



**COMPETENCY STANDARD
FOR
SERVER ADMINISTRATION
(ICT Sector)**

Level: 05

Competency Standard Code: CS-ICT-SA-L5-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 Server Administration 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. "Server Administration" is selected as one of the priority occupations of Informal 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 Informal 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 guides

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 Skill Certificate – Level-5 in Server Administration 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
NPVC	National Pre-Vocation Certificate
NSQF	National Skills Qualifications Framework
PPP	Public Private Partnership
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
ICT	Information Communication Technology
KPI	Key performance indicator
CPU	Central Processing Unit
OSH	Occupational safety and health
PPE	Personal protective equipment
RAM	Random Access Memory
GPO	Group Policy Object
SMB	Server Message Block
NFS	Network File System
AD	Active Directory
ADC	Application Delivery Controller
BDC	Backup Domain Controller
IIS	Internet Information Service
IPAM	IP Address Management
FTP	File Transfer Protocol
SFTP	Secure File Transfer Protocol
NAT	Network Address Translator
AWS	Amazon Web Services
GCP	Google Cloud Platform
OCI	Oracle Cloud Infrastructure

Approved by

**_____ th Executive Committee (EC) Meeting of NSDA
Held on _____**

**Md. Saniul Ferdous
Deputy Director (Admin)
and**

**Assigned Officer for Authority and EC meeting
National Skills Development Authority**

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**Competency Standards for National Skill Certificate – 5 in
Server Administration in ICT Sector**

Course Structure

SL	Unit Code and Title		UoC Level	Nominal Duration (Hours)
Generic Competencies				20
1.	GU011L4V1	Lead Small Team	4	20
Sector Specific Competencies				15
2.	SUICT04L3V1	Comply to Ethical Standards in the ICT Workplace	3	15
Occupation Specific Competencies				325
3.	OUSA01L5V1:	Configure Virtual Environment for Server	5	15
4.	OUSA02L5V1:	Install and Prepare Windows Server Environment	5	15
5.	OUSA03L5V1:	Manage Windows Roles and Features	5	40
6.	OUSA04L5V1:	Implement Network and Server Services for Windows	5	60
7.	OUSA05L5V1:	Install and Prepare Linux Server Environment	5	40
8.	OUSA06L5V1:	Manage Linux File System and Permissions	5	45
9.	OUSA07L5V1:	Implement Network and Server Services for Linux	5	70
10.	OUSA08L5V1:	Work with Basic Cloud Services	5	40
Total Nominal Learning Hours				360

Units & Elements at Glance

Generic Competencies

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GU011L4V1	Lead Small Team	<ol style="list-style-type: none">1. Provide team leadership2. Assign responsibilities3. Set performance expectations for team members4. Supervise team performance	20

Sector Specific Competencies

Code	Unit of Competency	Elements of Competency	Duration (Hours)
SUICT04L3V1	Comply to Ethical Standards in the ICT Workplace	<ol style="list-style-type: none">1. Uphold the requirements of clients2. Deliver quality products and services3. Maintain professionalism at workplace4. Maintain workplace code of conduct.	15

Occupation Specific Competencies

Code	Unit of Competency	Elements of Competency	Duration (Hours)
OUSA01L5V1:	Configure Virtual Environment for Server	<ol style="list-style-type: none"> 1. Describe concept of Server 2. Interpret Virtualization and Virtual Machine 3. Explain concepts of virtualization Technology 4. Interpret Virtual Network & Service Configuration 5. Install & Configure Virtual machine 	15
OUSA02L5V1	Install and Prepare Windows Server Environment	<ol style="list-style-type: none"> 1. Install Windows Server Operating System 2. Configure Network 3. Create Users & Groups 	15
OUSA03L5V1	Manage Windows Roles and Features	<ol style="list-style-type: none"> 1. Manage Storage and Files 2. Install and configure File server 3. Install Active Directory service 4. Configure Active Directory service 5. Configure Group Policy Object (GPO) 	40
OUSA04L5V1	Implement Network and Server Services for Windows	<ol style="list-style-type: none"> 1. Implement Domain Name Service (DNS) 2. Install & Configure Dynamic Host Control Protocol (DHCP) 3. Install & Configure IP Address Management (IPAM) Server 4. Install & Configure Internet Information Service (IIS) 5. Implement FTP and SFTP server 6. Configure Windows Firewall 7. Perform Basic Monitoring and Backup Management 	60
OUSA05L5V1	Install and Prepare Linux Server Environment	<ol style="list-style-type: none"> 1. Prepare Physical/ Virtual Environment for Linux OS Installation 2. Install Linux Based Operating System (OS) 	40

		<ul style="list-style-type: none"> 3. Execute Basic Linux Commands 4. Manage user and group Accounts 5. Configure Network Services 	
OUSA06L5V1	Manage Linux File System and Permissions	<ul style="list-style-type: none"> 1. Interpret Linux File System 2. Manage Partitions and Linux File system 3. Manage Linux Permissions and Ownership 	45
OUSA07L5V1	Implement Network and Server Services for Linux	<ul style="list-style-type: none"> 1. Configure yum/DNF Repositories 2. Configure Server Services for Linux 3. Test Client-Server network 4. Schedule Linux Tasks 	70
OUSA08L5V1	Work with Basic Cloud Services	<ul style="list-style-type: none"> 1. Describe concept of cloud services 2. Configure virtual private cloud 	40

Generic Competencies

Unit Code and Title	GU011L4V1: Lead Small Team
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to lead small team. It specifically includes – provide team leadership; assign responsibilities; set performance expectations for team members; and supervised team performance.
Nominal Hours	20 Hours
Elements of Competency	Performance Criteria Bold & Underlined terms are elaborated in the Range of Variables
1. Provide team leadership	1.1 <u>Work requirements</u> are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members 1.3 <u>Team members’ queries and concerns</u> are recognized, discussed and dealt with
2. Assign responsibilities	2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and attitudes required to properly undertake the assigned task 2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements 3.2 Performance expectations are based on individual team members’ duties and area of responsibility 3.3 Performance expectations are discussed and directed to implement in the workplace
4. Supervise team performance	4.1 <u>Monitoring of performance</u> are taken place against defined performance criteria and / or assignment instructions and corrective action taken if required 4.2 Team members are provided <u>feedback</u> , positive support and advice on strategies to overcome any deficiencies 4.3 <u>Performance issues</u> which cannot be rectified or addressed within the team are referenced to appropriate personnel 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on clients’ / customers’ needs and satisfaction 4.5 Team operations are monitored to ensure that employer / client needs and requirements are met 4.1 Follow-up communication is provided on all issues affecting the team 4.6 All relevant documentation is completed

Range of Variables	
Variable	Range (may include but are not limited to):
1. Work requirements	1.1 Client Profile 1.2 Assignment instructions
2. Team member's queries and concerns	2.1 Roster 2.2 Shift details
3. Monitoring of performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1 Formal process 4.2 Informal process 4.3 Sandwich process
5. Performance issues	5.1 Work output 5.2 Work quality 5.3 Team participation 5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service
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 evidence that the candidate: 1.1 maintained or improved individuals and / or team performance given a variety of possible scenario 1.2 assessed and monitored team and individual performance against set criteria 1.3 represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4 allocated duties and responsibilities, having regard to individual's knowledge, skills and attitude and the needs of the tasks to be performed 1.5 set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
2. Underpinning knowledge	2.1 Company policies and procedures 2.2 Relevant legal requirements 2.3 How performance expectations are set 2.4 Methods of Monitoring Performance 2.5 Client expectations 2.6 Team members' duties and responsibilities
3. Underpinning skills	3.1 Informal performance counselling skills

	<p>3.2 Team building skills</p> <p>3.3 Negotiating skills</p>
4. Required attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Promptness in carrying out activities</p> <p>4.3 Sincere and honest to duties</p> <p>4.4 Environmental concerns</p> <p>4.5 Eagerness to learn</p> <p>4.6 Tidiness and timeliness</p> <p>4.7 Respect for rights of peers and seniors in workplace</p> <p>4.8 Communicate with peers and seniors in workplace</p>
5. Resource implications	<p>The following resources must be provided:</p> <p>5.1 Workplace (actual or simulated)</p> <p>5.2 Tools, equipment and facilities appropriate to processes or activity</p> <p>5.3 Materials relevant to the proposed activity</p> <p>5.4 Equipment and outfits appropriate in applying safety measures</p> <p>5.5 Relevant drawings, manuals, codes, standards and reference material</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 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>	

Sector Specific (Common) Competencies

Unit Code and Title	SUICT04L3V1: Comply to Ethical Standards in the ICT Workplace
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to comply to ethical standards in the ICT workplace. It specifically includes upholding the requirements of clients, delivering quality products and services, maintaining professionalism at workplace and maintaining workplace code of conduct.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables
1. Uphold the requirements of clients	1.1 Clients' requirements are identified. 1.2 Confidentiality of information is maintained in accordance with workplace policies/organizational policies/national legislation. 1.3 Potential conflicts of interest are identified and involved parties of potential conflicts are notified. 1.4 <u>Proprietary rights</u> of client/customer is asserted.
2. Deliver quality products and services	2.1. Products and services are provided according to the clients' requirements. 2.2. Work is completed as per standards. 2.3. Quality processes are implemented when developing products and services.
3. Maintain professionalism at workplace	3.1 Work processes are delivered as per standards. 3.2 Skills, knowledge and qualifications are presented in a professional manner. 3.3 Services and products developed by self and others are delivered as per workplace standard. 3.4 Unbiased and objective information are provided to clients. 3.5 Realistic estimates for time, cost and delivery of outputs are presented during negotiation.
4. Maintain workplace code of conduct.	4.1 Workplace code of conduct are interpreted 4.2 Workplace code of conduct is followed.
Range of variables	
Variables	Range (may include but not limited to)
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	Assessment required evidence that the candidate: 1.1 asserted proprietary rights of client/customer. 1.2 completed work to industry and international standards. 1.3 implemented quality processes when developing products and services. 1.4 delivered services and products developed by self and others. 1.5 provided unbiased and objective information to clients. 1.6 followed workplace code of conduct.

2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1. Corporate code of confidentiality of information 2.2. organizational policies, national legislation and workplace policies in relation to IT sector 2.3. Law and regulations pertaining to proprietary rights 2.4. Quality processes for products and services 2.5. Procedure of provided to client information 2.6. Method of estimating for time, cost and delivery products and services 2.7. Workplace code of conduct in IT sector
3. Underpinning Skills	<ul style="list-style-type: none"> 3.1. Upholding confidentiality of information in accordance with organizational policies, national legislation and workplace policies 3.2. Asserting proprietary rights of client/customer 3.3. Completing work in accordance with industry and international standards 3.4. Implementing quality processes when developing products and services 3.5. Delivering correctly services and products developed by self and others 3.6. Providing unbiased and objective information are to clients. 3.7. Presenting realistic estimates for time, cost and delivery of outputs during negotiation 3.8. Following workplace code of conduct
4. Underpinning Attitudes	<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 and seniors in workplace.
5. Resource Implications	<ul style="list-style-type: none"> 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
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 center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<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>	

Occupation Specific (Core) Competencies

Unit Code and Title	OUSA01L5V1: Configure Virtual Environment for Server
Unit Descriptor	This unit covers the knowledge, skills and attitude required to configure virtual environment for server. It includes describing concept of server, interpreting virtualization and virtual machine, explaining concepts of virtualization technology, interpreting virtual network & service configuration and installing & configuring virtual machine
Nominal Hours	15 hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Describe concept of Server	1.1 Types of <u>server based on OS</u> are identified and defined. 1.2 Advantages and limitations of server OS are stated. 1.3 Types of <u>server based on Hardware</u> are identified and defined. 1.4 Peripherals for server are identified and stated.
2. Interpret Virtualization and Virtual Machine	2.1 Virtualization is described 2.2 <u>Types of virtualization</u> are defined 2.3 Limitations of virtualization are stated 2.4 <u>Virtualization platforms</u> are identified and selected
3. Explain concepts of virtualization Technology	3.1 <u>Virtualization Technologies</u> are defined. 3.2 Benefits of virtualization are stated
4. Interpret Virtual Network & Service Configuration	4.1 <u>Types of virtual networks</u> are identified. 4.2 <u>Hardware configuration</u> are interpreted.
5. Install & Configure Virtual Machine	5.1 Virtual Machine is identified and selected. 5.2 Configuration of physical machine is checked. 5.3 Available storage and technical configuration are ensured. 5.4 Virtual machine is installed. 5.5 Virtual machine is configured as required.
Range of Variables	
Variables	Range (may include but not limited to)
1. Server based on OS	1.1 Windows Server 1.2 Linux Server
2. Server based on Hardware	2.1 Tower Server 2.2 Rack Server 2.3 Blade Server 2.4 Mainframe Server
3. Types of virtualizations	3.1 Network virtualization 3.2 Storage virtualization 3.3 Server virtualization 3.4 Data virtualization 3.5 Desktop virtualization 3.6 Application virtualization
4. Virtualization platform	4.1 Bare Metal 4.1.1 VMware

	4.1.2 Hyper-V 4.2 Hosted 4.2.1 Oracle VirtualBox 4.2.2 QEMU 4.2.3 Proxmox
5. Virtualization Technology	5.1 KVM 5.2 Hyper-V 5.3 ESXI
6. Types of virtual networks	6.1 Bridge 6.2 NAT 6.3 Host only
7. Hardware configuration	7.1 Memory 7.2 Processor 7.3 Storage 7.4 Network adapter
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	Assessment required evidence that the candidate: 1.1 described concept of server 1.2 interpreted virtualization and virtual machine 1.3 explained concepts of virtualization technology 1.4 interpreted virtual network & service configuration 1.5 installed & configured virtual machine
2. Underpinning knowledge	2.1 Advantages and limitations of server OS 2.2 Server Hardware and Peripherals 2.3 Remote access controller 2.3.1 IDRAC 2.3.2 ILO 2.3.3 IPMI 2.4 Storage (RAID) 2.5 Virtualization 2.6 Limitations of virtualization 2.7 Virtualization platform 2.8 Virtualization Technology 2.9 Virtual networks 2.10 Hardware specification
3. Underpinning skills	3.1 Configuring virtual machine as required 3.2 Interpreting Hardware configuration 3.3 Checking configuration of physical machine 3.4 Installing virtual machine
4. Underpinning Attitudes	4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for the rights of peers and seniors in the workplace

	4.6. Communication with peers and seniors in the workplace
5. Resource implications	The following resources must be provided: 5.1 Relevant tools, equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
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 center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<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>	

Unit Code and Title	OUSA02L5V1: Install and Prepare Windows Server Environment
Nominal Hours	15 hours
Unit Descriptor	This unit covers the knowledge, skills, and attitudes required to Install and Prepare Windows Server Environment. It specifically includes installing windows Server Operating System, configuring network and creating users & groups
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Install Windows Server Operating System	1.1 Requirements are identified according to the workplace requirement. 1.2 Logical diagram is prepared according to the requirements. 1.3 Hardware and software requirements are identified and selected. 1.4 <u>Operating system mode</u> is selected 1.5 Server Operating System is installed fulfilling installation requirements.
2. Configure Network	2.1 <u>TCP/IP properties</u> are configured 2.2 Firewall is configured.
3. Create Users & Groups	3.1 Users and groups are created as per requirements. 3.2 Users are added to the group. 3.3 Permissions are assigned for files and folders.
Range of Variables	
Variables	Range (may include but not limited to)
1. Operating system mode	1.1 Standard/ Datacenter (GUI) 1.2 Core 1.3 Nano
2. TCP/IP properties	2.1 IP Address 2.2 Subnet mask 2.3 Gateway 2.4 DNS
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	Assessment required evidence that the candidate: 1.1 identified and selected hardware and software requirements 1.2 configured TCP/IP properties 1.3 created users & groups
2. Underpinning knowledge	2.1 Logical diagram 2.2 Hardware and software requirements 2.3 Server Operating System

	<ul style="list-style-type: none"> 2.4 Domain Controller 2.5 TCT/IP properties 2.6 Firewall
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Preparing Logical diagram 3.2 Installing Server Operating System 3.3 Configuring TCT/IP properties and Firewall
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
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 center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<p>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.</p>	

Unit Code and Title	OUSA03L5V1: Manage Windows Roles and Features
Unit Descriptor	This unit covers the knowledge, skills, and attitudes required to manage windows roles and features. It specifically includes managing storage and Files, installing and configuring file server, installing active directory service, configuring active directory service and configuring Group Policy Object (GPO)
Nominal Hours	40 hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Manage Storage and Files	1.1 local storage services are defined 1.2 local storage services are configured and accessed 1.3 volume management is performed 1.4 storage arrays are managed 1.5 iSCSI target folder is configured 1.6 redundant storage spaces are configured 1.7 server roles are selected and features are added
2. Install and configure File server	2.1 Required <u>file server</u> is identified 2.2 File server is installed and configured 2.3 Firewall is configured to access file server
3. Install Active Directory service	3.1 Features of Active Directory Domain Services (ADDS) are stated 3.2 <u>Services of ADDS</u> are identified and selected 3.3 ADDS is installed 3.4 Installed services are checked
4. Configure Active Directory service	4.1 Features of Server manager are stated 4.2 Active Directory users and computers are selected 4.3 Windows support tools are installed 4.4 User and groups are created using ADDS
5. Configure Group Policy Object (GPO)	5.1 <u>Types of GPOs</u> are identified 5.2 Benefits of Group Policy Objects are stated 5.3 <u>Group Policy Object (GPO)</u> is configured and updated 5.4 GPO Backup is performed 5.5 GPO Restore is performed if required
Range of Variables	
Variables	Range (may include but not limited to)
1. File server	1.1 SMB 1.2 NFS
2. Services of ADDS	2.1 Forest, domain, tree 2.2 AD 2.3 ADC 2.4 BDC Service
3. Types of GPOs	3.1 Local Group Policy Objects 3.2 Non-local Group Policy Objects 3.3 Starter Group Policy Objects
4. Group Policy Object (GPO)	4.1 GPO 4.2 Console 4.3 MMC 4.4 GPO Blocking

	<ul style="list-style-type: none"> 4.5 GPO Inheritance 4.6 GPO Enforcement
<p>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.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 managed storage and files 1.2 installed and configured file server 1.3 installed active directory service 1.4 configured active directory service 1.5 configured group policy object (GPO)
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Server manager 2.2 Users and groups 2.3 Permissions of files and folders 2.4 Local storage services 2.5 Volume management 2.6 Storage arrays 2.7 iSCSI Target Folder 2.8 Server Roles 2.9 Remote desktop services
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 creating Users and groups 3.2 Assigning Permissions for files and folders 3.3 Configuring and accessing Local storage services 3.4 Performing Volume management 3.5 Configuring iSCSI Target Folder 3.6 Selecting Server Roles and adding features 3.7 enabling Remote desktop services
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
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 center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<p>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.</p>	

Unit Code and Title	OUSA04L5V1: Implement Network and Server Services for Windows
Unit Descriptor	This unit covers the knowledge, skills, and attitudes required to Implement Network and Server services for windows. It specifically includes implementing Domain Name Service (DNS), installing & Configuring Dynamic Host Control Protocol (DHCP), installing & configuring IP Address Management (IPAM) Server, installing & configuring Internet Information Service (IIS), implementing FTP and SFTP server, configuring Windows Firewall and performing basic monitoring and backup management
Nominal Hours	60 hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1.Implement Domain Name Service (DNS)	1.1 The DNS Role is installed and configured. 1.2 DNS Preferences are set up. 1.3 Forward and Reverse Lookup Zones are created 1.4 Firewall is configured to access DNS. 1.5 DNS is tested and ensured based on client server environment
2.Install & Configure Dynamic Host Control Protocol (DHCP)	2.1 Roles and features are added. 2.2 DHCP is installed and Scopes are configured. 2.3 DHCP is tested and ensured based on client server environment
3.Install & Configure IP Address Management (IPAM) Server	3.1 IPAM is installed on selected interface. 3.2 IPAM is configured. 3.3 DNS is managed using IPAM. 3.4 DHCP is managed using IPAM.
4.Install & Configure Internet Information Service (IIS)	4.1 Required server is selected 4.2 Web server (IIS) is added and <u>configuration of (IIS)</u> is performed. 4.3 IIS addons are enabled. 4.4 Firewall is configured to access IIS. 4.5 IIS is tested and ensured based on client server environment
5.Implement FTP and SFTP server	5.1 FTP/ SFTP site is added 5.2 FTP/ SFTP is configured. 5.3 Firewall is configured to access FTP/SFTP. 5.4 FTP/ SFTP is tested and ensured based on client server environment
6.Configure Windows Firewall	6.1 Firewall zones and IP addresses are configured for public, private and domain network. 6.2 Firewall services and logging are configured and tested.
7.Perform Basic Monitoring and Backup Management	7.1 <u>Monitoring tools</u> are configured as per requirement 7.2 Generated Logs are analyzed

	<p>7.3 Backup features for server are installed</p> <p>7.4 Types of backups are selected</p> <p>7.5 Backup features for server are configured</p>
Range of Variables	
Variables	Range (may include but not limited to)
1. Configuration of (IIS)	<p>1.1 Name base</p> <p>1.2 IP base</p> <p>1.3 Port base</p>
2. Monitoring tools	<p>2.1 Netflow analyzer</p> <p>2.2 Syslog</p>
3. Types of backup	<p>3.1 VSS full backup</p> <p>3.2 VSS copy backup</p> <p>3.3 Incremental backup</p> <p>3.4 Full backup</p>
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>Assessment required evidence that the candidate:</p> <p>1.1 installed and configured The DNS Role</p> <p>1.2 configured firewall to access DNS</p> <p>1.3 installed & configured dynamic host control protocol (DHCP)</p> <p>1.4 installed & configure internet information service (IIS)</p> <p>1.5 configured FTP/ SFTP.</p> <p>1.6 configured Firewall to access FTP/SFTP.</p>
2. Underpinning knowledge	<p>2.1 IPAM</p> <p>2.2 SFTP</p> <p>2.3 Dynamic Host Control Protocol</p> <p>2.4 Domain Name System</p> <p>2.5 Web Server (IIS)</p> <p>2.6 File Transfer Protocol</p> <p>2.7 Virtual Private Network</p> <p>2.8 Mail server</p> <p>2.9 Firewall</p> <p>2.10 Service Port</p> <p> 2.10.1 Default port</p> <p> 2.10.2 Secure port</p> <p> 2.10.3 Custom port</p>
3. Underpinning skills	<p>3.1 Installing DHCP and configuring Scopes</p> <p>3.2 Testing and ensuring DHCP</p> <p>3.3 Configuring Firewall to access DNS</p> <p>3.4 Installing and configuring The DNS Role</p> <p>3.5 Adding and configuring IIS</p> <p>3.6 Configuring Firewall to access IIS and FTP</p>

4. Underpinning attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5. Resource implications	The following resources must be provided: 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
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 center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<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>	

Unit Code and Title	OUSA05L5V1: Install and Prepare Linux Server Environment
Unit Descriptor	This unit covers the knowledge, skills, and attitudes required to install and prepare Linux server environment. It specifically includes preparing physical/ virtual environment for Linux OS installation, installing Linux based Operating System (OS), executing basic Linux commands, managing user and group accounts and configuring network services
Nominal Hours	40 hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Prepare Physical/ Virtual Environment for Linux OS Installation	1.1. Available storage is checked. 1.2. <u>Partitioning scheme</u> is selected as per requirement. 1.3. <u>Partitions</u> are created as per requirement. 1.4. Physical configuration for Linux server is checked.
2. Install Linux Based Operating System (OS)	2.1 OS version is selected for installation. 2.2 <u>Installation media</u> is prepared. 2.3 Linux OS is installed.
3. Execute Basic Linux Commands	3.1 <u>Types of Terminals</u> are identified. 3.2 <u>Basic Linux commands</u> are executed.
4. Manage user and group Accounts	4.1 Users are created as per requirement 4.2 Groups are created as per requirement. 4.3 Permissions are assigned to groups and users according to user and group policy. 4.4 Users and groups list are viewed.
5. Configure Network Services	5.1 Equipment connected to the network are configured as per technical specifications. 5.2 Hostname is defined. 5.3 <u>Network parameters</u> are configured and tested.
Range of Variables	
Variables	Range (may include but not limited to)
1. Partitioning Scheme	1.1 Master Boot Record (MBR) 1.2 GUID Partition Table (GPT)
2. Partitions	2.1 Primary 2.2 Extended 2.3 Swap 2.4 Logical Volume Manager (LVM) 2.5 Redundant Arrays of Independent Disk (RAID)
3. Installation Media	3.1 USB Drive 3.2 DVD/ CD 3.3 Network Drive 3.4 ISO from Local Drive

4. Types of Terminals	4.1 Priviledged 4.2 Non-priviledged		
5. Basic Linux commands	5.1 pwd 5.2 cd 5.3 ls 5.4 cat 5.5 cp 5.6 mv 5.7 mkdir 5.8 rmdir 5.9 rm 5.10 touch 5.11 locate 5.12 kill 5.13 ping 5.14 find 5.15 grep 5.16 sudo 5.17 df 5.18 du 5.19 head	5.20 chmod 5.21 chown 5.22 tail 5.23 diff 5.24 tar 5.25 jobs 5.26 wget 5.27 uname 5.28 top 5.29 man 5.30 history 5.31 echo 5.32 zip, unzip 5.33 hostname 5.34 useradd 5.35 compgen -u 5.36 userdel 5.37 usermod 5.38 vi	5.39 vim 5.40 ps 5.41 who 5.42 last 5.43 uptime 5.44 date 5.45 which 5.46 unzip 5.47 bzip2 5.48 poweroff 5.49 halt 5.50 shutdown 5.51 reboot
6. Network parameters	6.1 Static 6.2 Dynamic 6.3 IP address 6.4 Subnet mask 6.5 Default Gateway 6.6 DNS		
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	Assessment required evidence that the candidate: 1.1 prepared physical/ virtual environment for Linux OS installation 1.2 installed Linux based operating system (OS) 1.3 executed basic Linux commands 1.4 managed user and group accounts 1.5 configured network services		
2. Underpinning knowledge	2.1 Partitioning scheme 2.2 Partitions types 2.3 Installation media 2.4 Linux command 2.5 Access privileges 2.6 Network parameters		

3. Underpinning skills	<ul style="list-style-type: none"> 3.1. Creating Partitions 3.2. Executing basic Linux commands 3.3. Preparing installation media 3.4. Setting access permission for users and group 3.5. Configuring services for network
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
6. Methods of assessment	<ul style="list-style-type: none"> 6.1 Written Test 6.2 Demonstration 6.3 Oral Questioning 6.4 Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1 Competency assessment must be done in NSDA accredited center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<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>	

Unit Code and Title	OUSA06L5V1: Manage Linux File System and Permissions
Unit Descriptor	This unit covers the knowledge, skills, and attitudes required to manage Linux file system and permissions. It specifically includes interpreting Linux File System, managing partitions and Linux file system and managing Linux Permissions and Ownership.
Nominal Hours	45 hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Interpret Linux File System	1.1 Linux file system hierarchy is defined. 1.2 Functions of <u>Linux file systems</u> are stated. 1.3 <u>Linux directory structure</u> is explained. 1.4 <u>Linux runlevels</u> are interpreted.
2. Manage Partitions and Linux File system	2.1 Disks, Partitions and persistent mounts are created as per requirement. 2.2 Partitions are mounted or unmounted according to requirements. 2.3 <u>Files types</u> are interpreted. 2.4 Directories and files are created and permissions are provided. 2.5 Linux <u>editors</u> or <u>commands</u> are used to modify files.
3. Manage Linux Permissions and Ownership	3.1 <u>File permission</u> is checked 3.2 File permission is changed as per requirement 3.3 Ownership is set as required.
Range of Variables	
Variables	Range (may include but not limited to)
1. Linux File Systems	1.1 Ext2 1.2 Ext3 1.3 Ext4 1.4 Swap 1.5 LVM 1.6 BTRFS 1.7 XFS
2. Linux Directory Structure	2.1 Root (/) 2.2 /bin 2.3 /boot 2.4 /dev 2.5 /etc 2.6 /home 2.7 /lib 2.8 Media 2.9 /mnt 2.10 /opt

	<ul style="list-style-type: none"> 2.11 /tmp 2.12 /usr 2.13 /proc
3. Linux Runlevels	<ul style="list-style-type: none"> 3.1 Halt. 3.2 Single-user text mode. 3.3 Not used (user-definable) 3.4 Full multi-user text mode. 3.5 Not used (user-definable) 3.6 Full multi-ser graphical mode (with an X-based login screen) 3.7 Reboot.
4. File types	<ul style="list-style-type: none"> 4.1 Regular file 4.2 Directory 4.3 Character device file 4.4 Block device file 4.5 Local socket file 4.6 Named pipe 4.7 Symbolic link
5. Editor	<ul style="list-style-type: none"> 5.1 VIM 5.2 NANO 5.3 VI
6. Commands	<ul style="list-style-type: none"> 6.1 ls 6.2 touch 6.3 cat 6.4 cp 6.5 mv 6.6 rm 6.7 chmod 6.8 chown 6.9 chgrp 6.10 getfacl 6.11 setfacl
7. File permission	<ul style="list-style-type: none"> 7.1 File system Permission 7.2 Access Control List
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1 Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Interpreted Linux file system 1.2 Managed partitions and Linux file system 1.3 Managed Linux permissions and ownership
2 Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Linux file system 2.2 Linux directory structure 2.3 Linux runlevels 2.4 Partition type 2.5 File's type

	2.6 Access privilege of files 2.7 Command for file management
3 Underpinning skills	3.1 Using Linux editor 3.2 Changing file permission 3.3 Changing ownership
4 Underpinning attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5 Resource implications	The following resources must be provided: 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
6 Methods of assessment	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 NSDA accredited center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<p>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.</p>	

Unit Code and Title	OUSA07L5V1: Implement Network and Server Services for Linux
Unit Descriptor	This unit covers the knowledge, skills and attitude required to implement network and server services for Linux. It includes configuring yum/DNF Repositories, configuring server services for Linux, testing Client-Server network and scheduling Linux Tasks
Nominal Hours	70 hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Configure yum/DNF Repositories	1.1 Yum/DNF package is interpreted and installed. 1.2 Yum/DNF repositories are configured at the server side. 1.3 Yum/DNF repositories are configured at the client side. 1.4 Packages are installed as per requirements using yum. 1.5 Packages are updated as per requirements using yum.
2. Configure Server Services for Linux	2.1 Linux Server Services are interpreted. 2.2 Packages for the services are installed including dependencies. 2.3 Package status is checked. 2.4 Service is configured using console or graphical environment. 2.5 Firewall policy are configured for the service. 2.6 SELinux policy and boolean are configured for the service. 2.7 Services are started, enabled and monitored.
3. Test Client-Server network	3.1 loop-back address (127.0.0.1) is checked 3.2 Ping command is performed for check network 3.3 Traceroute command is used for route verification. 3.4 Nslookup and dig is used to check DNS. 3.5 File sharing is performed between client and server.
4. Schedule Linux Tasks	4.1 Linux tasks (Crontab) are scheduled. 4.2 Log/ temporary files are managed.
Range of Variables	
Variables	Range (may include but not limited to)
1. Linux Server Services	1.1 SSH 1.2 FTP Server 1.3 DHCP Server 1.4 NFS, SMB Server 1.5 iSCSI Server 1.6 BIND server 1.7 Apache Server 1.8 Mail Server 1.9 Proxy Server
2. Linux tasks (Crontab)	2.1 One-time tasks 2.2 Recurring tasks 2.3 System tasks
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	Assessment required evidence that the candidate: 1.1 configured yum repositories 1.2 configured server services for Linux 1.3 tested client-server network 1.4 scheduled Linux tasks
2. Underpinning knowledge	2.1 Yum package 2.2 Yum repositories 2.3 Linux Server Services 2.4 Firewall and SELinux policy 2.5 loop-back address 2.6 Linux commands 2.7 Linux task scheduling
3. Underpinning skills	3.1 Installing Yum package 3.2 Yum repositories are configured at the server side 3.3 Configuring Firewall and selinux policy 3.4 Using Tracroute command 3.5 Managing Log/ temporary files
4. Underpinning Attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for the rights of peers and seniors in the workplace 4.6 Communication with peers and seniors in the workplace
5. Resource implications	The following resources must be provided: 5.1 Relevant tools, equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
6. Methods of assessment	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 NSDA accredited center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<p>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.</p>	

Unit Code and Title	OUSA08L5V1: Work with Basic Cloud Services
Unit Descriptor	This unit covers the knowledge, skills, and attitudes required to Work with basic cloud services. It specifically includes describing concept of cloud services and configuring virtual private cloud
Nominal Hours	40 hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Describe concept of cloud services	1.1 Cloud services are identified. 1.2 <u>Types of cloud services</u> are defined. 1.3 Scope of cloud services is identified.
2. Configure virtual private cloud	2.1 <u>Requirements</u> are collected for virtual private cloud 2.2 <u>Cloud service providers</u> are identified and selected 2.3 Virtual private cloud is created as per requirement
Range of Variables	
Variables	Range (may include but not limited to)
1. Types of cloud services	1.1 In terms of Service 1.1.1 Infrastructure as a service (IaaS) 1.1.2 Platform as a service (PaaS) 1.1.3 Software as a service (SaaS) 1.2 In terms of Localization 1.2.1 Private 1.2.2 Public 1.2.3 Hybrid
2. Requirements	2.1 Computing service 2.2 Storage service 2.3 Load balancer 2.4 Security group 2.5 Network service a. IP Addressing b. NAT c. Routing
3. Cloud service providers	3.1 Amazon web services (AWS) 3.2 Microsoft web services (Azure) 3.3 Google Cloud platform (GCP) 3.4 Oracle Cloud Infrastructure (OCI)
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	Assessment required evidence that the candidate: 1.1 described concept of cloud services 1.2 configured virtual private cloud
2. Underpinning knowledge	2.1 Cloud services 2.2 Scope of cloud services

	2.3 Virtual private cloud
3.Underpinning skills	3.1. Collecting requirements for virtual private cloud 3.2. creating Virtual private cloud using cloud services
4.Underpinning attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5.Resource implications	The following resources must be provided: 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning materials.
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 center. 7.2 Assessment should be done by NSDA certified/ nominated assessor
<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 Server Administration is developed by SEIP on 25 May 2021.

S.N.	Name	Position in the committee
1.	Dr. Md. Sanwar Jahan Bhuiyan, DEPD (Private-1), SEIP.	Member
2.	Mr. Mursil Mahmud, Quality Assurance Officer (CSE), SEIP.	Member
3.	Mr. Al-MustafaTawqir Hossain, Quality Assurance Officer, SEIP.	Member
4.	Mr. Md Rafiqul Islam Bhuiyan, Chief Executive Officer(CEO), LEISC-SEIP Project.	Member
5.	Engr. Md. Moklesur Rahman, Maintenance engineer, Dhaka WASA. (Network)	Member
6.	Mr. Tayab Khan, Head of IT Infrastructure, SHEBA Group (ISP, IIG, ICX, Software)	Member
7.	Engr. Mohammed Liakwat Ali Khan, Sr. Assistant Director, Daffodil University Project	Member
8.	Engr. S.M Shameem Ahsan, Curriculum Development & Training Executive, LEISC-SEIP Project	Member
9.	Engr. Md Abul Kalam Azad, Assessment & Certification Executive, LEISC-SEIP Project	Member
10.	Mr. Sacchidanand Majumder, LMI & Research Executive, LEISC-SEIP Project	Member
11.	Mr. Md. Saif Uddin, Consultant (Process Expert), Swisscontact	Member
12.	Mr. Md. Asif Uddin Sagar, Office Secretary, LEISC-SEIP Project	Member

Validation of Competency Standard

The Competency Standards for National Skills Certificate in Server Administration, Level-5 is validated by NSDA on 21 June 2022.

S/N	Name and Information	Designation	Signature and Date
01	Shafquat Haider, Chairman, ICT ISC, Email: ciproco@bol-online.com, shafquat.haider@gmail.com, Mobile: 01711532597	Chairperson	
02	MD. Abdulla Al Mabud, Specialist (LMD), Bangladesh Technical Education Board (BTEB), Email: mabud82@gmail.com, Mobile: 01718406271	Member	
03	Khondoker Ali Asgor Pavel, Chief Executive Officer, bitBirds Solutions, Dhaka. Email: email@aliasgorpavel.com Mobile: 01711873008	Member	
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Workshop Minutes

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 Prime Minister's Office
 National Skills Development Authority
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Minutes of the Competency Standard Validation Workshop on “Server Administration including windows Server” Occupation.

Chairman	: Mr. Shafquat Haider, Chairman, ICT ISC
Date	: 14 June 2022
Time	: 9:00am - 5:00pm
Place	: ISC Conference Room, NSDA, Biniyog Bhaban, Agargaon, Dhaka-1207

The Chairman welcomed all those present and started the work of the workshop. During the day-long workshop, the competency standard of Server Administration including Windows Server Occupation was reviewed and finalized in detail. The activities related to the finalized standard through validation workshop are presented below:

Serial No.	Content of validation	Whether it was appropriate		What actions have been taken if not appropriate?
		Yes	No.	
1	Name and level of occupation		No.	<ul style="list-style-type: none"> ▪ The name of the occupation has been changed from "Server Administration including Windows Server" to "Server Administration". ▪ UoC Level for Occupation Specific Units updated from 3 to 5.
2	Nominal Hour	Yes		360 hours
3	Unit of Competency		No.	From the proposed Generic Units <ul style="list-style-type: none"> ▪ “Work in a Team Environment”, “Demonstrate Interpersonal and Communication Skills” and “Support innovation and Manage Change” are excluded. ▪ Following unit is added to Generic Competencies: <ul style="list-style-type: none"> ▪ “Lead Small Team”. Following unit from Sector Specific Units is excluded: <ul style="list-style-type: none"> ▪ Access Information Using Internet and Electronic Mail

				At Occupation Units following changes are made: <ul style="list-style-type: none"> ▪ Sequence of Units of competencies are rearranged. ▪ Nominal Hours of Occupation Specific
4	Element		No.	Proper refinement of required elements has been achieved by keeping consistent elements.
5	Performance Criteria		No.	Necessary refinement of performance criteria has been achieved.
3	Variables		No.	Appropriate addition, modification and refinement of variables has been done keeping in view the performance criteria.
3	Critical Aspect of Competence		No.	Appropriate changes have been made in the critical aspect of competency as per the change of units.
3	Underpinning knowledge		No.	Necessary addition, changings and refinements have been made.
9	Underpinning Skills		No.	Necessary added, changes and refinements have been made.
10	Attitude	Yes		
11	Resources	Yes		
12	Assessment methods	Yes		
13	Others			<ul style="list-style-type: none"> ▪ Overall, the occupation has been included in Level-5 according to NSQF (BNQF 1-6).

Through the above activities, the Competency Standard has been finalized and validated as “**Server Administration, Level-5**”.

Chairman
Committee on Standard and
Curriculum Validation,
Chairman - ICT ISC