

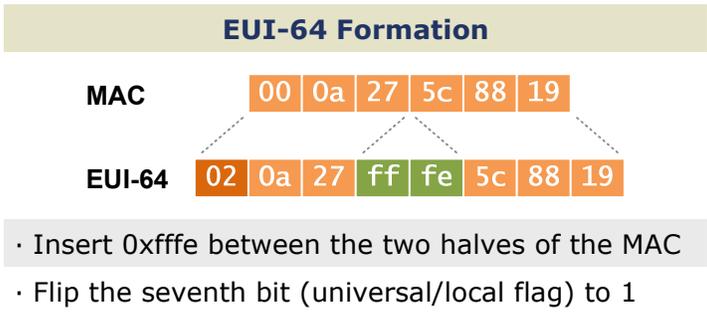
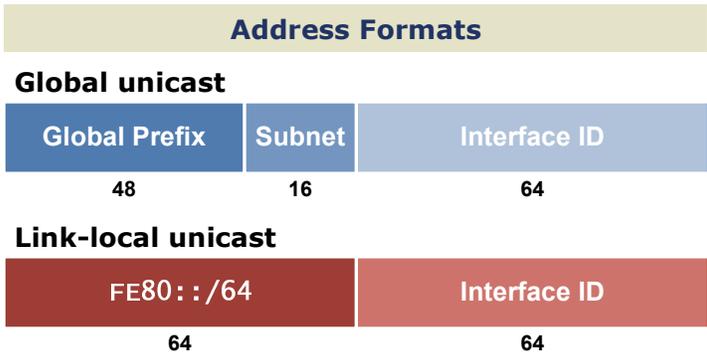
- Version** (4 bits) · Always set to 6
- Traffic Class** (8 bits) · A DSCP value for QoS
- Flow Label** (20 bits) · Identifies unique flows (optional)
- Payload Length** (16 bits) · Length of the payload in bytes
- Next Header** (8 bits) · Header or protocol which follows
- Hop Limit** (8 bits) · Similar to IPv4's time to live field
- Source Address** (128 bits) · Source IP address
- Destination Address** (128 bits) · Destination IP address

- ### Address Types
- Unicast** · One-to-one communication
 - Multicast** · One-to-many communication
 - Anycast** · An address configured in multiple locations

- ### Multicast Scopes
- | | |
|--------------------------|---------------------|
| 1 Interface-local | 5 Site-local |
| 2 Link-local | 8 Org-local |
| 4 Admin-local | E Global |

- ### Special-Use Ranges
- | | |
|----------------------|---------------------|
| ::0 | Default route |
| ::/128 | Unspecified |
| ::1/128 | Loopback |
| ::/96 | IPv4-compatible* |
| ::FFFF:0:0/96 | IPv4-mapped |
| 2001::/32 | Teredo |
| 2001:DB8::/32 | Documentation |
| 2002::/16 | 6to4 |
| FC00::/7 | Unique local |
| FE80::/10 | Link-local unicast |
| FEC0::/10 | Site-local unicast* |
| FF00::/8 | Multicast |
- * Deprecated

- ### Address Notation
- Eliminate leading zeros from all two-byte sets
 - Replace up to one string of consecutive zeros with a double-colon (::)



- ### Extension Headers
- Hop-by-hop Options (0)**
Carries additional information which must be examined by every router in the path
 - Routing (43)**
Provides source routing functionality
 - Fragment (44)**
Included when a packet has been fragmented by its source
 - Encapsulating Security Payload (50)**
Provides payload encryption (IPsec)
 - Authentication Header (51)**
Provides packet authentication (IPsec)
 - Destination Options (60)**
Carries additional information which pertains only to the recipient

- ### Transition Mechanisms
- Dual Stack**
Transporting IPv4 and IPv6 across an infrastructure simultaneously
 - Tunneling**
IPv6 traffic is encapsulated into IPv4 using IPv6-in-IP, UDP (Teredo), or Intra-Site Automatic Tunnel Addressing Protocol (ISATAP)
 - Translation**
Stateless IP/ICMP Translation (SIIT) translates IP header fields, NAT Protocol Translation (NAT-PT) maps between IPv6 and IPv4 addresses