**LAPORAN PRAKTIKUM**

**Routing OSPF Lanjutan**



Oleh:

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***KEMENTRIAN RISET, TEKNOLOGI DAN PERGURUAN TINGGI***

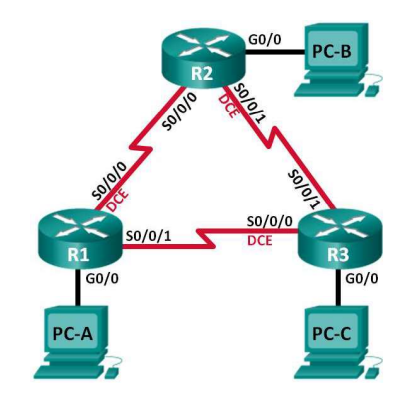
***POLITEKNIK NEGERI LHOKSEUMAWE***

***TAHUN AJARAN 2024/2025***

1. **Tujuan Praktikum**
2. Mempelajari prinsip kerja dan cara konfigurasi OSPF untuk memastikan paket dirutekan secara optimal dalam jaringan yang dibagi berdasarkan area.
3. Mahasiswa mampu mendesain jaringan dengan menerapkan konsep OSPF.
4. **Alat dan Bahan**

* Router Cisco
* PC atau laptop
* Kabel UTP
* Kabel Serial
* Software Packet Tracer

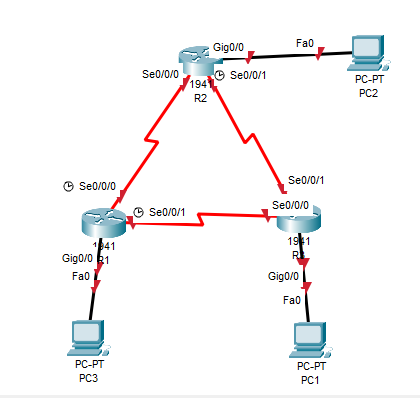
**Langkah Praktikum**

**Topology**

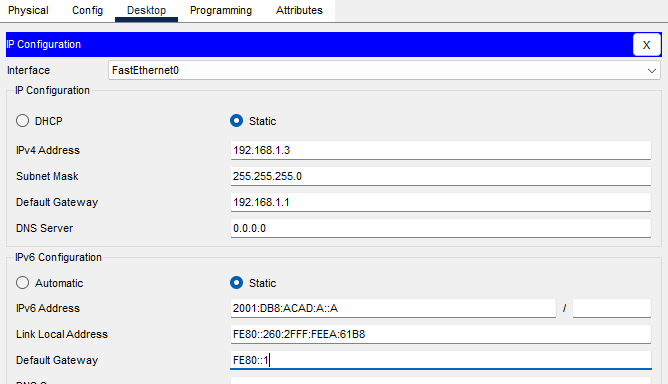
**Addressing Table**

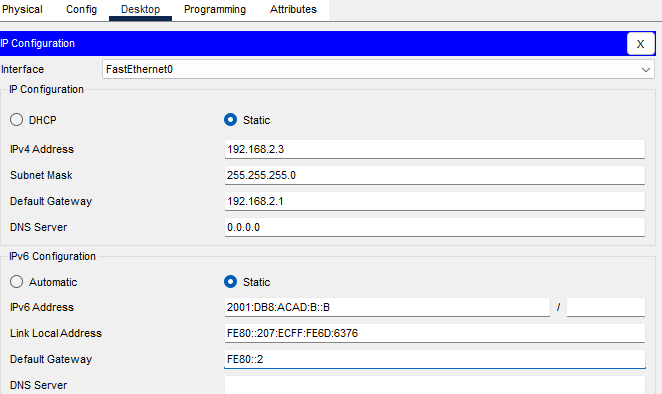
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **OSPF Router ID** | **Interface** | **IP Address** | **Default Gateway** |
| R1 | 1.1.1.1 | G0/0 | 192.168.1.1/24 | N/A |
| 2001:DB8:ACAD:A::1/64 |
| FE80::1 link-local |
|  |  | S0/0/0 | 192.168.12.1/30 | N/A |
| 2001:DB8:ACAD:12::1/64 |
| FE80::1 link-local |
|  |  | S0/0/1 | 192.18.13.1/30 | N/A |
| 2001:DB8:ACAD:13::1/64 |
| FE80::1 link-local |
| R2 | 2.2.2.2 | G0/0 | 192.168.2.1/24 | N/A |
| 2001:DB8:ACAD:B::2/64 |
| FE80::2 link-local |
|  |  | S0/0/0 | 192.168.12.2/30 | N/A |
| 2001:DB8:ACAD:12::2/64 |
| FE80::2 link-local |
|  |  | S0/0/1 | 192.168.23.1/30 | N/A |
| 2001:DB8:ACAD:23::2/64 |
| FE80::2 link-local |
| R3 | 3.3.3.3 | G0/0 | 192.168.3.1/24 | N/A |
| 2001:DB8:ACAD:C::3/64 |
| FE80::3 link-local |
|  |  | S0/0/0 | 192.168.13.2/30 | N/A |
| 2001:DB8:ACAD:13::3/64 |
| FE80::3 link-local |
|  |  | S0/0/1 | 192.168.23.2/30 | N/A |
| 2001:DB8:ACAD:23::3/64 |
| FE80::3 link-local |
| PC-A |  | NIC | 192.168.1.3/24 | 192.168.1.1 |
| 2001:DB8:ACAD:A::A/64 | FE80::1 |
| PC-B |  | NIC | 192.168.2.3/24 | 192.168.2.1 |
| 2001:DB8:ACAD:B::B/64 | FE80::2 |
| PC-C |  | NIC | 192.168.3.3/24 | 192.168.3.1 |
| 2001:DB8:ACAD:C::C/64 | FE80::3 |

**Bagian 1: Membangun Jaringan dan Memuat Konfigurasi Perangkat**

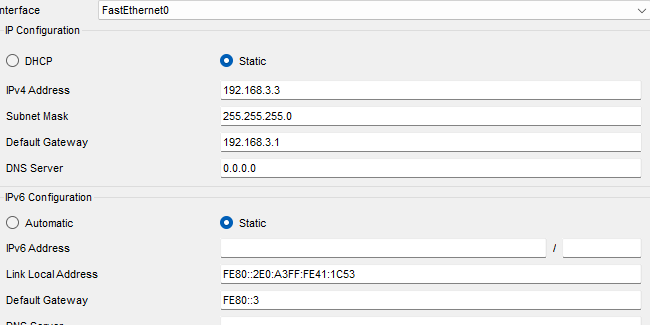
**Langkah 1: Sambungkan kabel jaringan seperti yang ditunjukkan dalam topologi.**

**Langkah 2: Konfigurasikan host PC.**

**PC-A**

**PC-B**

**PC-C**

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**Langkah 3: Memuat konfigurasi router.**

**Router R1 Configuration:**

*conf t*

*service password-encryption*

*no ip domain lookup*

*hostname R1*

*enable secret class*

*line con 0*

*logging synchronous*

*password cisco*

*login*

*line vty 0*

*password cisco*

*login*

*banner motd @Unauthorized Access is Prohibited!@*

*ipv6 unicast-routing*

*ipv6 router ospf 1*

*router-id 1.1.1.1*

*passive-interface g0/0*

*interface g0/0*

*ip address 192.168.1.1 255.255.255.0*

*ipv6 address 2001:db8:acad:a::1/64*

*ipv6 address fe80::1 link-local*

*interface s0/0/0*

*clock rate 128000*

*ip address 192.168.12.1 255.255.255.0*

*ipv6 address 2001:db8:acad:12::1/64*

*ipv6 address fe80::1 link-local*

*ipv6 ospf 1 area 0*

*no shutdown*

*interface s0/0/1*

*ip address 192.168.13.1 255.255.255.0*

*ipv6 address 2001:db8:acad:13::1/64*

*ipv6 address fe80::1 link-local*

*ipv6 ospf 1 area 0*

*no shutdown*

*router ospf 1*

*network 192.168.1.0 0.0.0.255 area 0*

*network 129.168.12.0 0.0.0.3 area 0*

*network 192.168.13.0 0.0.0.3 area 0*

*passive-interface g0/0*

*end*

**Router R2 Configuration:**

*conf t*

*service password-encryption*

*no ip domain lookup*

*hostname R2*

*enable secret class*

*line con 0*

*logging synchronous*

*password cisco*

*login*

*line vty 0*

*password cisco*

*login*

*banner motd @Unauthorized Access is Prohibited!@*

*ipv6 unicast-routing*

*ipv6 router ospf 1*

*router-id 2.2.2.2*

*interface g0/0*

*ip address 192.168.2.1 255.255.255.0*

*ipv6 address 2001:db8:acad:B::2/64*

*ipv6 address fe80::1 link-local*

*no shutdown*

*interface s0/0/0*

*ip address 192.168.12.2 255.255.255.252*

*ipv6 address 2001:db8:acad:12::2/64*

*ipv6 address fe80::2 link-local*

*ipv6 ospf 1 area 0*

*no shutdown*

*interface s0/0/1*

*clock rate 128000*

*ipv6 address 2001:db8:acad:23::2/64*

*ipv6 address fe80::2 link-local*

*no shutdown*

*router ospf 1*

*network 192.168.2.0 0.0.0.255 area 0*

*network 192.168.12.0 0.0.0.3 area 0*

*network 192.168.23.0 0.0.0.3 area 0*

*end*

**Router R3 Configuration:**

*conf t*

*service password-encryption*

*no ip domain lookup*

*enable secret class*

*hostname R3*

*line con 0*

*logging synchronous*

*password cisco*

*login*

*line vty 0*

*password cisco*

*login*

*banner motd @Unauthorized Access is Prohibited!@*

*interface g0/0*

*ipv6 address 2001:db8:acad:c::3/64*

*ipv6 address fe80::3 link-local*

*interface s0/0/0*

*clock rate 128000*

*ip address 192.168.13.1 255.255.255.252*

*ipv6 address 2001:db8:acad:13::3/64*

*ipv6 address fe80::3 link-local*

*no shutdown*

*interface s0/0/1*

*ip address 192.168.23.2 255.255.255.252*

*ipv6 address 2001:db8:acad:23::3/64*

*ipv6 address fe80::3 link-local*

*router ospf 1*

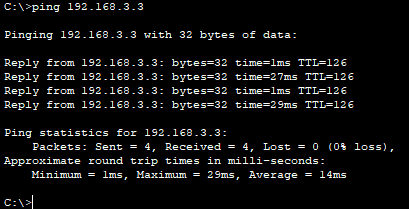
*network 192.168.3.0 0.0.0.255 area 0*

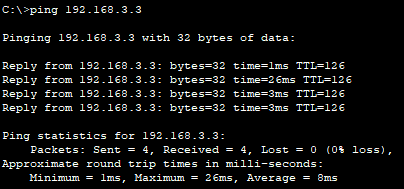
*passive-interface g0/0*

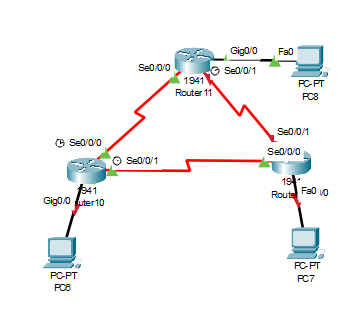
*end*

**Langkah 3: Melakukan tes ping**

**Ping Pc 1 ke Pc 3**

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**Ping Pc 2 ke 3**

**Bagian 2 : Topologi Ospf Lanjutan**

**Konfigurasi R1**

Router>en

Router#conf t

**Konfigurasi Keamanan**

Router(config)#service password-encryption

Router(config)#no ip domain lookup

Router(config)#hostname R1

R1(config)#enable secret class

**Konfigurasi Konsol dan Akses Remote Konsol :**

R1(config)#line con 0

R1(config-line)#logging synchronous

R1(config-line)#password cisco

R1(config-line)#login

Virtual Terminal (VTY):

R1(config)#line vty 0

R1(config-line)#password cisco

R1(config-line)#login

Pesan Banner

R1(config)#banner motd @Unauthorrized Access is Prohibited!@

**Konfigurasi IPv6 dan Routing OSPF IPv6 Unicast Routing:**

R1(config)#ipv6 unicast-routing

**OSPFv3 (IPv6):**

R1(config)#ipv6 router ospf 1

R1(config-rtr)#router-id 1.1.1.1

R1(config-rtr)#passive-interface g0/0

**Konfigurasi Interface Interface GigabitEthernet 0/0:**

R1(config)#interface g0/0

R1(config-if)#ip add 192.168.1.1 255.255.255.0

R1(config-if)#ipv6 address 2001:db8:acad:a::1/64

R1(config-if)#ipv6 address fe80::1 link-local

**Interface Serial 0/0/0:**

R1(config)#int s0/0/0

R1(config-if)#clock rate 128000

R1(config-if)#ip add 192.168.12.1 255.255.255.252

R1(config-if)#ipv6 add 2001:db8:acad:12::1/64

R1(config-if)#ipv6 ospf 1 area 0

R1(config-if)#no sh

Interface Serial 0/0/1:

R1(config)#int s0/0/1

R1(config-if)#ip add 192.168.13.1 255.255.255.252

R1(config-if)#ipv6 add 2001:db8:acad:13::1/64

R1(config-if)#ipv6 ospf 1 area 0

R1(config-if)#no sh

**OSPFv2 (IPv4)**

R1(config)#router ospf 1

R1(config-router)#network 192.168.1.0 0.0.0.255 area 0

R1(config-router)#network 192.168.12.0 0.0.0.3 area 0

R1(config-router)#network 192.168.13.0 0.0.0.3 area 0

R1(config-router)#passive-interface g0/0

**Konfigurasi R2**

Router(config)#hostname R2

**Service Password Encryption:**

Router(config)#service password-encryption

**Disable IP Domain Lookup:**

Router(config)#no ip domain lookup

**Password dan Login**

**Enable Secret Password:**

R2(config)#enable secret class

**Console Line Configuration:**

R2(config-line)#password cisco

R2(config-line)#login

R2(config-line)#logging synchronous

**VTY Line Configuration:**

R2(config-line)#password cisco

R2(config-line)#login

**Banner**

R2(config)#banner motd @Unathorized Access is Prohibited!@

**IPv6 Routing dan OSPFv3**

**Enable IPv6 Routing:**

R2(config)#ipv6 unicast-routing

**Konfigurasi OSPFv3:**

R2(config)#ipv6 router ospf 1

R2(config-rtr)#router-id 2.2.2.2

**Interface Configuration**

**GigabitEthernet 0/0:**

R2(config-if)#ip add 192.168.2.1 255.255.255.0

R2(config-if)#ipv6 add 2001:db8:acad:B::2/64

R2(config-if)#no shutdown

**Serial 0/0/0:**

R2(config-if)#ip add 192.168.12.2 255.255.255.252

R2(config-if)#ipv6 add 2001:db8:acad:12::2/64

R2(config-if)#no shutdown

**Serial 0/0/1:**

R2(config-if)#clock rate 128000

R2(config-if)#ipv6 add 2001:db8:acad:23::2/64

R2(config-if)#no shutdown

**Konfigurasi OSPF untuk IPv4**

**Router OSPF Configuration:**

R2(config-router)#network 192.168.2.0 0.0.0.255 area 0

R2(config-router)#network 192.168.12.0 0.0.0.3 area 0

R2(config-router)#network 192.168.23.0 0.0.0.3 area 0

**Konfigurasi R3**

Router>enable

Router#configure terminal

**! Pengamanan dasar router**

service password-encryption

no ip domain lookup

enable secret class

**! Memberikan nama pada router**

hostname R3

**! Konfigurasi keamanan akses console**

line console 0

logging synchronous

password cisco

login

exit

**! Konfigurasi keamanan akses VTY**

line vty 0 4

password cisco

login

exit

**! Banner MOTD (Message of the Day)**

banner motd @

Unauthorized Access is Prohibited!

@

**! Mengaktifkan IPv6 routing**

ipv6 unicast-routing

**! Konfigurasi interface GigabitEthernet 0/0**

interface GigabitEthernet0/0

ip address 192.168.3.1 255.255.255.0

ipv6 address 2001:db8:acad:c::3/64

ipv6 address fe80::3 link-local

no shutdown

exit

**! Konfigurasi interface Serial 0/0/0**

interface Serial0/0/0

clock rate 128000

ip address 192.168.13.1 255.255.255.252

ipv6 address 2001:db8:acad:13::3/64

ipv6 address fe80::3 link-local

no shutdown

exit

**! Konfigurasi interface Serial 0/0/1**

interface Serial0/0/1

ip address 192.168.23.2 255.255.255.252

ipv6 address 2001:db8:acad:23::3/64

ipv6 address fe80::3 link-local

no shutdown

exit

**! Konfigurasi OSPF untuk IPv4**

router ospf 1

network 192.168.3.0 0.0.0.255 area 0

network 192.168.13.0 0.0.0.3 area 0

network 192.168.23.0 0.0.0.3 area 0

passive-interface GigabitEthernet0/0

exit

**! Konfigurasi OSPF untuk IPv6**

ipv6 router ospf 1

router-id 3.3.3.3

exit

**! Mengaktifkan OSPF untuk IPv6 pada interface**

interface GigabitEthernet0/0

ipv6 ospf 1 area 0

exit

interface Serial0/0/0

ipv6 ospf 1 area 0

exit

interface Serial0/0/1

ipv6 ospf 1 area 0

exit

**! Menyimpan konfigurasi**

end

write memory