

**IT Technology 2. sem**

**Assignment 01**

**Source Nat**

**&**

**SRX source and destination nat**



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University College

Authors

Tihamer Biliboc

[tiha0006@edu.eal.dk](mailto:tiha0006@edu.eal.dk)

Sebastian Thomle Mason

[seba7286@edu.eal.dk](mailto:seba7286@edu.eal.dk)

Anthony James Peak

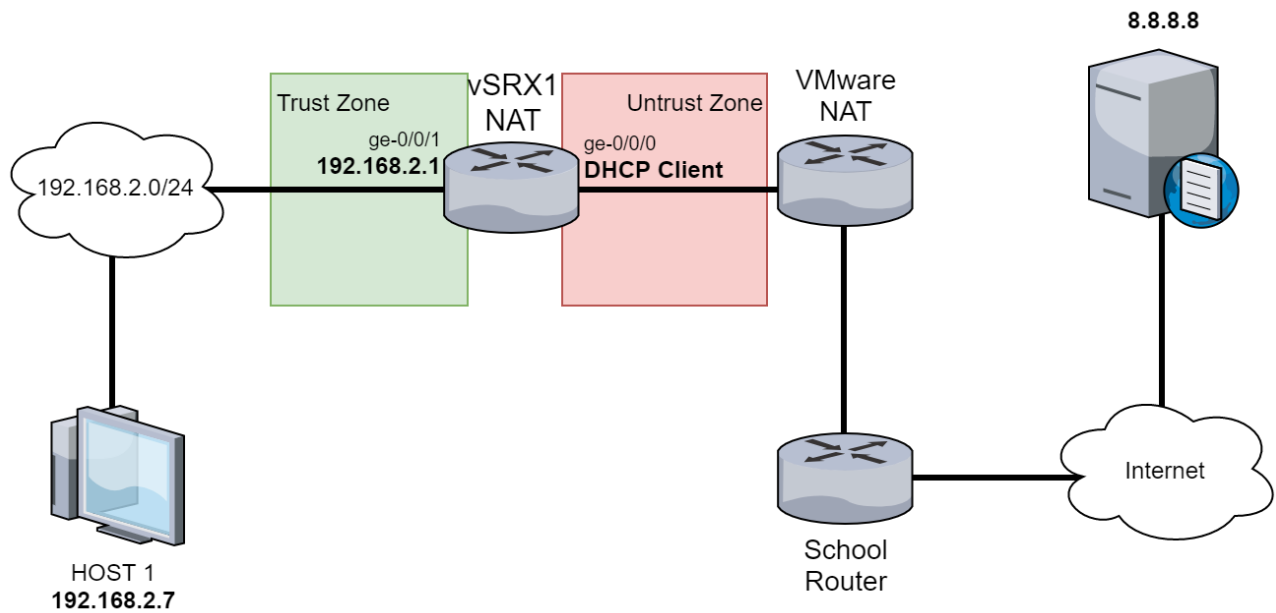
[anth0662@edu.eal.dk](mailto:anth0662@edu.eal.dk)

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# Assignment 01

A topology diagram with explanation.



The vSRX1 router is configured to use Port Address Translation (PAT), allowing the private network infrastructure behind the “Trust Zone” to be hidden from the network infrastructure beyond the untrust zone. The Google DNS server (8.8.8.8) is added as a target for test pings.

## One screenshots and descriptions of how to set up the SRX router(s) in VMware.

```
root@% cli
root> edit
Entering configuration mode

[edit]
root# edit security nat source
t rule-set rs1 fr
om zone trust
set rule-set rs1 to zone untrust
set rule-set rs1 rule r1 match source-address 0.0.0.0/0
set rule-set rs1 rule r1 match destination-address 0.0.0.0/0
set rule-set rs1 rule r1 then source-nat interface
top
edit security policies from-zone trust to-zone untrust
set policy internet-access match source-address any destination-address any application any
set policy internet-access then permit
[edit security nat source]
root# set rule-set rs1 from zone trust

[edit security nat source]
root# set rule-set rs1 to zone untrust

[edit security nat source]
root# set rule-set rs1 rule r1 match source-address 0.0.0.0/0

[edit security nat source]
root# set rule-set rs1 rule r1 match destination-address 0.0.0.0/0

[edit security nat source]
root# set rule-set rs1 rule r1 then source-nat interface

[edit security nat source]
root# top

[edit]
root# edit security policies from-zone trust to-zone untrust

[edit security policies from-zone trust to-zone untrust]
root# ...ress any destination-address any application any

[edit security policies from-zone trust to-zone untrust]
root# set policy internet-access then permit

[edit security policies from-zone trust to-zone untrust]
root#
```

```
[edit]
edit security nat source
set rule-set rs1 from zone trust
set rule-set rs1 to zone untrust
set rule-set rs1 rule r1 match source-address 0.0.0.0/0
set rule-set rs1 rule r1 match destination-address 0.0.0.0/0
set rule-set rs1 rule r1 then source-nat interface
top
edit security policies from-zone trust to-zone untrust
set policy internet-access match source-address any destination-address any
application any
set policy internet-access then permit
```

One screenshot and description of how to configure the used PCs.

Editing Wired connection 2

Connection name: **Wired connection 2**

General | Ethernet | 802.1X Security | DCB | Proxy | IPv4 Settings | IPv6 Settings

Method: Manual

**Addresses**

Address	Netmask	Gateway
192.168.2.7	24	192.168.2.1

Add  
Delete

DNS servers: 8.8.8.8

Search domains:

DHCP client ID:

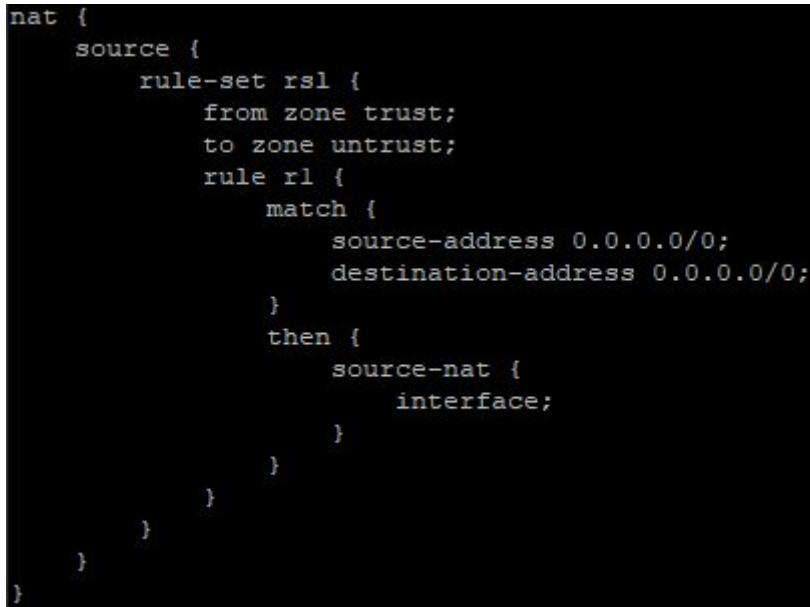
☒ Require IPv4 addressing for this connection to complete

Routes...

Cancel Save

Open network settings and edit the connection to match the above.

**One screenshot, description, and commands on how to configure the SRX router(s) with PAT for relevant subnet(s).**

A screenshot of a terminal window showing the configuration of a NAT source rule on an SRX router. The configuration is as follows:

```
nat {  
  source {  
    rule-set rs1 {  
      from zone trust;  
      to zone untrust;  
      rule r1 {  
        match {  
          source-address 0.0.0.0/0;  
          destination-address 0.0.0.0/0;  
        }  
        then {  
          source-nat {  
            interface;  
          }  
        }  
      }  
    }  
  }  
}
```

```
[edit]  
edit security nat source  
set rule-set rs1 from zone trust  
set rule-set rs1 to zone untrust  
set rule-set rs1 rule r1 match source-address 0.0.0.0/0  
set rule-set rs1 rule r1 match destination-address 0.0.0.0/0  
set rule-set rs1 rule r1 then source-nat interface  
top  
edit security policies from-zone trust to-zone untrust  
set policy internet-access match source-address any destination-address any  
application any  
set policy internet-access then permit
```

**Show how ping was used for troubleshooting.**

```
Terminal - root1@ubuntu: ~
File Edit View Terminal Tabs Help
root1@ubuntu:~$ ping google.com -c 10
PING google.com (172.217.17.142) 56(84) bytes of data.
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=1 ttl=127 time=40.1 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=2 ttl=127 time=31.5 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=3 ttl=127 time=27.5 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=4 ttl=127 time=31.3 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=5 ttl=127 time=31.3 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=6 ttl=127 time=31.2 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=7 ttl=127 time=30.7 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=8 ttl=127 time=39.2 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=9 ttl=127 time=27.5 ms
64 bytes from ams15s30-in-f14.1e100.net (172.217.17.142): icmp_seq=10 ttl=127 time=27.6 ms

--- google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9028ms
rtt min/avg/max/mdev = 27.550/31.841/40.165/4.247 ms
```

Ping was used for verifying connections in the network as well as testing connections at the end.

**Show how traceroute was used for troubleshooting.**

```
root1@ubuntu:~$ traceroute google.com
traceroute to google.com (172.217.17.110), 30 hops max, 60 byte packets
 1  _gateway (192.168.2.1)  3.095 ms  3.069 ms  3.030 ms
 2  192.168.248.2 (192.168.248.2)  3.342 ms  3.308 ms  3.391 ms
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  *^C
```

Traceroute was not used during this assignment.

After the assignment was done, traceroute showed the above when tracerouting outside the local network. Most likely a problem with the untrust-to-trust security policy.



**Run Wireshark and show one screenshot/description that proves that the NATTING for all subnets is working.**

1	0.000000	192.168.2.7	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=1/256, ttl=64 (reply in 2)
2	0.037242	8.8.8.8	192.168.2.7	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=1/256, ttl=127 (request in 1)
3	1.006235	192.168.2.7	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=2/512, ttl=64 (reply in 4)
4	1.037665	8.8.8.8	192.168.2.7	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=2/512, ttl=127 (request in 3)
5	2.010518	192.168.2.7	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=3/768, ttl=64 (reply in 6)
6	2.041816	8.8.8.8	192.168.2.7	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=3/768, ttl=127 (request in 5)
7	3.017672	192.168.2.7	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=4/1024, ttl=64 (reply in 8)
8	3.056875	8.8.8.8	192.168.2.7	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=4/1024, ttl=127 (request in 7)
9	4.023278	192.168.2.7	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=5/1280, ttl=64 (reply in 10)
10	4.054755	8.8.8.8	192.168.2.7	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=5/1280, ttl=127 (request in 9)

*Img1: Between Host1 and vSRX1*

3	9.887009	192.168.248.131	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=31854/28284, ttl=63 (reply in 4)
4	9.923066	8.8.8.8	192.168.248.131	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=31854/28284, ttl=128 (request in 3)
5	10.892421	192.168.248.131	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=21842/21077, ttl=63 (reply in 6)
6	10.917387	8.8.8.8	192.168.248.131	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=21842/21077, ttl=128 (request in 5)
7	11.900552	192.168.248.131	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=31994/64124, ttl=63 (reply in 8)
8	11.923947	8.8.8.8	192.168.248.131	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=31994/64124, ttl=128 (request in 7)
9	12.907793	192.168.248.131	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=21524/5204, ttl=63 (reply in 10)
10	12.935961	8.8.8.8	192.168.248.131	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=21524/5204, ttl=128 (request in 9)
11	13.909547	192.168.248.131	8.8.8.8	ICMP	98 Echo (ping) request	id=0x0b7a, seq=24809/59744, ttl=63 (reply in 12)
12	13.936154	8.8.8.8	192.168.248.131	ICMP	98 Echo (ping) reply	id=0x0b7a, seq=24809/59744, ttl=128 (request in 11)

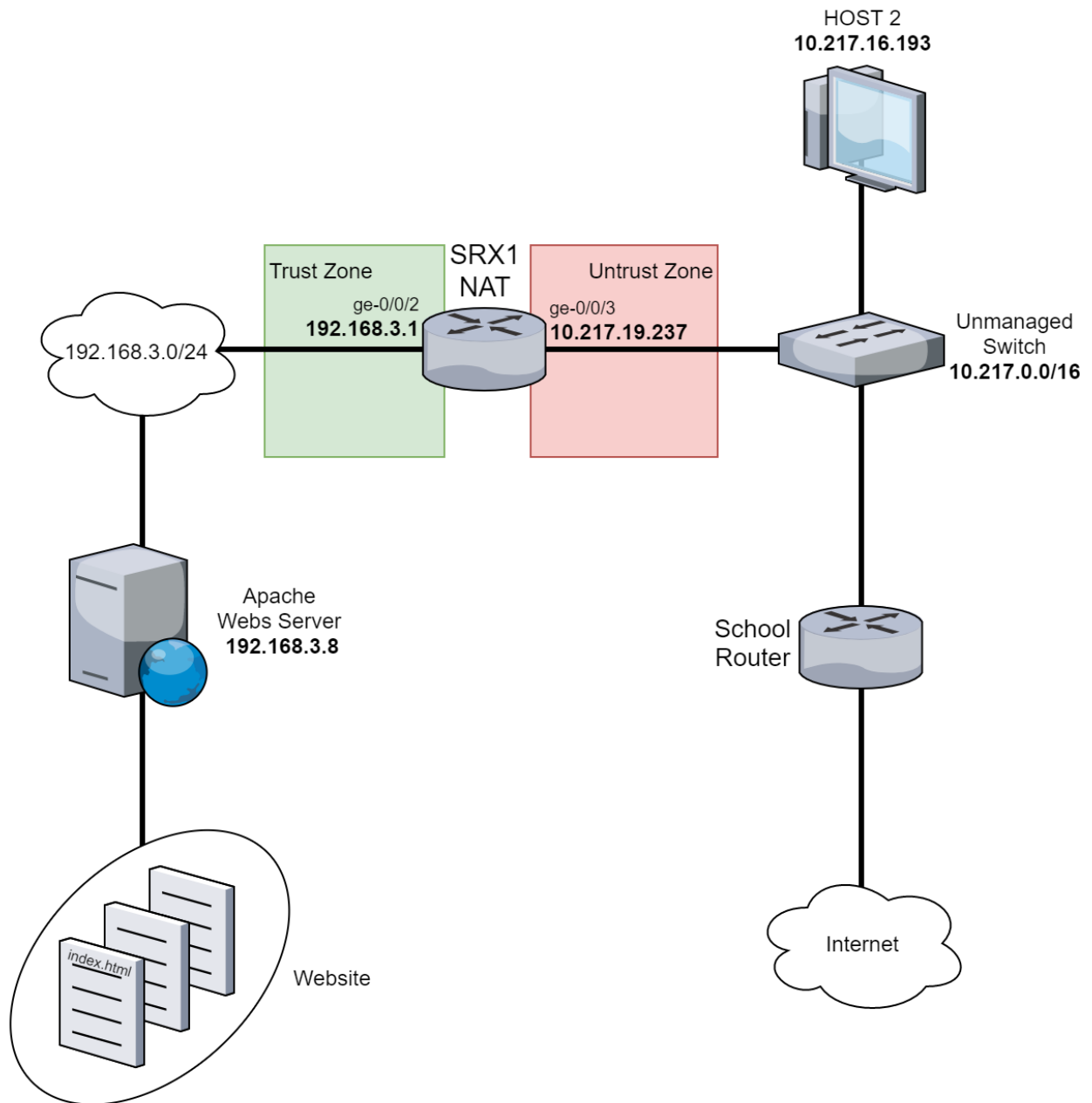
*Img2: Between vSRX1 and internet*

As seen above, when Host1(192.168.2.7) pings 8.8.8.8 in *Img1*, the router(vSRX1) changes the src-ip to the routers ip(192.168.248.131) in *Img2*.

When 8.8.8.8 then replies, it sends the reply to the router which then changes the dst-ip to Host1's ip.

# Assignment 04

## A topology diagram with explanation



Destination NATTING is configured on a real SRX, with port 80 traffic being forwarded to the web server, such that the website can be accessed from the untrusted zone using the IP of interface ge-0/0/3.

# A Low Level Design

LOW LEVEL DESIGN								
INSTANCE TYPE	INTERFACE	UNIT	IP ADDRESS	MASK	FAMILY	CONNECTS TO	STATUS	Comments
SRX-D3	ge-0/0/0	0				Management port	up	
	ge-0/0/1	0	192.168.2.1	/24	inet		up	
	ge-0/0/2	0	192.168.3.1	/24	inet	VMnet 3	up	ge-0/0/2 is connected via cable to the laptop interface
	ge-0/0/3	0	10.217.19.237	/16 <sup>1</sup>	inet	Unmanaged switch	up	
Web Server	ge-0/0/0	0	192.168.3.8	/24	inet	VMnet bridge to laptop interface	up	Laptop is connected via cable to the ge-0/0/2 interface on SRX-D3
Workstation	ge-0/0/0	0	10.217.16.193	/16 <sup>2</sup>	inet	Unmanaged switch	up	

<sup>1</sup> This is a estimated value, could be unstable

<sup>2</sup> See above

## How to install the Apache Webserver on a Raspberry Pi

```
sudo apt-get install apache2
```

For more info see [here](https://www.raspberrypi.org/documentation/remote-access/web-server/apache.md)<sup>3</sup>.

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<sup>3</sup> <https://www.raspberrypi.org/documentation/remote-access/web-server/apache.md>

## A filled out test plan

TEST PLAN			
ASSERTION	METHOD	EXPECTED RESULT	SUCCESS
Web Server accessible via router untrust zone IP	Use a web browser on Host 2 to access 10.217.19.237	Web page displays successfully	✓
Web Server can access router	Ping 192.168.3.1 from Web Server	Ping replies received	✓
Host 2 can access router	Ping 10.217.19.237 from Host 2	Ping replies received	✓
Routing table	Ping Web Server from Host 1	Ping replies received	✓
Untrust to trust zone policy functioning	Ping 192.168.3.1 from Host 2	Ping refused	✓
Trust to untrust zone policy functioning and correct default route	Ping 10.217.16.193 from Web Server	Ping successful	✓

**Put the router configuration and the topology diagram in GitLab**

[Diagram](#)<sup>4</sup>

[Configs](#)<sup>5</sup>

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<sup>4</sup> <https://github.com/Sebski123/Network/tree/master/ITT2/ass01%2B04SRXsourceAndDestinationNat/Diagrams>

<sup>5</sup> [https://github.com/Sebski123/Network/tree/master/ITT2/ass01%2B04SRXsourceAndDestinationNat/SRX\\_configs](https://github.com/Sebski123/Network/tree/master/ITT2/ass01%2B04SRXsourceAndDestinationNat/SRX_configs)