

# Dokumen Hasil Tugas Praktikum Jaringan Komputer Lanjut

## Modul 2

### OSPF v2

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1. Topology Jaringan
2. Hasil Konfigurasi IP pada PC

#### 2.1. PC1

```
PC1> ip 192.168.55.2/24 192.168.55.1
Checking for duplicate address...
PC1 : 192.168.55.2 255.255.255.0 gateway 192.168.55.1

PC1> save
Saving startup configuration to startup.vpc
. done
```

Gambar 1.2 IP PC1

#### 2.2. PC2

```
PC2> show ip

NAME           : PC2[1]
IP/MASK         : 192.115.4.2/24
GATEWAY         : 192.115.4.1
DNS             :
MAC             : 00:50:79:66:68:01
LPORT          : 10030
RHOST:PORT      : 127.0.0.1:10031
MTU:            : 1500
```

Gambar 1.3 IP PC2

### 2.3. PC3

```
PC3> show ip

NAME           : PC3[1]
IP/MASK        : 192.115.3.2/24
GATEWAY        : 192.115.3.1
DNS            :
MAC            : 00:50:79:66:68:02
LPORT         : 10032
RHOST:PORT     : 127.0.0.1:10033
MTU:           : 1500
```

Gambar 1.4 IP PC3

## 3. Hasil Konfigurasi IP Interface pada Router

### 3.1. Router 1

```
R1(config)#do sh ip int br
Interface                IP-Address      OK? Method Status        Protocol
FastEthernet0/0          192.55.2.1      YES manual up             up
FastEthernet0/1          192.55.3.1      YES manual up             up
FastEthernet1/0          192.55.4.1      YES manual up             up
FastEthernet2/0          192.55.1.1      YES manual up             up
Ethernet3/0              unassigned      YES unset  administratively down down
Ethernet3/1              unassigned      YES unset  administratively down down
Ethernet3/2              unassigned      YES unset  administratively down down
Ethernet3/3              unassigned      YES unset  administratively down down
R1(config)#
```

Gambar 1.5 IP Interface Router 1

### 3.2. Router 2

```
R2#sh ip int br
Interface                IP-Address      OK? Method Status        Protocol
FastEthernet0/0          unassigned      YES unset  administratively down down
FastEthernet0/1          unassigned      YES unset  administratively down down
FastEthernet1/0          192.55.4.2      YES manual up             up
FastEthernet2/0          unassigned      YES unset  administratively down down
Ethernet3/0              192.55.6.1      YES manual up             up
Ethernet3/1              192.55.7.2      YES manual up             up
Ethernet3/2              unassigned      YES unset  administratively down down
Ethernet3/3              unassigned      YES unset  administratively down down
```

Gambar 1.6 IP Interface Router 2

### 3.3. Router 3

```
R3#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	unassigned	YES	unset	administratively down	down
FastEthernet0/1	unassigned	YES	unset	administratively down	down
FastEthernet1/0	192.55.3.2	YES	manual	up	up
FastEthernet2/0	unassigned	YES	unset	administratively down	down
Ethernet3/0	192.55.5.1	YES	manual	up	up
Ethernet3/1	192.55.6.2	YES	manual	up	up
Ethernet3/2	unassigned	YES	unset	administratively down	down
Ethernet3/3	unassigned	YES	unset	administratively down	down

Gambar 1.7 IP Interface Router 3

### 3.4. Router 4

```
R4#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	unassigned	YES	unset	administratively down	down
FastEthernet0/1	unassigned	YES	unset	administratively down	down
FastEthernet1/0	unassigned	YES	unset	administratively down	down
FastEthernet2/0	192.55.2.2	YES	manual	up	up
Ethernet3/0	192.168.55.1	YES	manual	up	up
Ethernet3/1	192.55.5.2	YES	manual	up	up
Ethernet3/2	192.55.7.1	YES	manual	up	up
Ethernet3/3	unassigned	YES	unset	administratively down	down

Gambar 1.8 IP Interface Router 4

### 3.5. Router 5

```
R5#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.55.1.2	YES	manual	up	up
FastEthernet0/1	192.0.1.2	YES	manual	up	up
FastEthernet1/0	unassigned	YES	unset	administratively down	down
FastEthernet2/0	unassigned	YES	unset	administratively down	down
Ethernet3/0	unassigned	YES	unset	administratively down	down
Ethernet3/1	unassigned	YES	unset	administratively down	down
Ethernet3/2	unassigned	YES	unset	administratively down	down
Ethernet3/3	unassigned	YES	unset	administratively down	down

Gambar 1.9 IP Interface Router 5

### 3.6. Router 6

```
R6#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.0.1.1	YES	manual	up	up
FastEthernet0/1	192.0.2.1	YES	manual	up	up
FastEthernet1/0	unassigned	YES	unset	administratively down	down
FastEthernet2/0	unassigned	YES	unset	administratively down	down
Ethernet3/0	unassigned	YES	unset	administratively down	down
Ethernet3/1	unassigned	YES	unset	administratively down	down
Ethernet3/2	unassigned	YES	unset	administratively down	down
Ethernet3/3	unassigned	YES	unset	administratively down	down

Gambar 1.10 IP Interface Router 6

### 3.7. Router 7

```
R7#sh ip int br
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0    192.0.2.2       YES manual up          up
FastEthernet0/1    192.115.1.2     YES manual up          up
FastEthernet1/0    192.115.2.2     YES manual up          up
FastEthernet2/0    unassigned      YES unset  administratively down down
Ethernet3/0        unassigned      YES unset  administratively down down
Ethernet3/1        unassigned      YES unset  administratively down down
Ethernet3/2        unassigned      YES unset  administratively down down
Ethernet3/3        unassigned      YES unset  administratively down down
```

Gambar 1.11 IP Interface Router 7

### 3.8. Router 8

```
R8#sh ip int br
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0    192.115.1.1     YES manual up          up
FastEthernet0/1    unassigned      YES unset  administratively down down
FastEthernet1/0    unassigned      YES unset  administratively down down
FastEthernet2/0    unassigned      YES unset  administratively down down
Ethernet3/0        192.115.3.1     YES manual up          up
Ethernet3/1        unassigned      YES unset  administratively down down
Ethernet3/2        unassigned      YES unset  administratively down down
Ethernet3/3        unassigned      YES unset  administratively down down
```

Gambar 1.12 IP Interface Router 8

### 3.9. Router 9

```
R9#sh ip int br
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0    192.115.2.1     YES manual up          up
FastEthernet0/1    unassigned      YES unset  administratively down down
FastEthernet1/0    unassigned      YES unset  administratively down down
FastEthernet2/0    unassigned      YES unset  administratively down down
Ethernet3/0        192.115.4.1     YES manual up          up
Ethernet3/1        unassigned      YES unset  administratively down down
Ethernet3/2        unassigned      YES unset  administratively down down
Ethernet3/3        unassigned      YES unset  administratively down down
```

Gambar 1.13 IP Interface Router 9

## 4. Hasil Konfigurasi OSPF

### 4.1. Router 1

```
R1#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 55.1.0.0
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.55.1.0 0.0.0.255 area 55
    192.55.2.0 0.0.0.255 area 55
    192.55.3.0 0.0.0.255 area 55
    192.55.4.0 0.0.0.255 area 55
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway         Distance         Last Update
  Distance: (default is 110)
```

Gambar 1.14 Routing Protokol Router 1

#### 4.2. Router 2

```
R2#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 55.2.0.0
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.55.4.0 0.0.0.255 area 55
    192.55.6.0 0.0.0.255 area 55
    192.55.7.0 0.0.0.255 area 55
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway         Distance         Last Update
    55.1.0.0         110             00:01:02
  Distance: (default is 110)
```

Gambar 1.15 Routing Protokol Router 2

#### 4.3. Router 3

```
R3#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 55.3.0.0
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.55.3.0 0.0.0.255 area 55
    192.55.5.0 0.0.0.255 area 55
    192.55.6.0 0.0.0.255 area 55
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway         Distance         Last Update
    55.2.0.0         110             00:00:42
    55.1.0.0         110             00:00:42
  Distance: (default is 110)
```

Gambar 1.16 Routing Protokol Router 3

#### 4.4. Router 4

```

R4#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 55.4.0.0
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.55.2.0 0.0.0.255 area 55
    192.55.5.0 0.0.0.255 area 55
    192.55.7.0 0.0.0.255 area 55
    192.168.55.0 0.0.0.255 area 55
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway          Distance      Last Update
    55.3.0.0          110          00:10:52
    55.2.0.0          110          00:00:43
    55.1.0.0          110          00:00:43
  Distance: (default is 110)

```

Gambar 1.17 Routing Protokol Router 4

#### 4.5. Router 5

```

R5#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 55.5.0.1
  It is an area border router
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.0.1.0 0.0.0.3 area 0
    192.55.1.0 0.0.0.255 area 55
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway          Distance      Last Update
    55.4.0.0          110          00:00:42
    55.3.0.0          110          00:00:42
    55.2.0.0          110          00:00:42
    55.1.0.0          110          00:00:42
  Distance: (default is 110)

```

Gambar 1.18 Routing Protokol Router 5

#### 4.6. Router 6

```

R6#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 0.6.0.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.0.1.0 0.0.0.3 area 0
    192.0.2.0 0.0.0.3 area 0
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway          Distance      Last Update
    55.5.0.1          110          00:00:29
  Distance: (default is 110)

```

Gambar 1.19 Routing Protokol Router 6

#### 4.7. Router 7

```

R7#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 0.7.115.1
  It is an area border router
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.0.2.0 0.0.0.3 area 0
    192.115.1.0 0.0.0.15 area 115
    192.115.2.0 0.0.0.15 area 115
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway          Distance      Last Update
    55.5.0.1          110          00:00:32
  Distance: (default is 110)

```

Gambar 1.20 Routing Protokol Router 7

#### 4.8. Router 8

```

R8#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 115.8.0.0
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.115.1.0 0.0.0.15 area 115
    192.115.3.0 0.0.0.255 area 115
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway         Distance         Last Update
    0.7.115.1        110              00:00:37
  Distance: (default is 110)

```

Gambar 1.21 Routing Protokol Router 8

#### 4.9. Router 9

```

R9#sh ip protocols
Routing Protocol is "ospf 26"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 115.9.0.0
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.115.2.0 0.0.0.15 area 115
    192.115.4.0 0.0.0.255 area 115
  Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway         Distance         Last Update
    0.7.115.1        110              00:00:45
    115.8.0.0        110              00:00:45
  Distance: (default is 110)

```

Gambar 1.22 Routing Protokol Router 9

### 5. Hasil Pengujian PING

#### 5.1. Ping PC1 ke PC2

```

PC1> ping 192.115.4.2
192.115.4.2 icmp_seq=1 timeout
192.115.4.2 icmp_seq=2 timeout
84 bytes from 192.115.4.2 icmp_seq=3 ttl=58 time=87.127 ms
84 bytes from 192.115.4.2 icmp_seq=4 ttl=58 time=88.653 ms
84 bytes from 192.115.4.2 icmp_seq=5 ttl=58 time=68.617 ms

```

Gambar 1.23 Hasil PING PC1 ke PC2

#### 5.2. Ping PC2 ke PC3



```
PC2> ping 192.115.3.2
84 bytes from 192.115.3.2 icmp_seq=1 ttl=61 time=57.629 ms
84 bytes from 192.115.3.2 icmp_seq=2 ttl=61 time=59.150 ms
84 bytes from 192.115.3.2 icmp_seq=3 ttl=61 time=58.230 ms
84 bytes from 192.115.3.2 icmp_seq=4 ttl=61 time=58.680 ms
84 bytes from 192.115.3.2 icmp_seq=5 ttl=61 time=57.697 ms
```

Gambar 1.24 Hasil PING PC2 ke PC3

### 5.3. Ping PC13 ke PC1

```
PC3> ping 192.168.55.2
192.168.55.2 icmp_seq=1 timeout
192.168.55.2 icmp_seq=2 timeout
84 bytes from 192.168.55.2 icmp_seq=3 ttl=58 time=100.160 ms
84 bytes from 192.168.55.2 icmp_seq=4 ttl=58 time=121.730 ms
84 bytes from 192.168.55.2 icmp_seq=5 ttl=58 time=122.725 ms
```

Gambar 1.25 Hasil PING PC3 ke PC1

## 6. Hasil Pengujian Trace

### 6.1. Trace PC2 ke PC1

```

PC2> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.4.1    10.140 ms  5.106 ms  10.058 ms
 2  192.115.2.2   103.629 ms 30.591 ms 30.724 ms
 3  192.0.2.1     61.597 ms 41.110 ms 52.081 ms
 4  192.0.1.2    241.201 ms 61.594 ms 72.103 ms
 5  192.55.1.1    301.334 ms 92.174 ms 93.151 ms
 6  192.55.2.2    302.294 ms 114.685 ms 113.646 ms
 7      * * *
 8  192.168.55.2   110.640 ms 4294966.879 ms 4294965.397 ms

PC2> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.4.1    9.120 ms  10.088 ms  10.088 ms
 2  192.115.2.2   31.043 ms  31.106 ms  40.588 ms
 3  192.0.2.1     52.105 ms  41.110 ms  30.544 ms
 4  192.0.1.2    62.095 ms  51.608 ms  61.613 ms
 5  192.55.1.1    72.111 ms  104.143 ms 115.172 ms
 6  192.55.3.2   280.740 ms 104.157 ms 124.134 ms
 7  192.55.5.2   374.388 ms 125.388 ms 136.216 ms
 8      * * *
 9  192.168.55.2   550.448 ms 4294966.881 ms 4294965.393 ms

PC2> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.4.1    9.093 ms  9.697 ms  10.033 ms
 2  192.115.2.2   30.092 ms  30.611 ms  29.638 ms
 3  192.0.2.1     31.093 ms  31.244 ms  30.068 ms
 4  192.0.1.2    52.225 ms  51.063 ms  51.135 ms
 5  192.55.1.1    62.604 ms  72.084 ms  61.630 ms
 6  192.55.4.2   601.929 ms  71.656 ms  82.630 ms
 7  192.55.7.1   133.687 ms  92.129 ms  104.150 ms
 8      * * *
 9  192.168.55.2   117.738 ms 4294966.598 ms 4294965.513 ms

PC2> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.4.1   10.093 ms  9.081 ms  10.031 ms
 2  192.115.2.2   30.583 ms  20.173 ms  30.086 ms
 3  192.0.2.1     41.117 ms  40.601 ms  40.100 ms
 4  192.0.1.2    51.608 ms  51.603 ms  52.054 ms
 5  192.55.1.1    61.615 ms  60.603 ms  62.619 ms
 6  192.55.4.2    62.640 ms  71.100 ms  73.096 ms
 7  192.55.6.2    92.620 ms  93.161 ms  93.290 ms
 8  192.55.5.2    92.627 ms  104.628 ms 103.941 ms
 9      * * *
10  192.168.55.2   108.158 ms 4294965.912 ms 4294964.427 ms

PC2> 

```

Gambar 1.26 Hasil Trace PC2 ke PC1

## 6.2. Trace PC3 ke PC1

```

PC3> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.3.1    9.587 ms  9.725 ms  9.597 ms
 2  192.115.1.2   30.951 ms  30.141 ms  30.131 ms
 3  192.0.2.1     51.114 ms  51.123 ms  51.139 ms
 4  192.0.1.2     72.351 ms  71.632 ms  73.141 ms
 5  192.55.1.1    72.607 ms  72.653 ms  71.700 ms
 6  192.55.2.2    93.613 ms  94.150 ms  93.972 ms
 7  192.168.55.2  104.113 ms  103.162 ms  103.705 ms

PC3> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.3.1    4.076 ms  9.581 ms  10.125 ms
 2  192.115.1.2   20.620 ms  19.554 ms  20.652 ms
 3  192.0.2.1     40.578 ms  30.042 ms  41.091 ms
 4  192.0.1.2     51.111 ms  51.628 ms  62.590 ms
 5  192.55.1.1    62.098 ms  62.103 ms  72.121 ms
 6  192.55.4.2   300.842 ms  102.680 ms  115.170 ms
 7  192.55.7.1   125.177 ms  124.155 ms  103.156 ms
 8  192.168.55.2  113.663 ms  114.114 ms  114.688 ms

PC3> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.3.1    9.224 ms  9.155 ms  9.158 ms
 2  192.115.1.2   31.469 ms  19.754 ms  30.569 ms
 3  192.0.2.1     51.592 ms  41.153 ms  51.133 ms
 4  192.0.1.2     72.583 ms  73.112 ms  72.619 ms
 5  192.55.1.1    93.610 ms  82.138 ms  93.141 ms
 6  192.55.3.2   103.167 ms  114.189 ms  114.210 ms
 7  192.55.5.2   134.703 ms  114.690 ms  125.254 ms
 8      * * *
 9  192.168.55.2  131.736 ms  4294966.032 ms  4294964.548 ms

PC3> trace 192.168.55.2 -P 1 -m 32
trace to 192.168.55.2, 32 hops max (ICMP), press Ctrl+C to stop
 1  192.115.3.1    9.551 ms  30.641 ms  10.102 ms
 2  192.115.1.2   41.104 ms  52.257 ms  30.188 ms
 3  192.0.2.1     82.122 ms  72.667 ms  62.758 ms
 4  192.0.1.2     82.940 ms  103.695 ms  92.671 ms
 5  192.55.1.1   124.643 ms  103.626 ms  105.079 ms
 6  192.55.3.2   113.738 ms  124.704 ms  125.268 ms
 7  192.55.6.1   374.324 ms  146.252 ms  157.189 ms
 8  192.55.7.1   134.616 ms  176.878 ms  323.332 ms
 9  192.168.55.2  134.643 ms  125.216 ms  146.675 ms

PC3> 

```

Gambar 1.27 Hasil Trace PC3 ke PC1