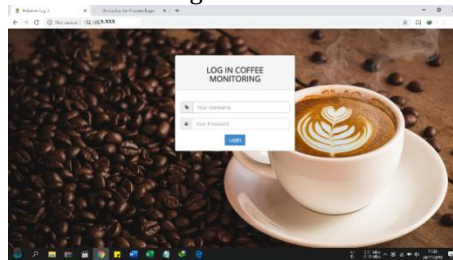


Parking succeed  
Details Door Lock web services can be shown in Figure 8.



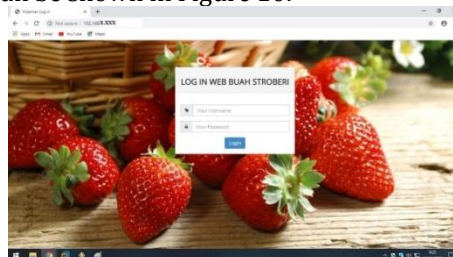
**Fig 8.** VPS Service Door Lock

Details Coffee web services can be shown in Figure 9.



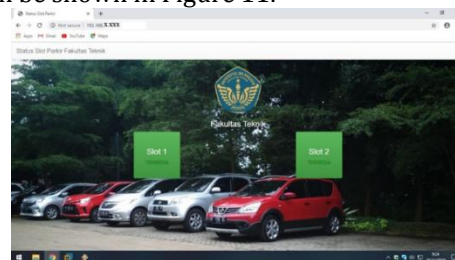
**Fig 9.** Coffee VPS Services

Details stoberi web services can be shown in Figure 10.



**Fig 10.** VPS Service stoberi

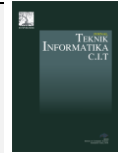
Details stoberi web services can be shown in Figure 11.



**Fig 11.** VPS Service Center

#### 4. Conclusion

Based on research done, it can be concluded that the VPS to be an alternative as a private server space for researchers using the Linux operating system, Ubuntu and CentOS-based virtual server manager Proxmox. Evidenced by the results of testing the researchers were able to use the operating system with its VPS services without disturbing each other VPS in the same computer.



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