 Computer Science and Creative Technologies

**Coursework or Assessment Specification**

## Module Details

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| --- | --- |
| **Module Code** | UFCFDU-30-1 |
| **Module Title** | Networking |
| **Module Leader** | Andrew Cracknell |
| **Module Tutors** | Andrew Cracknell, Leonard Shand |
| **Year** | 2020/21 |
| **Component/Element Number** | 2 |
| **Total number of assessments for this module** | 2 |
| **Weighting** | 40% |
| **Total Assignment Time** |  |
| **Element Description** | Report |

## Dates

|  |  |
| --- | --- |
| **Date issued to students** |  |
| **Date to be returned to students** |  |
| **Submission Date** |  |
| **Submission Place** |  |
| **Submission Time** |  |
| **Submission Notes** |  |

## Feedback

|  |  |
| --- | --- |
| **Feedback provision will be** | given when the submission is returned |

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# Section 1: Overview of Assessment

This assignment assesses the following module learning outcomes:

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| **Module Learning Outcomes** | **Reference** |
| Design, build, configure, optimise, test and troubleshoot simple and complex networks. | MO1 |
| Explain networking devices and operations. | MO2 |

The assignment is worth ***40%*** of the overall mark for the module.

Broadly speaking, the assignment requires you to design, build, configure, optimise test and troubleshoot simple and complex networks.

The assignment is described in more detail in section 2.

This is an individual assignment.

Working on this assignment will help you to better understand the complexities of modern internetworked systems.

If you have questions about this assignment, please ask the module leader.

# Section 2: Task Specification

Your company provides IT support services to local SMEs. You are a Network Engineer responsible for supporting several customers. One of your customers, AWC Limited, a local produce distributer in Townsville has recently taken over another firm with 25 people in Citylimits, a neighbouring town.

The office at Townsville has 461 desktop computers 17 printers and one server. The network is connected to the internet via a service provider. The site has wireless capability with 7 access points installed. The server is running Windows 2008R2 and has DNS, DHCP and Active directory installed. Users gain access to the networked environment by logging in with their AD credentials.

The office in Citylimits has 278 desktop machines, three servers and two printers. Wireless capability is supplied via 4 access points in ad-hoc configuration. The servers are in a domain forest with an Active Directory setup, DNS and DHCP.

They wish to implement a new fibre WAN to link the offices, which are 20kM apart. The new setup should include a firewall at each site. The WAN link is to be configured using RIP2. It has been proposed that the three servers in Citylimits be consolidated. To that end, someone suggested that the Main AD server remain as is and one other server should be backed up fully (cloned) and then reconfigured with ESXi. The other server will be cloned and then implemented on that hypervisor.

You are required to design, install, test and implement a prototype WAN to the above scenario.

This task needs to be performed in a hypervisor of your choice.

Document your progress and record any problems along the way. Explain why your solution is working properly or why it is not. If it is not working properly, explain how it could potentially be fixed.

# Section 3: Deliverables

Provide a written report (3,000 words)

Your report should contain the following sections:

1. A review and analysis of the requirements
   * One server for each site
   * Each server configured as detailed in the task specification
   * The two sites are connected by a WAN link implementing RIP2
   * The CityLimits site has a DMZ
   * Each site has one desktop to demonstrate functionality
2. Provide a design solution
   * Include a network diagram including routers, switches and their configuration
   * Justify the components used
   * Explain how the system is optimised
3. Implement the design
   * Provide annotated screenshots demonstrating operation of the system and its components
4. Devise a test plan
   * Tests should demonstrate that the requirements have been met and the required functionality is covered
   * Tests should include monitoring network performance and errors
5. Test functionality and report all issues
   * Tests should be recorded as pass or fail. All fails must be described and their cause and resolution recorded. The test must then be rerun for a pass.
6. Evaluate the success of the implementation with respect to the requirements

Include this document in your deliverables (not part of the word count)

# Section 4: Marking Criteria

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-84 | 85-100 | Mark & Advice for Improvement |
| **Requirements analysis and design solution**  **(25%)** | Superficial analysis, unrealistic hardware specification, no diagram or configurations | Some analysis, poor choice of hardware, basic diagram, no configurations | Adequate analysis, basic choice of hardware, basic diagram, basic system configurations | Good analysis justifying good choice of hardware, basic diagram, basic system configurations | Good analysis justifying good choice of hardware, detailed diagram and optimised system configurations | Good analysis justifying good choice of hardware, detailed diagram and optimised system configurations | Excellent analysis justifying good choice of hardware, detailed diagram and optimised system configurations |  |
| **Implementation**  **(35%)** | The system does not operate | Some operation of the system is possible | Basic communication between systems | Basic communication between clients | Secure access and communication between clients | Secure access and communication between clients, operational DMZ | Secure access and communication between clients, operational DMZ, optimised protocols |  |
| **Test**  **(20%)** | No test plan | Poor test coverage and documentation | Basic functionality tested | Good test coverage with performance results | Well documented test plan and results | An excellent test plan with monitoring data | An excellent test plan comparing protocol performance |  |
| **Evaluation**  **(20%)** | No evaluation | Generic evaluation | Basic, relevant evaluation | Good evaluation | Good evaluation with recommendations | Convincing evaluation and recommendations backed by evidence | Convincing evaluation and recommendations backed by evidence, including protocols |  |

# Section 5: Feedback mechanisms

Sufficient time has been allocated in the classroom for the design to be implemented. During these sessions you can request assistance with any issues that are not directly related to your design.

Feedback will be given during the sessions on your implementation. This will ensure you have the opportunity to maximise the use of the classroom resources in developing your solution.

You will not receive feedback on any of the other sections until after the whole assignment has been marked and returned to you. The feedback will be added to the returned submission.

# Appendices and Additional Information

None