

		<b>Unit ID: 2310</b>
<b>Domain</b>	<b>NETWORKING</b>	
<b>Title:</b>	<b>Perform routing and switching on network devices</b>	
<b>Level:5</b>	<b>Credits: 9</b>	

### **Purpose**

This unit standard is intended for those who perform routing and switching on network devices. People credited with this unit standard are able to describe and demonstrate several cisco configuration modes; perform basic switch configurations; perform layer 3 configurations; describe and verify switching concepts; configure, verify and troubleshoot interswitching connectivity; configure, verify and troubleshoot Spanning Tree Protocols (STP) protocols; describe routing concepts; interpret routing table components and demonstrate an understanding of routing protocols.

This unit standard is intended for those who work in the networking environment.

### **Special Notes**

1. Entry information:

Prerequisites:

- None
2. Assessment evidence may be collected from a real or a simulated workplace in which networking operations are carried out.
  3. Tools and equipment may include but are not limited to computer, external devices, storage devices and other and basic computer applications.
  4. Performance of all elements in this unit standard must comply with industry standards.
  5. Regulations and legislation relevant to this unit standard include the following:
    - Labour Act 2007(Act No 11, 2007).
    - Regulations relating to the health and safety of employees at work under schedule 1 (2) of the Labour Act No.11 of 2007 and all subsequent amendments.

### **Quality Assurance Requirements**

This unit standard and others within this sub-field may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details

of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority on [www.namqa.org](http://www.namqa.org) and the Namibia Training Authority on [www.nta.com.na](http://www.nta.com.na)

## **Elements and Performance Criteria**

### **Element 1: Describe and demonstrate several cisco configuration modes**

#### **Performance Criteria**

- 1.1 User and privilege execution mode is described and demonstrated.
- 1.2 Global configuration mode is described and demonstrated.
- 1.3 Interface configuration mode is described and demonstrated.
- 1.4 Virtual Local Area Network (VLAN) configuration mode is described and demonstrated.
- 1.5 Virtual teletype (VTY) Line configuration mode is described and demonstrated.

### **Element 2: Perform basic switch configurations**

#### **Range**

Basic switch configurations may include but not limited to name and Internet Protocol (IP) address.

#### **Performance Criteria**

- 2.1 Connection to the switch is performed.
- 2.2 Power over Ethernet is explained.
- 2.3 Existing configurations are cleared.
- 2.4 Basic switch configurations are performed.
- 2.5 Switch passwords are configured.
- 2.6 Port speed, duplex and port security are configured.
- 2.7 Configurations are saved and connectivity is verified.

### **Element 3: Perform layer 3 configurations**

#### **Performance Criteria**

- 3.1 Dynamic Host Configuration Protocol (DHCP) server is configured.
- 3.2 Domain Name System (DNS) server is configured.

#### **Element 4: Describe and verify switching concepts**

##### **Performance Criteria**

- 4.1 MAC learning and aging is explained.
- 4.2 MAC address table is described and verified.
- 4.3 Frame switching is explained.
- 4.4 Frame flooding is explained.

#### **Element 5: Configure, verify and troubleshoot interswitching connectivity**

##### **Range**

Trunking protocols may include but not limited to Dynamic Trunking Protocol (DTP), VLAN Trunk Protocol (VTP) and 802.1Q.

##### **Performance Criteria**

- 5.1 Trunk ports are configured and verified.
- 5.2 Virtual Local Area Network (VLANs) are added and removed on a trunk.
- 5.3 Trunking protocols are explained and configured.
- 5.4 Native Virtual Local Area Network (VLAN) is explained and configured.

#### **Element 6: Configure, verify and troubleshoot Spanning Tree Protocols (STP) Protocols**

##### **Performance Criteria**

- 5.1 STP modes are configured.
- 5.2 STP root bridge selection is explained and demonstrated.

#### **Element 7: Describe routing concepts**

##### **Performance Criteria**

- 7.1 Packet handling and path selection through a network is explained.

7.2 Forward decisions and route lookups are described.

### **Element 8: Interpret routing table components**

#### **Performance Criteria**

- 8.1 Prefix and network mask are explained.
- 8.2 Next hop is explained.
- 8.3 Routing protocol codes are explained.
- 8.4 Administration distance and Metric is explained.
- 8.5 Gateway of last resort is explained.

### **Element 9: Demonstrate an understanding of routing protocols**

#### **Range**

Routing protocols may include but not limited to Routing Information Protocol (RIP), Open Standard Path First (OSPF) protocol, Internet Gateway Routing Protocol (IGRP), Border Gateway Protocol (BGP) and Intermediate System to Intermediate System (IS-IS).

#### **Performance Criteria**

- 9.1 Routing protocols are identified.
- 9.2 Routing protocols are explained and described.
- 9.3 Types of routing protocols are configured according to requirements.

### **Registration Data**

<b>Subfield:</b>	Information and Communication Technology
<b>Date first registered:</b>	30 July 2020
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<b>Anticipated review:</b>	2025
<b>Body responsible for review:</b>	Namibia Training Authority