

# Networking

- [IPv6](#)
  - [IPv6 CLI commands](#)
- [IPv4](#)
  - [How ARP works](#)
- [Routing](#)
  - [BGP figure out networks belonging to AS](#)
- [Operating](#)
  - [How to test if 9000 MTU/Jumbo Frames are working](#)
- [Links & Tools](#)
  - [tcpdump Cheat Sheet](#)
  - [Wireshark Sample Captures](#)
  - [Useful Network Diagnostic CLI commands](#)

# IPv6

# IPv6 CLI commands

## IPv6 Commands

Below are the most important helpful commands for checking and diagnosing the IPv6 environment

### Windows 8 / 10

Command	Function
<b>ipconfig /all</b>	displays all interface details
<b>ping ::1</b>	Test IPv6 protocol host internally (localhost)
<b>netsh interface ipv6 show interface</b>	Interface status (all) and IPv6 addresses
<b>netsh interface ipv6 showaddress</b>	IPv6 addresses including validity displays
<b>netsh interface ipv6 show privacy</b> <b>netsh interface ipv6 show global</b>	See <a href="#">IPv6 Configuration and Privacy Extensions</a>
<b>netsh interface ipv6 show route</b> <b>route print -6</b>	Show IPv6 routing table
<b>netsh interface ipv6 show neighbors</b>	Mapping IPv6 addresses to MAC addresses
<b>netsh interface ipv6 show destination</b>	Destination cache incl. PMTU values
<b>netsh interface ipv6 dump</b>	show all changes
<b>netsh interface ipv6 reset</b>	reset all changes

### Linux

Command	Function
<b>ifconfig -a</b> <b>ifconfig eth0   grep inet6</b>	displays all interface details ETH0 only IPv6 addresses
<b>ping6 ::1</b>	Test IPv6 protocol host internally (localhost)
<b>ip -6 address show</b> <b>ip -6 maddr show</b>	Interface status (all) and IPv6 addresses show multicast groups
<b>netsh interface ipv6 showaddress</b>	IPv6 addresses including validity displays
<b>ip -6 route show</b> <b>route -A inet6 -n</b>	Show IPv6 routing table
<b>ip -6 neighb show</b>	Mapping IPv6 addresses to MAC addresses
<b>ip -6 route get to {ipv6_addr}</b>	Destination cache incl. PMTU values

<b>test -f /proc/net/if_inet6 &amp;&amp; echo</b>	check if IPv6 is active
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# macOS since 10.7

Command	Function
<b>ifconfig -a</b> <b>ifconfig -L</b>	displays all interface details shows the period of validity of the addresses
<b>ping6 ::1</b> <b>traceroute6 {ipv6-host}</b>	Test IPv6 protocol host internally (localhost)
<b>netstat-f inet</b>	show all IPv6 connections
<b>netstat -g</b>	show multicast groups
<b>netstat -rnf inet6</b>	Show IPv6 routing table
<b>ndp -a</b>	Mapping IPv6 addresses to MAC addresses
<b>dscacheutil -flushcache</b>	clear DNS cache
<b>nettop -n -m route</b>	View routing statistics in real time
<b>nettop -n</b>	Show TCP & UDP sockets in real time

# IPv4

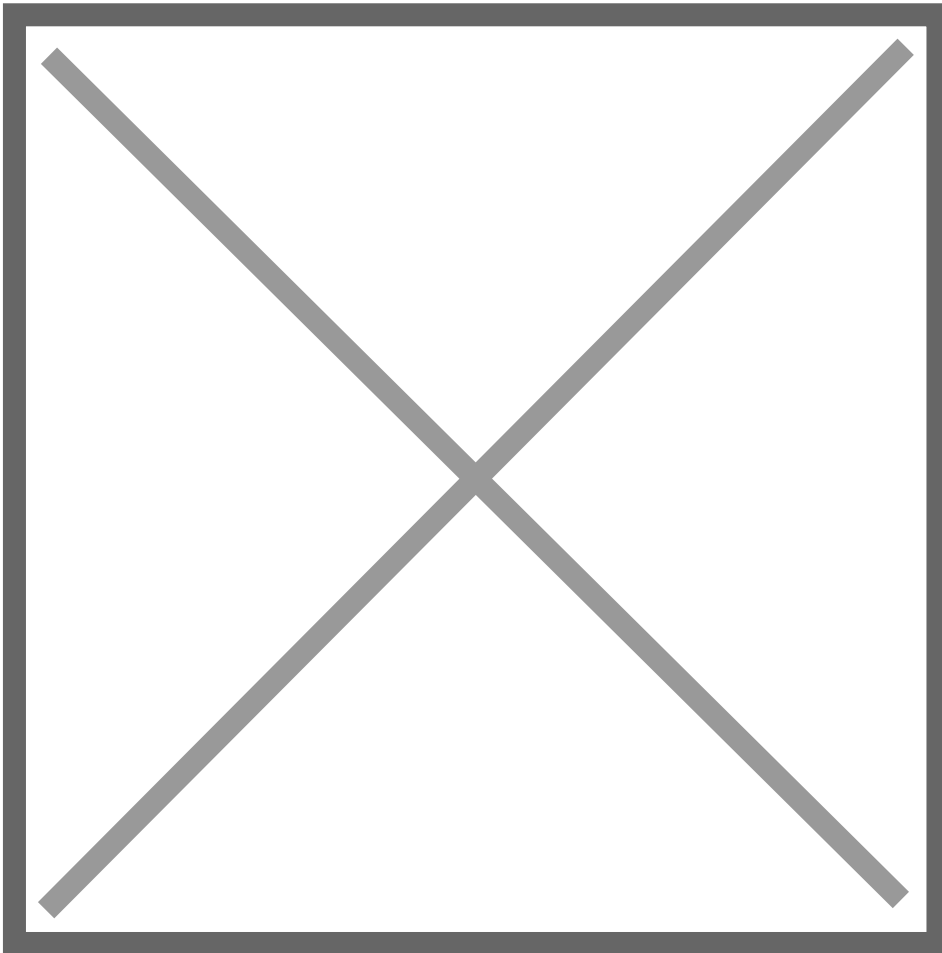
IPv4

# How ARP works

Very good explanation how ARP in IPv4 works:

<https://www.tummy.com/articles/networking-basics-how-arp-works/>

<https://www.geeksforgeeks.org/arp-reverse-arprarp-inverse-arp-inarp-proxy-arp-and-gratuitous-arp/>



# Routing

# BGP figure out networks belonging to AS

## BGP List prefixes

To list all prefixes originated on AS1759 against the Routing Assets Database (RADb), issue the command below.

```
whois -h whois.radb.net -- '-i origin AS1759' | grep -Eo "(route:|route6:).*"
route:      139.157.0.0/16
route:      147.44.0.0/16
route:      193.178.133.0/24
....
route6:     2001:2003::/32
route6:     2a00:8a00:4000::/35
route6:     2a03:62a0:3501::/48
```

Thanks to this Link: <https://www.noction.com/knowledge-base/bgp-filtering>



# Operating

Operating

# How to test if 9000 MTU/Jumbo Frames are working

## Description

You setup mtu 9000 on your interfaces and want now to test if it works. There're different possibilities to do this on the different operating system.

The following shows how to test it.

## Linux

```
ping -M do -s 8972 <ip>
```

## macOS

```
ping -D -s 8184 <ip>
```

## Windows

```
ping -f -l 9000 <ip>
```

## Links

Thanks to: <https://blah.cloud/hardware/test-jumbo-frames-working/>

# Links & Tools

Links & Tools

# tcpdump Cheat Sheet

tcpdump Cheat Sheet (<https://www.comparitech.com/net-admin/tcpdump-cheat-sheet/>)

[tcpdump cheat sheet](#)

# Wireshark Sample Captures

If you need to see how different protocols behave on the network here are some sample captures from Wireshark

- <https://wiki.wireshark.org/SampleCaptures>
- <https://packetlife.net/captures/>
- <https://www.netresec.com/?page=PcapFiles>
- <https://tshark.dev/search/pcaptable/>

# Useful Network Diagnostic CLI commands

Useful CLI commands to do network diagnostics with tcpdump / tshark etc.

## tcpdump

Command	Description
<code>tcpdump -nni &lt;network-interface&gt; icmp</code>	show icmp packets
<code>tcpdump -nni &lt;network-interface&gt; "icmp[0] == 0"</code>	ICMP type 0 echo reply
<code>tcpdump -nni &lt;network-interface&gt; "icmp[0] == 3"</code>	ICMP destination unreachable
<code>tcpdump -nni &lt;network-interface&gt; "icmp[0] == 4"</code>	ICMP source quench
<code>tcpdump -nni &lt;network-interface&gt; "icmp[0] == 5"</code>	ICMP redirect
<code>tcpdump -nni &lt;network-interface&gt; "icmp[0] == 8"</code>	ICMP echo request
<code>tcpdump -nni &lt;network-interface&gt; "icmp[0] == 11"</code>	ICMP time exceeded
<code>tcpdump -nni &lt;network-interface&gt; "tcp[tcpflags] &amp; (tcp-rst) !=0"</code>	Detect tcp reset and ICMP packets