

Title	Demonstrate and apply advanced knowledge of personal computer engineering		
Level	6	Credits	15

Purpose	<p>This unit standard covers multi-user, multi-tasking network operating systems and operating system characteristics. This includes installation procedures, security issues, back up procedures, and remote access.</p> <p>People credited with this unit standard are able to demonstrate:</p> <ul style="list-style-type: none"> – advanced knowledge of network operating system engineering principles; – advanced knowledge of network system components; – and apply advanced knowledge of network operating system planning and installation; and – apply advanced knowledge of NOS administration and maintenance.
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Classification	Electronic Engineering > Computer Engineering
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Available grade	Achieved
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Prerequisites	Unit 11566, <i>Demonstrate and apply intermediate knowledge of personal computer engineering</i> , or demonstrate equivalent knowledge and skills.
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Guidance Information

- 1 This unit standard is intended for use in engineering courses at diploma level with assessment primarily against presented assignments.
- 2 This unit standard is one of two designed to cover knowledge and application of personal computer engineering, the other being Unit 11566, *Demonstrate and apply intermediate knowledge of personal computer engineering*.
- 3 Reference
Health and Safety at Work Act 2015;
and all subsequent amendments and replacements.
- 4 Definitions
Advanced knowledge – means employing specialised knowledge, with depth in more than one area of the subject matter, to analyse, reformat, and evaluate a wide range of information.
ARP – address resolution protocol.

BIOS – Basic Input/Output System.

FTP – file transfer protocol.

Industry practice – practice used and recommended by organisations involved in the electrotechnology industry.

ipconfig – command that displays all current TCP/IP network configuration values.

LAN – Local Area Network.

nbtstat – command that displays NetBIOS over TCP/IP (NetBT) protocol statistics.

NIC – network interface card.

NOS – Network Operating System.

ping – TCP/IP connectivity test command.

TCP/IP – Transmission Control Protocol/ Internet Protocol, a suite of protocols used for transfer of information between computers.

tracert – command that traces the route taken by packets across an IP network.

WAN – Wide Area Network.

- 5 All measurements are to be expressed in Système International (SI) units, and, where required, converted from Imperial units into SI units.
- 6 All activities must comply with: any policies, procedures, and requirements of the organisations involved; the standards of relevant professional bodies; and any relevant legislative and/or regulatory requirements.
- 7 Range
 - a performance in relation to the outcomes of this unit standard must comply with the Health and Safety at Work Act 2015;
 - b laboratory and workshop safety practices are to be observed at all times.

Outcomes and performance criteria

Outcome 1

Demonstrate advanced knowledge of network operating system engineering principles.

Range evidence of two operating systems is required.

Performance criteria

- 1.1 Fundamentals, similarities, and differences of various operating systems are described in accordance with industry practice.

Range functions, structure, characteristics, major system components, Microsoft Windows family, Unix/Linux.

- 1.2 Computer networking is analysed and explained in accordance with industry practice in terms of types, nodes, and interfacing.

Range LANs, WANs, protocols, media, common network devices.

Outcome 2

Demonstrate advanced knowledge of network system components.

Performance criteria

- 2.1 Physical components of a network are described in terms of function, construction, and operating characteristics in accordance with industry practice.
- Range NIC, topologies, media, devices.
- 2.2 Components and characteristics of TCP/IP Networking are described in accordance with industry practice.
- Range may include but is not limited to – IP version 4, TCP/IP model, classes of addressing, name resolution, common protocols; evidence of four required.
- 2.3 The description identifies the function and operating characteristics of common network services in accordance with industry practice.
- Range may include but is not limited to – remote administration and access, directory services, mail, printing, file sharing, domain name service (DNS), dynamic host configuration protocol (DHCP); evidence of six required.

Outcome 3

Demonstrate and apply advanced knowledge of network operating system planning and installation.

Range evidence of three operating systems is required.

Performance criteria

- 3.1 The planning processes and procedures are described in terms of purpose, hardware, software, and timing required for network operating system installation in accordance with industry practice.
- Range may include but is not limited to – NOS characteristics, Microsoft Windows, Linux, software compatibility, server hardware.
- 3.2 NOSs and the boot processes are installed in accordance with industry practice.
- Range may include but is not limited to – hardware compatibility, installation media, BIOS settings, disk partitions, boot process.
- 3.3 System configuration procedures and installation of services are completed in accordance with industry practice.
- Range may include but is not limited to – creating and sharing of directories, installation of web services, FTP server, email server.

Outcome 4

Demonstrate and apply advanced knowledge of NOS administration and maintenance.

Range evidence of three operating systems is required.

Performance criteria

4.1 NOS administration is described in terms of purpose and application in accordance with industry practice.

Range may include but is not limited to – backup, upgrades and patches, hardware upgrades, disk management, logs, username, password and permissions.

4.2 Threats to network security and measures used to mitigate these threats are described in accordance with industry practice.

Range threats may include but are not limited to – virus, denial of service; mitigation measures may include but are not limited to – security policy, username and password standards, encryption, intrusion detection systems, patches, firewalls.

4.3 NOS administration and troubleshooting procedures are demonstrated in accordance with industry practice.

Range back up, patches, drive mapping, disk management, network performance, network management, troubleshooting, ping, tracert, ARP, ipconfig, nbtstat.

This unit standard is expiring. Assessment against this standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 April 2000	31 December 2021
Review	2	18 December 2006	31 December 2021
Rollover and Revision	3	28 June 2018	31 December 2021
Review	4	28 January 2021	31 December 2021

Consent and Moderation Requirements (CMR) reference

0003

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.