BIRD Internet Routing Daemon

Ondřej Zajíček

CZ.NIC z.s.p.o.

RIPE 66

BIRD overview

- BIRD Internet Routing Daemon
- Routing protocols BGP, OSPF and RIP
- IPv4 and IPv6 support
- Linux and BSD kernel support
- Free and open source software (GPL)

BIRD advantages

- Programmable filters
- Clear and structured config files
- Multiple protocol instances
- Multiple routing tables
- Automatic reconfiguration on the fly
- Extensive documentation
- Low memory and CPU requirements
- Brief and well structured source code

BIRD disadvantages

- Lower number of features and extensions
- UI and configuration different from Cisco
- Strict separation of IPv4 and IPv6
- No multicast routing support

Filters - example

```
filter bgp_in
prefix set martians;
{
    martians = [ 10.0.0.0/8+, 172.16.0.0/12+
        192.168.0.0/16+, 169.254.0.0/16+, 224.0.0.0/4+,
        240.0.0.0/4+, 0.0.0.0/32-, 0.0.0.0/0{25,32} ];

    if net ~ martians then reject;
    if bgp_path.first != 1234 then reject;
    if bgp_path.len > 64 then reject;

    if net ~ [120.10.0.0/16+, 120.20.0.0/16+]
    then bgp_local_pref = 500;
    else bgp_local_pref = 100;

    bgp_med = 0;
    accept;
}
```

BIRD deployments

Route servers in IXPs (check Euro-IX report), CDNs, ...

Recently added features

- Dynamic IPv6 router advertisements
- RDNSS and DNSSL support for RAs
- Selective propagation of non-best routes
- Undo and timeout for reconfigurations
- Lightweight BIRD control tool for embedded environments
- Looking glass tool

Current development

- IPv4 and IPv6 integration
- IS-IS
- BGP ADD_PATH (patch available)
- BGPsec (patch available)
- MPLS VPN route reflector (branch available)

Why open source routing daemon?

Common answers:

- PC based routers
- Small embedded routers
- BGP route servers and reflectors

Why open source routing daemon?

Platform for innovations:

- New protocols and extensions
  - Wireless routing (OLSR, Babel, . . .)
  - BGPsec
  - . . .
- Experimental data planes
  - FPGA cards
  - OpenFlow
  - . . .
- Scientific experimental purposes
- Routing control plane for startup equipment vendors

Why open source routing daemon?

Network topology aware applications:

- Intelligent HTTP mirrors / redirectors
- Network monitoring tools
- Network visualisation
- (Virtual) server IP management
- Anycast propagation for high availability

Feedback

- Are you using open source routing daemons?
- What features would you need or want?
- Some interesting use cases?
- Your experiences?

Questions?

http://labs.nic.cz/
http://bird.network.cz/