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

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

QUEUES & RINGS (cont.)

ethtool -X *<iface>* **equal** *<n>*
Spread RSS over n queues

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 -T *<iface>*
Show timestamping support

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>
```