# **Higher Nationals**

# **Assignment Brief – BTEC (RQF)**

**Higher National Diploma in Computing**

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| **Student Name /ID Number** | **Aaron Mascarenhas** |
| **Unit Number and Title** | **Unit 17 – Network Security** |
| **Academic Year** | **2019- 2020** |
| **Unit Assessor** | **Dr Sam Al-Jajjoka** |
| **Assignment Title** | **Packet Tracer simulationand modellingtool to build and test a small data network – Assignment 2** |
| **Issue Date** | **22.04.2020** |
| **IV Name** | **Omar Mufti** |
| **Final submission date** | **27.05.2020** |
| **Re-submission date (if required)** |  |

**Plagiarism**

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalised. It is your responsibility to ensure that you understand correct referencing practices. As a university level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

**Student Declaration**

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| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.  Student signature: Aaron Date: 24/04/20 |

**Learning Outcomes and Assessment Criteria**

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|  | Grading Criteria | Met | Grading Criteria | Met | Grading Criteria | Met |  |
| **LO3** | P5 |  | M3 |  | D2  D3 |  |  |
| **LO3** | P6 |  |  |  |  |
|  |  |  |  |  |  |
| **LO4** | P7 |  | M4 |  |  |
| **LO4** | P8 |  | M5 |  |  |

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| **Assessor Feedback:**  \*Please note that constructive and useful feedback should allow students to understand:   1. Strengths of performance 2. Limitations of performance 3. Any improvements needed in future assessments   Feedback should be against the learning outcomes and assessment criteria to help students understand how these inform the process of judging the overall grade.  Feedback should give full guidance to the students on how they have met the learning outcomes and assessment criteria. | | | | |
| **Grade:** | **Assessor Signature:** | | | **Date:** |
| **Resubmission Feedback:** | | | | |
| **Grade:** | | **Assessor Signature:** | **Date:** | | |

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| Submission Format: |
| Submission for this assignment should be in the form of   1. A working prototype (using Packet Tracer). 2. A formal report.   You are expected to make use of appropriate structure – including headings, paragraphs, subsections and illustrations. All work must be supported with research and referenced using the Harvard Referencing System |
| Unit Learning Outcomes: |
| **LO3** Configure Network Security measures for the corporate environment  **LO4** Undertake the testing of a network using a Test Plan |
| Assignment Brief and Guidance: |
| **Scenario 1:**  **P5** Configure Network Security for your network.  **P6** Discuss different cryptographic types of Network Security  **M3** Provide Network Security configuration scripts/files/screenshots with comments.  **D2** Discuss what is meant by Quality of Service (QoS) in relation to Network Security configuration.  As a recently hired LAN technician, your network manager has asked you to demonstrate your ability to configure a small LAN. Your tasks include configuring initial settings on two switches using the Cisco IOS and configuring IP address parameters on host devices to provide end-to-end connectivity. You are to use two switches and two hosts/PCs on a cabled and powered network.  **Objectives**   * Configure hostnames and IP addresses on two Cisco Internetwork Operating System (IOS) switches using the command-line interface (CLI). * Use Cisco IOS commands to specify or limit access to the device configurations. * Use IOS commands to save the running configuration. * Configure two host devices with IP addresses. * Verify connectivity between the two PC end devices.  **Addressing Table**    |  |  |  |  | | --- | --- | --- | --- | | **Device** | **Interface** | **IP Address** | **Subnet Mask** | | **Class-A** | VLAN 1 | 128.107.20.10 | 255.255.255.0 | | **Class-B** | VLAN 1 | 128.107.20.15 | 255.255.255.0 | | **Student-1** | NIC | 128.107.20.25 | 255.255.255.0 | | **Student-2** | NIC | 128.107.20.30 | 255.255.255.0 |   **Requirements**   * Use a console connection to access each switch. * Name **Class-A** and **Class-B** switches. * Use the **8ubRu** password for all lines. * Use the **C9WrE** secret password. * Encrypt all clear text passwords and show which encryption is more secure * Include the word **warning** in the message-of-the-day (MOTD) Banner. * Configure addressing for all devices according to the Addressing Table. * Save your configurations. * Verify connectivity between all devices. * Discuss what is meant by Quality of Service (QoS) in relation to Network Security for above network configuration.   **Scenario 2:**  **P7** Create a Test Plan for your network.  **P8** Comprehensively test your network using the devised Test Plan.  **M4** Provide scripts/files/ screenshots of the testing of your network.  **M5** Make some improvement recommendations.  **D3** Critically evaluate the design, planning, configuration and testing of your network.  In this scenario, you will demonstrate and reinforce your ability to configure routers for inter-VLAN communication and configure static routes to reach destinations outside of your network. Among the skills you will demonstrate are configuring inter-VLAN routing, static and default routes.   **Addressing Table**  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Device** | **Interface** | **IP Address** | **Subnet Mask** | **Default Gateway** | **VLAN** | | R1 | S0/0/0 | 172.31.1.2 | 255.255.255.0 | N/A | N/A | | G0/0.10 | 172.31.10.1 | 255.255.255.0 | N/A | 10 | | G0/0.20 | 172.31.20.1 | 255.255.255.0 | N/A | 20 | | G0/0.30 | 172.31.30.1 | 255.255.255.0 | N/A | 30 | | G0/0.88 | 172.31.88.1 | 255.255.255.0 | N/A | 88 | | G0/0.99 | 172.31.99.1 | 255.255.255.0 | N/A | 99 | | S1 | VLAN 88 | 172.31.88.33 | 255.255.255.0 | 172.31.88.1 | 88 | | PC-A | NIC | 172.31.10.21 | 255.255.255.0 | 172.31.10.1 | 10 | | PC-B | NIC | 172.31.20.22 | 255.255.255.0 | 172.31.20.1 | 20 | | PC-C | NIC | 172.31.30.23 | 255.255.255.0 | 172.31.30.1 | 30 | | PC-D | NIC | 172.31.88.24 | 255.255.255.0 | 172.31.88.1 | 88 |   **VLAN Table**   |  |  |  | | --- | --- | --- | | **VLAN** | **Name** | **Interfaces** | | 10 | Sales | F0/11-15 | | 20 | Production | F0/16-20 | | 30 | Marketing | F0/5-10 | | 88 | Management | F0/21-24 | | 99 | Native | G0/1 |  **Requirements**  * Configure inter-VLAN routing on **R1** based on the **Addressing Table**. * Configure trunking on **S1**. * Configure four directly attached static route on **HQ** to each VLANs 10, 20, 30 and 88. * Configure directly attached static routes on **HQ** to reach **Outside Host**.   + Configure the primary path through the Serial 0/1/0 interface.   + Configure the backup route through the Serial 0/1/1 interface. * Configure a directly attached default route on **R1**. * Enter the command to view the port status and disable all unused ports on **S1**. * Verify connectivity by making sure all the PCs can ping **Outside Host**. * Comprehensively test your network, provide screenshots and report any problems you have in the troubleshooting table below.   **Troubleshooting Documentation**   |  |  | | --- | --- | | **Problem** | **Solution** | |  |  | |  |  | |  |  | |  |  |   **Improvement**   * **Could you make some improvement recommendations to the above network?**   **Evaluation**   * **Critically evaluate the above network design, your planning, configuration and testing and how could it be better implement next time.**   \**Please access HN Global for additional resources support and reading for this unit. For further guidance and support on report writing please refer to the Study Skills Unit on HN Global. Link to www.highernationals.com* |
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| **Learning Outcomes and Assessment Criteria** | | |
| Pass | Merit | Distinction |
| **LO3** Configure Network Security measures for the corporate environment | |  |
| **P5** Configure Network Security for your network.  **P6** Discuss different cryptographic types of Network Security | **M3** Provide Network Security configuration scripts/files/screenshots with comments. | **D2** Discuss what is meant by Quality of Service (QoS) in relation to Network Security configuration.  **D3** Critically evaluate the design, planning, configuration and testing of your network. |
| **LO4** Undertake the testing of a network using a Test Plan | |
| **P7** Create a Test Plan for your network.  **P8** Comprehensively test your network using the devised Test Plan. | **M4** Provide scripts/files/ screenshots of the testing of your network.  **M5** Make some improvement recommendations. |

