Unit 27: Network Operating Systems

Unit code: K/601/0468
QCF Level 4: BTEC Higher National
Credit value: 15

Aim
To provide learners with the knowledge, skills and techniques necessary to install, configure, troubleshoot and maintain a reliable network operating systems service.

Unit abstract
Modern enterprise organisations rely on the use of a range of network operating systems (NOS), to establish the networking services necessary to run their IT infrastructure. Supporting a NOS is considered one of the primary roles of a professional network administrator. It is part of their duties to identify the NOS as required, undertake the installation and deployment of network servers, and configure, support and maintain the NOS. This may also involve routine administration, the management of systems and user security policies as well as more specific specialist tasks.

This unit will allow learners to install, configure, support and maintain complex NOS and servers. They will learn the skills and knowledge to use the NOS, to provide enterprise users access to the services and resources, in a secure environment, making sure that business data is protected against internal and external attacks or disasters.

Learning outcomes
On successful completion of this unit a learner will:

1. Understand network operating systems principles
2. Be able to plan the implementation of network operating systems
3. Be able to implement network operating systems
4. Be able to manage network operating systems.
UNIT 27: NETWORK OPERATING SYSTEMS

Unit content

1 Understand network operating systems principles

NOS: types eg standalone, infrastructure based, cluster based

NOS services: types eg file, web, print, remote access, proxy, terminal services, firewall, access control, infrastructure management, e-commerce

Disaster recovery: backup methodology, data recovery, mirrored systems, virtualisation, UPS (Uninterruptible Power Supply), backup-power supply, off site management, high availability, fault tolerance

NOS selection: open source, proprietary, general purpose, task specific

NOS security: management of updates/patches, anti-virus protection, physical access policies, service access policies, user access policies, policy management, user audits, group audits, continual vetting of access, authentication policies and practice, password policy

2 Be able to plan the implementation of network operating systems

Naming system: method eg registration of server on directory service, infrastructure requirement, issue of local name for server

Addressing: method eg allocation of addresses for NOS services

Installation: preparation eg selection of hardware, memory requirement, standalone, infrastructure, virtual server, storage requirement, disk partitioning, RAID allocation

Service: selection eg file, web, print, remote access, proxy, terminal services, firewall, access control, infrastructure management, e-commerce

Security: policy eg patch management, anti-virus management, access requirement, administrative rights, authentication, password policy

Disaster recovery: policy eg backup methodology, mirrored services, virtualisation, UPS, backup-power supply, off site management, high availability, fault tolerance

3 Be able to implement network operating systems

NOS: installation: eg selection of media, application of NOS to selected installation environment, application of naming system, application of addressing

Service: installation: eg file, web, print, remote access, proxy, terminal services, firewall, access control, infrastructure management, e-commerce

Security: configuration eg installation of updates, installation of anti-virus management, setting of administrative rights, setting of authentication policy, setting of password policy

Disaster recovery: configuration eg mirrored services, virtualisation, UPS, backup-power supply, off site management, high availability, fault tolerance services

Testing: eg access to network, other devices able to access services
4 Be able to manage network operating systems

Performance: baseline eg establishing normal performance without load, establishing performance with load

Monitor: performance eg setting up and monitoring event logs, optimising server performance, using performance tools

Updating NOS: eg implementing a security policy and auditing system, applying patches, security updates, reviewing user access, adding new services
## Learning outcomes and assessment criteria

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<td><strong>The learner can:</strong></td>
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| **LO1** Understand network operating systems principles | 1.1 evaluate types of NOS and NOS services  
1.2 discuss the benefit of disaster recovery and NOS security  
1.3 critically compare a selection of current NOS’s in use |
| **LO2** Be able to plan the implementation of network operating systems | 2.1 plan the implementation of a NOS for a required service to meet a given specification  
2.2 evaluate the plan and analyse user feedback |
| **LO3** Be able to implement network operating systems | 3.1 implement a NOS service based on a prepared plan  
3.2 test the NOS to meet user requirements  
3.3 document and analyse test results against expected results |
| **LO4** Be able to manage network operating systems | 4.1 establish and justify a performance baseline  
4.2 monitor NOS performance against the baseline  
4.3 justify performance optimisation and update to NOS. |
**Guidance**

### Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

The learning outcomes associated with this unit are closely linked with:

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This unit has links to the Level 4 and Level 5 National Occupational Standards for IT and Telecoms Professionals, particularly the areas of competence of:

- IT/Technology Infrastructure Design and Planning
- Systems Development
- IT Application Management/Support
- IT/Technology Management and Support.

### Essential requirements

Learners must have access to a live or ‘detached’ network environment to create the network infrastructure and develop their skills; this may also be successfully accomplished using virtual machines.

This is a technical unit, which requires that learners are provided with an appropriate networking environment to allow them to practice all the skills and techniques outlined in the criteria, and to produce the required evidence to prove their competence.

Learners need to be provided with the opportunity to build a computer systems network of at least one client and one server, so they will be in position to install the NOS and configure it for client’s access. Learners must also install the networking services and configure them as required. This may be in a contained environment and could be via a training LAN or may be on one system using multiple virtual machine images.
Resources

Books
ISBN-10: 0596006284
ISBN-10: 059514814X
ISBN-10: 0131118943

Websites
www.cisco.com
www.howstuffworks.com/operating-system.htm/printable
www.microsoft.com

Employer engagement and vocational contexts

Working with a live system will present many risks, that the centre, employer and learner must be aware of. In using a current vocational context to deploy an additional or alternate solution will enhance the learners’ experience and enable understanding of wider technical application.