Open. Together.
cRPD: Cloud-Grade routing for microservices environment

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cRPD: Introduction

Juniper routing protocol stack decoupled from JUNOS and packaged for Linux container environments

- Deployable on demand as a microservice
- Lightweight: 3 seconds startup, ~256 MB image size, ~512 MB RAM
- Can program Linux FIB: IPv4, IPv6, MPLS
- NETCONF, OpenConfig, CLI
- Automation, Telemetry, Programmability
- Supports Kubernetes, Docker swarm
Usecase: SONiC

- Rich route policy language
- Route Aggregation: FIB optimization
- BGP add-path for path diversity
- Programmability: gRIBI, JET
- MPLS Ready
**Usecase: Egress Peer Engineering**

**Goal**
- Steer traffic from CDN server towards one of the peering connections to lower transit costs

**Solution**
- BGP add-path to advertise multiple BGP paths
- Install route into multiple tables, each with different paths or tunnels (Multi Topology Routing) using policies
- For each session, application picks a table to send data traffic using one of the tables based on criteria
- Use either MPLS or GRE tunnels
Use case: Scale out Route Server

Goal
- Build a BGP route server that can service thousands of BGP clients

Solution
- Multiple instances of cRPD behind a NATed bridge or load balancer
- Clients see all routes come from a single route server
- Support large number of BGP clients > 10K

LAN (10.1.0.0/24)

172.17.0.2
172.17.0.3
172.17.0.4

10.1.0.1
10.1.0.2
10.1.0.3
10.1.0.4
10.1.0.5

r1
r2
r3
r4
r5

AS100 1/8
AS200 2/8
AS300 3/8
AS400 4/8
AS500 5/8

AS100
AS200
AS300
AS400
AS500
Use case: DDOS Mitigation using BGP

Goal

- Mitigate DDOS attacks

Solution

- Dynamically steer traffic to scrubber upon detecting DDOS attack
- Distribute firewall filters over BGP using flowspec
- cRPD as RR to advertise flow routes into the network
- Firewall rules can also be distributed to application servers over BGP
- Filters installed into kernel using nftables
RPD: Advantages

• Large deployment base: Datacenter, Service Provider, Enterprise
• Feature richness: Extensive Policy Language, BGP add-path, LU, BMP, …
• Performance: Deployed in the most demanding networks, High scale, Low footprint
• Standards compliant: Extensive interop testing, Hardened over years
• Familiarity and expertise: Juniper CLI
• Single sourced: Same code across all Juniper platforms
• Programmability: gRPC based APIs, Easy integration with SDN controllers
• Open Interfaces: NETCONF, OpenConfig, gRIBI, …

• Qualification, Professional Services, Support
Additional Information

Demos at Expo Hall

• cRPD + SONiC on QFX 5200, QFX 5210
• cRPD as BGP Peering Router with 200M route scale
• cRPD Programmable Routing using gRPC APIs

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