MUM-ID-2019

ADIGAMA
TEKNOLOGI SOLUSI

# BGP IMPLEMENTATION

REYNALDI MULYATAMA | PT ADIGAMA TEKNOLOGI SOLUSI

# REYNALDI MULYATAMA

Using MikroTik 2016

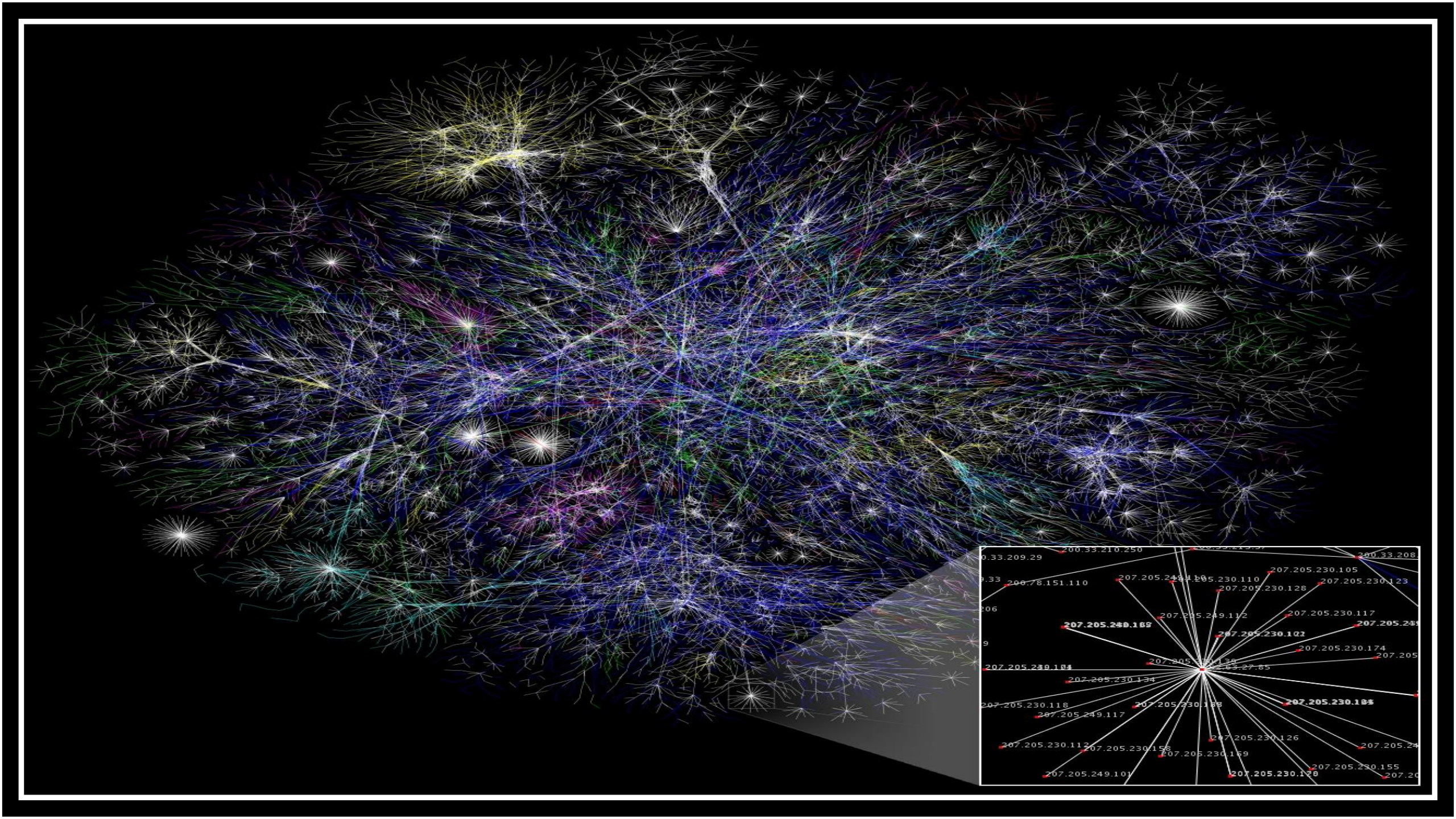
- MikroTik Certification
  - MikroTik Certified Network Associate
  - MikroTik Certified Routing Engineer
  - MikrotTik Certified Traffic Control Engineer
  - MikroTik Certified User Mangement Engineer
  - MikroTik Certified Ipv6 Engineer
  - MikroTik Certified Inter - Networking Engineer
- Experience
  - 2018 - Academy Trainer at SMK MADINATUL QURAN BOGOR
  - 2019 - Director at PT ADIGAMA TEKNOLOGI SOLUSI


BGP

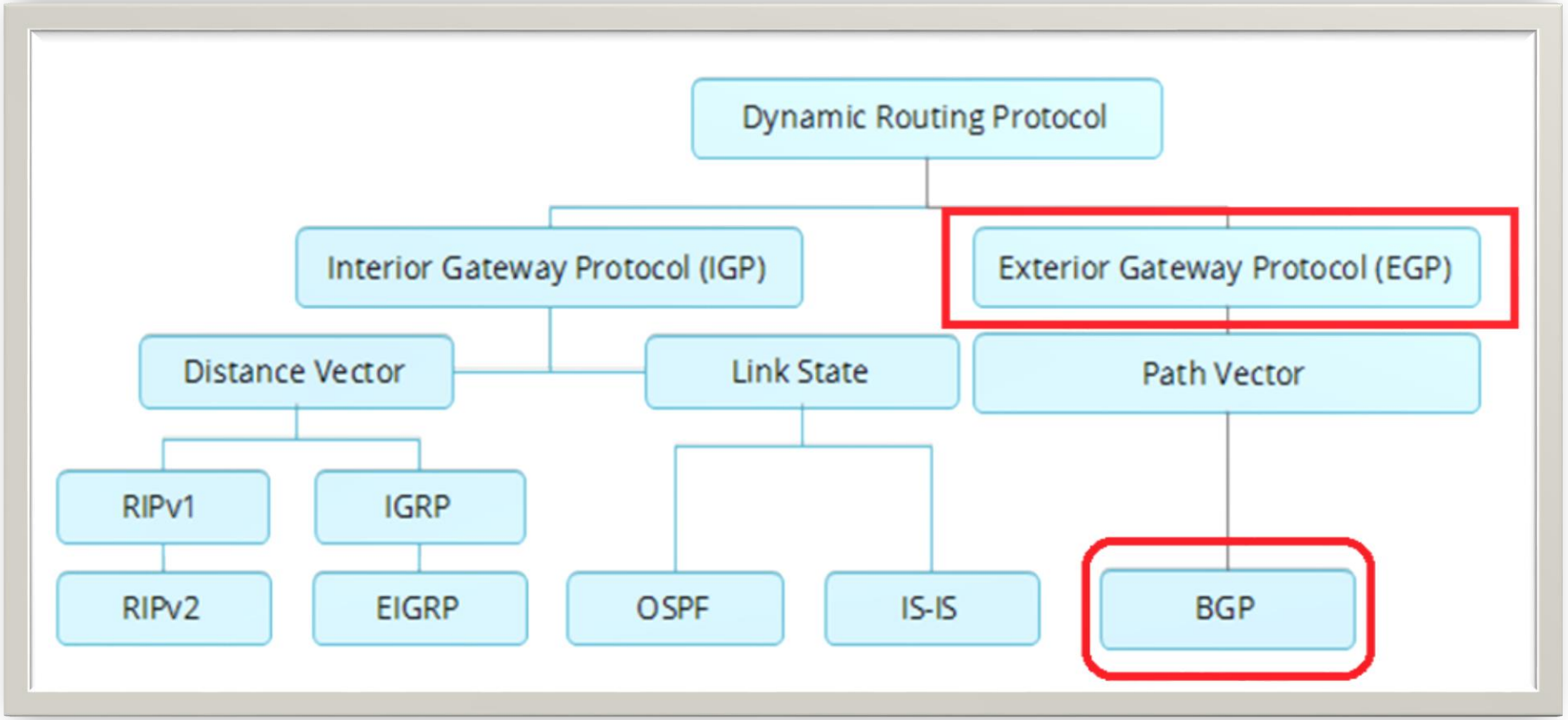
# APA ITU BGP ???

- 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

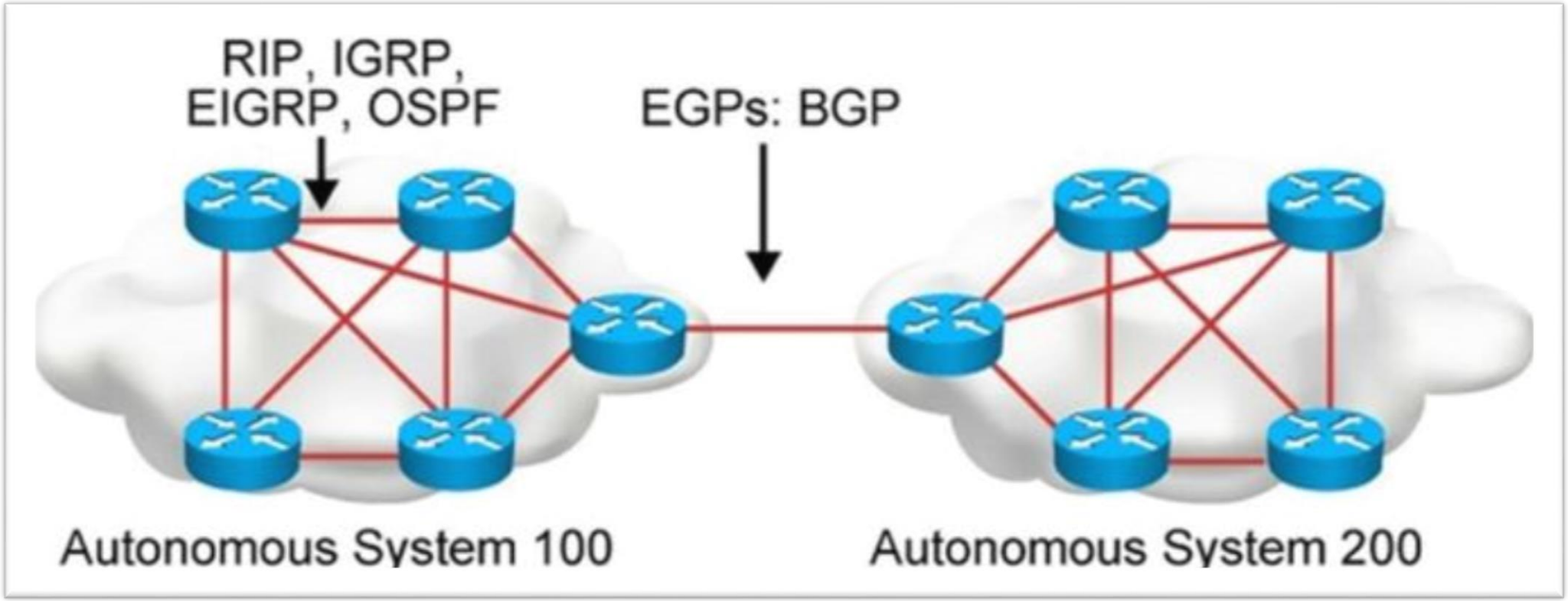
# MENGAPA BGP ???


200.33.210.250
200.78.151.110
207.205.230.105
207.205.230.110
207.205.230.123
207.205.230.128
207.205.249.112
207.205.230.117
207.205.230.174
207.205.230.134
207.205.230.118
207.205.249.117
207.205.230.126
207.205.230.155
207.205.230.129

# KLASIFIKASI ROUTING



# EGP VS IGP

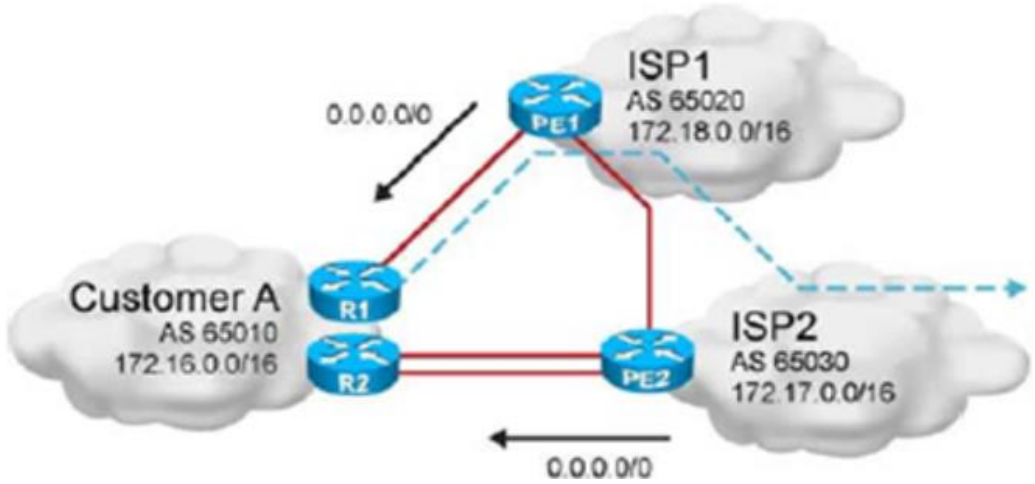

RIP, IGRP,
EIGRP, OSPF
EGPs: BGP
Autonomous System 100
Autonomous System 200

# 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)

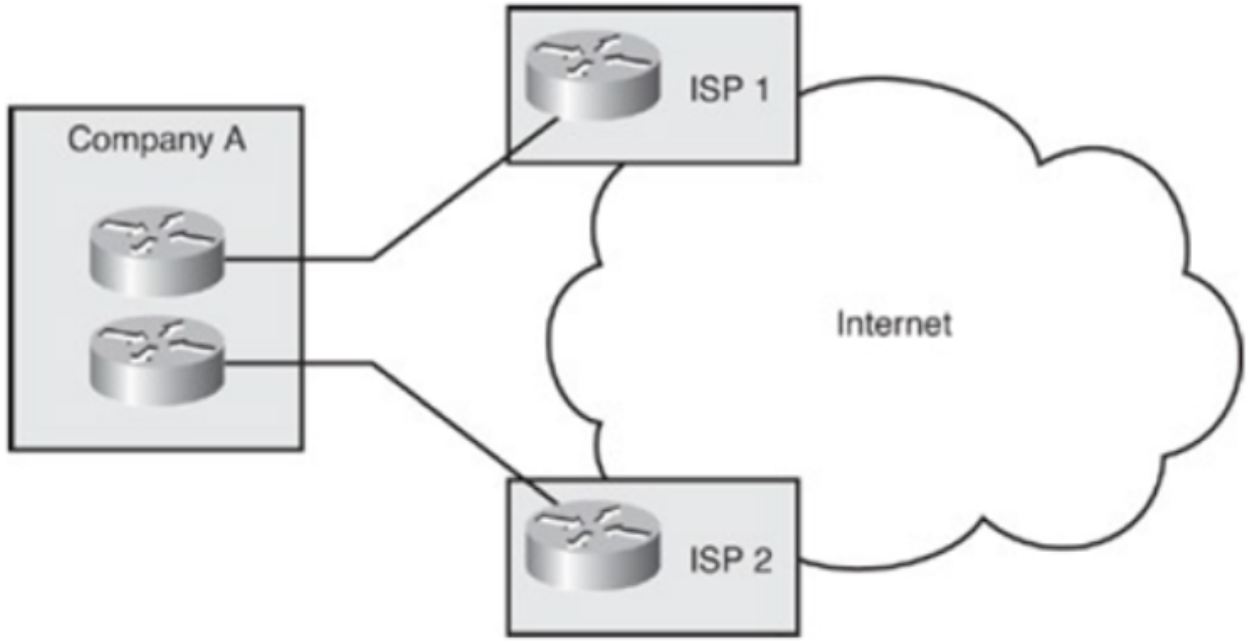
# JENIS - JENIS BGP

- 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)



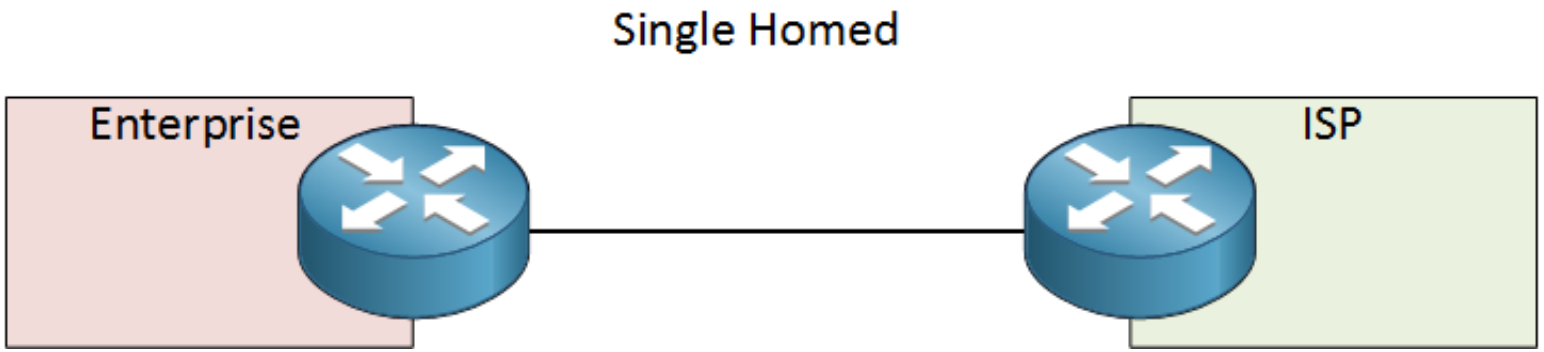
# KAPAN BUTUH BGP ???

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



# KAPAN TIDAK BUTUH BGP ???

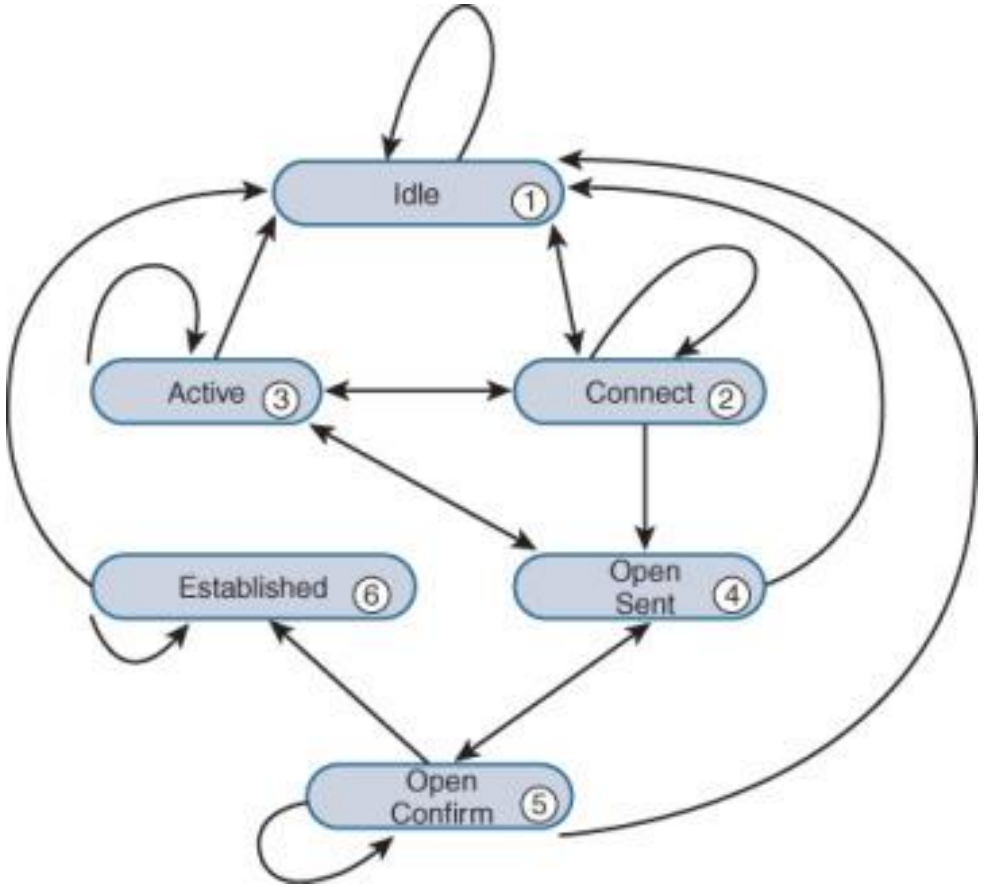
- BGP tidak di gunakan ketika satu koneksi ke internet atau Autonomous System ini dikenal sebagai single-homed



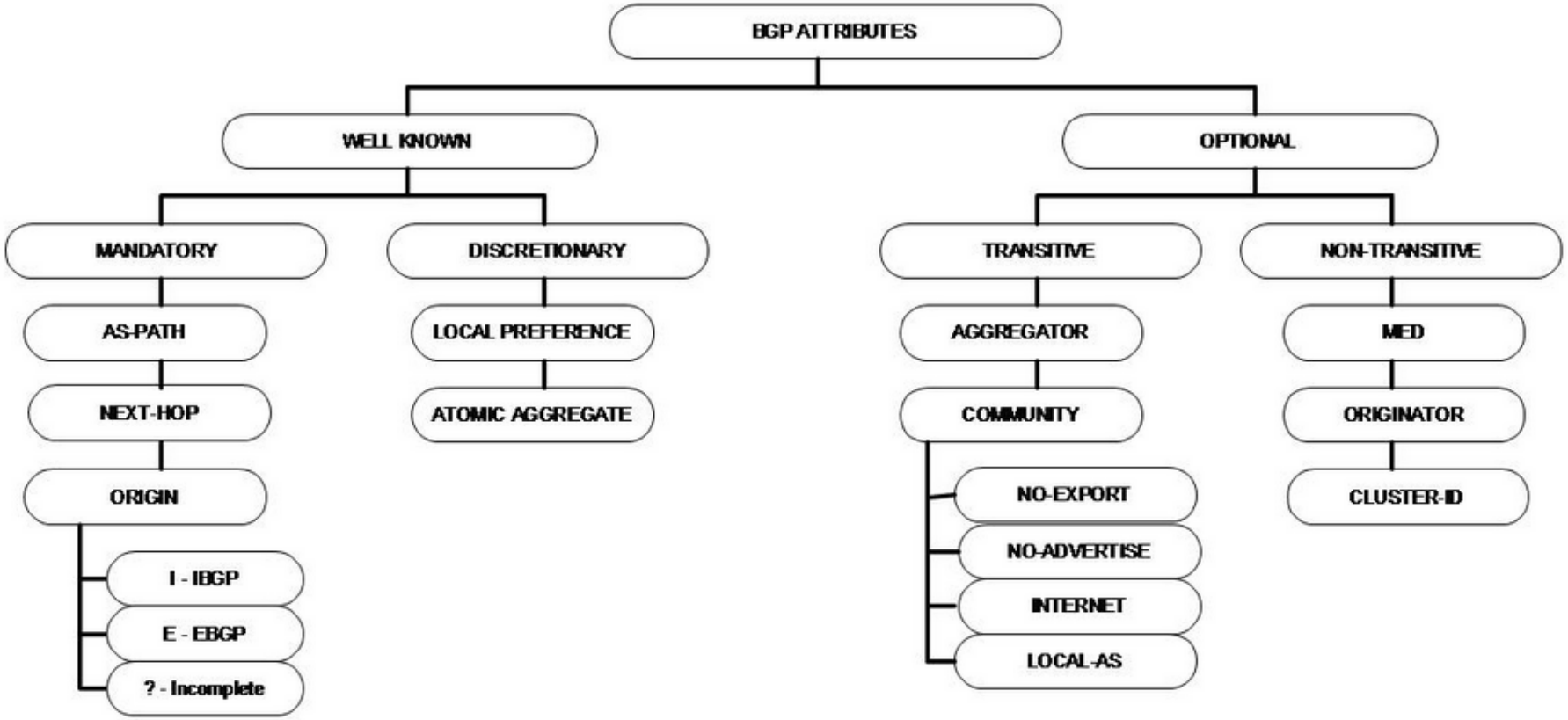
# BGP TYPE MESSAGE

- Open
- Keeplive
- Update
- Notification

# BGP STATES


Idle 1
Connect 2
Active 3
Open Sent 4
Open Confirm 5
Established 6

# BGP ATTRIBUTE

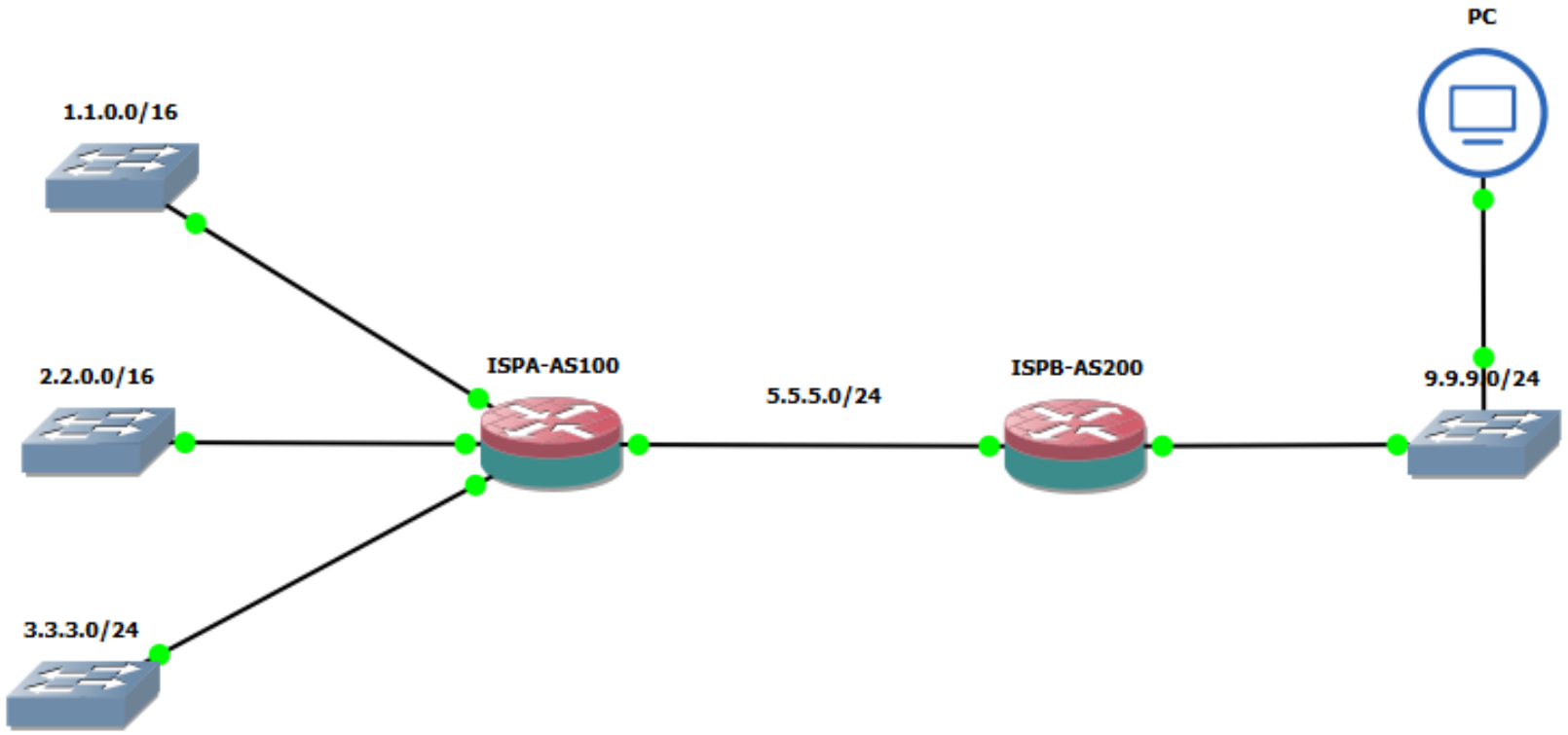


# HANDS ON LABS

# PERSYARATAN UNTUK MENERAPKAN BGP

- Publik IP Address
- Routing Protocol
  - Static atau Dynamic

# TOPOLOGI BGP



# STEP BY STEP KONFIGURASI (1)

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- 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)

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- 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

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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
[admin@ISPA-AS100] >
```

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 :
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