Sybau Labubu Tracer
Nayaka Ghana Subrata - 13523090

Setelah melakukan beberapa analisis dan juga memahami *requirement gathering* dari spesifikasi yang diberikan, *goals* utamanya adalah untuk membuat 4 region topologi jaringan dengan masing-masing memiliki 3 bagian yang sama, yakni *government*, *enterprise*, dan *public* pada “cisco packet tracer”.

Pertama, rangkai topologinya (perangkat kerasnya), mulai saja dari sebuah negara terlebih dahulu, dengan mengikuti sketsa diagram di bawah.

Gokouloryn (.gk):

```
Global_External_Switch (2960)
└──(Copper ST) Fa0/1 ⇄ Gi0/0 Gokouloryn_Border (1941) [AS 65001]
                   |
                   | (Backbone Network 10.1.0.0/24)
                   └── Fa0/1 Gokouloryn_CoreSW (2960) ⇄ Gi0/1
Gokouloryn_Border [10.1.0.1]

Gokouloryn_CoreSW (2960)
├──(Copper ST) Fa0/2 ⇄ Gi0/0 Gokouloryn_Government (1941)
[10.1.0.2]
│      |
│      └──(LAN Gov) Fa0/1 Gokouloryn_GovSW (2960) ⇄ Gi0/1
Gokouloryn_Government
│            └──(Clients) Fa0/2 Gokouloryn_GovSW ⇄ NIC
Gokouloryn_GovPC1 [DHCP]
│
├──(Copper ST) Fa0/3 ⇄ Gi0/0 Gokouloryn_Enterprise (1941)
[10.1.0.3]
│      |
│      └──(LAN Ent) Fa0/1 Gokouloryn_EntSW (2960) ⇄ Gi0/1
Gokouloryn_Enterprise
│            ├── Fa0/2 EntSW ⇄ NIC Gokouloryn_DHCP  [STATIC
10.1.20.2]
│            ├── Fa0/3 EntSW ⇄ NIC Gokouloryn_DNS   [STATIC
10.1.20.10]
│            ├── Fa0/4 EntSW ⇄ NIC Gokouloryn_Web   [STATIC
10.1.20.20]
│            └── Fa0/5 EntSW ⇄ NIC Gokouloryn_EntPC1[DHCP]
│
└──(Copper ST) Fa0/4 ⇄ Gi0/0 Gokouloryn_Public (1941) [10.1.0.4]
       |
       └──(LAN Pub) Fa0/1 Gokouloryn_PubSW (2960) ⇄ Gi0/1
Gokouloryn_Public
             ├── Fa0/2 PubSW ⇄ NIC Gokouloryn_PubPC1      [DHCP]
             ├── Fa0/3 PubSW ⇄ NIC Gokouloryn_PubTestEven [STATIC
10.1.30.100]
             └── Fa0/4 PubSW ⇄ NIC Gokouloryn_PubTestOdd  [STATIC
10.1.30.101]
```

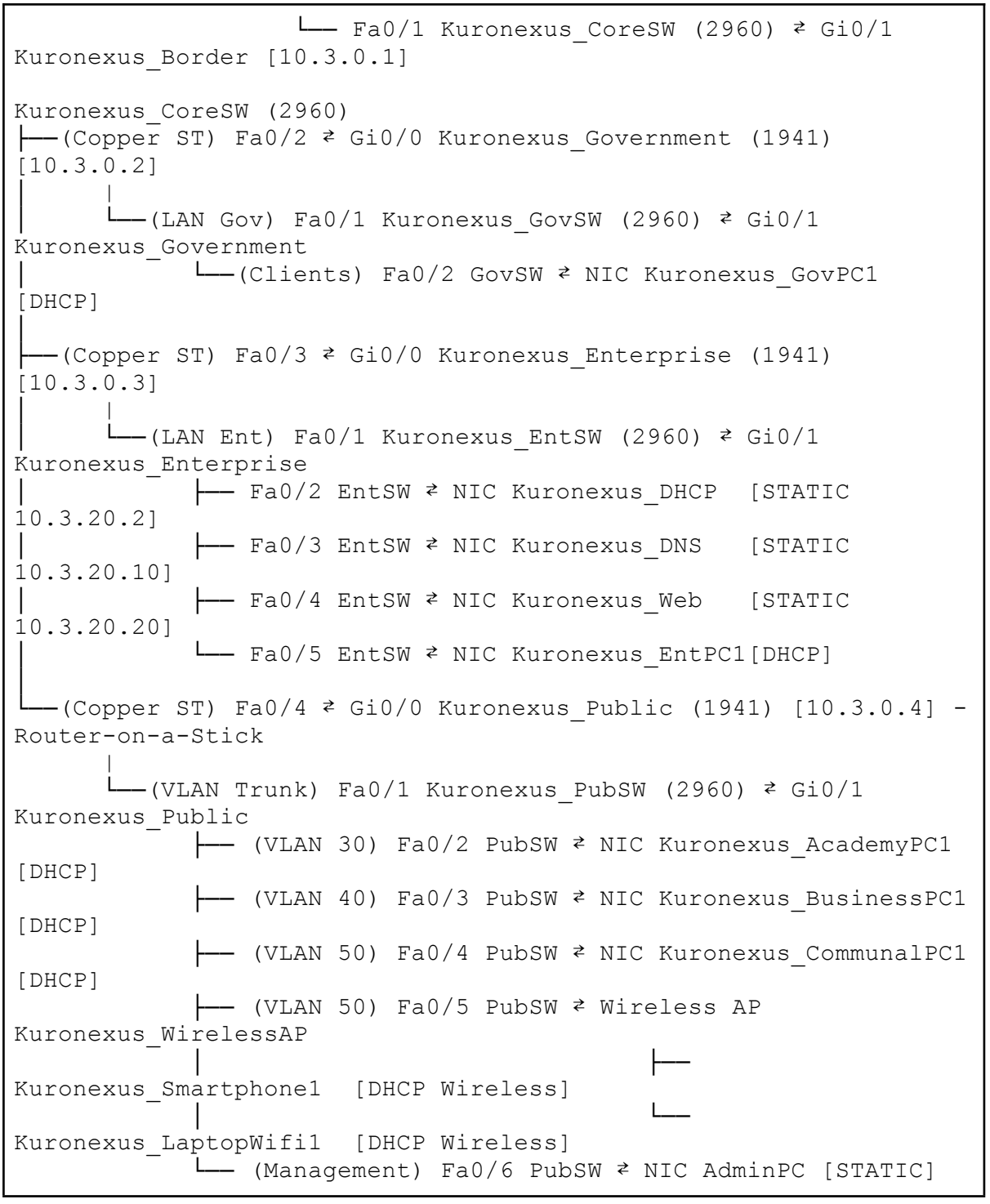
Rurinthia (.rr):

```
Global_External_Switch (2960)
└──(Copper ST) Fa0/2 ⇄ Gi0/0 Rurinthia_Border (1941) [AS 65002]
                   | [IPv4: 192.168.100.2, IPv6:
2001:DB8:100::2/64]
                   |
                   | (Backbone Network - Dual Stack)
                   └── Fa0/1 Rurinthia_CoreSW (2960) ⇄ Gi0/1
Rurinthia_Border [10.2.0.1, 2001:DB8:2::1]

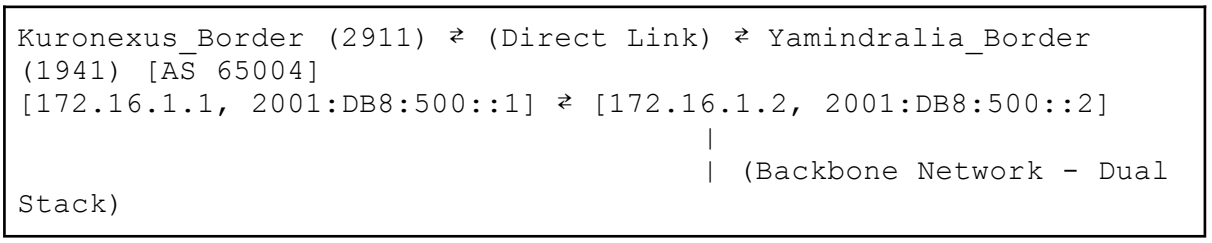
Rurinthia_CoreSW (2960)
├──(Copper ST) Fa0/2 ⇄ Gi0/0 Rurinthia_Government (1941)
[10.2.0.2, 2001:DB8:2::2/64]
│      |
│      └──(LAN Gov) Fa0/1 Rurinthia_GovSW (2960) ⇄ Gi0/1
Rurinthia_Government
│            └──(Clients) Fa0/2 GovSW ⇄ NIC Rurinthia_GovPC1 [DHCP
v4/v6]
│
├──(Copper ST) Fa0/3 ⇄ Gi0/0 Rurinthia_Enterprise (1941)
[10.2.0.3, 2001:DB8:2::3/64]
│      |
│      └──(LAN Ent) Fa0/1 Rurinthia_EntSW (2960) ⇄ Gi0/1
Rurinthia_Enterprise
│            ├── Fa0/2 EntSW ⇄ NIC Rurinthia_DHCP  [STATIC
10.2.20.2, 2001:DB8:20::2/64]
│            ├── Fa0/3 EntSW ⇄ NIC Rurinthia_DNS   [STATIC
10.2.20.10, 2001:DB8:20::10/64]
│            ├── Fa0/4 EntSW ⇄ NIC Rurinthia_Web   [STATIC
10.2.20.20, 2001:DB8:20::20/64]
│            └── Fa0/5 EntSW ⇄ NIC Rurinthia_EntPC1[DHCP v4/v6]
│
└──(Copper ST) Fa0/4 ⇄ Gi0/0 Rurinthia_Public (1941) [10.2.0.4,
2001:DB8:2::4/64]
      |
      └──(LAN Pub) Fa0/1 Rurinthia_PubSW (2960) ⇄ Gi0/1
Rurinthia_Public
            └── Fa0/2 PubSW ⇄ NIC Rurinthia_PubPC1 [DHCP v4/v6]
```

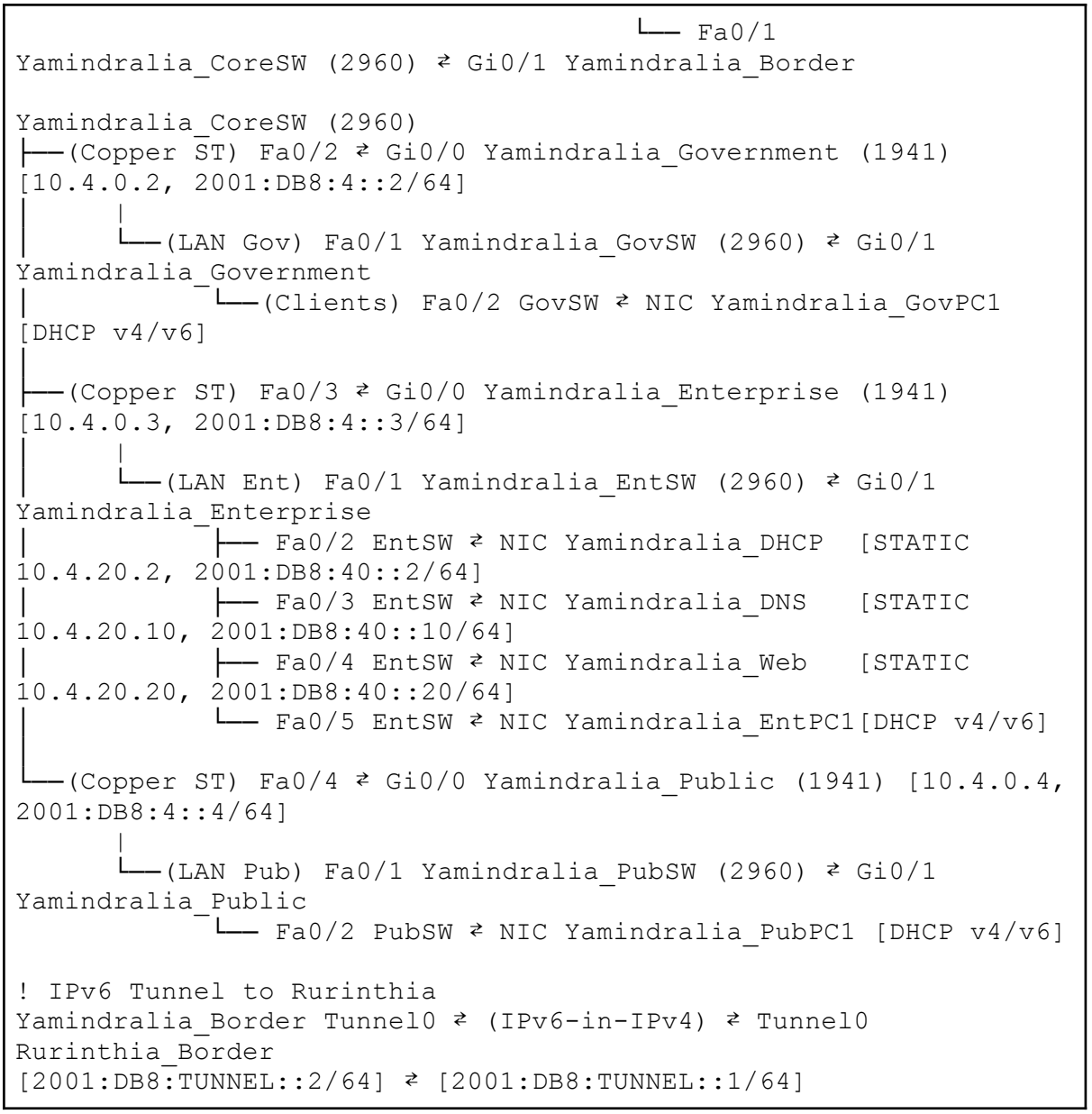
Kuronexus (.kr):

```
Global_External_Switch (2960)
└──(Copper ST) Fa0/3 ⇄ Gi0/0 Kuronexus_Border (2911) [AS 65003]
                   | [IPv4: 192.168.100.3]
                   |
                   ├── Gi0/2 ⇄ Gi0/0 Yamindralia_Border (Direct
Link: 172.16.1.1 ⇄ 172.16.1.2)
                   |
                   | (Backbone Network)
```

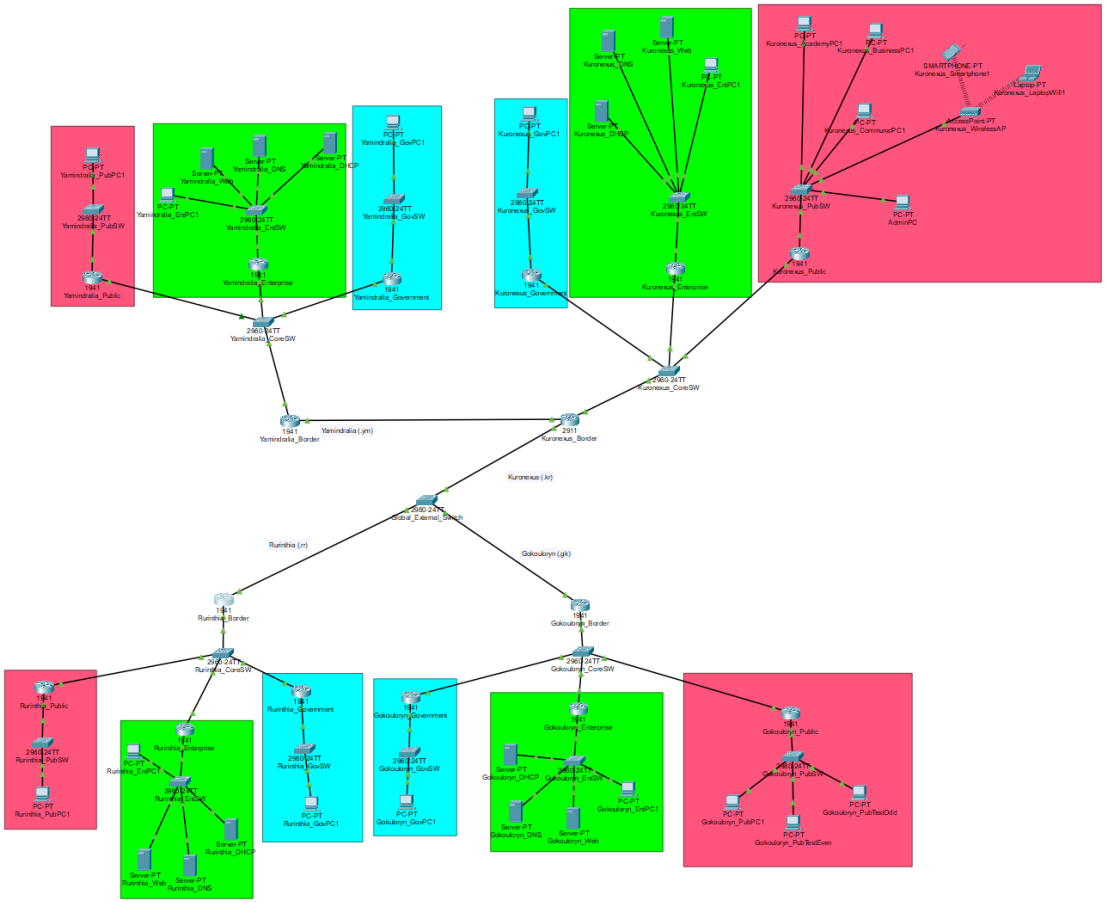


Yamindralia (.ym):





Dan berikut adalah implementasi pada cisco:



Atau bisa melihatnya pada github.

Pada gambar di atas, terdapat 3 daerah yang dibagi menjadi beberapa warna. Warna merah menunjukkan daerah *public*, warna hijau menunjukkan daerah *enterprise*, dan warna biru menunjukkan daerah *government*.

Selanjutnya, untuk masing-masing region, lakukan *setup* pada *routing, config, telnet/ssh,* dan lainnya.

A. Gokouloryn

Berikut adalah skema alamat IP-nya:

Zona	Network	Gateway	DHCP range	Server IP
External	192.168.100.0/24	-	-	Border: 192.168.100.1
Backbone	10.1.0.0/24	-	-	Border: 10.1.0.1, Gov: 10.1.0.2, Ent:

				10.1.0.3, Pub: 10.1.0.4
Government	10.1.10.0/24	10.1.10.1	10.1.10.10-50	-
Enterprise	10.1.20.0/24	10.1.20.1	10.1.20.50-100	DHCP:10.1.20.2, DNS:10.1.20.10, Web:10.1.20.20
Public	10.1.30.0/24	10.1.30.1	10.1.30.10-50	Test devices: .100, .101

Dan berikut adalah *setup* dari negara Gokouloryn:

1. ***Gokouloryn_Border (Router 1941)***

```
Router>enable
Router#configure terminal
Router(config)#hostname Gokouloryn_Border
Gokouloryn_Border(config)#

! Interface ke External Network
Gokouloryn_Border(config)#interface GigabitEthernet0/0
Gokouloryn_Border(config-if)#ip address 192.168.100.1
255.255.255.0
Gokouloryn_Border(config-if)#no shutdown
Gokouloryn_Border(config-if)#exit

! Interface ke Core Switch (Backbone Area 0)
Gokouloryn_Border(config)#interface GigabitEthernet0/1
Gokouloryn_Border(config-if)#ip address 10.1.0.1
255.255.255.0
Gokouloryn_Border(config-if)#no shutdown
Gokouloryn_Border(config-if)#exit

! OSPF Configuration
Gokouloryn_Border(config)#router ospf 1
Gokouloryn_Border(config-router)#router-id 1.1.1.1
Gokouloryn_Border(config-router)#network 10.1.0.0 0.0.0.255
area 0
Gokouloryn_Border(config-router)#exit

! BGP Configuration
Gokouloryn_Border(config)#router bgp 65001
Gokouloryn_Border(config-router)#bgp router-id 1.1.1.1
Gokouloryn_Border(config-router)#network 10.1.0.0 mask
255.255.255.0
Gokouloryn_Border(config-router)#network 10.1.10.0 mask
255.255.255.0
Gokouloryn_Border(config-router)#network 10.1.20.0 mask
```

```
255.255.255.0
Gokouloryn_Border(config-router)#network 10.1.30.0 mask
255.255.255.0
Gokouloryn_Border(config-router)#redistribute ospf 1
Gokouloryn_Border(config-router)#exit

! Redistribution OSPF to BGP
Gokouloryn_Border(config)#router ospf 1
Gokouloryn_Border(config-router)#redistribute bgp 65001
subnets
Gokouloryn_Border(config-router)#exit

! NAT Configuration (PAT for even IP addresses)
Gokouloryn_Border(config)#access-list 101 permit ip host
10.1.30.100 any
Gokouloryn_Border(config)#access-list 101 permit ip host
10.1.30.102 any
Gokouloryn_Border(config)#access-list 101 permit ip host
10.1.30.104 any
Gokouloryn_Border(config)#access-list 101 permit ip host
10.1.30.106 any
Gokouloryn_Border(config)#access-list 101 permit ip host
10.1.30.108 any
Gokouloryn_Border(config)#access-list 101 permit ip host
10.1.30.110 any
Gokouloryn_Border(config)#ip nat inside source list 101
interface GigabitEthernet0/0 overload
Gokouloryn_Border(config)#interface GigabitEthernet0/0
Gokouloryn_Border(config-if)#ip nat outside
Gokouloryn_Border(config-if)#exit
Gokouloryn_Border(config)#interface GigabitEthernet0/1
Gokouloryn_Border(config-if)#ip nat inside
Gokouloryn_Border(config-if)#exit

! SSH/Telnet Configuration
Gokouloryn_Border(config)#username admin password cisco123
Gokouloryn_Border(config)#enable password cisco123
Gokouloryn_Border(config)#ip domain-name gokouloryn.local
Gokouloryn_Border(config)#crypto key generate rsa
! (Choose 1024 bits when prompted)
Gokouloryn_Border(config)#line vty 0 4
Gokouloryn_Border(config-line)#login local
Gokouloryn_Border(config-line)#transport input all
! Alternative: transport input telnet ssh (if above doesn't
work)
Gokouloryn_Border(config-line)#exec-timeout 5 0
Gokouloryn_Border(config-line)#exit
Gokouloryn_Border(config)#ip ssh version 2
Gokouloryn_Border(config)#exit
```

2. Gokouloryn_Government (Router 1941)

```
Router>enable
Router#configure terminal
Router(config)#hostname Gokouloryn_Government
Gokouloryn_Government(config)#

! Interface ke Core Switch (Backbone)
Gokouloryn_Government(config)#interface GigabitEthernet0/0
Gokouloryn_Government(config-if)#ip address 10.1.0.2
255.255.255.0
Gokouloryn_Government(config-if)#no shutdown
Gokouloryn_Government(config-if)#exit

! Interface ke Government Zone
Gokouloryn_Government(config)#interface GigabitEthernet0/1
Gokouloryn_Government(config-if)#ip address 10.1.10.1
255.255.255.0
Gokouloryn_Government(config-if)#no shutdown
Gokouloryn_Government(config-if)#exit

! OSPF Configuration
Gokouloryn_Government(config)#router ospf 1
Gokouloryn_Government(config-router)#router-id 1.1.1.2
Gokouloryn_Government(config-router)#network 10.1.0.0
0.0.0.255 area 0
Gokouloryn_Government(config-router)#network 10.1.10.0
0.0.0.255 area 10
Gokouloryn_Government(config-router)#exit

! ACL for Government Zone Security (CORRECTED)
Gokouloryn_Government(config)#no ip access-list extended
GOV_SECURITY
Gokouloryn_Government(config)#ip access-list extended
GOV_SECURITY
! Allow Government zone outbound traffic
Gokouloryn_Government(config-ext-nacl)#permit ip 10.1.10.0
0.0.0.255 any
! Allow established connections (return traffic)
Gokouloryn_Government(config-ext-nacl)#permit tcp any
10.1.10.0 0.0.0.255 established
! Allow DHCP traffic
Gokouloryn_Government(config-ext-nacl)#permit udp any eq 67
10.1.10.0 0.0.0.255 eq 68
Gokouloryn_Government(config-ext-nacl)#permit udp 10.1.10.0
0.0.0.255 eq 68 any eq 67
! Allow DNS responses
Gokouloryn_Government(config-ext-nacl)#permit udp any eq 53
10.1.10.0 0.0.0.255
! Allow OSPF routing protocol
Gokouloryn_Government(config-ext-nacl)#permit ospf any any
! Allow ICMP replies only (not requests)
Gokouloryn_Government(config-ext-nacl)#permit icmp any
10.1.10.0 0.0.0.255 echo-reply
! BLOCK all other inbound traffic to Government zone
Gokouloryn_Government(config-ext-nacl)#deny ip any
10.1.10.0 0.0.0.255
```

```
! Allow all other traffic (between other zones)
Gokouloryn_Government(config-ext-nacl)#permit ip any any
Gokouloryn_Government(config-ext-nacl)#exit

! Apply ACL to the correct interface and direction
Gokouloryn_Government(config)#interface GigabitEthernet0/0
Gokouloryn_Government(config-if)#ip access-group
GOV_SECURITY in
Gokouloryn_Government(config-if)#exit

! DHCP Helper Address
Gokouloryn_Government(config)#interface GigabitEthernet0/1
Gokouloryn_Government(config-if)#ip helper-address
10.1.20.2
Gokouloryn_Government(config-if)#exit
```

3. *Gokouloryn_Enterprise (Router 1941)*

```
Router>enable
Router#configure terminal
Router(config)#hostname Gokouloryn_Enterprise
Gokouloryn_Enterprise(config)#

! Interface ke Core Switch (Backbone)
Gokouloryn_Enterprise(config)#interface GigabitEthernet0/0
Gokouloryn_Enterprise(config-if)#ip address 10.1.0.3
255.255.255.0
Gokouloryn_Enterprise(config-if)#no shutdown
Gokouloryn_Enterprise(config-if)#exit

! Interface ke Enterprise Zone
Gokouloryn_Enterprise(config)#interface GigabitEthernet0/1
Gokouloryn_Enterprise(config-if)#ip address 10.1.20.1
255.255.255.0
Gokouloryn_Enterprise(config-if)#no shutdown
Gokouloryn_Enterprise(config-if)#exit

! OSPF Configuration
Gokouloryn_Enterprise(config)#router ospf 1
Gokouloryn_Enterprise(config-router)#router-id 1.1.1.3
Gokouloryn_Enterprise(config-router)#network 10.1.0.0
0.0.0.255 area 0
Gokouloryn_Enterprise(config-router)#network 10.1.20.0
0.0.0.255 area 20
Gokouloryn_Enterprise(config-router)#exit

! ACL for Enterprise Zone Security (HTTPS, DNS, DHCP only +
Gov full access)
Gokouloryn_Enterprise(config)#ip access-list extended
ENT_SECURITY
Gokouloryn_Enterprise(config-ext-nacl)#permit tcp any
10.1.20.0 0.0.0.255 eq 443
```

```
Gokouloryn_Enterprise(config-ext-nacl)#permit tcp 10.1.20.0
0.0.0.255 any eq 443
Gokouloryn_Enterprise(config-ext-nacl)#permit udp any
10.1.20.0 0.0.0.255 eq 53
Gokouloryn_Enterprise(config-ext-nacl)#permit udp 10.1.20.0
0.0.0.255 any eq 53
Gokouloryn_Enterprise(config-ext-nacl)#permit udp any eq 67
10.1.20.0 0.0.0.255 eq 68
Gokouloryn_Enterprise(config-ext-nacl)#permit udp 10.1.20.0
0.0.0.255 eq 67 any eq 68
Gokouloryn_Enterprise(config-ext-nacl)#permit ip 10.1.10.0
0.0.0.255 10.1.20.0 0.0.0.255
Gokouloryn_Enterprise(config-ext-nacl)#permit ip 10.1.20.0
0.0.0.255 10.1.10.0 0.0.0.255
Gokouloryn_Enterprise(config-ext-nacl)#permit ospf any any
Gokouloryn_Enterprise(config-ext-nacl)#permit icmp any any
Gokouloryn_Enterprise(config-ext-nacl)#permit tcp any any
eq 80
Gokouloryn_Enterprise(config-ext-nacl)#permit tcp 10.1.20.0
0.0.0.255 any established
Gokouloryn_Enterprise(config-ext-nacl)#permit ip 10.1.20.0
0.0.0.255 any
Gokouloryn_Enterprise(config-ext-nacl)#exit
Gokouloryn_Enterprise(config)#interface GigabitEthernet0/1
Gokouloryn_Enterprise(config-if)#ip access-group
ENT_SECURITY in
Gokouloryn_Enterprise(config-if)#exit
```(config)#access-list 120 permit udp any eq 68 any eq 67
Gokouloryn_Enterprise(config)#access-list 120 permit udp
any eq 67 any eq 68
Gokouloryn_Enterprise(config)#access-list 120 permit ip
10.1.10.0 0.0.0.255 10.1.20.0 0.0.0.255
Gokouloryn_Enterprise(config)#access-list 120 permit ospf
any any
Gokouloryn_Enterprise(config)#access-list 120 permit icmp
any any echo-reply
Gokouloryn_Enterprise(config)#access-list 120 deny ip any
10.1.20.0 0.0.0.255
Gokouloryn_Enterprise(config)#access-list 120 permit ip any
any
Gokouloryn_Enterprise(config)#interface GigabitEthernet0/1
Gokouloryn_Enterprise(config-if)#ip access-group 120 in
Gokouloryn_Enterprise(config-if)#exit
```

### 4. *Gokouloryn_Public (Router 1941)*

```
Router>enable
Router#configure terminal
Router(config)#hostname Gokouloryn_Public
Gokouloryn_Public(config)#

! Interface ke Core Switch (Backbone)
```
```

```
Gokouloryn_Public(config)#interface GigabitEthernet0/0
Gokouloryn_Public(config-if)#ip address 10.1.0.4
255.255.255.0
Gokouloryn_Public(config-if)#no shutdown
Gokouloryn_Public(config-if)#exit

! Interface ke Public Zone
Gokouloryn_Public(config)#interface GigabitEthernet0/1
Gokouloryn_Public(config-if)#ip address 10.1.30.1
255.255.255.0
Gokouloryn_Public(config-if)#no shutdown
Gokouloryn_Public(config-if)#exit

! OSPF Configuration
Gokouloryn_Public(config)#router ospf 1
Gokouloryn_Public(config-router)#router-id 1.1.1.4
Gokouloryn_Public(config-router)#network 10.1.0.0 0.0.0.255
area 0
Gokouloryn_Public(config-router)#network 10.1.30.0
0.0.0.255 area 30
Gokouloryn_Public(config-router)#exit

! DHCP Helper Address
Gokouloryn_Public(config)#interface GigabitEthernet0/1
Gokouloryn_Public(config-if)#ip helper-address 10.1.20.2
Gokouloryn_Public(config-if)#exit
```

Server Configuration

A. DHCP Server

Konfigurasi Network Settings:

- **IP Address: `10.1.20.2`**
- **Subnet Mask: `255.255.255.0`**
- **Default Gateway: `10.1.20.1`**
- **DNS Server: `10.1.20.10`**

DHCP Service Configuration (via GUI Services tab):

```
! DHCP Pool untuk Government Zone
Pool Name: GOV_POOL
Default Gateway: 10.1.10.1
DNS Server: 10.1.20.10
Start IP Address: 10.1.10.10
Subnet Mask: 255.255.255.0
```

```
Maximum Users: 40

! DHCP Pool untuk Enterprise Zone
Pool Name: ENT_POOL
Default Gateway: 10.1.20.1
DNS Server: 10.1.20.10
Start IP Address: 10.1.20.50
Subnet Mask: 255.255.255.0
Maximum Users: 50

! DHCP Pool untuk Public Zone
Pool Name: PUB_POOL
Default Gateway: 10.1.30.1
DNS Server: 10.1.20.10
Start IP Address: 10.1.30.10
Subnet Mask: 255.255.255.0
Maximum Users: 40
```

B. DNS Server

Konfigurasi Network Settings:

- **IP Address:** `10.1.20.2`
- **Subnet Mask:** `255.255.255.0`
- **Default Gateway:** `10.1.20.1`
- **DNS Server:** `10.1.20.10`

DNS Service Configuration (via GUI Services tab):

```
! DNS Records (Add via GUI)
Type: A Record
Name: web.gk
Address: 10.1.20.20

Type: A Record
Name: border.gk
Address: 192.168.100.1

Type: A Record
Name: gokouloryn.gk
Address: 10.1.20.20

Type: A Record
Name: web.rr
Address: 10.2.20.20

Type: A Record
Name: web.kr
Address: 10.3.20.20
```

```
Type: A Record
Name: web.ym
Address: 10.4.20.20

Type: A Record
Name: border.rr
Address: 192.168.100.2

Type: A Record
Name: border.kr
Address: 192.168.100.3

Type: A Record
Name: border.ym
Address: 172.16.1.2

! DNS Settings
DNS Service: ON
```

C. Web Server

Konfigurasi Network Settings:

- **IP Address:** `10.1.20.20`
- **Subnet Mask:** `255.255.255.0`
- **Default Gateway:** `10.1.20.1`
- **DNS Server:** `10.1.20.10`

HTTP Service Configuration (via GUI Services tab):

```
<!DOCTYPE html>
<html>
<head>
    <title>Welcome to Gokouloryn</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #f0f8ff;
            margin: 0;
            padding: 20px;
        }
        .header {
            color: #0066cc;
            text-align: center;
            border-bottom: 3px solid #0066cc;
            padding-bottom: 10px;
```

```
        }
        .content {
            margin-top: 20px;
            text-align: center;
        }
    </style>
</head>
<body>
    <div class="header">
        <h1>Welcome to Gokouloryn National Web Portal</h1>
        <h2>Republic of Gokouloryn</h2>
    </div>
    <div class="content">
        <p>This is the official website of the Republic of
Gokouloryn</p>
        <p><strong>Server Details:</strong></p>
        <ul style="list-style: none;">
            <li>Server IP: 10.1.20.20</li>
            <li>Domain: web.gk</li>
            <li>Country TLD: .gk</li>
            <li>AS Number: 65001</li>
        </ul>
        <p><em>Serving the citizens of Gokouloryn since
2025</em></p>
    </div>
</body>
</html>
```

B. Kuronexus

Berikut adalah skema alamat IP-nya:

Zona	**Network**	**Vlan**	**Gateway**	**DHCP range**	**Special**
External	192.168.100.3/24	-	-	-	Border Router
Link to Yamindralia	172.16.1.0/30	-	-	-	Kuronexus: .1, Yamindralia: .2
Backbone	10.3.0.0/24	-	-	-	Border: .1, Gov: .2, Ent: .3, Pub: .4
Government	10.3.10.0/24	-	10.3.10.1	10.3.10.10-50	-

Enterprise	10.3.20.0/24	-	10.3.20.1	10.3.20.50-100	DHCP:.2, DNS:.10, Web:.20
Public Academy	10.3.30.0/24	30	10.3.30.1	10.3.30.10-50	Educational
Public Business	10.3.40.0/24	40	10.3.40.1	10.3.40.10-50	Commercial
Public Communal	10.3.50.0/24	50	10.3.50.1	10.3.50.10-80	Public + Wireless

Dan berikut adalah *setup* dari negara Kuronexus:

1. ***Kuronexus_Border (Router 2911)***

```
enable
configure terminal
hostname Kuronexus_Border

! External Interface
interface GigabitEthernet0/0
ip address 192.168.100.3 255.255.255.0
no shutdown
exit

! Backbone Interface
interface GigabitEthernet0/1
ip address 10.3.0.1 255.255.255.0
no shutdown
exit

! Link to Yamindralia
interface GigabitEthernet0/2
ip address 172.16.1.1 255.255.255.252
no shutdown
exit

! OSPF
router ospf 1
router-id 3.3.3.1
network 10.3.0.0 0.0.0.255 area 0
network 172.16.1.0 0.0.0.3 area 0
redistribute bgp 65003 subnets
exit

! BGP
router bgp 65003
bgp router-id 3.3.3.1
network 10.3.0.0 mask 255.255.255.0
network 10.3.10.0 mask 255.255.255.0
```

```
network 10.3.20.0 mask 255.255.255.0
network 10.3.30.0 mask 255.255.255.0
network 10.3.40.0 mask 255.255.255.0
network 10.3.50.0 mask 255.255.255.0
neighbor 192.168.100.1 remote-as 65001
neighbor 192.168.100.2 remote-as 65002
neighbor 172.16.1.2 remote-as 65004
redistribute ospf 1
exit

! SSH/Telnet
username admin password cisco123
enable password cisco123
ip domain-name kuronexus.local
crypto key generate rsa
line vty 0 4
login local
transport input all
exec-timeout 5 0
exit
ip ssh version 2
exit
```

2. *Kuronexus_Government (Router 1941)*

```
enable
configure terminal
hostname Kuronexus_Government

! Backbone Interface
interface GigabitEthernet0/0
ip address 10.3.0.2 255.255.255.0
no shutdown
exit

! Government Zone Interface
interface GigabitEthernet0/1
ip address 10.3.10.1 255.255.255.0
ip helper-address 10.3.20.2
no shutdown
exit

! OSPF
router ospf 1
router-id 3.3.3.2
network 10.3.0.0 0.0.0.255 area 0
network 10.3.10.0 0.0.0.255 area 10
exit

! ACL for Government Zone Security
ip access-list extended GOV_SECURITY_KR
permit ip 10.3.10.0 0.0.0.255 any
```

```
permit tcp any 10.3.10.0 0.0.0.255 established
permit udp any eq 67 10.3.10.0 0.0.0.255 eq 68
permit udp any eq 53 10.3.10.0 0.0.0.255
permit icmp any 10.3.10.0 0.0.0.255 echo-reply
permit ospf any any
deny ip any 10.3.10.0 0.0.0.255
permit ip any any
exit

interface GigabitEthernet0/1
ip access-group GOV_SECURITY_KR in
exit
```

3. Kuronexus_Enterprise (Router 1941)

```
enable
configure terminal
hostname Kuronexus_Enterprise

! Backbone Interface
interface GigabitEthernet0/0
ip address 10.3.0.3 255.255.255.0
no shutdown
exit

! Enterprise Zone Interface
interface GigabitEthernet0/1
ip address 10.3.20.1 255.255.255.0
no shutdown
exit

! OSPF
router ospf 1
router-id 3.3.3.3
network 10.3.0.0 0.0.0.255 area 0
network 10.3.20.0 0.0.0.255 area 20
exit

! ACL for Enterprise Zone Security
ip access-list extended ENT_SECURITY_KR
permit tcp any 10.3.20.0 0.0.0.255 eq 443
permit tcp 10.3.20.0 0.0.0.255 any eq 443
permit udp any 10.3.20.0 0.0.0.255 eq 53
permit udp 10.3.20.0 0.0.0.255 any eq 53
permit udp any eq 67 10.3.20.0 0.0.0.255 eq 68
permit udp 10.3.20.0 0.0.0.255 eq 67 any eq 68
permit ip 10.3.10.0 0.0.0.255 10.3.20.0 0.0.0.255
permit ip 10.3.20.0 0.0.0.255 10.3.10.0 0.0.0.255
permit ospf any any
permit icmp any any
permit tcp any any eq 80
permit tcp 10.3.20.0 0.0.0.255 any established
```

```
permit ip 10.3.20.0 0.0.0.255 any
exit

interface GigabitEthernet0/1
ip access-group ENT_SECURITY_KR in
exit
```

4. *Kuronexus_Public (Router 1941) - Router-on-a-Stick*

```
enable
configure terminal
hostname Kuronexus_Public

! Backbone Interface
interface GigabitEthernet0/0
ip address 10.3.0.4 255.255.255.0
no shutdown
exit

! Trunk Interface for VLANs
interface GigabitEthernet0/1
no ip address
no shutdown
exit

! VLAN 30 - Academy
interface GigabitEthernet0/1.30
encapsulation dot1Q 30
ip address 10.3.30.1 255.255.255.0
ip helper-address 10.3.20.2
no shutdown
exit

! VLAN 40 - Business
interface GigabitEthernet0/1.40
encapsulation dot1Q 40
ip address 10.3.40.1 255.255.255.0
ip helper-address 10.3.20.2
no shutdown
exit

! VLAN 50 - Communal (Wireless)
interface GigabitEthernet0/1.50
encapsulation dot1Q 50
ip address 10.3.50.1 255.255.255.0
ip helper-address 10.3.20.2
no shutdown
exit

! OSPF - Area 0 untuk semua VLAN (sesuai requirement)
router ospf 1
router-id 3.3.3.4
```

```
network 10.3.0.0 0.0.0.255 area 0
network 10.3.30.0 0.0.0.255 area 0
network 10.3.40.0 0.0.0.255 area 0
network 10.3.50.0 0.0.0.255 area 0
exit
```

VLAN Configuration

1. ***Kuronexus_PubSW (Switch 2960)***

```
enable
configure terminal
hostname Kuronexus_PubSW

! Create VLANs
vlan 30
name Academy
exit
vlan 40
name Business
exit
vlan 50
name Communal
exit

! Trunk port to router
interface FastEthernet0/1
switchport mode trunk
switchport trunk allowed vlan 30,40,50
no shutdown
exit

! VLAN 30 - Academy ports
interface FastEthernet0/2
switchport mode access
switchport access vlan 30
no shutdown
exit

! VLAN 40 - Business ports
interface FastEthernet0/3
switchport mode access
switchport access vlan 40
no shutdown
exit

! VLAN 50 - Communal ports (including wireless AP)
interface FastEthernet0/4
switchport mode access
switchport access vlan 50
no shutdown
exit
```

```
interface FastEthernet0/5
switchport mode access
switchport access vlan 50
no shutdown
exit

! Management port (default VLAN 1)
interface FastEthernet0/6
switchport mode access
switchport access vlan 1
no shutdown
exit
```

Server Configuration

A. DHCP Server

Network Settings:

- **IP: 10.3.20.2/24, Gateway: 10.3.20.1, DNS: 10.3.20.10**

DHCP Service Configuration (via GUI Services tab):

```
Pool: GOV_POOL_KR
Default Gateway: 10.3.10.1
DNS Server: 10.3.20.10
Start IP: 10.3.10.10
Subnet Mask: 255.255.255.0
Max Users: 40

Pool: ENT_POOL_KR
Default Gateway: 10.3.20.1
DNS Server: 10.3.20.10
Start IP: 10.3.20.50
Subnet Mask: 255.255.255.0
Max Users: 50

Pool: ACADEMY_POOL
Default Gateway: 10.3.30.1
DNS Server: 10.3.20.10
Start IP: 10.3.30.10
Subnet Mask: 255.255.255.0
Max Users: 40

Pool: BUSINESS_POOL
```

```
Default Gateway: 10.3.40.1
DNS Server: 10.3.20.10
Start IP: 10.3.40.10
Subnet Mask: 255.255.255.0
Max Users: 40

Pool: COMMUNAL_POOL
Default Gateway: 10.3.50.1
DNS Server: 10.3.20.10
Start IP: 10.3.50.10
Subnet Mask: 255.255.255.0
Max Users: 70
```

B. DNS Server

Network Settings:

- **IP: 10.3.20.10/24, Gateway: 10.3.20.1, DNS: 127.0.0.1**

DNS Service Configuration (via GUI Services tab):

```
Type: A Record
Name: web.kr
Address: 10.3.20.20

Type: A Record
Name: border.kr
Address: 192.168.100.3

Type: A Record
Name: web.gk
Address: 10.1.20.20

Type: A Record
Name: web.rr
Address: 10.2.20.20

Type: A Record
Name: web.ym
Address: 10.4.20.20
```

C. Web Server

Network Settings:

- **IP: 10.3.20.20/24, Gateway: 10.3.20.1, DNS: 10.3.20.10**

HTTP Service Configuration (via GUI Services tab):

```
<!DOCTYPE html>
<html>
<head>
    <title>Welcome to Kuronexus</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background: linear-gradient(135deg, #1a1a2e,
#16213e);
            color: #fff;
            margin: 0;
            padding: 20px;
        }
        .header {
            color: #00ff88;
            text-align: center;
            border-bottom: 3px solid #00ff88;
            padding-bottom: 10px;
            text-shadow: 0 0 10px #00ff88;
        }
        .content {
            margin-top: 20px;
            text-align: center;
        }
        .vlan-info {
            background: rgba(0, 255, 136, 0.1);
            border: 1px solid #00ff88;
            padding: 15px;
            border-radius: 10px;
            margin-top: 15px;
        }
        .vlan-list {
            display: flex;
            justify-content: space-around;
            margin-top: 20px;
        }
        .vlan-box {
            background: rgba(255, 255, 255, 0.1);
            padding: 10px;
            border-radius: 8px;
            border: 1px solid #00ff88;
        }
    </style>
</head>
<body>
    <div class="header">
        <h1>Welcome to Kuronexus National Web Portal</h1>
        <h2>Federated Republic of Kuronexus</h2>
    </div>
    <div class="content">
```

```
        <p>This is the official website of the Federated Republic
of Kuronexus</p>
        <p><strong>Server Details:</strong></p>
        <ul style="list-style: none;">
            <li>Server IP: 10.3.20.20</li>
            <li>Domain: web.kr</li>
            <li>Country TLD: .kr</li>
            <li>AS Number: 65003</li>
            <li>Border Router: 2911 Model</li>
        </ul>
        <div class="vlan-info">
            <h3>🌐 Advanced VLAN Network</h3>
            <p>Kuronexus features a sophisticated VLAN-based
public network</p>
            <div class="vlan-list">
                <div class="vlan-box">
                    <h4>VLAN 30 - Academy</h4>
                    <p>Educational Network</p>
                    <p>10.3.30.0/24</p>
                </div>
                <div class="vlan-box">
                    <h4>VLAN 40 - Business</h4>
                    <p>Commercial Network</p>
                    <p>10.3.40.0/24</p>
                </div>
                <div class="vlan-box">
                    <h4>VLAN 50 - Communal</h4>
                    <p>Public + Wireless</p>
                    <p>10.3.50.0/24</p>
                </div>
            </div>
            <p>📶 Wireless Network Available in Communal VLAN</p>
        </div>
        <p><em>Serving the citizens of Kuronexus since
2025</em></p>
    </div>
</body>
</html>
```

Konfigurasi Wireless Network (VLAN 50)

Wireless Access Point Configuration

Kuronexus_WirelessAP:

- **SSID: `KuronexusCommunal`**
- **VLAN: 50**
- **IP Assignment: DHCP from central server**

Wireless Devices:

1. **Kuronexus_Smartphone1 - Connect to SSID, get DHCP IP from VLAN 50 range**
2. **Kuronexus_LaptopWifi1 - Connect to SSID, get DHCP IP from VLAN 50 range**
3. **Yamindralia**

Berikut adalah skema alamat IP-nya:

Zona	**IPv4 Network**	**IPv6 Network**	**Gateway IPv4**	**Gateway IPv6**	**Server IPs**
Link to Kuronexus	172.16.1.0/30	2001:DB8:500::/64	-	-	Yamin: .2/.2, Kuro: .1/.1
IPv6 Tunnel	-	2001:1::/64	-	-	Yamin: ::2, Rurinthia: ::1
Backbone	10.4.0.0/24	2001:DB8:4::/64	-	-	Border: .1/.1, Gov: .2/.2, Ent: .3/.3, Pub: .4/.4
Government	10.4.10.0/24	2001:DB8:10::/64	10.4.10.1	2001:DB8:10::1	-
Enterprise	10.4.20.0/24	2001:DB8:40::/64	10.4.20.1	2001:DB8:40::1	DHCP:.2/.2, DNS:.10/.10, Web:.20/.20
Public	10.4.30.0/24	2001:DB8:400::/64	10.4.30.1	2001:DB8:400::1	-

Dan berikut adalah *setup* dari negara Yamindralia:

1. ***Yamindralia_Border (Router 1941)***

```
enable
configure terminal
hostname Yamindralia_Border
ipv6 unicast-routing

! Link to Kuronexus (Direct Link - Dual Stack)
interface GigabitEthernet0/0
ip address 172.16.1.2 255.255.255.252
ipv6 address 2001:DB8:500::2/64
no shutdown
exit

! Backbone Interface (Dual Stack)
interface GigabitEthernet0/1
ip address 10.4.0.1 255.255.255.0
ipv6 address 2001:DB8:4::1/64
no shutdown
```

```
exit

! OSPF IPv4
router ospf 1
router-id 4.4.4.1
network 10.4.0.0 0.0.0.255 area 0
network 172.16.1.0 0.0.0.3 area 0
redistribute bgp 65004 subnets
exit

! OSPFv3 IPv6
ipv6 router ospf 1
router-id 4.4.4.1
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 0
exit
interface GigabitEthernet0/0
ipv6 ospf 1 area 0
exit

! BGP IPv4
router bgp 65004
bgp router-id 4.4.4.1
network 10.4.0.0 mask 255.255.255.0
network 10.4.10.0 mask 255.255.255.0
network 10.4.20.0 mask 255.255.255.0
network 10.4.30.0 mask 255.255.255.0
neighbor 172.16.1.1 remote-as 65003
redistribute ospf 1
exit

! IPv6 Tunnel to Rurinthia (IPv6-in-IPv4)
interface Tunnel0
ipv6 address 2001:1::2/64
tunnel source GigabitEthernet0/0
tunnel destination 192.168.100.2
tunnel mode ipv6ip
ipv6 ospf 1 area 0
no shutdown
exit

! Static IPv6 routes untuk Rurinthia
ipv6 route 2001:DB8:2::/64 Tunnel0
ipv6 route 2001:DB8:20::/64 Tunnel0
ipv6 route 2001:DB8:30::/64 Tunnel0
ipv6 route 2001:DB8:100::/64 Tunnel0

! Redistribution OSPF to BGP
router ospf 1
redistribute bgp 65004 subnets
exit

! SSH/Telnet
username admin password cisco123
```

```
enable password cisco123
ip domain-name yamindralia.local
crypto key generate rsa
line vty 0 4
login local
transport input all
exec-timeout 5 0
exit
ip ssh version 2
exit
```

2. *Yamindralia_Government (Router 1941)*

```
enable
configure terminal
hostname Yamindralia_Government
ipv6 unicast-routing

! Backbone Interface (Dual Stack)
interface GigabitEthernet0/0
ip address 10.4.0.2 255.255.255.0
ipv6 address 2001:DB8:4::2/64
no shutdown
exit

! Government Zone Interface (Dual Stack)
interface GigabitEthernet0/1
ip address 10.4.10.1 255.255.255.0
ipv6 address 2001:DB8:10::1/64
ip helper-address 10.4.20.2
no shutdown
exit

! OSPF IPv4
router ospf 1
router-id 4.4.4.2
network 10.4.0.0 0.0.0.255 area 0
network 10.4.10.0 0.0.0.255 area 10
exit

! OSPFv3 IPv6
ipv6 router ospf 1
router-id 4.4.4.2
exit
interface GigabitEthernet0/0
ipv6 ospf 1 area 0
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 10
exit

! ACL for Government Zone Security (IPv4)
```

```
ip access-list extended GOV_SECURITY_YM
permit ip 10.4.10.0 0.0.0.255 any
permit tcp any 10.4.10.0 0.0.0.255 established
permit udp any eq 67 10.4.10.0 0.0.0.255 eq 68
permit udp any eq 53 10.4.10.0 0.0.0.255
permit icmp any 10.4.10.0 0.0.0.255 echo-reply
permit ospf any any
deny ip any 10.4.10.0 0.0.0.255 log
permit ip any any
exit

interface GigabitEthernet0/1
ip access-group GOV_SECURITY_YM in
exit
```

3. Yamindralia_Enterprise (Router 1941)

```
enable
configure terminal
hostname Yamindralia_Enterprise
ipv6 unicast-routing

! Backbone Interface (Dual Stack)
interface GigabitEthernet0/0
ip address 10.4.0.3 255.255.255.0
ipv6 address 2001:DB8:4::3/64
no shutdown
exit

! Enterprise Zone Interface (Dual Stack)
interface GigabitEthernet0/1
ip address 10.4.20.1 255.255.255.0
ipv6 address 2001:DB8:40::1/64
no shutdown
exit

! OSPF IPv4
router ospf 1
router-id 4.4.4.3
network 10.4.0.0 0.0.0.255 area 0
network 10.4.20.0 0.0.0.255 area 20
exit

! OSPFv3 IPv6
ipv6 router ospf 1
router-id 4.4.4.3
exit
interface GigabitEthernet0/0
ipv6 ospf 1 area 0
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 20
```

```
exit

! ACL for Enterprise Zone Security
ip access-list extended ENT_SECURITY_YM
permit tcp any 10.4.20.0 0.0.0.255 eq 443
permit tcp 10.4.20.0 0.0.0.255 any eq 443
permit udp any 10.4.20.0 0.0.0.255 eq 53
permit udp 10.4.20.0 0.0.0.255 any eq 53
permit udp any eq 67 10.4.20.0 0.0.0.255 eq 68
permit udp 10.4.20.0 0.0.0.255 eq 67 any eq 68
permit ip 10.4.10.0 0.0.0.255 10.4.20.0 0.0.0.255
permit ip 10.4.20.0 0.0.0.255 10.4.10.0 0.0.0.255
permit ospf any any
permit icmp any any
permit tcp any any eq 80
permit tcp 10.4.20.0 0.0.0.255 any established
permit ip 10.4.20.0 0.0.0.255 any
exit

interface GigabitEthernet0/1
ip access-group ENT_SECURITY_YM in
exit
```

4. Yamindralia_Public (Router 1941)

```
enable
configure terminal
hostname Yamindralia_Public
ipv6 unicast-routing

! Backbone Interface (Dual Stack)
interface GigabitEthernet0/0
ip address 10.4.0.4 255.255.255.0
ipv6 address 2001:DB8:4::4/64
no shutdown
exit

! Public Zone Interface (Dual Stack)
interface GigabitEthernet0/1
ip address 10.4.30.1 255.255.255.0
ipv6 address 2001:DB8:400::1/64
ip helper-address 10.4.20.2
no shutdown
exit

! OSPF IPv4
router ospf 1
router-id 4.4.4.4
network 10.4.0.0 0.0.0.255 area 0
network 10.4.30.0 0.0.0.255 area 30
exit
```

```
! OSPFv3 IPv6
ipv6 router ospf 1
router-id 4.4.4.4
exit
interface GigabitEthernet0/0
ipv6 ospf 1 area 0
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 30
exit
```

Server Configuration

A. DHCP Server

Network Settings:

- **IPv4: 10.4.20.2/24, Gateway: 10.4.20.1, DNS: 10.4.20.10**
- **IPv6: 2001:DB8:40::2/64, Gateway: 2001:DB8:40::1, DNS: 2001:DB8:40::10**

DHCP Service Configuration (via GUI Services tab):

```
Pool: GOV_POOL_YM
Default Gateway: 10.4.10.1
DNS Server: 10.4.20.10
Start IP: 10.4.10.10
Subnet Mask: 255.255.255.0
Max Users: 40

Pool: ENT_POOL_YM
Default Gateway: 10.4.20.1
DNS Server: 10.4.20.10
Start IP: 10.4.20.50
Subnet Mask: 255.255.255.0
Max Users: 50

Pool: PUB_POOL_YM
Default Gateway: 10.4.30.1
DNS Server: 10.4.20.10
Start IP: 10.4.30.10
Subnet Mask: 255.255.255.0
Max Users: 40
```

B. DNS Server

Network Settings:

- **IPv4: 10.4.20.10/24, Gateway: 10.4.20.1, DNS: 127.0.0.1**
- **IPv6: 2001:DB8:40::10/64, Gateway: 2001:DB8:40::1, DNS: ::1**

DNS Service Configuration (via GUI Services tab):

```
Type: A Record
Name: web.ym
Address: 10.4.20.20

Type: AAAA Record
Name: web.ym
Address: 2001:DB8:40::20

Type: A Record
Name: border.ym
Address: 172.16.1.2

Type: A Record
Name: web.gk
Address: 10.1.20.20

Type: A Record
Name: web.rr
Address: 10.2.20.20

Type: A Record
Name: web.kr
Address: 10.3.20.20
```

C. Web Server

Konfigurasi Network Settings:

- **IPv4: 10.4.20.20/24, Gateway: 10.4.20.1, DNS: 10.4.20.10**
- **IPv6: 2001:DB8:40::20/64, Gateway: 2001:DB8:40::1, DNS: 2001:DB8:40::10**

HTTP Service Configuration (via GUI Services tab):

```
<!DOCTYPE html>
```

```
<html>
<head>
    <title>Welcome to Yamindralia</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background: linear-gradient(45deg, #ffd700, #ffed4e);
            color: #8b4513;
            margin: 0;
            padding: 20px;
        }
        .header {
            color: #b8860b;
            text-align: center;
            border-bottom: 3px solid #daa520;
            padding-bottom: 10px;
            text-shadow: 2px 2px 4px rgba(0,0,0,0.3);
        }
        .content {
            margin-top: 20px;
            text-align: center;
            background: rgba(255, 255, 255, 0.8);
            padding: 20px;
            border-radius: 15px;
            border: 2px solid #daa520;
        }
        .connectivity-info {
            background: rgba(184, 134, 11, 0.1);
            padding: 15px;
            border-radius: 10px;
            margin-top: 15px;
            border: 1px solid #daa520;
        }
        .tunnel-box {
            background: rgba(255, 215, 0, 0.3);
            padding: 10px;
            border-radius: 8px;
            margin: 10px 0;
            border: 1px solid #b8860b;
        }
    </style>
</head>
<body>
    <div class="header">
        <h1>Welcome to Yamindralia National Web Portal</h1>
        <h2>Sultanate of Yamindralia</h2>
    </div>
    <div class="content">
        <p>This is the official website of the Sultanate of
Yamindralia</p>
        <p><strong>Server Details:</strong></p>
        <ul style="list-style: none;">
            <li>IPv4: 10.4.20.20</li>
            <li>IPv6: 2001:DB8:40::20</li>
            <li>Domain: web.ym</li>
```

```
            <li>Country TLD: .ym</li>
            <li>AS Number: 65004</li>
        </ul>
        <div class="connectivity-info">
            <h3>🌐 Dual Stack & International Connectivity</h3>
            <p>Yamindralia supports both IPv4 and IPv6
protocols</p>
            <div class="tunnel-box">
                <h4>🚇 IPv6 Tunnel to Rurinthia</h4>
                <p>Direct IPv6 communication via tunnel</p>
                <p>Tunnel: 2001:DB8:TUNNEL::2/64</p>
            </div>
            <div class="tunnel-box">
                <h4>🔗 Direct Link to Kuronexus</h4>
                <p>Physical connection for IPv4 routing</p>
                <p>Link: 172.16.1.2/30</p>
            </div>
            <p>Access to all countries via Kuronexus gateway</p>
        </div>
        <p><em>Serving the citizens of Yamindralia since
2025</em></p>
    </div>
</body>
</html>
```

4. **Rurinthia**

Berikut adalah skema alamat IP-nya:

Zona	**IPv4 Network**	**IPv6 Network**	**Gateway IPv4**	**Gateway IPv6**	**Server IPs**
External	192.168.100.2/24	2001:DB8:100::2/64	-	-	Border: .2/.2
Backbone	10.2.0.0/24	2001:DB8:2::/64	-	-	Border: .1/.1, Gov: .2/.2, Ent: .3/.3, Pub: .4/.4
Government	10.2.10.0/24	2001:DB8:10::/64	10.2.10.1	2001:DB8:10::1	-
Enterprise	10.2.20.0/24	2001:DB8:20::/64	10.2.20.1	2001:DB8:20::1	DHCP:.2/.2, DNS:.10/.10, Web:.20/.20
Public	10.2.30.0/24	2001:DB8:30::/64	10.2.30.1	2001:DB8:30::1	-

Dan berikut adalah *setup* dari negara Rurinthia:

1. ***Rurinthia_Border (Router 1941)***

```
enable
configure terminal
hostname Rurinthia_Border
ipv6 unicast-routing

! External Interface
interface GigabitEthernet0/0
ip address 192.168.100.2 255.255.255.0
ipv6 address 2001:DB8:100::2/64
no shutdown
exit

! Backbone Interface
interface GigabitEthernet0/1
ip address 10.2.0.1 255.255.255.0
ipv6 address 2001:DB8:2::1/64
no shutdown
exit

! OSPF IPv4
router ospf 1
router-id 2.2.2.1
network 10.2.0.0 0.0.0.255 area 0
redistribute bgp 65002 subnets
exit

! OSPFv3 IPv6
ipv6 router ospf 1
router-id 2.2.2.1
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 0
exit

! BGP IPv4
router bgp 65002
bgp router-id 2.2.2.1
network 10.2.0.0 mask 255.255.255.0
network 10.2.10.0 mask 255.255.255.0
network 10.2.20.0 mask 255.255.255.0
network 10.2.30.0 mask 255.255.255.0
neighbor 192.168.100.1 remote-as 65001
neighbor 192.168.100.3 remote-as 65003
redistribute ospf 1
exit

! IPv6 Tunnel to Yamindralia (akan dikonfigurasi setelah
Yamindralia selesai)
interface Tunnel0
ipv6 address 2001:1::1/64
```

```
tunnel source GigabitEthernet0/0
tunnel destination 172.16.1.2
tunnel mode ipv6ip
ipv6 ospf 1 area 0
no shutdown
exit

! Static IPv6 routes untuk Yamindralia
ipv6 route 2001:DB8:4::/64 Tunnel0
ipv6 route 2001:DB8:40::/64 Tunnel0
ipv6 route 2001:DB8:400::/64 Tunnel0

! SSH/Telnet
username admin password cisco123
enable password cisco123
ip domain-name rurinthia.local
crypto key generate rsa
line vty 0 4
login local
transport input all
exec-timeout 5 0
exit
ip ssh version 2
exit
```

2. Rurinthia_Government (Router 1941)

```
enable
configure terminal
hostname Rurinthia_Government
ipv6 unicast-routing

! Backbone Interface
interface GigabitEthernet0/0
ip address 10.2.0.2 255.255.255.0
ipv6 address 2001:DB8:2::2/64
no shutdown
exit

! Government Zone Interface
interface GigabitEthernet0/1
ip address 10.2.10.1 255.255.255.0
ipv6 address 2001:DB8:10::1/64
ip helper-address 10.2.20.2
no shutdown
exit

! OSPF IPv4
router ospf 1
router-id 2.2.2.2
network 10.2.0.0 0.0.0.255 area 0
network 10.2.10.0 0.0.0.255 area 10
```

```
exit

! OSPFv3 IPv6
ipv6 router ospf 1
router-id 2.2.2.2
exit
interface GigabitEthernet0/0
ipv6 ospf 1 area 0
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 10
exit

! ACL for Government Zone Security
ip access-list extended GOV_SECURITY_V4
permit ip 10.2.10.0 0.0.0.255 any
permit tcp any 10.2.10.0 0.0.0.255 established
permit udp any eq 67 10.2.10.0 0.0.0.255 eq 68
permit udp any eq 53 10.2.10.0 0.0.0.255
permit icmp any 10.2.10.0 0.0.0.255 echo-reply
permit ospf any any
deny ip any 10.2.10.0 0.0.0.255 log
permit ip any any
exit

interface GigabitEthernet0/1
ip access-group GOV_SECURITY_V4 in
exit
```

3. *Rurinthia_Enterprise (Router 1941)*

```
enable
configure terminal
hostname Rurinthia_Enterprise
ipv6 unicast-routing

! Backbone Interface
interface GigabitEthernet0/0
ip address 10.2.0.3 255.255.255.0
ipv6 address 2001:DB8:2::3/64
no shutdown
exit

! Enterprise Zone Interface
interface GigabitEthernet0/1
ip address 10.2.20.1 255.255.255.0
ipv6 address 2001:DB8:20::1/64
no shutdown
exit

! OSPF IPv4
router ospf 1
```

```
router-id 2.2.2.3
network 10.2.0.0 0.0.0.255 area 0
network 10.2.20.0 0.0.0.255 area 20
exit

! OSPFv3 IPv6
ipv6 router ospf 1
router-id 2.2.2.3
exit
interface GigabitEthernet0/0
ipv6 ospf 1 area 0
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 20
exit

! ACL for Enterprise Zone Security
ip access-list extended ENT_SECURITY_V4
permit tcp any 10.2.20.0 0.0.0.255 eq 443
permit tcp 10.2.20.0 0.0.0.255 any eq 443
permit udp any 10.2.20.0 0.0.0.255 eq 53
permit udp 10.2.20.0 0.0.0.255 any eq 53
permit udp any eq 67 10.2.20.0 0.0.0.255 eq 68
permit udp 10.2.20.0 0.0.0.255 eq 67 any eq 68
permit ip 10.2.10.0 0.0.0.255 10.2.20.0 0.0.0.255
permit ip 10.2.20.0 0.0.0.255 10.2.10.0 0.0.0.255
permit ospf any any
permit icmp any any
permit tcp any any eq 80
permit tcp 10.2.20.0 0.0.0.255 any established
permit ip 10.2.20.0 0.0.0.255 any
exit

interface GigabitEthernet0/1
ip access-group ENT_SECURITY_V4 in
exit
```

4. Rurinthia_Public (Router 1941)

```
enable
configure terminal
hostname Rurinthia_Public
ipv6 unicast-routing

! Backbone Interface
interface GigabitEthernet0/0
ip address 10.2.0.4 255.255.255.0
ipv6 address 2001:DB8:2::4/64
no shutdown
exit

! Public Zone Interface
```

```
interface GigabitEthernet0/1
ip address 10.2.30.1 255.255.255.0
ipv6 address 2001:DB8:30::1/64
ip helper-address 10.2.20.2
no shutdown
exit

! OSPF IPv4
router ospf 1
router-id 2.2.2.4
network 10.2.0.0 0.0.0.255 area 0
network 10.2.30.0 0.0.0.255 area 30
exit

! OSPFv3 IPv6
ipv6 router ospf 1
router-id 2.2.2.4
exit
interface GigabitEthernet0/0
ipv6 ospf 1 area 0
exit
interface GigabitEthernet0/1
ipv6 ospf 1 area 30
exit
```

Server Configuration

A. DHCP Server

Network Settings:

- **IPv4: 10.2.20.2/24, Gateway: 10.2.20.1, DNS: 10.2.20.10**
- **IPv6: 2001:DB8:20::2/64, Gateway: 2001:DB8:20::1, DNS: 2001:DB8:20::10**

DHCP Service Configuration (via GUI Services tab):

```
Pool: GOV_POOL_RR
Default Gateway: 10.2.10.1
DNS Server: 10.2.20.10
Start IP: 10.2.10.10
Subnet Mask: 255.255.255.0
Max Users: 40

Pool: ENT_POOL_RR
```

```
Default Gateway: 10.2.20.1
DNS Server: 10.2.20.10
Start IP: 10.2.20.50
Subnet Mask: 255.255.255.0
Max Users: 50

Pool: PUB_POOL_RR
Default Gateway: 10.2.30.1
DNS Server: 10.2.20.10
Start IP: 10.2.30.10
Subnet Mask: 255.255.255.0
Max Users: 40
```

B. DNS Server

Network Settings:

- **IPv4: 10.2.20.10/24, Gateway: 10.2.20.1, DNS: 127.0.0.1**
- **IPv6: 2001:DB8:20::10/64, Gateway: 2001:DB8:20::1, DNS: ::1**

DNS Service Configuration (via GUI Services tab):

```
Type: A Record
Name: web.rr
Address: 10.2.20.20

Type: AAAA Record
Name: web.rr
Address: 2001:DB8:20::20

Type: A Record
Name: border.rr
Address: 192.168.100.2

Type: A Record
Name: web.gk
Address: 10.1.20.20

Type: A Record
Name: web.kr
Address: 10.3.20.20

Type: A Record
Name: web.ym
Address: 10.4.20.20
```

C. Web Server

Konfigurasi Network Settings:

- **IPv4: 10.2.20.20/24, Gateway: 10.2.20.1, DNS: 10.2.20.10**
- **IPv6: 2001:DB8:20::20/64, Gateway: 2001:DB8:20::1, DNS: 2001:DB8:20::10**

HTTP Service Configuration (via GUI Services tab):

```
<!DOCTYPE html>
<html>
<head>
    <title>Welcome to Rurinthia</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #ffe6e6;
            margin: 0;
            padding: 20px;
        }
        .header {
            color: #cc0000;
            text-align: center;
            border-bottom: 3px solid #cc0000;
            padding-bottom: 10px;
        }
        .content {
            margin-top: 20px;
            text-align: center;
        }
        .ipv6-info {
            background-color: #ffcccc;
            padding: 10px;
            border-radius: 5px;
            margin-top: 15px;
        }
    </style>
</head>
<body>
    <div class="header">
        <h1>Welcome to Rurinthia National Web Portal</h1>
        <h2>Kingdom of Rurinthia</h2>
    </div>
    <div class="content">
        <p>This is the official website of the Kingdom of
Rurinthia</p>
        <p><strong>Server Details:</strong></p>
        <ul style="list-style: none;">
            <li>IPv4: 10.2.20.20</li>
            <li>IPv6: 2001:DB8:20::20</li>
```

```
            <li>Domain: web.rr</li>
            <li>Country TLD: .rr</li>
            <li>AS Number: 65002</li>
        </ul>
        <div class="ipv6-info">
            <h3>🌐 Dual Stack Ready!</h3>
            <p>This server supports both IPv4 and IPv6
protocols</p>
            <p>IPv6 Tunnel to Yamindralia: Available</p>
        </div>
        <p><em>Serving the citizens of Rurinthia since
2025</em></p>
    </div>
</body>
</html>
```

Notes

Ada beberapa implementasi yang lupa saya cantumkan ketika membuat dokumentasi, berikut adalah implementasi *routing* antar-negara dari tiap negara:

A. Gokouloryn_Border

```
router bgp 65001
neighbor 192.168.100.2 remote-as 65002
neighbor 192.168.100.3 remote-as 65003
exit
```

B. Rurinthia_Border

```
router bgp 65002
neighbor 192.168.100.1 remote-as 65001
neighbor 192.168.100.3 remote-as 65003
exit
```

C. Kuronexus_Border

```
router bgp 65003
neighbor 192.168.100.1 remote-as 65001
neighbor 192.168.100.2 remote-as 65002
neighbor 172.16.1.2 remote-as 65004
exit
```