**Assignment Brief**

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| **Academic year and term:** | **2021/22** – Semester-1, Year 2 |
| **Module title:** | Network Design and Troubleshooting |
| **Module code:** | **QAC020N253A** |
| **Module Convener:** | **Mohammed Hasan** |
| **Learning outcomes assessed as agreed at the programme level meeting** | *Students who successfully complete this module will be able to:*  *1. Identify, analyse and communicate principles and processes of Network Design.*  *2. Critically analyse and evaluate business and technical Requirements.*  *3. Plan and design a Network Infrastructure (LAN/WAN/MAN).*  *4. Design and evaluate a management and implementation Strategy for a Network.*  *5. Collect and synthesise information to inform a choice of vendor solutions, with the module assignment providing a good opportunity to test this area.*  *6. Evaluate a range of information comparing alternative methods and techniques used in Network Design.*  *7. Be able to troubleshoot and maintain integrated, complex networks.* |
| **Assessed Learning outcomes** | *1,2,3,7* |
| **Type of assessment:** | 60% of the total module marks |
| **Assessment deadline:** | Individual Report to be submitted on **10/01/2022** (no later than 2pm). This should be submitted via Turnitin on Moodle as a word-processed document file. Including network simulation file attached.  Recommended maximum words (2500 words) |
| **Kind reminder:** *it is student’s full responsibility to ensure that all assignments are submitted on the correct link and on time (before 2pm). Failure to do so may result in CAPPED Resit and/or failure of the module.* | |

**Assignment Support**

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| This is an individual assignment based on the case study scenario presented below. This assignment will assess your understanding of the principles of network design and the ability to analyse, design and create a network infrastructure fully configured and tested which will reflect your understanding of network design and troubleshooting.  **How will your work be assessed?**  Your work will be assessed by a subject expert who will use the marking grid provided in this assessment brief. When you access your marked coursework, it is important that you reflect on the feedback so that you can use it to improve future assignments.  **How will feedback be provided?**  Students will have access to formative feedback on each task set in workshops, thereby helping them to refine their approach to the summative tasks that have been set. However, please note that this feedback is limited to recommendations on improving your work. Lecturers will not confirm any grades or marks.  The feedback can be one-to-one or in-group sessions.  Your work will be assessed by a subject expert who will use the marking grid provided in this assessment brief. When you access your marked coursework it is important that you reflect on the feedback so that you can use it to improve future assignments. |

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| **Assignment support:**  Although you will be guided throughout the module by your lecturer, you can get extra support for your assignment, just make an appointment with the ACE team for any language, research and study skills issues and/or talk, email the Computing ACE expert for any advice on how to approach your assignment. *REMEMBER: they are not here to give you the answers!*  **Specific requirements for the assignment: you will need to use network simulation software to complete the network design, network simulation such as packettracer, GNS3 etc..** |

**Assignment Tasks**

**Scenario:**

As a computer network engineer, you have been assigned a task to study and evaluate a third party proposed network submitted to comit.co.uk. The company consists of 3 departments; Sales, HR/Finance and Engineering. Each of the departments uses a dedicated server file server.

The company uses two other servers; web and email by which all departments have access to. The web and email server should be accessible via the internet (external access).

The network infrastructure floor diagram, shown in figure 1, illustrates the proposed distribution and location of network components provided by a third-party company. Figure 2 illustrates the network topology provided by the third party.

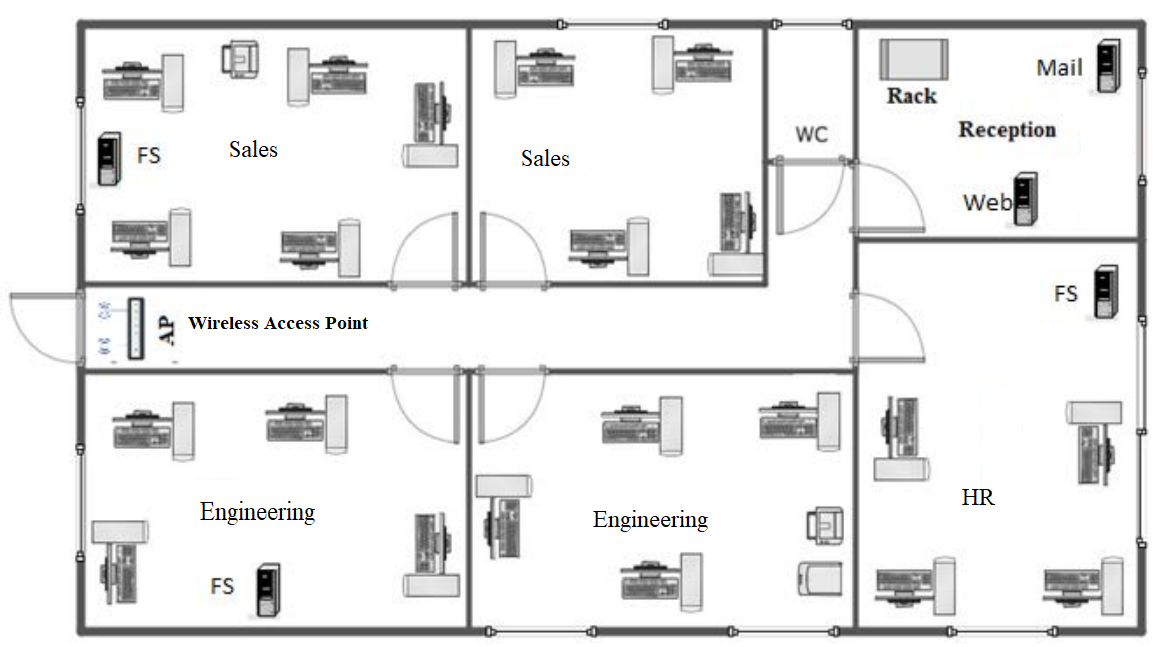


Figure 1: Existing network floor diagram

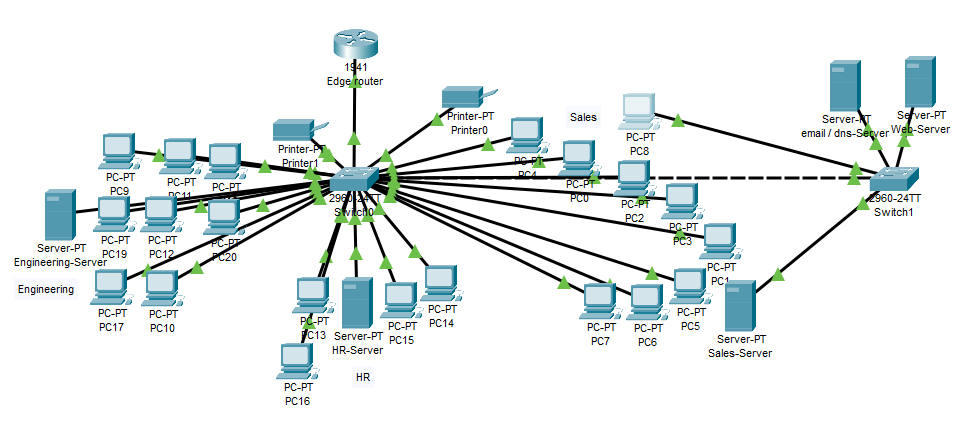


Figure 2: Proposed Network topology

The proposal provided the following design consideration and reasoning as it has been configured based on some of the considerations listed as follows:

1. The existing network was not segmented into many VLAN due to the limited number of 21 users.
2. Each and every department assigned a dedicated file server, which will be managed by the department staff and hence will be allocated as close to the users as possible to ease the management, for example, HR/Finance server will be close to the HR/Finance users and so is sales etc..
3. The backup services will be performed automatically on an external Hard Disk Drive, the backup device will be placed as close to each server as possible and will be secured in a local cabinet.

The company director expressed concerns and asked you to evaluate the third party network solution and based on which you are to design a new solution.

Comit.co.uk uses private network address of 192.168.41.0/24, and a public IP address of 211.212.213.160/29. Security, availability and scalability are paramount and hence your design and configuration must be based on these criteria.

Table 1 shows the users distribution and requirement according to comit.co.uk’s policy.

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| **Department** | **Hosts** | **Security Requirements** |
| HR/Finance | 7 | Need a complete isolation from all users of other groups |
| Engineering | 8 PC  1 Printer  1 Scanner | Need a complete isolation from all users of other groups |
| Sales | 9 PC  1 Printer | Need a complete isolation from all users of other groups |
| File Servers | 3 servers | Each server proposed to be placed near allocated ie. Sales, HR/ Finance and engineers. |
| Web, email Servers | 2 servers  1 will act as internal dns server | Web and email servers will be used by all users including external access. |

**NOTE:**

* All computers will use a Microsoft product such as servers and workstations.
* LAN Network needs to be physically redundant at least at wiring / Switches level.

**Tasks / Deliverable:**

Produce a report and a network simulation file that demonstrate a complete solution to above scenario including:

1. The network given in the above scenario may have many areas of network security concerns, you are to **evaluate the given network design in terms of security, availability and scalability. Your evaluation should include discussions of potential security impacts of the given network**.
2. Using diagrams, design a new secured and reliable network. Your network design should include:

* Analysis and evaluation of topology used including Network documentation (topology documentation, Devices configuration tables and end devices configuration table).
* Analysis and evaluation of devices / technologies used.
* Network security consideration.
* Sample related configuration of Switches, Routers (a full configuration including network simulation file must be attached in the appendix).
* Test all servers including web and email servers functionality.
* Test the connectivity across all network including to/from DMZ.

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| **Marking criteria** | | | | |
| **Assessment Criteria** | | **Assessment Criteria** | | |
| ***Introduction*** | | ***Introduction*** | | |
| 6 | Introduction to the context and/or background to the topic, indicating the purpose of the report. | **10 Marks** |
| 4 | The introduction includes some definitions of complex terminology or acronyms indicating ideas in view of the conclusion of the report. |
| ***Knowledge and understanding*** | | ***Knowledge and understanding*** | | |
| 6 | Demonstrate effective approach to study and research including explanation and discussion of subject concepts, exploring requirements of given assignment. | **10 Marks** |
| 4 | Using relevant information paraphrased / interpreted from sound sources, summarising and making sense of information. |
| ***Application and Analysis*** | | ***Applying knowledge and analysis*** | | |
| 7 | Discussion, examination and analysis of different network components, exploring the relationship between different components. | **15 Marks** |
| 5 | Reasoning of device/components selection based on priori-knowledge, backed by evidence of research from sound sources. |
| 3 | Discussion and analysis of different network models. |
| ***Evaluation and judgement*** | | ***Evaluation of different components and network model*** | | |
| 8 | The judgment in selecting components shows understanding of issues based on evaluating and comparing different network components supported by literature. | **15 Marks** |
| 7 | Evaluation of different technologies and/or protocols such as VLANs, Trunking, Access control, DHCP etc. |
| ***Design and Implementation*** | | ***Network implementation and design*** | | |
| 10 | Implementation and Configuration of all network components and protocol with evidence (sample network configuration scripts). | **20 Marks** |
| 6 | The plan accommodated the necessary devices and accounted for the unforeseen. |
| 4 | Evidence related to the work carried out in designing and implementation is apparent and demonstrate autonomy and independence. |
| ***Testing and documentation*** | | ***Testing and documentation*** | | |
| 6 | A well-defined document that reflects testing of given requirements, protocol, and selected components used. | **10 Marks** |
| 4 | Demonstrate and present network testing using appropriate technical language evidently related to the work carried. |
| ***Presentation / reflection*** | | ***Presentation, document structure and reflection*** | | |
| 6 | The document is well styled using appropriate academic language, presenting information using many methods including graphs, text and diagrams where applicable. | **10 Marks** |
| 4 | The report reflects autonomous and creativity including an insight reflection of learning supported by theory. |
| ***Referencing*** | | ***Academic integrity and referencing*** | | |
| 6 | References are correctly presented to an appropriate academic style and relevant to the subject. | **10 Marks** |
| 4 | References are from different sources (Books, journals, periodicals and technical reports) to support the discussion within the report, properly cited and paraphrased to relevant source of information. |
| **TOTAL:** | | **100** |  |  |

**Assignment Procedures and Guidelines**

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| **Submission instructions: Please include all configuration scripts and network simulation file in your assignment appendix.**  A digital version of all assignment submissions. These must be submitted via Turnitin on the module’s Moodle site. They must be submitted as a Word file… and must not include scanned in text or text boxes. They must be submitted before 2pm on the given date. For further general details on coursework preparation refer to the online information via StudentZone [http://studentzone.roehampton.ac.uk/howtostudy/index.html.](http://studentzone.roehampton.ac.uk/howtostudy/index.html) |

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| **Word count**  **Don’t exceed the word count**    You need to state the word count at the end of their assignment. 10% over the stated word count is permitted without penalty.  If students go beyond this, then there is a penalty of 5 marks for every additional 10% beyond the word count with a maximum of a 15 mark penalty reduction.    There is no specific penalty for submitting a piece which is below the word count, but please note that shorter submissions are likely to attract poorer grades, particularly where they lack the necessary depth of analysis.    Tables and figures (e.g. diagrams, graphs, photographs, etc) may be used as evidence to support academic argument. They are mostly used in report writing. However, it is important that tables and figures are used purposefully (i.e. with good reasons) and when appropriate. They should also be referenced correctly.    **How do you calculate the word count?**    The word count includes the Abstract or Executive Summary and all in-text citations. The word count does not include the Bibliography and Appendices.    *Please note that Appendices should only include supplementary information, not information critical to your work.* |

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| **Use of pictures/images:**  It is **mandatory** that you add the following statement to your assignment: ‘disclosure: diagrams, pictures or any other images used in this assignment are for educational purposes only’.  Although images, diagrams and photographs etc..can be used in assignments, they MUST be referenced. However, you can access the following websites (copyright-friendly):   * [Pixabay](http://pixabay.com/)   Free photos for commercial and private use - no attribution necessary. Some photos may come from other websites, such as Shutterstock, which may not fall under public domain - check each photo to ensure that it is public domain.   * [Photos Public Domain](http://www.photos-public-domain.com/)   Search public domain clip art and photos by category. All photos on this site were taken by the author and released as public domain.   * [Picdrome](http://picdrome.com/)   The Picdrome gallery is divided by categories (e.g. Abstract, Food & Drink, Nature, Technology, etc.). You may also search for specific images, but the search will take you to a custom Google search of Picdrome, which makes viewing the photos a bit more difficult.   * [Ars Publik](http://www.arspublik.com/)   Browse images under categories such as medical, advertisements, people, sports, space, etc.   * [Public Domain Images](http://www.public-domain-image.com/)   Browse by category or search for images. Varied categories; the site also includes vintage photography and space images.   * [Unsplash](https://unsplash.com/)   "All photos published on Unsplash are licensed under Creative Commons Zero which means you can copy, modify, distribute and use the photos for free, including commercial purposes, without asking permission from or providing attribution to the photographer or Unsplash."   * [Shutterography](https://www.shutterography.com/)   Free images for personal and commercial use.  *(adapted from the University of Pennsylvania:* [*https://guides.library.upenn.edu/c.php?g=475958&p=3255323*](https://guides.library.upenn.edu/c.php?g=475958&p=3255323)*)* |

***Assignment Preparation and Guidelines***

* All components of the assignment (text, diagrams. code etc.) must be submitted in ….**one-word file** (hand-written text or hand drawn diagrams are not acceptable), any other accompanied materials such as simulation file, code, etc. should be attached in appendices.
* Standard and commonly used fonts such as Arial or Calibri should be used, font size must be within the range of 10 to 15 points including the headings, body text and any texts within diagrams,
* Spacing should not be less than 1.5
* Pay attention to the Assessment criteria / Marking scheme, the work is to be concise and technical. Try to analyse, compare and evaluate rather than simply describe.
* All figures, screenshots, graphs and tables must be numbered and labelled.
* Tables and figures (e.g. diagrams, graphs, photographs, etc) may be used as evidence to support academic argument. They are mostly used in report writing. However, it is important that tables and figures are used purposefully (i.e. with good reasons) and when appropriate. They should also be referenced correctly.
* Screenshots without description / discussion does not constitute understanding and maybe assumed irrelevant.
* The assignment should be logically structured, the core of the report may start by defining the problem / requirements, followed by the proposed solution including a detailed discussion, analysis and evaluation, leading to implementation and testing stage, finally a conclusion and/or personal reflection on learning.
* Please access your Turnitin Test Page via Dashboard or My modules to learn more about Turnitin and to make a test submission and to check your similarity score before uploading your final version
* You will have opportunity to submit as many times to your module pages as you want up until the deadline.
* Make sure to make backup of your work to avoid distress for loss or damage of your original work, use multiple storage media (memory stick, cloud and personal computer).
* Please note file size limitation might apply. You work must be under 50MB.

***Assignment support:***

* During the delivery of the module, you will have several opportunities to get formative feedback on your assessment during tutorials.
* Although you will be guided throughout the module by your lecturer, you can get extra support for your assignment, just make an appointment with the ACE team for any language, research and study skills issues and/or talk, email the Computing ACE expert for any advice on how to approach your assignment. REMEMBER: they are not here to give you the answers!
* Students will have access to formative feedback on each task set in workshops, thereby helping them to refine their approach to the summative tasks that have been set.
* However, please note that this feedback is limited to recommendations on improving your work. Lecturers will not confirm any grades or marks.
* The feedback can be one-to-one or in-group sessions.

# *Marking and feedback process*

Between you handing in your work and then receiving your feedback and marks within 20 working days, there are a number of quality assurance processes that we go through to ensure that students receive marks which reflects their work. Please note that the summative feedback and the grades remain provisional until approval from the exam board.

A brief summary is provided below.

* **Step One** – The module and marking team meet to agree standards, expectations and how feedback will be provided.
* **Step Two** – A subject expert will mark your work using the criteria provided in the assessment brief.
* **Step Three** – A moderation meeting takes place where all members of the teaching and marking team will review the marking of others to confirm whether they agree with the mark and feedback
* **Step Four** – Work at Levels 5 and 6 then goes to an external examiner who will review a sample of work to confirm that the marking between different staff is consistent and fair
* **Step Five** – Your mark and feedback is processed by the Office and made available to you.

***Plagiarism and Collusion***

* **Academic Integrity** is a matter that is taken very seriously at the university and student should endeavour to enforce it to all their assignments. In other words, plagiarism, collusion (working and copying from another student) and ghost writing will not be tolerated and will result in sanctions eg: capped resit, suspension and/or withdrawal. Correct referencing demonstrates your academic and professional skill. It also reflects your academic honesty and thus to some degree protects you from cases of plagiarism.
* You must write your assignment in your own words to demonstrate your understanding of the subject.
* Material from external sources must be properly referenced and cited within the text using the Harvard referencing system,
* You are required to follow the**Roehampton Harvard referencing System**. Please refer to Moodle for the latest version of the **Roehampton Harvard referencing System** or ask the library.
* An accompanying list of references (on a **separate page and in alphabetical order**) must also be provided as part of your work.
* It is mandatory that you add the following statement to your assignment: ‘disclosure: diagrams, pictures or any other images used in this assignment are for educational purposes only’.
* Plagiarism: occurs when you present somebody else’s work as your own, whether that work is an idea, graphs, figure, illustration or a pure text. Be it available in web, textbooks, reports or otherwise.
* Wholesale use of text and diagrams from websites is considered as plagiarism when not acknowledged.
* Plagiarism will be dealt with firmly and can lead to serious consequences and disciplinary procedures.
* Collusion: occurs when copying another student’s report (Text, Figures, Illustration etc..) and submitting it as your own.

***Submission and Late submission***

* Students must ensure that their work is satisfactory and fit for purpose, both academically and free from any plagiarism.
* Students must use an appropriate coversheet, which must include the subject, assignment title, student ID and date-time.
* Tutors, lecturers and module convenors do not have the authority to extend the submission deadlines nor the exam time/date. In case of any mitigating circumstances, students should fill in the relevant mitigating circumstances form(s) available at qahe.uormitigatingcircumstances@qa.com
* The marking of the assignment will be capped at 40 if the assignment is submitted within first seven (7) days after the deadline, any submission late than 7 days will be ignored.
* The Submission File should be appropriate to the topic/title of the assignment and contain the Student ID, (Student ID-Assignment title)
* All coursework related material must be attached as an appendix in the final coursework/assignment document, including any computer-generated document, software/ code, simulation file etc..

# *Resit submission date: TBC*

For students, who are offered a resit, you are required to improve and resubmit your original work. You must resubmit your work using the specific resit Turnitin link on Moodle. Please check the Moodle page and your emails for more information.

You should:

1. Review your previously submitted work and read carefully the feedback given by the marker.
2. Use this feedback to help you revisit and rewrite your work, improving it in the areas identified as weak in the original marking process.

If you did not submit work at the first opportunity you cannot reflect on your feedback. However, you are still required to submit your work. Please note that a non-submission will result in a Qualified-Fail. The original marking criteria will still apply, please refer to the marking criteria.

# *Mitigating circumstances/what to do if you cannot submit a piece of work or attend your presentation*

The University Mitigating Circumstances Policy can be found on the University website [- Mitigatin](http://www.roehampton.ac.uk/uploadedFiles/Pages_Assets/PDFs_and_Word_Docs/Quality_and_Standards/Mitigat)[g Circumstances Policy](http://www.roehampton.ac.uk/uploadedFiles/Pages_Assets/PDFs_and_Word_Docs/Quality_and_Standards/Mitigating%20circumstances%20policy%20August%202013.pdf). Please contact the MITIGATING CIRCUMSTANCES TEAM ON: [QAHE.uormitigatingcircumstances@qa.com](mailto:QAHE.uormitigatingcircumstances@qa.com)