Balai Pengembangan Talenta Indonesia
Kementerian Pendidikan Dasar dan Menengah

KEMENDIKDASMEN RAMAH #PENDIDIKAN BERMUTU UNTUK SEMUA

LKS DIKMEN
TINGKAT NASIONAL

KISI-KISI SOAL

LOMBA KOMPETENSI SISWA DIKMEN 2025

SMK/SMA/MAK/MA

Cabang Ajang

Teknologi Informasi Sistem Administrasi Jaringan

(IT Network System Administration)

KISI-KISI

TEKNOLOGI INFORMASI SISTEM ADMINISTRASI JARINGAN

(IT NETWORK SYSTEMS ADMINISTRATION)

LOMBA KOMPETENSI SISWA SEKOLAH MENENGAH KEJURUAN
TINGKAT NASIONAL XXXIII
TAHUN 2025

Modul A - Linux Environment

Description

In the heart of a growing digital infrastructure, a new challenge was set: to design and deploy a fully integrated Linux Environment that mirrors the real-world demands of enterprise-grade networks. This was the mission to architect a secure, resilient system where each component worked in harmony.

The journey began with the foundation of all communication: DNS. Using BIND9, the team built a reliable naming system, carefully crafting forward and reverse zones to ensure that services could be reached by name rather than cryptic IPs.

Next came LDAP, the digital directory of users and credentials. With slapd, they created a centralized identity hub that connected email services and VPN access. Users could now authenticate seamlessly, whether sending mail or tunneling into the network from afar.

But security was paramount. So, they rolled up their sleeves and built their own Certificate Authority using OpenSSL. This CA would become the gatekeeper of trust, issuing certificates for the web servers, mail servers, and even the VPN, ensuring encrypted, tamper-proof communication across the board.

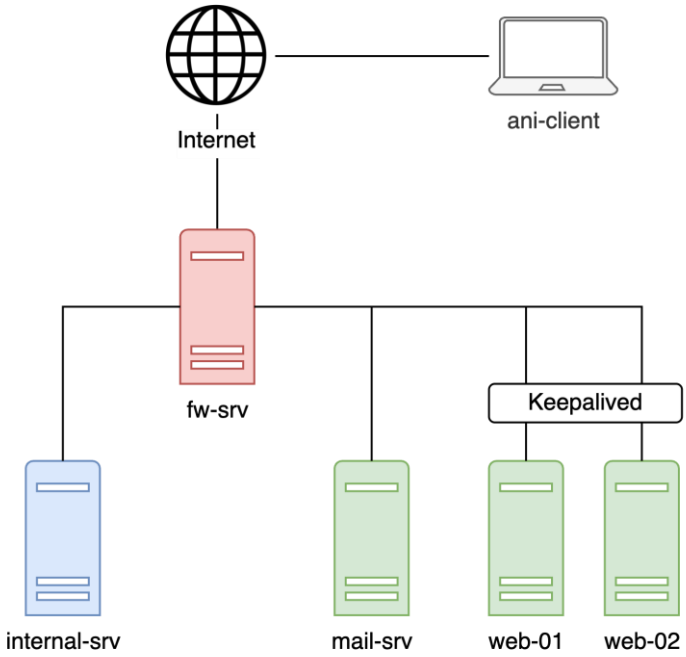
For public-facing applications, they deployed two web servers: web-01 and web-02. To prevent downtime, they introduced Keepalived, assigning a virtual IP that could failover between nodes. Sitting in front was HAProxy, smartly routing incoming traffic based on load. NGINX handled backend duties, serving websites with certificates from their in-house CA. For internal access, they created a virtual host protected with basic authentication—a hidden gateway for administrators. This internal NGINX server was provisioned and configured automatically using **Ansible**, including tasks to install the web server, apply custom configuration, and enable basic HTTP authentication.

Communication wasn't complete without email. Using Postfix and Dovecot, they set up a mail server capable of both delivery and retrieval. On top of it, they added Roundcube, giving users a friendly web interface to access their inboxes. With LDAP integration and SSL encryption, the system was both seamless and secure.

To shield and control the network, the team configured nftables, a modern firewall tool, crafting rules to protect every service deployed.

Finally, they turned to remote access. With OpenVPN, they created a secure tunnel into the network. Only users authenticated via LDAP could connect. Once inside, clients could reach the web server (www) via the firewall's public IP, and log in to their webmail through Roundcube just as if they were onsite.

Topology



Services

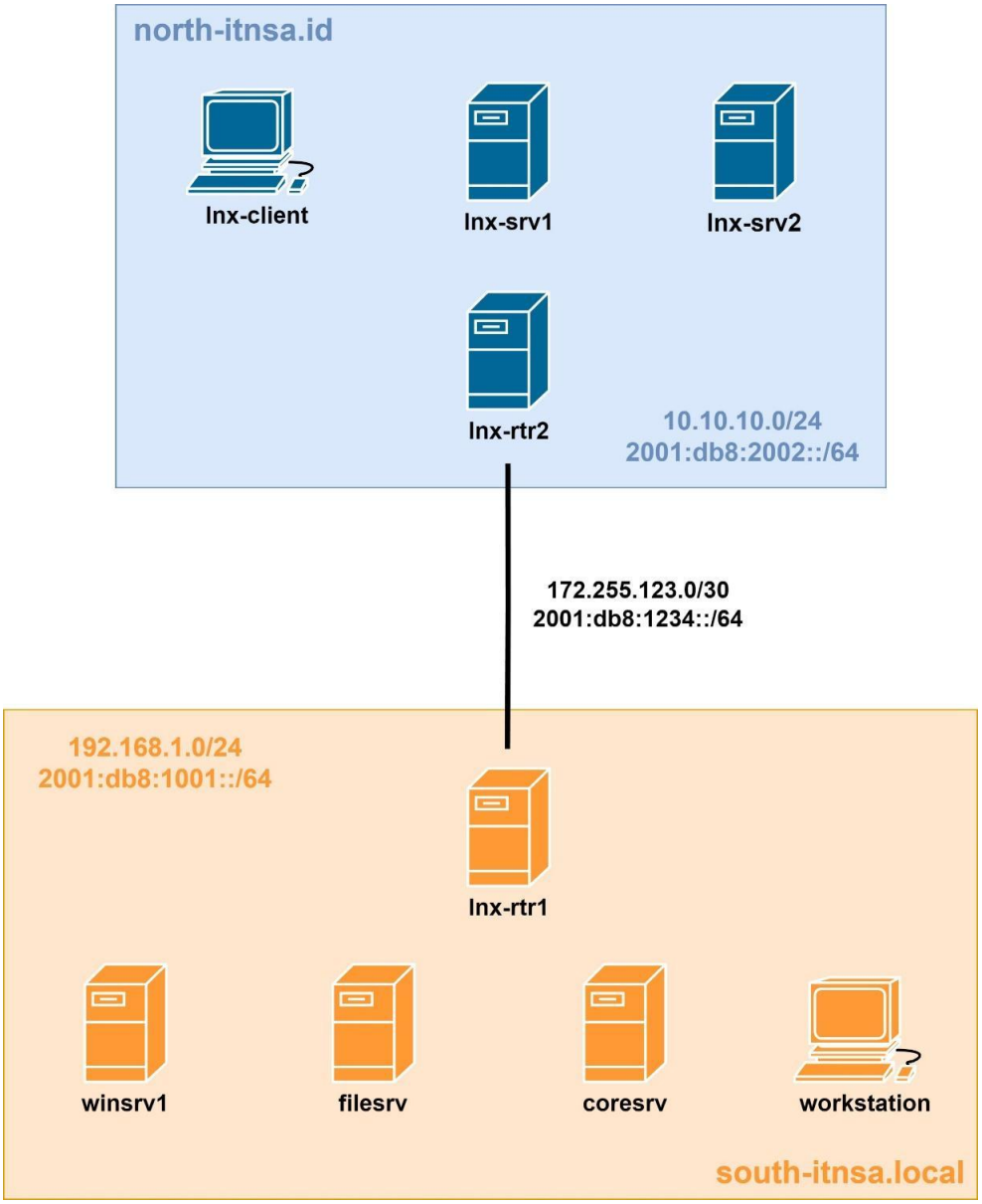
- **internal-srv**
  - DNS Server (Bind9)
  - LDAP Directory (slapd)
  - Certificate Authority (OpenSSL)
  - Ansible
- **fw-srv**
  - Security (nftables)
  - VPN Server (OpenVPN)
- **mail-srv**
  - Mail Server (Postfix & Dovecot)
  - Web Mail (Roundcube)
- **web-01 & web-02**
  - Virtual IP (Keepalived)
  - Load Balancer (Haproxy)
  - Web Server (Nginx)
- **ani-client**
  - VPN Client (OpenVPN)

Modul B – Troubleshooting - System Integration

Description

You are system administrator for a company named **itnsa.id**. This company has two sites (North and South). Each site implements a different technology stack. The North site is using technology from Microsoft, while the South site is using an open-source solution (Linux Debian). There is some problem happening on each site; your task is to use the provided network topology diagram to diagnose these problems and issues, then restore it until all resources on each site are operational.

Topology



No information Services for this Module

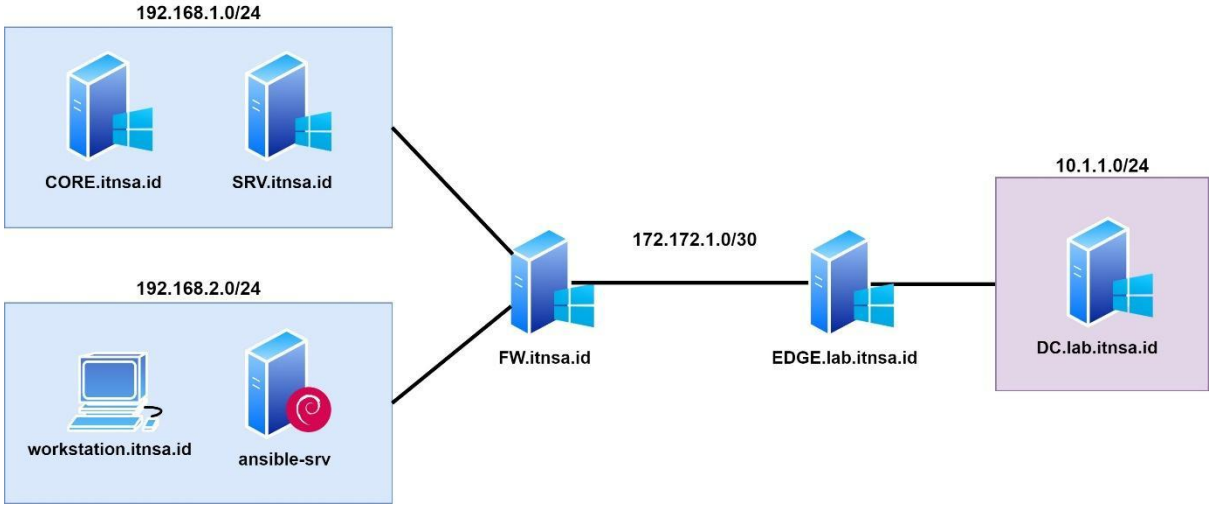
Modul C - Windows Environment

Description

You have been appointed as the system administrator for itnsa.id and lab.itnsa.id. In this organization, Microsoft technologies are primarily used to provide centralized management, file services, and web services. At the same time, Ansible is utilized to automate system configuration, deployment, and routine administrative tasks.

Your role is to ensure all services are properly configured, integrated, and operational within the given time constraints. Attention to detail and time management are critical to your success in this assignment.

Topology



Services

- **CORE.itnsa.id**
  - Act as Domain Controller for `itnsa.id`
  - AD Object creation (using PowerShell to create it)
  - AD Site and Replication config
  - DNS Server for `itnsa.id` (Forward and Reverse)
  - Policy configuration

- **SRV.itnsa.id**
  - Server for Client Resources (Shared Folder, Web Services, Backup)
  - Personal shared folder
  - Group shared folder
  - DFS namespaces
  - DFS replication master
  - IIS Web services
  - FSRM

- **WORKSTATION.itnsa.id**
  - Client of `itnsa.id`

- **ansible-srv**
  - Ansible Controller
  - NOT JOINED TO DOMAIN

- **EDGE.itnsa.id**
  - Server for DFS replication, DHCP and Router (itnsa.id)
  - DHCP for client inside itnsa.id
  - DFS namespaces
  - DFS replication backup
  - RRAS for Routing and NAT
  - Site to Site VPN Gateway

- **EDGE.lab.itnsa.id**
  - Server for DHCP and Router (lab.itnsa.id)
  - DHCP for client inside lab.itnsa.id
  - RRAS for Routing and NAT
  - Site to Site VPN Gateway

- **DC.lab.itnsa.id**
  - Act as Domain Controller for `lab.itnsa.id`
  - Child domain of `itnsa.id`
  - AD Object creation (manual)
  - AD Site and Replication config
  - DNS Server for `lab.itnsa.id` (Forward)

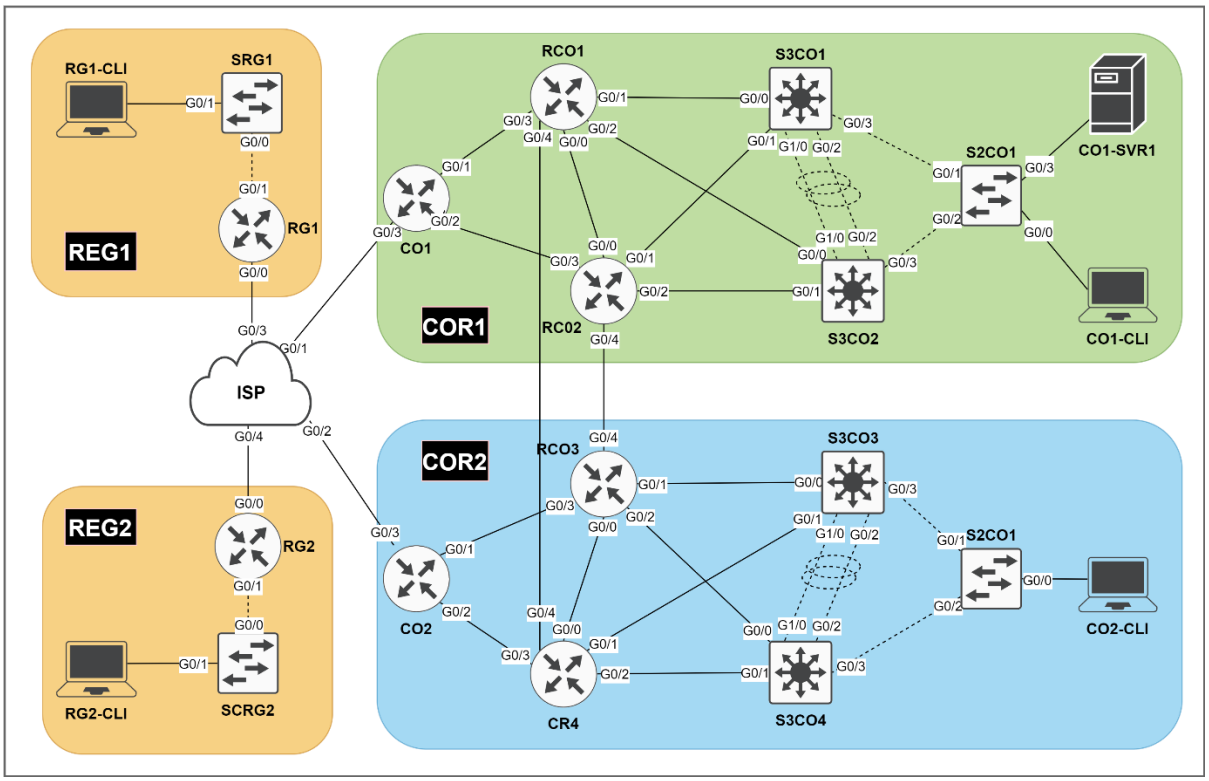
Modul D - Network Systems

Description

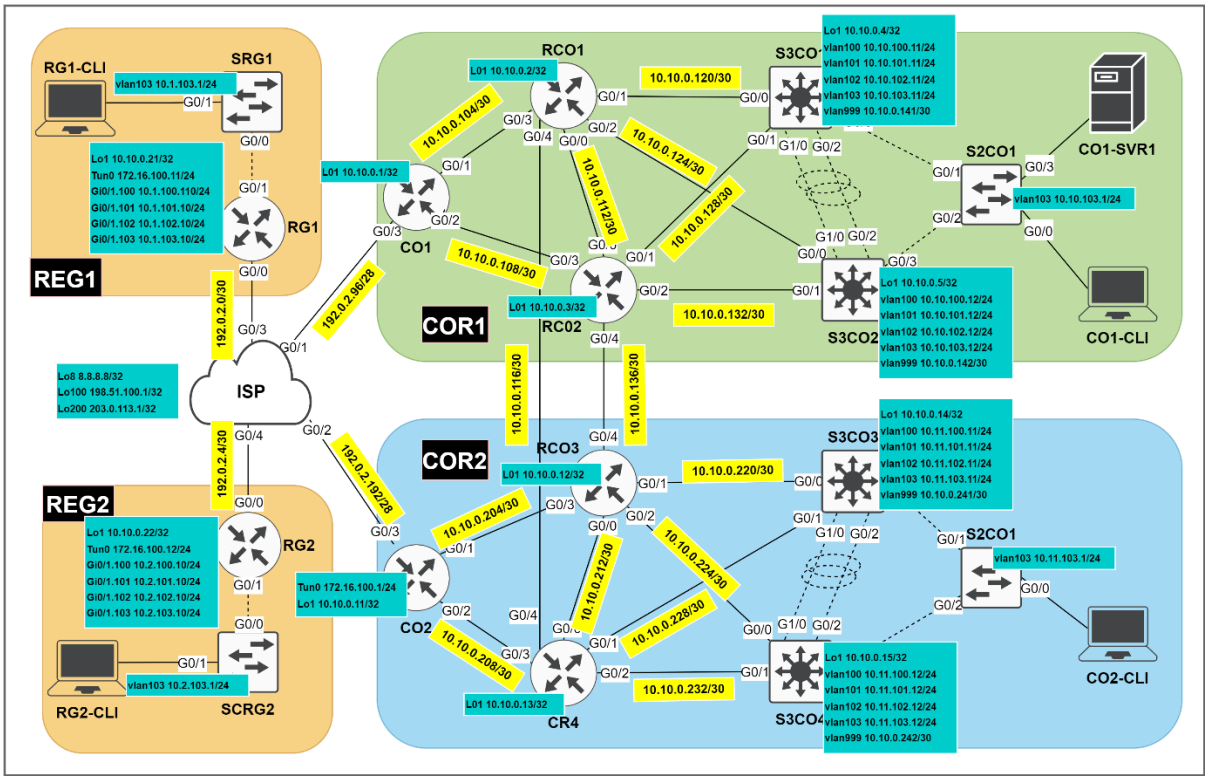
In today's IT landscape, proficiency in network technology is increasingly vital for individuals aspiring to excel in any IT engineering discipline. This test project presents numerous challenges drawn from real-world scenarios, focusing predominantly on IT Networking and Integration. Successfully completing this project with a high score demonstrates your readiness to manage network infrastructures for multi-branch enterprises.

This test project is designed using a variety of network technologies that should be familiar to those who have studied for Cisco CCNA - Implementing and Administering Cisco Solutions certification track. In addition to the knowledge gained from this certification track, you are expected to have ENARSI (Implementing Cisco Enterprise Advanced Routing and Services) certification knowledge to complete this Test Project.

Topology



Gambar Topologi Module C – Network Systems



Gambar Skema IP Address Module C – Network Systems

Services

- **Basic Configuration Router & Switch**
- **Layer 2**
  - VLAN Configuration
  - Virtual Trunking Protocol (VTP)
  - Spanning-Tree Protocol
  - Link Aggregation (LACP/PAGP mode Interfaces)

- **Layer 3**
  - IPv4 and IPv6 addressing
  - Static Routing
  - Dynamic Routing Protocol (EIGRP & OSPF)
  - Border Gateway Protocol

- **IP Services**
  - DHCP
  - FHRP
  - Network Address Translation

- **Security & VPN**
  - VPN (DMVPN)
  - Access Controll List
  - Port Security
  - Remote SSH