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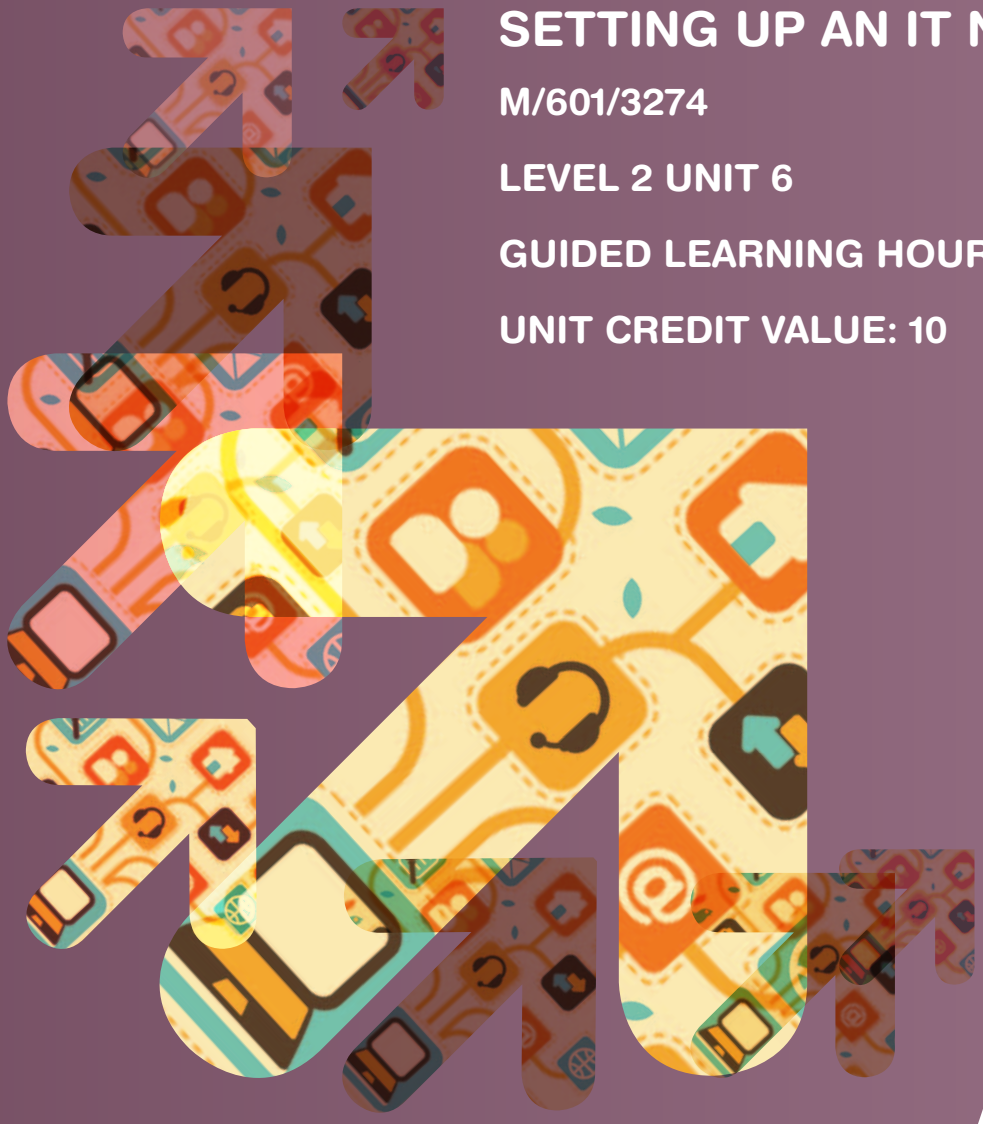
OCR LEVEL 2 CAMBRIDGE TECHNICAL

CERTIFICATE/DIPLOMA IN

IT



SETTING UP AN IT NETWORK

M/601/3274

LEVEL 2 UNIT 6

GUIDED LEARNING HOURS: 60

UNIT CREDIT VALUE: 10

OCR

SETTING UP AN IT NETWORK

M/601/3274

LEVEL 2

AIM OF THE UNIT

Networking skills are highly valued in the IT industry and on completing this unit learners will gain the underpinning knowledge of the features, benefits and services of an IT network in an organisation.

The aim of this unit is to give learners an understanding of the role of computer networks within organisations, in addition they will investigate the components of a network and to provide them with the skills to set up and test a local area network.

ASSESSMENT AND GRADING CRITERIA

Learning Outcome (LO) The learner will:	**Pass** The assessment criteria are the pass requirements for this unit. The learner can:	**Merit** To achieve a merit the evidence must show that, in addition to the pass criteria, the learner is able to:	**Distinction** To achieve a distinction the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
1 Know the current use of computer networks	P1 describe how the use of computer networks can improve communications for individuals and organisations	M1 explain the benefits of computer networks in improving communication within an organisation	
	P2 describe how a network is used by an organisation to manage its resources	M2 explain how digital communications flow through an organisation	
2 Know the features and services of local and wide area network technologies	P3 describe potential faults with computer networks		
	P4 describe the features and services of local and wide area network technologies		D1 justify the use of different network setups
3 Understand how network hardware and software components are connected	P5 explain how hardware, software and addressing combine to support network communications		
4 Be able to set up a simple local area network	P6 set up and test a simple local area network	M3 configure advanced security settings on a local area network	D2 implement a test plan to test advanced security settings on a local area network

TEACHING CONTENT

The unit content describes what has to be taught to ensure that learners are able to access the highest grade.

Anything which follows an i.e. details what must be taught as part of that area of content.

Anything which follows an e.g. is illustrative, it should be noted that where e.g. is used, learners must know and be able to apply relevant examples to their work though these do not need to be the same ones specified in the unit content.

Learners will need to look at the following areas

LO1 Know the current use of computer networks

- **communication in computer networks could be:**
    - individual (e.g. Blogs, emails,)
    - organisational: (e.g. email, wikis, file storage, data centres)
    - collaborative (e.g. social networking, webinars)
    - live (e.g. video, interactive web conferencing, desktop sharing, Communication in terms of sharing of electronic documents between group members on project work).
- **resources:**
    - Data Protection Act as it applies to shared data
    - hardware
    - software.
- **network specific issues:**
    - speed of connection
    - costs (e.g. Staff skills, resources)
    - down time/loss of productivity
    - system Security (e.g. unauthorised access, loss of data, malware, virus protection)
    - physical Security (e.g. backup medium, hardware components)
    - backup (e.g. recovery, security)
    - hacking
    - firewalls.

LO2 Know the features and services of local and wide area network technologies

- **features:**
    - look at different topologies; (e.g. star, bus, ring)
    - different types of network ; (e.g. peer-to peer, client server)
    - data rates
    - addressing (e.g. IP, Mac).
- **services:**
    - communication in a network; (e.g. email, conferencing, forums)
    - logins; (e.g. usernames, passwords, different types of access depending on the access required)
    - security
    - software deployment (e.g. different software in different areas of the network or with different logins/settings/access).
- **protocols:**
    - basic knowledge of:
        - TCP/IP and OSI models; to include purpose of the models, function in terms of addressing
        - network protocols
        - transport protocols
        - application protocols.

LO3 Understand how network hardware and software components are connected

- **hardware:**
    - network cards (e.g. Ethernet, Wireless)
    - workstations
    - servers (e.g. File, Print, Web)
    - routers
    - switches
    - wireless/mobile devices.
- **connections:**
    - cabled (e.g. Fibre optics, UTP, STP)
    - connectors (e.g. RJ45, Fibre connectors)
    - addressing in terms of network connectivity
    - WAN in terms of
        - ASDL
        - ISDN
        - Broadband.

- **software:**
  - application-based (e.g. Internet browsers, Firewalls, Email)
  - operating systems (e.g. Windows NOS, MAC OS, UNIX)
  - utility for testing network functionality (e.g. Ping, Ipconfig).

LO4 Be able to set up a simple local area network

- **relevant health and safety (e.g. lifting, protection against electric shock)**
- **preparation:**
  - components (e.g. Cabling, Switches, Hub, Network interface cards, Software needed).
- **setup:**
  - hardware
  - software
  - security.
- **simple LAN setup:**
  - peer to peer
  - client server.
- **explain faults:**
  - commonly occurring (e.g. Addressing conflicts, accessibility, network card failure, cabling issues)
  - loss of service (e.g. Print, File, Email)
  - user errors (e.g. power, incorrect logins).
- **test :**
  - addressing (e.g. user rights, space allocation)
  - connectivity
  - functionality
  - usage
  - communications
  - file transfers.
- **security** (e.g. Firewall , Permission, Access control, Different types of User rights).
- **troubleshooting:**
  - look at problems solving (e.g. Connectivity, IP addressing).

DELIVERY GUIDANCE

To deliver this unit the tutor could follow the teaching content order although this must be with a focus on learner participation and discussion based on experiences.

Know the current use of computer networks

This could be enhanced by the use of visits or talks with IT network staff. Learners to be encouraged to discuss their own experiences with using networks and to research the many different ways of communication, the ways resources are managed and any issues which come with using a network. Learners to be encouraged to research and describe the Data Protection Act as it applies to shared data. They will need to look at an organisation and look at the flow of communication, how it flows in and out of an organisation i.e. how is the information provided to all the users in the organisation (email, notice boards, meetings, blogs, virtual environments, logs, website, etc, does it always work? What are the constraints such as security, speed?). They should be encouraged to explore communication methods reporting and sharing their findings with the group and discussing the benefits and risks.

Know the features and services of local and wide area network technologies

Learners to be introduced to the different topologies of networking. Learners should be encouraged to create wall displays, posters or leaflets about the topologies, their uses and visual representations of them.

Learners to look at the different types of networks as in peer to peer and client server, making this as practical as possible and involving the identification of the networking components will add to the motivation and interest and will help with an understanding of how the network hardware components are connected. They will need to investigate the different uses of the different networks and their suitability for different users. Learners will need to look at addressing and how this is incorporated into the network, they could be given a network in which they need to either find IP and MAC addresses or to put the IP addresses onto the machines and find the MAC addresses of the computers. This would also encourage the use of utility software to find the addresses.

Learners to research the different services and protocols that relate to local and wide area networks. The internet which could be considered as a WAN can be easily used to research the advantages and disadvantages of the services and protocols with the WANs and LANs. These findings could form the basis of a group discussion.

Understand how network hardware and software components are connected

Be able to set up a simple local area network

Learners are to be encouraged to handle and use the range of network components safely. This should be delivered where possible as a practical activity giving the learners detailed instructions in connecting the hardware components together, installation of network cards, and physically creating peer to peer and client server networks. This means that the learners will have to pay careful consideration to the planning of the installation of the hardware and software, and will need to consider any health and safety issues. Working in small groups in a workshop environment is to be encouraged.

The learners will need to know how to test their installations in terms of functionality, and as a practical activity could be presented with networks containing faults and could create checklists and then check the functionality of the network to become familiar with the types of tests and the testing process. In addition to the practical environment there are a variety of simulation packages such as packet tracer that will support the learning of connecting, using and testing and learners should also be given experience of these where possible.

The learners should investigate the different types of network security such as firewalls, access rights to folders, files, etc, passwords, usernames, access control. As a group or individually they should identify the level of security which is appropriate to networks such as small local LANs large organisational LANs, WANs, wireless networks. Presentations could be made to the larger group and any conflicts or misunderstandings discussed and corrected. The learners should have the opportunity to set up security on practice networks and to create the implementation test plans that include testing user access and permissions to web sites, access to network drives and individual folders, files and software.

SUGGESTED ASSESSMENT SCENARIOS AND TASK PLUS GUIDANCE ON ASSESSING THE SUGGESTED TASKS

Assessment and Grading Criteria P1, P2, M1, M2

For P1, learners must describe how the use of computer networks can improve communications for individuals and organisations.

Evidence for criterion P2 must show how networks allow sharing of information, hardware, software and staffing relating if possible to the data protection act. A detailed presentation could be used to evidence the learners work.

For merit criterion M1 the learners must explain the benefits that computer networks give in terms of communication. They could evidence this showing the use of some of the following: blogs, forums emails, social networking, desktop sharing, video, file sharing etc and explaining how organisations can benefit from using these methods.

For merit criterion M2 the learner must show they can explain how the digital communications flow through an organisation. They must show with examples of identified organisations how the communication flows into and out of those organisations. This could be in the form of diagrams, narrative etc with explanations and annotations.

Assessment Criterion P3

Learners should describe a range of potential faults with computer networks, as identified in the teaching content. This could be evidenced by a report or a presentation.

Assessment Criteria P4, P5, D1

For P4 the learners must describe the features and services of LAN and WAN technologies. They must also make sure that the technologies chosen are complex enough that they show:

- features that include the different topologies, whether they are going to use peer to peer or client server
- services, including communication and file transfer
- protocols; they should include their purposes and functions together with examples
- the data security; this should include any access control to include login, virus protection, backup, hacking and firewalls.

The learner could deliver this as a presentation with supporting observations and statements or a detailed report.

For P5, learners could use the model chosen in P4 and demonstrate the chosen model with diagrams including explanations on how the hardware, software and addressing combine to support the network communications. They must explain and show the cabling used and how addressing is used to create access.

For distinction criterion D1 learners must show they can justify the use of different network setups. This could be evidenced with leaflets, presentations or reports, which detail the different networks and justify why the network is suitable and most appropriate for the identified different types of users.

Assessment Criteria P6, M3, D2

Learners should set up a basic LAN and test it for functionality.

For P6, this should be a practical activity in which the learners should be observed setting up, using and testing a simple LAN.

Acceptable forms of evidence could be detailed witness statements from the tutor supporting a detailed report and test plan from the learner and could be enhanced by clearly annotated photographic evidence or a video recording of the activity.

For merit criterion M3 this can be evidenced as an extension of P6 and learners must evidence the setting up and using security such as firewalls, file and folder permission across the network, access controls, user rights and anti-virus. Acceptable forms of evidence could be detailed witness statements from the tutor, records with a report detailing how they completed the tasks. These can be enhanced with photographic or screenshot evidence.

For distinction criterion D2 evidence must take the form of a detailed test plan/table which identifies the essential tests on security settings to include testing user permissions and accessibility to any banned/restricted websites. The detail could have the learner explaining why they are doing the tests and what they expect to happen. Each test must be carried out and the results recorded, clearly evidenced and any faults corrected and the system retested.

MAPPING WITHIN THE QUALIFICATION TO THE OTHER UNITS

Unit 4: Installing Computer Hardware

Unit 5: Installing Computer Software

Unit 7: IT Support

Unit 8: IT Fault Diagnosis and Remedy

LINKS TO NOS

7.1 IT/Technology Service Operations and Event Management

7.5 IT/Technology Management and Support

7.7 IT/Technology Capacity Management

CONTACT US

Staff at the OCR Customer Contact Centre are available to take your call between 8am and 5.30pm, Monday to Friday.

We're always delighted to answer questions and give advice.

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