

Upgrading your network tools

Unified + Workshop Edition



Why This Change?

Linux networking used to rely on a **collection of small tools**, each handling one job:

Tool	Purpose
ifconfig	Show or configure interfaces
route	Display or modify routing tables
arp	Manage neighbor (ARP) cache
netstat	Show sockets, routing, interfaces
ipmaddr, iptunnel	Manage multicast/tunnels

Each had different syntax, limited IPv6 support, and were inconsistent.

Finter the iproute2 suite — the modern replacement that unifies all those tasks under one coherent command: ip.

What is iproute2?

iproute2 is the current standard networking toolkit for Linux.

It replaces:

- ifconfig \rightarrow ip addr, ip link
- route → ip route
- arp → ip neighbor
- netstat → ss

Developed to handle:

- IPv4 and IPv6 natively
- · Multiple addresses per interface
- Advanced routing (policy, multipath, VRF)
- · Consistent, scriptable syntax

The Core Concept

All ip commands follow a simple pattern:

```
ip [OBJECT] [COMMAND] [OPTIONS]
```

Examples:

- ip addr show
- ip link set eth0 up
- ip route add 10.0.0.0/24 via 192.168.1.1
- ip neighbor show
- Phink of ip as a single command with many "subcommands" for specific network objects.



Rasic Equivalents

Upgrading your Network Tools

Legacy Command	Modern Equivalent (ip)
ifconfig	ip addr show Or ip link show
ifconfig eth0 up	ip link set eth0 up
ifconfig eth0 192.168.1.10/24	ip addr add 192.168.1.10/24 dev eth0
route -n	ip route show
route add default gw 192.168.1.1	ip route add default via 192.168.1.1
arp -n	ip neighbor show
arp -d 192.168.1.5	ip neighbor del 192.168.1.5 dev eth0

Working with Neighbors (ARP/ND)

Old way:

```
arp -n
```

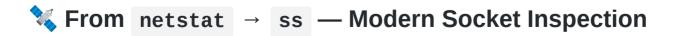
New way:

```
ip neighbor show
```

To add or delete entries:

```
ip neighbor add 192.168.1.5 lladdr 00:11:22:33:44:55 dev eth0
ip neighbor del 192.168.1.5 dev eth0
```

Works for both IPv4 ARP and IPv6 Neighbor Discovery.



Why replace netstat?

- netstat is deprecated and slow parses /proc directly.
- · Lacks modern protocol visibility (IPv6, SCTP, etc.).
- ss is part of iproute2: fast, filterable, and script-friendly.

Common equivalences

netstat	ss
netstat -tuln	ss -tuln
netstat -tanp	ss -tanp
netstat -rn	ip route show
netstat -s	SS -S

Practical examples

Faster than netstat and supports fine-grained filters.

Filtering

```
ss -t state listening
ss -u src 192.168.1.10
ss -t dst 10.0.0.5:22
ss -tan 'sport = :443' | grep ESTAB
```

Bonus: Statistics

ss -s

Displays TCP/UDP totals, retransmits, queues — great for diagnostics.



Try: watch -n1 ss -s for live socket stats.

Examples: Common Tasks

Task	Old Command	New Command
Show interface IPs	ifconfig	ip -brief addr
Show default gateway	route -n	ip route show default
Bring up interface	ifconfig eth0 up	ip link set eth0 up
Check ARP table	arp -n	ip neighbor show
Show routing	netstat -rn	ip route
Check listening ports	netstat -tuln	ss -tuln

Why Scripts Should Use ip and ss

- Structured, predictable text output.
- JSON available (ip -j, ss -j).
- Fast, non-blocking, IPv6-ready.
- Excellent for automation and monitoring pipelines.



Quick Reference Cheat Sheet

Upgrading your Network Tools

```
ip addr show  # Show IP addresses
ip link show  # Show interfaces
ip route show  # Show routes
ip neighbor show  # Show ARP/ND entries
ss -tuln  # Show listening sockets
ss -s  # Socket statistics summary
```

Migration Summary

Legacy Tool	Status	Replacement
ifconfig	Deprecated	ip addr, ip link
route	Deprecated	ip route
arp	Deprecated	ip neighbor
netstat	Deprecated	SS
ipmaddr, iptunnel	Deprecated	ip maddr, ip tunnel

Wrap-Up

- **Old habits:** ifconfig , route , arp , netstat
- Modern tools: ip addr, ip route, ip neighbor, ss
- Mindset: Unified, scriptable, and future-proof.

Questions?

```
$ ip help
$ ss --help
```