NIX.CZ and BIRD

Ondrej Filip / feela@network.cz

Mar 4, 2014, Peering Day, Vienna

NIX·CZ

BIRD

- Project started 1998
- Open source routing daemon – "like Quagga"
- Developed by CZ.NIC (.cz registry)
- Presented on PeeringDay 1 in Prague
- Used by many other IXPs as RS – including VIX and NIX.CZ (more thant 50% market share according to Euro-IX)
- LINX Conspicuous Contribution Award 2010

cz.nic

BIRD – basic features

- IPv4/IPv6
- static
- RIP, RIPv2, RIPng
- OSPFv2, OSPFv3
- BGP
- IPv6 RAdv

BIRD – features

- Low memory consumption
- Lightweight
- Flexible design – protocol PIPE
- Powerful configuration and filtering language
- Smart reconfiguration
- Linux (many distribution, OpenWRT), FreeBSD, NetBSD, OpenBSD
- Current version 1.4.0

Recent feature - ROA

- Support of ROA tables
- Dynamically filled (e.g. from IRR db) using CLI
- ROA can be matched in filters - roa_check()
- ROA_UNKNOWN, ROA_VALID, ROA_INVALID

```
roa table myroa {
 roa 217.31.192.0/20 max 20 as 25192;
}
```

Recent feature – filter limits

- Keep filtered, limits
- Filtered routes kept in RIB (but not active)
- Handy for RS with single RIB
- Separate 'import' and 'receive' limits
- Actions: block, warn, disable, restart
- Limits are checked during reconfiguration (1.4.0)

Recent feature – allow-local-as

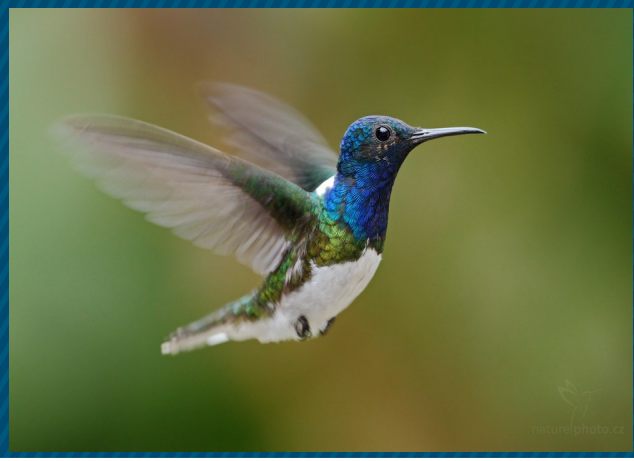
- Allowas-in (Cisco syntax)
- BGP loop prevention mechanism reject routes with the local AS number in the AS path
- This allows to loose or disable the check
- Maximum number of local ASNs in the AS path may be specified
- (1.4.0)

Recent feature – reconfiguration

- Advanced reconfiguration commands
  - configure check
  - configure timeout
  - configure confirm
  - configure undo

Recent feature – lightweight CLI

- Standard client birdc – uses libncurses, libhistory, libreadline
- Lightweight client – no additional libraries
- Mainly for embedded systems (OpenWRT)



Recent feature – protocol templates

```
template bgp NIXPEERS {
        local as 112;
        export filter bgp_out;
        start delay time 120;
        mrtdump all;
        import limit 50000 action warn;
}
protocol bgp NIXRS1 from NIXPEERS {
        neighbor 91.210.16.1 as 47200;
        import limit 60000 action block;
}
```

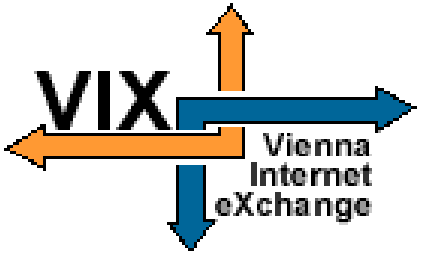
Recent feature – extended c. lists

```
if  peeras < 65535 then
{
   if ((o,peeras) ~ bgp_community) || ((ro,o,peeras) ~
                  bgp_ext_community) then return false;
   if ((myas,peeras) ~ bgp_community) || ((ro,myas,peeras) ~
                  bgp_ext_community) then return true;
   if ((o, myas) ~ bgp_community) || ((ro,o,myas) ~
                   bgp_ext_community) then return false;
}
return true;
```

Recent feature – BFD

- Bidirectional Forwarding Detection
- RFC-5880 – RFC-5884
- Subsecond peer timers
- Supports BGP and OSPF
- Separate thread
- (1.4.0)

BIRD deploymets



BIRD@NIX.CZ

- AS112 (with Knot DNS) – with BFD
- Dual RS in peering VLAN and secure VLAN
- Linux and FreeBSD – different config. styles
- About 130 BGP sessions
- Reconfigured every 2 hrs – intranet data & RPSL (RIPE DB)
- Filters based on prefix & AS path
- BGP Community
- RTBH Filtering

Work in progress

- Mainly driven by Gold Support contractors
- BGP add-path (1.4.1)
- BGP graceful restart (1.4.1)
- BGP equal cost multipath
- RPKI
- …
- IPv4 & IPv6 integration
- IS-IS

Thank You!

Ondrej Filip • feela@network.cz • http://bird.network.cz