# State of SRv6- October 2019

Written by the authors of the key SRv6 documents ([SRH](#) and [Net-PGM](#))

## 1    STRONG CUSTOMER ADOPTION

In 2019, SRv6 gained solid customer traction with noteworthy live deployments:

- **SoftBank Corporation**: The company aims to further enhance the efficiency and functionality of its network by introducing the latest technologies such as SRv6. It aims to realize a highly reliable mobile network that can cope with the future traffic for the age of 5G and IoT. Softbank Corporation announced that they introduced SRv6 and began full-scale operations on a commercial network in April 2019. ([https://www.softbank.jp/corp/news/press/sbkk/2019/20190424_03/](https://www.softbank.jp/corp/news/press/sbkk/2019/20190424_03/))
- **Iliad**: The SRv6 deployment enables Iliad to build a network that is extremely scalable with improved reliability, flexibility and agility, all while helping to reduce CapEx and OpEx. To further expand the SRv6 benefits across the entire network, Iliad has developed its own SRv6 software stack that will equip its homegrown "NodeBox" designed to aggregate the traffic from mobile base stations. ([https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=1978361](https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=1978361))
- **LINE Corporation** uses an SRv6 overlay to provide per-service policy on a shared underlay network in the Data Center. The hypervisor takes care of encap/decap, and openstack is used as the SRv6 control plane with in-house developed extensions. ([https://speakerdeck.com/line_developers/line-data-center-networking-with-srv6](https://speakerdeck.com/line_developers/line-data-center-networking-with-srv6))
- **China Telecom** (Sichuan) deployed an SRv6 overlay solution, reducing service provisioning time. Featuring flexible deployment and a committed SLA, SRv6 supports various service scenarios, including government and enterprise private line, 5G transport, and home broadband scenarios. ([https://www.lightreading.com/video/video-services/huawei-helps-china-telecom-sichuan-launch-commercial-srv6-network/d/d-id/749842](https://www.lightreading.com/video/video-services/huawei-helps-china-telecom-sichuan-launch-commercial-srv6-network/d/d-id/749842))
- **China Unicom** has deployed SRv6 L3VPN over a China 169 backbone network from Guangzhou to Beijing to provide inter-as CloudVPN services.
- **CERNET2** is the largest IPv6-only national education and research network in the world. Tsinghua University has deployed SRv6 L3VPN over the CERNET2 from Beijing to Nanjing to provide L3VPN services for universities.

**These deployments support commercial traffic on a range of interoperable hardware – running on either custom or merchant silicon – at multi-Tbps line rate performance.**

If you want to learn more about the growing ecosystem supporting SRv6, read this very comprehensive document. ([https://datatracker.ietf.org/doc/draft-matsushima-spring-srv6-deployment-status/](https://datatracker.ietf.org/doc/draft-matsushima-spring-srv6-deployment-status/))

## 2    STANDARDIZATION

**SRv6 standardization is well on its way and can be considered as nearly complete.**

- Segment Routing architecture is RFC 8402. It defines two data-plane instantiations of SR: SR over MPLS (SR-MPLS) and SR over IPv6 (SRv6). SRv6 uses a new type of routing header called the SR Header (SRH).
- SPRING working group's charter and milestones are solely about completing SRv6 standardization.
- Segment Routing Header (SRH) has been approved as Proposed Standard RFC in October 2019.
- SRv6 network programming draft is on track. Authors expect the SPRING last call early 2020.
- Other drafts – IS-IS, BGP, and SR-TE Control Plane – are WG status with some already in last-call status. They should be RFC in 2020.

## 3    SRV6 VALUE PROPOSITION

As a brief reminder, here are some characteristics of SRv6:

- Unlimited reachability: 5G, IoT, MSDC require 128-bit address space
- IP native: handset, sensors, containers talk IP
- Stateless Inter-Domain Integrated Policy:
    - Stateless: the network program is in the header, not as state in intermediate endpoints
    - Inter-domain: no reclassification at domain boundary
    - Integrated: a network instruction in the network program can represent any behavior: topological (TE, FRR), VPN or service (container, VM, appliance). Metadata for enhanced OAM, performance monitoring or service programming is foreseen in the base solution.
- Efficient load-balancing day One
- Simplification
    - As IP is the native protocol used by endpoints, MPLS shim layers can be eliminated
    - No MPLS label space (20 bit)
    - No MPLS resource allocation (3 MPLS FIB entries for each IP entry, associated counters, ucode)
    - No MPLS to the host/endpoint
- Inherent scaling provided by IP summarization
- SR domain deployment: security, path-MTU
    - Straightforward re-use of MPLS design practice
- Support techniques to leverage legacy hardware and/or minimize MTU overhead
- Large set of interoperable multi-Tbps custom and merchant products with deployment experience
- Smart-NIC support
- Rich open-source ecosystem (Linux, FD.IO, SNORT…)

## 4    CONCLUSION

SRv6 enjoys strong customer adoption with a rich ecosystem of open-source and interoperable multi-Tbps-linerate hardware from (in alphabetical order: Barefoot, Broadcom, Cisco Systems, and Huawei).

Several deployments with significant commercial traffic experience have been reported: Softbank Corporation, Iliad, Line Corporation, China Telecom, China Unicom, CERNET2.

SRv6 standardization is well on its way: its key document (SRH) has been approved as a Proposed Standard RFC in October 2019. Other documents should be RFC by spring 2020.

The key characteristics of the SRv6 solutions are: reach, scale, simplicity, functionality, and integration.