

**LAPORAN PRAKTIKUM  
ADMINISTRASI DAN KEAMANAN JARINGAN**

**Jobsheet NAT**



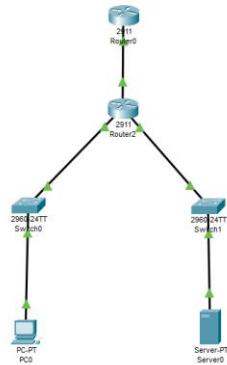
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**JURUSAN TEKNOLOGI INFORMASI  
POLITEKNIK NEGERI MALANG  
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## Langkah-Langkah Praktikum

### 1. Bangun Topologi Fisik di Simulator:

- Tempatkan perangkat: Router /Firewall, 2 Switch, 1 PC klien (LAN), 1 Web Server (DMZ).
- Sambungkan sesuai kabel (straight-through / cross-over).



### 2. Konfigurasi IP & Default Gateway:

- Router/Firewall:  
interface G0/1  
ip address 192.168.10.1 255.255.255.0  
no shutdown  

```
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 203.0.113.2 255.255.255.252
Router(config-if)#ip address 203.0.113.2 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
interface G0/2
ip address 192.168.20.1 255.255.255.0
no shutdown
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
interface G0/0
ip address 203.0.113.1 255.255.255.252
no shutdown
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 203.0.113.1 255.255.255.252
Router(config-if)#ip address 203.0.113.1 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-6-CHANGED: Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#
```
- PC LAN: 192.168.10.10 /24, Gateway 192.168.10.1

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.10.10

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.10.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::201:42FF:FEBC:6C75

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MDS

Username:

Password:

- Server DMZ: 192.168.20.10 /24, Gateway 192.168.20.1

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.20.10

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.20.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::204:9AFF:FE58:BADA

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MDS

Username:

Password:

### 3. Konfigurasi Routing Dasar:

```
ip route 0.0.0.0 0.0.0.0 203.0.133.1
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 203.0.133.1
Router(config)#
```

### 4. Konfigurasi NAT:

```
interface G0/0
```

```
ip nat outside
```

```
interface G0/1
```

```
ip nat inside
```

```
access-list 1 permit 192.168.10.0 0.0.0.255
```

```
ip nat inside source list 1 interface G0/0 overload
```

```
Router(config)#interface GigabitEthernet0/1
```

```
Router(config-if)#ip nat inside
```

```
Router(config-if)#exit
```

```
Router(config)#interface GigabitEthernet0/2
```

```
Router(config-if)#ip nat inside
```

```
Router(config-if)#exit
```

```
Router(config)#interface GigabitEthernet0/0
```

```
Router(config-if)#ip nat outside
```

```
Router(config-if)#exit
```

```
Router(config)#
```

```
Router(config)#access-list 1 permit 192.168.10.0 0.0.0.255
```

```
Router(config)#ip nat inside source list 1 interface GigabitEthernet0/0 overload
```

```
Router(config)#
```

## 5. Konfigurasi Firewall / ACL:

```
ip access-list extended FW_RULES
permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 80
permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 443
permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 22
deny ip 192.168.20.0 0.0.0.255 192.168.10.0 0.0.0.255
permit tcp any host 192.168.20.10 eq 80
permit tcp any host 192.168.20.10 eq 443
Router(config)#ip access-list extended FW_RULES
Router(config-ext-nacl)#permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.Y eq 80
^
% Invalid input detected at '^' marker.

Router(config-ext-nacl)#permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 80
Router(config-ext-nacl)#permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 443
Router(config-ext-nacl)#permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 22
Router(config-ext-nacl)#deny ip 192.168.20.0 0.0.0.255 192.168.10.0 0.0.0.255
Router(config-ext-nacl)#permit tcp any host 192.168.20.10 eq 80
^
% Invalid input detected at '^' marker.

Router(config-ext-nacl)#permit tcp any host 192.168.20.10 eq 80
Router(config-ext-nacl)#permit tcp any host 192.168.20.10 eq 443
Router(config-ext-nacl)#exit
~
~
~
```

## Uji & Verifikasi (Detail)

### 1. Ping Test

Dari PC LAN → ping 192.168.10.1 (gateway LAN)

Dari PC LAN → ping 192.168.20.10 (server DMZ)

Dari PC LAN → ping 203.0.113.1 (uji keluar ke internet)

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 6ms, Average = 1ms

C:\>ping 192.168.20.10

Pinging 192.168.20.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 203.0.113.1

Pinging 203.0.113.1 with 32 bytes of data:

Request timed out.
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254

Ping statistics for 203.0.113.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

### 2. Telnet / HTTP Test

telnet 192.168.20.10 80 (akses Web Server di DMZ).

telnet 192.168.20.10 22 (akses SSH, seharusnya hanya LAN yang boleh, Internet tidak boleh).

```
C:\>telnet 203.0.113.2 80
Trying 203.0.113.2 ...
% Connection refused by remote host
C:\>telnet 203.0.113.2 22
Trying 203.0.113.2 ...Open

[Connection to 203.0.113.2 closed by foreign host]
```

### 3. NAT Check

```
Pinging 203.0.113.1 with 32 bytes of data:
```

	Router>enable				
	Router#show ip nat translations				
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254					
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254					\$ Invalid input detected at '^' marker.
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254					
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254	Router#show ip nat translations				
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		Pro Inside global	Inside local	Outside local	Outside global
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:213	192.168.10.10:13	203.0.113.1:13	203.0.113.1:13
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:214	192.168.10.10:14	203.0.113.1:14	203.0.113.1:14
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:215	192.168.10.10:15	203.0.113.1:15	203.0.113.1:15
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:216	192.168.10.10:16	203.0.113.1:16	203.0.113.1:16
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:217	192.168.10.10:17	203.0.113.1:17	203.0.113.1:17
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:218	192.168.10.10:18	203.0.113.1:18	203.0.113.1:18
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:219	192.168.10.10:19	203.0.113.1:19	203.0.113.1:19
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:220	192.168.10.10:20	203.0.113.1:20	203.0.113.1:20
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:221	192.168.10.10:21	203.0.113.1:21	203.0.113.1:21
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:222	192.168.10.10:22	203.0.113.1:22	203.0.113.1:22
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:223	192.168.10.10:23	203.0.113.1:23	203.0.113.1:23
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:224	192.168.10.10:24	203.0.113.1:24	203.0.113.1:24
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:225	192.168.10.10:25	203.0.113.1:25	203.0.113.1:25
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:226	192.168.10.10:26	203.0.113.1:26	203.0.113.1:26
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:227	192.168.10.10:27	203.0.113.1:27	203.0.113.1:27
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:228	192.168.10.10:28	203.0.113.1:28	203.0.113.1:28
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:229	192.168.10.10:29	203.0.113.1:29	203.0.113.1:29
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:230	192.168.10.10:30	203.0.113.1:30	203.0.113.1:30
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:231	192.168.10.10:31	203.0.113.1:31	203.0.113.1:31
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:232	192.168.10.10:32	203.0.113.1:32	203.0.113.1:32
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:233	192.168.10.10:33	203.0.113.1:33	203.0.113.1:33
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:234	192.168.10.10:34	203.0.113.1:34	203.0.113.1:34
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:235	192.168.10.10:35	203.0.113.1:35	203.0.113.1:35
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:236	192.168.10.10:36	203.0.113.1:36	203.0.113.1:36
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:237	192.168.10.10:37	203.0.113.1:37	203.0.113.1:37
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254		icmp 203.0.113.1:238	192.168.10.10:38	203.0.113.1:38	203.0.113.1:38
Reply from 203.0.113.1: bytes=32 time<1ms TTL=254	Router#				

Perintah: show access-lists

#### 4. Firewall / ACL Logs

```
Router>enable
Router#show access-lists
Standard IP access list 1
  10 permit 192.168.10.0 0.0.0.255
  20 permit 192.168.20.0 0.0.0.255
Extended IP access list FW_RULES
  10 permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq www
  20 permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 443
  30 permit tcp 192.168.10.0 0.0.0.255 host 192.168.20.10 eq 22
  40 deny ip 192.168.20.0 0.0.0.255 192.168.10.0 0.0.0.255
  50 permit tcp any host 192.168.20.10 eq www
  60 permit tcp any host 192.168.20.10 eq 443
Router#
```