tcpdump Packet capture

CONCEPTS

Options go first, then the filter. Quote the filter so the shell leaves parentheses alone.

Interface -i, -Q
↓ filter
BPF filter expression
↓ -s, -c
Capture kernel buffer
↓ -w / print
Output terminal or pcap

The filter runs in the kernel, so a precise filter drops unwanted packets early and loses fewer of the ones you want.

CAPTURE

tcpdump -D
List capture interfaces

tcpdump -i *<iface>*
Capture on one interface

tcpdump -i any
Capture on all interfaces

tcpdump -c *<n>*
Stop after n packets

tcpdump -s 0
Capture full packets

tcpdump -s *<bytes>*
Limit bytes kept per packet

tcpdump -Q in
Only inbound packets (in, out, inout)

tcpdump -B *<kib>*
Raise the capture buffer

OUTPUT

tcpdump -n
No host name lookups

tcpdump -nn
No host or port name lookups

tcpdump -v
More protocol detail (-vv, -vvv more)

tcpdump -q
Short, quiet lines

tcpdump -A
Payload as ASCII

tcpdump -X
Payload as hex and ASCII

OUTPUT (cont.)

tcpdump -e
Show link-level (MAC) header

tcpdump -tttt
Readable date and time

tcpdump -l
Line-buffer stdout for pipes

SAVE AND READ

tcpdump -w *<file>*.pcap
Write raw packets to a file

tcpdump -r *<file>*.pcap
Read a saved capture

tcpdump -w *<file>*.pcap **--print**
Save and also print

tcpdump -U -w *<file>*.pcap
Flush each packet to the file

tcpdump -C *<size>* **-w** *<file>*
Rotate by size (millions of bytes)

tcpdump -W *<n>*
Keep at most n files (ring buffer)

tcpdump -G *<sec>* **-w** *<file>*-%FT%T.pcap
Rotate by time

tcpdump -Z *<user>*
Drop root after opening device

FILTERS: HOSTS AND PORTS

host *<ip>*
Traffic to or from a host

src host *<ip>*
Only from this host

dst host *<ip>*
Only to this host

net *<cidr>*
A whole network, e.g. 10.0.0.0/8

port *<n>*
Source or destination port

src port *<n>*
Source port only

dst port *<n>*
Destination port only

portrange *<a>*-*<b>*
A range of ports

ether host *<mac>*
A MAC address

FILTERS: PROTOCOLS AND LOGIC

tcp
TCP only (also udp, icmp)

icmp
ICMP, e.g. ping

udp
UDP only

arp
ARP requests and replies

ip6
IPv6 only

A and B
Both must match

A or B
Either matches

not A
Negate (also !)

'(A or B) and C'
Group with quoted parentheses

TCP DETAILS

'tcp[tcpflags] & tcp-syn != 0'
Packets with SYN set

'tcp[tcpflags] & tcp-rst != 0'
Resets

'tcp[tcpflags] & (tcp-syn|tcp-fin) != 0'
Connection start or end

Reading a line

Flags	Meaning
[S]	SYN, connection start
[S.]	SYN-ACK
[.]	ACK only
[P.]	data pushed
[F.]	FIN, closing
[R]	RST, refused or reset

RECIPES

Watch DNS

```
sudo tcpdump -i any -nn port 53
```

HTTP requests as text

```
sudo tcpdump -i <iface> -nn -A -s 0 'tcp dst port 80'
```

Capture to a ring of files

```
sudo tcpdump -i <iface> -nn -w cap -C 100 -W 10 -Z $USER
# keeps ten files of about 100 MB each
```