

IPv6 and Stateless Auto Configuration and Stateless DHCP

- The Client configures link-local address fe80.
- Joins a Multicast Group ff02::1
- Client Sends a Router Solicitation with ICMP type 133 to the Multicast Group. Note that a Router Solicitation as well as a Router Advertisement, are part of the Neighbor Discovery Protocol.
- The Router responds with a Router Advertisement with ICMP type 134. This can be used for (Stateless)

Autoconfiguration:

-Stateless Autoconfiguration will Multicast the /64 prefix. It will ALSO offer to be Default Router via a Router Solicitation. (ICMP message multicast)

-If the **M-flag** (“Managed”) is set in the SAC: Managed FLAG is set, then the O flag is disregarded. (redundant) Now ONLY **Statefull DHCP** is used to configure the interface and via SAC the default router.

Note that DHCPv6 only publishes a Prefix, NOT an individual IP address. And there is no “exclude” range possible as the likelihood for duplicate IPv6 addresses is minimal and solved by DAD.

Command:

```
(config-if)#ipv6 nd managed-config-flag
```

This is the default when a DHCP6 server pool is configured.

-DHCP – Lite or Stateless DHCP:

If the M-Flag is **NOT set** and the **O flag is set** in the SAC message, then the prefix /64 is published via Stateless Autoconfiguration, (SAC) the default router address is offered as well via SAC, and DHCP is used for “OTHER” configuration parameters. This typically implies the DNS server.

Command:

```
(config-if) # ipv6 nd other-config-flag
```

IF both flags are NOT set, then DHCP is not used and only the routing Prefix (/64) and default router IPv6 address are conveyed.

Note that other ICMP message types used in neighbor discovery are (source Wikipedia):

Neighbor Solicitation (Type 135)

Neighbor solicitations are used by nodes to determine the link layer address of a neighbor, or to verify that a neighbor is still reachable via a cached link layer address.

Neighbor Advertisement (Type 136)

Neighbor advertisements are used by nodes to respond to a Neighbor Solicitation message.