# **Higher Nationals**

# **Assignment Brief – BTEC (RQF)**

**Higher National Diploma in Computing**

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| **Student Name /ID Number** | Aaron Mascarenahas |
| **Unit Number and Title** | **Unit 17 – Network Security** |
| **Academic Year** | **2019 - 2020** |
| **Unit Assessor** | **Dr Sam Al-Jajjoka** |
| **Assignment Title** | **Assignment 1-Crumlin Computers Limited (CCL) – Network Security Project** |
| **Issue Date** | **10.01.2020** |
| **IV Name** | **Omar Mufti** |
| **Final submission date** | **20.02.2020** |
| **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: 1/02/20 |

**Learning Outcomes and Assessment Criteria**

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|  | Grading Criteria | Met | Grading Criteria | Met | Grading Criteria | Met |  |
| **LO1** | P1 |  | M1 |  | D1 |  |  |
| **LO1** | P2 |  |  |  |  |
|  |  |  |  |  |  |
| **LO2** | P3 |  | M2 |  |  |
| **LO2** | P4 |  |  |  |  |

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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 TWO documents and a prototype network model.  **Task 1:**   1. A formal report.   **Task 2**   1. A working network (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: |
| LO1 Examine Network Security principles, protocols and standards.  LO2 Design a Secure network for a corporate environment. |
| Assignment Brief and Guidance: |
| Crumlin Computers Limited (CCL), based in Manchester, is a Small Business Enterprise providing computing services to local SMEs including but not limited to Network Planning, Setup, Configurations, Testing and Security. CCL prides itself on providing unrivalled support to its customers. Due to the recent business growth, CCL have acquired new headquarters in London. CCL therefore requires someone who can setup their network at their new HQ in London. CCL are very conscious about security, especially Network Security for their new HQ in London.  You have recently been employed by CCL as their network manager and your principal duties include among other things setting up their network including implementing a secure working environment in terms of their network. Your task as their newly appointed network manager is to create a prototype network as a proof-of-concept. Your prototype must be accompanied by written material that explains how your networking solution can increase security and scalability as well as address issues of reliability and availability.  **Task 1**  **Describe briefly each of the following security threats**   * Adware * Virus * Worms * Spyware * Trojan * Rootkits * Logic bomb * Botnets * Man-in-the-middle * DDoS * Spoofing * Spam * Phishing * Spear phishing * Pharming * Dumpster diving * Tailgating * Impersonation * Hoaxes * Whaling * Vishing * SQL injection * Write a report on how to minimise the impact of the above Malwares on CCL by conducting a detailed analysis of Network Security Principles using McCumber Cube - Cybersecurity Cube, involving all the technologies, devices, tools and techniques, to mitigate threats and implement a secure network. * Discuss briefly a possible Network Security protocols that will enable a secure network for CCL’s London HQ, i.e. MD5, SSL, VPN, AES, SHA ½, RSA, DES, 3DES, IPSEc, DNS, HTTP, HTTPS, FTP, SMTP. * Compare and contrast how transport layer protocols: DHCP and Telnet protocols can support communications across data networks in CCL.  What are block and stream ciphers? What are the differences, and when would you use one vs. the other? **Task 2**  The end users at CCL in Manchester want to access applications in London HQ using a remote desktop client over the internet. Create a small network to help the user for remote access, and include screenshots of the network and verifications in your final documentation.     * Your design must include a minimum of one routers, one switch, and two PCs. * Fully configure the network and use IPv4 (subnetting must be included as a part of your addressing scheme). * Determine which network hardware and software to use in this network and clearly identify them. * Secure the network using Telnet, secure passwords and console passwords (minimum). * Improve your network by adding another router to the above design (2 routers in total), at least one switch and 2 PCs and find out what other security measures, such as: SSH1, SSH2, etc**.** can be implemented to remotely access your network, with strong encryption using Packet Tracer and why. * Verify that your **security measures** above been implemented correctly. * Discuss which **security measures** in Task 2 you would use for CCL, where and why.     \**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*](http://www.highernationals.com) |
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| **Learning Outcomes and Assessment Criteria** | | |
| Pass | Merit | Distinction |
| **LO1** Examine Network Security Principles, protocols and standards | |  |
| **P1** Discuss the different types of Network Security devices  **P2** Examine Network Security Protocols | **M1** Compare and contrast at least two major Network Security Protocols | **LO1 & 2**  **D1** Discuss, using examples, the importance of Network Security. |
| **LO2** Design a secure network for a corporate environment | |
| **P3** Investigate the purpose and requirements of a secure network according to a given scenario.  **P4** Determine which network hardware and software to use in this network | **M2** Create a design of a secure network according to a given scenario. |

