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| 1.jpg  **Assessment Cover Sheet** |

**Due Date**

19/5/2024

**Course Code**

IT6003

**Assessment Title**

Implementing and documenting a network for Global Connect Solutions (GCS)

**Course Title**

Networks and Data Communications

**Internal Moderator’s Name**

Alex James

**External Examiner’s Name**

Not must-pass

Group

Uncontrolled

**Assessment Type**

**Instructions:**

1. This cover sheet must be completed (section in red below) and attached to your assessment before submission in soft copy.
2. The time allowed for this assessment is around 80 days.
3. This assessment carries 30 marks (30% of the module) distributed to a total of 8 questions assessing CILOs 1, 2, 3, 4 and 5.
4. The materials allowed for use in this assessment are Chapters 1-to-4.
5. The **use of generative AI tools is strictly prohibited**.
6. References consulted (if any) must be properly acknowledged and cited.
7. The assessment has a total of 2 pages.

**Programme Title**

**Learner ID**

**Date Submitted**

**Learner Name**

**Programme Code**

**Lecturer’s Name**

***By submitting this assessment for marking, I affirm that this assessment is my own work.***

**Learner Signature**

Do not write beyond this line. For assessor use only.

**Assessor’s Name**

**Marking Date**

**Marks Obtained**

**Comments:**

# **Scenario**

Global Connect Solutions (GCS) is a multinational technology consulting firm specializing in comprehensive networking solutions. Responding to increased demand, GCS is expanding its global operations. Your team, hired as network engineers, is tasked with planning, designing, implementing, and troubleshooting the network infrastructure. The project involves deploying both IPv4 and IPv6 protocols, hosting internal email servers, FTP services, DHCP, and enabling remote access for network devices. Additionally, your design should incorporate redundant links between regions to enhance network resilience**.**

## **Project Overview:**

GCS is expanding its operations to the following regions:

1. **North America:**
   * City: New York, Toronto
   * Staff: 150, 90
2. **Europe:**
   * City: London, Berlin
   * Staff: 120, 80
3. **Asia-Pacific:**
   * City: Tokyo, Sydney
   * Staff: 180, 110
4. **Middle East**
   * City: Manama, Dubai
   * Staff: 220, 120

# **Project Debrief**

The project consists of two main parts:

## **Part1: Network Planning and Design Report:**

Your team is required to provide a detailed report on the network plan. The report should include:

1. IP addressing and subnetting scheme (IPv4 using VLSM and IPv6) for the entire organization.
2. Describe the choice of the Application Layer protocols, including TCP, for Global Connect Solutions' network. Provide details on how this protocol operates to ensure reliable and efficient communication between devices.
3. List of necessary network devices and an explanation of their functions.
4. Specification of the protocol used to operate the LANs and how this protocol operates.
5. Identification and explanation of the transmission media used in the organization.
6. Before implementing a security policy, the network manager requires an understanding of the network layer protocols. Within the TCP/IP protocol stack, describe the specific protocol operating at the network layer. Additionally, use Packet Tracer to simulate a communication process between a PC in one branch to a PC in a different branch or region. Provide detailed explanations and, if possible, include screenshots. Address the following aspects:

a. Identify the network devices involved in the data flow.

b. Specify the interfaces utilized in the communication process.

c. Addresses (IP and MAC address) used in the communication.

d. Protocols needed for communication and what these protocols are used for.

1. Choose a dynamic routing protocol (for both IPv4 and IPv6) and provide the advantages of this routing protocol over any other dynamic routing protocol.

## **Part 2: Implementation and Troubleshooting**

1. Configure the network in Packet Tracer and submit a fully operational version on Moodle.

* Ensure the network is accurately set up in Packet Tracer.
* Submit a functional implementation on Moodle for assessment.

1. Deploy two application layer services utilizing IPv4 and another two application layer services utilizing IPv6.

* Implement and describe two services at the application layer using IPv4.
* Implement and describe two services at the application layer using IPv6.