

Unit 43: Networking Infrastructure

Unit code: A/601/1964

QCF Level 5: BTEC Higher National

Credit Value 15

● Aim

To provide learners with an understanding of networking infrastructures, the directory based system that supports the addressing and resource management of any large scale networked system.

● Unit abstract

Network infrastructure systems such as Active Directory (from Microsoft) or eDirectory (from Novell) amongst many others, are systems used to manage resources, naming of devices, allocation of rights, privileges and security policies.

Each can be used to deploy software as well as control the behaviour of the network infrastructure. Learners taking this unit will explore the principles supporting any network infrastructure system, design a solution for a given networked environment as well as implement and test the solution.

This unit has links to many vendor qualifications and can be used to encourage the study and certification of these by learners. Additionally this unit links to all networking and systems support units and offers learners the opportunity to build a complex network system.

● Learning outcomes

On successful completion of this unit a learner will:

- 1 Understand the principles of network infrastructure management.
- 2 Be able to design complex network infrastructure systems
- 3 Be able to implement complex network infrastructure systems
- 4 Be able to test complex network infrastructure systems.

Unit content

1 Understand the principles of network infrastructure management

Name resolution: services eg Domain Name System (DNS), eDirectory, Active Directory; requirements eg addressing, resource management, user management, services management, security of resources, access control

Technology: resources eg servers supporting networking infrastructure management, routers, printers, switches, firewalls, clients, wireless access, cabled access, remote workstations, 3G based remote access

Security: resources eg rights management, resource availability, user management, access times, group allocation, timed access, encryption, authentication, Virtual Private Network (VPN), tunneling, remote access, RADIUS (Remote Access Dial In Support), TACACS (Terminal Access Controller Access-Control System), IPSec, certificate authorities, PKI (Public Key Infrastructure)

2 Be able to design complex network infrastructure systems

Addressing: naming methodology, delivery of addresses, identification of devices and resources

Rights: designing user and group rights, access rights to resources, access to files, access to printers, access to services

Security: creation of remote access services, deployment of VPN access, time based rules, trust management, access control and login, logging, system activity audit trail

Deployment: scalable, use of technology, adaptable, change management, commercial requirements, supportive of environment

3 Be able to implement complex network infrastructure systems

Addressing: application of naming methodology, delivery of addresses

Rights: issue of rights to users, apply rights to groups, apply access rights to resources, access to files, access to printers, access to external services

Security management: remote access services, deployment of VPN access rules, trust management, access control and login, logging, system activity audit trail

Interaction: with external DNS, with other directory services, with existing directory services infrastructure

4 Be able to test complex network infrastructure systems

System assurance: security of system, access, availability, visibility of all resources

User assurance: valid access issued, group access, inheritance of rights

Documentation: test plan; test results; analyse results

Learning outcomes and assessment criteria

Learning outcomes On successful completion of this unit a learner will:	Assessment criteria for pass The learner can:
LO1 Understand the principles of network infrastructure management	1.1 evaluate current name resolution services 1.2 discuss the technologies that support network infrastructure management 1.3 discuss security resources available in network infrastructure management
LO2 Be able to design complex network infrastructure systems	2.1 design a network infrastructure for a given networked environment 2.2 evaluate addressing and deployment solutions for a given networked environment 2.3 evaluate rights and security requirements for a given networked environment
LO3 Be able to implement complex network infrastructure systems	3.1 implement a network infrastructure based on a prepared design
LO4 Be able to test complex network infrastructure systems	4.1 critically review and test an implemented system 4.2 evaluate system and user assurance of the implemented system.

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:

Level 3	Level 4	Level 5
Unit 5: Managing Networks	Unit 24: Networking Technologies	Unit 44: Local Area Networking Technologies
Unit 9: Computer Networks	Unit 25: Routing Concepts	Unit 45: Wide Area Networking Technologies
Unit 10: Communication Technologies	Unit 26: Design a Small or Home Office (SOHO) Network	Unit 46: Network Security
Unit 32: Networked Systems Security	Unit 27: Network Operating Systems	

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
- IT/Technology Service Operations and Event Management
- IT/Technology Management and Support
- Change and Release Management.

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.

Learners must have access to facilities which allow them the opportunity to fully evidence all of the criteria of the unit. If this cannot be guaranteed then centres should not attempt to deliver this unit.

Implementation of the infrastructure solution must be tested systematically and procedurally based on the technology used in the design solution. The solution implemented may be on a live system, but ideally should be tested in a simulated or sand box environment.

Resources

Books

Mackin J and McLean I – *MCSE Implementing, Managing & Maintaining a Windows Server 2003 Network Infrastructure* (Microsoft, 2006) ISBN-10: 0735622884

White G et al – *CompTIA Security+ All-in-One Exam Guide, Second Edition* (McGraw Hill, 2009) ISBN-10: 0071601279

Employer engagement and vocational contexts

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

