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| COURSEWORK ASSIGNMENT | |
| **Module Title:Operating systems and Networks** | **Module Code: 5COM1055** |
| **Assignment Title: Halifax Network Expansion** | **Individual Assignment** |
| **Tutor**: Azita Pourghasem | **Internal Moderator**: **Dr Cherry** |

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| Student ID Number **ONLY**: | Year Code: |
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| Marks Awarded %:  75 | Marks Awarded after Lateness Penalty applied %:  **Per UH regulations** |
| * Where genuine serious adverse circumstances apply, you may apply for an extension to the hand-in date, provided the extension is requested a reasonable period in advance of the deadline. | |
| Please refer to your student handbook for details about the grading schemes used by the School when assessing your work. Guidance on assessment will also be given in the Module Guide. | |
| Guidance on avoiding academic assessment offences such as plagiarism and collusion is given at this URL: <http://www.studynet.herts.ac.uk/ptl/common/LIS.nsf/lis/citing_menu> | |

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| **ASSIGNMENT BRIEF**  ***Students, you should delete this section before submitting your work.*** | | |
| **This Assignment assesses the following module Learning Outcomes (Take these from the module DMD):**  Successful students will typically...  **Learning Outcomes: Knowledge and Understanding**   * [i] how operating systems and networks concepts are embodied in practical systems; * [ii] how operating systems and networks can be configured to meet user requirements; * [iii] the underlying principles of operating systems and networks including points of similarity and difference between alternatives.  **Learning Outcomes: Skills and Attributes**  * [i] use the command line and other tools to configure operating systems and networks; * [ii] identify and correct system configuration errors; * [iii] articulate and make decisions in the deployment of appropriate operating systems and networks. | | |
| **Assignment Brief: See attached assignment description.** | | |
| **Submission Requirements:**  The assignment must be submitted by **28 March 2021** | | |
| This assignment is worth 75  **%** of the overall assessment for this module.  **Marks awarded for: See detailed criteria in the end of the document.**  A note to the Students:   1. For undergraduate modules, a score above 40% represent a pass performance at honours level. 2. For postgraduate modules, a score of 50% or above represents a pass mark. 3. Modules may have several components of assessment and may require a pass in all elements. For further details, please consult the relevant Module Guide or ask the Module Leader. | | |
| Typical (hours) required by the student(s) to complete the assignment: 35 hours | | |
| **Date Work handed out:**  **01/02/2021** | **Date Work to be handed in:**  **28/03/2021** | **Target Date for the return of the marked assignment:**  **25/04/2021** |
| **Type of Feedback to be given for this assignment:**  ***Formative Feedback*** | | |

**Network protocols and Architectures Assignment**

**Module Leader:**   **Azita Pourghasem**

**Module Name:**  **Operating Systems and Networks**

**Module code:**  **5COM1055**

**Date Issued:**   **01/02/2021**

**To be submitted by:**  **28/03/2021**

**Assignment task Description:**

**This is an individual assessment comprised of 2 tasks.**

**Task 1 carries 50%, task 2 carries 25%.**

**The information in this brief is provided for your information ONLY.**

**Scenario**

Recently there has been a change in the landscape of the local Halifax branch in Hatfield by adding a new floor to the main building. The computer network of the branch needs to be expanded too. The network designer has come with the topology in Figure 1:

Diagram

Description automatically generated Figure 1

As a new network engineer for this branch, you have been asked to assign the IP addresses and configure this small network for full connectivity.

**Task 1(carries 50% of overall marks)**

You will need to configure the network according to Figure 1. The IP address is given to the network is 192.168.X.0 /24 where X will be the last two digits of your student ID.To make sure that everything is tested properly before the implementation, an initial prototype will be built on Packet Tracer. You need to configure all the LAN and WAN interfaces on routers and PCs according to the IP subnetted addresses. When all PCs can ping their default gateways and each other from the old network to the new expansion, then the configuration is implemented correctly.

**Assignment Requirements:**

You will need to complete the followings

1. Implement the physical topology using Packet Tracer
2. Assigning correct IPv4 address to the network using subnetting.
3. Create a table for all the IP address allocated:

| **Device** | **Interface** | **IP Address or Network** | **Default Gateway** |
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1. Configure all the devices (IMPORTANT NOTE: Use either “cisco” or “class” as passwords for your configurations.)
2. The IP address for the calculation of the subnets is 192.168.X.0 /24 where X will be the last two digits of your student ID
3. Provide the screenshot of the Ping result from:
   * 1. 1-Admin computer to the Server
     2. 2-Management computer to accountant
     3. 3-Ping result from Wireless laptop to ISP
     4. 4-Ping result from Admin to ISP

**Task 2**

You need to provide a report of not more than 1000 words where you explain the role of Default Gateway and evaluate the use and benefits of Dynamic Host Configuration Protocol for the Task 1. As you will need to do some research about DHCP you need to use Harvard referencing to cite your sources.

You can add the DHCP configuration commands to the index or implement it and screenshot your configuration.

List of items to submit by individuals:

1-A latest version of packet tracer file with physical and logical configuration

2-Only one .pdf file consist of:

* At least 4 readable screenshots of Ping results, clearly explained the aim of the tests
* A completed table of IP addresses
* A report of 1000 words to describe and evaluate the use of DHCP and describing Default Gateway.

**Notes for students**

* For undergraduate modules, a score above 40% represent a pass performance at honours level.
* For postgraduate modules, a score of 50% or above represents a pass mark.
* Late submission of any item of coursework for each day or part thereof (or for hard copy submission only, working day or part thereof) for up to five days after the published deadline, coursework relating to modules at Levels 0, 4, 5, 6 submitted late (including deferred coursework, but with the exception of referred coursework), will have the numeric grade reduced by 10 grade points until or unless the numeric grade reaches or is 40. Where the numeric grade awarded for the assessment is less than 40, no lateness penalty will be applied.
* Late submission of referred coursework will automatically be awarded a grade of zero (0).
* Coursework (including deferred coursework) submitted later than five days (five working days in the case of hard copy submission) after the published deadline will be awarded a grade of zero (0).
* Regulations governing assessment offences including Plagiarism and Collusion are available from <https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs> (please refer to UPR AS14)
* Guidance on avoiding plagiarism can be found here: <https://herts.instructure.com/courses/61421/pages/referencing-avoiding-plagiarism?module_item_id=779436>

Modules may have several components of assessment and may require a pass in all elements. For further details, please consult the relevant Module Handbook (available on Studynet/Canvas, under Module Information) or ask the Module Leader.

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| **Numeric Grade** |  |  | | | |
|  | ***Network diagrams using Packet Tracer for physical implementations. 10%*** **Configuration 20%** ***General Rules 5%*** | ***IP addressing calculations and correct detailed table of the nodes.******20%*** | ***Troubleshooting and Full connectivity test screenshots. Admin computer to server***  ***Management computer to accountant***  ***PING test result from Wireless laptop to ISP and Admin to ISP 20%*** | ***Critical evaluation of Default Gateways backed up by appropriate references. 8%***  ***DHCP 12%***  ***Report writing 5%*** |
| **90-100** | **Outstanding** | Outstanding breadth and depth demonstrated. Outstanding integration of literature and/or theory into work.  Outstanding exploration and demonstration of topic showing in depth knowledge and understanding | Outstanding use of appropriate technologies as applied to the problem domain. Occasionally stepping beyond expectations using sophisticated solutions. Consistently accurate and outstanding application of skills and techniques demonstrated | Solutions are novel within context. Profound depth of engagement and incisive ideas development. Planning is meticulous; decision making is perceptive. Methodologies are used in an outstanding manner. | Outstanding level of analysis, critical evaluation and/or reflection with outstanding application to derived solutions (where required).  Highly developed / focused work. Original and well-informed personal response |
| **80-90** | **Excellent** | Excellent breadth and depth demonstrated. Excellent integration of literature and/or theory into work.  Excellent exploration and demonstration of topic showing in depth knowledge and understanding | Excellent use of appropriate technologies as applied to the problem domain. Occasionally stepping beyond expectations using sophisticated solutions. Consistently accurate and Excellent application of skills and techniques demonstrated | Solutions reframe task within context. Profound depth of engagement and incisive ideas development. Planning is meticulous; decision making is perceptive. Methodologies are used in an Excellent manner | Excellent level of analysis, critical evaluation and/or reflection with Excellent application to derived solutions (where required).  Highly developed / focused work. Original and well-informed personal response |
| **70-79** | **Very good** | Very good breadth & depth demonstrated. Very good integration of literature and/or theory into work.  Very good level of knowledge and understanding demonstrated. Covers all relevant points and issues. | Very good use of appropriate technologies as applied to the problem domain. Very good and highly accurate application of skills and techniques demonstrated. Minor errors in technique and/or application with little or no impact on deliverables. | Solutions are innovative within its context. Considerable depth of engagement and successful ideas development clearly documented. Detailed planning and clear rationale for decisions. Methodologies are used in a very good manner | Very good level of analysis, critical evaluation and/or reflection of issues with Very good application to derived solutions (where required). Well-developed personal response |
| **60-69** | **Good** | Good breadth & depth demonstrated appropriate to topic.  Literature and/or theory integrated very well.  Good level of knowledge and understanding demonstrated. | Good use of appropriate technologies as applied to the problem domain. High level and very accurate application of skills and techniques understanding demonstrated. Small errors in technique and/or application with little impact on deliverables | Solutions relate directly to task and may step beyond conventions  Strong engagement with subject material and processes, evaluation of alternatives, solutions come from process. Strong use of methodologies to derive solutions | good level of, analysis, critical evaluation and/or reflection but not consistently taken to full extent with good application to derived solutions (where required). Partial personal response tends towards descriptive |
| **50-59** | **Clear Pass** | Good use of legends. Depth appropriate to topic BUT moderate breadth or vice versa. Literature and/or theory integrated into work.  Good grasp of the topic and some of its implications. Knowledge and understanding is demonstrated. Minor errors / omissions. | Evidence of use of appropriate technologies as applied to the problem domain. Good and reasonably accurate application of skills and techniques demonstrated. Some errors in technique and/or application with minor impact on deliverables | Solutions are appropriate to task, work well within conventions. Evidence of use of subject material and planning processes, range of alternatives put forward and evaluated  Experimentation to support implementation within conventions Good use of methodologies to derive solutions | Evidence of analysis and/or reflection but critical evaluation could be expanded on further. Good application to derived solutions (where required). Primarily descriptive personal response, sometimes restricted to immediate concerns |
| **40-49** | **Marginal Pass** | Satisfactory use of legends demonstrated but limited in breadth OR depth. Uncritical and quoted without comment where necessary. Satisfactory content / level of knowledge of the topic. Addresses part of the question. Some errors / omissions. | Satisfactory use of appropriate technologies as applied to the problem domain. Satisfactory application of skills and techniques demonstrated but with minor inaccuracies. Errors in technique and/or application with some impact on deliverables | Solutions limited to task and address conventions. Solutions found or adopted  Some planning but completion is rushed. Some experiments but limited alternatives. Methodologies are applied to derive solutions but steps are missed. | Satisfactory level of analysis and/or reflection but limited evidence of critical evaluation. Satisfactory application to derived solutions (where required). Descriptive personal response mainly restricted to immediate concerns |
| **30-39** | **Marginal Fail** | Limited in breadth and depth demonstrated. Some parts of legends used/quoted without comment. Limited content / knowledge. Limited or muddled understanding of the topic/question. | Limited use of appropriate technologies as applied to the problem domain. Limited application of skills and techniques demonstrated. Many errors in technique and/or application with high impact on deliverables. | Solutions reframe task inappropriately and do not address conventions. Basic use of strategies, few alternatives, limited evaluation with limited experimentation. Limited use of methodologies to derive solutions. | Limited evidence of analysis, critical evaluation and/or reflection. Limited application to derived solutions (where required).Too descriptive in parts. Limited personal response. |
| **20-29** | **Clear Fail** | Lacking in breadth and depth. Some parts of legends irrelevant to topic area. Lacking knowledge Content irrelevant / inaccurate.  Does not address the question and therefore does not meet the learning outcomes. | Very little use of appropriate technologies as applied to the problem domain. Very little skill and application of techniques demonstrated. High number of errors with very high impact on deliverables. | Lacking in appropriate solutions with very limited use of strategies, no evaluation and little evidence of ideas development. Little use of methodologies | Lacking in its level of analysis / critical evaluation and/or reflection. Minimal application to derived solutions (where required)  Mainly descriptive, lacking in personal response. |
| **0-19** | **Little or Nothing of Merit** | No / unsatisfactory evidence of Legends used and irrelevant to topic area  No / unsatisfactory level of knowledge demonstrated.  Content not appropriate to the topic. | No use of appropriate technologies as applied to the problem domain. No skill and application of technique demonstrated. Very high number of errors in deliverable or no deliverable submitted. | No or completely inappropriate solution. No use of strategies, no planning and no experimentation. No application of methodology | Unsatisfactory level of analysis / critical evaluation and or reflection. No application to derived solutions (where required)  Wholly descriptive. No personal response. |