**Part A: Micro Project Proposal**

**Title: ICMP Protocol**

**1.0 Introduction:**

The Internet Control Message Protocol (ICMP) is an integral part of the Internet Protocol Suite. It is primarily used for diagnostic and error reporting purposes in IP networks. ICMP messages are encapsulated within IP packets and are typically generated by network devices, such as routers or hosts, to communicate network-related information.

ICMP provides various functionalities, including:

1. Echo Request and Reply: ICMP Echo Request (commonly known as a "ping") is used to test the reachability of a network device by sending an ICMP Echo Request message and expecting an ICMP Echo Reply in return.

2. Error Reporting: ICMP is responsible for reporting errors encountered during IP packet processing. For example, if a router encounters an issue while forwarding an IP packet, it can send an ICMP error message back to the source host.

3. Network Path and Reachability Information: ICMP messages like Time Exceeded and Destination Unreachable provide valuable information about network path issues, such as packet fragmentation problems or unreachable destinations.

4. Network Address Mask Discovery: ICMP provides a mechanism for hosts to discover the subnet mask associated with a network interface.

ICMP plays a crucial role in network troubleshooting, network health monitoring, and network management. It enables network administrators to identify and resolve network issues efficiently.

Understanding ICMP is essential for network professionals to diagnose and address network problems effectively.

**2.0 Aim of the Topic:**

The Internet Control Message Protocol (ICMP) serves several important purposes in IP networks. Its main aim is to facilitate communication between network devices by providing a means for error reporting, network diagnostics, and network reachability information. ICMP achieves this aim through various functionalities. One of the key functions is the Echo Request and Reply mechanism, commonly known as "ping." This allows network devices to test the reachability of other devices by sending an ICMP Echo Request message and expecting an ICMP Echo Reply in return. Another important aim of ICMP is error reporting. If a network device encounters an issue while processing an IP packet, it can generate an ICMP error message and send it back to the source host. This helps in identifying and resolving network problems, such as unreachable destinations or packet fragmentation issues.

**3.0 Course Outcome:**

1. Understanding ICMP basics.
2. Error and control messages.
3. Configure ICMPv6 network.
4. Troubleshoot problems using ICMP.
5. Explore topics like ICMP extension messages.

**4.0 Proposed Methodology :**

Gather data relevant to ICMP.

**5.0 Resource Required :**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No** | | **Name of Resource / Material** | | **Specification** | | **Qty** | |
|  | |  | |  | |  | |
|  | 16 GB RAM, Windows 11  OS |
|  | 1 |  | Computer System |  | 1 |
|  |  |  |
|  |
|  | |  | |  | |  | |
|  | 2 |  | Internet |  | Youtube / Wikipedia |  |  |
|  |  |  |  |
|  | |  | |  | Advanced computer  network ( 22520 ) |  | |
|  | 3 |  | textbook/manual |  | 1 |
|  |  |  |
|  |

**6.0 Action Plan:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No.** | **Details of Activity** | **Planned Start Date** | **Planned finish**  **Date** | **Name of team**  **Members** |
| 1 | Data Collection |  |  |  |
| 2 | Analysis |  |  |  |
| 3 | Design |  |  |  |
| 4 | Development |  |  |  |
| 5 | Report Writing |  |  |  |
| 6 | Presentation |  |  |  |