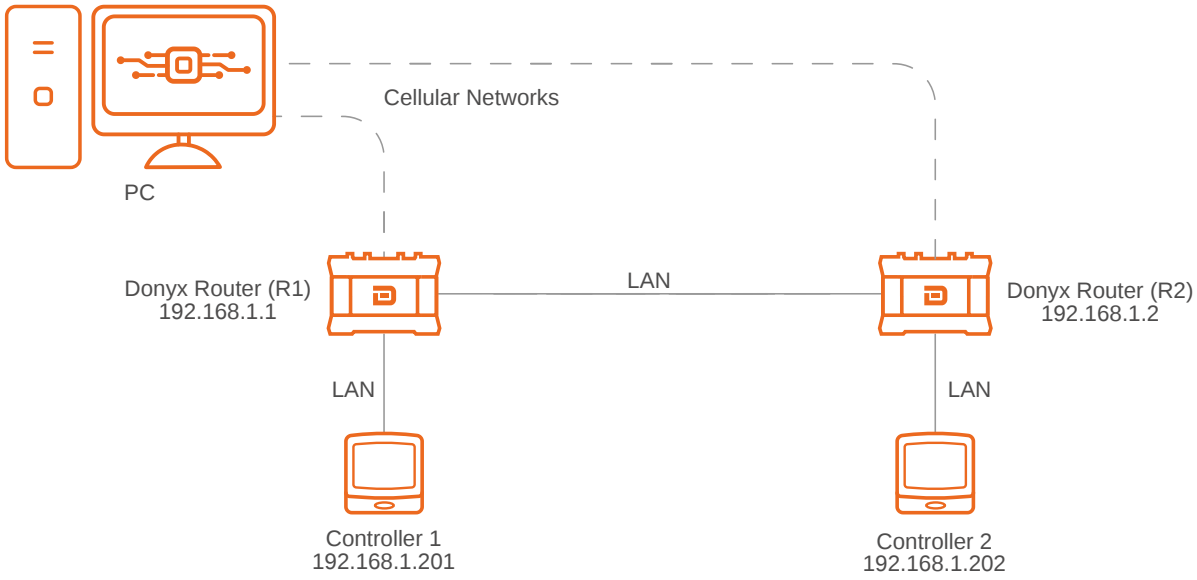
SNAT Configuration for Controller Monitoring

In this scenario, a **PC** is utilized for monitoring and managing controllers, which are connected to two *Donyx* routers. The routers are integrated into a single local network.

This topology is implemented for link redundancy and is designed to provide high availability in the event of a connection failure on either channel.

The objective is to ensure reachability for both controllers through either of the two routers.

Network Redundancy Topology for Controller Monitoring:



To implement this topology, port forwarding rules to each controller must be configured on both routers. Additionally, an **SNAT** rule must be defined on each device.

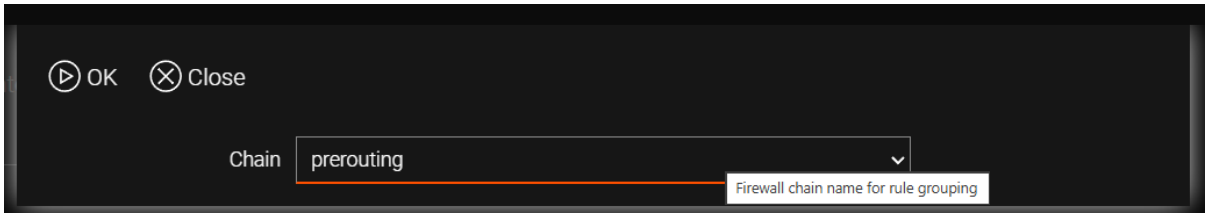
Donyx routers support configuration via both the web interface and the **CLI**.

DNAT (Port Forwarding) Configuration in the Donyx routers Web Interface

Assume that each controller responds to requests on **TCP** port *80*.

In this scenario, port forwarding for **R1** must be configured according to the following procedure:

1. Navigate to the */firewall/nat* section and click the **Add** button.
2. In the pop-up panel, select *Prerouting* from the **Chain** dropdown list and click **OK**.



3. In the displayed form, configure port forwarding for the first controller as shown in the example below.

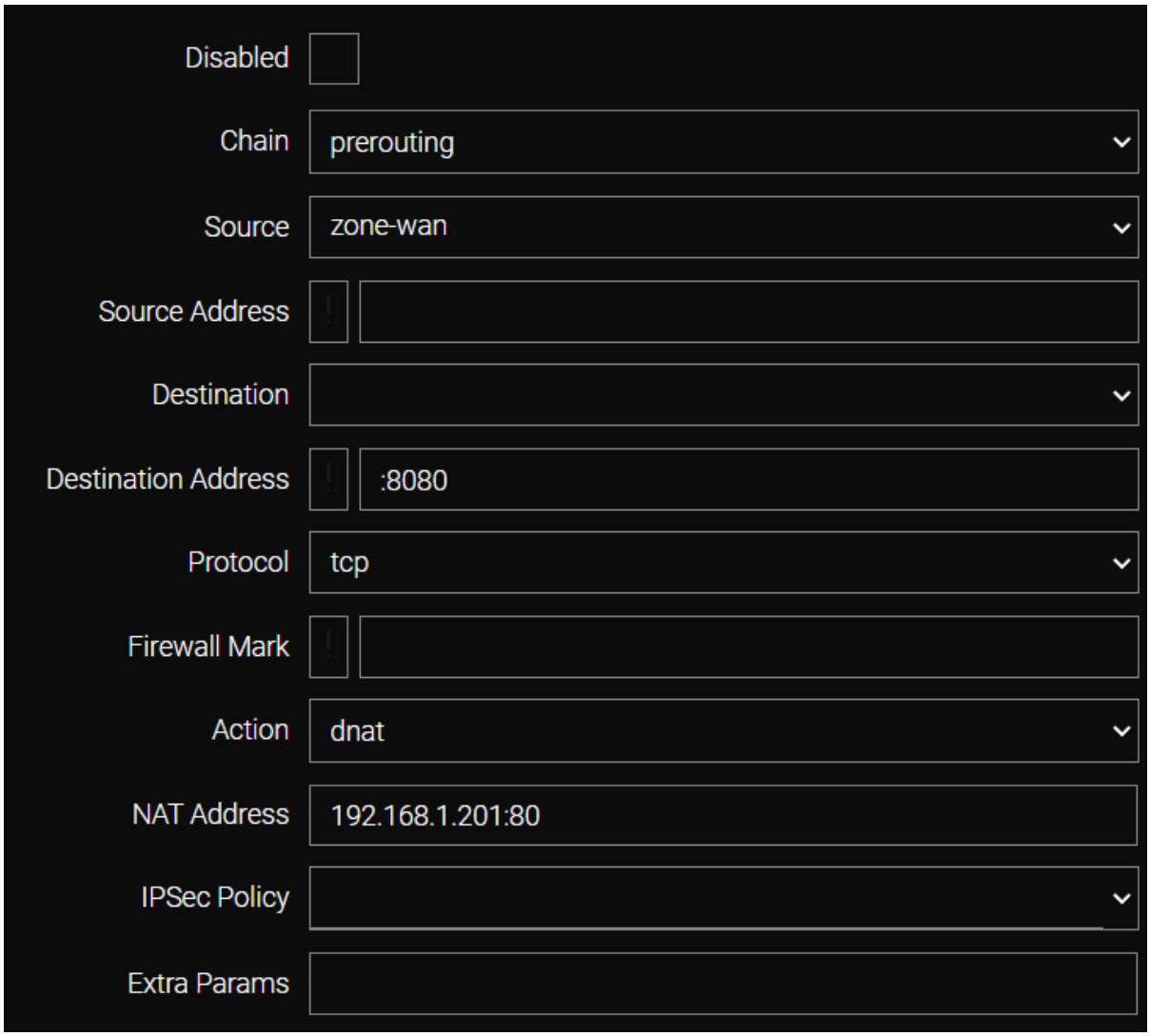


Table 1. Fields Descriptions

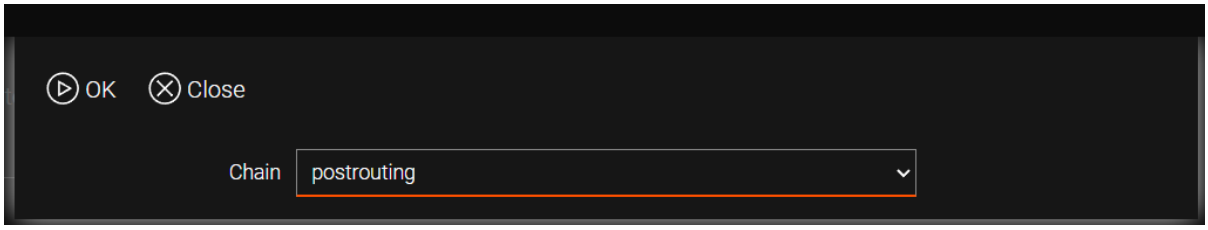
Field	Value
Chain	The **Iptables** chain where packet processing occurs. For port forwarding (**DNAT**), the *prerouting* chain is used.
Source	The interface or zone for the processed packets. In this example, *zone-wan* is used (packets originating from the service provider side).
Destination Address	The external port on the **ROUTER** that will respond to controller requests. For this example, port *8080* is used (notated as *:8080*).
Protocol	The transport protocol (**TCP** or **UDP**) utilized by the controller.
Action	The action performed on the packet. In this context, *dnat* (port forwarding).
NAT Address	The destination IP address and port to which the traffic is forwarded.

4. Click **Apply** to save the settings.
5. Port forwarding for the second controller on *R1* is configured in a similar manner, specifying a different external port (*8081*) and a different destination device address (*192.168.1.202*). The destination port remains unchanged, as the device responds on that specific port.

Port forwarding on router *R2* is configured identically to the setup on *R1*.

SNAT Configuration on Donyx Routers

1. Navigate to the */firewall/nat* section and click the **Add** button. In the pop-up panel, select *postrouting* from the **Chain** dropdown list and click **OK**.



2. For router *R1*, complete the form as shown in the example:

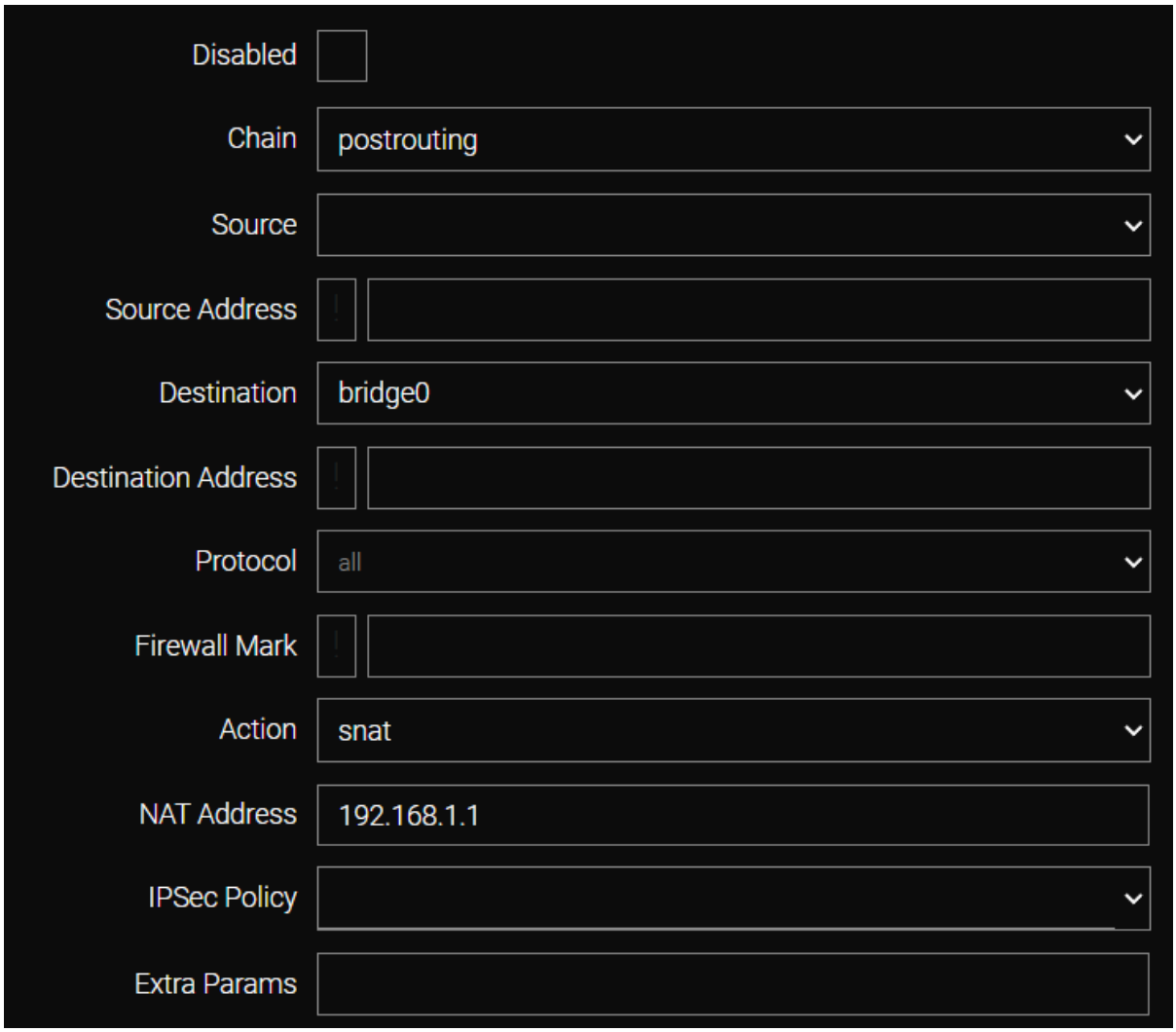


Table 2. Fields Descriptions

Field	Value
Chain	The **Iptables** chain where packet processing occurs. For **SNAT**, the *postrouting* chain is used.
Destination	The interface or zone for the processed packets. In this example, *bridge0* (the default network bridge serving the local network) is specified. Ensure that the bridge to which the controller is connected is selected.
Protocol	*all* (default).
Action	The action performed on the packet. In this context, *snat* (source address substitution).
NAT Address	The address utilized as the source. In this example, it is *192.168.1.1*.

3. The configuration of router **R2** is performed in a similar manner to **R1**. The primary difference is that *192.168.1.2* is specified as the *NAT Address*.

4. Click **Apply** to save the settings.

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.

Operational Principles

Controllers #1 and #2 utilize independent **Default Routes**.

- For **Controller #1** (*192.168.1.201*), the default gateway is **Router R1** (*192.168.1.1*).
- For **Controller #2** (*192.168.1.202*), the default gateway is **Router R2** (*192.168.1.2*).

In the absence of an **SNAT** rule, a packet arriving at the forwarded port of **Router R1** for **Controller #2** (*192.168.1.202*) will trigger a response directed to **Router R2** (the default gateway). Consequently, the polling **PC** will not establish a connection with the controller.

When **SNAT** rules are configured, the source address of the incoming packet is substituted with the router's own local **IP** address. Since the local address resides within the same subnet as the controller, the controller directs the response to this known local address rather than following the **Default Route**.

The response packet returns to the router where the **SNAT** substitution occurred. The system then performs an inverse address substitution and forwards the packet to the original sender, ensuring established connectivity.

CLI Configuration for Controller Monitoring

Execute the following commands on both **Router 1** and **Router 2** (commands with a hyphen instead of a parameter value, e.g., *disabled* -, may be omitted):

For port forwarding to Controller 1:

```
/firewall nat add chain=prerouting
    action dnat
    disabled -
    dst -
    dst-addr :8080
    extra -
    mark -
    nat-addr 192.168.1.201:80
    policy -
    protocol tcp
    src zone-wan
    src-addr -
    apply
```

For port forwarding to Controller 2:

```
/firewall nat add chain=prerouting
    action dnat
    disabled -
    dst -
    dst-addr :8081
    extra -
    mark -
    nat-addr 192.168.1.202:80
    policy -
    protocol tcp
    src zone-wan
    src-addr -
    apply
```

For SNAT configuration on R1:

```
/firewall nat add chain=postrouting
    action snat
    disabled -
    dst bridge0
    dst-addr -
    extra -
    mark -
    nat-addr 192.168.1.1
    policy -
    protocol all
    src -
    src-addr -
    apply
```

For SNAT configuration on R2:

```
/firewall nat add chain=postrouting
    action snat
    disabled -
    dst bridge0
    dst-addr -
    extra -
    mark -
    nat-addr 192.168.1.2
    policy -
    protocol all
    src -
    src-addr -
    apply
```

Configuration is finalized with the command, which writes the settings to the router's non-volatile memory.

```
/system config commit
```

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.