



CCIE Security Version 5 Advanced Technologies Class



IOS Router Planes

What are the traffic planes on the IOS router?
Which traffic is handled by which plane?

Traffic Classification

▶ Traffic Types

- Unicast
- Multicast
- Broadcast (only for IPv4)

▶ Traffic Types

- Non-IP (ARP, Layer 2 Keepalives, CDP, LLDP, IS-IS)
- IP (IPv4 and IPv6)

Traffic Classification

- ▶ Unicast and multicast traffic can be of two types
 - Control packets or receive-adjacency packets (belong to the network)
 - Data packets or transit packets (belong to the users)
- ▶ Control Packets
 - Can be both layer 2 (non-IP) and layer 3 (IP)
- ▶ Data Packets
 - Usually are layer 3 packets (IPv4 and IPv6), exception being MPLS

Traffic Processing

▶ Control packets processing

- Always processed switched

▶ Data packets processing

- In general CEF switched
- Can be process switched if special handling is required, like fragmentation or CEF incomplete adjacency

Router Traffic Planes

▶ What are Traffic Planes?

- Logical separation between data packets and control packets

▶ What is the scope of Traffic Planes?

- Used to easily build different security policies

▶ What are the IP Traffic Planes?

- Data Plane and Control Plane

▶ Which Planes should be secured?

- Both

Control Packet Planes

- ▶ Control Packets are divided into two sub-planes
 - Control Plane and Management Plane

Control Packet Planes

▶ Control Plane

- Responsible with all protocols used to build and maintain the forwarding path and network services
- Examples: routing protocols, IGMP, PIM, LDP, ISAKMP

▶ Management Plane

- Responsible with all protocols used to access, manage and monitor the network
- Example: telnet, SSH, TFTP, RADIUS, TACACS, SNMP, Netflow

Data Packet Planes

▶ Data Packets are divided into two sub-planes

- Data Plane and Services Plane

▶ Data Plane

- Responsible with all transit traffic

▶ Services Plane

- Responsible with transit traffic for which services are applied
- Services example: NAT, MPLS, Firewall, QoS, IPsec, SSL



Knowledge is Power!