**IPv6 Multicast Address**

- Multicast Addresses: IPv6 multicast addresses (**prefix ff00::/8**) allow a single packet to be sent to multiple destinations (a multicast group). They can *only* be destination addresses, never source addresses.

- Well-Known Multicast Addresses: These are reserved addresses for predefined groups of devices running common protocols or services. Two key examples:

* **ff02::1** (All-nodes multicast group): All IPv6-enabled devices join this group. Sending a packet to this address is like an IPv4 broadcast; all devices on the link receive and process it. Used by routers to send Router Advertisements (RAs).
* **ff02::2** (All-routers multicast group): All IPv6 routers join this group (after enabling IPv6 unicast routing). Packets sent here are received by all IPv6 routers on the link.

- Solicited-Node Multicast Addresses: These are similar to all-nodes multicast, but they offer a performance advantage. They map to specific Ethernet multicast MAC addresses.

* This allows a network interface card (NIC) to quickly filter out unwanted multicast traffic at the hardware level (by checking the destination MAC address) *before* it's passed to the IPv6 software process.
* This reduces processing overhead on devices that are not the intended recipient of the multicast packet. Essentially, the NIC can say "this isn't for me" much faster.

A diagram of a computer network

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- Router Advertisements (RAs): Routers use the all-nodes multicast address (ff02::1) to send RAs. These messages help devices configure their IPv6 addresses and other network settings. Devices can also send Router Solicitations (RS) to the all-routers address (ff02::2) to request an RA.A diagram of a network

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- Key Difference: The primary difference between well-known and solicited-node multicast addresses lies in how they are handled at the network interface level. Solicited-node multicast leverages Ethernet multicast MAC addresses for efficient hardware-based filtering, while well-known multicast requires the device to process the packet up to the IPv6 layer to determine if it's intended for that device.