

MUM-ID-2019



# BGP IMPLEMENTATION

REYNALDI MULYATAMA | PT ADIGAMA TEKNOLOGI SOLUSI

# REYNALDI MULYATAMA

Using Mikrotik 2016

## ❖ Mikrotik Certification

- Mikrotik Certified Network Associate
- Mikrotik Certified Routing Engineer
- Mikrotik Certified Traffic Control Engineer
- Mikrotik Certified User Management Engineer
- Mikrotik Certified Ipv6 Engineer
- Mikrotik Certified Inter - Networking Engineer

## ❖ Experience

- 2018 - Academy Trainer at SMK MADINATUL QURAN BOGOR
- 2019 - Director at PT ADIGAMA TEKNOLOGI SOLUSI



# BGP



# APA ITU BGP ???

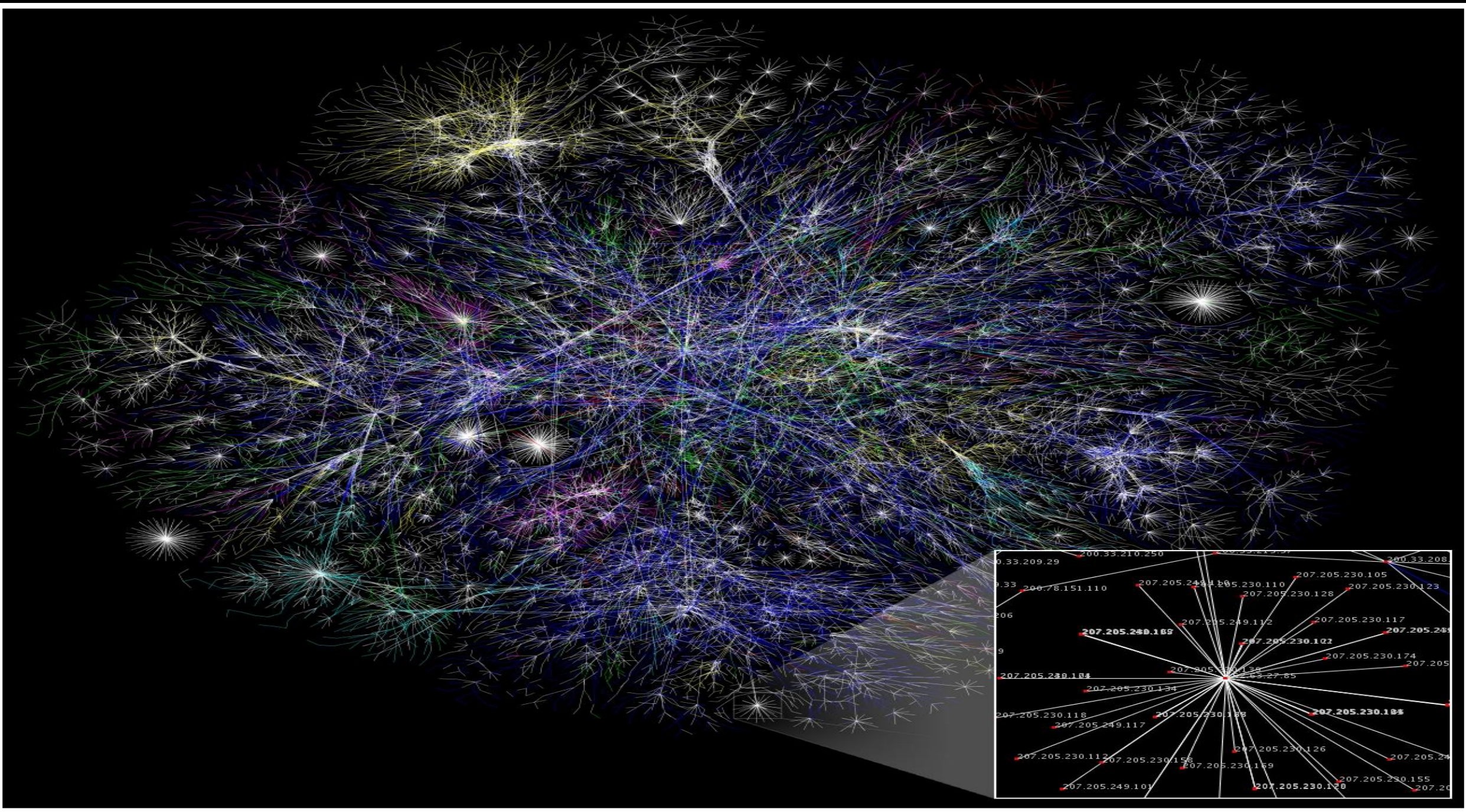
- Border Gateway Protocol
- Menggunakan TCP port 179
- Protocol ini yang menjadi *backbone* dari jaringan Internet dunia
- Sejak tahun 1994 BGP telah digunakan internet hingga saat ini
- Sebelum ada BGP routing protokol, internet menggunakan EGP routing protocol tetapi karena EGP sudah obsolete (kuno) maka diafiliasikanlah BGP dengan EGP
- Merupakan path Vector Protocol



# MENGAPA BGP ???

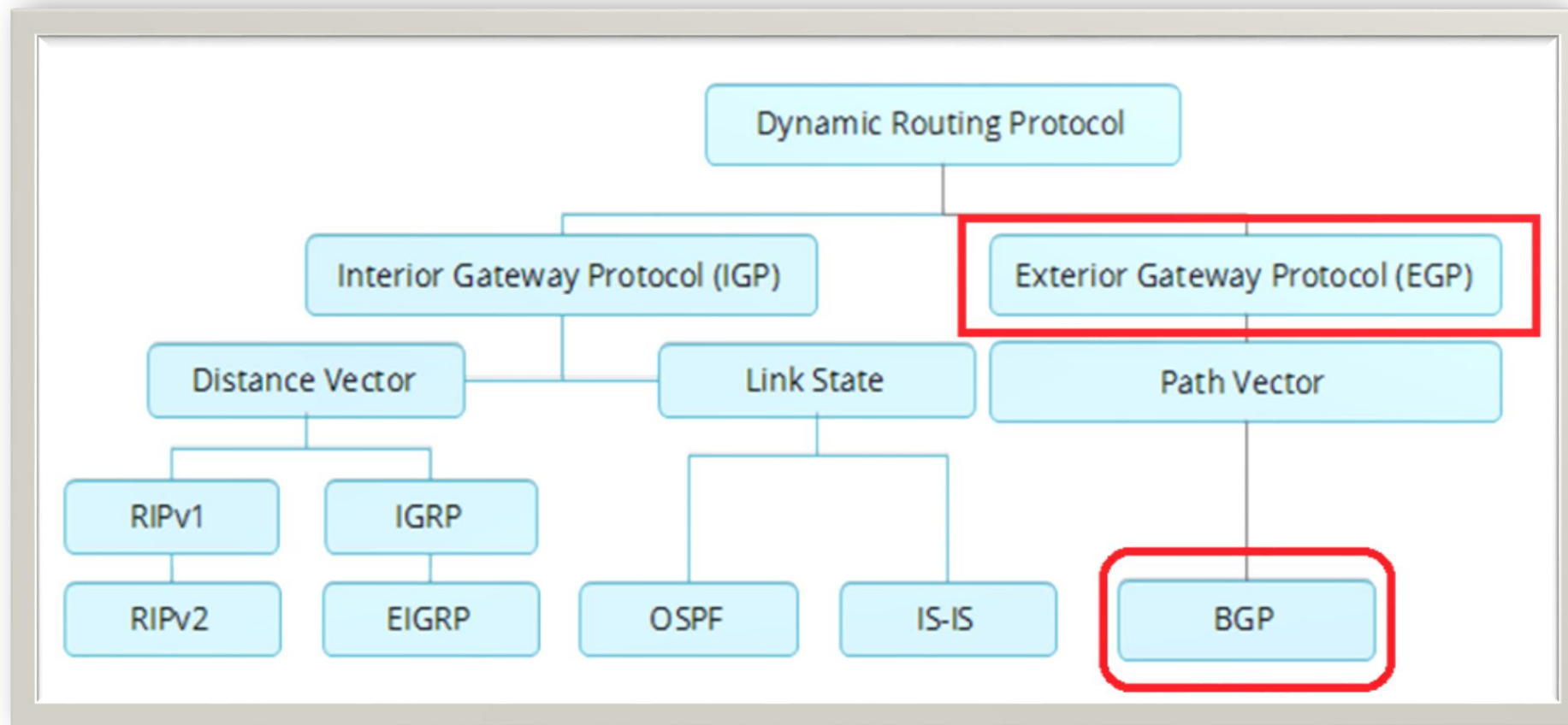




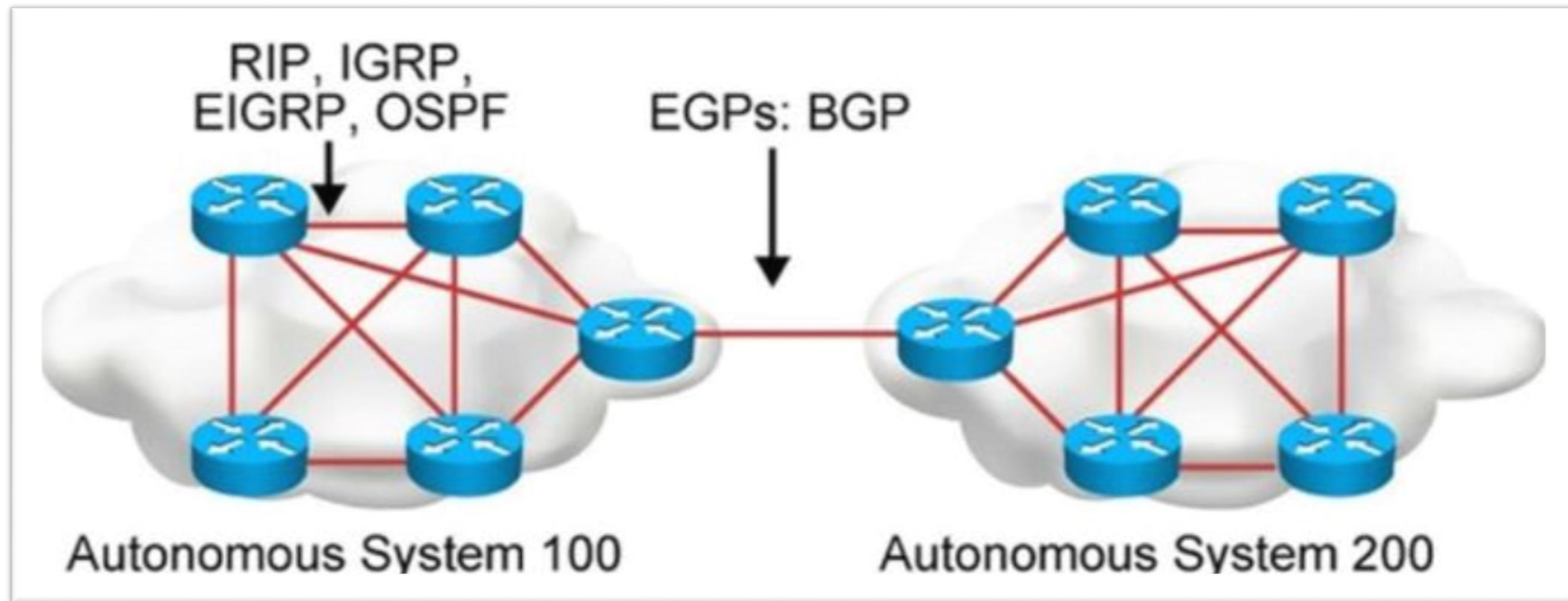




# KLASIFIKASI ROUTING



# EGP VS IGP



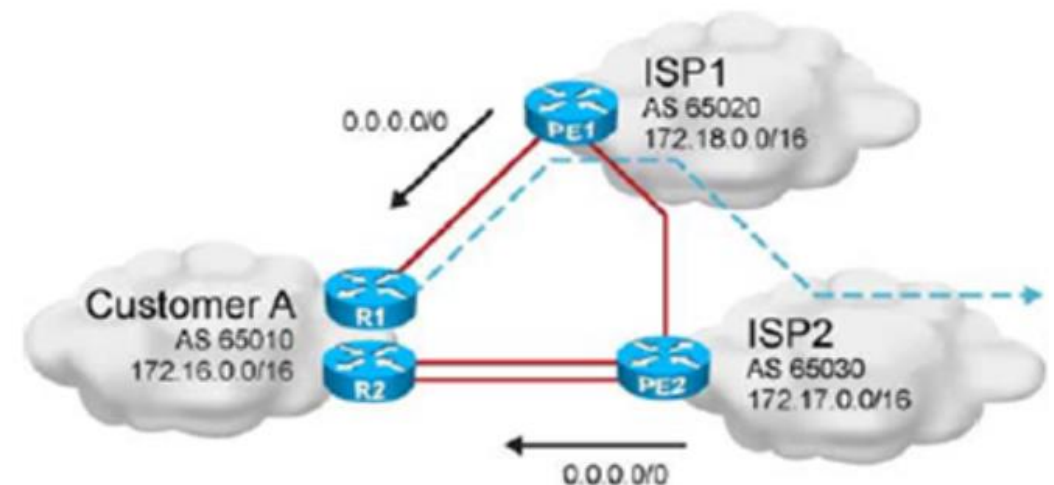


# AUTONOMOUS SYSTEM

- ❖ Collection of networks under single administration
- ❖ Memiliki AS Number 16 Bit & 32 Bit
- ❖ AS Number 64512 - 65534 merupakan AS Number Private
- ❖ AS Number BGP itu sendiri di atur oleh IANA (ICANN), lebih tepatnya RIR (Regional Internet Registry)
- ❖ RIR merupakan anak dari perusahaan IANA yang mengatur pengalokasian alamat IP (Public) dan ASN BGP
- ❖ Dan RIR itu terbagi menjadi 5 yaitu :
  - APNIC (Asia Pasific Network Information Centre)
  - AFRINIC (African Network Information Centre)
  - ARIN (American Registry For Internet Numbers - North America)
  - LACNIC (Latin American and Carribean Network Information Centre)
  - RIPE NCC (Reseaux IP Europeens Network Coordination Centre – Europe, Timur Tengah, Central Asia)

# JENIS - JENIS BGP

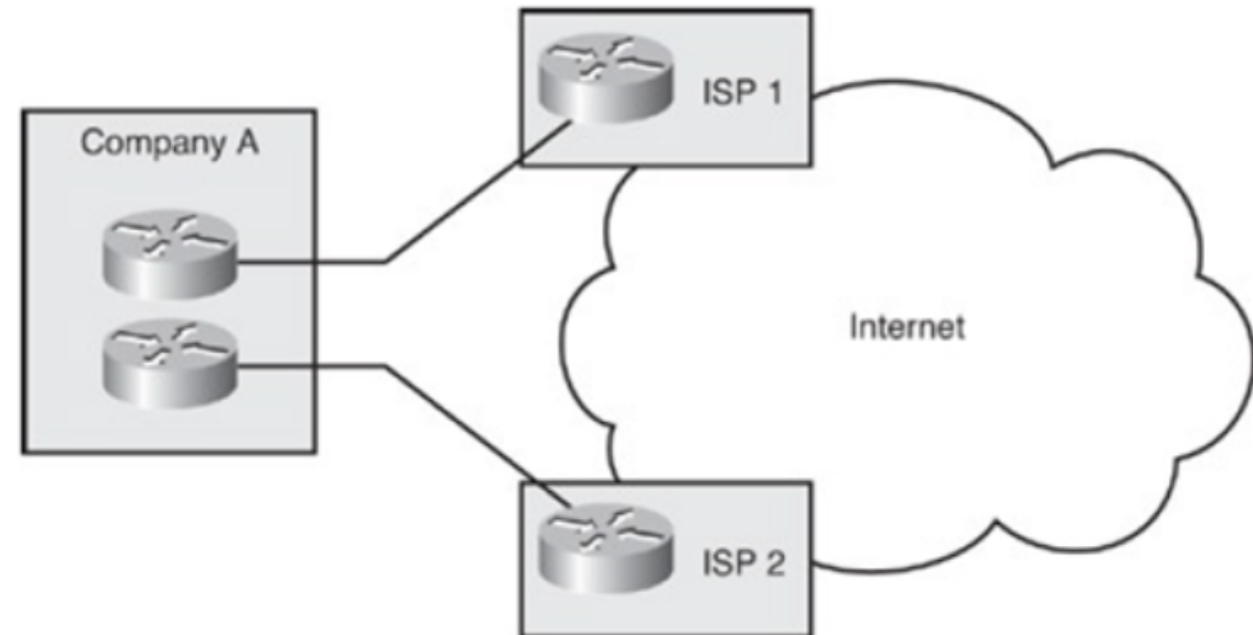
- ❖ BGP Eksternal (eBGP) ketika bgp berjalan antara router dalam Autonomous System yang berbeda, itu di sebut BGP Eksternal (eBGP)
- ❖ BGP Internal (iBGP) Ketika bgp berjalan antara router dalam Autonomous System yang sama, itu disebut BGP Internal (iBGP)





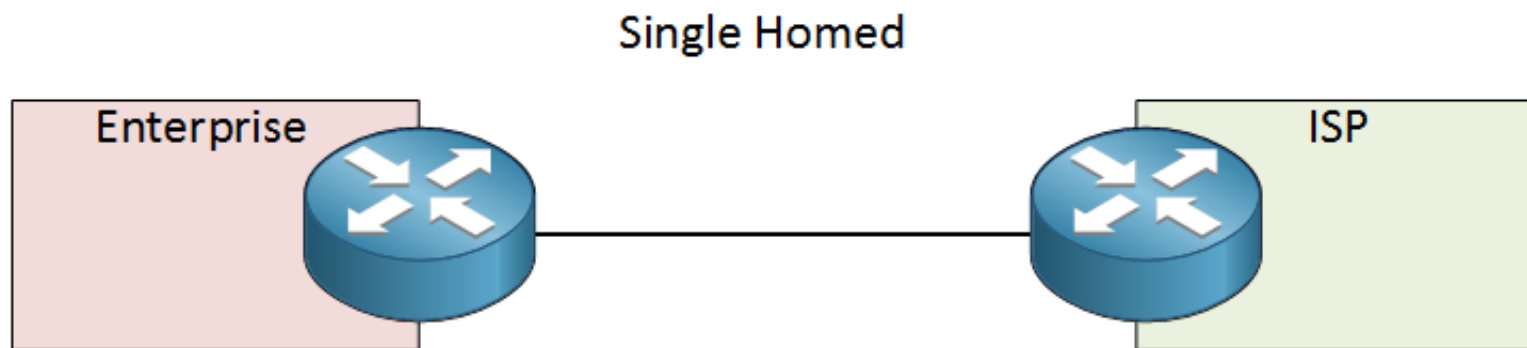
# KAPAN BUTUH BGP ???

- ❖ BGP digunakan ketika AS memiliki koneksi ke beberapa Autonomous System, ini dikenal sebagai Multi-homed



# KAPAN TIDAK BUTUH BGP ???

- ❖ BGP tidak di gunakan ketika satu koneksi ke internet atau Autonomous System ini dikenal sebagai single-homed

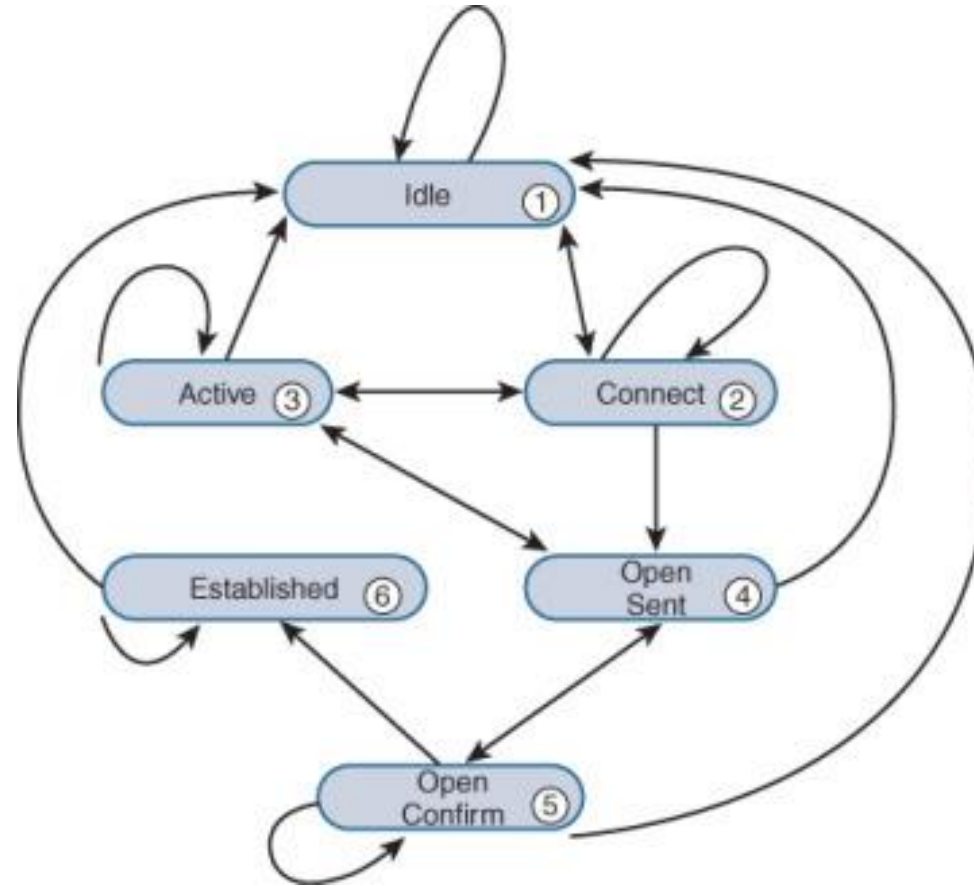


# BGP TYPE MESSAGE

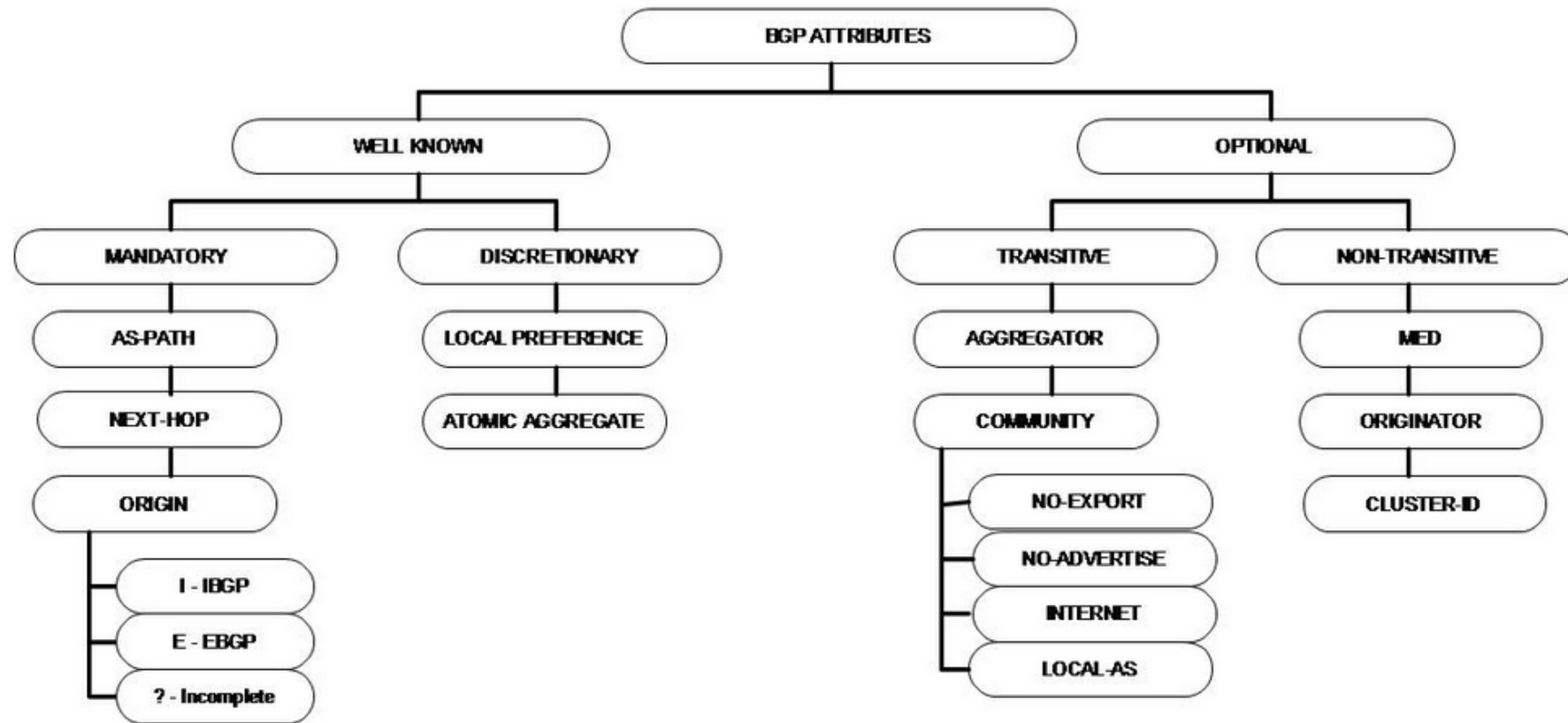
- ❖ Open
- ❖ Keepalive
- ❖ Update
- ❖ Notification



# BGP STATES



# BGP ATTRIBUTE



# HANDS ON LABS

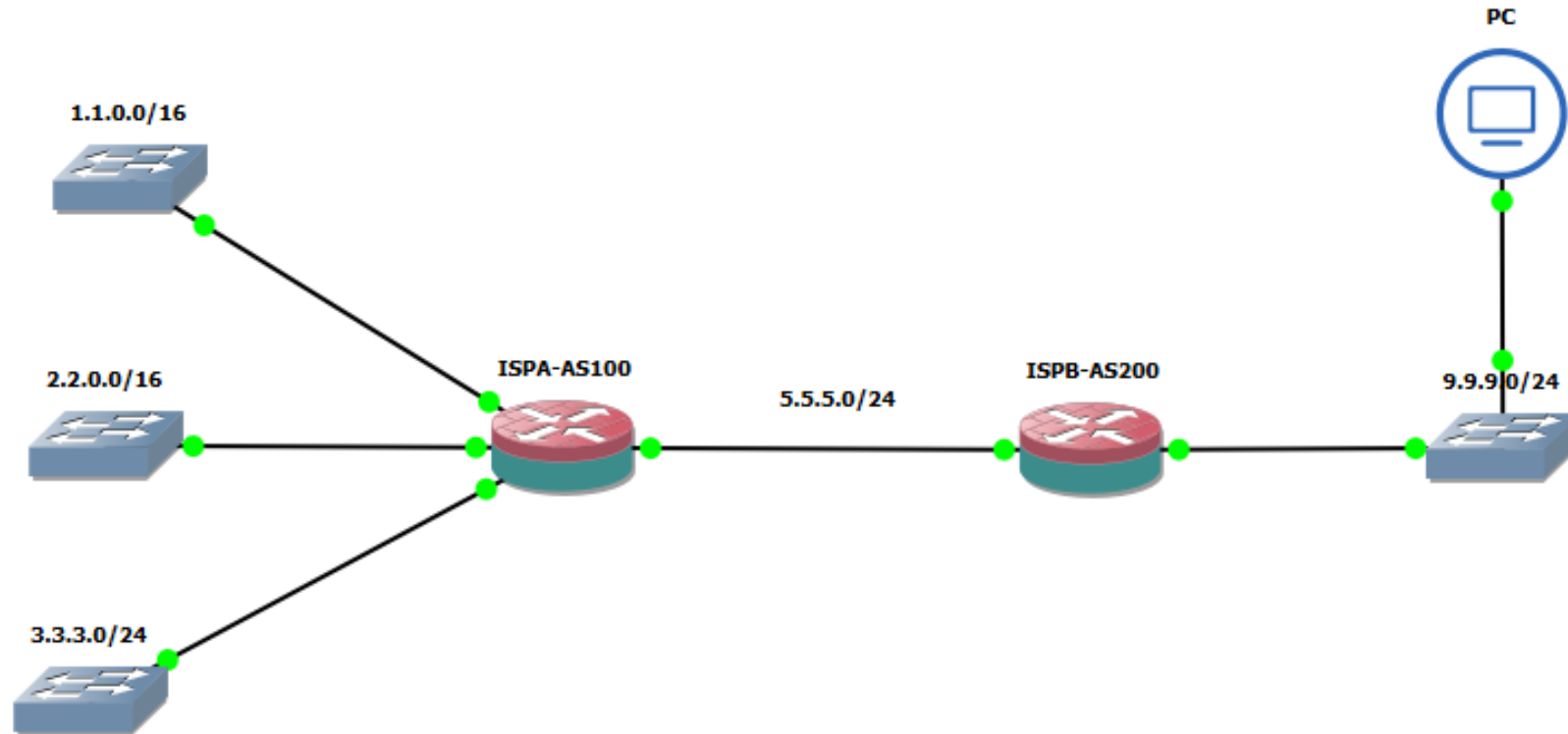


# PERSYARATAN UNTUK MENERAPKAN BGP

- ❖ Publik IP Address
- ❖ Routing Protocol
  - Static atau Dynamic



# TOPOLOGI BGP



# STEP BY STEP KONFIGURASI (1)

- Set Name pada masing - masing Router ISP
  - Router ISP-A

```
/system identity set name=ISPA-AS100
```

- Router ISP-B

```
/system identity set name=ISPB-AS200
```

# STEP BY STEP KONFIGURASI (2)

- Set Ip Address pada masing - masing Router ISP
- Router ISP-A

```
/ip address  
add address=1.1.0.1/16 interface=ether2 network=1.1.0.0  
add address=2.2.0.1/16 interface=ether3 network=2.2.0.0  
add address=3.3.3.1/24 interface=ether4 network=3.3.3.0  
add address=5.5.5.1/24 interface=ether1 network=5.5.5.0
```

- Router ISP-B

```
/ip address  
add address=9.9.9.1/24 interface=ether2 network=9.9.9.0  
add address=5.5.5.2/24 interface=ether1 network=5.5.5.0
```

# STEP BY STEP KONFIGURASI (3)

- Set AS Number BGP pada masing - masing router ISP
- Router ISPA-AS100

```
/routing bgp instance set default as=100
```

- Router ISPB-AS200

```
/routing bgp instance set default as=200
```



# STEP BY STEP KONFIGURASI (4)

- Set Peering BGP pada masing - masing Router ISP
- Router ISPA-AS100

```
/routing bgp peer  
add name=peer1 remote-address=5.5.5.2 remote-as=200 ttl=default
```

- Router ISPB-AS200

```
/routing bgp peer  
add name=peer1 remote-address=5.5.5.1 remote-as=100 ttl=default
```

# STEP BY STEP KONFIGURASI (5)

- Announce Advertise Network Reachability Information di masing - masing Router ISP
- Router ISP-A

```
/routing bgp network  
add network=1.1.0.0/16 synchronize=no  
add network=2.2.0.0/16 synchronize=no  
add network=3.3.3.0/24 synchronize=no  
add network=5.5.5.0/24 synchronize=no
```

- Router ISP-B

```
/routing bgp network  
add network=9.9.9.0/24 synchronize=no
```

# VERIFIKASI

```
Terminal
[admin@ISPA-AS100] > ip route print
Flags: X - disabled, A - active, D - dynamic,
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
#      DST-ADDRESS      PREF-SRC      GATEWAY      DISTANCE
0 ADC  1.1.0.0/16         1.1.0.1       ether2        0
1 ADC  2.2.0.0/16         2.2.0.1       ether3        0
2 ADC  3.3.3.0/24         3.3.3.1       ether4        0
3 ADC  5.5.5.0/24         5.5.5.1       ether1        0
4 ADb  9.9.9.0/24         5.5.5.2       20
```

```
Terminal
[admin@ISPB-AS200] > ip route print
Flags: X - disabled, A - active, D - dynamic,
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
#      DST-ADDRESS      PREF-SRC      GATEWAY      DISTANCE
0 ADb  1.1.0.0/16         5.5.5.1       20
1 ADb  2.2.0.0/16         5.5.5.1       20
2 ADb  3.3.3.0/24         5.5.5.1       20
3 ADC  5.5.5.0/24         5.5.5.2       ether1        0
4 Db   5.5.5.0/24         5.5.5.1       20
5 ADC  9.9.9.0/24         9.9.9.1       ether2        0
[admin@ISPB-AS200] >
```

# THANKS



## Contact Person :

Email : [reynaldi@adigama.co.id](mailto:reynaldi@adigama.co.id)

Phone : +62 81351 616119