



**PERTANDINGAN WORLDSKILLS  
MALAYSIA KATEGORI BELIA (WSMB)  
TAHUN 2020**

**( IT NETWORK SYSTEM  
ADMINISTRATION )**

**TECHNICAL DESCRIPTIONS**

**JABATAN PEMBANGUNAN KEMAHIRAN  
KEMENTERIAN SUMBER MANUSIA**

## 1.0 **WORLD SKILLS STANDARDS SPECIFICATION**

### **THE TEST PROJECT**

---

#### **1.1 FORMAT/STRUCTURE OF THE TEST PROJECT**

| PERIOD   | MODULE               | TASKS                                      |
|----------|----------------------|--------------------------------------------|
| Module A | Linux Environments   | Installation, configuration, and upgrading |
| Module B | Windows Environments | Installation, configuration, and upgrading |
| Module C | Cisco Environments   | Installation, configuration, and upgrading |

#### **1.2 TEST PROJECT DESIGN REQUIREMENTS**

Each Test Project module must be:

- At a level that a Competitor can comfortably complete;
- The highest level of difficulty in the competition included modules, must be less than equal to the following certification levels:
- Cisco Certified Network Associate (CCNA) Routing and Switching;
- Cisco Certified Network Associate (CCNA) Security;
- Cisco Certified Network Associate (CCNA) Voice;
- Microsoft Certified Solutions Expert (MCSE): Desktop Infrastructure;

- Microsoft Certified Solutions Expert (MCSE): Server Infrastructure; • Advanced Level Linux Certification LPIC-2 or equivalent skill set.

## 2.0 WORLDSKILL ASSESSMENT SPECIFICATION

The module marking criteria as follow. The following is not a definitive list but is an example of possible aspects which will be assessed:

| MODULE | TASKS |
|--------|-------|
|--------|-------|

|                    |                       |                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linux Environments | Basic Config          | Hostname, IP, Banner, Keyboard, Locale, Curl and SSH                                                                                                                                                                                                                                                                                                               |
|                    | Webserver application | Apache HTTPS-only, Apache certificate, Apache / PHP, Redis PHP Module, WWW Subfolder, Subfolder authentication, Redis web script and output                                                                                                                                                                                                                        |
|                    | DNS                   | Forwardzone A records CNAME DNS Reverse                                                                                                                                                                                                                                                                                                                            |
|                    | Mail                  | Mail directory, LDAP User, Secure SMTP Certificates SMTPS e IMAPS                                                                                                                                                                                                                                                                                                  |
|                    | FTP                   | FTP - Virtual user FTP - Sessions FTP - Chroot and Rename                                                                                                                                                                                                                                                                                                          |
|                    | Firewall              | Firewall clients network snat not working from another networks, Firewall SSH service on each host, Firewall stateful mode, Firewall all client sourced traffic allowed, Firewall ICMP ping allowed to local machine, Firewall default chains policy, Firewall LDAP and RADIUS services, Firewall L2TP/IPSec, Firewall clients network snat working, Firewall DNAT |
|                    | Reverse Proxy         | HAproxy load balancing, HAproxy load balancing (Header)                                                                                                                                                                                                                                                                                                            |
|                    | Authentication        | Root login and LDAP Users, SSH Login permissions ,Radius installed & running                                                                                                                                                                                                                                                                                       |
|                    | Share                 | RAID 5, Samba – Login, Samba - Home directory restriction, DFS folder, DFS accessible, Share is not visible, Samba login                                                                                                                                                                                                                                           |
|                    | LDAP                  | LDAP domain, LDAP domain secondary domain, LDAP Users, LDAP Users secondary domain ,CA, LDAP offline login, Only users in OU Mail can authenticate Rsync                                                                                                                                                                                                           |

|                     |                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | <p>Backup / Replication</p> <p>Monitoring</p> <p>VPN L2T</p> <p>CLIENT</p> <p>Routing</p>                        | <p>Redis entry, Update script, Update script schedule, Listing Script</p> <p>Cacti installed and collecting data, Icinga installed and notifies, Icinga notification received</p> <p>VPN is connected, VPN start/stop script, VPN IP-range,</p> <p>VPN routing, VPN services, VPN authentication, VPN Certificate</p> <p>Icedove configuration, Icedove sending &amp; receiving, Firefox website, FileZilla connection</p> <p>VLAN configuration, Routing enabled</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Windows Environment | <p>AD</p> <p>DHCP</p> <p>DFS</p> <p>GPO</p> <p>CA</p> <p>DNS</p> <p>DIRECT ACCESS</p> <p>RAID 5</p> <p>SHARE</p> | <p>Trust Relationship to domain, Trust relationship functional test, Creation of OU's, Creation of Groups, Creation of Users from spreadsheet, Daclients members, from edge, correct users in all groups, Migrated users, Migrated user files copied with perms, find expert users - moved and in migration folder, expert users all disabled</p> <p>DHCP configuration, DHCP partnership, DNS on both machines all records front and back</p> <p>DFS namespace ,DFS replication,DFS check</p> <p>disable first sign on GPO, managers website v1, local admin GPO, import user password, gpo expert, visitor user, fine-grained passwordv1, fine-grained passwordv2, GPOs non expert, default home page – edge, ping all 'round for firewall rules.</p> <p>CA setup, CA offline, CA Setup - enterprise sub ca, CA issued by ROOTCA,Template and autoenrollment</p> <p>CRL</p> <p>NCA (connection assistant) server, connect as DA name, DA testing</p> <p>Check disks, RAID array</p> <p>Home folders csv imported users, project share map, project share perms, Customized error messages, managers website v2, Check shares - departments</p> |

|         |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | RDS<br><br>Disk Security<br><br>VPN/RRAS | RDS users, DNS - check records for both websites, path of websites, path and contents of website?, certs from SUB CA, RDS configuration, check rds apps – bitlocker key + share, bitlocker functional test<br><br>RRAS installed - configured?, NAT-port mapping, Site to Site VPN s2s, functional VPN tunnel?, VPN authentication, connect to VPN, connect to internal websites                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Network | ROUTER/SWITCH/FIREWALL                   | Hostname, Domain name, Local passwords and services, RADIUS Database Remote management, RADIUS Fallback, Remote management, Remote management, Local AAA: IOS, Server based AAA, Local AAA: ASA ,IPv4 addressing and connectivity, IPv6 addressing and connectivity, Local time assignment<br><br>VTP Test from SW3, VTP server to SW1 Client, DTP interface status, Trunk link native VLAN, PAgP, Spanning-tree Mode, STP manipulation: priorities, STP manipulation: costs, STP features: root guard, STP manipulation: portfast,<br>EIGRP, Routing authentication, BGP, Route filtering, OSPFv2 neighbors, OSPFv3: Neighbors, OSPFv3: DR\BDR, Route redistribution, Policy-based routing, NAT, GLBP, HSRP, HSRP Authentication, DHCP Reservation, DHCP Client, Syslog, SNMPv2 Configuration backup<br><br>Command privilege levels: user1, Command privilege levels: user2, AAA Role-based CLI: user3, AAA Role-based CLI: user4, AAA Role-based CLI: user5, Port-security, DHCP-snooping, Dynamic ARP inspection<br><br>PPPoE, mGRE: connectivity, DMVPN Details, mGRE: NHRP phase 2, IKEv2 VPN connectivity, IKEv2 VPN traffic, Client-based RA VPN: profiling, Client-based RA VPN: Connectivity, Client-based RA VPN: Split-tunneling 1, Client-based RA VPN: Split-tunneling 2<br><br>Automation and Programmability<br>Basic network automation configuration management mechanisms using Ansible. |

### 3.0 WORLDSKILL ASSESMENT SCHEDULE

| MODULE / DAY          |                   | SCHEDULE |                   |
|-----------------------|-------------------|----------|-------------------|
| C1 Module A ( 6 Hour) | 9.00 am – 1.00 pm | break    | 2.00 pm – 4.00 pm |
| C2 Module B ( 6 Hour) | 9.00 am – 1.00 pm |          | 2.00 pm – 4.00 pm |
| C3 Module C ( 6 Hour) | 9.00 am – 1.00 pm |          | 2.00 pm – 4.00 pm |

### 4.1 TEST PROJECT CHANGE AT THE COMPETITION

- Test Project modules that are independently designed do not have 30% change at the Competition.
- The module teams must add or change a minimum of 30% and produce a corresponding marking scheme for their module Test Project and pass the project to the test group for validation.
- Each Test Project should have a detailed physical topology image followed by a detailed logical topology image.
- Acceptable changes to the modules include the following:
  - ✓ Topology ✓ Functionality ✓
  - Operating System ✓ Software
  - and hardware used



## 5.1 COMPETITOR INFORMATION

All information for registered Competitors is available from the Competitor Centre.

This information includes:

- Competition Rules
- Technical Descriptions
- Marking Schemes
- Test Projects
- Infrastructure List

## 6.0 INFRASTRUCTURE LIST

The Infrastructure List details all equipment, materials and facilities provided by the Competition Organizer and available at:

[WSMB2020 ITSNA SB02.pdf](#)

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring are specified below.

### 6.1 COMPETITOR'S TOOLBOX

Competitors are not required to bring a toolbox.

### 6.2 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY COMPETITORS IN THEIR TOOLBOX

It is optional, but allowed for the Competitors to bring keyboards and mice

### 6.3 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY EXPERTS

Experts and/or Competitors are not required to supply any materials, equipment or tools.

#### 6.4 MATERIALS AND EQUIPMENT PROHIBITED IN THE SKILL AREA

Regarding the use of electronic equipment within the competition area. Devices such as tablet, cell phones, media players, recorders, etc. are to follow WSMB rules and/or by the SMT presented rules for the actual Competition.