

RIPE65

# Open Source Roundtable

Quagga / Bird & Do we want a new RIPE Working Group?

## For Bird:

Ondrej Filip  
CZ NIC



## For Quagga:

Martin Winter / David Lamparter  
OpenSourceRouting.org



Open Source Routing

# Agenda

## **Popular Open Source Software & Status**

Overview of Bird, Quagga, OpenBGPd, Xorp

**1**

## **RIPE Working Group?**

Should we consider a RIPE WG for Open Source Projects?

**2**

## **How you can help**

Open Source needs your help. And it will help you.

**3**

## **Discussion**

Open Discussion on Quagga, Bird and the idea of the RIPE WG

**4**

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**Important reminder:**

**Quagga/Bird/... are not complete routers. They are only the Route Engine.**

**You still need a forwarding plane**

## Popular Open Source Software

# Bird

<http://bird.network.cz/>

# Bird

<http://bird.network.cz/>

- ▶ **Project started 1999**
  - Started as seminar project at Charles University, Prague
  - Since 2008 maintained by CZ.NIC Labs
- ▶ **Fast, efficient**
- ▶ **Modular**
- ▶ **Portable**



# Bird - Features

Based on Version 1.3.8

## ▶ **Protocols**

- RIP, RIPv2, RIPv6, OSPFv2, OSPFv3, BGPv4, BGPv6

## ▶ **Runs on Linux, FreeBSD, NetBSD, OpenBSD**

## ▶ **BGP ROA support (RPKI)**

## ▶ **IPv6 Router Advertisement**

## ▶ **Powerful configuration and filtering language (!)**

## ▶ **Multiple routing tables – internal and OS**

## ▶ **Missing / Limitations:**

- IPv4 & IPv6 separate daemon
- ISIS (IPv4 & IPv6)
- Non standard configuration

# Bird – Users

- ▶ **Bird is currently the most popular Open Source Solution for Route Servers**
  - Major use is for BGP processing and announcements
  - Smaller ISPs, DD-WRT (<4MB), CDN, DNS anycasts





# Bird – Work In Progress

- ▶ **BGP Add-path (beta)**
- ▶ **Looking glass - multiplatform (beta)**
- ▶ **IS-IS (IPv4 & IPv6)**
- ▶ **IPv4 & IPv6 integration**
- ▶ **MPLS**
- ▶ **... feedback welcome**

Popular Open Source Software

Quagga

<http://www.quagga.net/>

# Quagga

<http://www.quagga.net/>

- ▶ **Project started as fork of Zebra**
  - Open Source Community “owned”
  - Maintained by the community
  - OpenSourceRouting.org supports community with testing & development
- ▶ **Focus on full routing**

NO QUAGGA LOGO

**But do you know  
what a Quagga is?**



**Quagga**

Extinct relative of the Zebra

# Quagga - Features

Based on Version 0.99.21

## ▶ **Protocols**

- RIP, RIPv2, RIPng, OSPFv2, OSPFv3, ISIS (v4 only), BGPv4, BGPv6, Babel, SNMP

## ▶ **Runs on Linux, FreeBSD, NetBSD, OpenBSD, Solaris, and many more**

## ▶ **Cisco like CLI**

## ▶ **Missing / Limitations:**

- BGP inefficient for Route Server / many full feeds
- ISIS (IPv6) (and ISIS IPv4 is not yet useable)
- Multiple branches of Quagga:
  - Quagga.net (official “Master” branch), Euro-IX, Quagga-RE and more

# Quagga – Users

- ▶ **Some Route Server (smaller ones)**
- ▶ **Used by OpenFlow, SDNs and small router appliances as route processor**
- ▶ **Smaller ISPs (Linux routers with OSPF & BGP)**
- ▶ **Many large Datacenters/CDNs use custom modified versions**
- ▶ **You?**

# Quagga Routing Protocols Status

## BGP IPv4 & IPv6

Performance bad for large multiple tables

- Euro-IX Branch tries to fix it with threads (work in progress)
- OpenSourceRouting.org trying a few data structure improvements

## OSPFv2

Reported as robust by many users

Some OSR found open issues with large OSPF network topology changes

## OSPFv3

Separate (partially cloned from OSPFv2), but behind on fixes as many OSPFv2 bugs never made it to it.



# Quagga Routing Protocols Status

## ISIS

Implemented, but not yet usable (too buggy)

- ISIS for IPv4 should be ok in 1..2 releases
- ISIS for IPv6 missing (expected to be done after IPv4 implementation is working)

## RIPv1, RIPv2, RIPng

Working with no issues

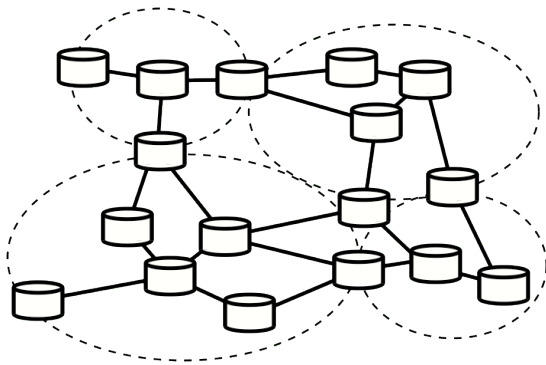
See [www.opensourcerouting.org/wiki/Testing+Efforts](http://www.opensourcerouting.org/wiki/Testing+Efforts)



# OpenSourceRouting (current) focus

OpenSourceRouting.org's main current work (in addition to community)

## ISIS / OSPF



Fixing ISIS (IPv4) to get it to a useable state

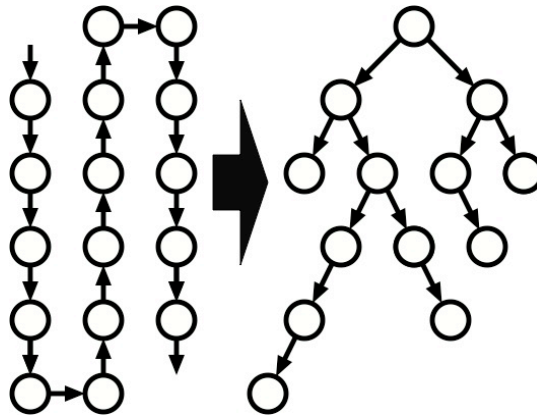
OSPF unnumbered interfaces

IGP Stability fixes



Open Source Routing

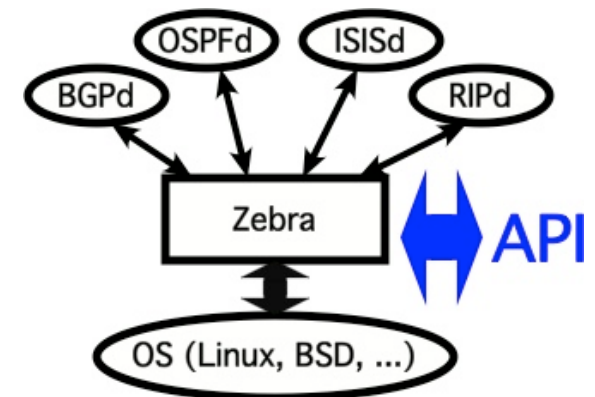
## Data structure changes



Trying to improve internal RIB structures

(Cleanup and Performance Changes)

## API to Zebra



Add API to decouple FIB updates from the OS below and allow forwarding engines to subscribe to direct updates from Zebra



Popular Open Source Software

OpenBGPD

<http://www.openbgpd.org/>

# OpenBGPD

<http://www.openbgpd.org/>

- ▶ **Project started as part of OpenBSD community**
  - BSD Licensed
  - Maintained by the BSD community
- ▶ **Focus on routing for OpenBSD systems**



Part of  
**OpenBSD**  
Project

# OpenBGPD - Features

Based on Version 4.6

## ▶ **Protocols**

- BGPv4, BGPv6 (OSPF available as part of OpenOSPFd)

## ▶ **Runs on OpenBSD, FreeBSD, OpenBSD, NetBSD, Linux**

## ▶ **BSD License**

## ▶ **Missing / Limitations:**

- BGP only
- Mostly BSD focused
- Limited deployment (less active community)

**Popular Open Source Software**

**XORP**

<http://www.xorp.org/>

# XORP

<http://www.xorp.org/>

- ▶ **Started as “Open Platform for Network Research”**
  - Answer of Juniper fans to Quagga
- ▶ **Goal to be Extensible Open Source Routing Platform**
- ▶ **Focus on good Documentation & clean code**



e**X**tensible  
**O**pen  
**R**outing  
**P**latform

# XORP - Features

Based on Version 1.8.5

## ▶ **Protocols**

- RIP, RIPv2, RIPng, OSPFv2, OSPFv3, BGPv4, BGPv6, IGMP, MLD, PIM-SM, OLSR

## ▶ **Runs on Linux, FreeBSD, OpenBSD, NetBSD, DragonFlyBSD, Windows**

## ▶ **Juniper like CLI**

## ▶ **Written in C++**

## ▶ **Forwarding Engine Abstraction (FEA)**

## ▶ **Missing / Limitations:**

- No ISIS
- Performance not yet evaluated

# XORP – Users

## ▶ Pica8 commercial stack based on XORP



- Code is closed but it's announced to be opened up in the future

## ▶ CandelaTech's testing equipment products are based on XORP



- <http://www.candelatech.com>

## ▶ Maine School and Library Network is completely served by Xorp based routers



- <http://networkmaine.net/msln/>

## ▶ AI3/SOI IPv6 multicast network for long distance learning project is based on Xorp routers

- <http://www.soi.asia>

## ▶ YOU?



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# Why a new Working Group?

## Reasons for a Open Source Working Group

- ▶ **Believe in a forum to discuss practical usage and problems of the various Projects**
  - We can't do BoF's at every RIPE meeting.
  - But would like to have a forum to discuss these projects in the Service Provider / RIPE community
- ▶ **Allows other projects a platform as well**
  - WG would not just be on routing projects, but allow any Open Source projects relevant to this community to join and get a platform.
  - Maybe existing community to vote on new projects based on relevancy and commitment (to this community)?

# **(Proposed) Charter Open Source WG**

The Open Source Working Group coordinates Open Source projects with Internet Providers and the RIPE community. The working group believes into the future benefits of Open Source in the community and regularly updates the community on selected projects.

*(Feedback welcome on a better charter!)*

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# Allow Open Source to save you money

Please consider supporting the Open Source Routing Movement with time and/or money

## Phase 1

Spend small amount of your resources (money or manpower) on helping out the Open Source Movement – maybe just 1% of your router budget

## Phase 2

Huge Improvements in the Open Source Routing Space as more developers and testers will fix it and add the missing features

## Phase 3

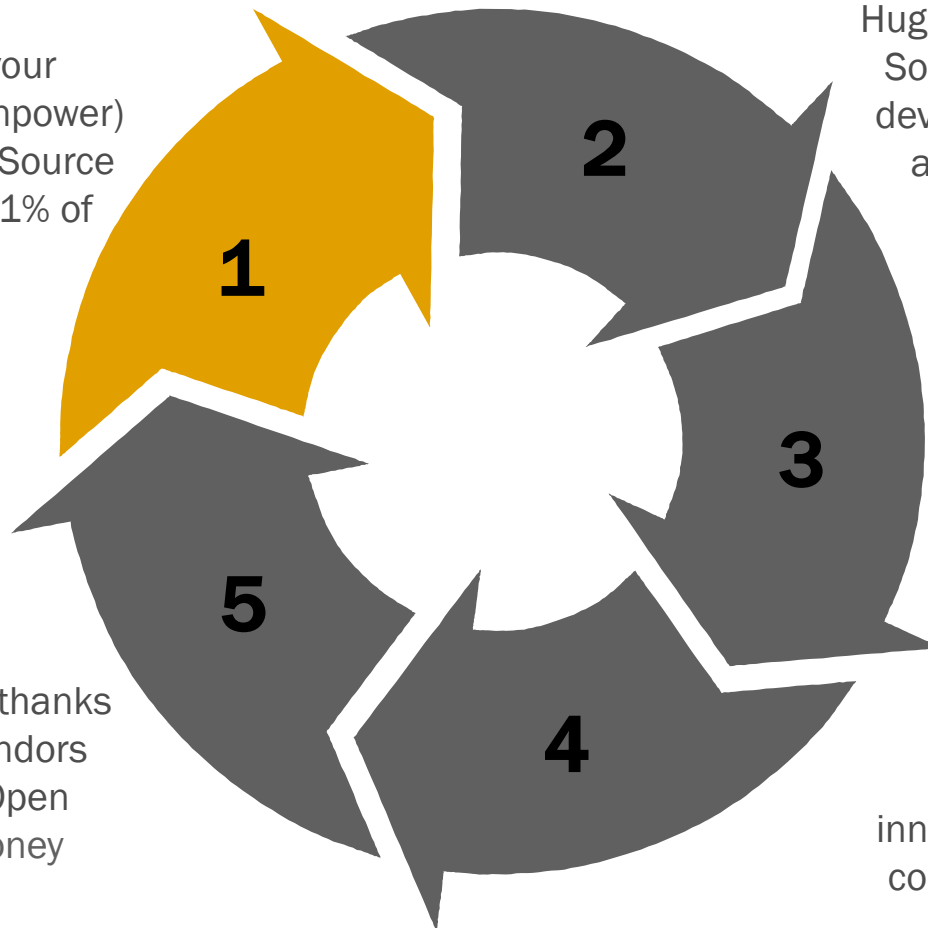
Open Source becomes a possibility in your network for many locations as it gets stable and has the needed features

## Phase 4

Traditional vendors need to innovate or lower their prices to compete with the Open Source Movement

## Phase 5

Lower Operational costs thanks to cheaper traditional vendors and savings from using Open Source Code → More money



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# Thank You - Discussion

The floor is open for discussion

- ▶ **Interested in a Open Source RIPE WG?**
- ▶ **Are you using Quagga / Bird / Xorp / OpenBGPD?**
- ▶ **Experiences?**
- ▶ **Interested in helping out? (\$\$ and/or Work)**

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