

**LOMBA KOMPETENSI SISWA  
PENDIDIKAN MENENGAH  
TINGKAT PROVINSI  
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**TEST PROJECT  
MODUL – NETWORK SYSTEMS  
IT NETWORK SYSTEMS ADMINISTRATION**

# Introduction

Network technology knowledge is becoming essential nowadays for people who want to build a successful career in any IT engineering field. This test project contains a lot of challenges from real life experience, primarily IT integration and IT outsourcing. If you can complete this project with the high score, you are ready to service the network infrastructure for any multi-branch enterprise.

## Description of project and tasks

This test project is designed using a variety of network technologies that should be familiar from the Cisco certification tracks. Tasks are broken down into following configuration sections:

Basic Configuration

- Switching
- Routing
- Services
- Security

All sections are independent but all together they build very complex network infrastructure. Some tasks are simple and straightforward; others may be tricky.

## Instructions to the Competitor

Your configuration will be marked with scripts, so therefore we need two important basic configurations:

1. no ip domain-lookup
2. exec-timeout 0 0 on console

## Basic Configuration

1. Configure device hostname according to the topology.
2. Configure domain name to "lks2025.id" on all devices.
3. Configure privileged mode password "P@ssw0rd" on all devices.
4. Create user "admin" with password "P@ssw0rd" with maximum privilege.
5. Configure IPv4 and IPv6 address on all devices according to the addressing table.
6. Display banner "Unauthorized Access is Strictly Prohibited" before user authentication on all devices. Use '!' as the delimiting character.

## Switching

1. Configure link aggregation on DC switches refer to the list below. The L3 switches must act as a negotiator to perform link aggregation if using negotiation protocol, meanwhile other switch must be configured as the responder.
  - a. SWL3-1 (channel 1) <=> SWL2-1 (channel 1) protocol using open-standard protocol (LACP)
  - b. SWL3-1 (channel 2) <=> SWL3-2 (channel 2) without using any negotiation (on)
  - c. SWL3-2 (channel 3) <=> SWL2-2 (channel 3) using Cisco proprietary protocol (PAgP)
2. Configure VTP version 2 with SWL3-1 as the VTP Server. Other switches must be configured as VTP client. Use VTP Domain **lks2025.id** and VTP Password **P@ssw0rd** Configure VLAN on the VTP server:
  - VLAN 30 (MANAGEMENT)
  - VLAN 40 (INTERNAL)
  - VLAN 50 (SERVER)
  - VLAN 99 (NATIVE)
3. Configure port connected to the end device as the access port and enable portfast feature on the port. Refer to Topology Diagram for VLAN Access.
4. Configure all port channel interface as the trunk port and only allow the created VLAN to be passed. Configure VLAN 99 as the Native VLAN.

## Routing

1. Configure EIGRP routing IPv4 on TM Sites with AS 10.
  - a. Advertise network VLANS 30, 40 and 50 on SWL3.
  - b. Make sure both TM routers can access all internal networks.
  - c. Configure passive interface on an interface that does not require EIGRP updates.
  - d. Configure Router ID
    - TMT-1 : 21.21.21.21
    - TMT-2 : 22.22.22.22
    - SWL3-1 : 23.23.23.23
    - SWL3-2 : 24.24.24.24
2. Configure OSPF Routing IPv4 on the CORE and other routers connected to CORE Router with process ID 10.
  - a. Advertise all installed networks including interface loopback except Internal TMT network (only network connected to CORE Router).
  - b. Configure the passive interface on the interface connected to SWL3.
  - c. Configure Router ID
    - BRT-1 : 1.1.1.1
    - BRT-2 : 8.8.8.8

- CORE : 9.9.9.9
- TMT-1 : 2.2.2.2
- TMT-2 : 3.3.3.3

3. Configure default route on SWL3-1 to TMT-1 and SWL3-2 to TMT-2. Use directly connected static route (exit interface).

## Services

1. Configure Network Address Translation IPv4
  - a. Configure dynamic port translation on TMT-1 and TMT-2 for the LAN subnet. VLAN 30, 40 and 50 IPv4 addresses are translated into IPv4 address of interface connected to the CORE. Create ACL with name VLANS to define source network.
2. Configure FHRP on TM site.
  - a. Configure HSRP IPv4 version 2 on TM for VLAN 30, VLAN 40 and VLAN 50 with group number same as the VLAN number.
    - SWL3-1 should be as forwarding packet for VLAN 30 and VLAN 50
    - SWL3-2 should be used as forwarding packet for VLAN 40.
  - b. Use the last Host IP of each VLAN as the virtual Router IP.
3. Configure DHCP service for TM site.
  - a. Configure DHCPv4 on TMT-2 Router for client on both TM VLANs (VLAN30 & VLAN40).
  - b. The IP range available for both pools is only 100 Host IPs from 101 to 200.
  - c. Use the virtual IP Router from FHRP as a gateway.
  - d. Use TM-SRV as DNS Server.
  - e. Make sure both TM clients get IP from TMT-2 router.
4. All Router devices must be synchronizing its time with BR-SRV.

## Security

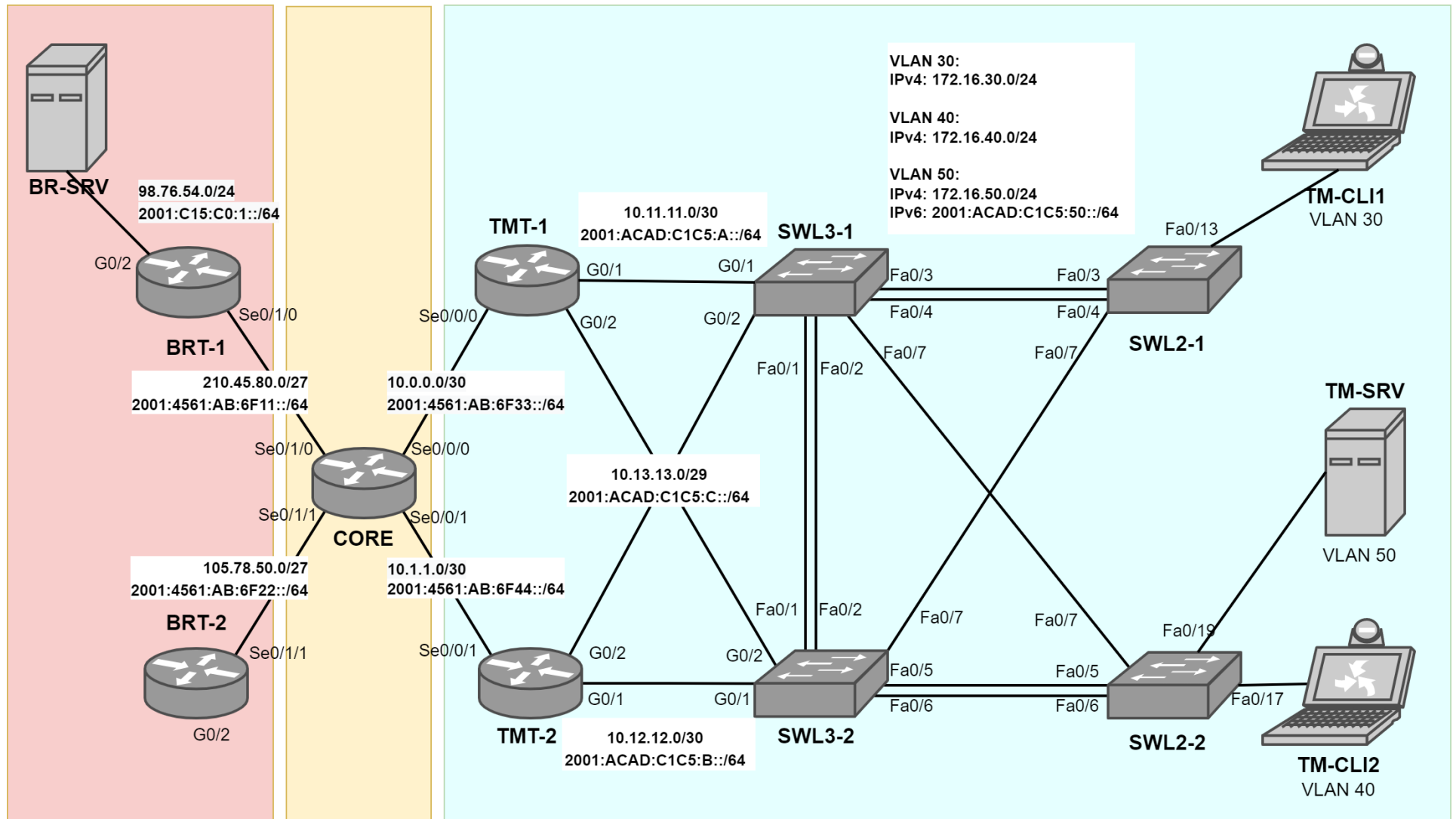
1. Configure SSH version 2 on both TMT-1 and TMT-2 devices.
  - a. Use local authentication
  - b. Only allow SSH traffic from 172.16.30.0/24 (use SSH as ACL Name)
3. Configure port security on SWL2-1 and SWL2-2 switch that is connected to hosts. Permit maximum 2 MAC Address and save those MAC address on running-config. In case of policy violation, the port should not be err-disabled but only save to syslog.

## Addressing Table

DEVICE	INTERFACE	ADDRESS
CORE	Ser0/1/0	210.45.80.1/27 2001:4561:AB:6F11::1/64
	Ser0/1/1	105.78.50.1/27 2001:4561:AB:6F22::1/64
	Ser0/0/0	10.0.0.1/30 2001:4561:AB:6F33::1/64
	Ser0/0/1	10.1.1.1/30 2001:4561:AB:6F44::1/64
BRT-1	Ser0/1/0	210.45.80.2/27 2001:4561:AB:6F11::2/64
	GigabitEthernet0/2	98.76.54.1/24 2001:C15:C0:1::1/64
	Loopback1	1.1.1.1/32
BRT-2	Ser0/1/1	105.78.50.2/27 2001:4561:AB:6F22::2/64
	Loopback1	8.8.8.8/32
BR-SRV	Ethernet0	98.76.54.10/24 2001:C15:C0:1::10/64
TMT-1	GigabitEthernet0/1	10.11.11.1/30 2001:ACAD:C1C5:A::1/64
	GigabitEthernet0/2	10.13.13.1/29 2001:ACAD:C1C5:C::1/64
	Ser0/0/0	10.0.0.2/30 2001:4561:AB:6F33::2/64
TMT-2	GigabitEthernet0/1	10.12.12.1/30 2001:ACAD:C1C5:B::1/64
	GigabitEthernet0/2	10.13.13.2/29 2001:ACAD:C1C5:C::2/64
	Ser0/0/1	10.1.1.2/30 2001:4561:AB:6F44::2/64
SWL3-1	GigabitEthernet0/1	10.11.11.2/30
	GigabitEthernet0/2	10.13.13.4/29
	VLAN30	172.16.30.1/24
	VLAN40	172.16.40.1/24

DEVICE	INTERFACE	ADDRESS
	VLAN50	172.16.50.1/24
<b>SWL3-2</b>	GigabitEthernet0/1	10.12.12.2/30
	GigabitEthernet0/2	10.13.13.3/29
	VLAN30	172.16.30.2/24
	VLAN40	172.16.40.2/24
	VLAN50	172.16.50.2/24
<b>SWL2-1</b>	VLAN30	172.16.30.11/24
<b>SWL2-2</b>	VLAN30	172.16.30.12/24
<b>TM-CLI1</b>	Ethernet0	DHCP
<b>TM-CLI2</b>	Ethernet0	DHCP
<b>TM-SRV</b>	Ethernet0	172.16.50.10/24 2001:ACAD:C1C5:50::10/64

# Network Topology



## Routing Diagram

