

# Policy Routing and BGP VPNs

## ISP/IXP Workshops

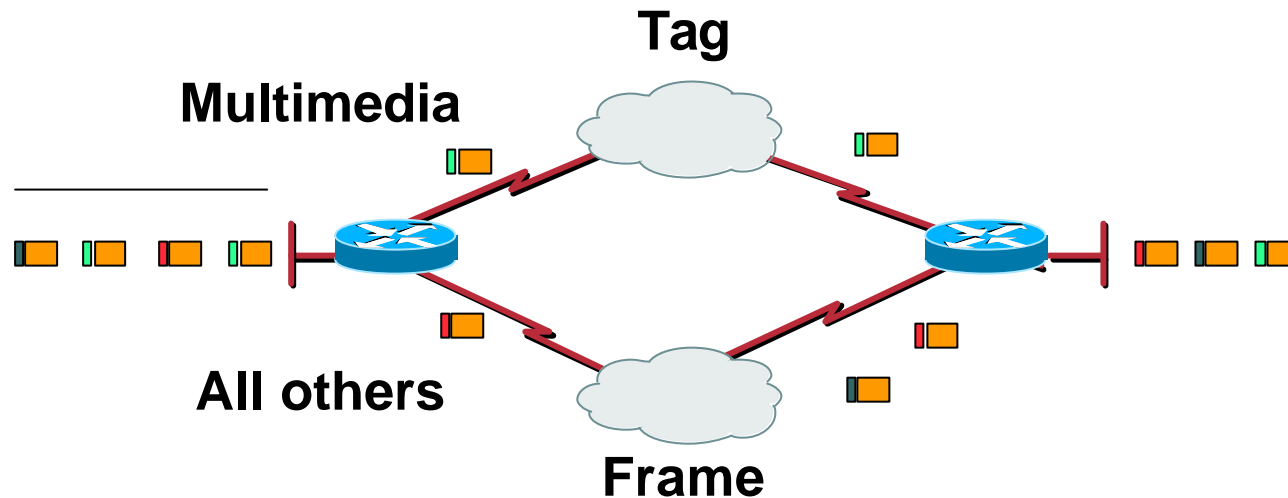
# Policy Routing

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- **Policy Routing is NOT Routing Policy!**
- **Policy Routing is about making routing decisions based upon attributes of user packet rather than destination address**
- **Examples:**  
**source address, packet length, etc...**

# Policy Routing

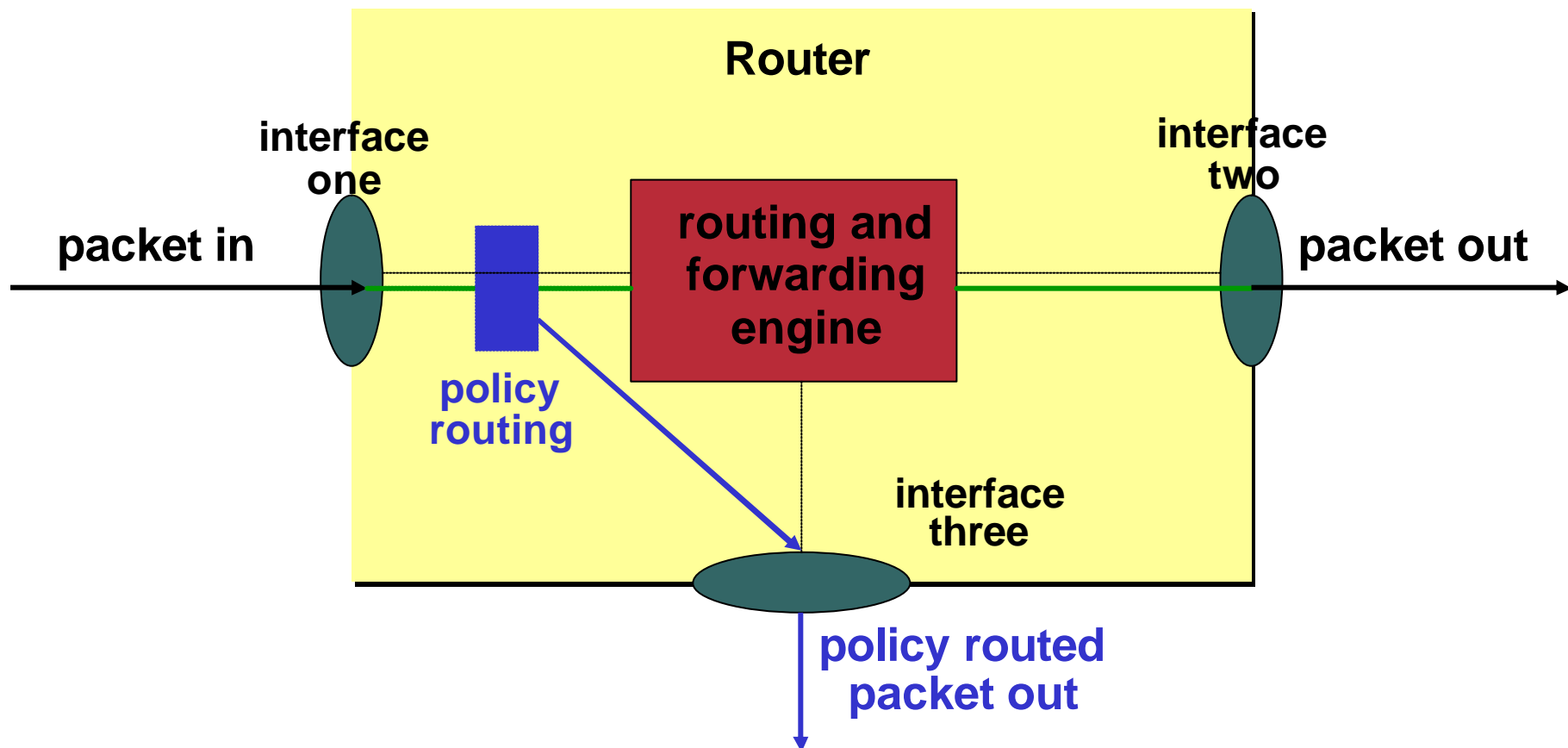
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- Sets IP Precedence/Type of Service Field
- Process switched in IOS 11.1/11.2
- Fast switched in IOS 11.3 and 12.0

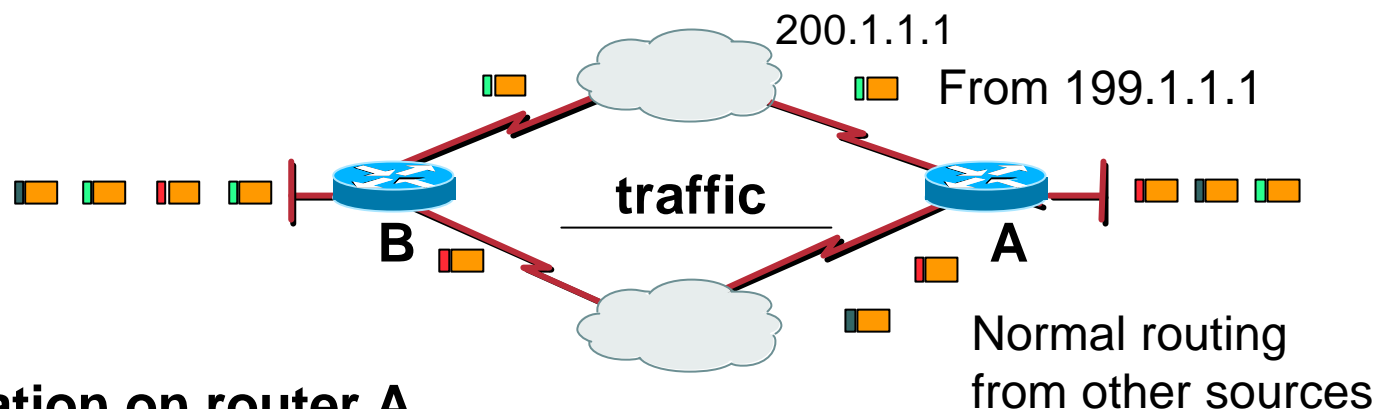
# Policy Routing

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# Policy Routing Configuration

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## Configuration on router A

```
interface ethernet 0
  ip policy route-map faster-access
!
route-map faster-access permit 10
  match ip address 10                                ! match source IP address
  set ip next-hop 200.1.1.1                          ! pointing to B's upper interface address
  set ip precedence critical                          ! set critical precedence for switched packets
!
access-list 10 permit 199.1.1.1
```

# BGP VPNs

## Case Study

# Virtual Private Networks (VPNs)

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- **Possible Implementations:**
  - Tunnels**
  - Packet filters**
  - Management problems**
- **Alternative:**
  - VPN using BGP**

# VPNs (Continued)

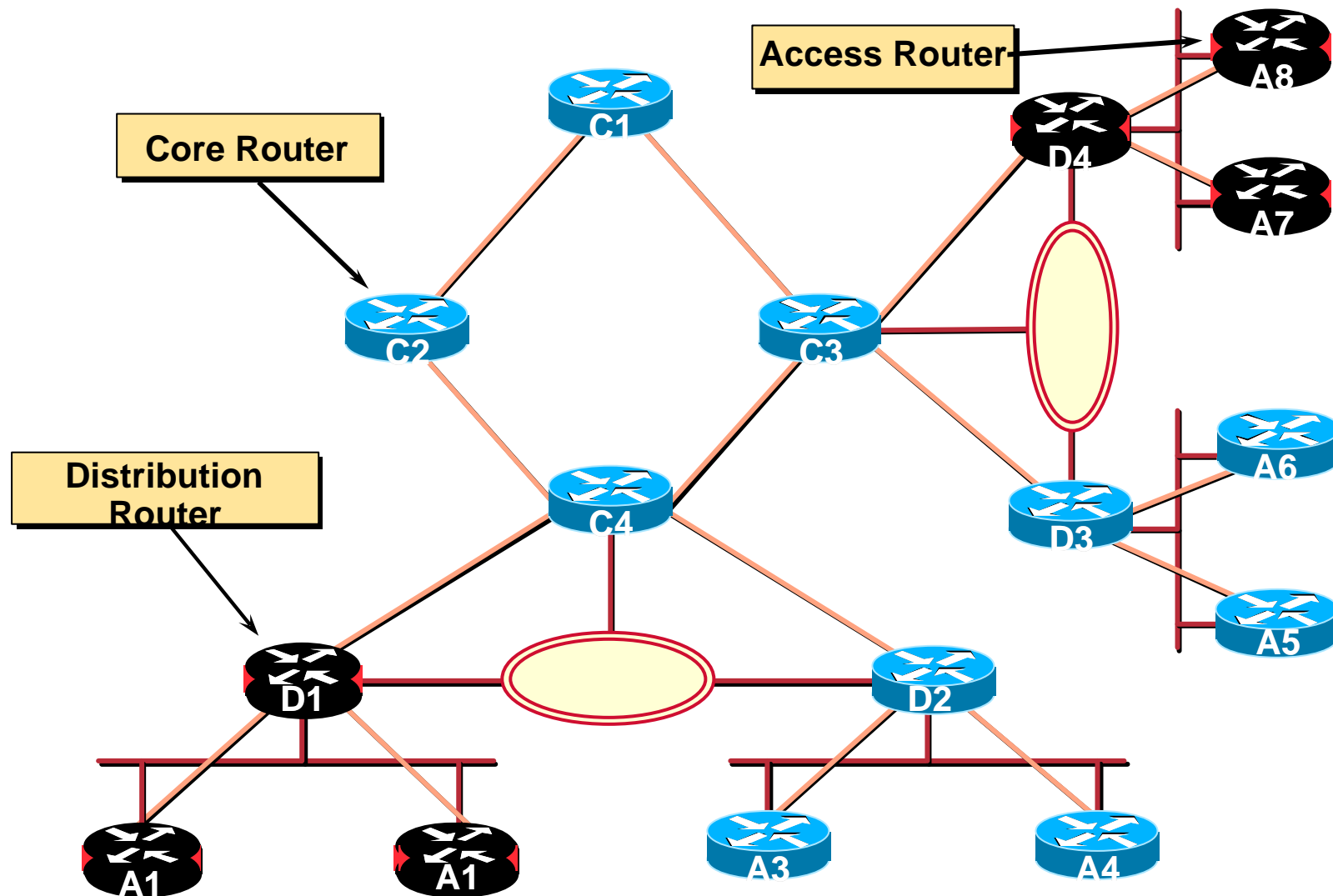
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- **Communities and multilevel route reflectors are used to build VPNs**
- **Each VPN is represented by a community**
- **Three-level route reflector**
  - Core route reflectors**
  - Distribution route reflectors**
  - Customer access routers**
- **Core route reflectors are fully meshed**



# VPNs

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# VPNs (Continued)

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- **Distribution routers are clients of core routers**
- **Customer routers are clients of distribution routers**
- **Core routers carry routes for all VPNs**
- **Core reflects single community to distribution router**

# VPNs (Continued)

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- **Customer routers advertise local VPN routes**
- **Point default to distribution router**
- **Customer routes marked with appropriate community**

# BGP VPN: Benefits

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- **Scalable**
- **No packet filters or tunnels**
- **Only route filters**
- **Easy to manage**
- **Customers need to know only the distribution router**

# BGP VPN: Caveats

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- Internet connectivity across the VPN is not possible
- Private network numbers
- Each VPN requires separate address space

# Policy Routing and BGP VPNs

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