



Virtual Routing & Forwarding Instances (VRFs)

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What Are VRFs?

» Virtual Routing and Forwarding Instances (VRF)

» VRFs create “virtual routers”

- VRF defines a new instance of the routing table
- Interfaces assigned to the VRF belong to that routing table
- Interfaces not in a VRF are in the “global” or “default” vrf

» Result is essentially a VPN

- Separates control plane instances
- Separates data plane based on routing
 - E.g. I can't reach you if I have no route to you
- Addressing can overlap in different VRFs

VRF Aware Routing

» Routing inside a VRF can be through...

- VRF aware static routes
- VRF aware dynamic routing
 - RIP
 - EIGRP
 - OSPF
 - IS-IS
 - MP-BGP
- Policy Routing

VRFs in IOS

» Specify locally significant VRF name

- ip vrf [name]
 - IPv4 only
- vrf definition [name]
 - Supports both IPv4 and IPv6

» Specify “route distinguisher”

- rd [ASN:nn | IP-address:nn]
- More on this in MP-BGP

» Apply VRF to interface

- ip vrf forwarding [name] | vrf forwarding [name]
- Removes IP address from interface

VRFs in IOS XR

- » Specify locally significant VRF name
 - vrf [name]
- » Route Distinguisher defined under BGP
 - router bgp [ASN]
 - vrf [name]
 - rd [value]
- » Apply VRF to interface
 - interface GigabitEthernet0/0/0/0
 - vrf [name]

VRF Lite

- » This minimum configuration is called “VRF Lite”
 - I.e. VRFs without any MPLS config
 - VRFs do not always mean MPLS
 - MPLS does not always mean VRFs

VRF Verification

» Normal commands become “VRF Aware”

- `show ip route vrf [vrf]`
- `ping vrf [vrf]`
- `traceroute vrf [vrf]`

» Features must become “VRF Aware”

- E.g. VRF Aware NAT, VRF Aware IPsec, etc.
- Not all features are supported

» Not all vrf parser syntax is intuitive

- ? is your friend

Q&A