

IN3230 – COMPUTER NETWORKS

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Objective:

- The objective of this project is to implement a very simple network stack. We will use a protocol called MIP, which stands for “Minimal Interconnection Protocol”. MIP is a minimal network layer protocol, that has only the bare necessities in the header and avoids overhead, making it quick to process and minimising latency.

1 HOW MIP IS DIFFERENT THAN IPV4

MIP was intentionally crafted for lightweight and low-latency communication. Its compact 4-byte header stands in contrast to the 20-byte header of IPv4. Notably, MIP's address space is significantly more constrained, allowing for the addressing of only 254 devices, whereas IPv4 offers a pool of 4,294,967,296 unique addresses. Furthermore, IPv4 is widely preferred for routing purposes and incorporates features such as an integrity checksum field, ensuring data reliability of the header fields during transmission. Since IPv4 was designed more than 40 years ago, some of the field became obsolete and not longer used. That makes an IPv4 header size redundant to some applications. The maximal packet size is 65,535 bytes compared to 2044 maximal SDU size of MIP protocol. Overall because of the constraints of the MIP protocol and its simplicity, performance of the MIP protocol would be better compared to the IPv4 protocol.

2 WHY WE NEED TO HANDLE THE MIP-ARP PROTOCOL

ARP (Address Resolution Protocol) is a protocol that enables nodes to connect the identification address like IPv4 or, in our case, MIP to the physical address of the node (MAC address). It is used on the LAN (Local area network). The distribution of the ip or mip addresses is not known by hosts beforehand, that is why we need to have a way to get this information. One of the alternatives to using ARP protocols, is having a static set of nodes connected to the network. In such case we don't need any resolution protocol and can use MAC address. If we want to connect a new node to the network, we would have to add the new MAC address of newly connected node manually to all nodes in network, which is a high maintenance cost.

Another possible solution is to assign one authority, that will store all the MAC addresses and MIP addresses. Newly connected devices would reach this node in order to get MAC address of destination node by MIP address.

3 FLOW CHART

