

**Pontificia Universidad Católica Madre y Maestra**  
**Facultad de Ciencias e Ingeniería**  
**Escuela de ingeniería en Computación y Telecomunicaciones.**



**Presentado Por:**

Miguel Estevez

2017-0200

**Asignatura:**

Laboratorio de Redes de Datos I

**Profesor:**

Pablo Rodriguez

**Fecha de Entrega:**

21 de octubre del 2020

## ARP

The address resolution protocol (arp) is a protocol used by the Internet Protocol (IP) [RFC826], specifically IPv4, to map IP network addresses to the hardware addresses used by a data link protocol. The protocol operates below the network layer as a part of the interface between the OSI network and OSI link layer. It is used when IPv4 is used over Ethernet.

The term address resolution refers to the process of finding an address of a computer in a network. The address is "resolved" using a protocol in which a piece of information is sent by a client process executing on the local computer to a server process executing on a remote computer. The information received by the server allows the server to uniquely identify the network system for which the address was required and therefore to provide the required address. The address resolution procedure is completed when the client receives a response from the server containing the required address.

An Ethernet network uses two hardware addresses which identify the source and destination of each frame sent by the Ethernet. The destination address (all 1's) may also identify a broadcast packet (to be sent to all connected computers). The hardware address is also known as the Medium Access Control (MAC) address, in reference to the standards which define Ethernet. Each computer network interface card is allocated a globally unique 6 byte link address when the factory manufactures the card (stored in a PROM). This is the normal link source address used by an interface. A computer sends all packets which it creates with its own hardware source link address, and receives all packets which match the same hardware address in the destination field or one (or more) pre-selected broadcast/multicast addresses.

There are four types of arp messages that may be sent by the arp protocol. These are identified by four values in the "operation" field of an arp message. The types of message are:

1. ARP-Request (Broadcast, source IP address of the requester)
2. ARP-Reply (Unicast to requester, the target)

To reduce the number of address resolution requests, a client normally **caches** resolved addresses for a (short) period of time. The arp cache is of a finite size, and would become full of incomplete and obsolete entries for computers that are not in use if it was allowed to grow without check. The arp cache is therefore periodically flushed of all entries. This deletes unused entries and frees space in the cache. It also removes any unsuccessful attempts to contact computers which are not currently running.

If a host changes the MAC address it is using, this can be detected by other hosts when the cache entry is deleted and a fresh arp message is sent to establish the new association. The use of gratuitous arp (e.g. triggered when the new NIC interface is enabled with an IP address) provides a more rapid update of this information.

## Proxy ARP

Proxy ARP is the name given when a node responds to an arp request on behalf of another node. This is commonly used to redirect traffic sent to one IP address to another system.

Proxy ARP can also be used to subvert traffic away from the intended recipient. By responding instead of the intended recipient, a node can pretend to be a different node in a network, and therefore force traffic directed to the node to be redirected to itself. The node can then view the traffic (e.g. before forwarding this to the originally intended node) or could modify the traffic. Improper use of Proxy ARP is therefore a significant security vulnerability and some networks therefore implement systems to detect this. Gratuitous ARP can also help defend the correct IP to MAC bindings.

**Referencia**

<https://erg.abdn.ac.uk/users/gorry/course/inet-pages/arp.html>