# M7. The Link Layer and LANs

What is ARP protocol? Which information can an ARP table contain possibly? Please describe in detail how the translation is done and how to send a datagram to a host over the Internet.

## ARP (Address Resolution Protocol)

Used to translate IP addresses in the network layer to MAC addresses in the link layer, when two hosts on the same network communicates.

1. Host A contacts host B in a broadcast frame on the network requesting the MAC address of the owner of the IP addresse of host B.
2. Host B returns the message in a standard frame
3. Host A stores the address in the Address Resolution Protocol table.

## ARP Table

Contains mappings of IP addresses to MAC addresses and Time To Live (indicates when mapping will be deleted from the table).

## **How is translation done and how to send datagram to host:**

**Translation**

**ARP**

* Search the ARP table to find the IP address.
* If not found
  + ARP query in the broadcasting frame, which MAC address has the IP address requested.
  + Stores the IP address and the MAC address in the ARP table.
* If the ARP can’t find the IP address, return an error.

**Send a datagram to a host over the internet**

Sending a package from host A to host B over the internet.

* Find the IP address of host B.
* Use DNS to find the router which hosts, host B’s IP address.
* Sends the package to the router and let the router create an ARP table to find host B’s IP address.