



## Design and Build Mail Server Systems Using Zimbra 8.8.15 and Antispam on Proxmox Mail Gateway 5.2

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### ABSTRACT

E-Mail or electronic mail media currently continues to grow and its users are increasing. However, the comfort and security of communicating via e-mail is now greatly reduced. One reason for the reduced level of security and comfort in using e-mail is spam. Spam is e-mail that goes to the user's e-mail that the user has never requested and wanted, if the spam is left in the e-mail inbox it will create full storage capacity and can make the mail server down. To avoid and prevent the presence of spam e-mails, the Zimbra 8.8.15 mail server requires anti spam to be able to block spam e-mails that will enter. Anti spam that will be used is Proxmox Mail Gateway 5.2 as using the LDAP (Light Weight Directory Access Protocol) feature.

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## 1. Introduction

Mail server is one of the most widely used server functions in the company. This is because the email function itself can reduce the cost of correspondence, is more efficient than manual communication and can include attachments that are useful as a complement to additional documents related to the contents of the email. Technology demands also cause every company to have its own mail server so that it becomes more efficient besides giving priority to data security especially in anticipation of cracker attacks that occur through computer networks. [1]

Zimbra 8.8.15 is an open source software for email servers and collaboration (groupware), which provides powerful email server solutions, scheduling, group calendars, contacts and document storage management via the web. Zimbra 8.8.15 Collaboration Suite (ZCS) is a powerful mail server application that can be used as a mail server application in the tens of thousands of users. The Zimbra 8.8.15 architecture includes integration of opensource applications that use industry standard protocols. [2]

Spam is the activity of sending messages to other people by using electronic devices continuously and in massive quantities without the wishes of the recipient. Emails are considered spam when a large number of them are sent to many recipients. Spam is usually used for advertising or marketing. This unwanted email causes shortages for the recipient, and consumes the user's network resources. The disadvantages of spam e-mail have been overcome on many occasions. In some cases for one user, 9 out of 10 e-mails are spam filling their inbox. [3]

Proxmox Mail Gateway 5.2 is useful for filtering email spam and email viruses. Incoming and outgoing e-mail through Proxmox Mail Gateway 5.2 in advance for filtering spam and viruses. When using Proxmox Mail Gateway 5.2, we can disable the antispam and antivirus services on the mail server. Proxmox Mail Gateway 5.2 can be used by all mail servers. [4]

LDAP (Light Weight Directory Access Protocol) is a protocol that regulates the mechanism of accessing directory services (Directory Service) that can be used to describe a lot of information about people, organizations, roles, services and many other entities. [6]



From the above reference it can be concluded that the use of anti spam mail gateway with LDAP (Light Weight Directory Access Protocol) features can filter spam email on Zimbra 8.8.15 mail servers and other mail servers. Therefore, researchers will use Proxmox Mail Gateway 5.2 to filter incoming email using the LDAP (Light Weight Directory Access Protocol) feature. LDAP (Light Weight Directory Access Protocol) in Proxmox Mail Gateway 5.2 can be used to filter objects that contain users that are not included in LDAP (Light Weight Directory Access Protocol) mail. Where the message will automatically return to the sender of the email.

## 2. Research methods

This study is divided into 5 stages, namely the proposed network design stage, network installation and configuration, Ubuntu Installation and Configuration, Zimbra 8.8.15 and Proxmox Mail Gateway 5.2, Zimbra 8.8.15 Mail Server Testing, Proxmox Mail Gateway 5.2 Anti-Spam Testing as in Figure 1.



Fig 1. Building Design Stages

a. Proposed Network Design

Below this is the topology of the proposed network design. Where Zimbra 8.8.15 as a Mail Server is installed on Ubuntu 18.04. And Proxmox Mail Gateway 5.2 will be installed on a different mail gateway server than the mail server. Within Zimbra 8.8.15 there is also an anti-spam feature but there are still plenty of spam e-mails that cannot be prevented by anti-spam which is located on Zimbra 8.8.15. Therefore, Proxmox Mail Gateway 5.2 will be installed to prevent spam e-mail from entering the user's email inbox. Zimbra 8.8.15 anti-spam and anti-spam can also be deactivated or disabled, because all of that is available at Proxmox Mail Gateway 5.2.

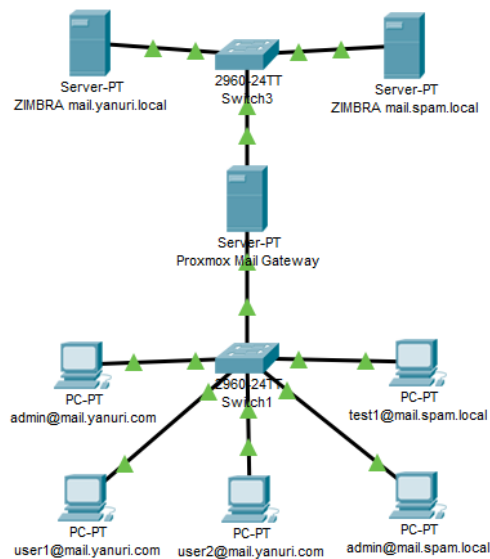
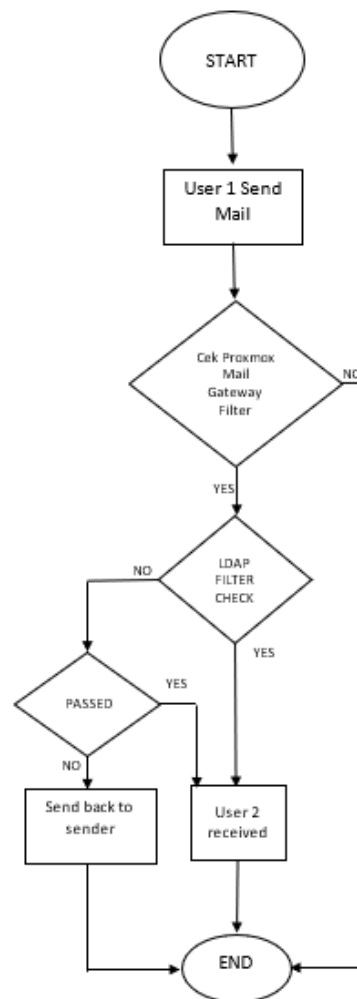


Fig 2. Proposed Network

- b. Network Installation and Configuration  
So that all devices can communicate with each other. Need to do the filtering on each device. What is done at this stage is:
  1. Switch configuration so that all computer devices are connected to each other.
- c. Installation and configuration of Ubuntu, Zimbra 8.8.15, Proxmox Mail Gateway 5.2.  
What is done at this stage is:
  1. Installing and configuring Ubuntu 18.04.
  2. Installing and configuring Zimbra 8.8.15 on Ubuntu 18.04.
  3. Installing and Configuring Proxmox Mail Gateway 5.2 for anti spam mail server.
- d. Testing the Zimbra Mail Server 8.8.15  
At this stage, testing will be carried out by testing the sending and receiving emails of each user with a different email address.
- e. Anti-Spam Proxmox Mail Gateway Testing 5.2.  
Proxmox Mail Gateway 5.2 has many features to secure e-mail servers from spam attacks. At this stage a spam email test will be sent to each email address with a different domain. Where this is done to test Proxmox Mail Gateway 5.2 in filtering spam emails received on each user in different domains by using the LDAP (Lightwiegth Directory Access protocol) feature. LDAP (Lightwiegth Directory Access protocol) is a protocol used to access various information in a directory. LDAP (Light Weight Directory Access Protocol) in Proxmox Mail Gateway 5.2 can be used to filter objects that contain users that are not included in LDAP (Light Weight Directory Access Protocol) Mail. Where the message will automatically return to the sender of the email.



**Fig 3.** Anti-Spam Testing Flow Chart

- a. User Send Mail  
Sender who has a different domain from the recipient sends an email.
- b. Check Proxmox Mail Gateway 5.2 Filter  
Proxmox Mail Gateway 5.2 will filter emails sent from user1 to users in different domains.
- c. LDAP (Light Weight Directory Access Protocol) Filter Check  
Before the email reaches the LDAP (Light Weight Directory Access Protocol) sender checks whether the sender is a user whose domain is registered in the LDAP (Light Weight Directory Access Protocol) setting.
- d. Passed  
If the sender is a user registered with LDAP (Light Weight Directory Access Protocol) the message will be delivered to the recipient.
- e. Send back to sender  
If the sender is a user who has not registered with the LDAP (Light Weight Directory Access Protocol) settings, LDAP (Light Weight Directory Access Protocol) will automatically send the message back to the recipient and provide information.
- f. User 2 Received  
User 2 whose domain has been registered in the LDAP (Light Weight Directory Access Protocol) settings can automatically receive messages.

### 3. Results and Discussion

#### 3.1. Installation & Display Process Flow Ubuntu 18.04

Below this is the installation process flow for the Ubuntu 18.04 installation which will be the operating system for the Zimbra 8.8.15 mail server.

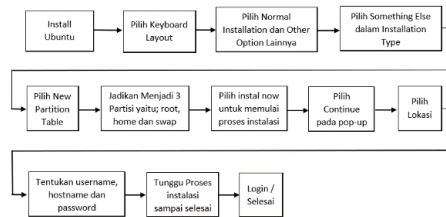


Fig 4. The Ubuntu Installation Process Flow 18.04

After the installation process is complete based on the flow of the image above, below is a display of Ubuntu 18.04.



Fig 5. Display Ubuntu 18.04

### 3.2. Zimbra Installation & Display Process Flow 8.8.15 8.8.15

Below is the flow of the installation process for the installation of Zimbra 8.8.15 8.8.15 which is installed on Ubuntu 18.04 as an operating system.

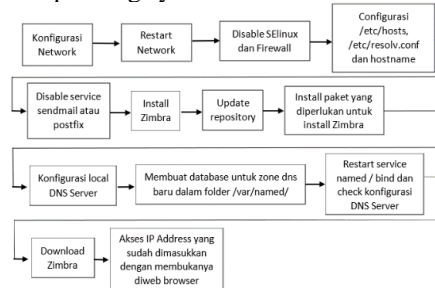


Fig 6. Zimbra Installation Process Flow 8.8.15 8.8.15

After the installation process is complete based on the installation process flow according to the picture above, below is a display of Zimbra 8.8.15 8.8.15 already installed on Ubuntu 18.04

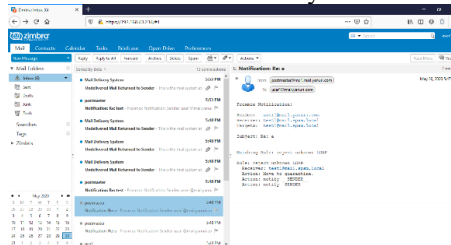
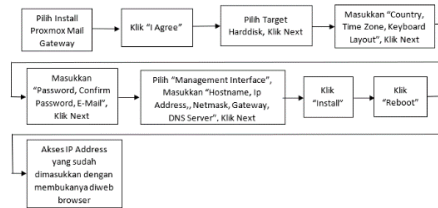


Fig 7. Display Zimbra 8.8.15 8.8.15

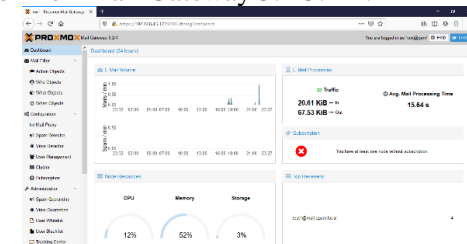
### 3.3. Proxmox Mail Gateway Installation & Display Process Flow 5.2 5.2-1

Below this is the installation process flowchart for the installation of Proxmox Mail Gateway 5.2 5.2-1 which is used as mail security.



**Fig 8. Proxmox Mail Gateway Installation Process Flow 5.2 5.2-1**

After the installation process is complete based on the flow according to the picture above, below is a display of Proxmox Mail Gateway 5.2 5.2-1.

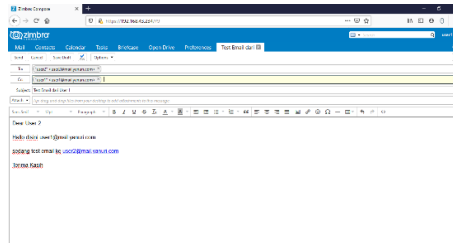


**Fig 9. Display of Proxmox Mail Gateway 5.2 5.2-1**

### 3.4. Testing the Zimbra Mail Server 8.8.15 (mail.yanuri.com)

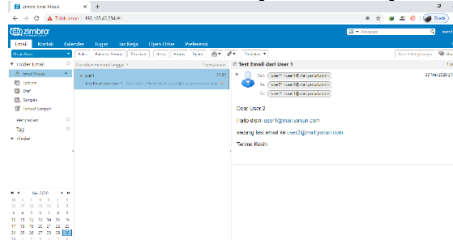
IP Address: 192.168.43.234  
 Netmask: 255.255.255.0  
 Broadcast: 192.168.43.255

The first test was performed on a Zimbra 8.8.15 mail server that uses a domain mail.yanuri.com aims to test the Zimbra 8.8.15 mail server which is running well and can send and receive e-mail locally. In this test the account used as the sender is user1@mail.yanuri.com and the recipient's account is user2@mail.yanuri.com Accountuser1@mail.yanuri.com will send an email to the account user2@mail.yanuri.com



**Fig 10. Sending Local Network Email from User1 to User2 (mail.yanuri.com)**

Messages that have been sent have been successfully received by the account user2@mail.yanuri.com



**Fig 11. Receiving Local Network Emails from User1 to User2 (mail.yanuri.com)**

Accountuser2@mail.yanuri.com will send an email to the account user1@mail.yanuri.com

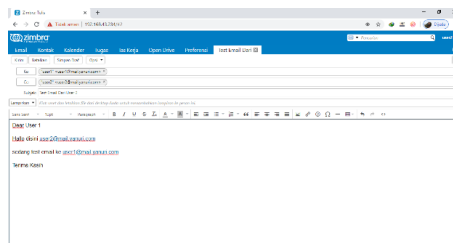


Fig 12. Sending Local Network Email from User2 to User1 (mail.yanuri.com)

Messages that have been sent have been successfully received by the account user1@mail.yanuri.com

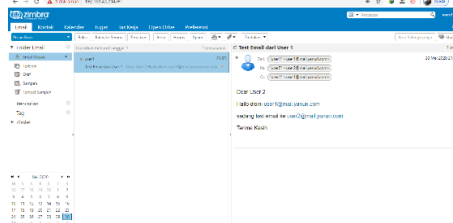


Fig 13. Receiving Local Network Email from User2 to User1 (mail.yanuri.com)

### 3.5. Testing the Zimbra Mail Server 8.8.15 (mail.spam.com)

IP Address: 192.168.43.143  
Netmask: 255.255.255.0  
Broadcast: 192.168.43.255

The second test was carried out on the Zimbra 8.8.15 mail server that uses the mail.spam.com domain. It aims to test the Zimbra 8.8.15 mail server which is already running well and can send and receive e-mail locally. In this test the account used as the sender is user1@mail.spam.com and the recipient's account is user2@mail.spam.com

Account user1@mail.spam.com will send an email to the account user2@mail.spam.com

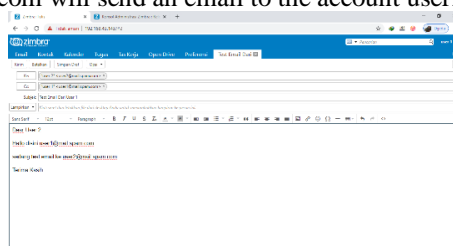


Fig 14. Sending Local Network Email from User1 to User2 (mail.spam.com)

Messages that have been sent have been successfully received by the account user2@mail.spam.com

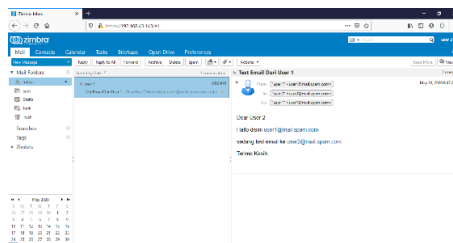
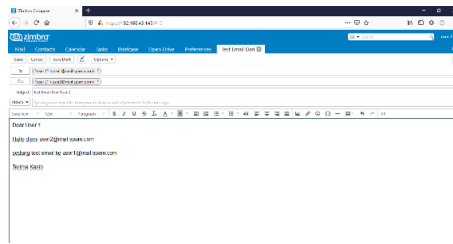
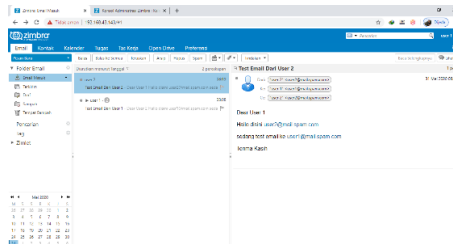


Fig 15. Receiving Local Network Emails from User1 to User2 (mail.spam.com)

Account user2@mail.spam.com will send an email to the account user1@mail.spam.com



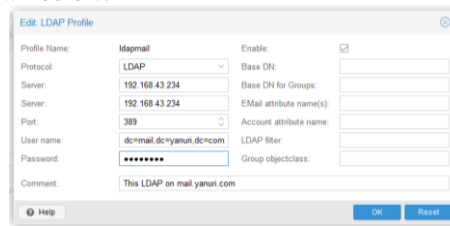
**Fig 16.** Sending Local Network Email from User2 to User1 (mail.spam.com)  
Messages that have been sent have been successfully received by the account user1@mail.spam.com



**Fig 17.** Receiving Local Network Email from User2 to User1 (mail.spam.com)

**3.6. Proxmox Mail Gateway Test Results 5.2.**

Setting LDAP (Lightweight Directory Access protocol) on Proxmox Mail Gateway 5.2 on the Configuration menu, click user management | LDAP. Enter the LDAP (Lightweight Directory Access protocol) configuration as shown below.



**Fig 18.** LDAP (Lightweight Directory Access protocol) settings

Note:

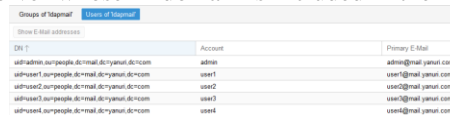
- Profile Name: The name of your LDAP profile. Give a name as you wish, do not use symbols or special characters.
- Protocol: LDAP. leave it as default.
- Server: Your LDAP / Zimbra 8.8.15 IP address (192.168.42.234)
- Port: 389 for LDAP.
- Username: You can use one of your email server users. to configure it use the LDAP format, as below: "uid = admin, ou = people, dc = mail, dc = yanuri, dc = com".
- Password: Your LDAP user password

After LDAP is set up in the configuration user management will display the settings that have been entered as shown below.



**Fig 19.** LDAP Setting

Below this is the account registered in LDAP. Where the account is automatically registered because all the accounts are in one mail server whose IP domain is included in the LDAP server settings.



**Fig 20.** LDAP registered account

Next we configure the rules to enable LDAP (Lightweight Directory Access protocol) Verification in Proxmox Mail Gateway 5.2 on the Mail Filter menu, select who objects and create a new rule as shown below.

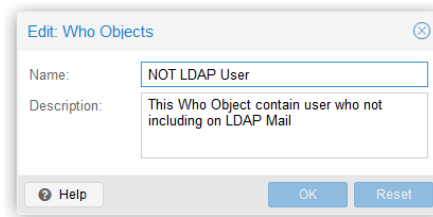


Fig 21. LDAP Setting Who Object

Then, select the Unknown LDAP address and select the LDAP (Lightweight Directory Access protocol) profile that was created in the previous step, ldapmail. This means users who are not included in the LDAP that was created in the previous stage will not be able to send e-mail to the mail server address that has been registered.

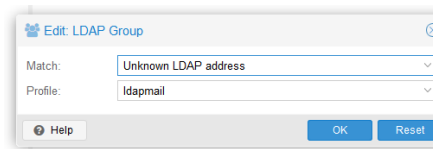


Fig 22. LDAP Group Settings

Next, I will give the bounce-back notification to the sender that their destination does not exist. To configure it, open the Mail Filter Menu | Select the Action Object and Add Notification. Below is the contents of the configuration.

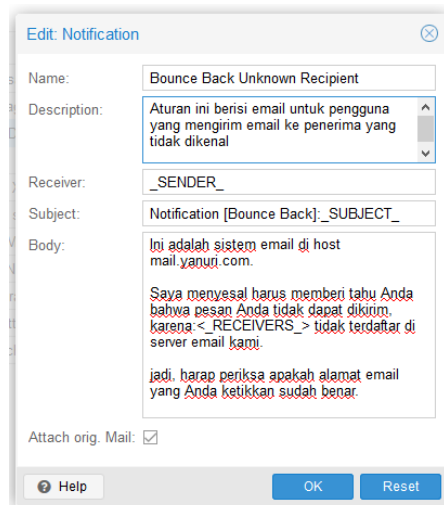


Fig 23. Bounce Back Notification

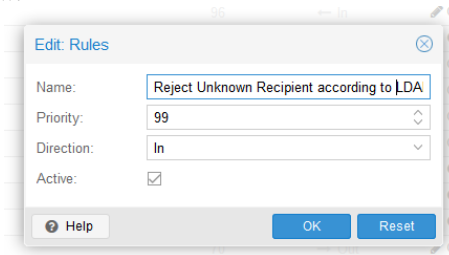
Note:

- Name: Bounce Back Recipient Unknown
- Description: This rule contains emails for users who send emails to unknown recipients
- Receiver: \_\_SENDER\_\_ (meaning, notification email will be sent to the sender)
- Subject: Fill as desired. For example "[Reflected] Notification: \_\_SUBJECT\_\_"
- Body: Your email content, for example:  
"This is the email system hosted at mail.yanuri.com."

I regret having to inform you that your message could not be sent, because:  
not registered on our email server.

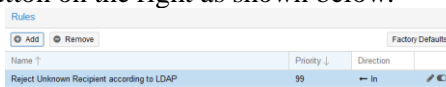
so please check that the email address you typed is correct. "

Then, to activate the object-oriented rules that have been configured. Open the Mail Filter menu, click add, then add the rules as below.



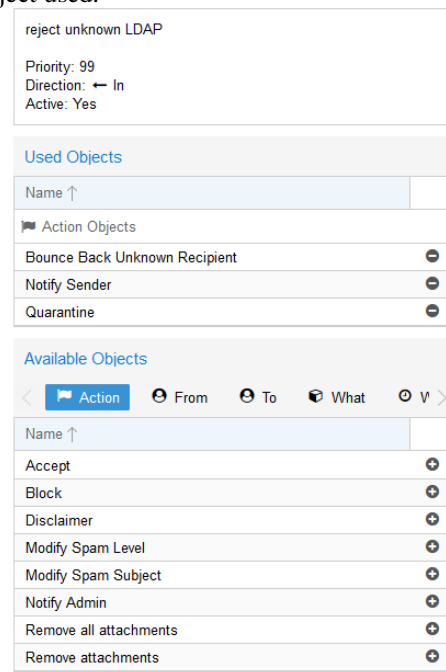
**Fig 24.** Object Oriented Rules

Do not forget to activate the Reject Unknown Recipient according to LDAP that was made earlier by clicking on the button on the right as shown below.



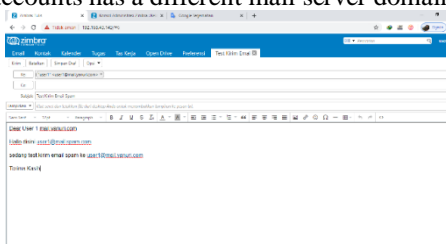
**Fig 25.** Make Rules

After creating rules in the previous stage, we also need to select the object to be executed by the created rule, so below this is the object used.



**Fig 26.** Object Used

Next do a test sending spam e-mail from the account user1@mail.spam.com to user1@mail.yanuri.com which is where each of these accounts has a different mail server domain.



**Fig 27.** Test Send Email Spam

After testing the sending of spam e-mail to a different e-mail address domain, Proxmox Mail Gateway 5.2 successfully blocked and returned messages sent by user1@mail.spam.com to user1@mail.yanuri.com. Below this is a report from an email that failed to send.

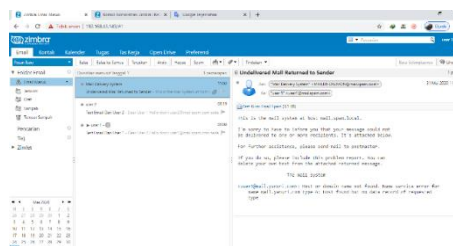


Fig 28. Spam Email Test Results

#### 4. Conclusion

Based on the test results and discussion explained in the previous chapter, the author tries to draw conclusions about the design of the mail server system using Zimbra 8.8.15 and anti spam on Proxmox Mail Gateway 5.2 as follows:

- a. Zimbra 8.8.15 mail server was successfully implemented on Ubuntu 18.04
- b. Proxmox Mail Gateway 5.2 has been successfully implemented and run.
- c. LDAP (Lightweight Directory Access Protocol) is a protocol used to access various information in a directory. LDAP (Lightweight Directory Access protocol) in Proxmox Mail Gateway 5.2 can be used to filter objects that contain users that are not included in LDAP Mail. Where the message will automatically return to the sender of the email.

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