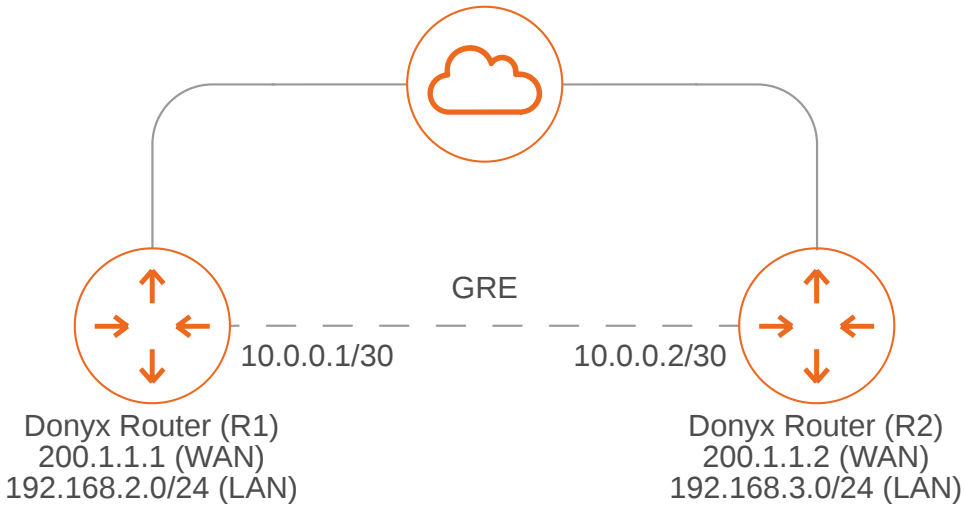
GRE Tunnel Configuration on Donyx Routers

A **Generic Routing Encapsulation (GRE)** tunnel establishes connectivity between two devices with mutually reachable IP addresses, enabling the configuration of routing via dedicated tunnel interfaces.

This type of tunnel does not include built-in encryption and is typically implemented within a private network or over an existing encrypted channel.

Donyx routers support automatic **IPsec** configuration for GRE tunnels. Please note that full mutual compatibility is guaranteed only between devices running the *dnxOS* platform; interoperability with third-party equipment may require manual adjustment.

Example of equipment integration via a GRE tunnel:



In this scenario, the routers access the Internet via interfaces with public IP addresses *200.1.1.1* and *200.1.1.2*.

The **GRE** tunnel endpoints are assigned addresses *10.0.0.1* and *10.0.0.2* from the *10.0.0.0/30* subnet, providing the two necessary addresses for a point-to-point connection.

Configuration

The GRE tunnel is configured in the */tunnel/gre* section of the *dnxOS* web interface or CLI.

To start the configuration, perform the following steps:

1. Click the **Add** button.
2. Assign a name to the tunnel (e.g., *GRE*).

The interface cannot be named *gre0* as this name is reserved for system requirements.

3. In the **Local IP** field, select the interface through which the tunnel will operate.
4. In the **Remote IP** field, specify the public IP address of the remote endpoint.
5. In the **Tunnel IP** field, enter the IP address and subnet mask assigned to the virtual tunnel interface.
6. Specify a value in the **Key** field if multiple tunnels are being established between the same endpoints.
7. If encryption is required, select *ipsec* in the **Encryption** field and specify the pre-shared key in the **psk** field. Identical settings must be configured on the remote side.
8. Click **Apply** to save and activate the settings.

Configuration on Router R1

Table 1. Parameters for Router R1

Field	Value
Local IP	*WAN* (selected from the list).
Remote IP	*200.1.1.2* (specified by the user).
Tunnel IP	*10.0.0.1/30* (specified by the user).
Key	*100* (specified by the user; optional if only a single GRE tunnel is present).
Encryption	*none* or *ipsec* (if *ipsec* is selected, necessary IPsec encryption settings will be automatically generated; identical settings must be configured on the other Donyx router).

CLI Configuration

To configure the tunnel via the CLI, establish an SSH session using administrator credentials and execute the following commands:

```
/tunnel gre add name=GRE
    disabled -
    do-not-frag true
    dscp 0
    encryption none
    keepalive-delay -
    key 100
    local-ip WAN
    mtu 1476
    remote-ip 200.1.1.2
    ttl 64
    tunnel-ip 10.0.0.1/30
    apply
```

Configuration on Router R2

Table 2. Parameters for Router R2

Field	Value
Local IP	*WAN* (selected from the list).
Remote IP	*200.1.1.1* (specified by the user).
Tunnel IP	*10.0.0.2/30* (specified by the user).
Key	*100* (specified by the user; optional if only a single GRE tunnel is present).
Encryption	*none* or *ipsec* (if *ipsec* is selected, necessary IPsec encryption settings will be automatically generated; identical settings must be configured on the other Donyx router).

CLI Configuration

```
/tunnel gre add name=GRE
    disabled -
    do-not-frag true
    dscp 0
    encryption none
    keepalive-delay -
    key 100
    local-ip WAN
    mtu 1476
    remote-ip 200.1.1.1
    ttl 64
    tunnel-ip 10.0.0.2/30
    apply
```

Firewall Configuration

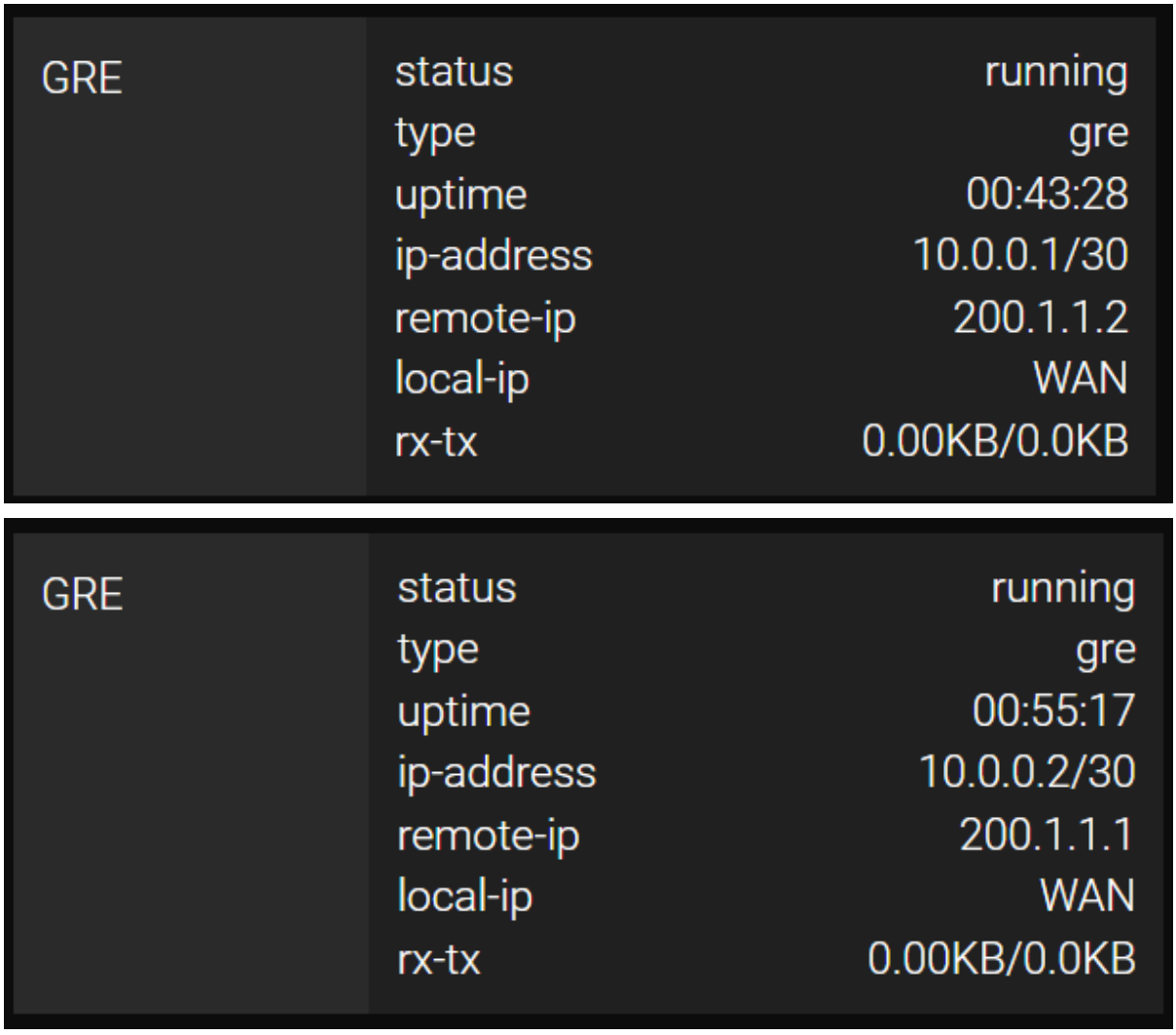
When **IPsec** encryption is utilized, the router automatically implements pre-installed firewall rules to facilitate the establishment of **GRE** tunnels.

However, if encryption is not used, a specific rule permitting **GRE** protocol traffic must be manually created in the */firewall/filter* section. This rule must be positioned above any rules that deny traffic from the *WAN* zone.

CLI Configuration

```
/firewall filter add chain=input
    action accept
    protocol gre
    src zone-wan
    reorder position=-1
    apply
/firewall filter status
```

Tunnel statuses are displayed on the router's dashboard

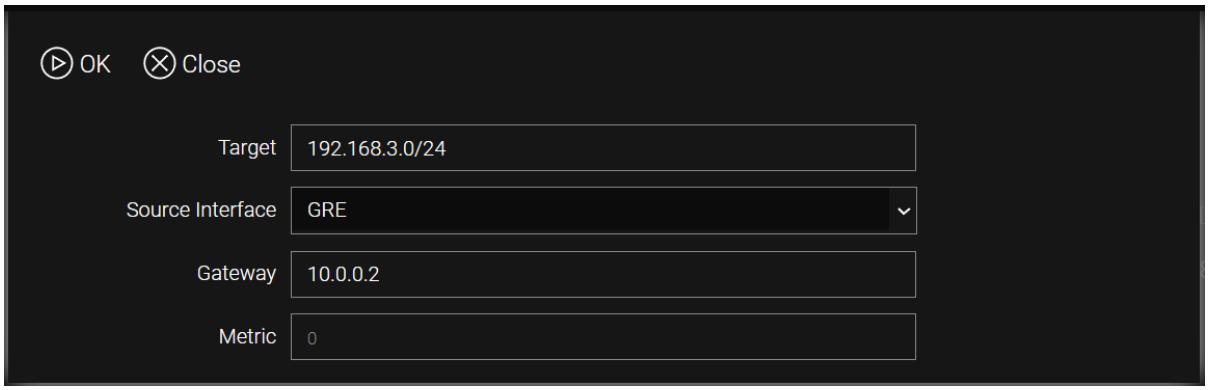


Static Route Configuration

Static routes to the remote local networks are configured using the **GRE** interfaces and their respective tunnel IP addresses as gateways.

Static routing parameters are managed in the */ip/route/list* section.

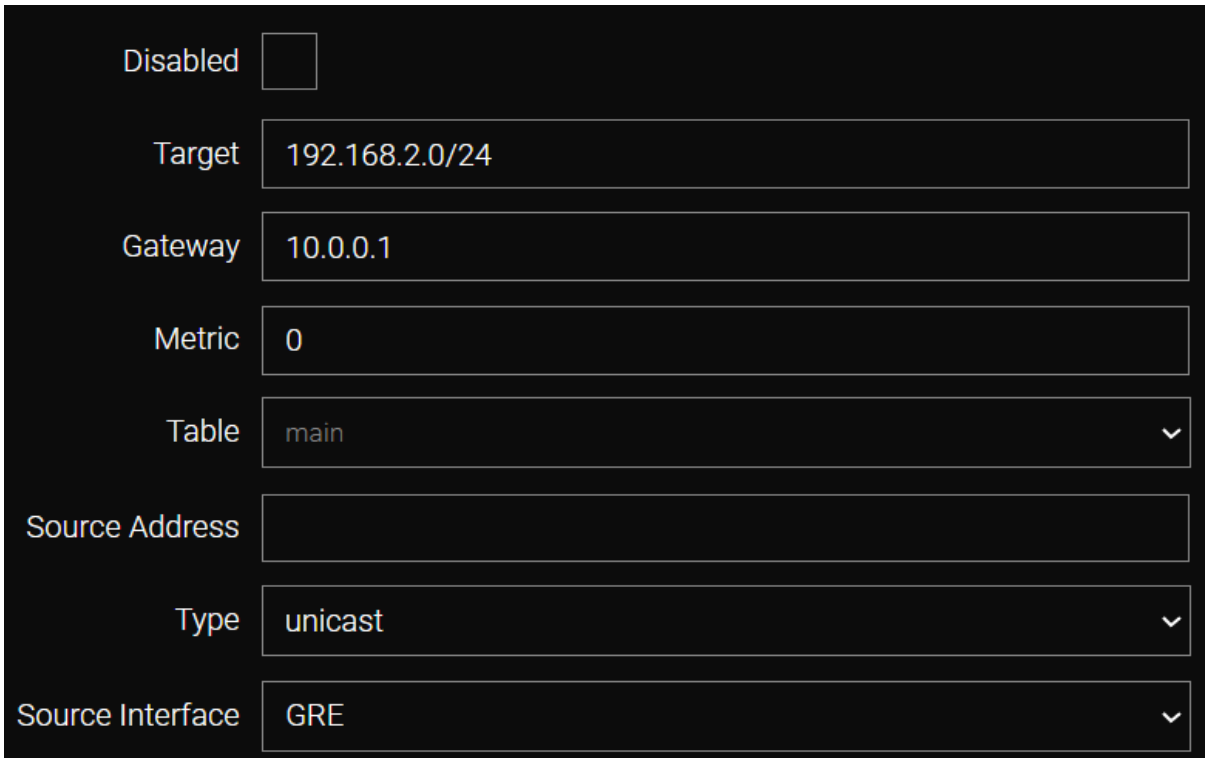
Configuration on Router R1



CLI Configuration

```
/ip route list add dst-addr=192.168.3.0/24 interface=GRE
    disabled -
    gateway 10.0.0.2
    metric -
    src-addr -
    table main
    type unicast
    apply
```

Configuration on Router R2

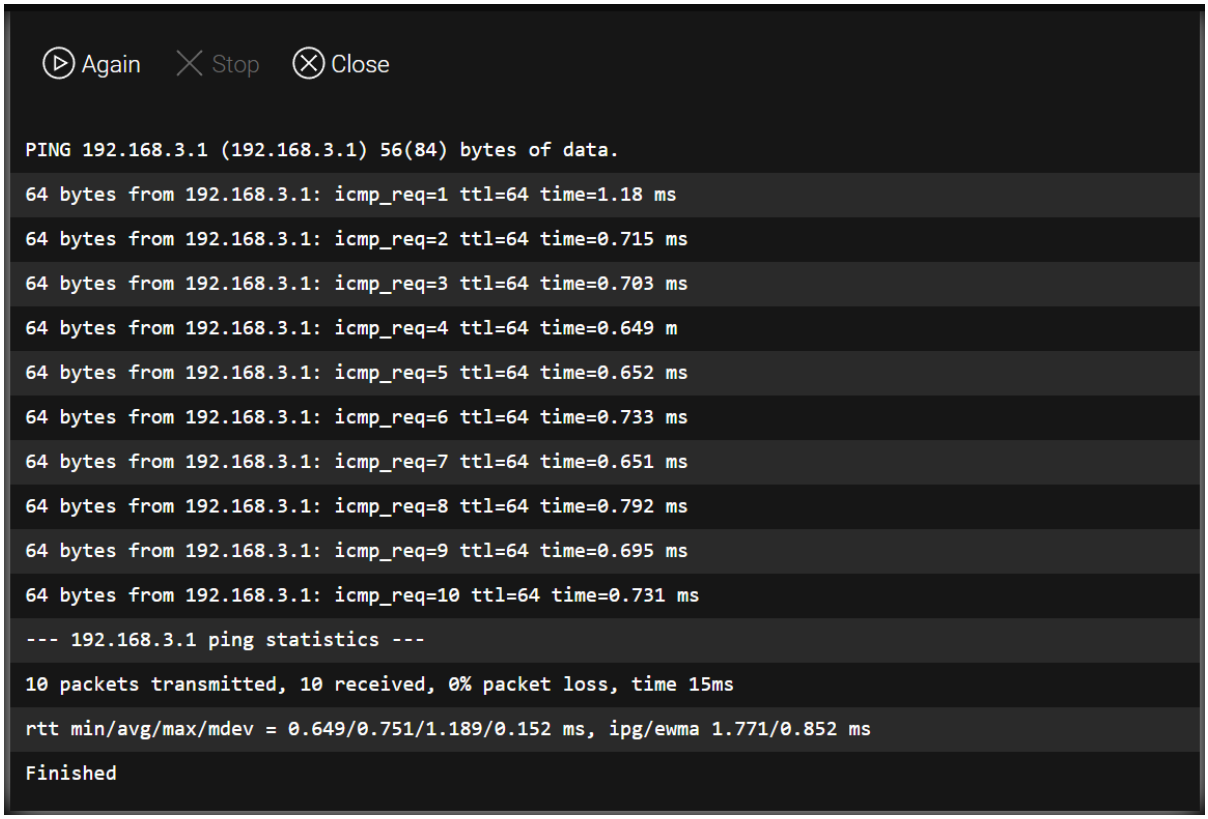


CLI Configuration

```
/ip route list add dst-addr=192.168.2.0/24 interface=GRE
    disabled -
    gateway 10.0.0.1
    metric -
    src-addr -
    table main
    type unicast
    apply
```

Ping (/tools/ping) — R2 from R1

Tunnel operation can be verified by sending a ping from the local address of router R1 to the address of the remote router R2.



CLI

```
admin@Router[/]> /tools ping host=192.168.3.1
PING 192.168.3.1 (192.168.3.1) 56(84) bytes of data.
64 bytes from 192.168.3.1: icmp_req=1 ttl=64 time=1.18 ms
64 bytes from 192.168.3.1: icmp_req=2 ttl=64 time=0.715 ms
64 bytes from 192.168.3.1: icmp_req=3 ttl=64 time=0.703 ms
64 bytes from 192.168.3.1: icmp_req=4 ttl=64 time=0.649 ms
64 bytes from 192.168.3.1: icmp_req=5 ttl=64 time=0.652 ms
64 bytes from 192.168.3.1: icmp_req=6 ttl=64 time=0.733 ms
64 bytes from 192.168.3.1: icmp_req=7 ttl=64 time=0.651 ms
64 bytes from 192.168.3.1: icmp_req=8 ttl=64 time=0.792 ms
64 bytes from 192.168.3.1: icmp_req=9 ttl=64 time=0.695 ms
64 bytes from 192.168.3.1: icmp_req=10 ttl=64 time=0.731 ms

--- 192.168.3.1 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 15ms
rtt min/avg/max/mdev = 0.649/0.751/1.189/0.152 ms, ipg/ewma 1.771/0.852 ms
```

All modifications are permanently saved to the router configuration only after executing the */system config commit* command or clicking the **commit** button in the web interface.