SRv6 Deployment at SoftBank

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SoftBank Corp

Personal Profile

- Takumi Torii
- Access Network Section
  Packet Network Department Backhaul Division
  IP & Transport Technology Division
- Short Bio
  - 2012-2020.3
    -Corporate Network Operations Section
    -L2/L3 vpn backbone NOC
  - 2020.4-
    -Team Leader of Development for CRAN/DRAN
    at Access Network Section.

Today’s Theme : Deployment

SoftBank

3 years
from feasibility Study to commercial deploy

Concept Announcement by Cisco

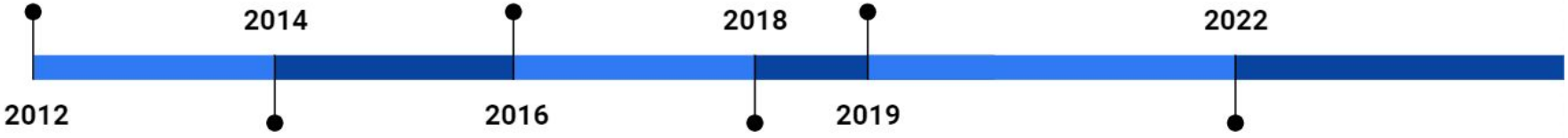
Cisco announced "Segment Routing" at Cisco NAG Meeting.

SRv6 feasibility study

SoftBank has started full-scale investigation of SRv6.

Press Release about "SRv6"

SoftBank has started operating SRv6 on commercial Networks.
https://www.softbank.jp/corp/news/press/sbkk/2019/20190424_03/



Draft Release

Segment Routing Architecture (draft-filsfils-spring-segment-routing-00)

Press Release about "Segment Routing"

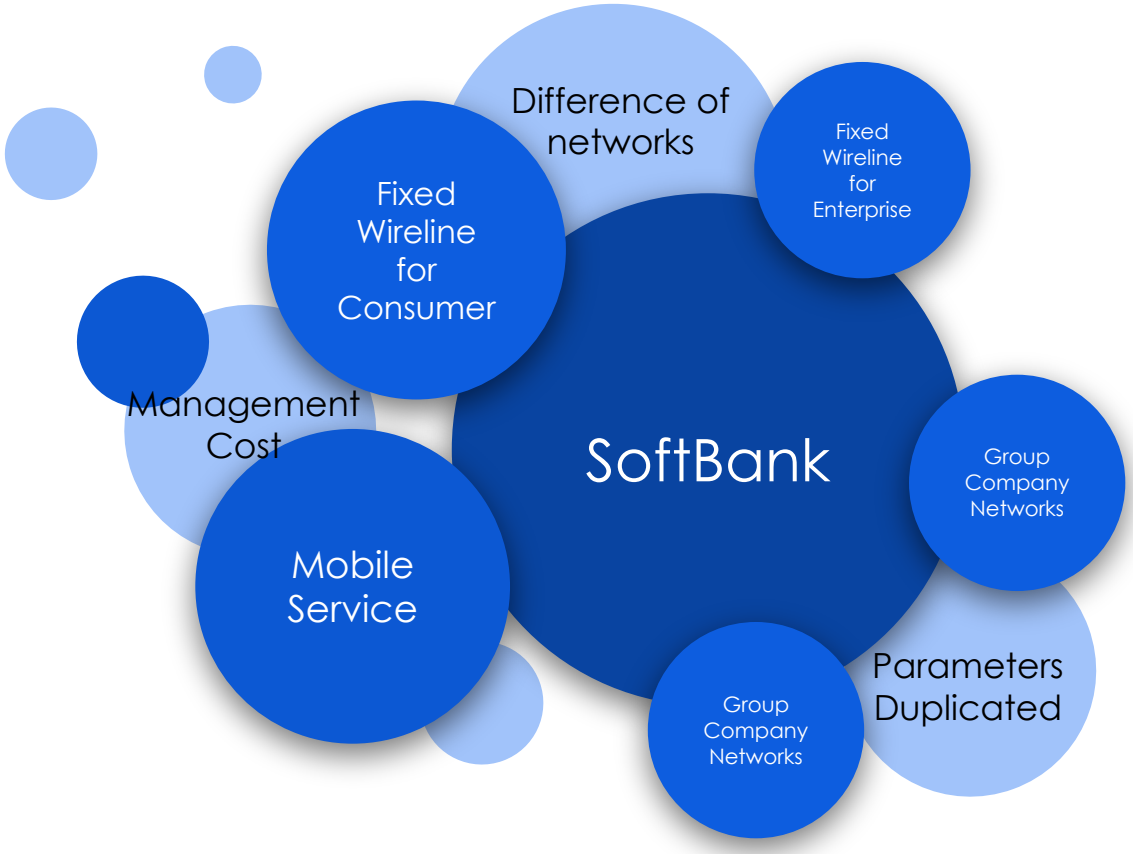
SoftBank has started operating Segment Routing on commercial Networks.
https://www.softbank.jp/corp/news/press/sbkk/2018/20180202_01/

Press Release about "Flex-algo"

SoftBank has started operating Flex-algo on commercial Networks for network slicing.
https://www.softbank.jp/corp/news/press/sbkk/2022/20220426_01/

Introduction

SoftBank's Network



Many type of Networks is Merged

=

Complicated

Legacy Network Problems

SoftBank

- Traffic Growth
  →100G/400G is needed for future

- Needs of new technology
  →PTP/SyncE, Telemetry・・・

- Cost of Energy
  →Too many inefficient Machine

- Legacy Protocols based on IPv4
  →Need to be replaced to IPv6 Network

- IPv4 Address exhaustion
  →Use of IPv6 address is needed!!!

New hardware and IPv6 End-to-End network were necessary

Prepare for「5G」

SoftBank

= SoftBank 4G Started in 2012

= SoftBank 5G Starting in 2020

Is Network ready for 5G?

- Faster
- More Responsive
- More Devices

5G will change…

SoftBank

eMBB
20GBbps

4G×20

Faster

URLLC
1ms

4G×0.1

More Responsive

mMTC
1Mdevice/㎢

4G×10

More Devices

※from 3GPP

5G Network Use Case

SoftBank

Self-driving Cars/Connected Cars

Private5G for Enterprise Users

Smart City for Municipality

Fast Response **High SLA** **Multi-Connection**

How can we control these different policies simply.

slice

SRv6 can do it

SoftBank

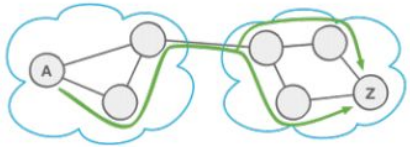
Simple

Scalable

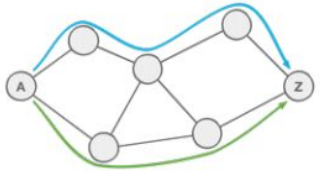
Seamless deployment

www.segment-routing.net

Network Programming



Unified Forwarding Plane



Traffic Engineering

How to Start SRv6?

SRv6 Deployment Model at SoftBank

SoftBank

Design Policy Arrangement

Protocols were considered and selected based on the flexibility and future-proofness

Maintaining Existing Network

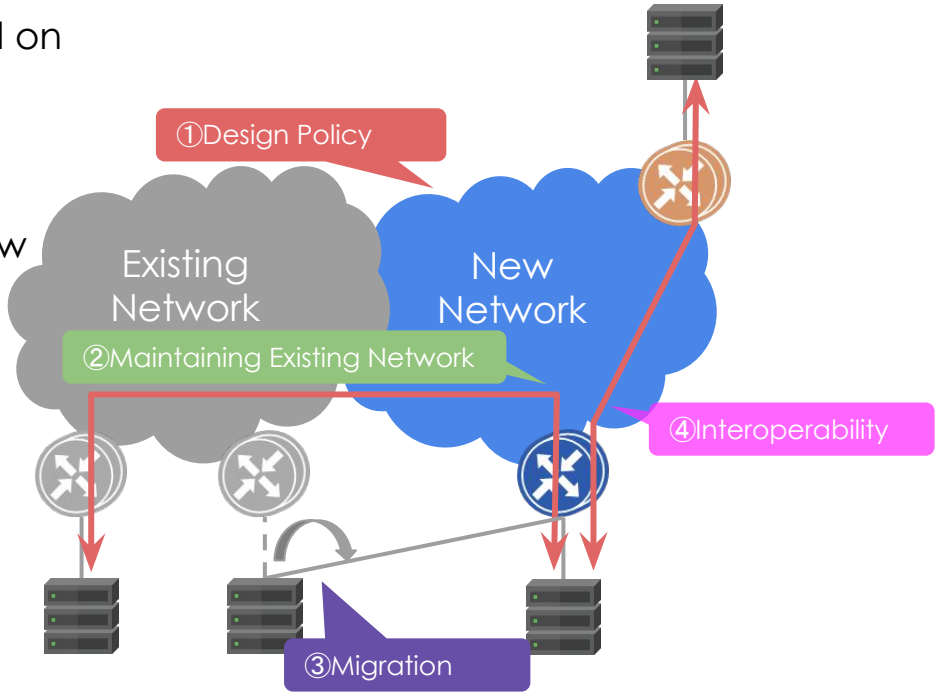
Inter-network connectivity between old and new was imperative during the transitional period

Migration

In order to take advantage of the new network and avoid the burden of parallel operation of the old and new, the migration had to be done as soon as possible.

Interoperability

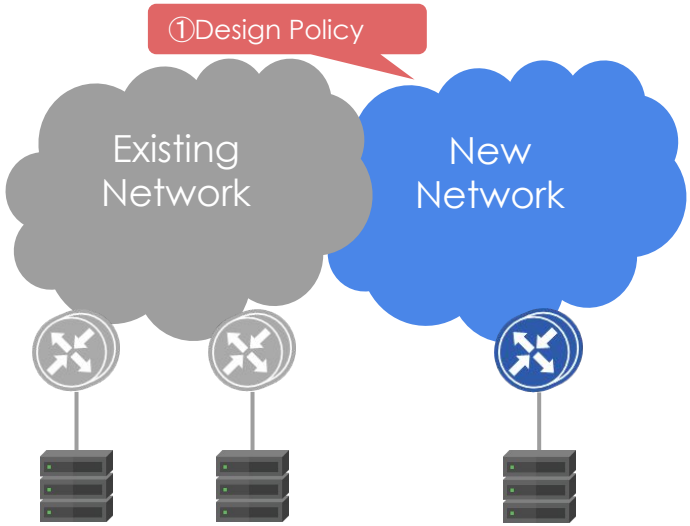
Implementation adjustment was required for multi-vendor support



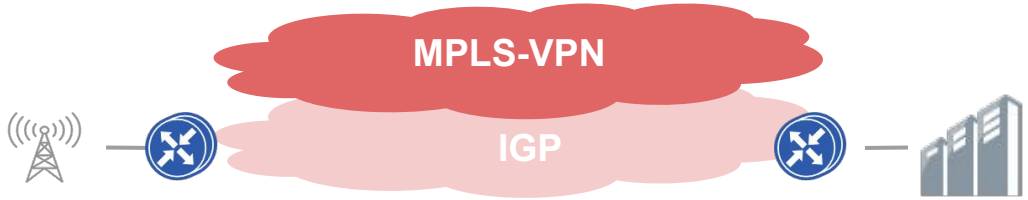
Design Policy Arrangement

Case Study①

SRv6 started in a small ring topology after rehearsal at labo.
Protocols were considered and selected based on the flexibility and future-proofness



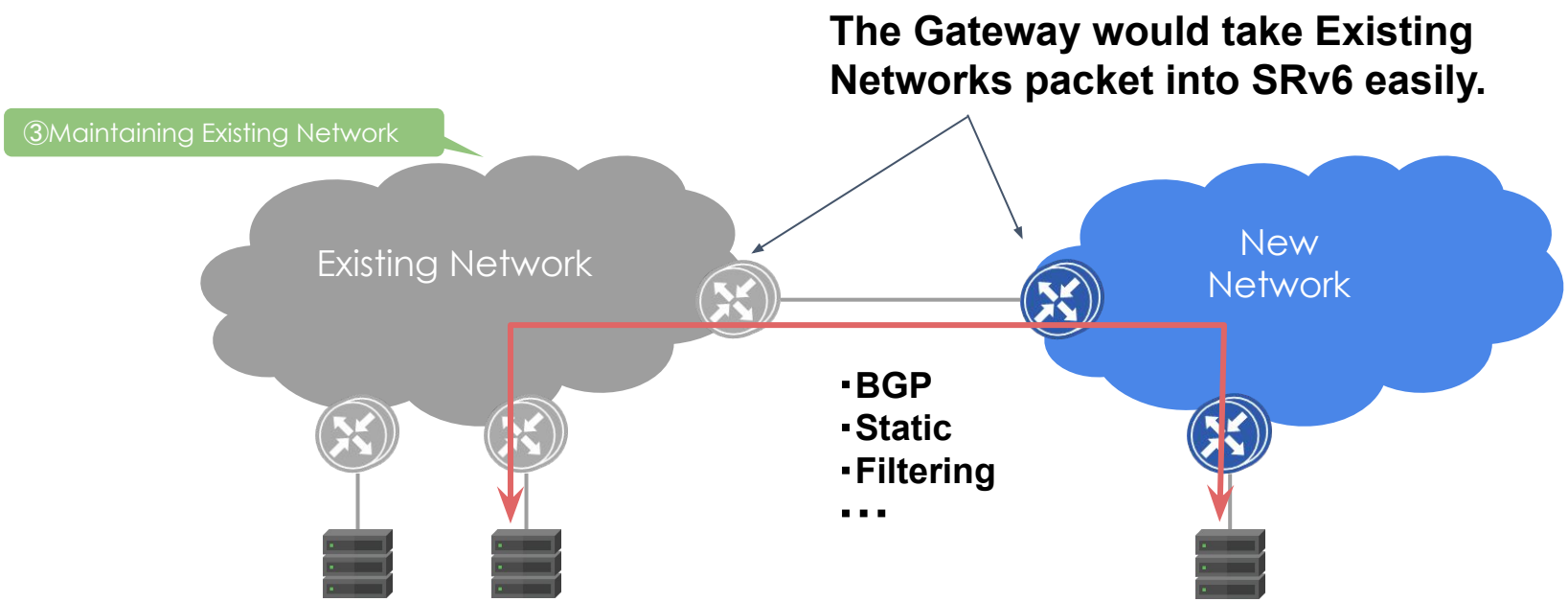
Existing Network



New Network

Maintaining Existing Network

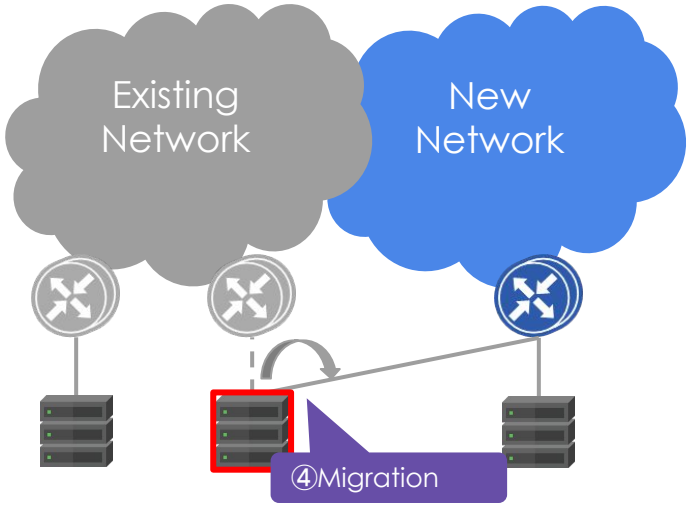
Next, we took into account the inter-network connectivity between the Existing and the New .



Migration

Case Study③

Last, we migrated “old RAN” and “Enterprise Service” to new Network.
During the process of “Migration”, we came across a few unexpected issues caused by “old RAN” and “Enterprise Service” switches.



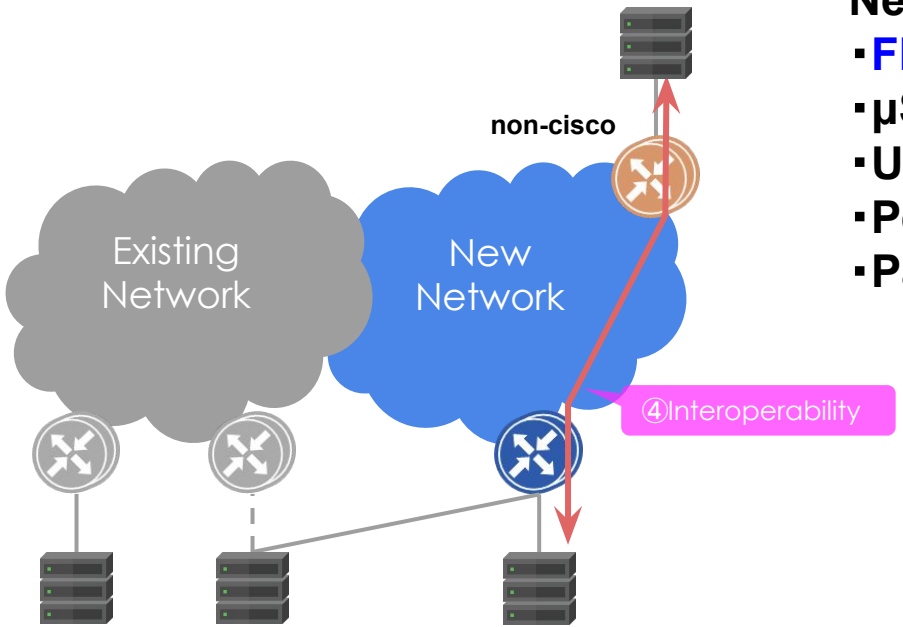
Issues Caused by	Vendor Support
New SRv6 Routers	Full support
Old Switches	Little support (EOL/EOS…)

Interoperability

Case Study④

SoftBank

Many SRv6 functions are ready or on roadmap.
However, Implementation adjustment was required for multi-vendor support



New functions on SRv6.

- **Flex-Algo**
- **µSID**
- **Unreachable Prefix Anouncement**
- **Performance Measurement**
- **Path Tracing・・・**

Flex-Algo

Self-driving Cars/Connected Cars

Fast Response
→Algo 128

Private5G for Enterprise Users

High SLA
→Algo 129

Smart City for Municipality

Multi-Connection
→Algo 130

Flex-Algo makes Network Slicing possible and realizes the simple control to these different requirements.

Are you ready for SRv6?

Conclusion:

SoftBank

It took 3 years for SoftBank to use SRv6.

However, it should be possible to start SRv6 in a shorter period of time and…

・Future Flexibility is important.

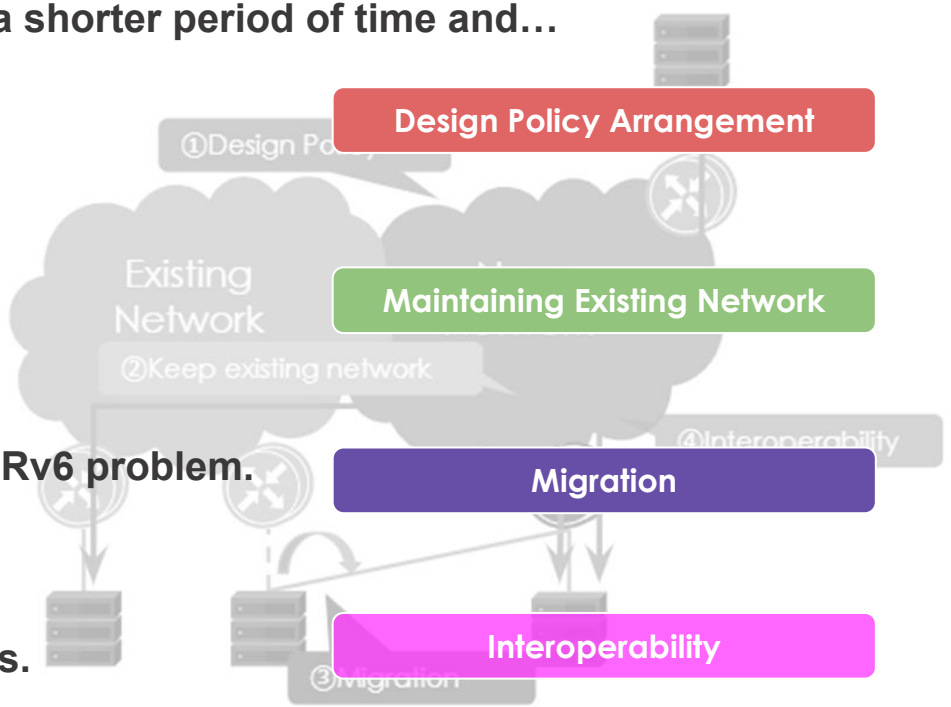
There are many RFCs to further improve SRv6.

・SRv6 network can work with Legacy network.

・We can expect great vendor support with the SRv6 problem.

・SRv6 new features are on roadmap.

Adjustment sometimes needed between vendors.



QA Time

Answering from Tokyo

Thank you

Information Evolution

develop with SRv6

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