rare.freertr.net  BIER & AMT implementation
P4 BMv2, TOFINO & DPDK dataplane
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Public
www.geant.org
Agenda

• RARE/freeRtr in a nutshell
• BIER RFC’s/draft implementation
• RARE (2021) /freeRtr (2017) BIER implementation experiment
• RARE / freeRtr AMT implementation experiment
• RARE / freeRtr BIER to AMT implementation experiment
• Conclusion
RARE project : Group focus

• GEANT project sub-task: RARE
  • Control plane software
  • Multiple data planes
  • Interface them and the result is ...

• Fully functional router
  • Running at hardware line rate
  • DIY “hackable/extensible” router
  • Control plane independence

One familiar platform
  Multiple solutions
  Each solution addresses
  R&E
  use case
RARE latest news (M27/48)

• RARE p4 targets
  bmv2 software switch
  Intel/barefoot Tofino on WEDGE-BF100-32X, APS-BF2556X-T1, others
  FPGAs under study

• RARE “p4” emulation targets

• RARE Network Programmable targets
  Broadcom under study
What we have

• BIER in MPLS – RFC8296
  • All the BitString lengths in software
  • 256bit mode in all the dataplanes – interops
• BIER ISIS – RFC8401 – decodes fine in wireshark
• BIER OSPF – RFC8444 – interops
• BIER IDR draft
• BIER PIM draft
• AMT relay and gateway – RFC7450 – interops

• All the above for v4 and v6, covered by automated testing
Experience

- [wwwin.nop.hu/trackMap.tcl](http://wwwin.nop.hu/trackMap.tcl) - a live network running dpdk dataplanes and sometimes a tofino node
- [lg.nop.hu](http://lg.nop.hu) - an ISP like setup
- [inf.nop.hu/mtrack.tcl](http://inf.nop.hu/mtrack.tcl) - measured from multiple endpoints talking to each other 0-24
- Regular streaming to loudspeakers with vlc: [demo](http://www.geant.org)
- All over BIER, initially in sw, nowadays in the dataplane
- Accessible via AMT: vlc amt://10.2.255.1@232.2.3.2:1234/ --amt-relay lo0.rtr1.c4e.hbone.hu
Key take-away – We are ready to roll into production

• Automated testing: www.freertr.net/tests.html
• 3rd party testing via Spirent usage
  • (thanks PSNC@WB team)
• P4 profile calibration
• DPDK is in operation
• Production instance

• Someone else? :)

www.geant.org
Useful links

• Project
  rare.freertr.net
  blog.freertr.net
  docs.freertr.net

• Contact
  rare-users@lists.geant.org
  rare-dev@lists.geant.org
  freertr@groups.io
  https://twitter.com/rare_freerouter
Special thanks ... And others ... Who make this possible!
Thank you

Any questions?

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