

Default Gateway

Find current setting

IPv4

Find Default Gateway in Linux using following options:

```
$ ip route show
-----
default via 192.168.1.1 dev eth1 proto static
192.168.1.0/24 dev eth1 proto kernel scope link src 192.168.1.100 metric
1
```

Alternative option using route:

```
$ route -n
-----
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use
Iface
0.0.0.0          192.168.1.1     0.0.0.0          UG    0      0      0 eth1
192.168.1.0      0.0.0.0         255.255.255.0    U     1      0      0 eth1
```

The above output shows my default gateway is 192.168.1.1. UG stands for the network link is Up and G stands for Gateway.

IPv6

Find Default Gateway in Linux using following options:

```
$ ip -6 route show
2001:1c00:2e16:720a::806 dev enpls0 proto kernel metric 100 pref medium
2001:1c00:2e16:720a::/64 dev enpls0 proto ra metric 100 pref medium
fd00::66:67:a::806 dev enpls0 proto kernel metric 100 pref medium
fd00::66:67:a::/64 dev enpls0 proto ra metric 100 pref medium
fe80::/64 dev enpls0 proto kernel metric 1024 pref medium
default via fe80::ee08:6bff:fe84:2043 dev enpls0 proto ra metric 100 pref
medium
```

Setting Default Gateway

IPv4

In case of DHCP the gateway is communicated via the DHCP options. Here is the list of the most common DHCP options exchanged with clients:

- DHCP option 1: subnet mask to be applied on the interface asking for an IP address
- DHCP option 3: default router or last resort gateway for this interface
- DHCP option 6: which DNS (Domain Name Server)

In case of manual configuration the gateway is specified in the `/etc/network/interfaces` file:

```
cat /etc/network/interfaces
-----
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
address 192.168.1.100
netmask 255.255.255.0
network 192.168.1.0
broadcast 192.168.1.255
gateway 192.168.1.1
```

IPv6

IPv6 works very differently from IPv4 when it comes to gateways. With IPv4, you need to specify a gateway manually or via a DHCP option. With IPv6, the IP stack locates gateways automatically by using ICMP-v6 Neighbor Discovery packets. Specifically, a client will listen for Router Advertisements, which may be sent gratuitously by a router or as a response to a Router Solicitation package. In addition to that a default route can be set with:

```
# ip -6 route add default via xx:xx:xx::xx dev eth0
```

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