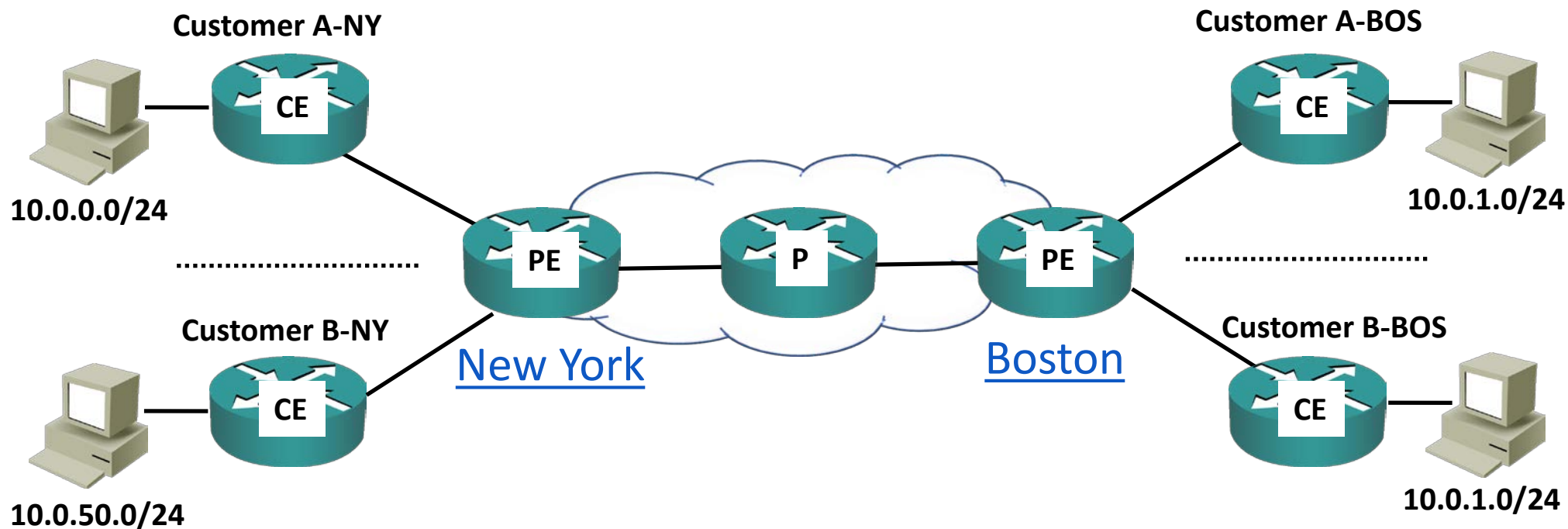


# Layer 3 MPLS VPN



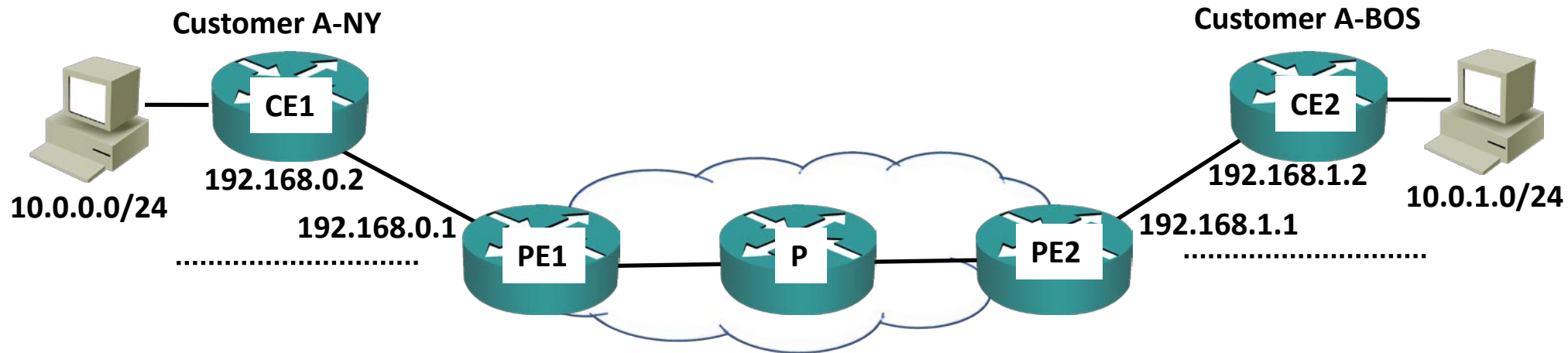
CE: Customer Edge device  
PE: Provider Edge device  
P: Provider core device

# Layer 3 MPLS VPN



- MPLS runs across the providers core on the PE and P routers
- The customer CE routers do not run MPLS
- The customer CE routers peer at Layer 3 with the provider PE routers
- Static routes or a routing protocol runs between the CE and PE
- The PE router looks like another customer router to the customer
- The provider's core routers are transparent to the customer
- The customer sites are in different IP subnets

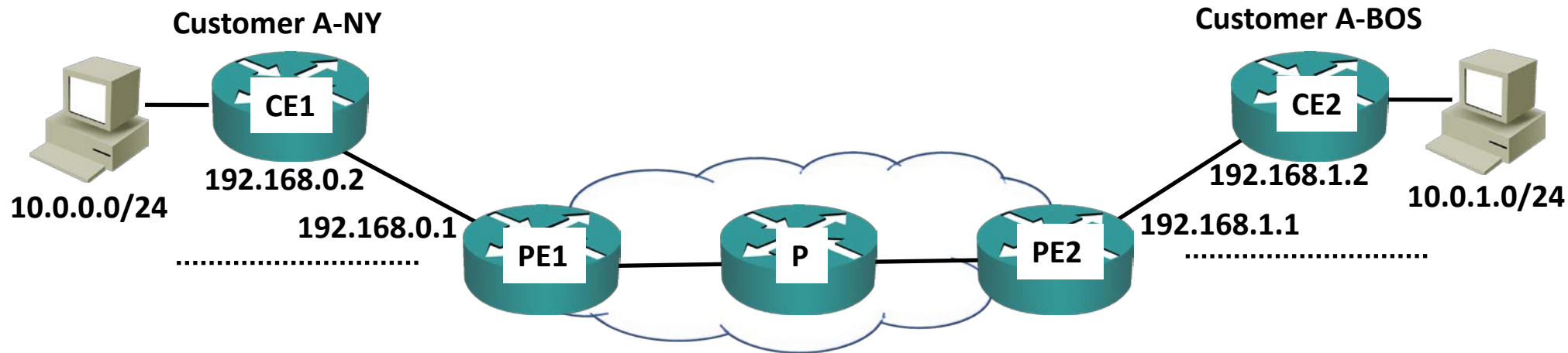
# CE Router Configuration – Static Routes



```
CE1(config)#ip route 10.0.1.0 255.255.255.0 192.168.0.1
```

```
CE2(config)#ip route 10.0.0.0 255.255.255.0 192.168.1.1
```

# PE Router Configuration – Static Routes



```
PE1(config)#ip route 10.0.0.0 255.255.255.0 192.168.0.2
```

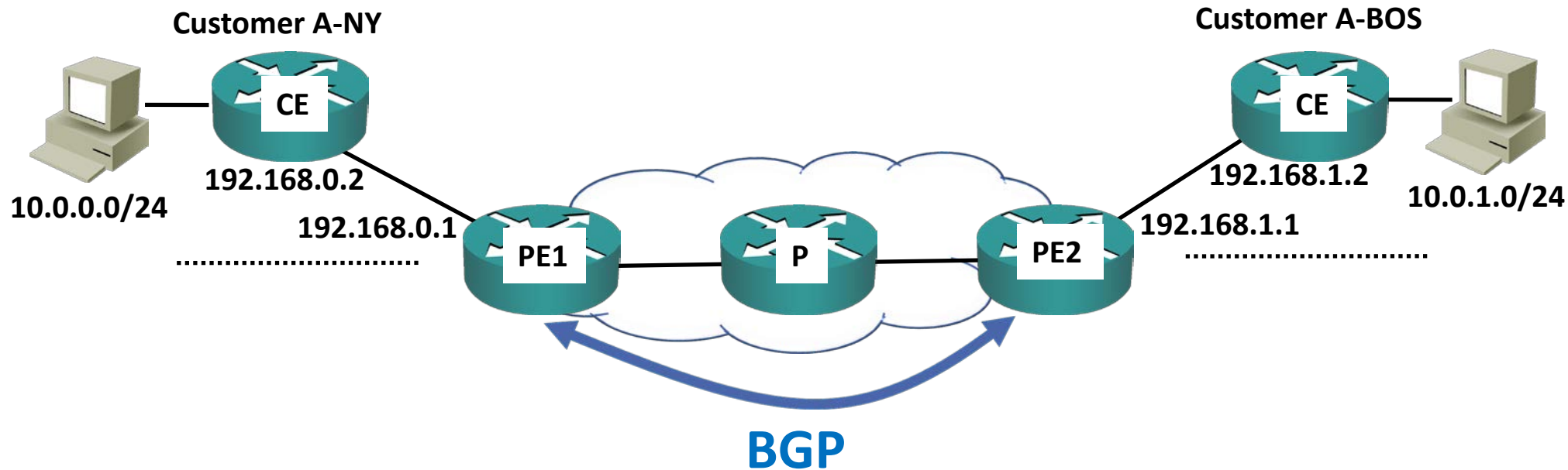
```
PE2(config)#ip route 10.0.1.0 255.255.255.0 192.168.1.2
```

# Layer 3 MPLS VPN



- The PE routers need to share customer routes with each other
- They are not typically physically connected to each other, there are P routers in between
- A routing protocol is required which is scalable enough to support many customer routes and also supports neighbours which are not physically adjacent
- BGP is used

# PE Router Configuration – BGP



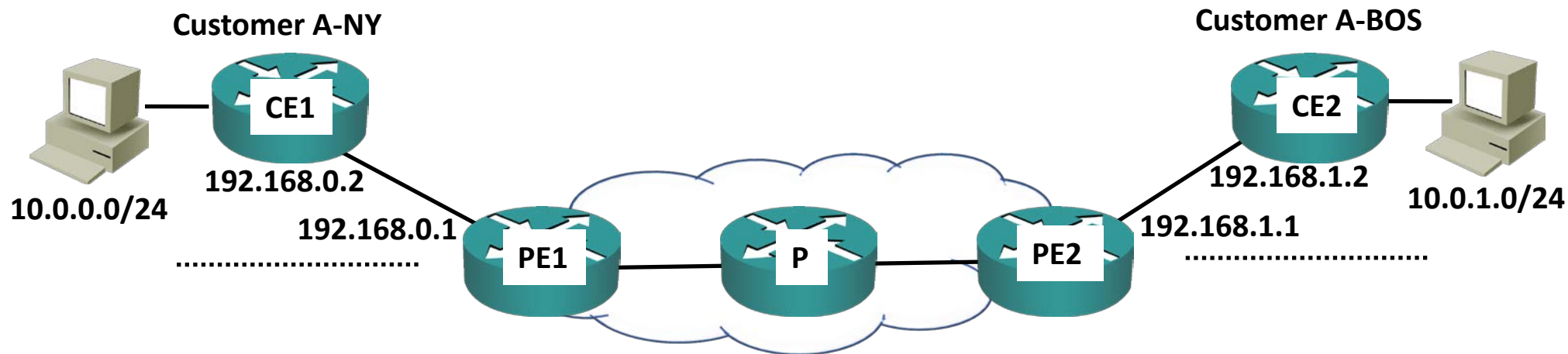
- PE1 to PE2: "Customer A can get to 10.10.0.0/24 via me"
- PE2 to PE1: "Customer A can get to 10.10.2.0/24 via me"

# Layer 3 MPLS VPN



- Technically, static routes or any routing protocol can be used between the PE and CE routers
- Service Providers will often gives customers the choice of only static or eBGP to keep things simple and lower their support overhead

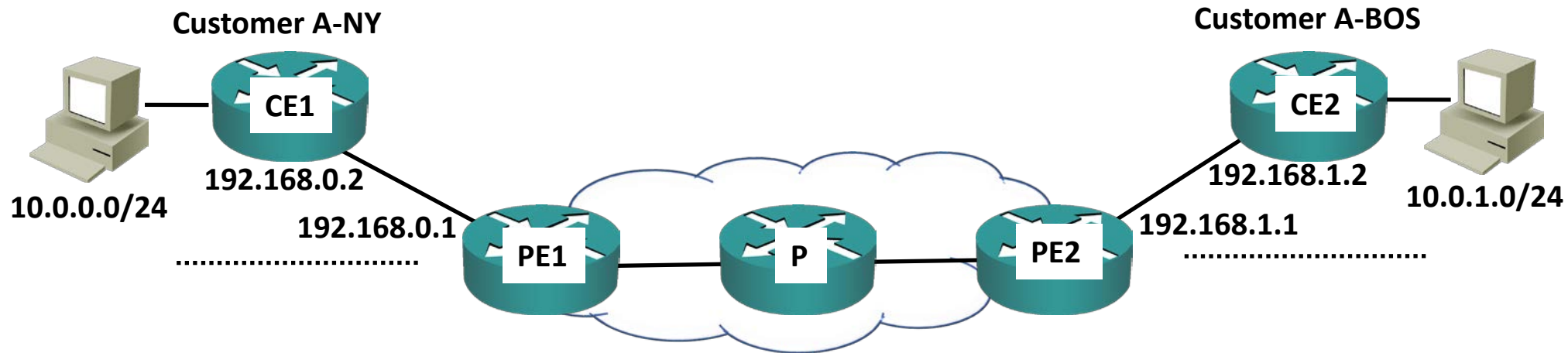
# CE Router Configuration – eBGP



```
CE1(config)#router bgp 65010
CE1(config-router)#neighbor 192.168.0.1 remote-as 65001
CE1(config-router)#network 10.0.0.0 mask 255.255.255.0
```



# CE Router Configuration – eBGP



```
CE2(config)#router bgp 65010
CE2(config-router)#neighbor 192.168.1.1 remote-as 65001
CE2(config-router)#network 10.0.1.0 mask 255.255.255.0
```