



# rare.freertr.net BIER & AMT implementation

P4 BMv2, TOFINO & DPDK dataplane

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Public

[www.geant.org](http://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



**under study**

- RARE “p4” emulation targets

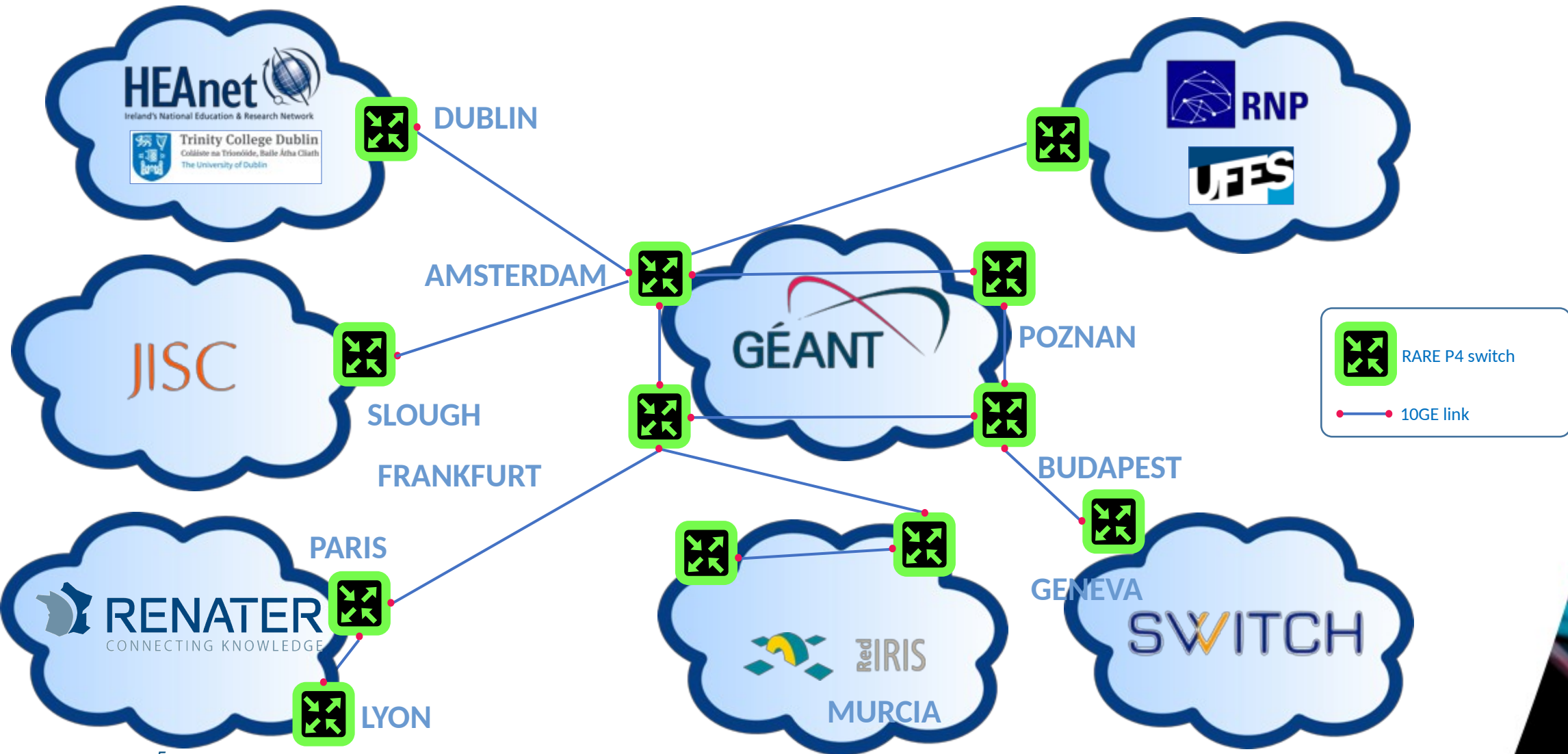


- RARE Network Programmable targets



Broadcom **under study**

# RARE P4 european testbed



## 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
- 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](http://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? :)



## Useful links

- Project

[rare.freertr.net](http://rare.freertr.net)

[blog.freertr.net](http://blog.freertr.net)

[docs.freertr.net](http://docs.freertr.net)

- Contact

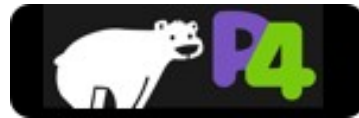
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## Special thanks ...



And others ...  
Who make this possible !

# Thank you

Any questions?

[www.geant.org](http://www.geant.org)

