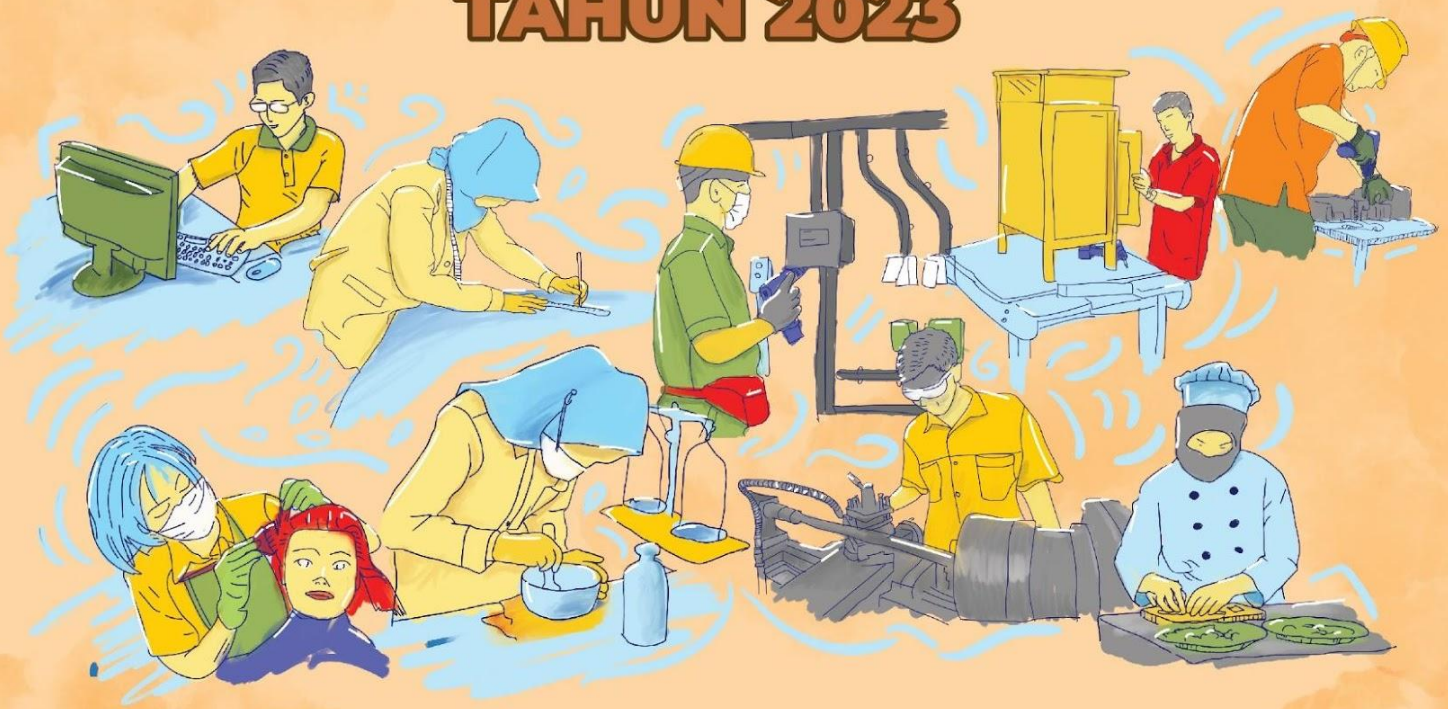
BALAI PENGEMBANGAN TALENTA INDONESIA
PUSAT PRESTASI NASIONAL
SEKRETARIAT JENDERAL
KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI

MERDEKA BELAJAR

LKS SMK-DIKSUS

# SOAL

## LOMBA KOMPETENSI SISWA SMK TINGKAT NASIONAL TAHUN 2023



## BIDANG LOMBA

**Teknologi Informasi Sistem Administrasi Jaringan**

*(IT Network System Administration)*

MERDEKA BERPRESTASI
Talenta Vokasi Menginspirasi

# ACTUAL TEST PROJECT
# MODUL B - INFRASTRUCTURE PROGRAMMABILITY & AUTOMATION

## *IT NETWORK SYSTEMS ADMINISTRATION*

**KELOMPOK INFORMATION AND COMMUNICATION TECHNOLOGY**

# Introduction

This Test Project consists of the following documentation/files:

- ITNSA_MC_ACTUAL_en.docx
- hosts (on BASTION VM: /etc/ansible)
- users.csv (on BASTION VM: /etc/ansible)
- .vault_pass (on BASTION VM: /etc/ansible)
- customers.json (on BASTION VM: /etc/ansible)

Accurate and up-to-date documentation has always been a challenge in IT. With multiple engineers working on the same systems, it is hard to keep track of who changed what. Applix Corporation decided to fix this problem and hired you to modernize, harden and extend their infrastructure.

# Documentations

The following documentations installed to DEV-LIN. You can use it with Zeal Docs.

- Ansible (version 2.10.8)
- Python 3 (version 3.9.2)
- Jinja (version 2.11.3)

# Description of Project and Tasks

You will be migrating VMs to Infrastructure as Code (IaC) and simplify the process of creating new services. You have access to development VMs (DEV-LIN). These VMs can be used for developing and testing your work.

**Login for all VMs and Devices:**

**Linux**

Username : root/user

Password : P@ssw0rd

**Windows**

Username : administrator/user

Password : P@ssw0rd

All VMs and devices are connected to the management network (10.22.0.0/24) and have a statically configured IP address. All IP addresses in network table will not change for marking. The management network will be used for configuring the different hosts. You can login using username and password over SSH or WinRM.

You may install any additionally required packages and features on the VMs.

# Instructions to the Competitor

## Part 1. Linux

Use Ansible to configure the Linux hosts LIN[1-4] from BASTION VM. there is preconfigured hosts file located under /etc/ansible/hosts. Do not change this file. Before assessment all LIN[1-4] VMs will be reset to original state and the LIN[1-4] VMs will be randomly removed and added to different groups in the hosts file. For marking, all playbooks will be run in order using the command “ansible-playbook playbookname.yml” in the /data/ansible/linux directory.

Variables like “hostname”, “webport” and “webcolor” in /etc/ansible/hosts are subject to change for marking.

### General

- Create a directory /data/ansible/linux
  - Place all playbooks directly inside this directory.
  - Feel free to create any additional folders or files you might need within this directory for executing the playbooks again.
  - When you run the playbooks for the second time, every task should either be in the “ok” state or be “skipped.”
  - For security, use the /etc/ansible/.vault_pass file to encrypt the ansible username and password, ensuring they are automatically decrypted when the playbooks are executed.

### Hostname

- Create a playbook called 1-hostname.yml for configuring the hostname
  - Every host should be assigned a hostname, derived from the “hostname” variable found in the /etc/ansible/hosts file.

### DNS

- Create a playbook called 2-dns-server.yml for configuring at least two DNS servers
  - Install a DNS service on all hosts in the group “dns”
  - The first host in “dns” group should be master for the domain “lksn2023.com”
  - All other hosts in this group should be slave DNS servers for domain “lksn2023.com”
  - Ensure every host listed in /etc/ansible/hosts has an A record for <hostname>.lksn2023.com.
  - The domain intranet.lksn2023.com must point to 10.22.0.51.
- Create a playbook called 3-dns-client.yml
  - Make sure, that all LIN Servers and BASTION use first DNS host as primary DNS server and all slave DNS servers as secondary nameserver
  - Set the DNS suffix to “lksn2023.com”.

### Web

- Create a playbook called 4-web-server.yml for configuring two or more web servers
- Install a web service on all hosts in the group “web”
  - The local website should listen on port “webport” variable in /etc/ansible/hosts
  - Display the following content with textcolor based on the “webcolor” variable in /etc/ansible/hosts file

    “Hello from <hostname> !”

- Create a virtual host listening on port 8081 called “intranet.lksn2023.com” displaying the following content

  “Welcome to the intranet of LKSN 2023”
  “This site was served by <hostname>”

### High availability intranet

- Create a playbook called 5-ha-intranet.yml for configuring two or more HA servers
- Install keepalived and HAProxy on all hosts in the group “ha”
  - Configure 10.22.0.51 as floating IP and use the last host in “ha” group as VRRP master
  - If the master fails, the second last server in the ha group should take over and so on (priority in reverse order)
  - Use password authentication
  - Configure HAProxy to load balance “http://intranet.lksn2023.com” between all available web servers using round robin
    - Add Header “x-haproxy-host” with the hostname of current HAProxy host

### Users

- Create a playbook called 6-users.yml for importing users on all LIN hosts
  - Import the users from /etc/ansible/users.csv on all LIN hosts
  - Make sure, that password is not changed if there is already an existing user with same username and UID

## Part 2. Windows

Use Ansible for configuring the Windows hosts, labeled as WIN, from the BASTION VM. A pre-configured hosts file is already available at /etc/ansible/hosts. This file should remain unchanged. For evaluation purposes, all playbooks will be executed in sequence using the command “ansible-playbook playbookname.yml” within the /data/ansible/windows directory.

### General

- Create a directory /data/ansible/windows
  - All playbooks should be located at the root of this directory
  - You are free to create folders/files in this directory for running the playbooks
  - Make sure ansible username, password and certificate secrets are encrypted and automatically decrypted when running the playbooks

### Hostname

- Create a playbook called 1-hostname.yml for configuring the hostname
  - All hosts should receive the hostname based on the “hostname” variable in /etc/ansible/hosts file

### Security and logging

- Create a playbook called 2-sec-log.yml for configuring security settings
  - Stop and disable the Remote Desktop Service on all Windows hosts

### Customer Deployments

- Create a playbook called 3-environment.yml for installing the customer environment
  - Configure all servers in group “dc” as DNS servers on all WIN hosts
  - Configure all servers in group “dc” as domain controller
    - Use customers.com as domain name
    - Use “P@ssw0rd” as safe password
  - Install IIS feature in group “iis”
- Create a playbook called 4-customers.yml for deploying customer web environments
  - For each customer in /etc/ansible/customers.json file
    - Create an OU based on “name” attribute
    - Create an AD user based on “username” and “password” attribute in this OU

- Create a DNS entry for domain_prefix.customers.com pointing to a random IIS server and use domain_prefix as randomization seed
- Create a virtual host listening on port 80 on the selected IIS server which displays the “message” attribute

# Equipment, machinery, installations, and materials required

## Network table

| ID | IP | OS | DESCRIPTION |
|---|---|---|---|
| DEV-LIN | 10.22.0.251 | Debian 11.7 (GNOME) | Development VM with the following software installed:<br>- Python3<br>- Zeal Docs<br>- Visual Studio Code |
| BASTION | 10.22.0.50 | Debian 11.7 | Bastion Server for deployer ansible with the following software installed:<br>- Ansible<br>- Python3 |
| LIN1 | 10.22.0.1 | Debian 11.7 | Dynamic Config |
| LIN2 | 10.22.0.2 | Debian 11.7 | Dynamic Config |
| LIN3 | 10.22.0.3 | Debian 11.7 | Dynamic Config |
| LIN4 | 10.22.0.4 | Debian 11.7 | Dynamic Config |
| WIN | 10.22.0.101 | Windows Server 2019 | Dynamic Config |

# Topology