



COMPETENCY STANDARD

IT Support Service

Level: 04

(ICT Sector)

Competency Standard Code: CS-ICT-ITSS-L4-EN-V1



**National Skills Development Authority
Prime Minister's Office
Government of the People's Republic of Bangladesh**

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This Competency Standard for **IT Support Service** is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

This document has been developed by NSDA in association with ICT Sector ISC, industry representatives, academia, related specialist, trainer and related employee.

Public and private institutions may use the information contained in this standard for activities benefitting Bangladesh.

Introduction

The NSDA aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skills ecosystem and delivery mechanism through a combination of well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. "**IT Support Service**" is selected as one of the priority occupations of **Information and Communication Technology** Sector. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

Generally, a competency standard informs curriculum, learning materials, assessment and certification of trainees enrolled in Skills Training. Trainees who successfully pass the assessment will receive a qualification in the National Skills Qualification Framework (NSQF) under Bangladesh National Qualification Framework (BNQF) and will be listed on the NSDA's online portal.

This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.

Overview

A **competency standard** is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of representative from NSDA, Key Institutions, ISC, and industry experts to identify the competencies required of an occupation in **Information and Communication Technology** sector.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guide

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide

Competency Standards for National Skills Certificate – Level-4 in IT Support Service in ICT Sector

Level Descriptors of NSQF (BNQF 1-6)

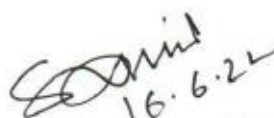
Level & Job classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyse, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break information into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.

List of Abbreviations

NSDA	National Skills Development Authority
BMET	Bureau of Manpower Employment and Training
ILO	International Labor Organization
ISC	Industry Skills Council
NSQF	National Skills Qualifications Framework
SCVC	Standards and Curriculum Validation Committee
SEIP	Skills for Employment Investment Program
STP	Skills Training Provider
UoC	Unit of Competency
GUI	Graphical User Interface
ESD	Electro-static discharge
IT	Information Technology
ICT	Information and Communication Technology
SOHO	Small Office Home Office
LCD	Liquid Crystal Display
OHS	Occupational health and safety
PPE	Personal protective equipment
RAM	Random Access Memory
RF	Radio frequency
SMD	Surface mounted device
USB	Universal serial bus

Approval of Competency Standard

Approved by
9th Executive Committee (EC) Meeting of NSDA
Held on 16 June 2022



16.6.22

Md. Saniul Ferdous
Deputy Director (Admin)
National Skills Development Authority
Prime Minister's Office

Deputy Director (Administration)
and
Officer of Secretarial Duties for EC Meeting
National Skills Development Authority

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Competency Standards for National Skill Certificate –4 in IT Support Service in ICT Sector

Course Structure

SL	Unit Code and Title		UoC Level	Nominal Duration (Hours)
Generic Units of Competencies				
Sector Specific Units of Competencies				
Occupation Specific Units of Competencies				280
1	OU-ICT-ITSS-01-L4-V1	Perform SOHO Networking	4	50
2	OU-ICT-ITSS-02-L4-V1	Set-up and Expand Networks	4	40
3	OU-ICT-ITSS-03-L4-V1	Perform Advanced Networking	4	100
4	OU-ICT-ITSS-04-L4-V1	Troubleshoot Networks	4	50
5	OU-ICT-ITSS-05-L4-V1	Maintain Network Security	4	40
Total Nominal Learning Hours				280

Units & Elements at Glance

Occupation Specific Units of Competencies

Code	Unit of Competency	Elements of Competency	Duration (Hours)
OU-ICT-ITSS-01-L4-V1	Perform SOHO Networking	<ol style="list-style-type: none"> 1. Interpret SOHO network 2. Plan for SOHO network 3. Implement wired SOHO network 4. Implement wireless SOHO network 5. Secure SOHO network 	50
OU-ICT-ITSS-02-L4-V1	Set-up and Expand Networks	<ol style="list-style-type: none"> 1. Gather organizational requirements of an existing network 2. Plan and design to expand an existing network 3. Expand the existing network 4. Test newly expanded network 5. Maintain record of maintenance 	40
OU-ICT-ITSS-03-L4-V1	Perform Advanced Networking	<ol style="list-style-type: none"> 1. Plan for an advanced network 2. Perform subnetting 3. Configure advance network services and protocol 4. Configure routing 5. Test newly created network 6. Maintain record of maintenance 	100
OU-ICT-ITSS-04-L4-V1	Troubleshoot Networks	<ol style="list-style-type: none"> 1. Interpret methodology and plan 2. Identify the problem 3. Identify the Solution 4. Solve the Problem 5. Clean workplace and update document 	50
OU-ICT-ITSS-05-L4-V1	Maintain Network Security	<ol style="list-style-type: none"> 1. Interpret network security 2. Configure Firewall services 3. Monitor the Threat 4. Document and report the threat 	40

Occupation Specific Units of Competencies

Unit Code and Title	OU-ICT-ITSS-01-L4-V1: Perform SOHO Networking
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to Perform SOHO Networking. It includes the task of interpreting SOHO Network, plan for SOHO Network, implementing wired SOHO network, implementing wireless SOHO network and securing SOHO network
Nominal Hours	50 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Interpret SOHO Network	1.1 SOHO Network is defined 1.2 Types of SOHO Network is identified 1.3 Functions of SOHO network is interpreted 1.4 <u>Naming convention</u> is interpreted 1.5 <u>Network model</u> is defined 1.6 <u>SOHO Network equipment</u> is identified
2. Plan for SOHO network	2.1 Basic purpose of LAN is identified and defined 2.2 Basic functions of LAN are identified and defined. 2.3 Small Office Home Office (SOHO) networking is designed. 2.4 Required <u>tools and equipment's</u> are identified and listed 2.5 <u>Materials and consumables</u> are identified and listed 2.6 Budget is prepared and documented for <u>Network</u> as per Requirements 2.7 Budget is sent to appropriate person for approval as per workplace practice
3. Implement wired SOHO network	3.1. Configuration requirements are identified 3.2. Tools and equipment are selected and collected from vendor 3.3. Materials and consumables are collected 3.4. SOHO Networks is installed and configured. 3.5. Necessary settings for LAN are configured 3.6. IP assign type is selected 3.7. IP address is assigned 3.8. Computer name is ensured and workgroup name are documented and confirmed 3.9. Documents and file sharing setting are confirmed 3.10. Add Printer and enable sharing are confirmed 3.11. Access requirements are determined and sharing is confirmed
4. Implement wireless SOHO network	4.1 Wireless Configuration requirements are identified 4.2 Tools and equipment for wireless configuration are selected and collected

	4.3 Materials and consumables are collected 4.4 Wireless SOHO Networks is installed and configured. 4.5 Necessary settings for WLAN are configured 4.6 IP address is Assigned as required 4.7 Computer name is ensured and workgroup name are documented and confirmed 4.8 Documents and file sharing setting are confirmed 4.9 Printer is added and enable sharing are confirmed 4.10 Access requirements are determined and sharing is confirmed
5. Secure SOHO Network	5.1 <u>Security problems</u> for SOHO networking is interpreted 5.2 MAC filtering is interpreted 5.3 Unauthorize device is controlled 5.4 Default firewall is enabled
Range of Variables	
Variables	Range (may include but not limited to):
1. Naming convention	1.1 NetBios 1.2 Hierarchical naming system
2. Network model	2.1. Workgroup 2.2. Domain 2.3. Standalone
3. SOHO Network equipment	3.1 Home router 3.2 IP Telephone 3.3 Alexa 3.4 Google Assistant
4. Tools and equipment's	4.1 Crimping tool 4.2 Connector 4.3 Boot cap 4.4 Face plate modular 4.5 Punching tool 4.6 Screw driver set 4.7 Cable tester 4.8 Cable cutter 4.9 Patch cord 4.10 RACK 4.11 Cable Tray 4.12 Cable Manager 4.13 Patch panel 4.14 Switch 4.15 Access point

5. Materials and consumables	5.1 Cable Tag 5.2 Cable tie 5.3 Cable Channel
6. Network	6.1 Small Office / Home Office [SOHO] 6.2 LAN 6.3 MAN 6.4 WAN 6.5 Wireless LAN, Wi-MAX 6.6 Intranet 6.7 Internet
7. Security problems	7.1 Zone Model 7.2 Segmentation 7.3 Sniffing 7.4 ARP Interception 7.5 MAN (Man in the Middle)
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidences that the candidate: 1.1 monitored and documented networks 1.2 assigned address is to client machine (automatically or statically. e.g.; assign IP address, sub netmask statically in the case of TCP/IP protocol) 1.3 assessed conflict of Network Interface Card (NIC) 1.4 configured Cisco Devices on IOS basics 1.5 applied a basic configuration using Cisco IOS 1.6 designed, installed and configured SOHO networking 1.7 maintained SOHO network security.
2. Underpinning knowledge	2.1 procedure of assign address to client machine (automatically or statically. e.g.; assign IP address, sub netmask statically in the case of TCP / IP protocol). 2.2 Organizational requirements to set-up a new network. 2.3 network topology and network protocol. 2.4 Documentation process for Network address plan. 2.5 DNS. 2.6 Host name assigning procedure. 2.7 Settings, computation and PC network address documentation for future maintenance purpose. 2.8 Procedure of connectivity with Intranet, Internet, Extranet.
3. Underpinning skills	3.1 Configuring cisco devices on IOS basics. 3.2 Applying a basic configuration using cisco IOS.

	3.3 Designing, installing and configuring SOHO networking. 3.4 Maintaining SOHO network security.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communication with peers and seniors at workplace.
5. Resource implications	The following resources must be provided: 5.1 workplace (actual or simulated) 5.2 Computer / Laptop / Notebook 5.3 internet 5.4 chat platform 5.5 affiliate platforms and tools 5.6 SEO tools 5.7 projector 5.8 learning manual
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated work place after completion of the training module 7.2 Assessment should be done by NSDA certified/nominated assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under NSQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	OU-ICT-ITSS-02-L4-V1: Set-up and Expand Networks
Nominal Hours	40 hours
Unit Descriptor	This unit covers the knowledge, skills and attitude required to set-up and expand networks. It includes the task of gathering organizational requirements of an existing network, planning and design to expand an existing network, expanding the existing network, testing newly expanded network and maintaining record of maintenance
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the range of variables
1. Gather organizational requirements of an existing network	1.1 Organizational requirements to expand an existing network are collect 1.2 Existing network design is reviewed for <u>expansion of the network</u> 1.3 Collected information is documented
2. Plan and design to expand an existing network	2.1. Collected information are analyzed and a network <u>design plan</u> is prepared. 2.2. Network design plan is reviewed and approved from the appropriate person of the organization 2.3. Required equipment and tools are listed and estimated budget calculated and documented 2.4. Estimated budget and required equipment list are discussed with and approved by the appropriate person
3. Expand the existing network	3.1. According to the approved network design plan an existing network is deployed 3.2. If Internet is in the plan, network is connected to the internet 3.3. <u>Equipment and materials</u> are collected to expand network 3.4. <u>Nodes</u> are connected to the network 3.5. <u>Deployment</u> of network is performed 3.6. <u>Network diagnostic tools</u> are installed for network testing
4. Test newly expanded network	4.1. Using network <u>diagnostic tools</u> , network is tested 4.2. Congestion of the network is observed 4.3. Reachability to Internet (if available) is tested
5. Maintain record of maintenance	5.1 Network maintenance plan is completed. 5.2 Network maintenance plan is approved by the appropriate person or from the organization 5.3 Approved network maintenance plan is documented 5.4 Support plan for the network is documented 5.5 User manual for the network is prepared.
Range of Variables	
Variable	Range (May include but not limited to)
1. Expansion of the network	1.1 Within network (Same network)

	1.2 Intra-network (Subnetting) 1.3 External Network (Different network)
2. Design plan	2.1. Network topology 2.2. Protocol to be use 2.3. Address plan 2.4. IP routing 2.5. NAT, PAT
3. Equipment and Materials (hardware and software)	5.1 Switch (Layer 2 and Layer 3) 5.2 Router 5.3 Edge modem 5.4 Modem 5.5 Bridge 5.6 Network interface card 5.7 Network cable 5.8 Optical fibre 5.9 Media converter 5.10 Connectors 5.11 PC 5.12 Server 2.6. Wireless access point
4. Nodes	3.1. Server 3.2. Client/ Workstation 3.3. Router 3.4. Switch 3.5. Network Printer 3.6. Network Scanner
5. Deployment	7.1 laying cables 7.2 Preparing patch cord 7.3 Using cable manager 7.4 Switch installation 7.5 Configuration of switch 7.6 Configuration of routing 7.7 IP address assignment 7.8 Establish NAT gateway 3.7. Access-list, prefix-list.
6. Network diagnostic tools	4.1 Wireshark 4.2 Cacti 4.3 Manage engine 4.4 PRTG 4.5 Solarwinds
7. Diagnostic tools	6.1 ifconfig/ipconfig 6.2 Wireshark 6.3 Snmp 6.4 Ping 6.5 Traceroute 6.6 Dig

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical aspects of	The assessment required evidence that the candidate:
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competency	1.1 analyzed collected information 1.2 discussed with and approved estimated budget and required equipment list by the appropriate person 1.3 gathered information from existing Servers and client computers 1.4 interpreted switch (Layer 2 and Layer 3) and router
2. Underpinning knowledge	2.1. Network Routing and switching, bridge 2.2. TCP/IP protocol and Addressing 2.3. NAT, Gateway, Proxy, NFS, 2.4. Directory server, NFS, http, ftp, SNMP 2.5. Transmission media such as optical fibre, UTP, wireless
3. Underpinning skill	3.1 Approving network design plan new network or an existing network is deployed 3.2 Using network diagnostic tools, network is tested 3.3 Gathering information from existing Servers and client computers 3.4 Testing newly established network or an expanded existing network
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates and seniors in workplace
5. Resource implication	Following resources must be provided- 5.1 Relevant Tools, Equipment and physical facilities required to perform activities 5.2 Materials and consumables are related to the activities 5.3 Relevant drawings, manuals, charts and diagrams
6. Methods of assessment	6.1 Written test 6.2 Demonstration 6.3 Oral questioning
7. Context of assessment	7.1 Competency assessment must be done in NSDA Accredited Assessment center 7.2 Assessment should be done by NSDA certified/ nominated assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under NSQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	OU-ICT-ITSS-03-L4-V1: Perform Advanced Networking
Nominal Hours	100 hours
Unit Descriptor	This unit covers the knowledge, skills and attitude required to perform advanced networking. It includes the task of planning for an advanced network, performing subnetting, configuring advance network services and protocol, configuring routing, testing newly created network and maintaining record of maintenance
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the range of variables
1. Plan for an advanced network	1.1 Organizational requirements to create advanced network are collected 1.2 Required <u>tools, equipment's</u> and <u>component</u> , are identified and listed 1.3 Materials and consumables are identified listed 1.4 Network design plan is approved by authorize person
2. Perform subnetting	2.1. Subnetting is interpreted 2.2. <u>Range of IP address</u> is identified and selected 2.3. Subnet mask is identified and selected 2.4. Subnetting is performed 2.5. According to the approved network design plan network is established
3. Configure advance network services and protocol	3.1. <u>Network simulation tools</u> are installed 3.2. Required Network services are identified 3.3. IP addresses is determined 3.4. Vlan is configured as per design plan 3.5. Dynamic Trunk protocol is applied if required 3.6. Spanning Tree protocol is identified and configured 3.7. <u>Services of network</u> is identified and configured
4. Configure routing	4.1. IP routing is interpreted 4.2. Routing protocol is interpreted 4.3. <u>Types of routing</u> is interpreted 4.4. <u>Terms of routing</u> is interpreted 4.5. <u>Routing services</u> is configured 4.6. Bandwidth management is performed as per requirement
5. Test newly created network	5.1 Network performance is monitored using <u>monitoring tools</u> 5.2 Congestion of the network is observed 5.3 Reachability to the internet (if available) is tested
6. Maintain record of maintenance	6.1 Network maintenance plan is completed. 6.2 Network maintenance plan is approved by the appropriate person or from the organization 6.3 Approved network maintenance plan is documented 6.4 Support plan for the network is documented 6.5 User manual for the network is prepared.
Range of Variables	

Variable	Range (May include but not limited to)
1. Tools and equipment's	1.1 Crimping tools 1.2 UTP cable 1.3 Cable tester
2. Component	2.1. Rj-45 connector 2.2. Switch 2.3. Router 2.4. ONU/ Media converter
3. Range of IP address	3.1. Class A 3.2. Class B 3.3. Class C
4. Network simulation tools	4.1 Packet Tracer 4.2 GNS3
5. Services of network	5.1 DHCP 5.2 DNS 5.3 NTP 5.4 VPN
6. Types of routing	6.1 Default routing 6.2 Static routing 6.3 Dynamic routing 6.4 Distance vector 6.5 Link state
7. Terms of routing	7.1 AS 7.2 EGP 7.3 IGP 7.4 OSPF 7.5 RIP 7.6 BGP 7.7 EIGRP
8. Routing services	8.1 Static routing, 8.2 Bridging 8.3 PPPoE 8.4 Pptp 8.5 L2tp 8.6 NAT 8.7 Port forwarding/mapping 8.8 Web Proxy 8.9 ACL 8.9.1 Source MAC address 8.9.2 Source MAC mask 8.9.3 Destination MAC address 8.9.4 Destination MAC mask 8.9.5 Class of Service (CoS) (802.1p) 8.9.6 Ethertype
9. Monitoring tools	9.1 Wireshark 9.2 Cacti 9.3 Manage engine 9.4 PRTG 9.5 Solarwinds
Evidence Guide	

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical aspects of competency	<p>The assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 analyzed collected information 1.2 discussed with and approved estimated budget and required equipment list by the appropriate person 1.3 gathered information from existing Servers and client computers 1.4 interpreted switch (Layer 2 and Layer 3) and router
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1. Network Routing and switching, bridge 2.2. TCP/IP protocol and Addressing 2.3. NAT, Gateway, Proxy, NFS, 2.4. Directory server, NFS, http, ftp, SNMP 2.5. Transmission media such as optical fibre, UTP, wireless 2.6. Determination of the best route of router 2.7. Type of ACL
3. Underpinning skill	<ul style="list-style-type: none"> 3.1 Approving network design plan new network or an existing network is deployed 3.2 Using network diagnostic tools, network is tested 3.3 Gathering information from existing Servers and client computers 3.4 Testing newly established network or an expanded existing network
4. Required attitude	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates and seniors in workplace
5. Resource implication	<p>Following resources must be provided-</p> <ul style="list-style-type: none"> 5.1 Relevant Tools, Equipment and physical facilities required to perform activities 5.2 Materials and consumables are related to the activities 5.3 Relevant drawings, manuals, charts and diagrams
6. Methods of assessment	<ul style="list-style-type: none"> 6.1 Written test 6.2 Demonstration 6.3 Oral questioning
7. Context of assessment	<ul style="list-style-type: none"> 7.1 Competency assessment must be done in NSDA Accredited Assessment center 7.2 Assessment should be done by NSDA certified/ nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under NSQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-ICT-ITSS-04-L4-V1: Troubleshoot Networks
Nominal Hours	50 hours
Unit Descriptor	This unit covers the knowledge, skills and attitude required to troubleshoot networks. It includes the task of interpreting methodology and plan, identifying the problem, identifying the Solution, solving the Problem and cleaning workplace and updating document
Elements of Competency	Performance Criteria Bold and Underlined terms are elaborated in the range of variables
1. Interpret methodology and plan	1.1 Troubleshoot methodology is interpreted 1.2 <u>Network tools and utilities</u> for troubleshooting are interpreted 1.3 Network design, support and maintenance documents are reviewed 1.4 Computer manuals and maintenance documents are reviewed 1.5 Appropriate person is consulted for identifying problems if required. 1.6 Plan of action is interpreted
2. Identify the problem	2.1. <u>Network Fault</u> is identified 2.2. Faulty hardware or software component are detected. 2.3. The problem scenarios are observed 2.4. Problems are detected using diagnostic tools
3. Identify the Solution	3.1. Appropriate person (if required) is consulted and solution is identified 3.2. Types of solutions are identified
4. Solve the Problem	4.1 <u>Replacement</u> of faulty hardware equipment is performed if required 4.2 Replaced equipment is tested 4.3 Configuration is performed as per solution requirement 4.4 Network activity is tested.
5. Clean workplace and update document	5.1 Tools and equipment are stored as per workplace procedures. 5.2 Network and computer maintenance and troubleshooting document are updated
Range of Variables	
Variable	Range (May include but not limited to)
1. Network tools and utilities	1.1 Cabling tools 1.1.1. Ethernet cable 1.1.2. Fiber Optic 1.2 N-MAP 1.3 Wireshark 1.4 Windows/Linux CLI 1.4.1. Nslookup

	1.4.2. Netstat 1.4.3. Ipconfig/ Ifconfig 1.4.4. Tracert 1.4.5. Ping 1.4.6. Pathping 1.4.7. ARP 1.4.8. IP table 1.4.9. TCP Dump
2. Network Fault	2.1. Wired Network 2.1.1. Cabling 2.1.2. PatchPanel 2.1.3. Fiber Optics 2.1.4. Vlan misconfiguration 2.2. Wireless Network 2.2.1. Coverage issues 2.2.2. Communication issue 2.2.3. Capacity 2.2.4. Overlap 2.2.5. Attenuation 2.3. Bandwidth issues 2.4. DNS issues 2.5. Malfunctioning devices 2.6. DHCP issue 2.7. IP configuration issue 2.8. Routing issues
3. Replacement	3.1 Replacement of network card 3.2 Cable 3.3 Switch 3.4 Router 3.5 Wireless access point 3.6 Modem 3.7 Software 3.8 Mother board components
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	The assessment required evidence that the candidate: 1.1 observed safe work practice and personal protective equipment (PPE) worn as required for the work performed 1.2 verified properly installed hardware and driver. 1.3 verified existing network environment
2. Underpinning knowledge	2.1 Network Design 2.2 Network Transmission media 2.3 Network Card

	2.4 Network cable 2.5 Network diagnostic tools (if not available in OS) ping, traceroute/tracert, iptraf, snmp tools 2.6 TCP/IP software IPv4, Ipv6, IPX/SPX (if not available in OS) 2.7 ESD Tool box
3. Underpinning skill	3.1 Conducting ping operation 3.2 Performing local/remote loop-back 3.3 Repairing or replacing faulty hardware equipment or software component 3.4 Using diagnostic tools the fault needs to be identified
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates and seniors in workplace
5. Resource implication	The following resources must be provided: 5.1 Relevant Tools 5.2 Equipment and physical facilities required to perform activities Relevant user manuals
6. Methods of assessment	6.1 Written test 6.2 Demonstration 6.3 Oral questioning
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated work place after completion of the training module 7.2 Assessment should be done by NSDA certified/nominated assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under NSQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	OU-ICT-ITSS-05-L4-V1: Maintain Network Security
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to maintain network security. It includes the task of interpreting network security, configuring firewall services monitoring the threat and document and report the threat
Nominal Hours	40 Hours
Elements of Competency	Performance Criteria <u>Bold & underlined</u> terms are elaborated in the Range of Variables
1. Interpret network security	1.1 Network security is defined 1.2 Types of network security is defined 1.3 <u>Network security control</u> is interpreted 1.4 <u>Common network security Vulnerabilities</u> are interpreted 1.5 <u>Network attack</u> architecture is interpreted 1.6 Search engine privacy is interpreted 1.7 Browser security and tracking prevention are interpreted 1.8 Network security best practices is interpreted
2. Configure firewall services	2.1. Security is ensured using network administration tool 2.2. Filter rules is configured as per requirement 2.3. Mangle/Packet Filtering is configured as per requirement 2.4. <u>Security services</u> is configured as per requirement 2.5. Access Control List (ACL) is configured as per requirement
3. Monitor the threat	3.1 Possible security threat is identified. 3.2 Possible cause of infection is determined 3.3 Identified security threat is monitored to find out its characteristics with <u>network monitoring tools</u> . 3.4 Capability of the security threat is determined from the analysis.
4. Document and report the threat	4.1 Network device hardening is interpreted 4.2 Network attack prevention is interpreted 4.3 Report is prepared using monitoring system 4.4 Report is documented and submitted to the authority

Range of Variables	
Variables	Range (may include but not limited to):
1. Network security control	1.1 Physical 1.2 Technical 1.3 Administrative 1.4 Authentication and access control 1.5 Wireless access point control
2. Common network security Vulnerabilities	2.1 Improperly installed hardware or software 2.2 Operating systems or firmware that have not been updated 2.3 Misused hardware or software 2.4 Poor or a complete lack of physical security 2.5 Insecure passwords 2.6 Design flaws in a device's operating system or in the network
3. Network attack	3.1 Human exploits 3.2 Social engineering 3.3 Denial of service 3.4 Wireless attack 3.5 Man in the middle attack 3.6 Password attack
4. Security services	4.1 SSH 4.2 Layer 7 protocol 4.3 IPsec
5. Network monitoring tools	5.1 Wireshark 5.2 Wincap 5.3 NST 5.4 Netminer 5.5 Cable testers
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidences that candidate: 1.1 determined possible cause of infection from the analysis 1.2 installed anti-malware software 1.3 started / activated malware guard 1.4 backed up important directory and files regularly and preserved 1.5 taken appropriate action if spam is identified

	1.6 updated regularly malware database of anti-malware software 1.7 downloaded / collected and applied security updates of OS and other software 1.8 used recovery disk if boot sector of the standalone system is damaged.
2. Underpinning knowledge	2.1 Procedure of protecting and preserving administrator accounts passwords in a secured place. 2.2 Methods of updating or renewing licenses. 2.3 Anti-malware software installation. 2.4 Common types of destructive software. 2.5 Defining and identifying techniques of common types of destructive software. 2.6 Common types of spam. 2.7 Types of network security solution
3. Underpinning skills	3.1 Determining, recording and applying relevant legal requirements and OSH standards to the installation and maintenance of computer hardware. 3.2 Checking and verifying the operating system and other software licenses. 3.3 Determining possible cause of infection from the analysis. 3.4 Installing anti-malware software. 3.5 Starting/activating malware guard. 3.6 Backing up important directory and files regularly and preserving. 3.7 Downloading/collecting and applying security updates of OS and other software. 3.8 Taking appropriate action in regard to spam. 3.9 Using recovery disk if boot sector of the standalone system is damaged to recover boot sector.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Environmental concerns. 4.5 Eagerness to learn. 4.6 Tidiness and timeliness. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communication with peers and seniors at workplace.

5. Resource implications	<p>The following resources must be provided:</p> <p>5.1 Workplace (actual or simulated)</p> <p>5.2 Computer / Laptop / Notebook</p> <p>5.3 Internet</p> <p>5.4 Software.</p>
6. Methods of assessment	<p>Methods of assessment may include but not limited to:</p> <p>6.1 Written test</p> <p>6.2 Demonstration</p> <p>6.3 Oral questioning</p>
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA Accredited Assessment center</p> <p>7.2 Assessment should be done by NSDA certified/ nominated assessor</p>
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under NSQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Development of Competency Standard

The Competency Standards for National Skills Certificate in IT support service, Level-4 is developed by NSDA on 25 – 27 and 30 January 2022.

Members of the Competency Standard Development Committee

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Validation of Competency Standard by Standard and Curriculum Validation Committee (SCVC)

The Competency Standards for National Skills Certificate in **IT Support Service, Level-4** Qualification is validated by NSDA on 21 March 2022.

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