

**NAME**

**ip** – show / manipulate routing, network devices, interfaces and tunnels

**SYNOPSIS**

**ip** [ *OPTIONS* ] *OBJECT* { *COMMAND* | **help** }

**ip** [ **-force** ] **-batch** *filename*

*OBJECT* := { **link** | **address** | **addrlabel** | **route** | **rule** | **neigh** | **ntable** | **tunnel** | **tuntap** | **maddress** | **mroute** | **mrule** | **monitor** | **xfrm** | **netns** | **l2tp** | **tcp\_metrics** | **token** | **macsec** | **vrf** | **mptcp** | **ioam** }

*OPTIONS* := { **-V**[*ersion*] | **-h**[*uman-readable*] | **-s**[*tatistics*] | **-d**[*etails*] | **-r**[*esolve*] | **-iec** | **-f**[*amily*] { **inet** | **inet6** | **link** } | **-4** | **-6** | **-B** | **-0** | **-l**[*oops*] { **maximum-addr-flush-attempts** } | **-o**[*ne**line*] | **-rc**[*ybuf*] [*size*] | **-t**[*imestamp*] | **-ts**[*hort*] | **-n**[*etns*] *name* | **-N**[*umeric*] | **-a**[*ll*] | **-c**[*olor*] | **-br**[*ief*] | **-j**[*son*] | **-p**[*retty*] }

**OPTIONS****-V, -Version**

Print the version of the **ip** utility and exit.

**-h, -human, -human-readable**

output statistics with human readable values followed by suffix.

**-b, -batch** <FILENAME>

Read commands from provided file or standard input and invoke them. First failure will cause termination of ip.

**-force** Don't terminate ip on errors in batch mode. If there were any errors during execution of the commands, the application return code will be non zero.

**-s, -stats, -statistics**

Output more information. If the option appears twice or more, the amount of information increases. As a rule, the information is statistics or some time values.

**-d, -details**

Output more detailed information.

**-l, -loops** <COUNT>

Specify maximum number of loops the 'ip address flush' logic will attempt before giving up. The default is 10. Zero (0) means loop until all addresses are removed.

**-f, -family** <FAMILY>

Specifies the protocol family to use. The protocol family identifier can be one of **inet**, **inet6**, **bridge**, **mpls** or **link**. If this option is not present, the protocol family is guessed from other arguments. If the rest of the command line does not give enough information to guess the family, **ip** falls back to the default one, usually **inet** or **any**. **link** is a special family identifier meaning that no networking protocol is involved.

- 4** shortcut for **-family inet**.
- 6** shortcut for **-family inet6**.
- B** shortcut for **-family bridge**.
- M** shortcut for **-family mpls**.
- 0** shortcut for **-family link**.
- o, -oneline**  
output each record on a single line, replacing line feeds with the `'\'` character. This is convenient when you want to count records with `wc(1)` or to `grep(1)` the output.
- r, -resolve**  
use the system's name resolver to print DNS names instead of host addresses.
- n, -netns <NETNS>**  
switches **ip** to the specified network namespace *NETNS*. Actually it just simplifies executing of:  
  

```
ip netns exec NETNS ip [ OPTIONS ] OBJECT { COMMAND | help }
```

to  
  

```
ip -n[etns] NETNS [ OPTIONS ] OBJECT { COMMAND | help }
```
- N, -Numeric**  
Print the number of protocol, scope, dsfield, etc directly instead of converting it to human readable name.
- a, -all**  
executes specified command over all objects, it depends if command supports this option.
- c[*color*][=*always|auto|never*]**  
Configure color output. If parameter is omitted or **always**, color output is enabled regardless of stdout state. If parameter is **auto**, stdout is checked to be a terminal before enabling color output. If parameter is **never**, color output is disabled. If specified multiple times, the last one takes precedence. This flag is ignored if **-json** is also given.  
  
Used color palette can be influenced by **COLORFGBG** environment variable (see **ENVIRONMENT**).
- t, -timestamp**  
display current time when using monitor option.
- ts, -tshort**  
Like **-timestamp**, but use shorter format.

**-rc, -rcvbuf<SIZE>**

Set the netlink socket receive buffer size, defaults to 1MB.

**-iec** print human readable rates in IEC units (e.g. 1Ki = 1024).

**-br, -brief**

Print only basic information in a tabular format for better readability. This option is currently only supported by **ip addr show**, **ip link show** & **ip neigh show** commands.

**-j, -json**

Output results in JavaScript Object Notation (JSON).

**-p, -pretty**

The default JSON format is compact and more efficient to parse but hard for most users to read. This flag adds indentation for readability.

## IP - COMMAND SYNTAX

### *OBJECT*

#### **address**

- protocol (IP or IPv6) address on a device.

#### **addrlabel**

- label configuration for protocol address selection.

**ioam** - manage IOAM namespaces and IOAM schemas.

**l2tp** - tunnel ethernet over IP (L2TPv3).

**link** - network device.

#### **maddress**

- multicast address.

#### **monitor**

- watch for netlink messages.

**mptcp** - manage MPTCP path manager.

**mrout** - multicast routing cache entry.

**mrule** - rule in multicast routing policy database.

#### **neighbour**

- manage ARP or NDISC cache entries.

**netns** - manage network namespaces.

**ntable** - manage the neighbor cache's operation.

**route** - routing table entry.

**rule** - rule in routing policy database.

**tcp\_metrics/tcpmetrics**  
- manage TCP Metrics

**token** - manage tokenized interface identifiers.

**tunnel** - tunnel over IP.

**tuntap** - manage TUN/TAP devices.

**vrf** - manage virtual routing and forwarding devices.

**xfrm** - manage IPSec policies.

The names of all objects may be written in full or abbreviated form, for example **address** can be abbreviated as **addr** or just **a**.

## COMMAND

Specifies the action to perform on the object. The set of possible actions depends on the object type. As a rule, it is possible to **add**, **delete** and **show** (or **list**) objects, but some objects do not allow all of these operations or have some additional commands. The **help** command is available for all objects. It prints out a list of available commands and argument syntax conventions.

If no command is given, some default command is assumed. Usually it is **list** or, if the objects of this class cannot be listed, **help**.

## ENVIRONMENT

### COLORFGBG

If set, its value is used for detection whether background is dark or light and use contrast colors for it.

COLORFGBG environment variable usually contains either two or three values separated by semicolons; we want the last value in either case. If this value is 0-6 or 8, chose colors suitable for dark background:

```
COLORFGBG=";0" ip -c a
```

## EXIT STATUS

Exit status is 0 if command was successful, and 1 if there is a syntax error. If an error was reported by the kernel exit status is 2.

## EXAMPLES

```
ip addr
```

Shows addresses assigned to all network interfaces.

`ip neigh`  
Shows the current neighbour table in kernel.

`ip link set x up`  
Bring up interface x.

`ip link set x down`  
Bring down interface x.

`ip route`  
Show table routes.

## HISTORY

**ip** was written by Alexey N. Kuznetsov and added in Linux 2.2.

## SEE ALSO

**ip-address(8)**, **ip-addrlabel(8)**, **ip-ioam(8)**, **ip-l2tp(8)**, **ip-link(8)**, **ip-maddress(8)**, **ip-monitor(8)**, **ip-mptcp(8)**, **ip-mroute(8)**, **ip-neighbour(8)**, **ip-netns(8)**, **ip-ntable(8)**, **ip-route(8)**, **ip-rule(8)**, **ip-tcp\_metrics(8)**, **ip-token(8)**, **ip-tunnel(8)**, **ip-vrf(8)**, **ip-xfrm(8)**  
IP Command reference **ip-cref.ps**

## REPORTING BUGS

Report any bugs to the Network Developers mailing list <[netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)> where the development and maintenance is primarily done. You do not have to be subscribed to the list to send a message there.

## AUTHOR

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