

Student Assignment Brief

**This document is intended for Coventry University Group students for their own use in completing their assessed work for this module. It must not be passed to third parties or posted on any website. If you require this document in an alternative format, please contact your Module Leader.**

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The work you submit for this assignment must be your own independent work, or in the case of a group assignment your own groups’ work. More information is available in the ‘[Assignment Task](#_Assignment_Task)’ section of this assignment brief.

# Assignment Information

**Module Name:** Networking

**Module Code:** 400IT

**Assignment Title:** Network Design and Implementation for Green Wood Company.

**Assignment Due:** 18:00 UK time

**Assignment Credits:**  10 credits

**Word Count (or equivalent):** [ 1000 words +/- 10%]

**Assignment Type:**

**Percentage Grade** (Applied Core Assessment). You will be provided with an overall grade between 0% and 100%. You have one opportunity to pass the assignment at or above 40%. Resit attempts will be capped at 40%

# Assignment Task

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| **Task:** |
| **Introduction:**  This assignment focuses on designing and implementing a network infrastructure for Green Wood Company, which has its head office in London and branch offices in Wroclaw and York. The objective is to create a scalable, secure, and efficient network using VLSM for IP addressing, appropriate routing protocols. Students will also perform network testing and document their findings to ensure the robustness and reliability of the designed network.  **Task 1: Design an IP Addressing Scheme using VLSM** **(Total marks = 12)**  For the IP addressing scheme, assign unique subnets to each department in each branch. Utilise a subnetting method that optimises IP address allocation while allowing for future scalability. Ensure IP addresses are efficiently assigned to devices.  Given an IP address and mask of 192.168.10.0/24, design an IP addressing scheme that satisfies the following requirements in the table below using VLSM for efficient use of IP addresses.  The 0th subnet is used. No subnet calculators should be used.   |  |  | | --- | --- | | **Location:** Subnet | **Number of Hosts** | | **London Head Office:** IT Office (Subnet A) | 6 | | **Wroclaw Branch:** Sales Office (Subnet B) | 6 | | **York Branch:** Marketing (Subnet C) | 6 |        |  |  |  | | --- | --- | --- | | **IT (Subnet A)** |  |  | | **Specification** | **Student Input** | **Marks (4 marks)** | | Default Subnet Mask (Binary) |  |  | | Custom subnet mask (Decimal) |  |  | | Total number of subnets |  |  | | Total Number of host addresses |  |  | | Number of usable addresses |  |  | | Number of bits borrowed |  |  | | First IP Host address |  |  | | Last IP Host address |  |  |        |  |  |  | | --- | --- | --- | | **Sales Office (Subnet B)** |  |  | | **Specification** | **Student Input** | **Marks (4 marks)** | | Default Subnet Mask (Binary) |  |  | | Custom subnet mask (Decimal) |  |  | | Total number of subnets |  |  | | Total Number of host addresses |  |  | | Number of usable addresses |  |  | | Number of bits borrowed |  |  | | First IP Host address |  |  | | Last IP Host address |  |  |        |  |  |  | | --- | --- | --- | | **Marketing (Subnet C)** |  |  | | **Specification** | **Student Input** | **Marks (4 marks)** | | Default Subnet Mask (Binary) |  |  | | Custom subnet mask (Decimal) |  |  | | Total number of subnets |  |  | | Total Number of host addresses |  |  | | Number of usable addresses |  |  | | Number of bits borrowed |  |  | | First IP Host address |  |  | | Last IP Host address |  |  |     **Task 2: Build and Configure the Network (Total marks = 18)**  Build the network infrastructure as depicted in the provided diagram using Cisco Packet Tracer. Connect the Headquarters in London with the Wroclaw and York branches using appropriate network devices such as routers, switches. Configure the devices with the designated IP addresses from the addressing scheme mentioned in Task 1.  A diagram of a computer network  AI-generated content may be incorrect.  Step 1: Select all the devices such as PCs, Switches, and Routers.  Step 2: Cable the network as shown in the topology.  Step 3: Configure the IP addresses and default gateway for the end devices (PC). The network router will use the FIRST network host address. Host computers will use any address in the subnet.    After configuring each host computer, record the host network settings with the ipconfig /all command and write down the information using the table below.  **London Site**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **IT Office** | | | | | | | **Device** | **IP address** | **Subnet Mask** | **Gateway** | **MAC Address** | **Marks (6 marks)** | | PC IT-1 |  |  |  |  |  | | PC IT-2 |  |  |  |  |  | | PC IT-3 |  |  |  |  |  | | PC IT-4 |  |  |  |  |  | | PC IT-5 |  |  |  |  |  | | PC IT-6 |  |  |  |  |  |   **Wroclaw Site**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Sale Office** | | | | | | | **Device** | **IP address** | **Subnet Mask** | **Gateway** | **MAC Address** | **Marks (6 marks)** | | PC Sale-1 |  |  |  |  |  | | PC Sale-2 |  |  |  |  |  | | PC Sale-3 |  |  |  |  |  | | PC Sale-4 |  |  |  |  |  | | PC Sale-5 |  |  |  |  |  | | PC Sale-6 |  |  |  |  |  |   **York Site**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Marketing Office** | | | | | | | **Device** | **IP address** | **Subnet Mask** | **Gateway** | **MAC Address** | **Marks (6 marks)** | | PC Market-1 |  |  |  |  |  | | PC Market-2 |  |  |  |  |  | | PC Market-3 |  |  |  |  |  | | PC Market-4 |  |  |  |  |  | | PC Market-5 |  |  |  |  |  | | PC Market-6 |  |  |  |  |  |   **Task 3: Use Routing Protocol for Communication (Total marks = 15)**  Implement a suitable dynamic routing protocol to facilitate communication between routers in the network. Ensure efficient routing of data packets between different subnets and branches.  Step 1: Enter the IP addresses and configure the following router interfaces using the table provided below:   |  |  |  | | --- | --- | --- | | **Device** | **IP address** | **Marks (4 Marks)** | | Router 3- se0/1/0 |  |  | | Router 3- se0/1/1 |  |  | | Router 4-Se0/1/0 |  |  | | Router 4-Se0/1/1 |  |  | | Router 5-Se0/1/0 |  |  | | Router 5-Se0/1/1 |  |  | | Router 6-Se0/1/0 |  |  | | Router 6-Se0/1/1 |  |  |     Step 2: Enter the IP addresses, subnet masks and configure the following router interfaces using addressing scheme mentioned in Task 1.  **Record IP Address for interface indicated in the table below**.   |  |  |  |  | | --- | --- | --- | --- | | **Device** | **IP address** | **Subnet Mask** | **Marks (4 marks)** | | Router 3-Gig 0/0 |  |  |  | | Router 5-Gig 0/0 |  |  |  | | Router 6-Gig 0/0 |  |  |  | | Router 0-Gig 0/1 |  |  |  | | Router 1-Gig 0/1 |  |  |  | | Router 2-Gig 0/1 |  |  |  |     Step 3: Configuration tasks for each Routers should also include the following:     |  |  |  | | --- | --- | --- | | **Task** | **Specification** | **Marks (4 marks)** | | Router name | Router (number) |  | | Encrypted privileged exec password | cisco |  | | Console access password | class (number) |  | | Telnet access password | class (number) |  |     Step 4: show the Routing Table for each Router.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Device** | **Protocol** | **Networks Advertised** | **Configuration Commands** | **Marks (3 marks)** | | Router 3 |  |  |  |  | | Router 4 |  |  |  |  | | Router 5 |  |  |  |  | | Router 6 |  |  |  |  |   **Task 4: Use Ping and Traceroute Commands for Basic Network Testing (Total marks = 15)**  Conduct network testing using the ping and traceroute commands to ensure connectivity between devices. Troubleshoot and rectify any connectivity issues that may arise during testing.  Ping and traceroute are two tools which are indispensable when testing TCP/IP network connectivity. Ping is a network administration utility used to test the reachability of a device on an IP network.  The traceroute utility is a network diagnostic tool for displaying the route and measuring the transit delays of packets travelling an IP network.    Step 1: Use the ping command to verify network connectivity.  Network connectivity can be verified with the **ping** command.  Use the following table to methodically verify connectivity with each network device. Take corrective action to establish connectivity if a test fails:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **From** | **To (Destination)** | **IP Address (Destination)** | **Ping results**  **(Screenshots)** | **Marks (7 marks)** | | PC IT-1 | PC IT-2 |  |  |  | | PC Sale-2 | PC Market-4 |  |  |  | | PC Market-1 | PC IT-5 |  |  |  | | PC Sale-2 | Router3 se0/1/1 |  |  |  | | PC Sale-6 | PC IT-4 |  |  |  | | PC IT-1 | Router 1-Gig 0/1 |  |  |  |     Step 2: Use the **Tracert** command to verify network connectivity.  Use the **Tracert** command to trace the path to a specific destination and write down the path to the destination.     |  |  |  |  |  | | --- | --- | --- | --- | --- | | **From** | **To (Destination)** | **IP Address (Destination)** | **Path to destination**  **(Screenshots)** | **Marks (8 marks)** | | PC Sale-3 | PC Sale-1 |  |  |  | | PC Market-5 | Router4 se/0/1/1 |  |  |  | | PC IT-1 | Router3 se0/1/0 |  |  |  | | PC Sale-5 | PC Market-2 |  |  |  | | PC IT-1 | PC Market-3 |  |  |  | | PC Market-1 | Router 2-Gig 0/1 |  |  |  |     **5 Task: Write a 1000-Word Report Marks (40 marks)**:  Compose a 1000-word report detailing the design of the network infrastructure for Green Wood Company. The report should address the following points: **Security**  1. Explain the security protocols implemented to safeguard network communications. 2. Elaborate on how communication between the head office and branch offices is secured.  **Topology**  1. Justify your choice of network topology for Green Wood Company's infrastructure. 2. Explain how the selected topology enhances network efficiency and resilience.  **Addressing Schemes**  1. Describe the method used to develop IP addressing schemes for the different departments. 2. Explain how you ensured efficient IP allocation and future scalability.  **Network Testing**  1. Discuss the results of the network testing using ping and traceroute commands. 2. Detail any troubleshooting performed and the resolution of connectivity issues.  **Reliability and Security**  1. Explain how your network design supports Green Wood Company by providing a reliable and secure networking infrastructure. 2. Discuss the benefits of the implemented security measures and topology in achieving this goal.  Submission Instructions: **How the Assignment will be assessed:**  You will be required to submit the following documentation into Aula for this coursework:  1) Lab scenario paper: To be uploaded with completed answers  2) Packet Tracer file (.pka): To be uploaded with completed topology  3) Notepad file: Containing saved device configurations  4) Report (include screenshots of the topology) explaining the design of your network.  **Instructions:** Follow the instructions throughout this worksheet as directed in completing the  network construction and answering the questions in this worksheet. It is advisable to thoroughly read through these instructions before attempting to complete the tasks.  A network design topology is provided. You are expected to design the network with packet tracer and save your work as a “.pka” file.  **IMPORTANT**: The Packet Tracer file (.pka) and device configurations are to be saved and uploaded to Aula when you are ready to submit your work. You should copy all device configurations and paste within a notepad file, save, and upload the file.  When saving these files, please ensure you save them using your **student ID (SID) and CW1** at the beginning of the filename. In total, you will be submitting four (4) files as outlined above. For example, SID\_CW1\_Report.docx, SID\_CW1\_topology.pka, SID\_CW1\_Device\_Configuration.txt, and SID\_CW1\_Lab\_Scenario\_Worksheet.docx.  All devices in the Packet Tracer file are provided, you are expected to configure it with IP addressing and routing information. It is advisable to familiarise yourself with using the latest version of Cisco Packet Tracer. When the software is executed, it will require you to create a Cisco Netacad Account using your university email address with a different password and further sessions require you to log in to Netacad when the software is started. You can also go to https://www.netacad.com/courses/packet-tracer where you can learn about the features of packet tracer in the Introduction to Packet Tracer course.  This is an individual assignment. Each student must submit their own work. Group/team submissions are NOT permitted.  Be sure to keep backup copies of your submission. Failure to successfully upload does not excuse late submission. |

# Marking and Feedback

**How will my assignment be marked?**

Your assignment will be marked by the module team

**How will I receive my grades and feedback?**

Provisional marks will be released once internally moderated.

Feedback will be provided by the module team alongside the grades release.

After marking is completed, you can access your marked work and feedback by clicking on the submission link. Feedback will be provided in the Turnitin viewer, and mark distributions will show you where marks were awarded or deducted. If you are unsure how to access your feedback, please ask your tutor for clarification.

Your provisional marks and feedback should be available within [2 weeks (10 working days)].

**What will I be marked against?**

Details of the marking criteria for this task can be found at the [bottom of this assignment brief](#Marking_Rubric).

# Assessed Module Learning Outcomes

The Learning Outcomes for this module align to the [marking criteria](#Marking_Rubric) which can be found at the end of this brief. Ensure you understand the marking criteria to ensure successful achievement of the assessment task. The following module learning outcomes are assessed in this task:

* 1. Explain the function and operation of the main components of a computer.
  2. Apply the concepts of communication within local and wide area networks and internetworks including access techniques.
  3. Demonstrate an understanding of the protocols of wired and wireless technologies and their application in a professional computing context.
  4. Design and implement a simple local area network (LAN).
  5. Diagnose and correct simple network problems.

# Assignment Support and Academic Integrity

If you have any questions about this assignment please see the [Student Guidance on Coursework](https://share.coventry.ac.uk/students/Registry/Pages/Coursework.aspx) for more information.

### Spelling, Punctuation, and Grammar:

You are expected to use effective, accurate, and appropriate language within this assessment task.

### Academic Integrity:

The work you submit must be your own, or in the case of groupwork, that of your group. All sources of information need to be acknowledged and attributed; therefore, you must provide references for all sources of information and acknowledge any tools used in the production of your work, including Artificial Intelligence (AI). We use detection software and make routine checks for evidence of academic misconduct.

Definitions of academic misconduct, including plagiarism, self-plagiarism, and collusion can be found [on the Student Portal](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fshare.coventry.ac.uk%2Fstudents%2FRegistry%2FPages%2FEssential-definitions.aspx&data=05%7C01%7Cab5576%40coventry.ac.uk%7C96dc42ffe3484dd999e808db0e964c5d%7C4b18ab9a37654abeac7c0e0d398afd4f%7C0%7C0%7C638119810903032146%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=%2FggkmIN9ZackqogiKZxEXKYD3QaXAk0jCME%2F1ne82YU%3D&reserved=0). All cases of suspected academic misconduct are referred for investigation, the outcomes of which can have profound consequences to your studies. For more information on academic integrity please visit the [Academic and Research Integrity](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fshare.coventry.ac.uk%2Fstudents%2FRegistry%2FPages%2FAcademic-and-Research-Integrity.aspx&data=05%7C01%7Cab5576%40coventry.ac.uk%7C96dc42ffe3484dd999e808db0e964c5d%7C4b18ab9a37654abeac7c0e0d398afd4f%7C0%7C0%7C638119810903032146%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=%2BPYuaO%2FDqY2x3ajLRlKjxHoEvTPzEqm%2B8wuQ%2FMvxlZk%3D&reserved=0) section of the Student Portal.

### Support for Students with Disabilities or Additional Needs:

If you have a disability, long-term health condition, specific learning difference, mental health diagnosis or symptoms and have discussed your support needs with health and wellbeing you may be able to access support that will help with your studies.

If you feel you may benefit from additional support, but have not disclosed a disability to the University, or have disclosed but are yet to discuss your support needs it is important to let us know so we can provide the right support for your circumstances. Visit [the Student Portal](https://livecoventryac.sharepoint.com/sites/students-healthandwellbeing/SitePages/Disabilities.aspx) to find out more.

### Unable to Submit on Time?

The University wants you to do your best. However, we know that sometimes events happen which mean that you cannot submit your assessment by the deadline or sit a scheduled exam. If you think this might be the case, guidance on understanding what counts as an extenuating circumstance, and how to apply is [available on the Student Portal.](https://livecoventryac.sharepoint.com/sites/students-registry-extensions-deferrals/SitePages/CU-Extensions-and-Deferrals-Guidance.aspx)

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# Administration of Assessment

**Module Tutor Name:** [Insert Module Leader name]

**Module Tutor Email:** [Insert Module Leader email]

**Assignment Category:** Written

**Attempt Type:** Standard

**Component Code:** Cw1

## Assessment Marking Criteria

**Coventry University Generic Assessment Criteria: Undergraduate**

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| --- | --- | --- |
| **Mark band** | **Outcome** | **Guidelines** |
| 80-100%  1st | Meets learning outcomes | 1st - Exceptional work with very high degree of understanding, creativity, and critical/analytic skills. Evidence of exceptional research well beyond minimum recommended using a range of methodologies. Exceptional understanding of knowledge and subject-specific theories. Demonstrates creative flair, a high degree of originality and autonomy.  Exceptional ability to apply learning resources. Demonstrates well-developed problem-solving skills. Work completed with very high degree of accuracy and proficiency and autonomy. Exceptional communication and expression, significant evidence of professional skill set. Student evidences deployment of a full range of exceptional technical, including proficiency in the English Language, and/or artistic skills. |
| 70-79%  1st | 1st - Excellent work with clear evidence of understanding, creativity and critical/analytical skills. Thorough research well beyond the minimum recommended using methodologies beyond the usual range. Excellent understanding of knowledge and subject-specific theories with evidence of considerable originality and autonomy.  Excellent ability to apply learning resources. Demonstrates consistent, coherent substantiated argument and interpretation. Demonstrates considerable creativity and clear problem-solving skills. Assessment completed with accuracy, proficiency, and considerable autonomy. Excellent communication and expression, some evidence of professional skill set. Student evidences deployment of a highly developed range of technical, including proficiency in the English Language, and/or artistic skills. |
| 60-69%  2:1 | 2:1 - Very good work demonstrating strong understanding of theories, concepts and issues with clear critical analysis. Thorough research, using established methodologies accurately, beyond the recommended minimum with little, if any, irrelevant material present. Very good understanding, evidencing breadth and depth, of knowledge and subject-specific theories with some originality and autonomy.  Very good ability to apply learning resources. Demonstrates coherent substantiated argument and interpretation. Demonstrates some originality, creativity and problem-solving skills. Work completed with accuracy, proficiency, and autonomy. Very good communication and expression with evidence of professional skill set. Student has a thorough command of a good range of technical, including proficiency in the English Language, and/or artistic skills. |
| 50-59%  2:2 | 2:2 - Good understanding of relevant theories, concepts and issues with some critical analysis. Research undertaken accurately using established methodologies, enquiry beyond that recommended may be present. Some errors may be present and some inclusion of irrelevant material. Good understanding, with evidence of breadth and depth, of knowledge and subject-specific theories with indications of originality and autonomy.  Good ability to apply learning resources. Demonstrates logical argument and interpretation with supporting evidence. Demonstrates some originality, creativity and problem-solving skills but with inconsistencies. Expression and presentation mostly accurate, proficient, and conducted with some autonomy. Good communication and expression with appropriate professional skill set. Student consistently demonstrates a well-developed range of technical, including proficiency in the English Language, and/or artistic skills. |
| 40-49%  3rd Class | 3rd - Meet the learning outcomes with a basic understanding of relevant theories, concepts and issues. Demonstrates an understanding of knowledge and subject-specific theories sufficient to deal with concepts. Assessment may be incomplete and with some errors. Research scope sufficient to evidence use of some established methodologies. Some irrelevant material likely to be present.  Basic ability to apply learning resources. Demonstrates ability to devise and sustain an argument. Demonstrates some originality, creativity and problem-solving skills but with inconsistencies. Expression and presentation sufficient for accuracy and proficiency. Sufficient communication and expression with basic professional skill set. Student demonstrates technical, including a basic level of proficiency in the English Language, and/or artistic skills. |
| 30-39%  Fail | Fails to achieve learning outcomes | Fail – Outcomes not met. Limited understanding of relevant theories, concepts and issues. Little evidence of research and use of established methodologies. Some relevant material will be present. Deficiencies evident in analysis. Fundamental errors and some misunderstanding likely to be present.  Limited ability to apply learning resources. Student’s arguments are weak and poorly constructed. Limited originality, creativity, and struggles with problem-solving skills. Expression and presentation insufficient for accuracy and proficiency. Insufficient communication and expression and with deficiencies in professional skill set. Student demonstrates some deficiencies in technical, including in their use of the English Language, and/or artistic skills. |
| 0-29%  Fail | Fail – Outcomes not met. Clear failure demonstrating very little understanding of relevant theories, concepts and issues. Minimal evidence of research and use of established methodologies and incomplete knowledge of the area. Serious and fundamental errors and aspects missing.  Very little evidence of ability to apply learning resources. Student’s arguments are very weak and with no evidence of alternative views. Little evidence of originality, creativity, and problem-solving skills. Expression and presentation deficient for accuracy and proficiency. Insufficient communication and expression and with deficiencies in professional skill set. Student demonstrates a lack of technical, including in their use of the English Language, and/or artistic skills. |