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A2 GCE

APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY

G055/01/IC Networking Solutions

INSTRUCTIONS FOR CANDIDATES

JUNE 2019



INFORMATION FOR CANDIDATES

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

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 design the layout of the new office to accommodate all devices that need to join the network. You will be required to meet with Jan Hydra, Chief Technical Officer of CambridgeCAD to discuss the suitability of your network design for the company.

In preparation for the meeting, you should carry out your own research and make notes. Your notes should include:

- Advantages and disadvantages of allowing remote access to the CambridgeCAD network
- The communication devices and media that will be installed in the CambridgeCAD network
- The security considerations that will need to be taken and how security might be implemented for all users of the network
- The software needed to enable all users to be able to access shared devices on the network
- Possible network topologies, their advantages and disadvantages and a justification of the chosen topology
- Use and organisation of logs to aid maintenance of the wider business centre network.

TASK 2

- (a) Produce a network diagram showing how the network will be **physically** connected.

Your diagram must be fully labelled to show:

- All computers that will be permanently in the office
- At least one device that will be brought in by a freelancer to work in the office and connected to the cabled network
- At least one device that will be brought in by a freelancer to work in the office and connected to the CambridgeCAD Wi-Fi
- At least one device that will be connected to the business centre's guest Wi-Fi
- Printer, plotter and storage device
- Connection media
- Connection devices.

[12]

- (b) Explain the path taken by data as it travels between the business centre's broadband connection and a laptop connected to the Wi-Fi on the CambridgeCAD network. [6]

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

TASK 3

Although provision of VLAN and internet is offered by the business centre, Jan Hydra needs to evaluate this service in comparison to the company providing its own separate network and internet connection.

Discuss the benefits and drawbacks of having the VLAN and internet connection managed by the business centre.

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

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

CASE STUDY

Cambridge Computer Aided Design Ltd (CambridgeCAD) is a growing company who use CAD software to produce 2D and 3D architectural drawings for small scale building projects.

Customers include small building contractors and independent architects whose projects are typically flat conversions, home extensions and garage construction. CambridgeCAD produce electronic drawings of building plans for customers. They can also produce 3D representations of the finished building. The company employs draughtsmen to create the electronic drawings and has a printer and a plotter that can both print on large paper.

There is a growing demand for the company's services and so the Board of Directors have made the decision to move to managed office space in a new business centre, two miles from Cambridge city centre. The business centre runs a network, connected to the internet, and provides a VLAN for each company that rents office space from them.

The new office space comes with access to high speed broadband. Users will access the broadband through a cabled connection or through Wi-Fi. Internet access, through the broadband connection is managed by the business centre. There will be enough space for four people who work permanently for CambridgeCAD and up to four others. As the volume of work is variable, freelance draughtsmen are employed on a contract basis. Some of these freelancers work from their own homes but CambridgeCAD will provide desk space so that they can choose to work in the office. Freelancers are expected to provide their own CAD software, compatible with the company's CAD software and with the formats needed by the plotter and printer. CambridgeCAD provide the drivers for the plotter for freelancers and printer drivers are in the public domain.

All permanent draughtsmen will access broadband through the cabled network. The company will have its own Virtual Local Area Network (VLAN) on the business centre's network. Eight network ports will be connected directly to the business centre's VLAN. To expand the number of devices that can be plugged into the business centre's VLAN, CambridgeCAD will install their own network switch, plugged into one of the network ports.

The business centre will charge a monthly fee for the provision of the VLAN, internet access and management of back-up services on the centre's storage. Freelancers will be able to plug in to this network at the office, if there are spare network ports, or will be able to connect to the company's Wi-Fi through a hub connected to the cabled VLAN through one of the available network ports. Any guests, will have access to the public Wi-Fi provided by the business centre.

All draughtsmen, whether permanent employees or freelance, must have access to the company's A1 plotter for creating paper versions of the architectural drawings and to the colour laser printer which can print drawings on A4 or A3 size paper.

Owing to the size of the drawing files, the company needs to have access to its own storage and will implement a server running an extranet. This will be connected to the network so that it can be backed up. The drawings stored by the company are the intellectual property of the architects that designed them, CambridgeCAD turns the designs into the finished drawings. These drawings must be stored securely and access must be controlled.

During the draughting process, drawings are continually checked by architects who will request any necessary amendments. Remote access to files is provided for the architects who are given authorisation to access their own drawings and to add annotations to them. Architects are unable to download the drawings or to amend them directly.

Jan Hydra, the company's Chief Technical Officer, has commissioned you to design the layout of the new office to enable the best use of the network.

These are the network requirements:

- Four high specification desktop computers with dual screens, with specialist CAD software, printer and plotter drivers installed
- A network with eight cabled connections on a VLAN provided by the business centre for CambridgeCAD. Each of the eight network ports is plugged into one switch port on the business centre's main switch (see Fig. 1)
- A network switch with computers plugged in
- A private wireless network accessible only to authorised people working for CambridgeCAD and connected to the company's VLAN
- Access to a public wireless network provided by the business centre
- Plotter using one of the cabled connections on the VLAN provided by the business centre for CambridgeCAD
- Printer using one of the cabled connections on the VLAN provided by the business centre for CambridgeCAD
- A networked storage device for secure storage and access to drawing files
- Access to the centre's back up services
- Shared internal and remote access to drawing files on the company's extranet for authorised users
- Standard office, communication and security software on all computers.

The office space is rectangular and the position of network ports is shown in Fig. 1. All of the 8 ports will be opened for CambridgeCAD to use.

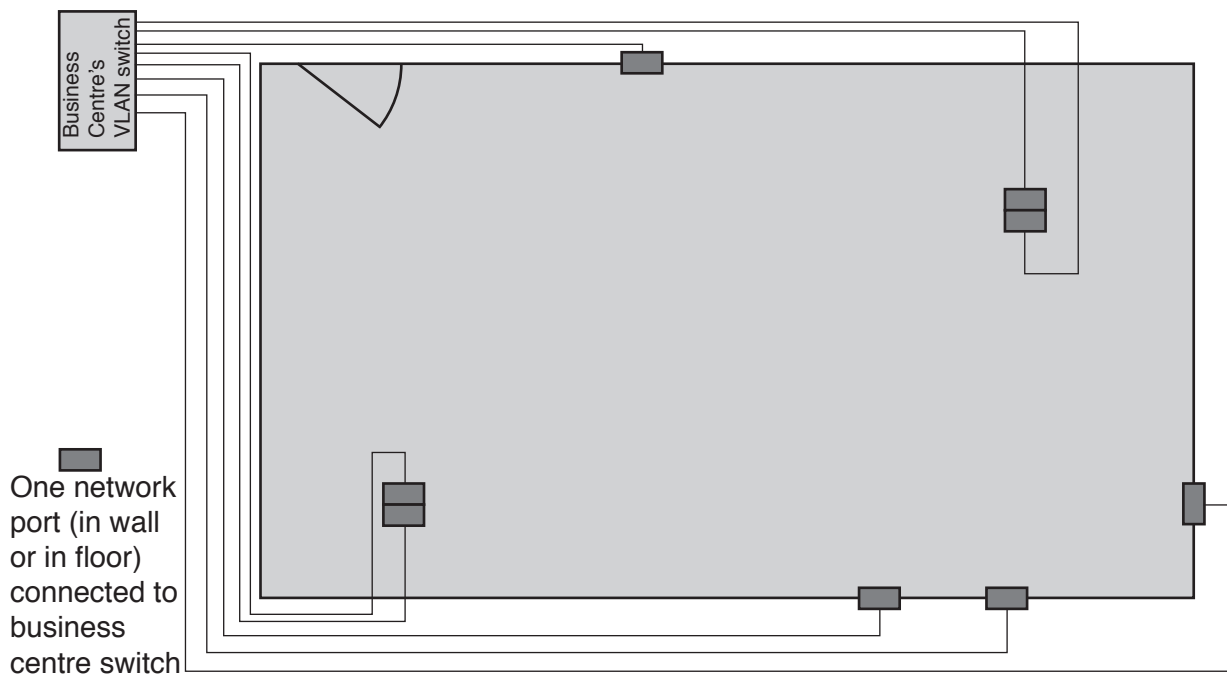


Fig. 1

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