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Monday 11 June 2018 – Morning

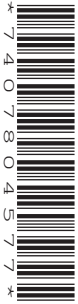
A2 GCE

APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY

G055/01/IC Networking Solutions

INSERT

Duration: 1 hour 30 minutes



INFORMATION FOR CANDIDATES

- This document consists of **8** pages.

INSTRUCTION TO EXAMS OFFICER/INVIGILATOR

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NOTICE TO CANDIDATES

The work you submit for these pre-release tasks **must** be your own.

- If you copy from someone else or allow another candidate to copy from you, or if you cheat in any other way, you may be **disqualified** from at least the subject concerned.
 - You **must** always keep your work secure and confidential while you are preparing it. **If it is stored on a computer network, keep your password secure. When printing work, collect all copies from the printer and destroy the copies you don't need.**
 - Any materials (e.g. books, information from the internet you have used to help complete this work, etc.) **must** be clearly acknowledged in the work itself.
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- All work **must** be submitted to your teacher once completed. Ensure you include your name, candidate number and centre number on all pages and that each page is hole punched in the top left-hand corner and secured with a treasury tag.
 - **You must not submit any materials other than your response to the pre-release tasks.**
 - When you hand in your completed tasks, you will be required to sign that you have understood and followed the regulations by completing a Candidate Authentication Statement.
 - Your work will be returned to you at the start of the exam, in the exam room. At the end of the exam, you **must** attach **all** tasks to your question paper using the treasury tag.

ALWAYS REMEMBER

YOUR WORK MUST BE YOUR OWN

PRE-RELEASE TASKS – INSTRUCTIONS FOR CANDIDATES

Read the attached case study and these instructions carefully, then carry out the tasks detailed below. There are two types of task.

In Task 1 you will produce notes that will help you to answer questions in the examination for this unit. The other tasks will be marked and will contribute up to 30 of the 100 marks available for this unit.

You will need your completed tasks when you take the examination for this unit.

The work produced in response to the pre-release tasks **must** be submitted to your teacher when it is completed. The work **must** be presented as a hard copy.

It is not acceptable for you to copy large parts of material from other sources as the tasks require you to apply your knowledge to the case study. Any books, information leaflets or other materials (e.g. videos, software packages or information from the Internet) which you have used to help you complete this work **must** be clearly acknowledged in the work itself. To present material copied from books or other sources without acknowledgement will be regarded as deliberate deception.

You **must not** submit any material other than your response to the pre-release tasks. The work **must** be collated so that it is presented in task order.

Each page of the work **must** be marked clearly with your name, candidate number, centre number and task number.

When you have completed the tasks you **must** sign and date a Candidate Authentication Statement. You **must** then ask your teacher to sign to confirm that the work is your own.

TASK 1

You have been asked to advise on how the new network would be implemented, the components needed and how it will improve working practices and efficiency for Nine Lives.

Carry out your own research and make notes that can be used in discussions with Matt and Sophie about the planning of the new network. Your notes should include:

- the expected uses and benefits for Nine Lives and the disadvantages that might be introduced by the new network, which includes the use of an intranet and extranet
- methods for connecting a LAN to a WAN, data transfer and transmission media
- LAN technologies used within the Nine Lives offices and the hardware and software components needed to access these technologies
- safety and security considerations for the new network
- the WAN services available to Nine Lives and how these might add value to the company.

TASK 2

- (a) Use the diagrams in Fig. 1 to draw a plan for the design of the new network in each of the three offices. It has been agreed with Matt and Sophie that the network will include the components in Table 1. Your design **must** include appropriate numbers of each of these network components, clearly labelled. Use a key if necessary. [6]
- (b) Set up a table as shown in Table 1. Using your table, explain the function of each component in the context of the Nine Lives network.

Component	Function within the Nine Lives network
16 port Gigabit Ethernet Switch	
DSL Router (with modem function)	
CAT6 UTP cabling	
Wireless access point	
Web server	
Network operating system	

Table 1

[12]

- (c) Briefly evaluate the method(s) you used to do this task. [3]

TASK 3

Matt and Sophie are aware that the network will need protocol software. It is likely that local area network protocols such as NetBIOS or NetBEUI will be needed for the equipment in each office. There will also be a need to include software for protocols such as FTP and HTTP for use in the wider network.

Explain why these protocols will be needed to help the Nine Lives network run effectively.

The work you produce for Task 3 **must not** exceed 250 words and you **must** include a word count.

The quality of written communication will be assessed through your answer to this task. [9]

CASE STUDY

Nine Lives is a company that creates software applications and interactive websites for charities. A charity will request the software and Nine Lives will produce it to meet their requirements. With the agreement of the charity, the software is produced in such a way that it can be adapted for other charities to use. This means that the cost to the charities can be kept as low as possible.

Affordable software for charities is in high demand across the UK, so Nine Lives has offices in Birmingham, Glasgow and Cardiff. This allows the company to make the best use of local talent across a wide area. A software development project will be completed by one or more teams from one or more offices so access to information and ease of communication is crucial.

The Glasgow office is the head office. The following people are based there:

- Matt, Chief Executive Officer (CEO)
- Sophie, Chief Technical Officer (CTO) and part-time project manager
- Divya, the company's administrator and finance officer
- one full-time project manager
- six software developers.

The Birmingham and Cardiff offices each employ three software developers and one project manager. When the company is very busy, freelance software developers are brought in to work on a project until it is finished.

Each project is led by a project manager, who needs to work closely with a team of software developers. For a big project, teams from different offices may work together. Project managers travel regularly between offices and so use laptop computers.

Each office currently has a cabled network, which uses outdated technology, with a file server, a printer, a switch and an ADSL router for internet connectivity. Hot-desks are provided at each office, where the laptops can be plugged into the network with cables.

Nine Lives needs to keep records of its customers for communication and accounting. The company also needs to safely store different versions of all code, so that it can be accessed at any time if changes are needed. Customer records and code are kept at each office and copied to the main office in Glasgow at the end of each week. Someone at each office logs in remotely to the Glasgow server, via their internet connection, and copies everything across.

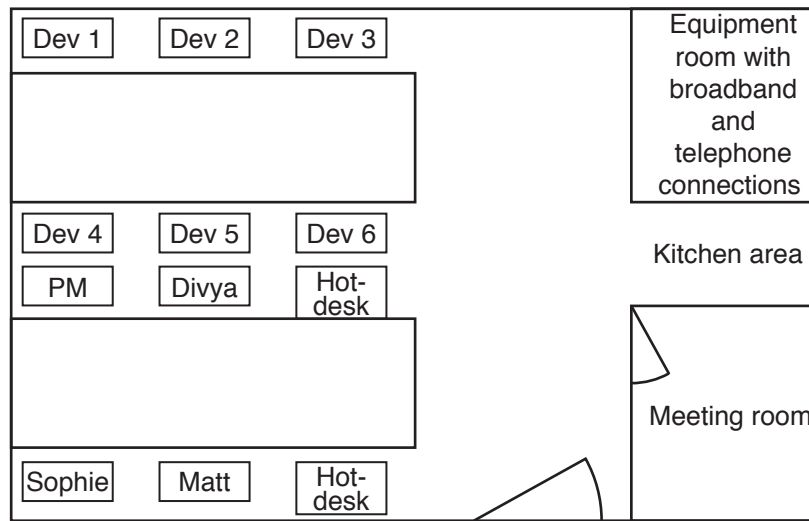
The company's policy is to use the same development software and the same version control software for every project. This software must be kept constantly up to date to help ensure that the products work on all up-to-date systems. When operating systems and other technologies are updated, the software that Nine Lives uses must also be updated. Upgrades are applied immediately and this must be done separately at each office.

Matt and Sophie, CEO and CTO of Nine Lives, want to improve the company's IT infrastructure. They feel that the three offices need to be better connected. As a company with a social focus, Nine Lives has only a small budget for improvement. Matt and Sophie want to create a more efficient network system to help all three offices operate on one network.

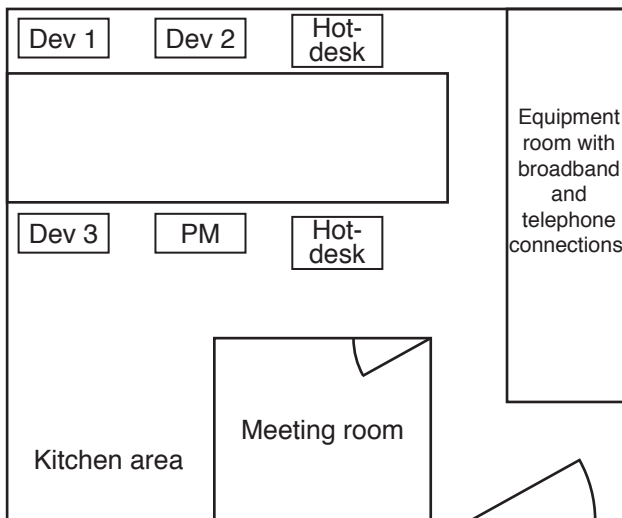
Crucial functions for the new network are that it must be possible to keep all customer records and code in one place and to access this data easily from anywhere. It must also help to improve communication within the company and to keep costs down. Matt and Sophie are particularly keen to investigate how an intranet and extranet might help.

Matt and Sophie are so busy that neither has the time to research their networking options and have asked you to give advice on the design options for the company network. To help you to visualise the network, Fig. 1 shows the current layout of the three offices.

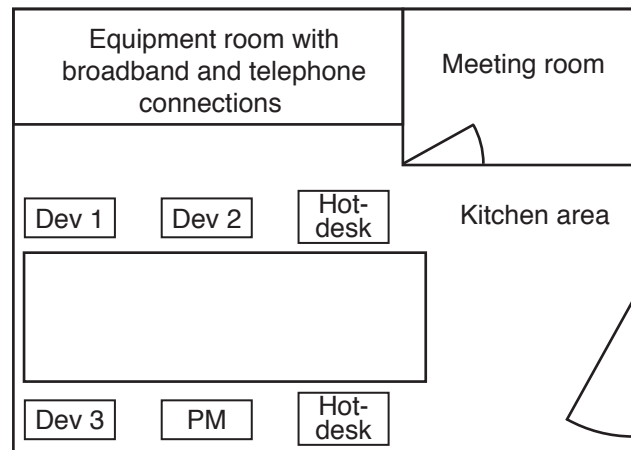
Glasgow Office



Birmingham Office



Cardiff Office



Key: Dev = software developer; PM = project manager

Fig. 1

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