Address resolution protocol (ARP)

The address resolution Protocol associates an ip address with physical address. On a typical physical network, such as a LAN, each device on a link is identified by a physical or station address usually imprinted on the network interface card.(NIC)

Physical address have local jurisdiction and can be changed easily. For example, if the NIC on a particular machine fails, the physical address changes. The IP address, on the other hand ,have universal jurisdiction and cannot be changed. ARP is used to find the physical address of the node when its Internet address is known.

Anytime a host or a router needs to find the physical address of another host on its network, it formats an ARP query packet that includes the IP address and broadcast it over the network. Every host on the network receives and processes the ARP packet, but only the intended recipient recognizes its internet address and sends back its physical address. The host both to its cache memory and to the datagram header, then sends the datagram on its way.

Reverse Address resolution protocol(RARP)

The RARP allows a host to discover its internet address when it knows only its physical address. The question here is ,why do we need RARP? A host is supposed to have its internet address stored on its hard disk !

RARP works much like ARP. The host wishing to retrieve its internet address broadcasts an RARP query packet that contains its physical address to every host on its physical network. A server on the network recognizes the RARP packet and returns the host's internet address.

Internet Control Message Protocol (ICMP)

The Internet control message protocol is a mechanism used by hosts and routers to send notification of datagram problems back to the sender.

IP is an unreliable and connectionless protocol. ICMP allows IP to inform a sender if a datagram is undeliverable. A datagram travels from router to router until it reaches one that can deliver it to its final destination. If a router is unable to route or deliver the datagram because of unusual conditions or due to congestion, ICMP allows it to inform the original source.

ICMP uses echo test/reply to test whether a destination is reachable and responding. It also handles both control and error message, but its sole function is ti\o report problems, not correction them. A datagram carries only source and destination address. For this reason ICMP can send message only to the source, not to an intermediate router.