

# **LOMBA KOMPETENSI SISWA**

## **SEKOLAH MENENGAH KEJURUAN**

### **TINGKAT NASIONAL XXVI 2018**



## **Modul A**

### **LINUX ENVIRONMENT**

## **IT NETWORK SYSTEMS**

### **ADMINISTRATION**

[LKSN2018\\_ITNSA\\_MODUL\\_A](#)

## CONTENTS

This Test Project proposal consists of the following document/file:  
LKS NASIONAL 2018\_ITNSA\_MODULA.pdf

## INTRODUCTION

The competition has a fixed start and finish time. You must decide how to best divide your time.

Please **carefully** read the following instructions!

When the competition time ends, please leave your station in a running state.

## PHYSICAL MACHINE (HOST)

### FOLDER PATHS

Virtual Machines: D:\KOMPETISI\VM

ISO Images: D:\KOMPETISI\ISO

Password for OS Pre-Install: Skills39

## SYSTEM TOOLS

- Install CURL

## LOGIN BANNER

Must be shown before the login prompt. Must appear for local and network logins.

“Welcome to [hostname] – LKSN 2018”

# PART I

## WORK TASK INSTALLATION (LNXSrv-A, LNXSrv-B, LNXSrv-C)

Note Please use the default configuration if you are not given details.

### WORK TASK SERVER LNXSrv-A

Configure the server with the hostname, domain and IP specified in the appendix.

- Install the services:

#### 1. DNS (bind9)

- Configure a forward zone called “nusantara.cloud”
  - Create for each host an A record to the respective IP
  - Create a CNAME record for ‘www’ that point to the appropriate host that serves websites for all clients
  - Create A record for ‘mail’ that points to the mail server
  - Create the appropriate MX records
  - Create a CNAME record for ‘ftp’ that point the ftp server
  - Create a CNAME record for ‘monitor’ to access monitoring websites
- Configure a reverse zone defined for network 10.20.20.0/25.
- Configure multiple views DNS for external and internal client, with the specification below:
  - External client will resolve www.nusantara.cloud to 100.100.50.1
  - Internal client will resolve www.nusantara.cloud to 10.20.20.1

#### 2. CA

- Configure as CA using OpenSSL
- Use “/etc/ca” as the CA root directory
  - Private key should have minimal permission
- CA attributes should be set as follows
  - Country code is set to ID
  - Organization is set to InaSkills
  - The common name is set to “LKS Nasional 2018 CA”
- Create a root CA certificate
- All certificates required in the test project should be published by CA

### 3. Mail

- Install and configure Postfix and Dovecot/Courier
  - Configure SMTPS (TCP 465) and IMAPS server for “nusantara.cloud” domain using certificates issued by **LNXSRV-A**.
  - Configure mail directory in “/home/[user]/Maildir”
  - Authentication has to be done through LDAP
    - Make sure that the corresponding local user do not exist and make sure LDAP user cannot login locally
  - Limit mailbox for each user to 1MB

### 4. SSH Server

- Install and configure SSH Server
  - Use key based for SSH authentication
  - Make sure user “batik” in LNXCLT-INT and LNXCLT-EXT can SSH to user root @LNXSRV-A without password
  - Allow root access
  - Change SSH port default to 2018

## WORK TASK SERVER LNXSRV-B AND LNXSRV-C

### WEB SERVER (Apache)

- The website page should display the following message:
  - “Welcome to Nusantara cloud on [hostname].”
  - Add the hostname dynamically with PHP.
- Enable HTTPS only for both sites
  - Use certificate signed by CA in LNXSRV-A
  - Make sure no certificate warning is shown
- Add the HTTP header “X-Served-By” with the server hostname as the value.
- Make sure PHP script can be run
  - Create php info page with the filename info.php
- Install and configure rsync on LNXSRV-B and synchronize /var/www directory (recursive) from LNXSRV-B to LNXSRV-C
  - Configure crontab to automatically synchronize for every minute.

## **WORK TASK SERVER LNXSRV-B**

Configure the server with the hostname, domain and IP specified in the appendix.

- Install the services:

### **1. LDAP**

- Install LDAP service
  - Configure the directory service of nusantara.cloud
  - Create users with OU and password specified in the appendix
  - VPN, FTP and Mail services should be available for LDAP users.

### **2. DHCP**

- Create DHCP for internal client with the following requirement below:
  - Range: 10.30.30.15 – 10.30.30.50
  - Netmask: /25
  - Gateway 10.30.30.1
  - DNS: 10.10.10.100
- The clients should automatically register their name with the DNS server after they have been assigned with an IP address by the DHCP server

## WORK TASK SERVER LNXSRV-C

Configure the server with the hostname, domain and IP specified in the appendix.

- Install the services:

### FTP Server

- Setup FTP with ProFTPD
  - Enable FTPS (implicit)
    - Make sure both FTP and FTPS are working
  - Use LDAP user for FTP login
    - Only users on OU “MISC” allowed to access FTP
  - Per user only one active concurrent session is allowed
  - Make sure the user is jailed in their respective home folder
  - File renaming is not allowed

## PART II

## WORK TASK INSTALLATION (LNXRTR)

Configure the router with the hostname, domain and IP specified in the appendix.

- **Routing**
  - Enable routing to forward IPv4 packet
- **Firewall**
  - Make sure that firewall operates in stateful mode
  - All other traffic must be dropped by default (no implicit allowing rule)
  - Allow all traffic from client and VPN networks to all networks
  - Allow VPN connection to LNXRTR
  - Allow HTTP and HTTPS connection to LNXRTR
  - Allow SNMP from LNXRTR to LNXSRV-B and LNXSRV-C
  - Allow DNS, IMAPS, SMTPS to LNXSRV-A
  - Allow access to the LDAP service on LNXSRV-B from all internal networks
  - Allow access to the FTP service on LNXSRV-C from all internal network
  - Make sure that SSH is allowed on each host
- **NAT**
  - Configure DNAT for DNS, IMAPS and SMTPS (TCP 465) to LNXSRV-A using IP external of LNXRTR
- **DHCP Relay**
  - Configure DHCP Relay to LNXSRV-B for internal client
- **Monitoring (Cacti)**
  - Configure Cacti with url <http://monitor.nusantara.cloud>
  - Create an admin user: “master” with password “Nusantara2018”
  - Create graph for interface traffic on LNXSRV-B and LNXSRV-C
- **Load balancer (HAProxy)**
  - Configure HTTP/HTTPS load balancer for [www.nusantara.cloud](http://www.nusantara.cloud), which is hosted by LNXSRV-B and LNXSRV-C
  - Use roundrobin as algorithm
- **OpenVPN**
  - Install OpenVPN service

- Configure VPN access to Internal networks
- Use LDAP user for OpenVPN client login
  - Use OU “VPN” for OpenVPN client login
- Use address range 10.2.3.100 to 10.2.3.199 for VPN clients
- Use certificate signed by LNXSRV-A

## PART III

### WORK TASK INSTALLATION (LNXCLT- INT, LNXCLT- EXT)

Note: Please use the default configuration if you are not given details.

#### WORK TASK CLIENT LNXCLT-INT

Note: Please use the default configuration if you are not given details

- Configure the client with the hostname, domain and IP specified in the appendix.
- Make sure LDAP user in OU “MISC” can login locally
- Make sure the client certificate is installed
- Install FileZilla FTP client
- Install Icedove mail client

#### WORK TASK CLIENT LNXCLT-EXT

Note: Please use the default configuration if you are not given details

- Configure the client with the hostname, domain and IP specified in the appendix.
- Make sure LNXCLT-EXT can access <https://www.nusantara.cloud>
- Make sure LNXCLT-EXT can access to LNXSRV-A and LNXSRV-B (via LNXRTR)
- Make sure VPN connection can be established
- Make sure the client certificate is installed
- Install FileZilla FTP client
- Install Icedove mail client

# APPENDIX

## LDAP USERS

USERNAME	OU	PASSWORD	DOMAIN
user1	VPN	Nusantara2018	nusantara.cloud
user2	VPN	Nusantara2018	nusantara.cloud
user3	MAIL	Nusantara2018	nusantara.cloud
user4	MAIL	Nusantara2018	nusantara.cloud
user5 – user99	MISC	Nusantara2018	nusantara.cloud

## SPECIFICATION

### LNXSrv-A

Operating System	Linux Debian 8.7
FQDN:	LNXSrv-A.nusantara.cloud
Root password	Nusantara2018
User Name:	batik
User Password:	Nusantara2018
eth0:	10.10.10.100/25

### LNXSrv-B

Operating System	Linux Debian 8.7
FQDN:	LNXSrv-B.nusantara.cloud
Root password	Nusantara2018
User Name:	batik
User Password:	Nusantara2018
eth0:	10.20.20.10/25

### LNXSrv-C

Operating System	Linux Debian 8.7
FQDN:	LNXSrv-C.nusantara.cloud
Root password	Nusantara2018
User Name:	batik



User Password:	Nusantara2018
eth0:	10.20.20.20/25

**LNXRTR**

Operating System	Linux Debian 8.7
FQDN:	LNXRTR.nusantara.cloud
Root password	Nusantara2018
User Name:	batik
User Password:	Nusantara2018
eth0:	10.10.10.1/25
eth1:	100.100.50.1/26
eth2:	10.20.20.1/25
eth3:	10.30.30.1/25

**LNXCILT-INT**

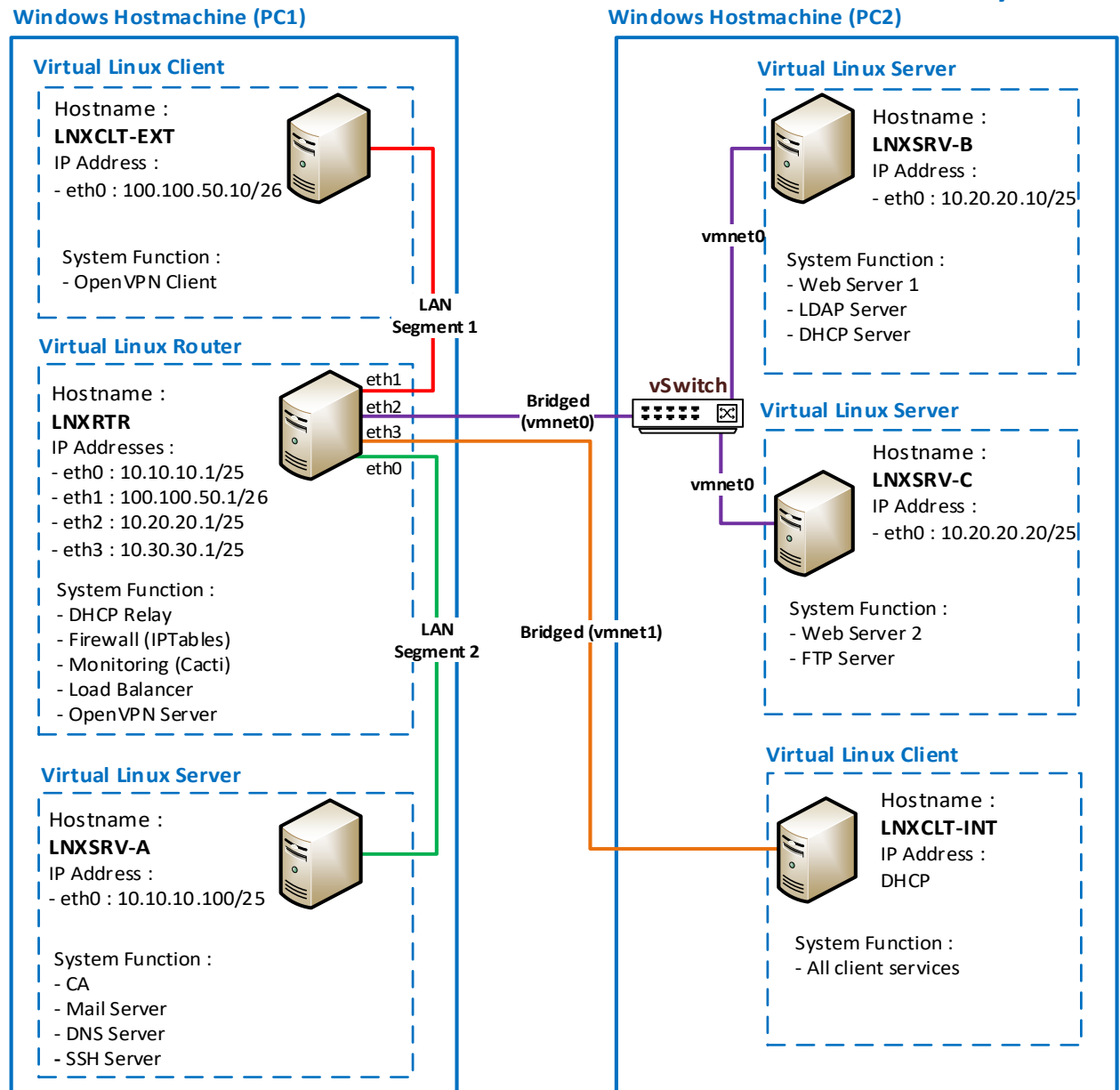
Operating System	Linux Debian 8.7 (GUI)
FQDN:	LNXCILT-INT.nusantara.cloud
Root password	Nusantara2018
User Name:	batik
User Password:	Nusantara2018
eth0:	DHCP

**LNXCILT-EXT**

Operating System	Linux Debian 8.7 (GUI)
FQDN:	LNXCILT-EXT.nusantara.cloud
Root password	Nusantara2018
User Name:	batik
User Password:	Nusantara2018
eth0:	100.100.50.10/26

# NETWORK SPECIFICATION (PHYSICAL VIEW)

## Physical View



# NETWORK SPECIFICATION (LOGICAL VIEW)

## Logical View

