

Advanced Networking Topics: BGP, BGP Hijacking, MPLS, MPLS-based VPNs, Segment Routing, and others

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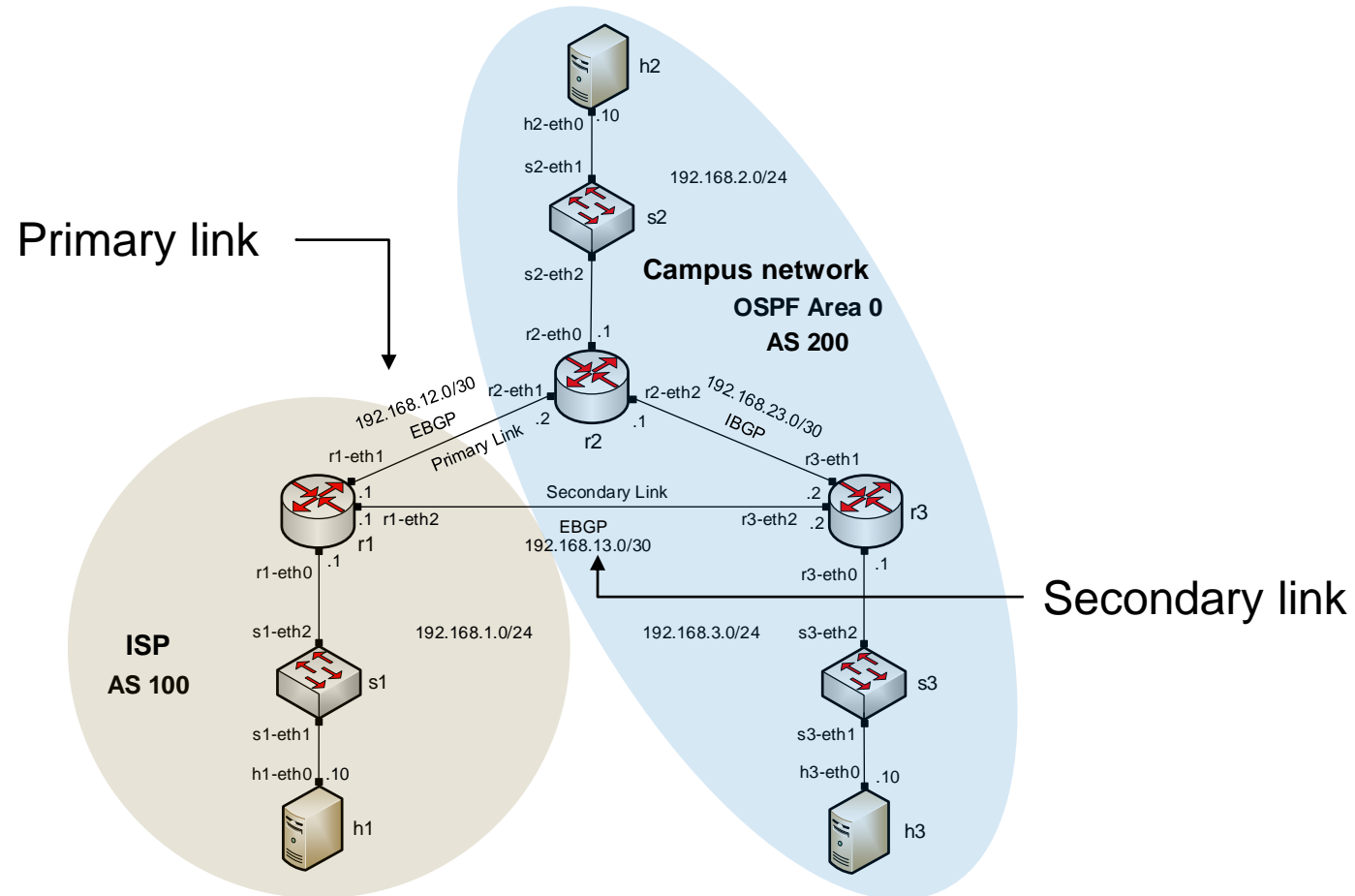
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Configuring OSPF, IBGP and EBGP Sessions, Local Preference, and MED

Lab activities are described in Lab 8.1, BGP Lab Series

Lab Topology

- Configure LOCAL_PREF and MED attributes to favor the primary link over the secondary one

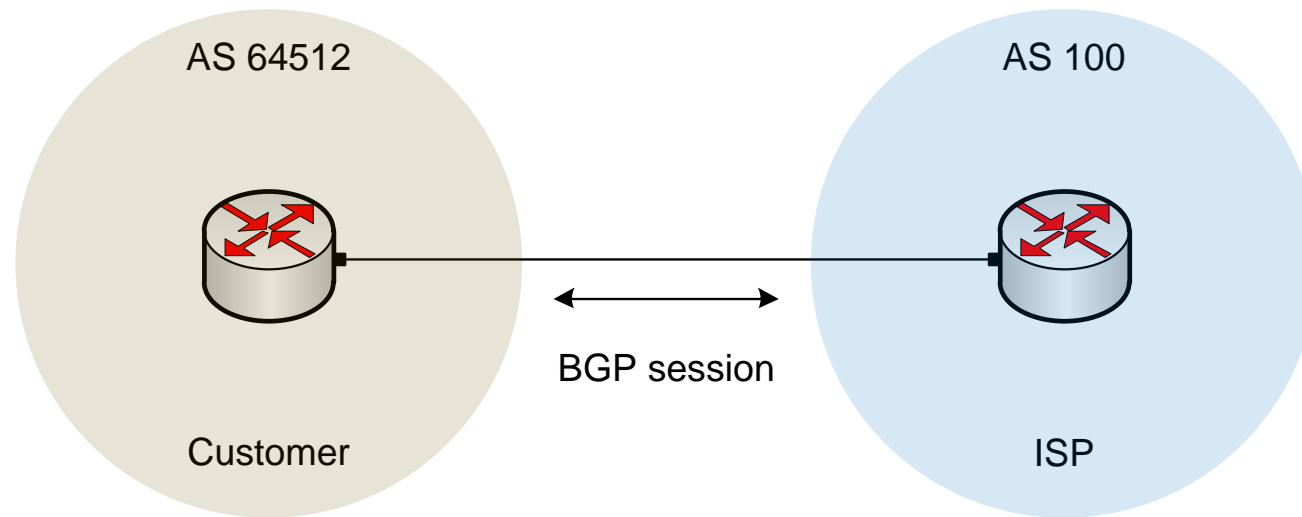


Using AS_PATH BGP attribute

Lab activities are described in Lab 7, BGP Lab Series

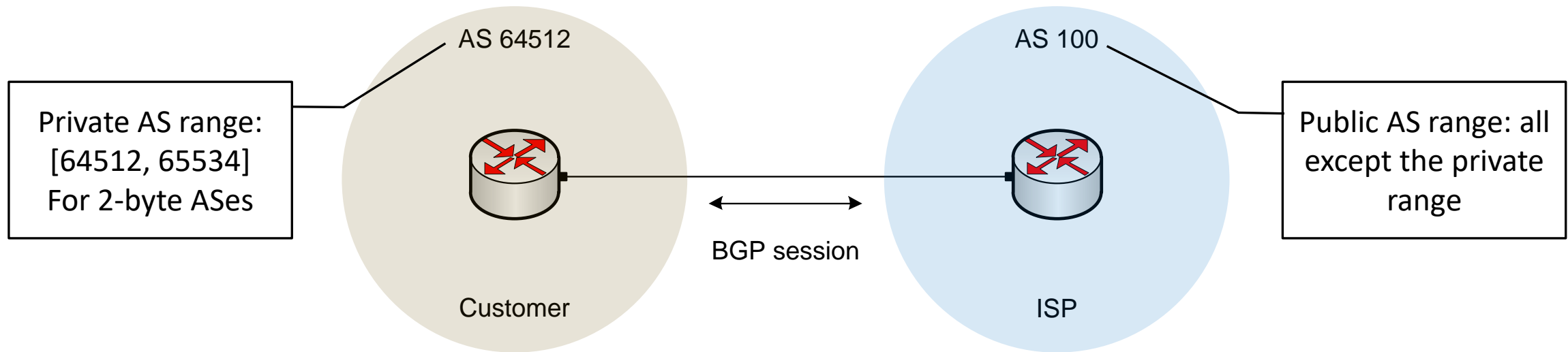
Autonomous System Number

- Each Autonomous System (AS) is identified by an Autonomous System Number (ASN) that is either public or private
- A public ASN can be advertised in the Internet
- A private ASN can't be advertised to external networks



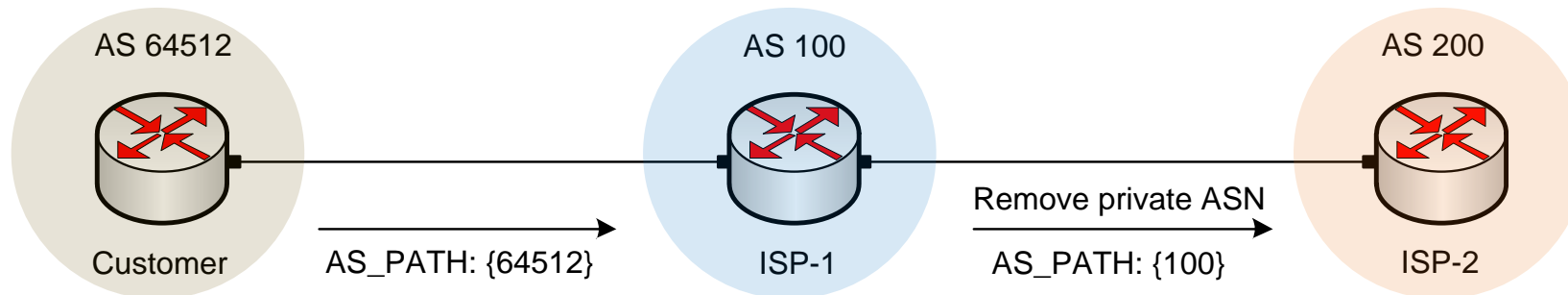
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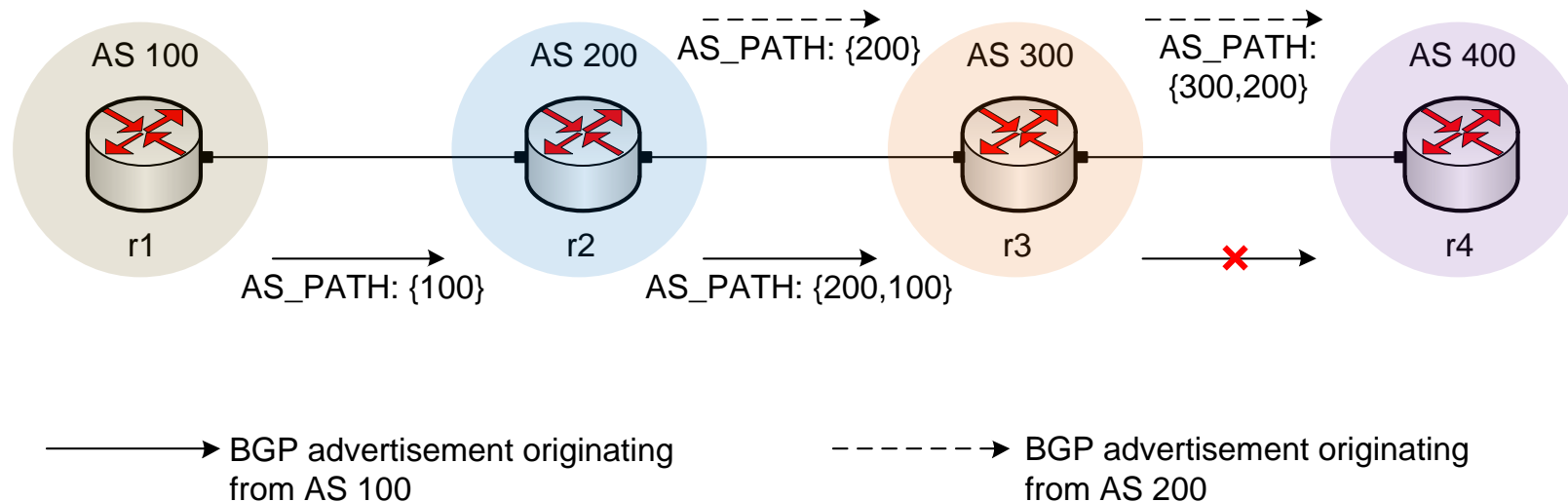
Removing Private ASN from the AS_PATH Attribute

- Routers running BGP must strip the private ASNs from the AS_PATH attribute list before advertising it to the Internet



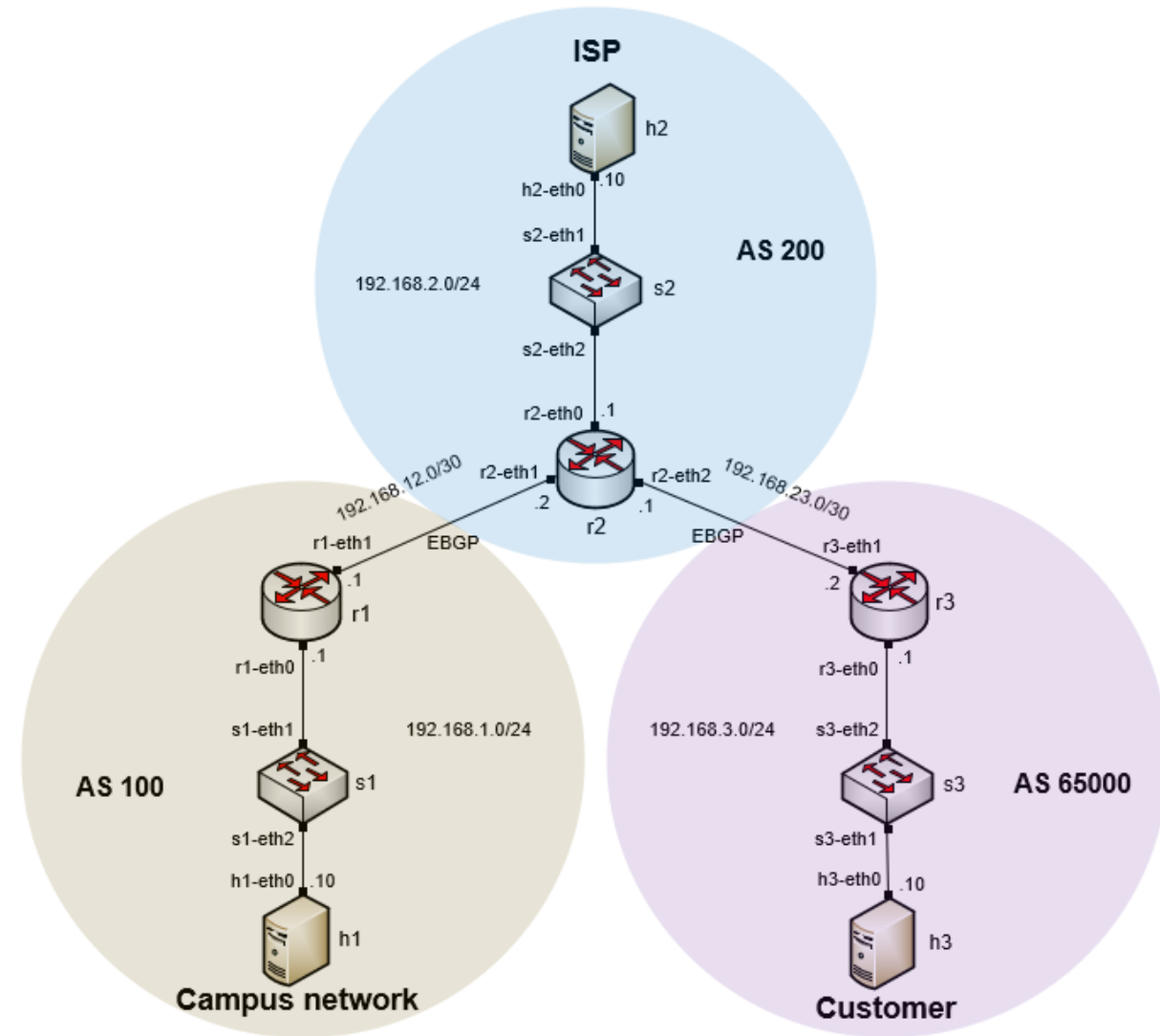
Route Filtering using AS_PATH Attribute

- Route filtering is used to control network traffic
- Route filtering can be applied based on the AS_PATH attribute



Lab Topology

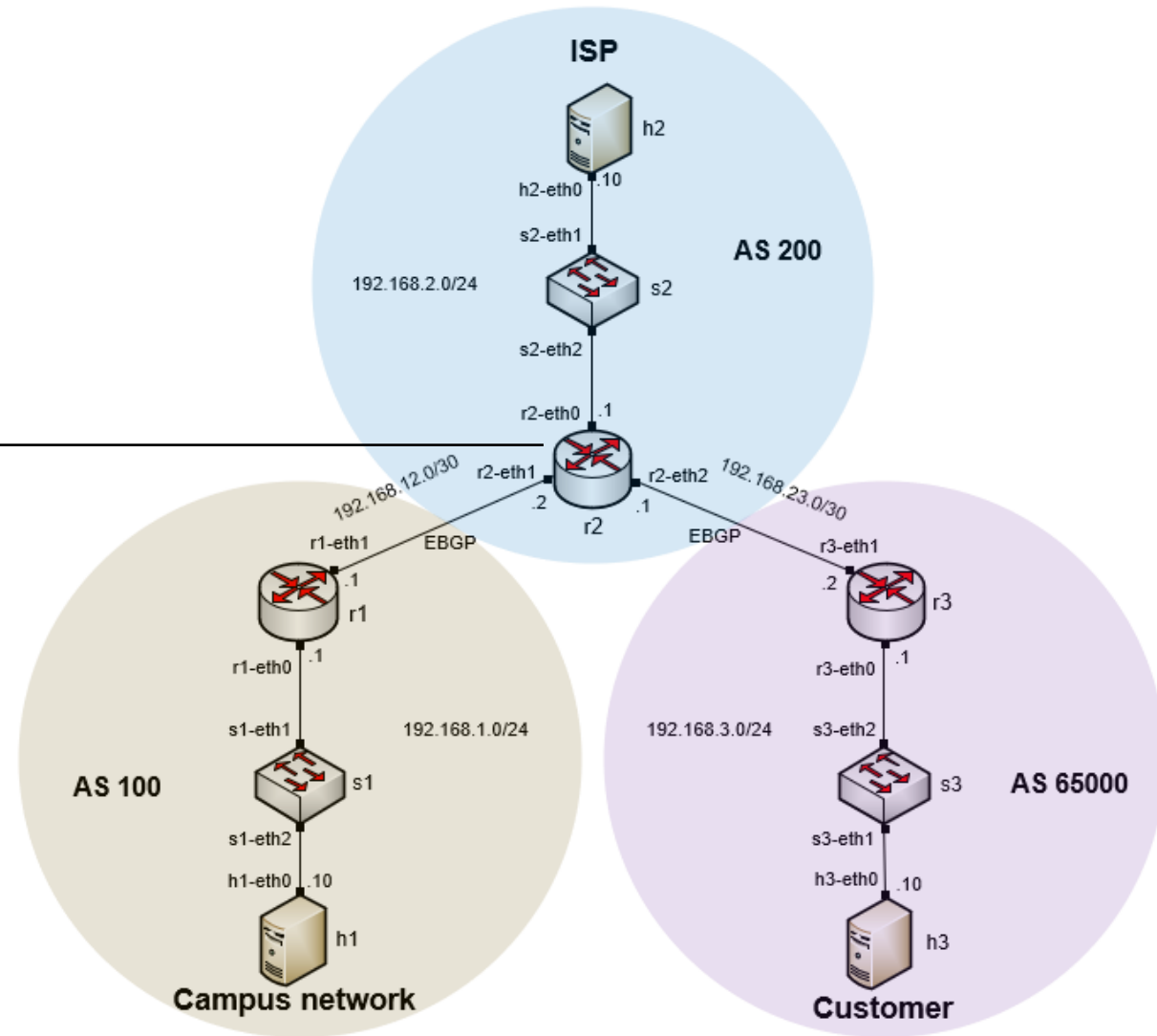
- The ISP and Campus have public ASNs and the Customer has a public ASN
- ISP removes the private ASN (ASN 100) when advertising routes to other networks
- The Customer will not receive routing updates from the Campus



Lab Topology

Router r2 removes the private AS before advertising routes to router r1 (192.168.12.1)

```
Host: r2
frr-pc# configure terminal
frr-pc(config)# router bgp 200
frr-pc(config-router)# neighbor 192.168.12.1 remove-private-AS
frr-pc(config-router)#
```



Lab Topology

Router r2 does not advertise routes from AS 100 (Campus) to AS 65000 (Customer)

```
Host: r2
frr-pc# configure terminal
frr-pc(config)# bgp as-path access-list 1 deny ^100$
frr-pc(config)# bgp as-path access-list 1 permit .*
frr-pc(config)# router bgp 200
frr-pc(config-router)# neighbor 192.168.23.2 filter-list 1 out
frr-pc(config-router)#
```

