ethtool NIC settings and stats

START HERE

ethtool *<iface>*
Link, speed, duplex

ethtool -g *<iface>*
Ring buffer sizes

ethtool -i *<iface>*
Driver and firmware

ethtool -p *<iface>* **10**
Blink the port LED

ethtool -S *<iface>*
NIC counters

ethtool -m *<iface>*
SFP module info

ethtool -k *<iface>*
Offload features

sudo ethtool -s *<iface>* **autoneg on**
Change link settings

Kernel stack TCP/IP, offloads → (rings) **Driver** ethtool -i → (DMA) **NIC** ethtool -S → (PHY) **Cable / module** ethtool, -m

CONCEPTS

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

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
Look at 'Link detected' first; 'Speed' and 'Duplex' show the negotiated values.

ethtool -s *<iface>* **speed** *<mbps>* **duplex full autoneg off**
Force speed and duplex
Both ends must match, or you get a duplex mismatch. Prefer autoneg on.

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

ethtool -s *<iface>* **advertise** *<hexmask>*
Limit advertised modes
Mask of modes from 'Supported link modes'; e.g. 0x008 is 100baseT/Full.

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
A known cure for flapping links on some NICs.

ethtool --show-fec *<iface>*
Show forward error correction

DRIVER & STATS

ethtool -i *<iface>*
Driver, version, bus address
Shows firmware-version and bus-info too; handy for bug reports.

ethtool -S *<iface>*
Per-NIC statistics
Names vary by driver. Pipe through grep -E 'err|drop|miss'.

ethtool -S *<iface>* **--all-groups**
Standard MAC/PHY stats

ethtool --phy-statistics *<iface>*
PHY statistics

ethtool -t *<iface>* **online**
Run a self-test
offline is a full test and can interrupt traffic.

ethtool -d *<iface>*
Dump registers

ethtool -e *<iface>*
Dump EEPROM

ethtool --cable-test *<iface>*
Test the cable
Needs PHY and driver support; the link drops during the test.

ethtool --json *<iface>*
Machine-readable output
Works only for some options.

OFFLOADS

ethtool -k *<iface>*
Show offload features
[fixed] means the feature cannot be changed.

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

ethtool -K *<iface>* **tso off gso off**
Toggle TSO and GSO
Disable while debugging captures with oversized packets.

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

ethtool -K *<iface>* **lro off**
Toggle LRO
Turn it off on routers and bridges; it breaks forwarding.

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

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

OFFLOADS (cont.)

ethtool -K *<iface>* **rxhash on**
Toggle RX hashing

ethtool --show-priv-flags *<iface>*
Driver private flags

QUEUES & RINGS

ethtool -g *<iface>*
Show ring buffer sizes
Compare 'Pre-set maximums' with 'Current hardware settings'.

ethtool -G *<iface>* **rx 4096 tx 4096**
Set ring buffer sizes
Larger rings absorb bursts and cut drops, at the cost of latency.

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

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

ethtool -n *<iface>*
Show flow classification rules

IDENTIFY & WAKE

ethtool -p *<iface>* *<secs>*
Blink the port LED
Find the right cable in a rack; stops after the seconds given.

ethtool *<iface>* **| grep Wake-on**
Show Wake-on-LAN state
g = wake on magic packet, d = disabled.

sudo ethtool -s *<iface>* **wol g**
Enable Wake-on-LAN
Many NICs reset this on boot; re-apply from a unit or NetworkManager.

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

IDENTIFY & WAKE (cont.)

ethtool -s *<iface>* **wol pumbg**
Combine wake triggers
p PHY, u unicast, m multicast, b broadcast, g magic packet.

ethtool -s *<iface>* **sopass** *<mac>*
Set SecureOn password
Needs wol s as well.

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
Vendor, part number, temperature and optical power levels (DOM).

ethtool -m *<iface>* **hex on**
Raw module EEPROM dump

ethtool -f *<iface>* *<file>*
Flash a firmware image
Risky; use the vendor's documented procedure.

ethtool -T *<iface>*
Show timestamping support
Check for PTP hardware clock 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>
```