BIRD update
RS memory optimization

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NIX.CZ

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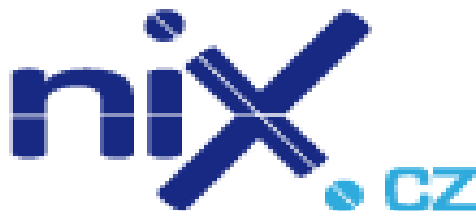
Since last update

- ➲ Last update in Vienna (1.3.4) – extended community filters
- ➲ More deployments
- ➲ New key BGP related features
  - ⑤ Protocol templates
  - ⑤ ROA basic support
  - ⑤ Import/export route limits improved
  - ⑤ Secondary route export

BIRD deployments

- CDNs, IXPs – check Euro-IX report

ROA

- ➲ Support of ROA tables
- ➲ Can be dynamically filled (from RPKI or IRR db) using CLI
- ➲ ROA can be matched in filters - roa_check()
  - ⑤ ROA_UNKNOWN
  - ⑤ ROA_VALID
  - ⑤ ROA_INVALID

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

Route limits

- ➲ General protocol option (not just for BGP)
- ➲ Number of routes received from or **sent to** a peer
- ➲ Four types of reaction
  - ⑤ WARN
  - ⑤ BLOCK
 - ⑤ RESTART
  - ⑤ DISABLE

Protocol templates

```
template bgp NIXPEERS {
        local as 112;
        export filter bgp_out;
        start delay time 120;
        debug { states, events };
        route limit 50000;
}

protocol bgp NIXRS1 from NIXPEERS {
        neighbor 91.210.16.1 as 47200;
        route limit 60000;
}
```

Side note: Route filtering problem

➲ Normally filters match best route only

➲ If best route denied no other exported

➲ Problem with customers behind two different peering partners if one partner (with better path) is filtered out

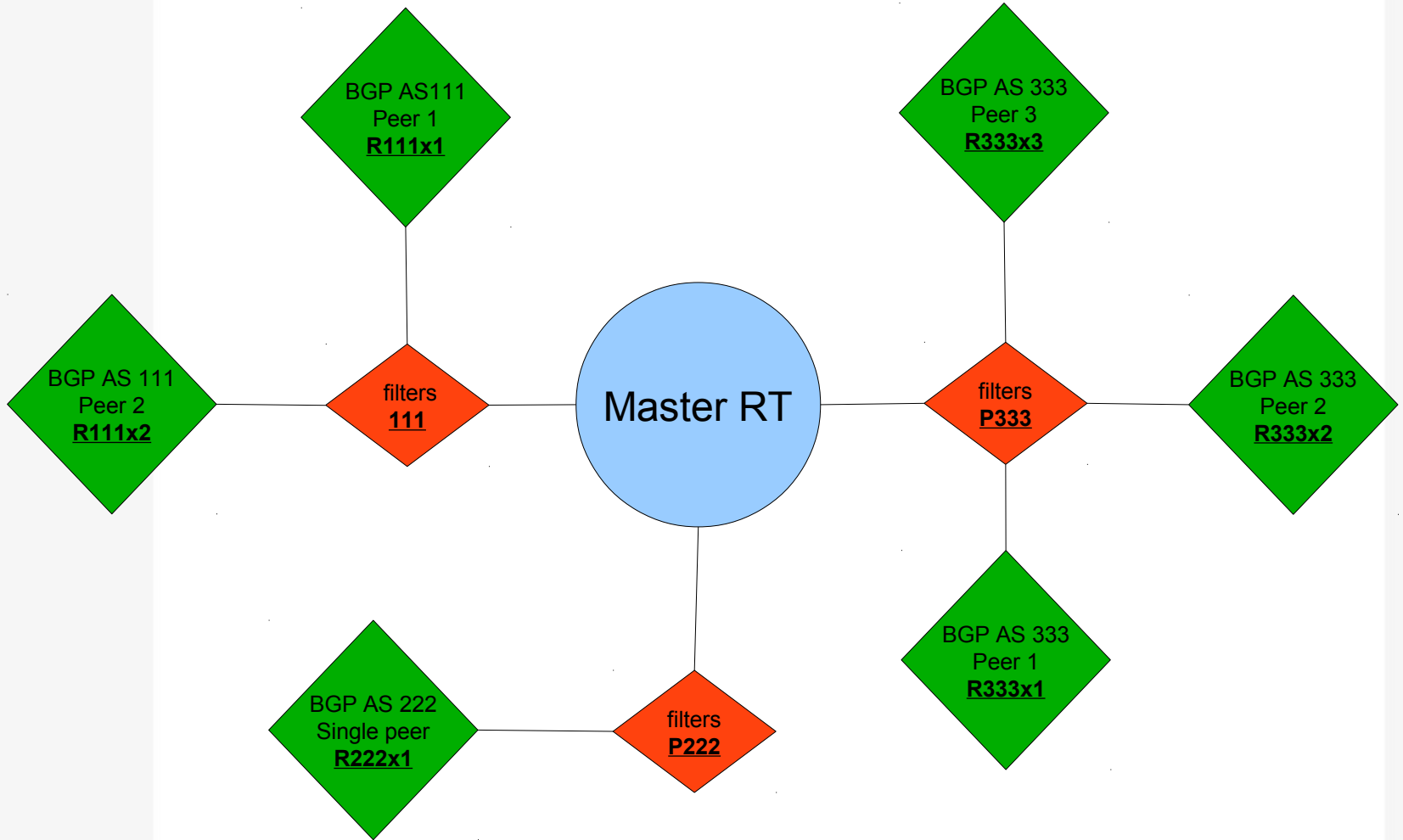➲ One solution multiple RIBs with PIPE protocol – but consumes a lot of memory (square complexity to # of routes)

Multiple RIBs
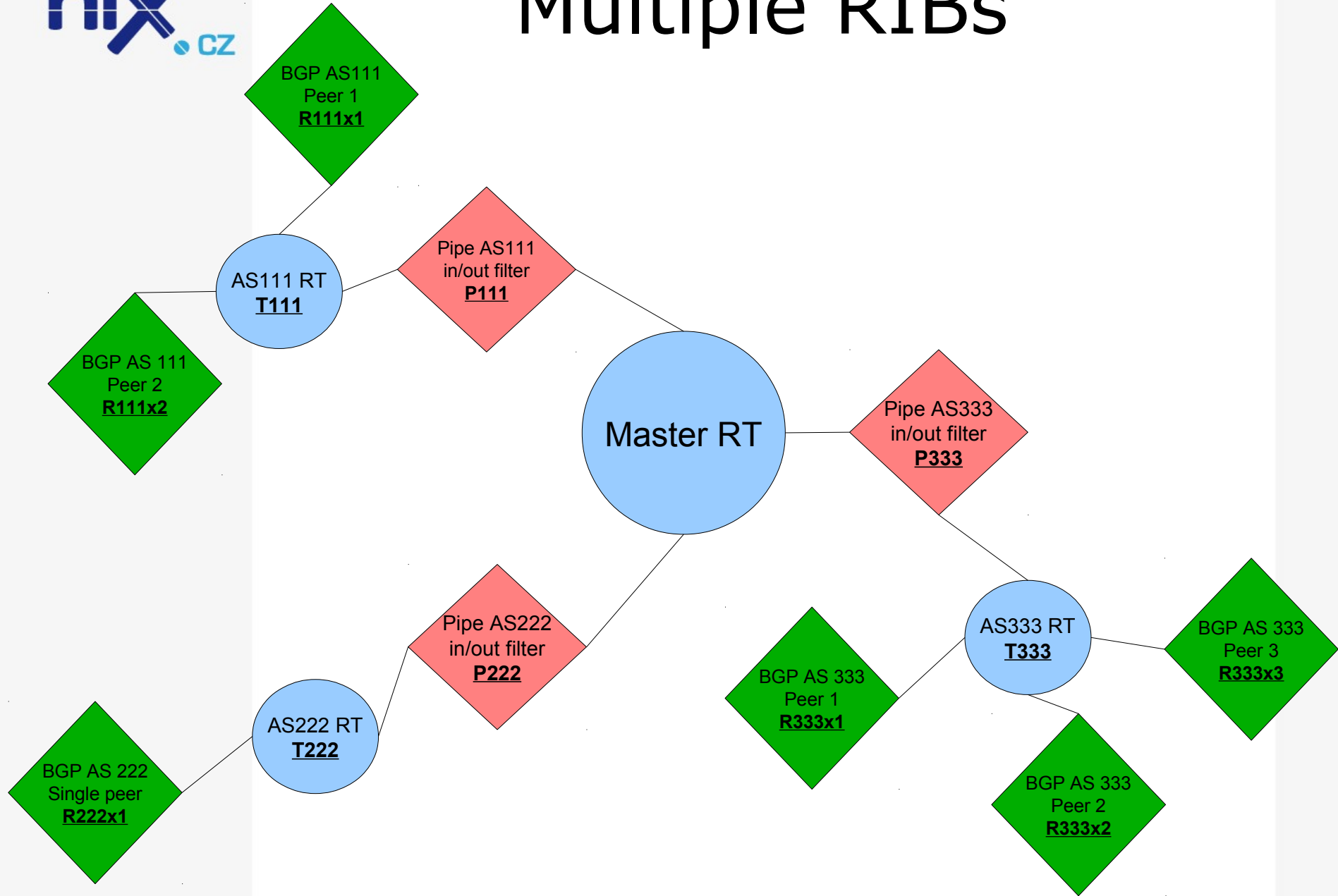
Single RIB

- ➲ Allow second best route to be exported
- ➲ BGP protocol option 'secondary;'
- ➲ Precondition: routing table sorted (a little bit slower)
  - ⑤ 'table master sorted;'
- ➲ No PIPE protocols
- ➲ Con - Can't check imported routes before filtering

Single RIB

```
template bgp NIXPEERS {
  local as myas;
  rs client;
  secondary;
  route limit 25000;
  start delay time 60;
  interpret communities off;
}

table master sorted;

protocol bgp R6881x1 from NIXPEERS {
  description "NIX.CZ - 91.210.16.243 - (1)";
  neighbor 91.210.16.243 as 6881;
  import filter bgp_in_AS6881;
  export where bgp_out(6881);
}
```

NIX.CZ Route Servers

- Two route servers
- BIRD 1.3.8 with single RIB configuration on Linux
- BIRD 1.3.5 with multiple RIBs configuration on FreeBSD
- ~30.000 IPv4 routes
- ~7.000 IPv6 routes
- Memory consumption 1/7 IPv4 and 1/4 IPv6

Work in progress

- ➲ BGP Add-path (beta)
- ➲ Looking glass (beta)
- ➲ IPv4 and IPv6 integration
- ➲ IS-IS
- ➲ … your feedback is welcome

Conclusion

- ➲ Secondary route export can save a lot of memory/CPU with
- ➲ More important for larger deployments
- ➲ New BGP features in BIRD
- ➲ And look forward to more :-)

Questions ?

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