ethtool NIC settings and stats

CONCEPTS

Lowercase letters show settings, uppercase letters change them: -k shows offloads, -K sets them.

Kernel stack TCP/IP, offloads
↓ rings
Driver ethtool -i
↓ DMA
NIC ethtool -S
↓ PHY
Cable / module ethtool, -m

Settings changed with ethtool live in the driver and are lost on reboot or driver reload; persist them via NetworkManager, udev or systemd-networkd.

Not every driver supports every option. 'Operation not supported' means the driver, not your syntax.

LINK

`ethtool <iface>`
Show link, speed, duplex

`ethtool -s <iface> speed <mbps> duplex full autoneg off`
Force speed and duplex

`ethtool -s <iface> autoneg on`
Enable autonegotiation

`ethtool -s <iface> advertise <hexmask>`
Limit advertised modes

`ethtool -r <iface>`
Restart autonegotiation

`ethtool -P <iface>`
Show permanent MAC address

`ethtool -a <iface>`
Show pause (flow control)

`ethtool -A <iface> rx off tx off`
Set pause parameters

`ethtool --show-eee <iface>`
Show Energy-Efficient Ethernet

`ethtool --set-eee <iface> eee off`
Turn EEE off

DRIVER & STATS

`ethtool -i <iface>`
Driver, version, bus address

`ethtool -S <iface>`
Per-NIC statistics

`ethtool -t <iface> online`
Run a self-test

`ethtool --cable-test <iface>`
Test the cable

`ethtool --json <iface>`
Machine-readable output

OFFLOADS

`ethtool -k <iface>`
Show offload features

`ethtool -K <iface> gro off`
Toggle GRO

`ethtool -K <iface> tso off gso off`
Toggle TSO and GSO

`ethtool -K <iface> rx on tx on`
Toggle checksum offload

`ethtool -K <iface> lro off`
Toggle LRO

`ethtool -K <iface> sg off`
Toggle scatter-gather

`ethtool -K <iface> rxvlan off`
Toggle VLAN tag offload

QUEUES & RINGS

`ethtool -g <iface>`
Show ring buffer sizes

`ethtool -G <iface> rx 4096 tx 4096`
Set ring buffer sizes

`ethtool -l <iface>`
Show channel (queue) counts

`ethtool -L <iface> combined <n>`
Set channel count

`ethtool -c <iface>`
Show interrupt coalescing

`ethtool -C <iface> rx-usecs <n>`
Set interrupt coalescing

QUEUES & RINGS (cont.)

`ethtool -x <iface>`
Show RSS table and hash key

IDENTIFY & WAKE

`ethtool -p <iface> <secs>`
Blink the port LED

`ethtool <iface> | grep Wake-on`
Show Wake-on-LAN state

`sudo ethtool -s <iface> wol g`
Enable Wake-on-LAN

`sudo ethtool -s <iface> wol d`
Disable Wake-on-LAN

Wake-on-LAN letters

Letter	Wakes on
`g`	magic packet
`u`	unicast
`m`	multicast
`b`	broadcast
`a`	ARP
`d`	disable all

MODULES & FLASH

`ethtool -m <iface>`
Show SFP/QSFP module info

`ethtool --version`
Print ethtool version

RECIPES

Dropped packets: look at counters and rings

```
ethtool -S <iface> | grep -Ei 'drop|miss|err'
ethtool -g <iface>
sudo ethtool -G <iface> rx 4096
```

Slow link: check what was negotiated

```
ethtool <iface> | grep -E 'Speed|Duplex|Auto|Link'
sudo ethtool -s <iface> autoneg on
ethtool -r <iface>
```

Find the port in a rack

```
ethtool -p <iface> 30
```

Keep Wake-on-LAN across reboots (NetworkManager)

```
nmcli connection modify <name> 802-3-ethernet.wake-on-lan magic
nmcli connection up <name>
```