SRv6

Technology and Deployment Use-Cases

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Acknowledgement

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  - Dennis Cai   Alibaba
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  - Satoru Matsushima   Softbank
  - Sébastien Parisot   Iliad/Free
  - Dan Bernier and Dan Voyer Bell Canada

- Eco-System Partners
  - Barefoot, Broadcom, Huawei, Intel, Marvell, Mellanox…

- Academic and Open-Source partners

- Cisco SR team
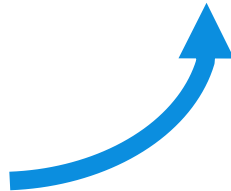
SR-MPLS: de-facto IPv4 solution

Americas **101**

EMEA **57**

APJC **43**

● Deployed
○ Deployment Planned
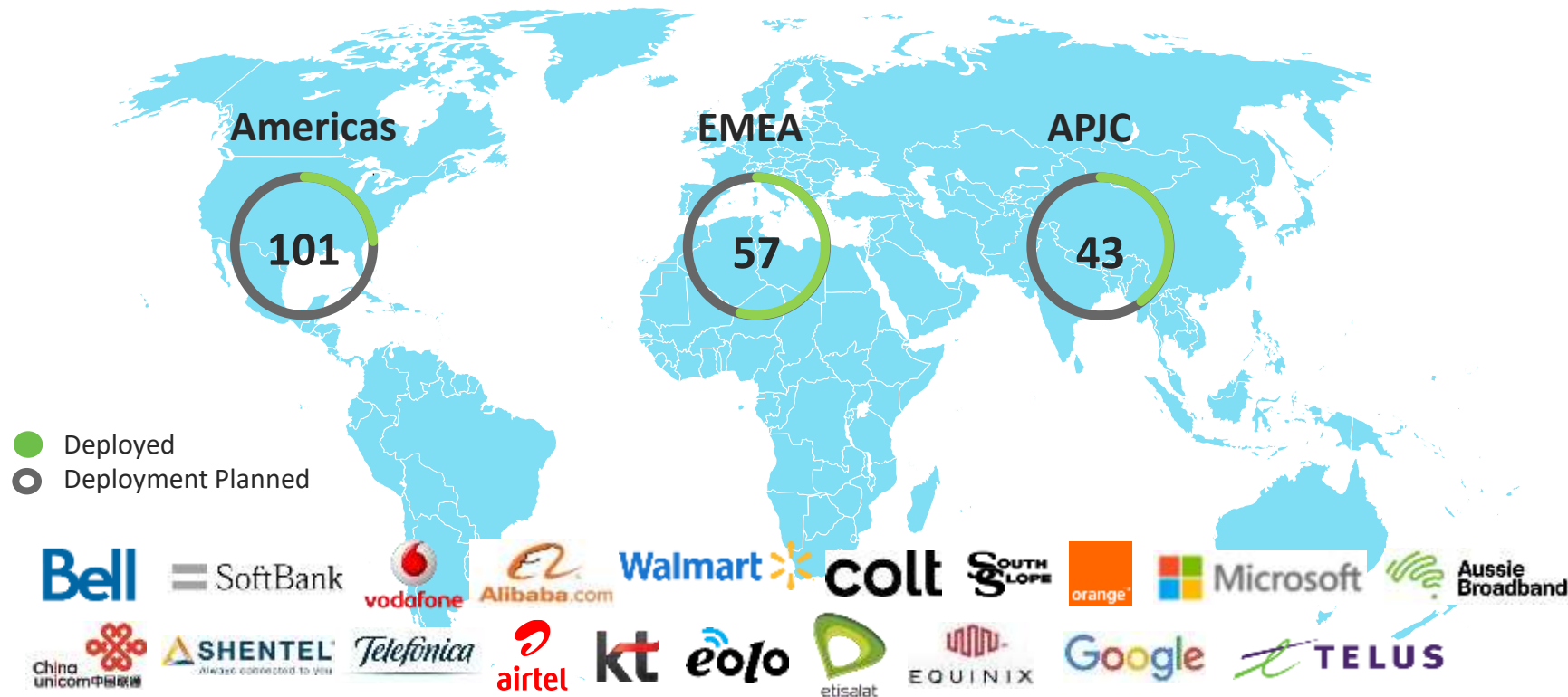
Let's focus on SRv6: SR for IPv6

Simplicity Always Prevails
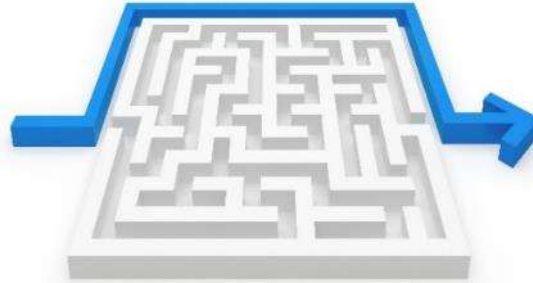
LDP

RSVP-TE

Inter-AS Option A/B/C

MPLS

UDP/VxLAN

NSH

Furthermore with more scale and functionality

SRv6 Eco-System

At record speed

- In 2019: 8 large-scale commercial deployments
  - Softbank, Iliad, China Telecom, LINE corporation,
    China Unicom, CERNET2, China Bank and Uganda MTN.

- 18 HW linerate implementations
  - Cisco Systems, Huawei
  - Broadcom, Barefoot, Intel, Marvell, Mellanox
  - Multiple Interop Reports

- 11 open-source platforms/ Applications
  - Linux, FD.io VPP, P4, Wireshark, tcpdump, iptables, nftables, snort, ExaBGP, Contiv-VPP

- First commercial SRv6 deployment

https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=1969030

iliad

- Nationwide deployment in Italy

- 1000 Cisco NCS 5500

- **1800 Iliad Nodeboxes**

Re: [spring] SPRING SRv6 Deployment Status draft

Sébastien Parisot <sparisot@free-mobile.fr> | Tue, 10 December 2019 09:34 UTC | Show header

Hi Satoru, Zafar,

I would like to provide an update to SRv6 deployment in Iliad's nationwide network in Italy.

As of the end of 2019, the SRv6 network consists of:
- 1000 Cisco NCS 5500 routers
- 1800 Iliad's Nodeboxes
- The network services 4.5 million mobile subscribers (as of Q3 2019)
- The network is carrying 300 Gbps of commercial traffic at peak hours
- It is expected to grow to more than 4000 Nodeboxes in 2020.

The following SRv6 features have been deployed:
- A Segment Routing Header based data plane
- End (PSP), End.X (PSP), End.DT4, T.Encaps.Red, T.Insert.Red functions
- BGP VPN SRv6 extensions
- ISIS SRv6 extensions
- SRH-based Topology Independent (TI-LFA) Fast Reroute mechanisms
- Support for ping and traceroute

Can you please update the SRv6 deployment draft accordingly?
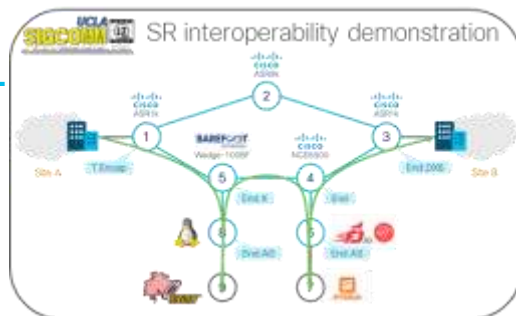
Thanks,
Sébastien

SRv6 Ecosystem

SRv6 is a Proposed Standard

- RFC 8402 - Architecture
    - Defines SRv6 with SRH and SRv6 SID's

- RFC xxxx – SR Extension Header (SRH)
    - Defines the SRv6 dataplane encapsulation

- Last-Call status
    - Net Pgm
    - ISIS
    - OAM

Shipping: Cisco NCS5500, NCS560, NCS540, ASR9k

- ISIS
  - TILFA and uLoop
  - Flex-Algo (Low-Delay Slice) with TILFA

- BGP
  - PIC Core/Edge
  - L3VPN (IPv4)
  - Internet (IPv4)
  - eVPN VPWS

- SRv6-SR-MPLS Gateway

- OAM
  - Ping
  - Trace
  - SID Verification

Shipping: DC – Cisco Nexus 9K GX series

Nexus 9K Platforms

- 16 X 400G

- 28x100G+8x400G

- 64x100G

N9K-C9316D-GX

N9K-C93600CD-GX

N9K-C9364C-GX

SRv6 forwarding performance

- 400G Line-rate Performance for SRv6

- 6.4 TBPS Packet Processing

- Insert up to 9 SIDs @ line-rate

- IS-IS, OSPFv3

- BGP
  - L3VPN (IPv4, IPv6)
  - Internet (IPv4,IPv6)

- VxLAN – SRv6 gateway

- OAM
  - Ping
  - Trace
  - SID verification