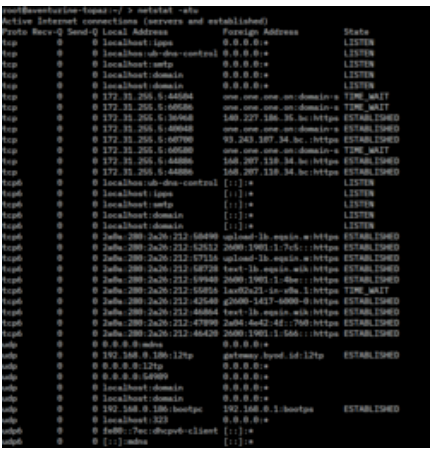


# Netstat

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<p><b>netstat</b></p> 	
<p>The <code>netstat</code> command in Linux</p>	
<b>Developers</b>	Various <a href="#">open-source</a> and <a href="#">commercial</a> developers
<b>Initial release</b>	1983; 43 years ago
<b>Written in</b>	Plan 9: <a href="#">C</a>
<b>Operating system</b>	<a href="#">Unix</a> , <a href="#">Unix-like</a> , <a href="#">Plan 9</a> , <a href="#">Inferno</a> , <a href="#">OS/2</a> , <a href="#">Microsoft Windows</a> , <a href="#">ReactOS</a>
<b>Platform</b>	<a href="#">Cross-platform</a>
<b>Type</b>	<a href="#">Command</a>
<b>License</b>	OS/2, Windows: <a href="#">Proprietary commercial software</a> net-tools, ReactOS: <a href="#">GPLv2</a> Plan 9: <a href="#">MIT License</a>

In [computing](#), `netstat` is a [command-line network utility](#) that displays open network sockets, [routing tables](#), and a number of network interface ([network interface controller](#) or [software-defined network interface](#)) and network protocol statistics. It is available on [Unix](#), [Plan 9](#), [Inferno](#), and [Unix-like operating systems](#) including [macOS](#), [Linux](#), [Solaris](#) and [BSD](#). It is also available on [IBM OS/2](#) and on [Microsoft Windows NT](#)-based operating systems including [Windows XP](#), [Windows Vista](#), [Windows 7](#), [Windows 8](#) and [Windows 10](#).

It is used for finding problems in the network and to determine the amount of traffic on the network as a performance measurement.<sup>[1]</sup> On Linux this program is mostly obsolete, although still included in many distributions.

On Linux, `netstat` (part of "net-tools") is superseded by `ss` (part of [iproute2](#)). The replacement for `netstat -r` is `ip route`, the replacement for `netstat -i` is `ip -s link`, and the replacement for `netstat -g` is `ip maddr`, all of which

are recommended instead.<sup>[2][3][4][5]</sup>

## Statistics provided

[\[edit\]](#)

**Netstat** provides statistics for the following:

- Proto – The name of the protocol ([TCP](#), [UDP](#), etc.). On some systems, the protocol name may be followed by "4" or "6", depending on whether the protocol is running over [IPv4](#) or [IPv6](#).
- Local Address – The [IP](#) address of the local computer and the port number being used. The name of the local computer that corresponds to the IP address and the name of the port is shown unless the `-n` parameter is specified. An asterisk (\*) is shown for the host if the server is listening on all interfaces. If the port is not yet established, the port number is shown as an asterisk.
- Foreign Address – The IP address and port number of the remote computer to which the socket is connected. The names that corresponds to the IP address and the port are shown unless the `-n` parameter is specified. If the port is not yet established, the port number is shown as an asterisk (\*).
- State – Indicates the state of a TCP connection. The possible states are as follows: CLOSE\_WAIT, CLOSED, ESTABLISHED, FIN\_WAIT\_1, FIN\_WAIT\_2, LAST\_ACK, LISTEN, SYN\_RECEIVED, SYN\_SEND, and TIME\_WAIT. For more information about the states of a TCP connection, see [RFC 793](#).

Parameters used with this command must be prefixed with a hyphen (-) rather than a slash (/). Some parameters are not supported on all platforms.

Name	Description	<a href="#">Windows</a>	<a href="#">ReactOS</a>	<a href="#">macOS</a>	<a href="#">BSD</a>	<a href="#">NetBSD</a>	<a href="#">FreeBSD</a>	<a href="#">Linux</a>	<a href="#">Solaris</a>	<a href="#">O</a>
<b>-a</b>	Displays all active connections and the TCP and UDP <a href="#">ports</a> on which the computer is listening.	Yes		Yes	Yes	Yes	Yes	Yes		
<b>-b</b>	Displays the binary (executable) program's name involved in creating each connection or listening port. ( <a href="#">Windows XP</a> , <a href="#">Windows Server 2003</a> and newer Windows operating systems; not Microsoft <a href="#">Windows 2000</a> or older).	Yes	No							N
<b>-b</b>	Causes <code>-i</code> to report the total number of <b>bytes</b> of traffic.		No	Yes		Yes				N

Name	Description	<a href="#">Windows</a>	<a href="#">ReactOS</a>	<a href="#">macOS</a>	<a href="#">BSD</a>	<a href="#">NetBSD</a>	<a href="#">FreeBSD</a>	<a href="#">Linux</a>	<a href="#">Solaris</a>	O
<b>-e</b>	Displays <a href="#">ethernet</a> statistics, such as the number of <a href="#">bytes</a> and packets sent and received. This parameter can be combined with -s.	Yes	Yes							N
<b>-f</b>	Displays fully qualified domain names < <a href="#">FQDN</a> > for foreign addresses (only available on <a href="#">Windows Vista</a> and newer operating systems).	Yes	No							N
<b>-f</b> <i>Address Family</i>	Limits display to a particular socket address family, <b>unix, inet, inet6</b>		No				Yes			N
<b>-g</b>	Displays multicast <b>g</b> roup membership information for both IPv4 and IPv6 (may only be available on newer operating systems)	No	No					Yes		
<b>-i</b>	Displays network <b>i</b> nterfaces and their statistics	No	No	Yes	Yes	Yes	Yes	Yes		
<b>-m</b>	Displays the <b>m</b> emory statistics for the networking code (STREAMS statistics on Solaris).	No	No	Yes	Yes	Yes	Yes		Yes	
<b>-n</b>	Displays active TCP connections, however, addresses and port numbers are expressed numerically and no	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Name	Description	<a href="#">Windows</a>	<a href="#">ReactOS</a>	<a href="#">macOS</a>	<a href="#">BSD</a>	<a href="#">NetBSD</a>	<a href="#">FreeBSD</a>	<a href="#">Linux</a>	<a href="#">Solaris</a>	<a href="#">O</a>
	attempt is made to determine names.									
<b>-o</b>	Displays active TCP connections and includes the process id (PID) for each connection. You can find the application based on the PID in the <b>Processes</b> tab in <a href="#">Windows Task Manager</a> . This parameter can be combined with -a, -n, and -p. This parameter is available on Microsoft <a href="#">Windows XP</a> , <a href="#">Windows Server 2003</a> , and <a href="#">Windows 2000</a> if a hotfix is applied. <sup>[6]</sup>	Yes	No							N
<b>-p protocol</b>	Shows connections for the <b>protocol</b> specified by <i>protocol</i> . In this case, <i>protocol</i> can be <b>tcp, udp, tcpv6, or udpv6</b> . If this parameter is used with -s to display statistics by protocol, <i>protocol</i> can be <b>tcp, udp, icmp, ip, tcpv6, udpv6, icmpv6, or ipv6</b> .	Yes	Yes	Yes	Yes	Yes	Yes			
<b>-p</b>	Show which <b>processes</b> are using which sockets (similar to -b under Windows) (you	No	No					Yes		

Name	Description	<a href="#">Windows</a>	<a href="#">ReactOS</a>	<a href="#">macOS</a>	<a href="#">BSD</a>	<a href="#">NetBSD</a>	<a href="#">FreeBSD</a>	<a href="#">Linux</a>	<a href="#">Solaris</a>	<a href="#">O</a>
	must be root to do this)									
<b>-P</b> <i>protocol</i>	Shows connections for the <b>protocol</b> specified by <i>protocol</i> . In this case, <i>protocol</i> can be <b>ip</b> , <b>ipv6</b> , <b>icmp</b> , <b>icmpv6</b> , <b>igmp</b> , <b>udp</b> , <b>tcp</b> , or <b>rawip</b> .	No	No						Yes	
<b>-r</b>	Displays the contents of the <a href="#">IP routing table</a> . (This is equivalent to the <b>route print</b> command under Windows.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yt
<b>-s</b>	Displays statistics by protocol. By default, statistics are shown for the <a href="#">TCP</a> , <a href="#">UDP</a> , <a href="#">ICMP</a> , and <a href="#">IP</a> protocols. If the IPv6 protocol for Windows XP is installed, statistics are shown for the TCP over <a href="#">IPv6</a> , UDP over IPv6, <a href="#">ICMPv6</a> , and IPv6 protocols. The -p parameter can be used to specify a set of protocols.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<b>-t</b>	Display only TCP connections.		No					Yes		Yt
<b>-u</b>	Display only UDP connections.	No	No					Yes		Yt
<b>-W</b>	Display wide output - doesn't truncate hostnames or IPv6 addresses	No	No				Yes			N
<b>-x</b>	Displays NetworkDirect	Yes								

Name	Description	<a href="#">Windows</a>	<a href="#">ReactOS</a>	<a href="#">macOS</a>	<a href="#">BSD</a>	<a href="#">NetBSD</a>	<a href="#">FreeBSD</a>	<a href="#">Linux</a>	<a href="#">Solaris</a>	<a href="#">O</a>
	connections, listeners, and shared endpoints.									
<b>-y</b>	Displays the TCP connection template for all connections. Cannot be combined with the other options.	Yes								
<b>-v</b>	When used in conjunction with -b it will display the sequence of components involved in creating the connection or listening port for all executables.	Yes	No							N
<b>Interval</b>	Redisplays the selected information every Interval seconds. Press CTRL+C to stop the redisplay. If this parameter is omitted, netstat prints the selected information only once.	Yes	Yes							N
<b>-h</b>	Displays help at the command prompt.	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	N
<b>-?</b>	Displays help at the command prompt.	Yes	No	No	No	No	No	No	No	Y
<b>/?</b>	Displays help at the command prompt.	Yes	Yes	No	No	No	No	No	No	N

On macOS, BSD systems, Linux distributions, and Microsoft Windows:

To display the statistics for only the TCP or UDP protocols, type one of the following commands:

```
netstat -sp tcp
```

```
netstat -sp udp
```

On Unix-like systems:

To display all ports open by a process with id *pid*:

```
netstat -aop | grep "pid"
```

To continuously display open TCP and UDP connections numerically and also which program is using them on Linux:

```
netstat -nutpacw
```

On Microsoft Windows:

To display active TCP connections and the process IDs every 5 seconds, type the following command (works on NT based systems only, or Windows 2000 with hotfix):

```
netstat -o 5
```

To display active TCP connections and the process IDs using numerical form, type the following command (works on NT based systems only, or Windows 2000 with hotfix):

```
netstat -no
```

Command	Explanation
<code>netstat -a</code>	Shows all sockets, both listening and non-listening, all protocols like TCP, UDP etc.
<code>netstat -at</code>	Shows only TCP connections (-au shows only UDP connections)
<code>netstat -ant</code>	Shows all TCP connections with no DNS resolution (show IP addresses instead).
<code>netstat -al</code>	Shows only listening sockets.
<code>netstat -aep</code>	Also show PID and to which program each socket belongs, e adds extra info like the user. Run as root to see all PIDs.
<code>netstat -s</code>	Shows network statistics.
<code>netstat -r</code>	Shows kernel routing information. This is the same output as route -e.
<code>netstat -i</code>	Displays a table of all network interfaces. Add -e to get output similar to ifconfig.
<code>netstat -ct</code>	Displays TCP connections continuously.
<code>netstat -g</code>	Display multicast group membership information for IPv4 and IPv6.
<code>netstat -lntu</code>	Display all services listening for TCP and UDP, all free open ports on the local machine.
<code>netstat -atnp   grep ESTAB</code>	Displays all currently "established" TCP connections.

Netstat uses an asterisk \* as a wildcard which means "any". An example would be

Example output:

```
...Local Address Foreign Address State
... *:smtp *: * LISTEN
```

Under "Local Address" \*, in  `*:smtp` , means the process is listening on all of the network interfaces the machine has for the port mapped as smtp (see /etc/services for service resolution). This can also be shown as 0.0.0.0. The first \*, in  `*: *` , means



4. [^ "Deprecated Linux networking commands and their replacements"](#). Doug Vitale Tech Blog. 21 December 2011.
  5. [^ "netstat man page \(notes section\)"](#). Retrieved 2 August 2014. "This program is obsolete. Replacement for netstat is ss. Replacement for netstat -r is ip route. Replacement for netstat -i is ip -s link. Replacement for netstat -g is ip maddr."
  6. [^ "The netstat command can now display process IDs that correspond to active TCP or UDP connections in Windows 2000"](#). Archived from [the original](#) on 24 August 2007.
- Dyson, Peter (1995). *Mastering OS/2 Warp*. Sybex. ISBN 978-0782116632.
  - Stanek, William R. (2008). *Windows Command-Line Administrator's Pocket Consultant, 2nd Edition*. Microsoft Press. ISBN 978-0735622623.
  - [netstat\(8\)](#) – [Linux](#) Programmer's [Manual](#) – Administration and Privileged Commands
  - [netstat\(1\)](#) – [FreeBSD](#) General Commands [Manual](#)
  - [netstat\(8\)](#) – [Solaris 11.4](#) System Administration Commands Reference [Manual](#)
  - [netstat\(1\)](#) – [Inferno](#) General commands [Manual](#)
  - [Microsoft Learn: Netstat](#) – documentation for the Windows netstat.exe command-line program
  - [net-tools](#) project page on SourceForge
  - [Netstat Command Archived](#) 2022-01-15 at the [Wayback Machine](#): [WindowsCMD.com Archived](#) 2022-01-11 at the [Wayback Machine](#)

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