

**LOMBA KOMPETENSI SISWA  
SMK TINGKAT NASIONAL KE-29  
TAHUN 2021**



**TEST PROJECT  
MODUL A – INTEGRATION SYSTEMS  
DAY 1**

**BIDANG LOMBA  
TEKNOLOGI INFORMASI SISTEM ADMINISTRASI JARINGAN  
*IT NETWORK SYSTEMS ADMINISTRATION***

## **DESCRIPTION OF PROJECT**

A small startup company's production environment contains numerous services within multiple Operating Systems. We will ask you to install, configure, and integrate the different services. You will have two work days to complete two different sets of tasks. Each set of tasks is to be completed within one work day. For the second work day, you will continue the work of another engineer, who should have fully configured systems according to the day one set of tasks. You may check, change, or update the existing systems, but we will only score the tasks you're supposed to do on the second work day.

## DAY 1 – NETWORK INFRASTRUCTURE

### Basic Configuration

- Configure IP Address of all network devices according to the addressing table.
- Create SSH user 'patah' with password specified in the appendix.
  - Make sure the user are able to enter configuration commands in the router.
- Allow server admins to SSH to all network devices.
- If you need to set additional password on the Routers, use **Skills39**

### NAT and Routing

- Configure Dynamic Routing for public addresses using Border Gateway Protocol
- Enable port NAT to all private addresses in sabang.net, indonesia.com, and merauke.net so that every device can connect to public subnets.
- Allow sabang.net to access merauke.net via encrypted VPN tunnel.
- On RTB, Create static NAT with Public IP 30.9.65.10 for STORAGE (172.17.11.102)

### Secure Virtual Private Network

- Configure VPN on the routers to enable tunneling between sabang.net and merauke.net.
- Secure the VPN with any IPsec protocol.
- Allow devices in sabang.net and merauke.net to communicate via encrypted VPN tunnel.

### RTX Layer 2 Segmentation

- Configure one interface in RTX using VLAN segmentation according to the VLAN Table in Appendix.
  - The interface name and ordering is sometimes assigned randomly due to an unknown bug in Cisco IOS, so please check connectivity carefully.
- VLAN Tagging already handled by virtual switch. There is no additional configuration on the server-side interface.

## DAY 1 – LINUX SERVICES

### Basic Configuration

- Configure IP Address of all Linux devices according to the addressing table.
  - Create SSH user 'patah' with password specified in the appendix.
  - Enable SSH access from any devices.

### Connectivity

- Configure port NAT in fw.sabang.net to enable access to other networks.

### Sabang DNS

- Access srv1 and srv2 and install bind9. Configure it to serve domain sabang.net and indonesia.com using the private addresses.
- Create A records of srv1.sabang.net, srv2.sabang.net, and CA.indonesia.com that points to their respective addresses.
- Create NS records:
  - ns1.sabang.net that points to address of srv1.sabang.net
  - ns2.sabang.net that points to address of srv2.sabang.net
- On both name servers, create the following subdomains using address record:
  - www.sabang.net that points to all addresses of fw.sabang.net
  - cert.indonesia.com that points to the address of CA.indonesia.com.
  - 100 user subdomain that points to all addresses of fw.sabang.net.:
    - user001.public.sabang.net
    - user002.public.sabang.net
    - user003.public.sabang.net
    - ...
    - user099.public.sabang.net
    - user100.public.sabang.net

## Sabang Web Hosting

- Access srv1 and srv2 and install apache2. Configure it to serve all websites in sabang.net.
  - Install curl to test the web service.
- Create /var/www/index.html default page with content specified in Appendix.
- Create /var/www/userXXX/index.html default page for 100 users with content specified in Appendix. Example:
  - /var/www/user001/index.html
  - /var/www/user002/index.html
  - /var/www/user003/index.html
  - ...
  - /var/www/user099/index.html
  - /var/www/user100/index.html
- Create virtual host [www.sabang.net](http://www.sabang.net) serving /var/www/index.html
- Create 100 virtual hosts userXXX.public.sabang.net serving /var/www/userXXX/index.html . Example:
  - user001.public.sabang.net serving /var/www/user001/index.html
  - user002.public.sabang.net serving /var/www/user002/index.html
  - user003.public.sabang.net serving /var/www/user003/index.html
  - ...
  - user099.public.sabang.net serving /var/www/user099/index.html
  - user100.public.sabang.net serving /var/www/user100/index.html

## Sabang Load Balancer

- Access fw.sabang.net and install haproxy. Configure it to loadbalance web requests.
  - Use /etc/haproxy/haproxy.cfg configuration file.
  - Do not change default configuration values.
- Load Balance www.sabang.net with round robin algorithm. Name the backend sabang\_www
- Load Balance 100 user websites with source ip algorithm. Name the backend sabang\_user
  - user001.public.sabang.net
  - user002.public.sabang.net
  - user003.public.sabang.net
  - ...
  - user099.public.sabang.net
  - user100.public.sabang.net

**Sabang Failover**

- Access srv1 and srv2 and install keepalived. Configure it to serve as a failover when one of the servers is down.
  - Set srv2 as backup.
  - Use virtual IP 172.16.1.205
  - Use VRRP ID 205
  - Use script to check DNS service. When DNS service is down, move virtual IP to another server.

**Sabang iSCSI**

- Access srv1 and srv2 and install tgt. Configure it to serve iSCSI target in sabang.net.
  - Use device /dev/sdb, /dev/sdc, /dev/sdd, /dev/sde, /dev/sdf, /dev/sdg, /dev/sdh, /dev/sdi, /dev/sdj, /dev/sdk
  - A total of 20 disks will become iSCSI targets
- Access fw.sabang.net and install open-iscsi. Configure it to connect to iSCSI target in srv1 and srv2.
  - Don't create any filesystem on the disk.
  - Make sure both disks from srv1 and srv2 are available on fw.sabang.net.

**Sabang DHCP**

- Access fw.sabang.net and install any dhcp server. Configure to serve DHCP in sabang.net.
  - Network: 172.16.0.0/20
  - Available Addresses: 172.16.0.1 - 172.16.14.253
  - Gateway: 172.16.15.254
- Create static lease for srv1 and srv2. Configure those servers to use DHCP.

## APPENDIX

### Users and Passwords

Username	Password	Remark
patah	KesultananDemak2021	New User
user	Skills39	-
Administrator	Skills39	Windows Server only
root	Skills39	Debian only

### Network Devices Addressing Table

Device Name	IP Address CIDR	Network
RTX	172.17.1.2/30	edge.sabang.net
	192.168.199.1/21	indonesia.com
	172.10.1.1/16	client
	30.9.65.9/29	Public
RTB	30.9.65.11/29	Public
	172.17.9.1/22	merauke.net

### End Devices Addressing Table

Device Name	IP Address CIDR	Network
srv1.sabang.net	172.16.1.201/20	sabang.net
srv2.sabang.net	172.16.1.202/20	sabang.net
fw.sabang.net	172.16.15.254/20	sabang.net
	172.17.1.1/30	edge.sabang.net
CA	192.168.192.168/21	indonesia.com
DC	172.17.10.100/22	merauke.net
STORAGE	172.17.11.102/22	merauke.net
budi-pc	172.10.19.45/16	client

**VLAN Table**

VLAN ID	Network Address
10	172.17.1.0/30
20	192.168.192.0/21

/var/www/index.html

```
<h1> Default Page </h1><br>
<br>
This page has not been modified by the owners.
```

/var/www/userXXX/index.html [Replace XXX in the folder name and file content with user number, for example /var/www/user009/index.html]

```
<h1> Default Page for userXXX </h1><br>
<br>
This page has not been modified by the user.
```



## TOPOLOGY

