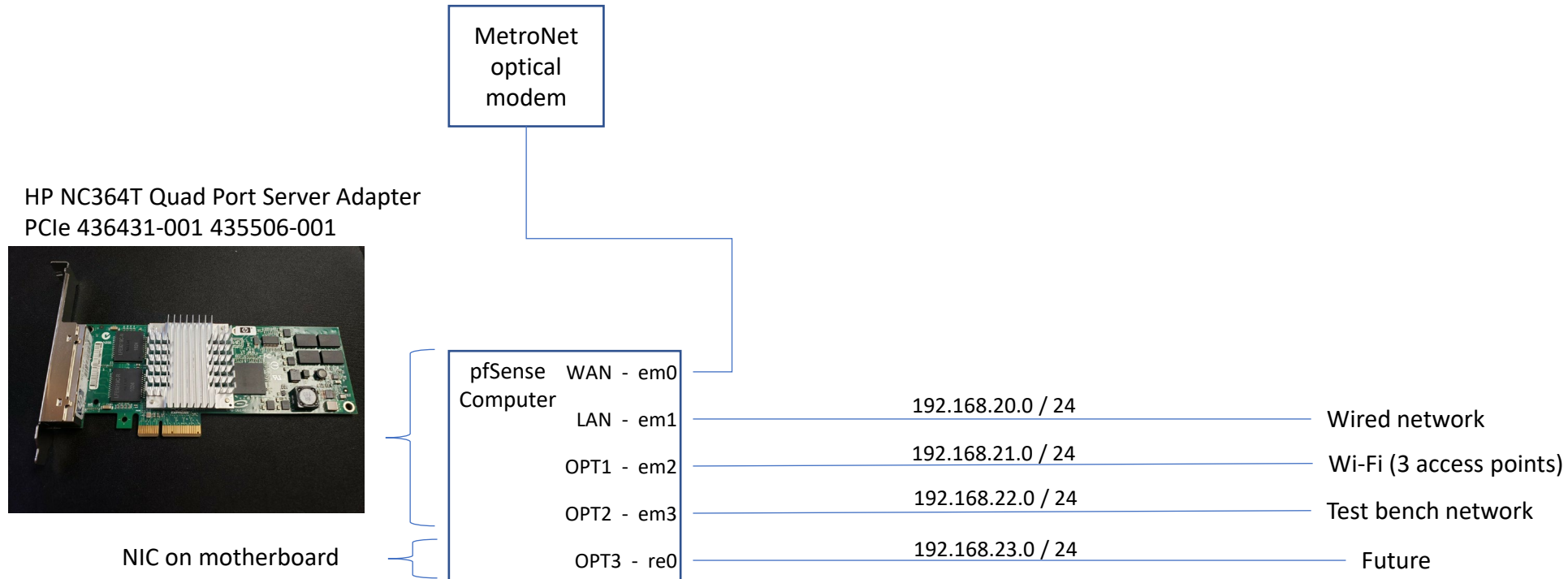


Network setup



Objective: Route traffic from OPT2 through VPN

using this document as guide:

<https://support.nordvpn.com/Connectivity/Router/1089079142/pfSense-2-4-4-setup-with-NordVPN.htm>

Ping and Trace route before adding NordVPN

```
1 <1 ms <1 ms <1 ms pfSense.localdomain [192.168.20.1]
2 1 ms 3 ms 2 ms 10.211.32.1
3 8 ms 9 ms 10 ms 10.192.110.201
4 11 ms 11 ms 8 ms 69.174.129.154
5 9 ms 11 ms 9 ms 69.174.129.151
6 9 ms 8 ms 9 ms 10.192.200.15
7 10 ms 8 ms 12 ms 99.83.69.210
8 8 ms 13 ms 8 ms 150.222.76.69
9 11 ms 10 ms 9 ms 52.93.238.190
10 * * * Request timed out.
11 * * * Request timed out.
12 * * * Request timed out.
13 * * * Request timed out.
14 * * * Request timed out.
15 39 ms 37 ms 39 ms 52.93.28.208
16 * * * Request timed out.
17 * * * Request timed out.
18 * * * Request timed out.
19 * * * Request timed out.
20 * * * Request timed out.
21 * * * Request timed out.
22 * * * Request timed out.
23 * * * Request timed out.
24 * * * Request timed out.
25 38 ms 38 ms 38 ms s3-console-us-standard.console.aws.amazon.com [205.251.242.103]
```

Origin:
Windows computer
on 192.168.20.xx

```
1 <1 ms <1 ms <1 ms 192.168.22.1
2 3 ms 1 ms 1 ms 10.211.32.1
3 8 ms 8 ms 8 ms 10.192.110.201
4 10 ms 8 ms 8 ms 69.174.129.154
5 9 ms 8 ms 8 ms 69.174.129.151
6 8 ms 7 ms 8 ms 10.192.200.15
7 7 ms 8 ms 7 ms 99.83.69.210
8 10 ms 8 ms 10 ms 150.222.76.69
9 7 ms 7 ms 8 ms 52.93.238.190
10 * * * Request timed out.
11 * * * Request timed out.
12 * * * Request timed out.
13 * * * Request timed out.
14 * * * Request timed out.
15 36 ms 39 ms 36 ms 52.93.28.208
16 * * * Request timed out.
17 * * * Request timed out.
18 * * * Request timed out.
19 * * * Request timed out.
20 * * * Request timed out.
21 * * * Request timed out.
22 * * * Request timed out.
23 * * * Request timed out.
24 * * * Request timed out.
25 37 ms 36 ms 39 ms s3-console-us-standard.console.aws.amazon.com [205.251.242.103]
```

Origin:
Windows computer
on 192.168.22.xx

```
Pinging amazon.com [54.239.28.85] with 32 bytes of data:
Reply from 54.239.28.85: bytes=32 time=39ms TTL=221
Reply from 54.239.28.85: bytes=32 time=40ms TTL=221
Reply from 54.239.28.85: bytes=32 time=38ms TTL=221
Reply from 54.239.28.85: bytes=32 time=40ms TTL=221

Ping statistics for 54.239.28.85:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 38ms, Maximum = 40ms, Average = 39ms
```

```
Pinging amazon.com [54.239.28.85] with 32 bytes of data:
Reply from 54.239.28.85: bytes=32 time=37ms TTL=226
Reply from 54.239.28.85: bytes=32 time=39ms TTL=226
Reply from 54.239.28.85: bytes=32 time=39ms TTL=226
Reply from 54.239.28.85: bytes=32 time=38ms TTL=226

Ping statistics for 54.239.28.85:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 37ms, Maximum = 39ms, Average = 38ms
```

Ping and Trace route after adding NordVPN

```
1 <1 ms <1 ms <1 ms pfSense.localdomain [192.168.20.1]
2 2 ms 3 ms 3 ms 10.211.32.1
3 9 ms 9 ms 9 ms 10.192.110.201
4 10 ms 8 ms 8 ms 69.174.129.154
5 8 ms 9 ms 9 ms 69.174.129.151
6 8 ms 9 ms 10 ms 10.192.200.15
7 7 ms 9 ms 9 ms 99.83.69.210
8 11 ms 9 ms 9 ms 150.222.76.71
9 9 ms 10 ms 9 ms 52.95.63.129
10 * * * Request timed out.
11 * * * Request timed out.
12 * * * Request timed out.
13 * * * Request timed out.
14 * * * Request timed out.
15 39 ms 40 ms 39 ms 52.93.28.88
16 * * * Request timed out.
17 * * * Request timed out.
18 * * * Request timed out.
19 * * * Request timed out.
20 * * * Request timed out.
21 * * * Request timed out.
22 * * * Request timed out.
23 * * * Request timed out.
24 * * * Request timed out.
25 40 ms 39 ms 40 ms 54.239.28.85
```

Origin:
Windows computer
on 192.168.20.xx

```
1 14 ms 14 ms 14 ms 10.8.1.1
2 22 ms 22 ms 22 ms D [64.44.133.1]
3 15 ms 17 ms 17 ms as16509.po11.spine01.ch3.unitedix.net [206.41.110.44]
4 18 ms 18 ms 17 ms 52.95.63.24
5 16 ms 17 ms 17 ms 52.93.238.180
6 * * * Request timed out.
7 * * * Request timed out.
8 * * * Request timed out.
9 * * * Request timed out.
10 * * * Request timed out.
11 38 ms 45 ms 40 ms 52.93.28.96
12 * * * Request timed out.
13 * * * Request timed out.
14 * * * Request timed out.
15 * * * Request timed out.
16 * * * Request timed out.
17 * * * Request timed out.
18 * * * Request timed out.
19 * * * Request timed out.
20 * * * Request timed out.
21 40 ms 41 ms 41 ms 54.239.28.85
```

Origin:
Windows computer
on 192.168.22.xx

```
Pinging amazon.com [176.32.103.205] with 32 bytes of data:
Reply from 176.32.103.205: bytes=32 time=40ms TTL=221
Reply from 176.32.103.205: bytes=32 time=38ms TTL=221
Reply from 176.32.103.205: bytes=32 time=40ms TTL=221
Reply from 176.32.103.205: bytes=32 time=38ms TTL=221
```

```
Ping statistics for 176.32.103.205:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 38ms, Maximum = 40ms, Average = 39ms
```

```
Pinging amazon.com [205.251.242.103] with 32 bytes of data:
Reply from 205.251.242.103: bytes=32 time=39ms TTL=235
Reply from 205.251.242.103: bytes=32 time=39ms TTL=235
Reply from 205.251.242.103: bytes=32 time=39ms TTL=235
Reply from 205.251.242.103: bytes=32 time=39ms TTL=235
```

```
Ping statistics for 205.251.242.103:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 39ms, Maximum = 39ms, Average = 39ms
```

Result trying to access amazon.com from LAN after adding NordVPN



Hmmm... can't reach this page

www.amazon.com took too long to respond

Try:

- Checking the connection
- [Checking the proxy and the firewall](#)
- [Running Windows Network Diagnostics](#)

ERR_CONNECTION_TIMED_OUT

Troubleshooting has completed

Problems found

resource (www.amazon.com) is online but isn't responding to connection attempts.

Detected



Interfaces before adding NordVPN

Interfaces ▾

Firewall

Assignments

WAN

LAN

OPT1

OPT2

OPT3

General Configuration

Enable

☒ Enable interface

Description

WAN

Enter a description (name) for the interface here.

IPv4 Configuration Type

Static IPv4

IPv6 Configuration Type

DHCP6

MAC Address

xxxxxxxxxxxx

This field can be used to modify ("spoof") the MAC address of this interface.
Enter a MAC address in the following format: xx:xx:xx:xx:xx:xx or leave blank.

MTU

If this field is blank, the adapter's default MTU will be used. This is typically 1500 bytes but can vary in some circumstances.

MSS

If a value is entered in this field, then MSS clamping for TCP connections to the value entered above minus 40 (TCP/IP header size) will be in effect.

Speed and Duplex

Default (no preference, typically autoselect)

Explicitly set speed and duplex mode for this interface.
WARNING: MUST be set to autoselect (automatically negotiate speed) unless the port this interface connects to has its speed and duplex forced.

WAN

Static IPv4 Configuration

IPv4 Address

192.69.181.148

/ 25

IPv4 Upstream gateway

WANGW - 192.69.181.129

+ Add a new gateway

If this interface is an Internet connection, select an existing Gateway from the list or add a new one using the "Add" button.
On local area network interfaces the upstream gateway should be "none". Gateways can be managed by [clicking here](#).

General Configuration

Enable

☒ Enable interface

Description

LAN

Enter a description (name) for the interface here.

IPv4 Configuration Type

Static IPv4

IPv6 Configuration Type

Track Interface

MAC Address

xxxxxxxxxxxx

This field can be used to modify ("spoof") the MAC address of this interface.
Enter a MAC address in the following format: xx:xx:xx:xx:xx:xx or leave blank.

MTU

If this field is blank, the adapter's default MTU will be used. This is typically 1500 bytes but can vary in some circumstances.

MSS

If a value is entered in this field, then MSS clamping for TCP connections to the value entered above minus 40 (TCP/IP header size) will be in effect.

Speed and Duplex

Default (no preference, typically autoselect)

Explicitly set speed and duplex mode for this interface.
WARNING: MUST be set to autoselect (automatically negotiate speed) unless the port this interface connects to has its speed and duplex forced.

LAN

Static IPv4 Configuration

IPv4 Address

192.168.20.1

/ 24

IPv4 Upstream gateway

None

+ Add a new gateway

If this interface is an Internet connection, select an existing Gateway from the list or add a new one using the "Add" button.
On local area network interfaces the upstream gateway should be "none". Gateways can be managed by [clicking here](#).

OPT2

General Configuration

Enable

☒ Enable interface

Description

OPT2

Enter a description (name) for the interface here.

IPv4 Configuration Type

Static IPv4

IPv6 Configuration Type

None

MAC Address

xxxxxxxxxxxx

This field can be used to modify ("spoof") the MAC address of this interface.
Enter a MAC address in the following format: xxxxxxxxxxxx or leave blank.

MTU

If this field is blank, the adapter's default MTU will be used. This is typically 1500 bytes but can vary in some circumstances.

MSS

If a value is entered in this field, then MSS clamping for TCP connections to the value entered above minus 40 (TCP/IP header size) will be in effect.

Speed and Duplex

Default (no preference, typically autoselect)

Explicitly set speed and duplex mode for this interface.
WARNING: MUST be set to autoselect (automatically negotiate speed) unless the port this interface connects to has its speed and duplex forced.

Static IPv4 Configuration

IPv4 Address

192.168.22.1

/ 24

IPv4 Upstream gateway

None

+ Add a new gateway

If this interface is an Internet connection, select an existing Gateway from the list or add a new one using the "Add" button.
On local area network interfaces the upstream gateway should be "none". Gateways can be managed by [clicking here](#).

Interfaces after adding NordVPN

WAN, LAN and OPT2 interfaces, no change.

Added new interface, NordVPN

General Configuration	
Enable	<input checked="" type="checkbox"/> Enable interface
Description	<input type="text" value="NordVPN"/> Enter a description (name) for the interface here.
IPv4/IPv6 Configuration	This interface type does not support manual address configuration on this page.
MAC Address	<input type="text" value="xx:xx:xx:xx:xx:xx"/> This field can be used to modify ("spoof") the MAC address of this interface. Enter a MAC address in the following format: xx:xx:xx:xx:xx:xx or leave blank.
MTU	<input type="text"/> If this field is blank, the adapter's default MTU will be used. This is typically 1500 bytes but can vary in some circumstances.
MSS	<input type="text"/> If a value is entered in this field, then MSS clamping for TCP connections to the value entered above minus 40 (TCP/IP header size) will be in effect.
Reserved Networks	
Block private networks and loopback addresses	<input type="checkbox"/> Blocks traffic from IP addresses that are reserved for private networks per RFC 1918 (10/8, 172.16/12, 192.168/16) and unique local addresses per RFC 4193 (fc00::/7) as well as loopback addresses (127/8). This option should generally be turned on, unless this network interface resides in such a private address space, too.
Block bogon networks	<input type="checkbox"/> Blocks traffic from reserved IP addresses (but not RFC 1918) or not yet assigned by IANA. Bogons are prefixes that should never appear in the Internet routing table, and so should not appear as the source address in any packets received. Note: The update frequency can be changed under System > Advanced, Firewall & NAT settings.

Assignments
WAN
LAN
OPT1
OPT2
OPT3
NORDVPN

System / General Setup before adding NordVPN

DNS Server Settings			
DNS Servers	<input type="text" value="206.225.75.225"/>	<input type="text" value="DNS Hostname"/>	<input type="text" value="none"/> ▼
	<input type="text" value="206.225.75.226"/>	<input type="text" value="DNS Hostname"/>	<input type="text" value="none"/> ▼
	<input type="text" value="8.8.8.8"/>	<input type="text" value="DNS Hostname"/>	<input type="text" value="none"/> ▼
	<input type="text" value="8.8.4.4"/>	<input type="text" value="DNS Hostname"/>	<input type="text" value="none"/> ▼
	<input type="text" value="192.168.20.1"/>	<input type="text" value="DNS Hostname"/>	<input type="text" value="none"/> ▼

System / General Setup after adding NordVPN

System

Hostname

pfSense

Name of the firewall host, without domain part

Domain

localdomain

Do not use '.local' as the final part of the domain (TLD), The '.local' domain is widely used by mDNS (including Bonjour/Rendezvous/Airprint/Airplay), and some Windows systems and networked devices. These will not n Alternatives such as '.local.lan' or '.mylocal' are safe.





































DNS Server Settings

DNS Servers				
206.225.75.225	DNS Hostname	none		Delete
206.225.75.226	DNS Hostname	none		Delete
8.8.8.8	DNS Hostname	none		Delete
8.8.4.4	DNS Hostname	none		Delete
192.168.20.1	DNS Hostname	none		Delete
103.86.96.100	DNS Hostname	none		Delete
103.86.99.100	DNS Hostname	NORDVPN_VPNV4 -		Delete
Address	Hostname	Gateway		

Firewall / NAT / Outbound before adding NordVPN

Automatic Rules:

	Interface	Source	Source Port	Destination	Destination Port	NAT Address	NAT Port	Static Port	Description
✓	WAN	127.0.0.0/8 ::1/128 192.168.20.0/24 192.168.21.0/24 192.168.22.0/24 192.168.23.0/24	*	*	500	WAN address	*	✓	Auto created rule for ISAKMP
✓	WAN	127.0.0.0/8 ::1/128 192.168.20.0/24 192.168.21.0/24 192.168.22.0/24 192.168.23.0/24	*	*	*	WAN address	*	✗	Auto created rule

Mappings										
<input type="checkbox"/>	Interface	Source	Source Port	Destination	Destination Port	NAT Address	NAT Port	Static Port	Description	Actions
<input type="checkbox"/>	✓ WAN	127.0.0.0/8	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - localhost to WAN	  
<input type="checkbox"/>	✓ WAN	127.0.0.0/8	*	*	*	WAN address	*	✗	Auto created rule - localhost to WAN	  
<input type="checkbox"/>	✓ WAN	::1/128	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - localhost to WAN	  
<input type="checkbox"/>	✓ WAN	::1/128	*	*	*	WAN address	*	✗	Auto created rule - localhost to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.20.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - LAN to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.20.0/24	*	*	*	WAN address	*	✗	Auto created rule - LAN to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.21.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - OPT1 to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.21.0/24	*	*	*	WAN address	*	✗	Auto created rule - OPT1 to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.22.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - OPT2 to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.22.0/24	*	*	*	WAN address	*	✗	Auto created rule - OPT2 to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.23.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - OPT3 to WAN	  
<input type="checkbox"/>	✓ WAN	192.168.23.0/24	*	*	*	WAN address	*	✗	Auto created rule - OPT3 to WAN	  

After switching to Manual Outbound NAT

Firewall / NAT / Outbound after adding NordVPN



Mappings										
<input type="checkbox"/>	Interface	Source	Source Port	Destination	Destination Port	NAT Address	NAT Port	Static Port	Description	Actions
<input type="checkbox"/>	✓ WAN	127.0.0.0/8	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - localhost to WAN	
<input type="checkbox"/>	✓ WAN	127.0.0.0/8	*	*	*	WAN address	*	✗	Auto created rule - localhost to WAN	
<input type="checkbox"/>	✓ WAN	::1/128	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - localhost to WAN	
<input type="checkbox"/>	✓ WAN	::1/128	*	*	*	WAN address	*	✗	Auto created rule - localhost to WAN	
<input type="checkbox"/>	✓ WAN	192.168.20.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - LAN to WAN	
<input type="checkbox"/>	✓ WAN	192.168.20.0/24	*	*	*	WAN address	*	✗	Auto created rule - LAN to WAN	
<input type="checkbox"/>	✓ WAN	192.168.21.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - OPT1 to WAN	
<input type="checkbox"/>	✓ WAN	192.168.21.0/24	*	*	*	WAN address	*	✗	Auto created rule - OPT1 to WAN	
<input type="checkbox"/>	✓ WAN	192.168.22.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - OPT2 to WAN	
<input type="checkbox"/>	✓ NORDVPN	192.168.22.0/24	*	*	*	NORDVPN address	*	✗		
<input type="checkbox"/>	✓ WAN	192.168.22.0/24	*	*	*	WAN address	*	✗	Auto created rule - OPT2 to WAN	
<input type="checkbox"/>	✓ WAN	192.168.23.0/24	*	*	500 (ISAKMP)	WAN address	*	✓	Auto created rule for ISAKMP - OPT3 to WAN	
<input type="checkbox"/>	✓ WAN	192.168.23.0/24	*	*	*	WAN address	*	✗	Auto created rule - OPT3 to WAN	

Firewall / Rules before adding NordVPN

LAN

Rules (Drag to Change Order)											
<input type="checkbox"/>	States	Protocol	Source	Port	Destination	Port	Gateway	Queue	Schedule	Description	Actions
<input checked="" type="checkbox"/>	✓ 0 / 1.89 MiB	*	*	*	LAN Address	443 80	*	*		Anti-Lockout Rule	
<input type="checkbox"/>	✓ 167 / 25.37 MiB	IPv4 *	LAN net	*	*	*	*	none		Default allow LAN to any rule	
<input type="checkbox"/>	✓ 0 / 0 B	IPv6 *	LAN net	*	*	*	*	none		Default allow LAN IPv6 to any rule	
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 *	OPT1 net	*	LAN net	*	*	none			
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 *	OPT3 net	*	LAN net	*	*	none			
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 *	OPT2 net	*	LAN net	*	*	none			

OPT1

Rules (Drag to Change Order)											
<input type="checkbox"/>	States	Protocol	Source	Port	Destination	Port	Gateway	Queue	Schedule	Description	Actions
<input type="checkbox"/>	✓ 199 / 22.74 MiB	IPv4 *	OPT1 net	*	*	*	*	none		Default allow OPT1 to any rule	
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 *	LAN net	*	OPT1 net	*	*	none			

OPT2

Rules (Drag to Change Order)											
<input type="checkbox"/>	States	Protocol	Source	Port	Destination	Port	Gateway	Queue	Schedule	Description	Actions
<input type="checkbox"/>	✓ 447 / 3.79 MiB	IPv4 *	OPT2 net	*	*	*	*	none		Default allow LAN to any rule	
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 *	LAN net	*	OPT2 net	*	*	none		Default allow LAN to any rule	

OPT3

Rules (Drag to Change Order)											
<input type="checkbox"/>	States	Protocol	Source	Port	Destination	Port	Gateway	Queue	Schedule	Description	Actions
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 *	LAN net	*	OPT3 net	*	*	none		Default allow LAN to any rule	
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 *	OPT3 net	*	*	*	*	none		Default allow OPT3 to any rule	

Firewall / Rules after adding NordVPN

- No Changes to LAN, OPT1 or OPT 3.
- Changes to OPT2
- No rules set up for NORDVPN

Floating

WAN

LAN

OPT1

OPT2

OPT3

NORDVPN

OpenVPN

Rules (Drag to Change Order)

<input type="checkbox"/>	States	Protocol	Source	Port	Destination	Port	Gateway	Queue	Schedule	Description	Actions
<input type="checkbox"/>	<div><div><div>✓</div><div>⚙</div></div><div>438 /3.80 MiB</div></div>	IPv4 *	OPT2 net	*	*	*	NORDVPN_VPNV4	none		Default allow LAN to any rule	<div><div>📌</div><div>✎</div><div>📄</div><div>🚫</div><div>🗑</div></div>
<input type="checkbox"/>	<div><div><div>✓</div></div><div>0 /0 B</div></div>	IPv4 *	LAN net	*	OPT2 net	*	*	none		Default allow LAN to any rule	<div><div>📌</div><div>✎</div><div>📄</div><div>🚫</div><div>🗑</div></div>