IPv4 Unicast. Broadcast, and Multicast

Unicast

Unicast transmission refers to one device sending a message to one other device  
 one-to-one communication

Unicast packet has a destination IP address that is a unicast address which goes to a single recipient.

A source IP address can only be unicast address,   
 **because the packet can only originate from a single** **source**

this is regardless of whether the destination IP address is a unicast, broadcast or multicast

NOTE:

IPv4 unicast addresses are in the range of 1.1.1.1 to 223.255.255.255

However, within there are many addresses reserved for special purposes

Broadcast

Broadcast transmission refers to a device sending a message to all the devices on a network

One-to-all communication

Broadcast packet has a destination IP address with all ones (1s) in the host portion,   
 or 32 one (1s) bits

**This packet must be processed by all devices in the same broadcast domain**  
 a broadcast domain identifies all hosts on the same network segment  
 it may be directed or limited

Multicast

Reduces traffic by allowing a host to send a single packet to a selected set of hosts that subscribe to a multicast group

**This packet is a packet with a destination IP address that is a multicast address**  
 IPv4 has reserved the 224.0.0.0 to 239.255.255.255 addresses as a multicast range

**Hosts that receive particular multicast packets are called** multicast clients

Each multicast group is represented by a single IPv4 multicast destination address

When an IPv4 host subscribes to a multicast group, the host processes packets addressed to this multicast address, and packets addressed to its uniquely allocated unicast address

Routing protocols such as OSPF use multicast transmissions