

Router for Academia Research Education

RARE

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GN4-3 WP6T1 – RARE technical leader

STF#21 Virtual meeting

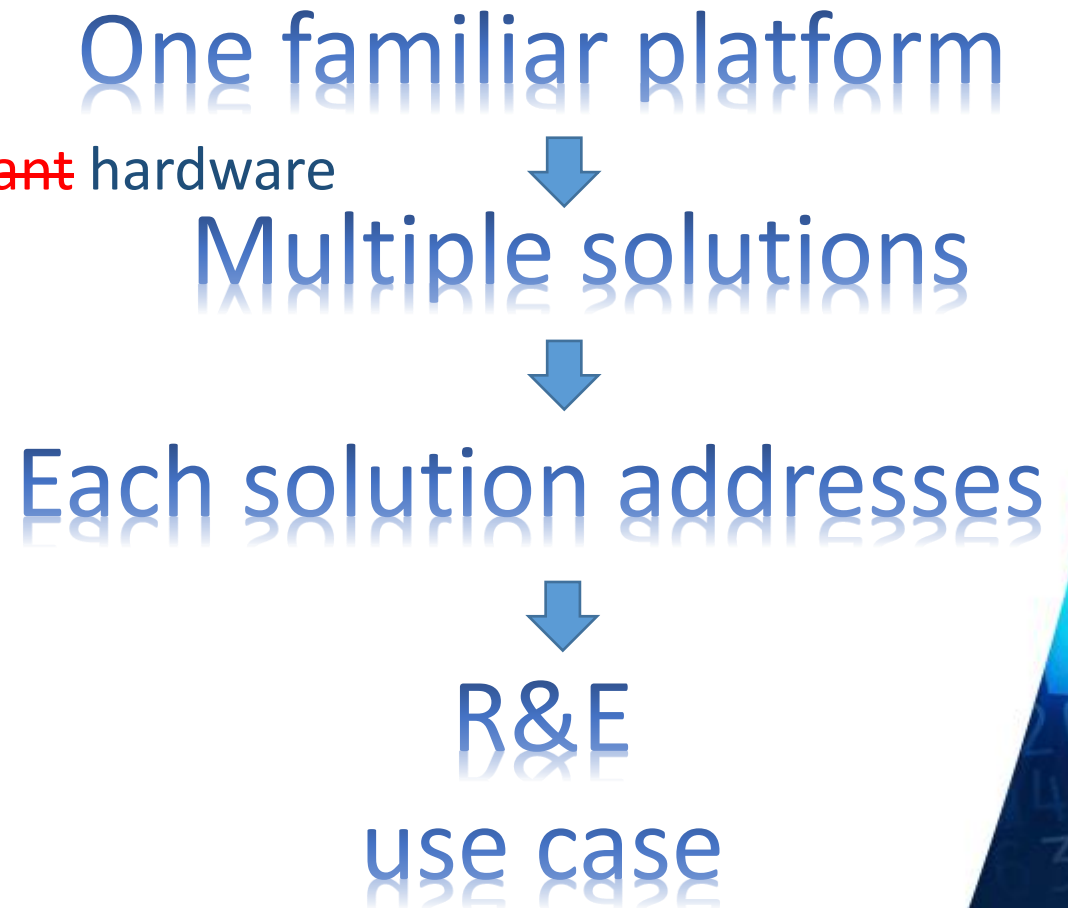
October 26th 2020

Restricted

www.geant.org

RARE project : Group focus

- WP6-T1 sub-task: RARE
 - Control plane software
 - ~~P4~~ (**not only P4**) data plane **compliant** hardware
 - that suits R&E use case
 - Interface them and the result is ...
- Fully functional router
 - running at hardware line rate
 - DIY “hackable/extensible” router
 - Control plane independence
 - ➔ that suits R&E use case



Why RARE now ?

- Starting from early 2010:
 - Several valuable Open Source control plane usage besides well know commercial vendor



Exa
BGP

VyOS



- Starting from 2020:
 - Dataplane solution reached maturity ready to implement production grade use case

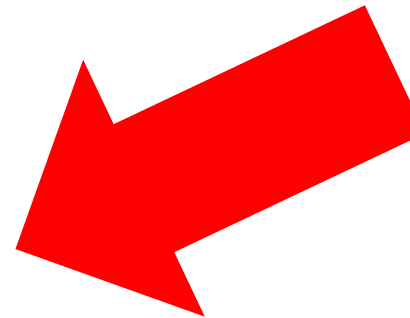


- NOS emergence

ARISTA



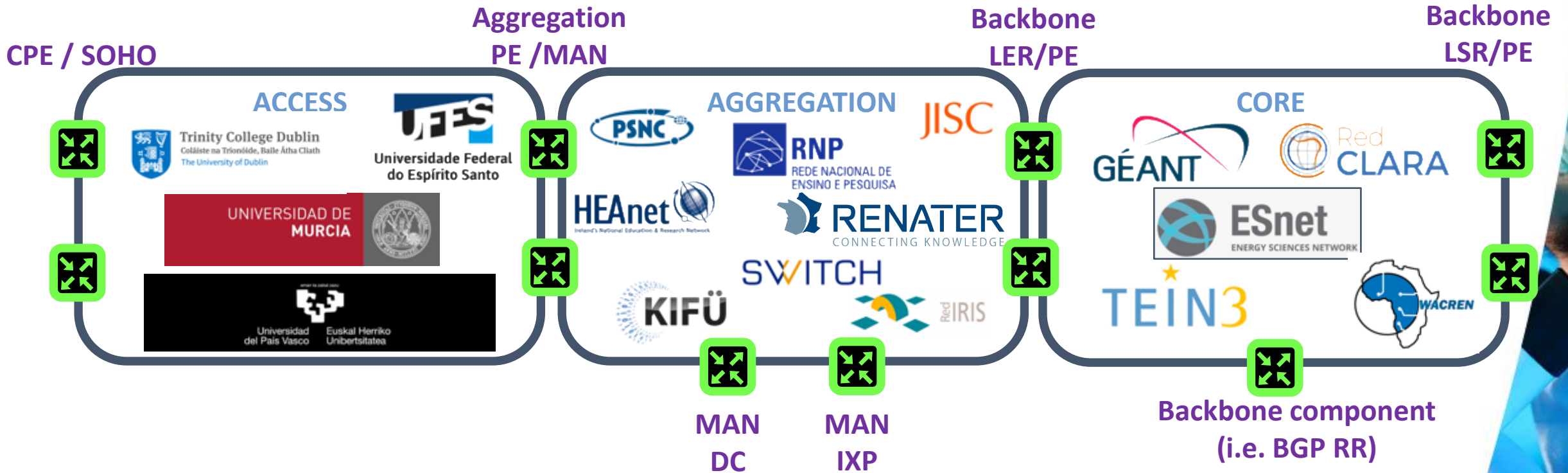
JUNIPER
NETWORKS



- Technology convergence (Hypervisor/VM, K8s/Container, kernel bypass ...)

It's a good time to tie Control Plane and Dataplane !

RARE use cases



IPv4 and IPv6 compliant !

RARE for everyone in R&E

- Routing (CP+DP) platform solution for the R&E context
 - Open Platform
 - Programmable
- RARE for Research and Education connectivity
 - Emerging NREN
 - Or not ...
- RARE for R&E content provider
 - IaaS owned by NREN
 - IaaS owned by International Global Research project
- RARE for R&E end user institution
 - Primary/Secondary schools
 - University campus
 - MAN network for Regional network
- RARE for International Global research project connectivity
 - Network research
 - Science research

RARE value proposition: Implement a solution to each R&E use case

- RARE for R&E connectivity (nx100GE, Tbps)
 - **Core** backbone node
 - **Edge** backbone node
- RARE for R&E content provider (1,10,25,40,50,100GE, Tbps)
 - **ToR** node
 - **Spine** node
 - **Edge** node
- RARE for R&E organization end user
 - **CPE** for SOHO primary schools
 - **MAN Router** for regional network

RARE latest news (M22)

- RARE p4 targets



bmv2 software switch



NPU on WEDGE-BF100-32X



under study

- RARE p4 discussion emulation targets

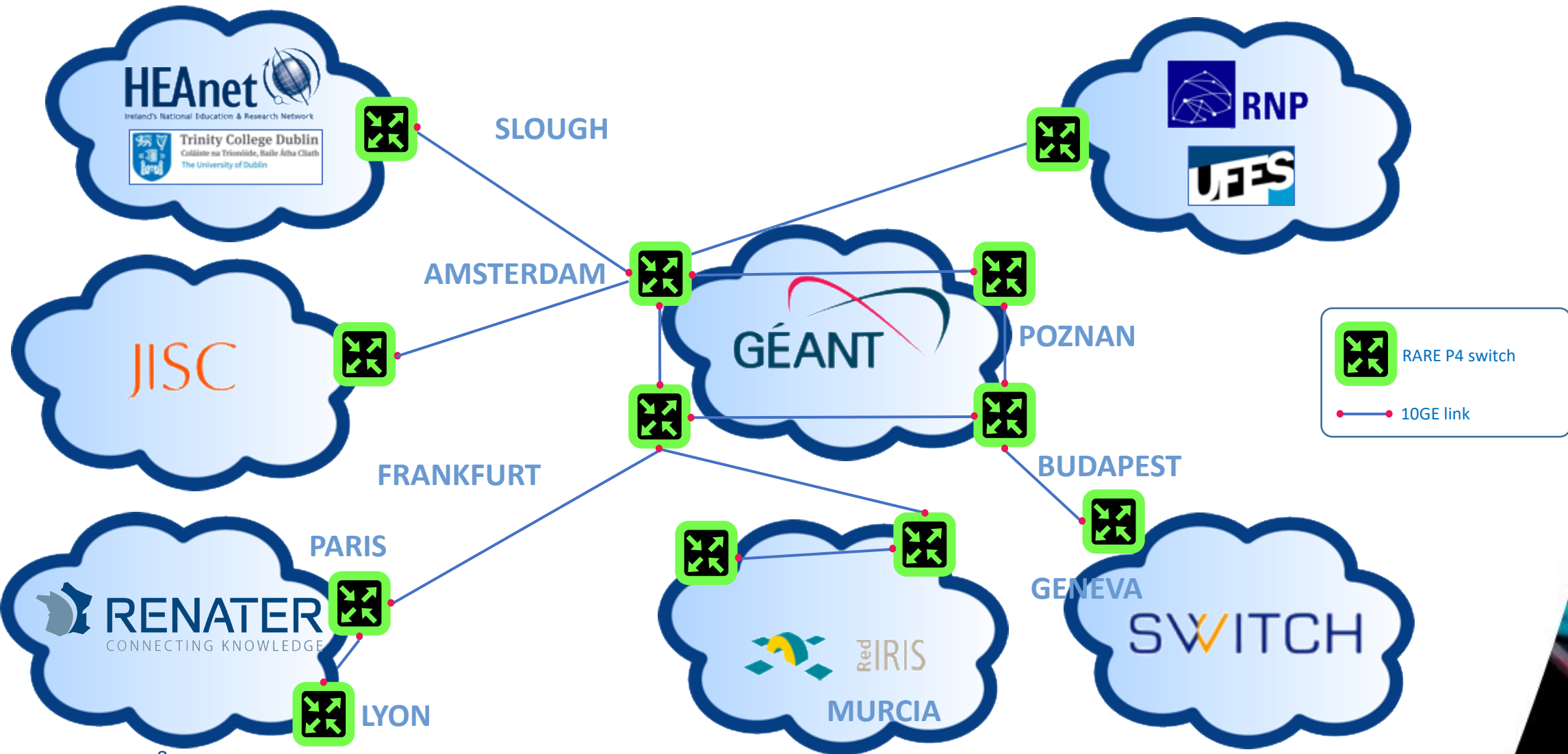


- RARE Network Programmable targets

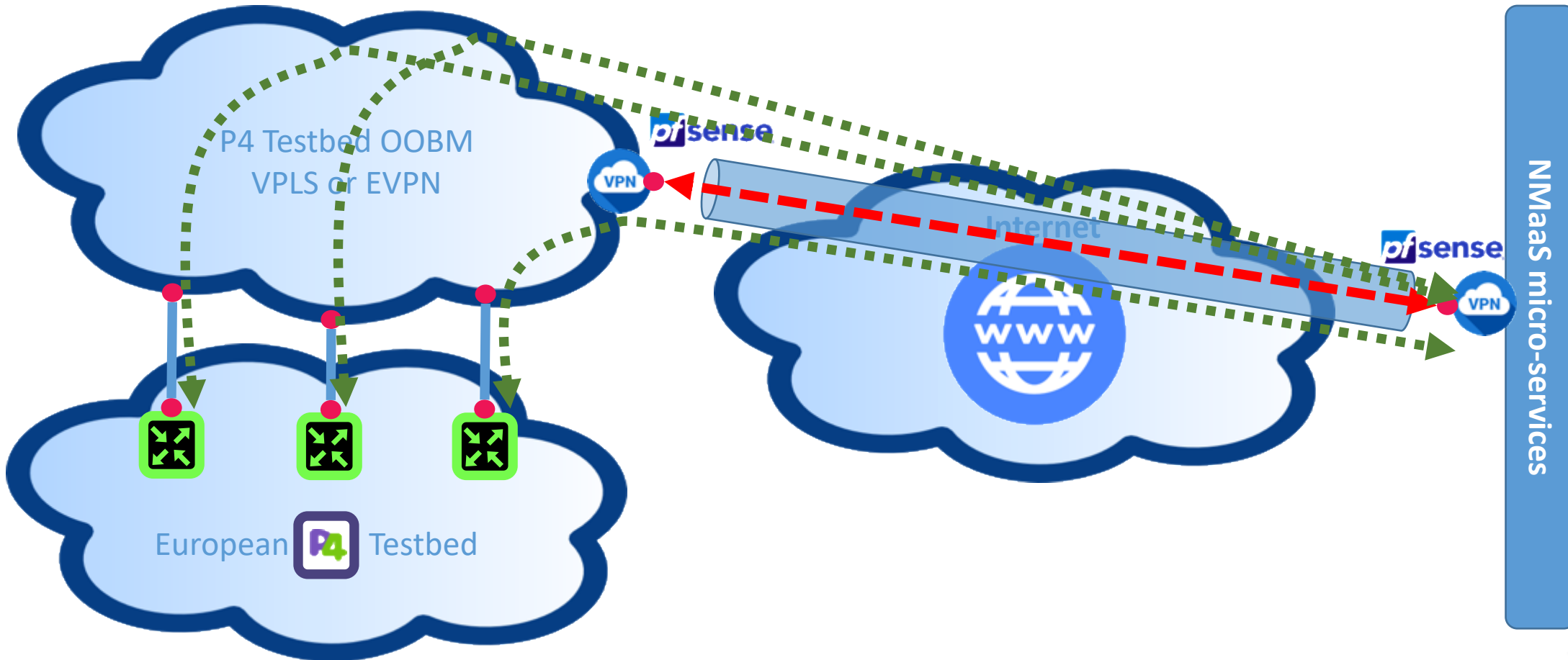


Broadcom **under study**

RARE validation designs: P4 european testbed design



RARE validation designs: P4 LAB network management via NMaaS !



Monitoring at EML ! (Prometheus agent)



Monitoring at EML ! (Grafana dashboard)

The screenshot shows the Grafana Labs website's 'Dashboards' page. The navigation bar includes 'Grafana Labs', 'Grafana', 'Products', 'Open Source', 'Learn', 'Downloads', 'My Account', and 'Contact us'. Below the navigation, there are tabs for 'Features', 'Contribute', 'Dashboards', 'Plugins', and 'Download'. The main heading is 'Dashboards' with the subtitle 'Official & community built dashboards'. On the right, there is a 'Product updates' section with a sign-up form. On the left, there is a 'Filter by:' section with dropdown menus for 'Name / Description' (searched for 'freeRouter'), 'Data Source', 'Panel Type', 'Category', 'Collector', and 'Sort By'. The main content area displays five search results for 'freeRouter' dashboards, each with a 'freeRouter' icon, a title, a description, and download/review statistics.

Name / Description	Downloads	Reviews
RARE/freeRouter - Link State IGP peers / reachability & neighbor count summary by fredericloui Display link state IGP peer reachability and neighbor count metrics	2	0
RARE/freeRouter - Routing / Computed - Redistributed by fredericloui	5	0
RARE/freeRouter - Routing / Interfaces by fredericloui	4	0
RARE/freeRouter - Routing / Neighbors by fredericloui	4	0
RARE/freeRouter - BFD states by fredericloui Display BFP state metrics	2	0

<https://grafana.com/grafana/dashboards?search=freeRouter>





Key take-way – We are ready to roll into production

- Automated testing
- 3rd party testing via Spirent usage
 - (thanks PSNC@WB team)
- P4 profile calibration
- DPDK currently in operation SOHO
- Candidate deployment for production



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Thank you

Any questions?

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