One year of FRRouting

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1 Year ago at RIPE 74:

What is FRR ?
(for the not so technical People)

- Open Source (GPLv2+) **Routing Stack**

- Implements RIP, RIPng, OSPF (v2&v3), ISIS, BGP, PIM, LDP

- Fork of Quagga

- Works on Linux and most BSD based systems

- For use in many Clouds as virtual routers, white box vendors and network providers (full routing stack)

1 Year ago at RIPE 74:

FRR - Why a new fork?

Community Led and Driven

Fast & Open Development
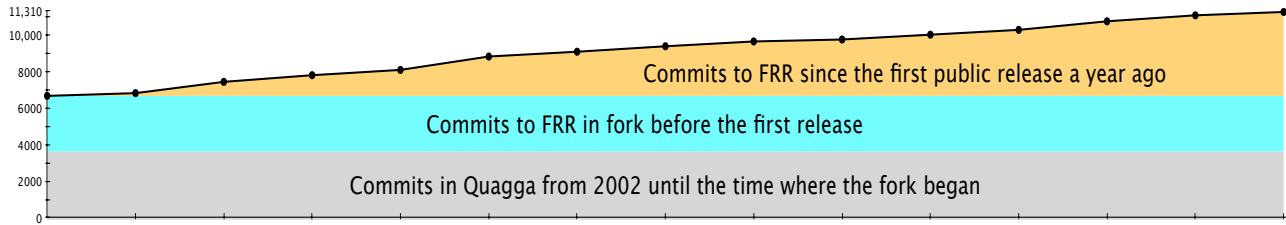
Open Community Model

1 Year ago at RIPE 74:

FRR - What's different?

- ▸ Methodical vetting of submissions

- ▸ Extensive automated testing of contributions

- ▸ Git Pull Requests

- ▸ Github centered development

- ▸ Elected Maintainers & Steering Committee

- ▸ Common Assets held in trust by Linux Foundation

What happened since the fork?

Code size doubled -

11,310
10,000
8000
Commits to FRR since the first public release a year ago
6000
Commits to FRR in fork before the first release
4000
2000
Commits in Quagga from 2002 until the time where the fork began
0

FRRouting fork announced

500st Pull Req submitted

1000st Pull Req submitted

1500st Pull Req submitted

Apr 2017   **Aug**   **Oct**   **Jan 2018**   **Mar**   **April**   **Now (May)**   **soon**

FRR 2.0

LDP IPv4/v6, BGP Add-Path, Nexthop tracking, JSON output, Linux VRF lite, OSPF unnumbered, Topology tests, BGP performance & Scale

FRR 3.0

BGP Large Comm, BGP partial EVPN RT-5, LDP Capabilities, ISIS SPF Backoff, PIM SM, PIM Multicast Source Discovery, NHRP

FRR 4.0

BGP RPKI, BGP EVPN Type 2/3, BGP v4 labeled unicast, ISIS Multitopo, EIGRP, BABEL, OSPFv2 VRF, PIM VRF, OSPFv2 Segment Routing

FRR 5.0

Policy-Based Routing Daemon, ISIS 3way Handshake, BGP VRF with NetNS, BGP Flowspec (limited)

FRR – 2.0 (April 2017)
First stable version

BGP

- Performance & Scale fixes
- AddPath Support
- Remote-AS internal/external Support
- BGP Hostname support
- Update Groups
- RFC 5549 (unnumbered) Support
- Nexthop tracking
- 32-bit route-tags

Testing

- Dejagnu unittests changed to pytest
- Topology Tests

Zebra

- MPLS Support IPv4/v6 for static LSPs
- 32-bit route-tags
- Nexthop Tracking
- RFC 5549 (unnumbered) Support

OSPF V2/V3

- OpenBSD Support restored
- 32-but route-tags
- RFC 5549 (unnumbered) Support

LDP (new)

- RFC 5036 (LDP Specification)
- RFC 4447 (Pseudowire Setup and Maintenance using LDP)
- RFC 4762 – (Virtual Private LAN Service (VPLS) using LDP)
- RFC 6720 - The Generalized TTL Security Mechanism (GTSM) for LDP
- RFC 7552 - Updates to LDP for IPv6

Others

- JSON Support
- VRF Lite (Linux VRF device support) for BGP and Zebra
- Snapcraft Packaging

FRR –3.0 (Oct 2017)

BGP

‣ BGP Shutdown Message

‣ RFC 8092 - Large Communities

‣ RFC 7432 - Partial support with Ethernet VPN

‣ Partial support with EVPN RT-5

‣ IDR Tunnel - Support for VXLAN ext. community (draft-ietf-idr-tunnel-encaps-03#section-3.2.1)

‣ misc fixes related to IPv6 VPN feature

‣ support for IPv4/IPv6 VPN Graceful Restart

PIM

‣ Unnumbered interfaces

‣ RFC 4611 - Multicast Source Discovery Protocol (MSDP)

‣ RFC 4601 - Protocol Independent Multicast - Sparse Mode

NHRP (new)

‣ RFC 2332 - NBMA Next Hop Resolution Protocol (NHRP)

‣ Linux only, for NBMA-GRE tunnels. No ATM, Not supported on BSD

ISIS

‣ SPF Backoff

OSPF V3

‣ RFC 4552 - Authentication/Confidentiality

Label Manager (new)

‣ Label Manager to share MPLS Label Space between different daemons.

LDP

‣ Unnumbered interfaces

‣ RFC 5561 - LDP Capabilities

‣ RFC 5918 - LDP 'Typed Wildcard' Forward Equivalence Class (FEC)

‣ RFC 5919 - Signaling LDP Label Advertisement Completion

‣ RFC 6667 - LDP 'Typed Wildcard' Forwarding Equivalence Class (FEC) for PWid and Generalized PWid FEC Elements

‣ RFC 7473 - Controlling State Advertisements of Non-negotiated LDP Applications

CLI

‣ Parser rewritten in Bison

‣ Lexer rewritten in Flex

‣ Definition grammar overhauled

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FRR –4.0 (March 2018)

BGP

- RPKI (using rtrlib)
- RFC 3107 v4 labeled unicast
- Type 2 and Type 3 EVPN routes
- RFC 6514 - BGP Multicast in MPLS/BGP IP VPNs
- RFC 7432 - BGP MPLS-Based Ethernet VPN
- draft-ietf-bess-evpn-overlay
- draft-ietf-bess-evpn-inter-subnet-forwarding
- draft-ietf-bess-evpn-prefix-advertisement
- draft-ietf-idr-tunnel-encaps
- draft-ietf-bess-evpn-proxy-arp-nd

BABEL (new)

- New daemon per RFC 6126

EIGRP (new)

- New daemon per RFC 7868

OSPF V2

- VRF Support
- Expermential Segment Routing

Zebra

- ability to create a static route that leaks across VRF's
- zapi (internal api for daemons improvements

PIM

- VRF support

CLI

- Tab completion for interface names, prefix-lists, route-maps and BGP peer names

FRR –5.0 (soon, ~ early June)

- **PIM**
  - Add a Multicast Trace Command
    - draft-ietf-idmr-traceroute-ipm-05
- **IS-IS**
  - Implement Three-Way Handshake as per RFC5303
- **BGP**
  - BGP Flowspec (limited)
  - Implement VPN-VRF route leaking per RFC4364. Please see the BGP VRFs section in the BGP section of the online manual.
  - Implement VRF with NETNS backend
- **PBRD (new)**
  - Add a new Policy Based Routing Daemon. Allow users to create and specify policy maps for controlling routing.

FRR – Packages

On https://github.com/FRRouting/frr/releases
- **Ubuntu 12.04 / 14.04** for 64bit Intel
- **Ubuntu 16.04** for 32/64bit Intel, ARM7, ARM8
- **Debian 8** for 64bit Intel
- **Debian 9** for 64bit Intel, ARM7, ARM8
- **CentOS 6 / 7** for 64bit Intel

FreeBSD
  In the offical ports

Alpine Linux, Gentoo Linux, OpenWRT
  Build instructions available

JOIN US:
https://frrouting.org
Github.com/frrouting
Mailing lists: lists.frrouting.org

FRROUTING