Bio-Routing UPDATE
DENOG 14

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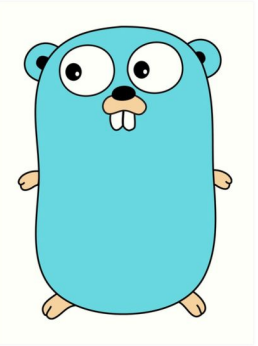
What is BIO routing?

- Routing daemon (library) written in golang
- Open source (https://github.com/bio-routing/bio-rd)
- Based on tbgp by takt in 2017
- Founded / initial commit in April 2018
- 23 contributors
- Nearly 1.100 commits
- Applications using BIO already in production in multiple large networks



Key concepts and focus of BIO

- Open Source (Apache 2.0)
- Focus on performance and memory efficiency
- BIO as library (integrate directly in your app, e.g. route injector, SDN controller, observability tooling, ...)
- BIO as full featured routing daemon
- Fast, type safe, binary APIs (gRPC)
- Native Prometheus integration

Status Quo - BGP

- 32bit ASN support (RFC6793)
- Communities (RFC1997)
- Large Communities (RFC8092)
- Multi Protocol (RFC4760)
  - IPv4/IPv6 unicast
- AddPath (RFC7911)
- Route Server (RFC7947)
- Route Reflection (RFC4456)
- Default eBGP deny filter (RFC8212)
- MD5 support (RFC2385)

NEW

- BGP Roles (RFC9234)
- Pluggable AdjRibIn(Factory)

Status Quo - BMP

- BGP Monitoring Protocol (BMP) Receiver (RFC7854)
- RIS + RIS-Mirror
- Using custom AdjRibIn to forward BGP UPDATEs/WITHDRAWs
- Track End Of RIB status
- More config options:
  - Accept connections from any router
  - Track pre and/or post policy events
  - Ignore events from certain peer ASNs
- Some groundwork for BMP Monitoring station support

NEW

Status Quo - IS-IS

- L2 support nearly done
- Packet handling complete
- Hello protocol implemented (p2p)
- LSDB synchronization done
- LSP generation done (to be triggered)

Misc new stuff

- Route age
- Global logging configuration
- Internal clean-ups and unifications
- Bio-rdc command line client
  - via gRPC
  - r/o currently
- Configuration file support
- Increased test coverage

Using BIO as library

- Route Injector at Exaring (AS51324)
  - REST and GRPC API (SDN Controller)
  - Stateless setup with multiple instances (runs in Kubernetes)
  - Used for Traffic Engineering
- Source Routing on the edge at Exaring (AS51324)
  - Source Routing from the (Linux) hosts
  - MPLSoUDP plumbing between host and router
  - SDN controller to steer traffic to desired router/peer
  - DENOG10 talk on the data plane part: https://youtu.be/4x4GK561moQ

Using BIO as library

- RTBH Route Injection at Mauve (AS48821)
  - Source code available: https://github.com/czerwonk/bioject
  - Injecting routes via gRPC API
  - Persists RIB state in SQLite DB
  - Metrics and distributed tracing via OpenCensus (https://opencensus.io/)
- BMP processing pipeline at Cloudflare (AS13335)
  - Stateless setup with multiple instances (runs in Kubernetes)
  - Decodes BMP monitoring messages into protobuf messages
  - Sends protobuf messages onto Kafka topic
  - Source code available: https://github.com/cloudflare/bbmp2kafka/

Roadmap

- Full table capable routing tables (without eating RAM for breakfast)
- BMP Monitoring station support
- IS-IS L2 (+L1) support
- Flow spec (planned)
- OSPF (planned)
    - PR for OSPFv3 packet handling pending
- r/w CLI tool

Source Code and Contribution

Source Code is available at:

https://github.com/bio-routing/bio-rd

We appreciate contribution! :-)

Thanks for your attention!

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