OCP SUMMIT

March 20-21
2018
San Jose, CA

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Yahoo! JAPAN Networks and Recent Efforts

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Agenda

- Yahoo! JAPAN
- Yahoo! JAPAN Networks
- Recent Efforts
- Why Backpack
- Backpack test results
- Future Plans

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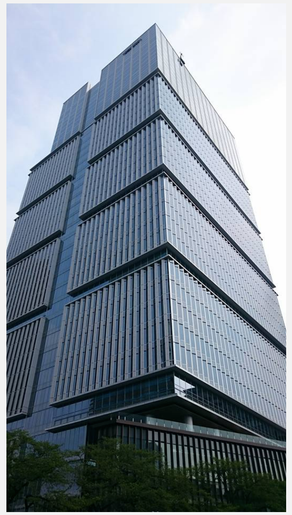
Yahoo! JAPAN

- Founded: January 31, 1996.
- Businesses: Internet Advertising, e-Commerce, Members Services, etc.
- Web services: 100+
- Smartphone Apps: 50+(iOS), 50+ (Android)
- Employees: 6162 (as of June 30, 2017)
- Head Office: Chyoda-ku, Tokyo, Japan



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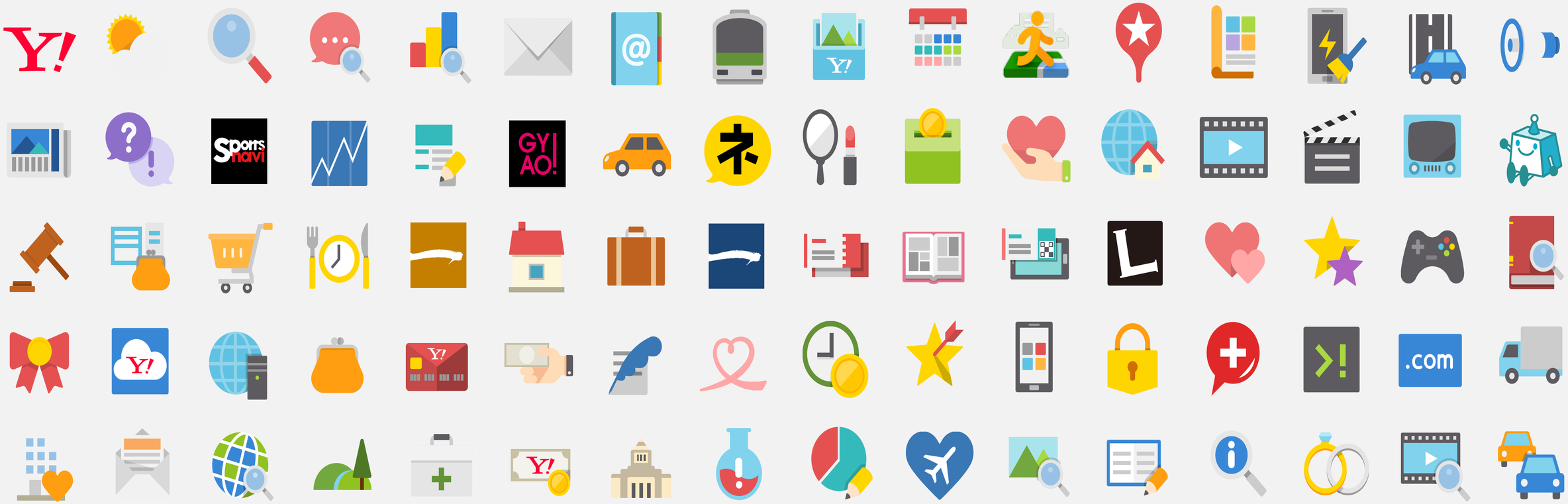
100+ services



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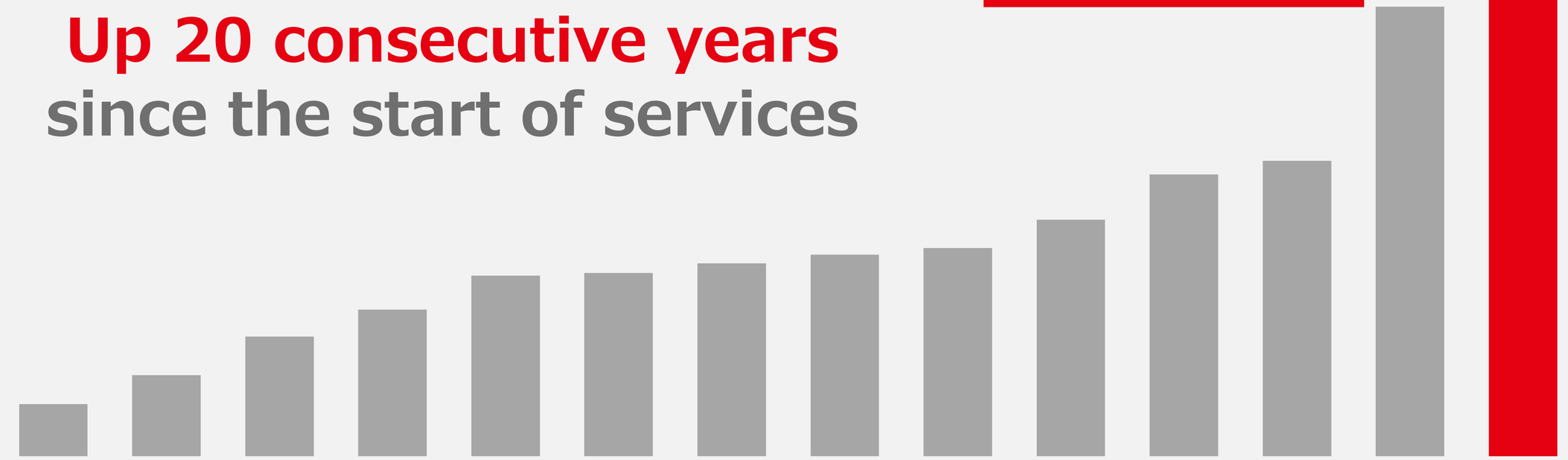
YAHOO! JAPAN

Full Year Revenue

¥853.7 Billion

Up 20 consecutive years
since the start of services



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Visited by 80% of Japanese internet users

Total monthly PV※1

75.7 Billion

Monthly Daily UBs ※2

93.02 million

※1. FY2017 2Q average ※2. FY2017 2Q average

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Becoming a Multi-big Data Driven Enterprise

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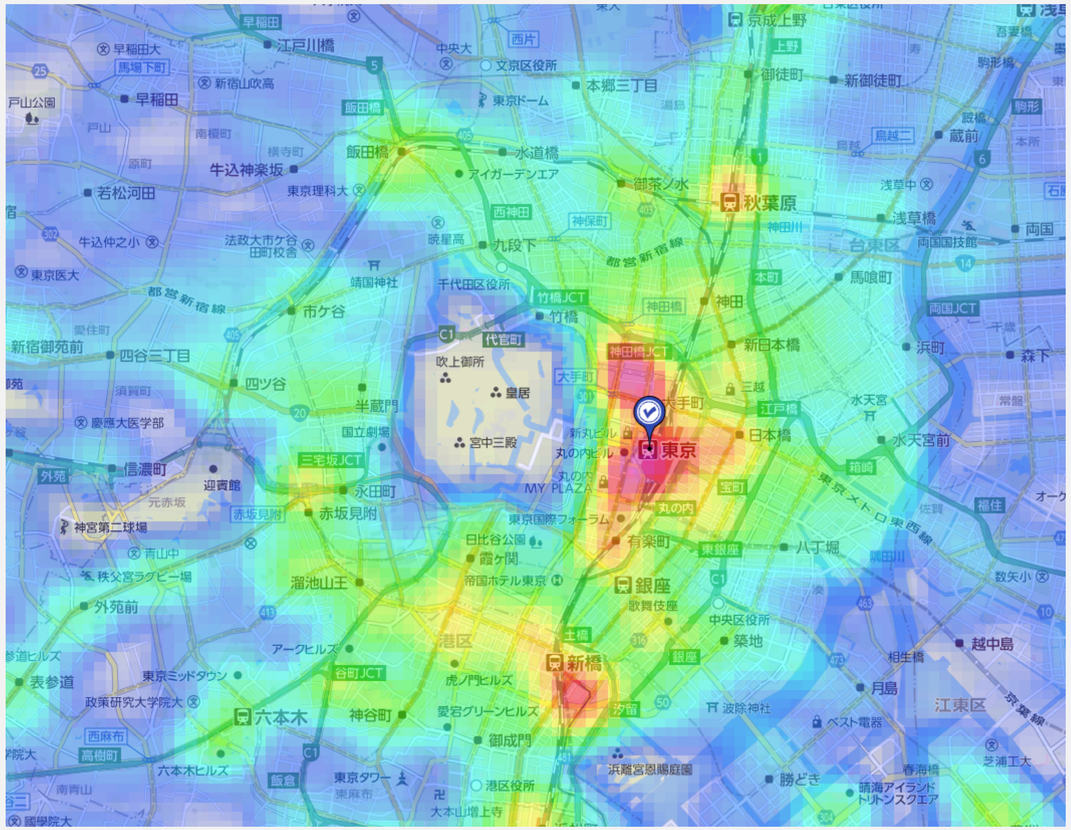
YAHOO! JAPAN

Congestion measurement with transit guide data



https://map.yahoo.co.jp/maps?layer=crowd&v=3&lat=35.681277&lon=139.766266&z=15

https://about.yahoo.co.jp/info/bigdata/special/2017/04/

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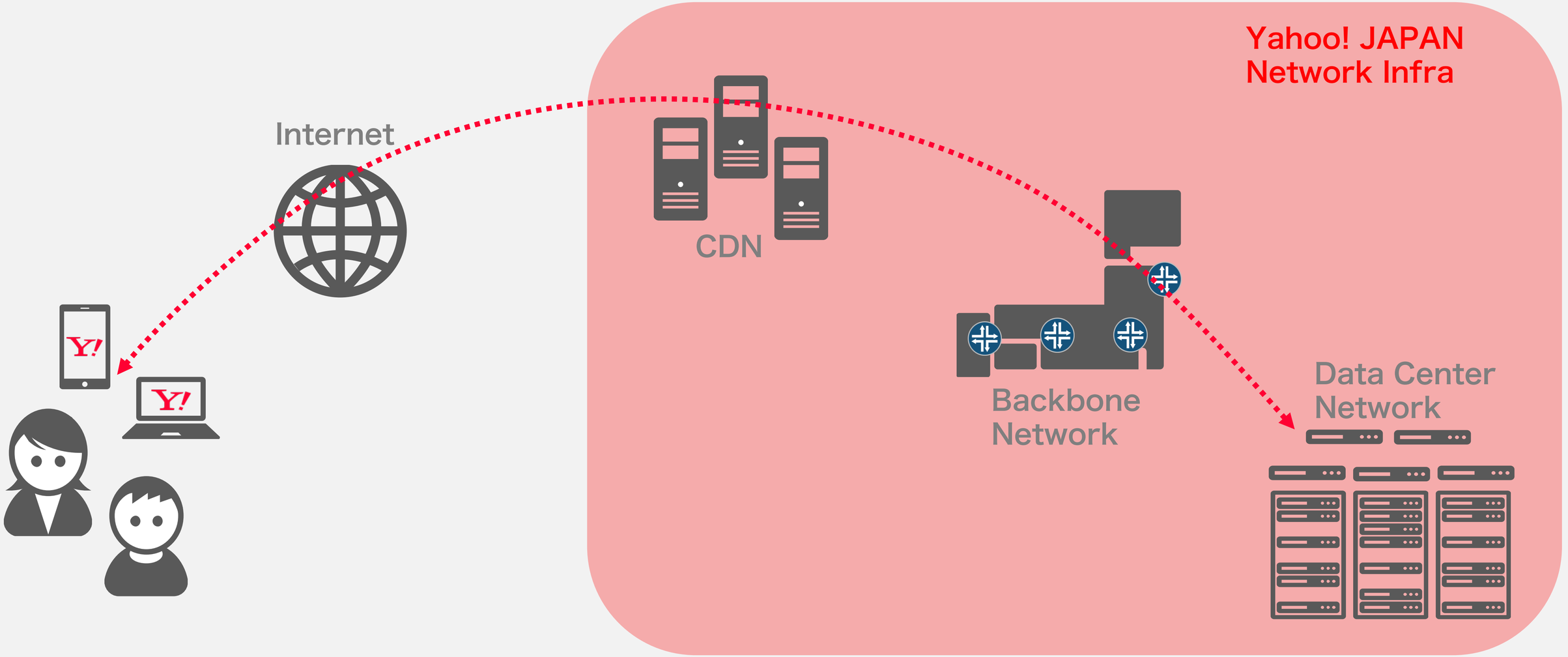
Yahoo! JAPAN Networks



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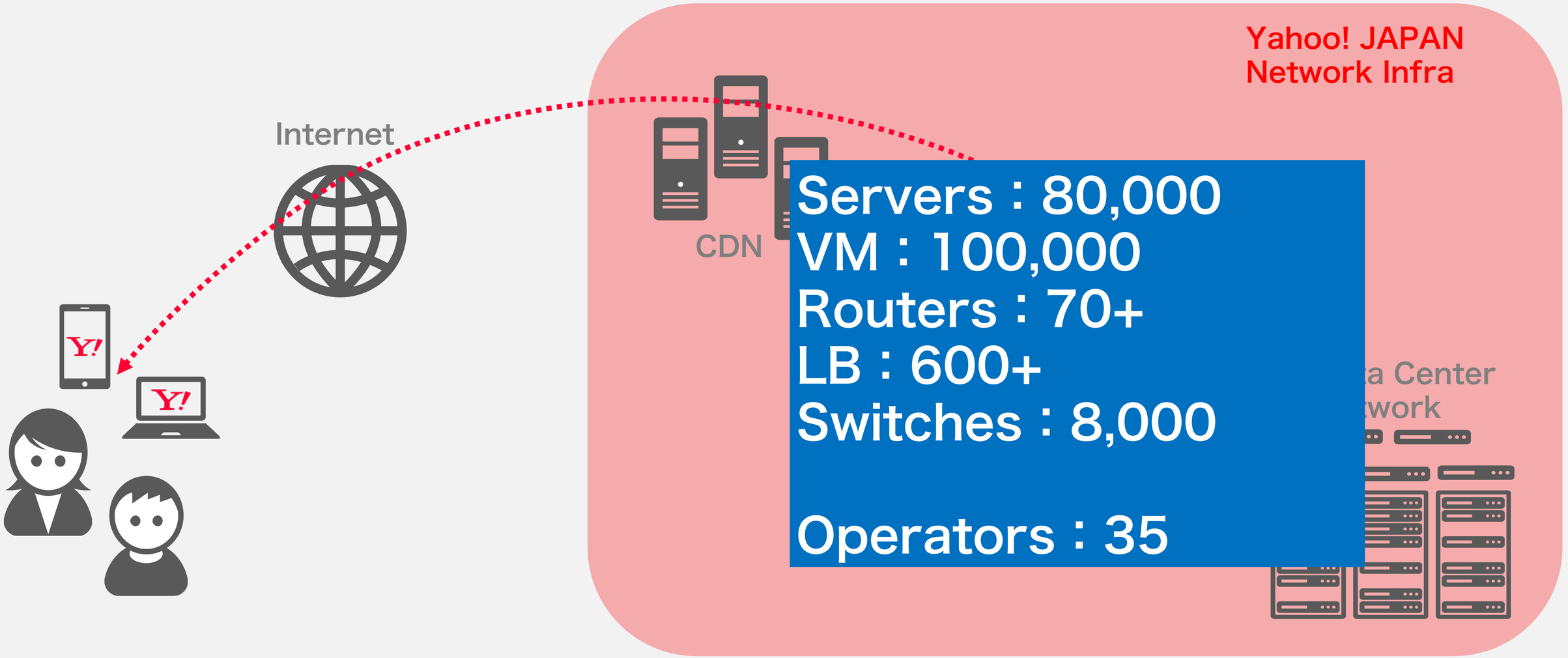
Yahoo! JAPAN Networks



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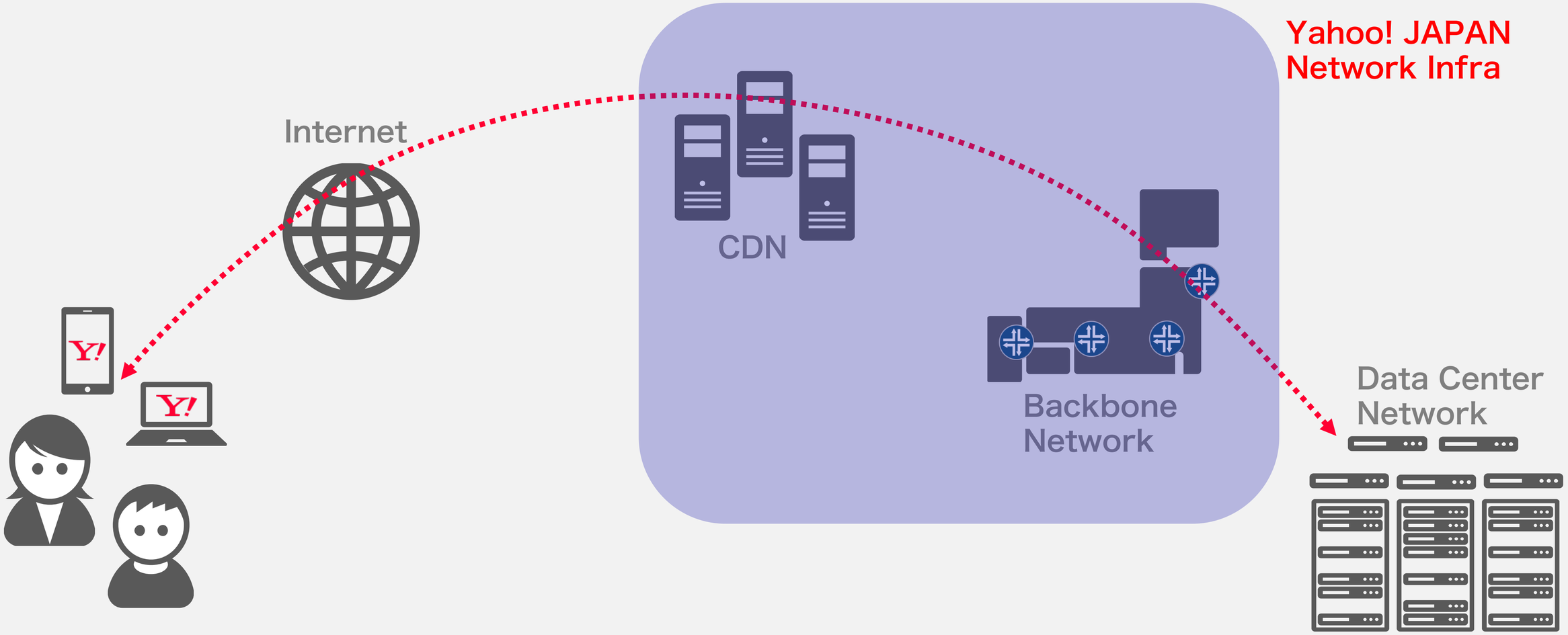
Yahoo! JAPAN Networks



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Backbone Network

6+ DCs (1DC in the US)

Internet

Internet

Tohoku

Actapio, Inc.

AS18140

Kyushu

Osaka

Tokyo

CDN

CDN

AS23816

AS24572

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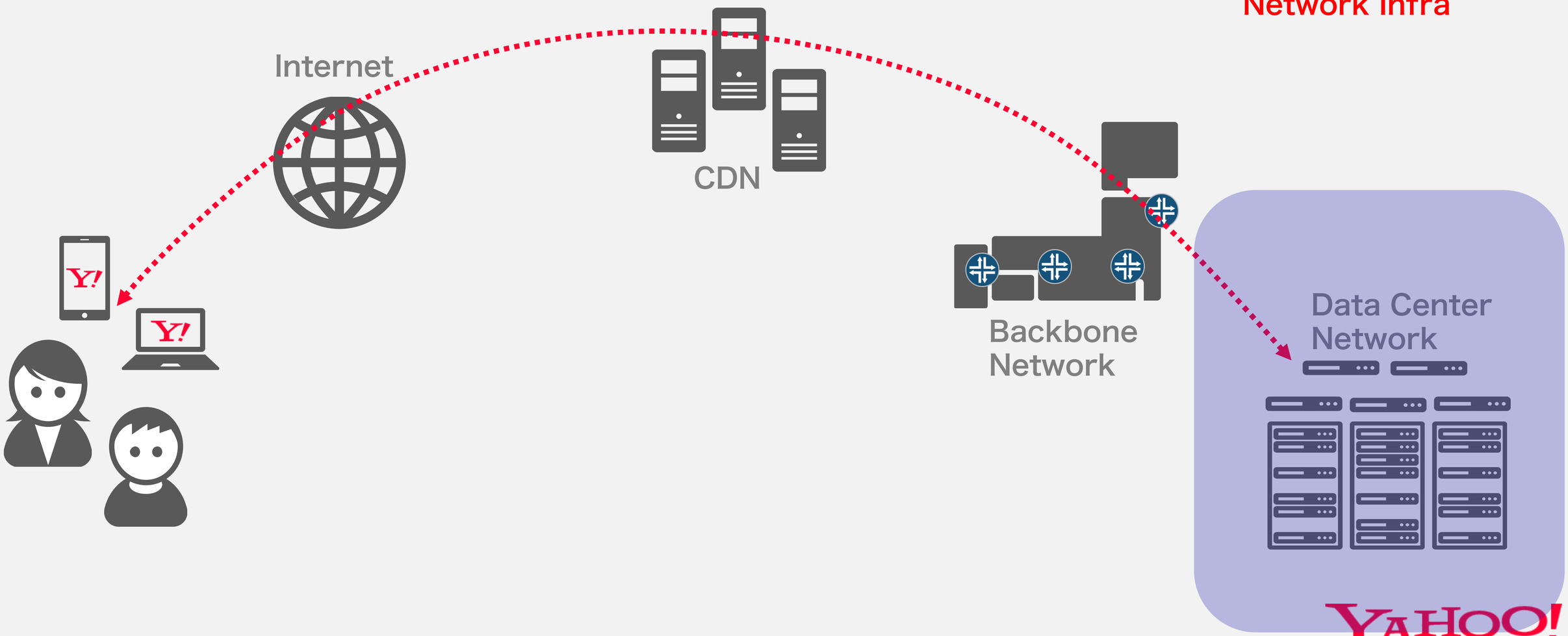
Yahoo! JAPAN Networks



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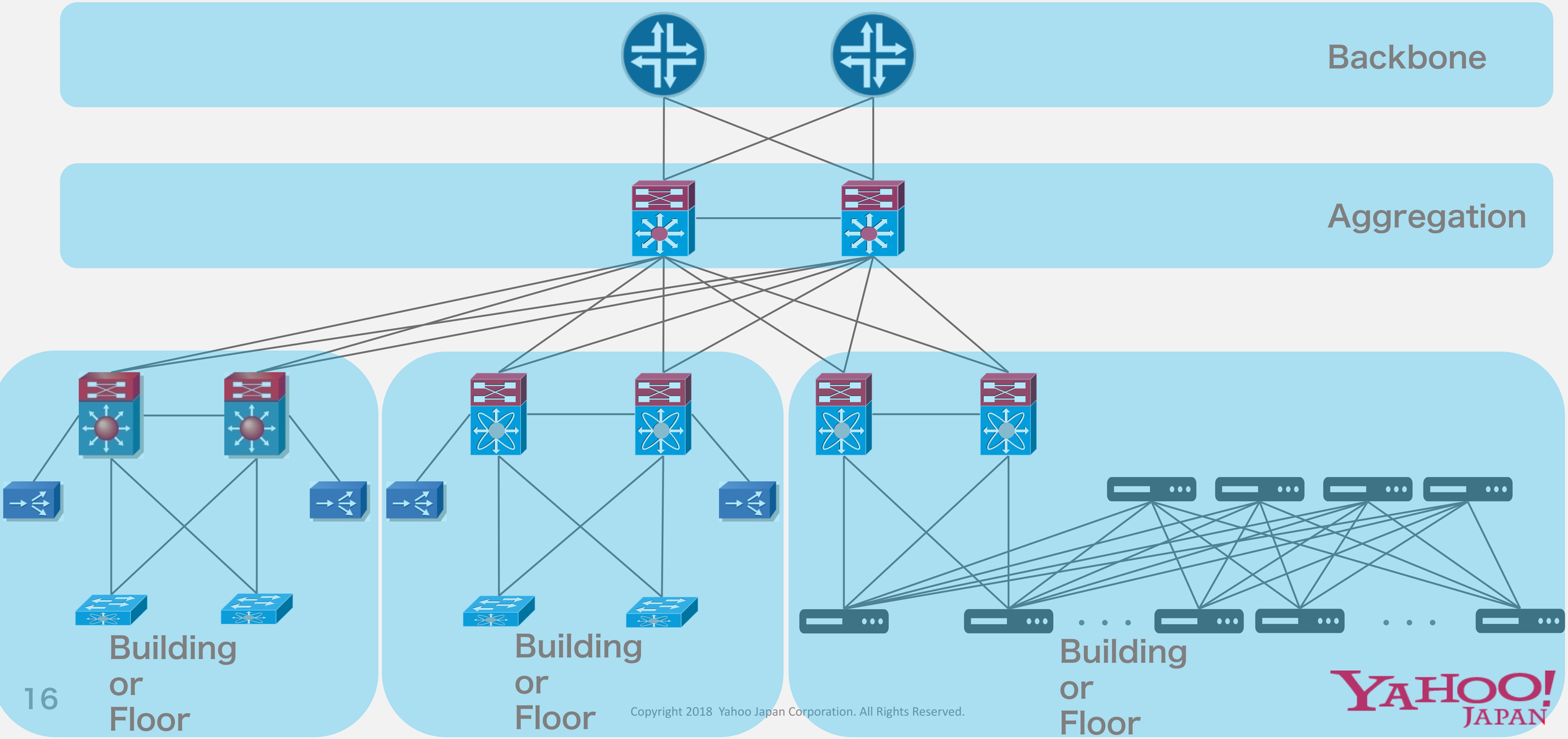
Data Center Network



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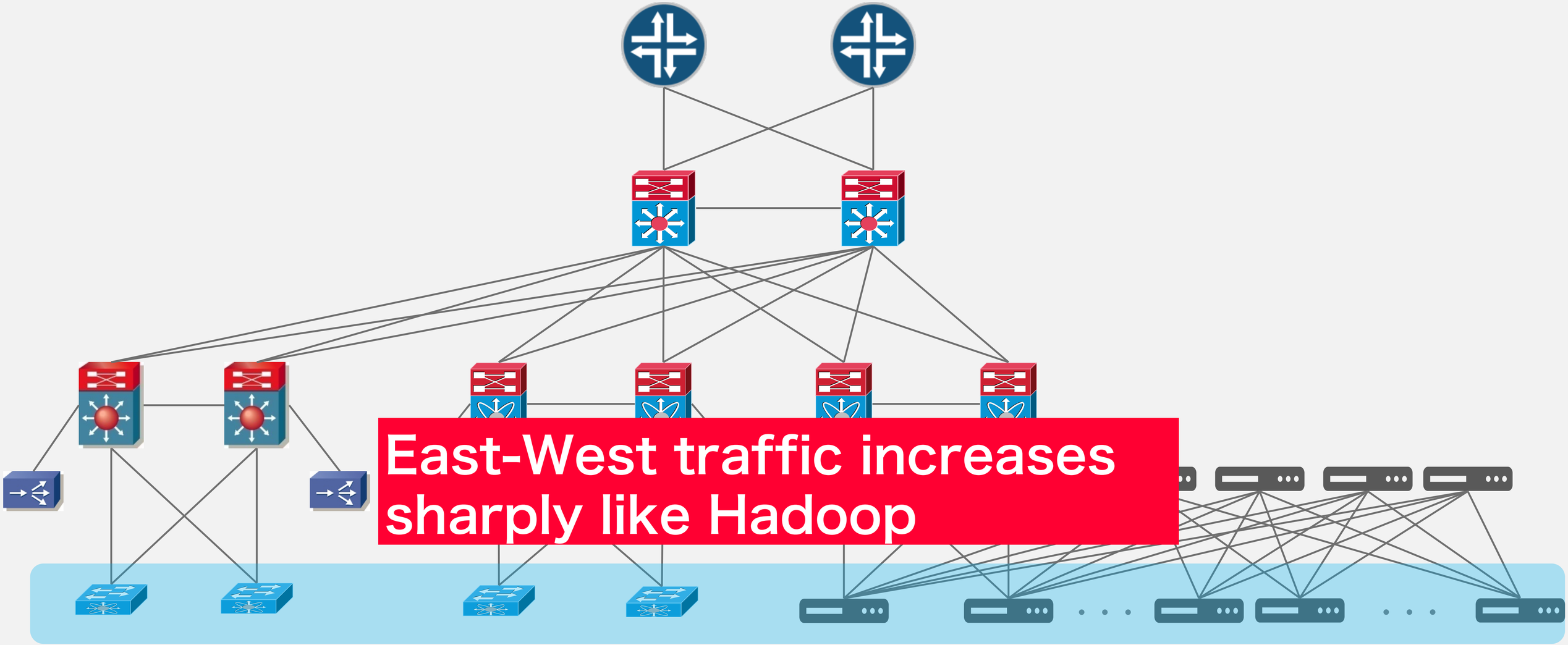
Data Center Network



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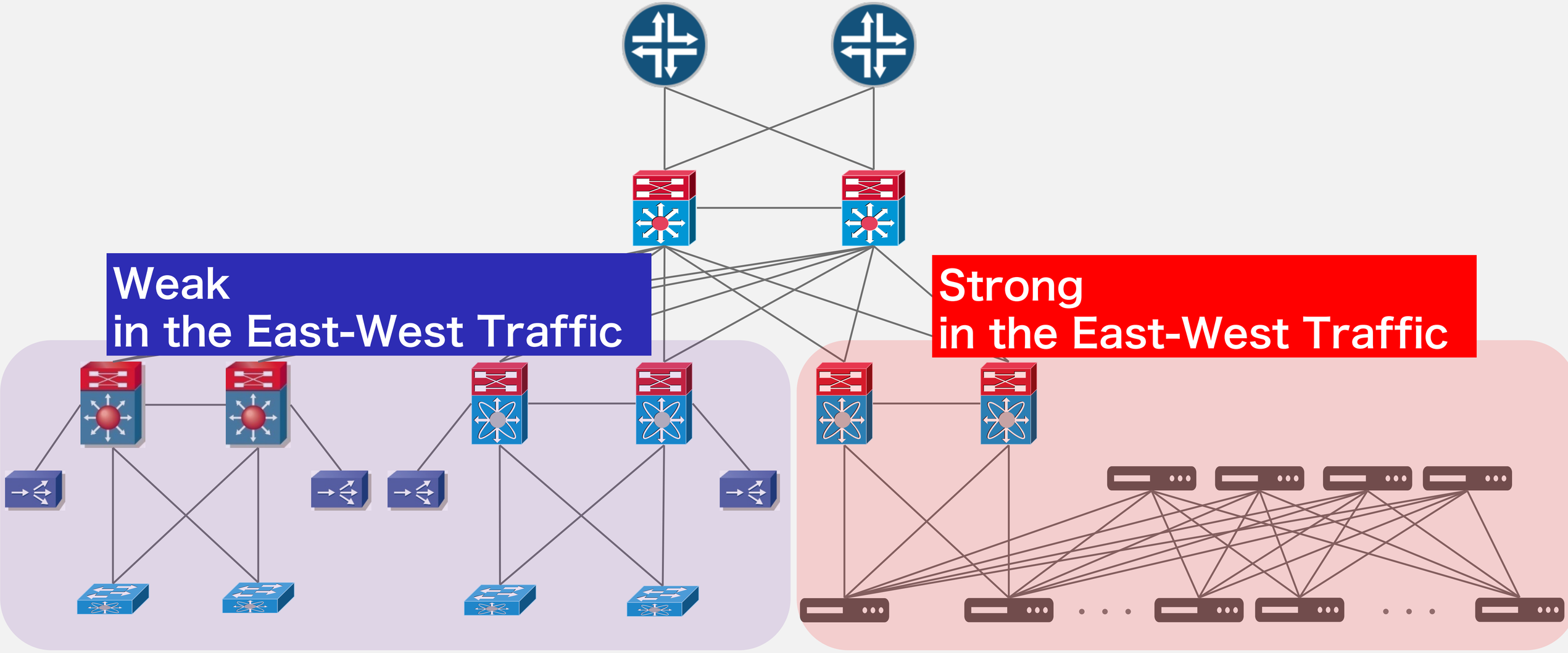
Data Center Network



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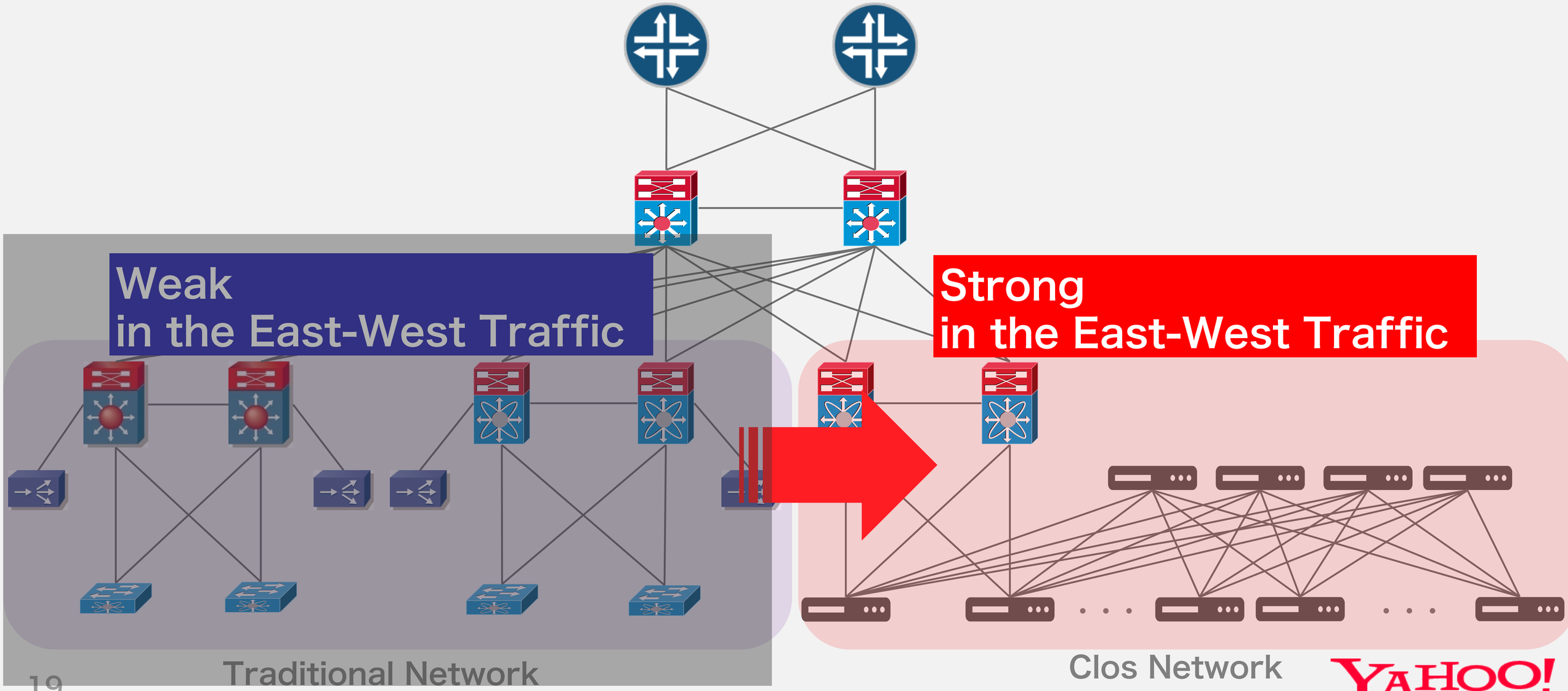
Data Center Network



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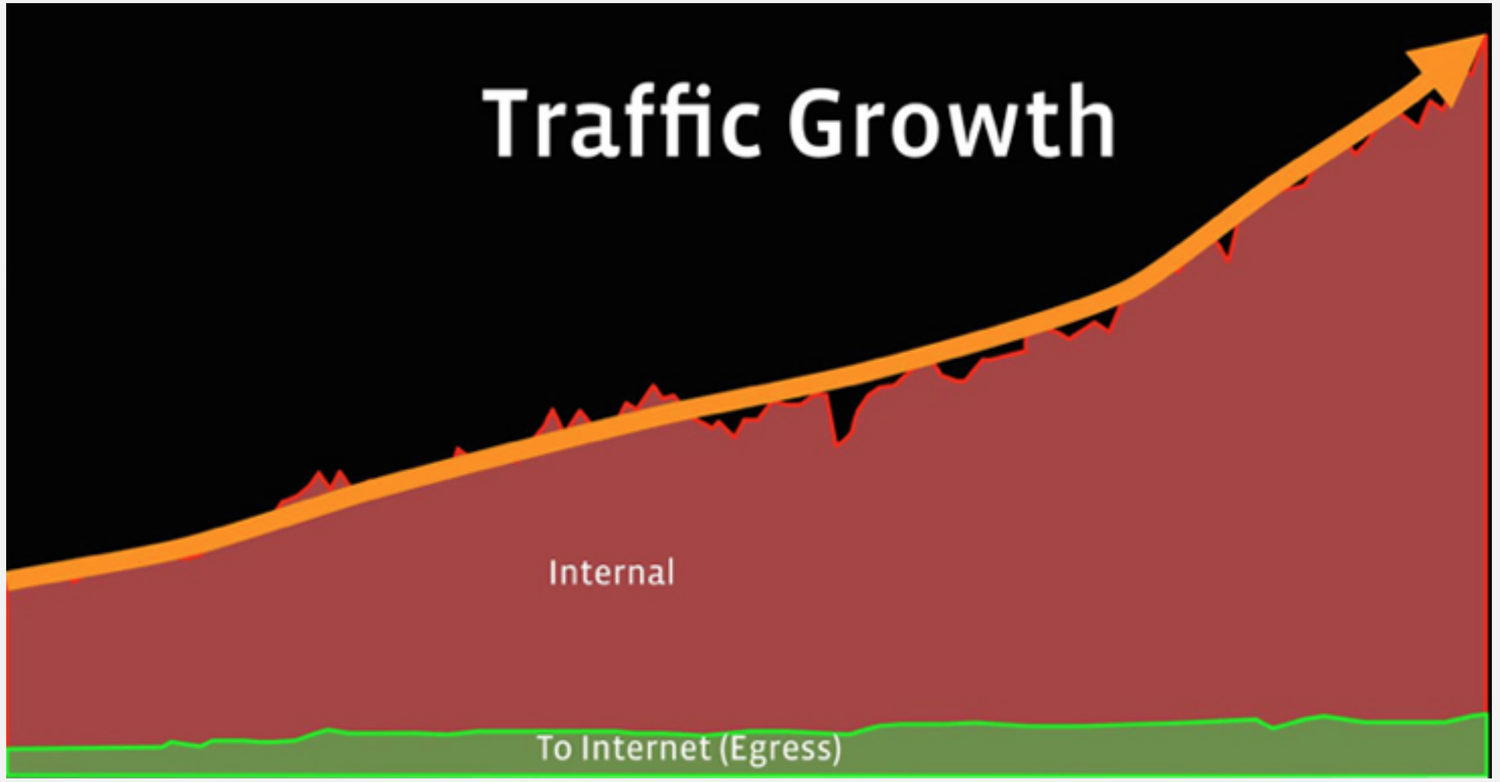
Facebook

https://code.facebook.com/posts/1782709872057497



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Recent Efforts

	Facebook	Yahoo! JAPAN		
Design	Clos Network	Clos Network		
Automation	Home Grown Tool	Home Grown + OSS + Apstra		
Software	FBOSS	EOS	Cumulus	NX-OS Junos
Chip	Merchant Silicon	Merchant Silicon		Custom Silicon
Box	OCP (Wedge, Backpack)	Arista	OCP (Edgecore, Backpack)	Cisco Juniper

Recent Efforts

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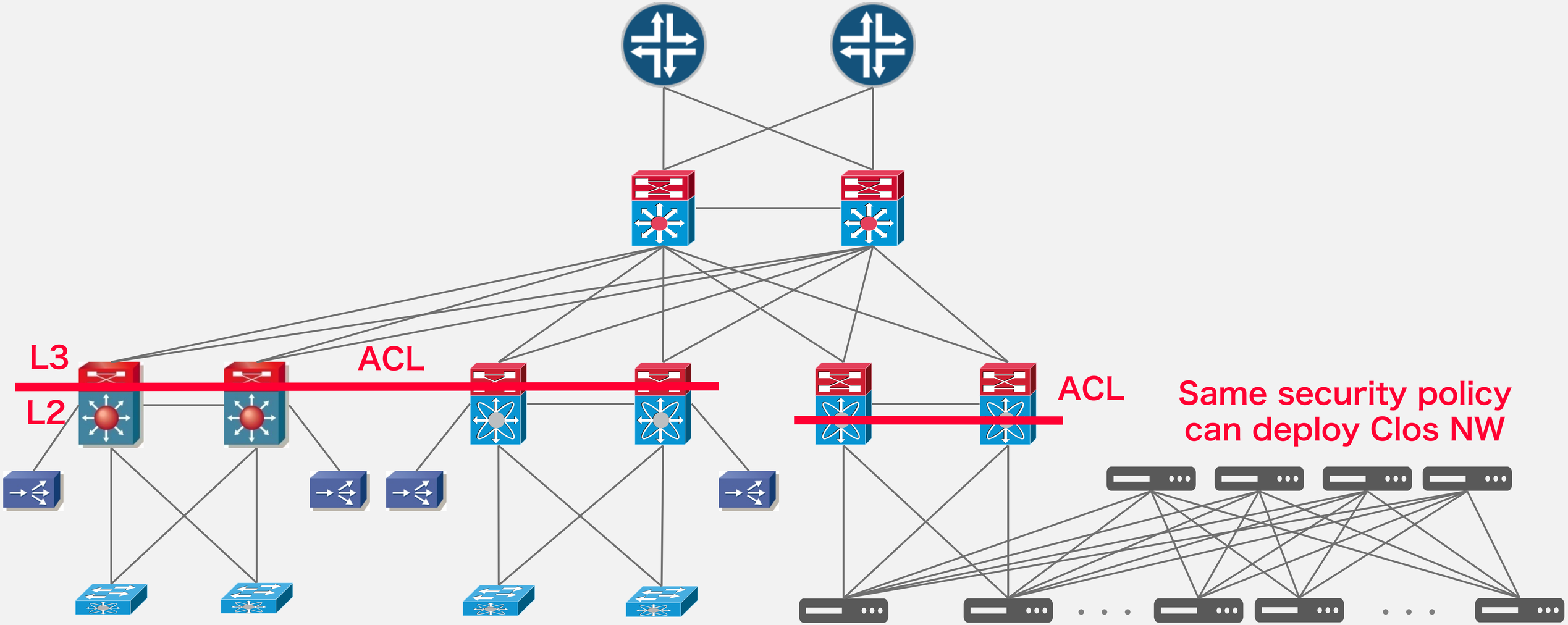
Internal Security Issues



Traditional Network

Clos Network

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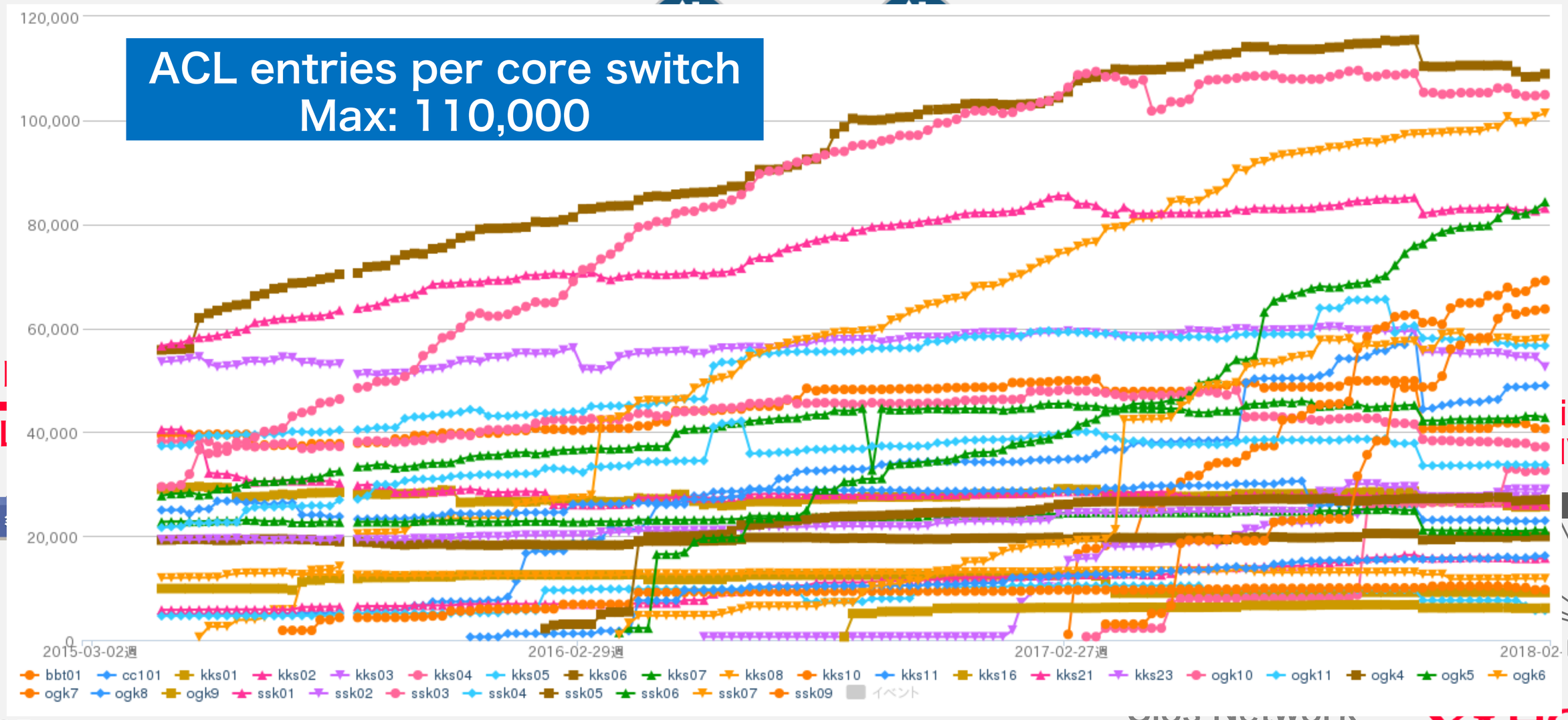
Internal Security Issues



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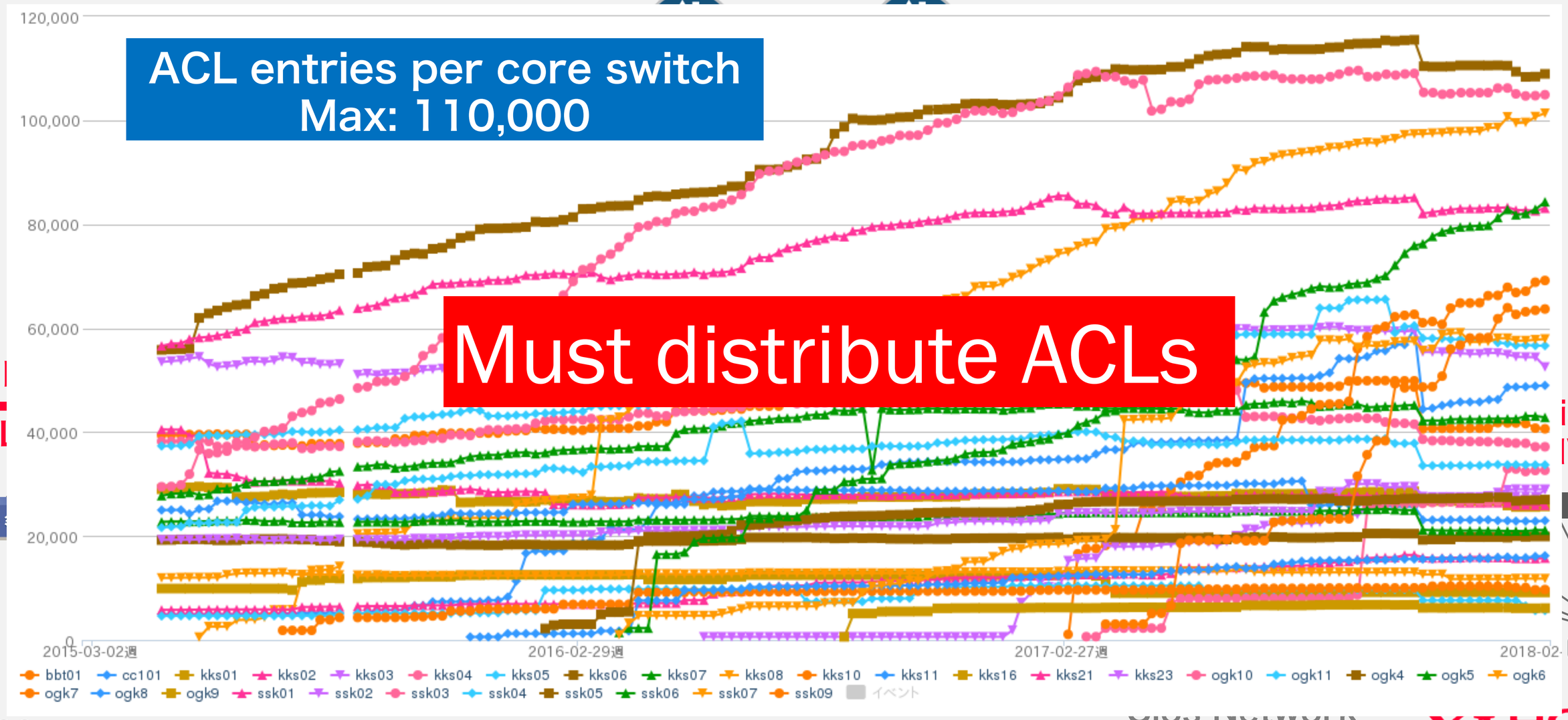
Internal Security Issues



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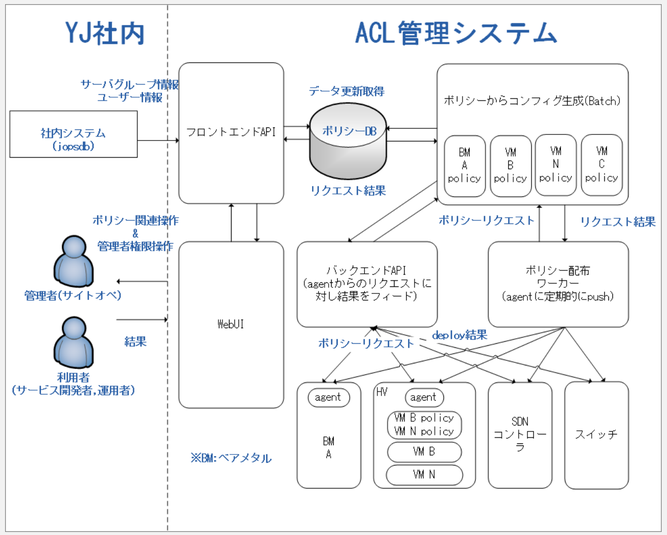
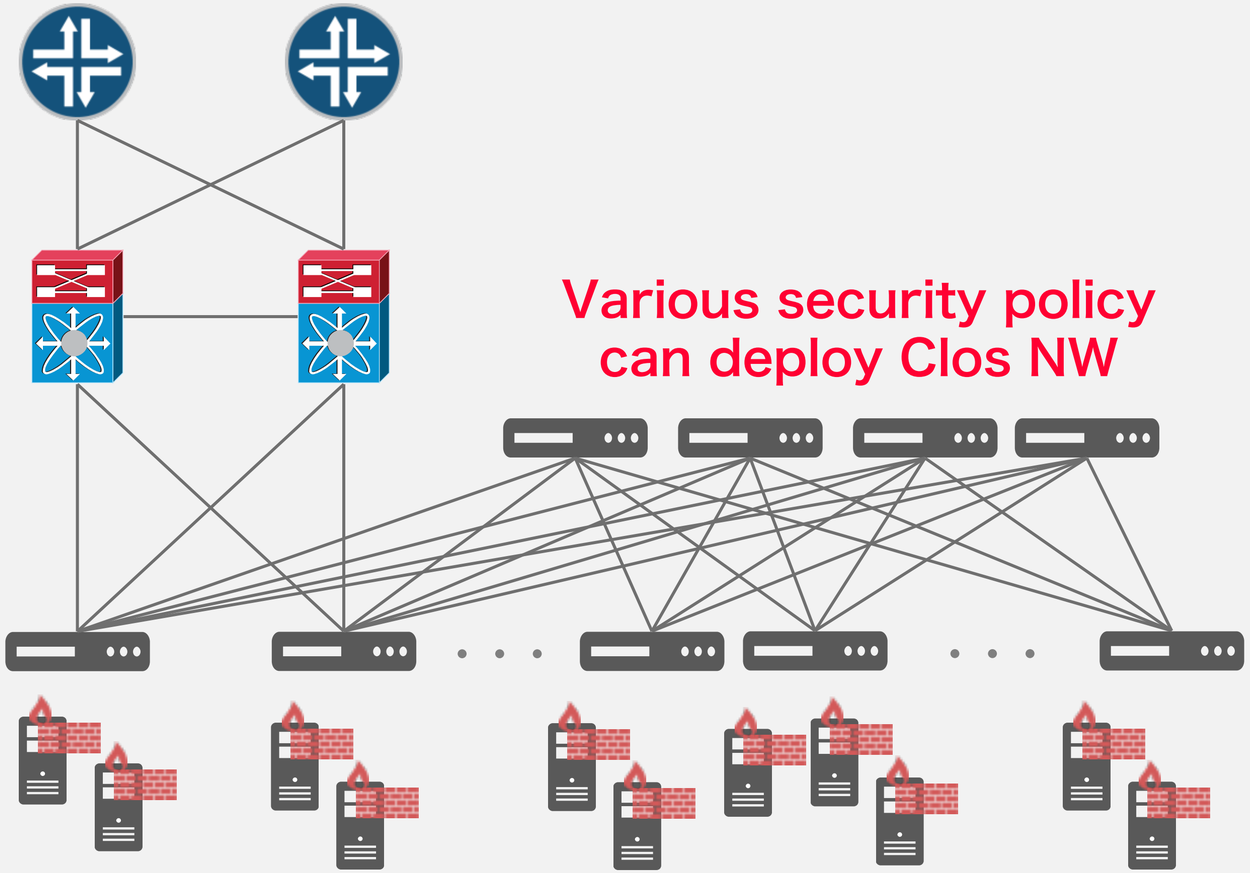
Internal Security Issues

- Developed iptables-based security management system
- Final testing in progress





Various security policy can deploy Clos NW

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- **Why Backpack**
- Backpack test results
- Future Plans

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Recent Efforts

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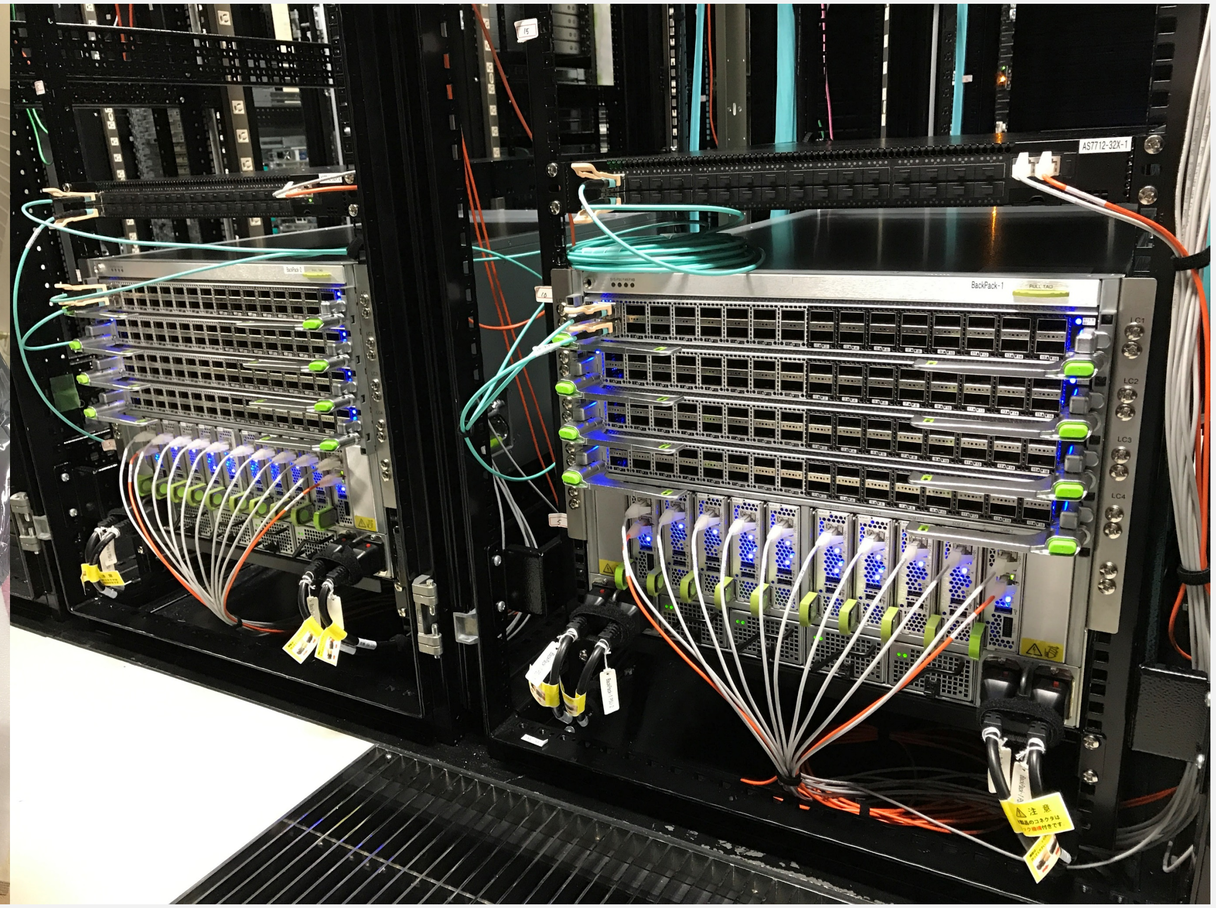
Design	Clos Network	Clos Network		
Automation	Home Grown Tool	Home Grown + OSS + Apstra		
Software	FBOSS	EOS	Cumulus	NX-OS Junos
Chip	Merchant Silicon	Merchant Silicon		Custom Silicon
Box	OCP (Wedge, Backpack)	Arista	OCP (Edgecore, Backpack)	Cisco Juniper

Backpack



http://www.opencompute.org/products/

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Backpack

http://www.opencompute.org/products/

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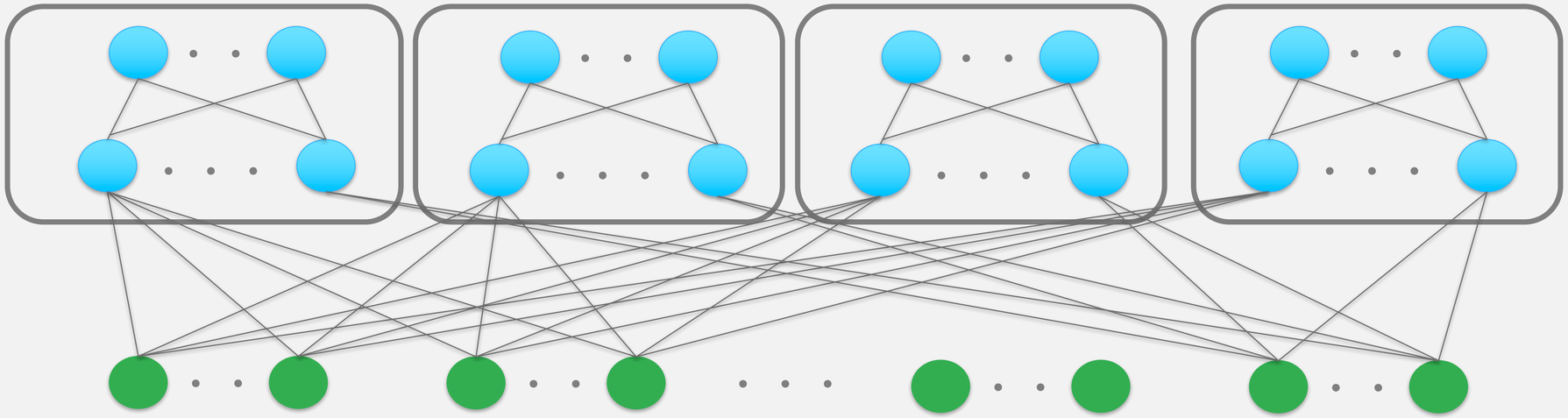
Why Backpack?

- When Clos Network is deployed with Box switches, 3-tier required.
- Until now we chose Chassis switches



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Why Backpack?

	2-Tier with Chassis SW	3-Tier with Box SW
Pros	High port densities (no Rack, Cable, Optics)	SW Upgrades = Short time No Single Point of Failure Same Operation = Simple
Cons	Software Upgrades = Long time SUP = Single Point of Failure ISSU = Complexity	Rack U required Cable management Optics Cost

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Cons	SW Upgrades = Long time SUP = Single Point of Failure ISSU = Complexity	Rack U required Cable management Optics Cost

Backpack
best of everything

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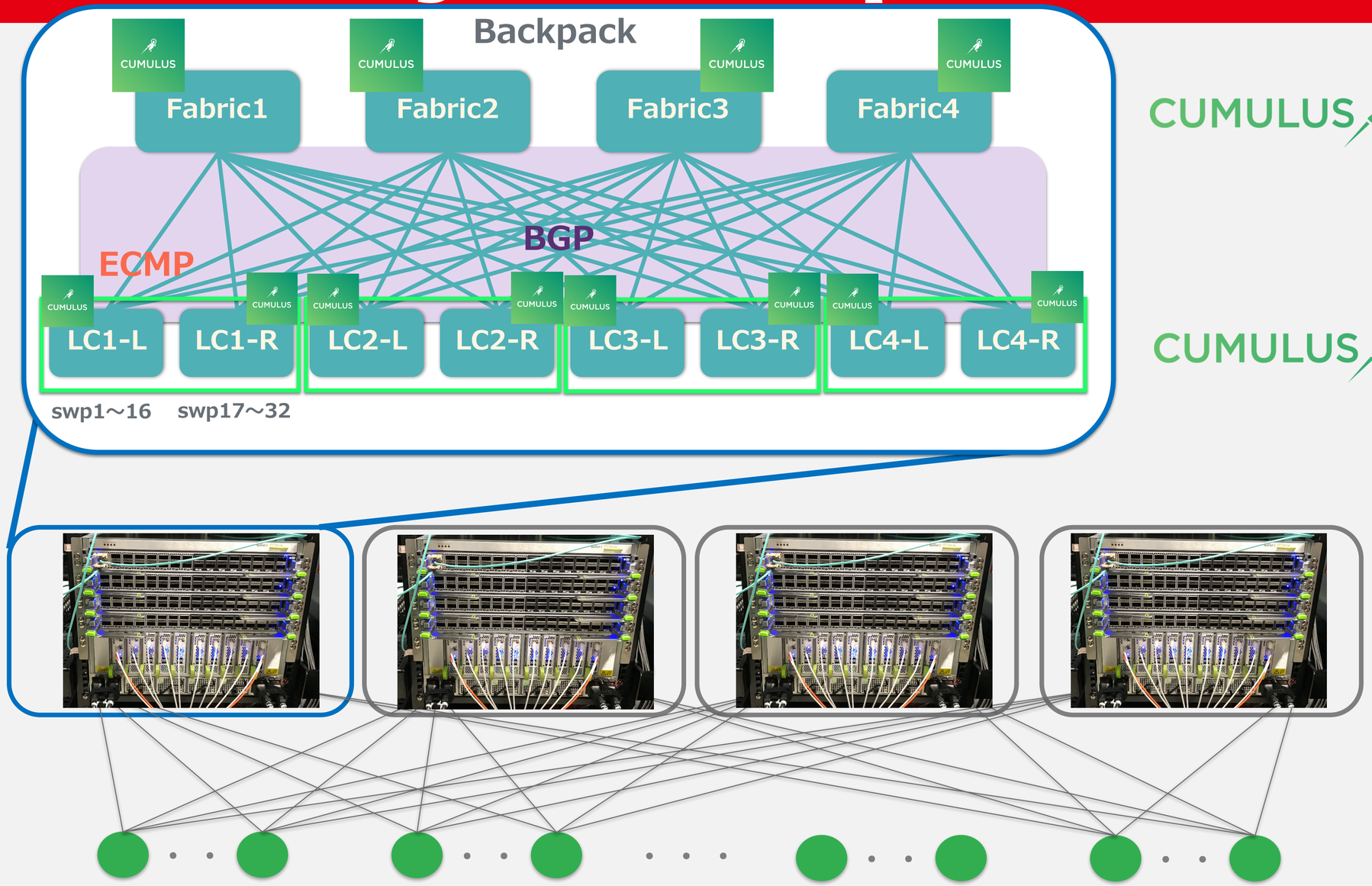
Why Backpack?



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Why Backpack?

```
cumulus@fb-bp01-lc101:~$ sudo vtysh -c 'show ip route'
Codes: K - kernel route, C - connected, S - static, R - RIP,
       O - OSPF, I - IS-IS, B - BGP, P - PIM, T - Table, v - VNC,
       V - VPN,
       > - selected route, * - FIB route

K>* 0.0.0.0/0 via [redacted]5.27.1, eth0
C>* [redacted]5.27.0/26 is directly connected, eth0
C>* [redacted]5.28.4/32 is directly connected, lo
B>* [redacted]5.28.5/32 [19/0] via fe80::2e0:ecff:fe59:2a38, fp0, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2a3c, fp1, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2a40, fp2, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2a44, fp3, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2ab9, fp12, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2abd, fp13, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2ac1, fp14, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2ac5, fp15, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2b3a, fp8, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2b3e, fp9, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2b42, fp10, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2b46, fp11, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2bbb, fp4, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2bbf, fp5, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2bc3, fp6, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2bc7, fp7, 00:03:08
B>* [redacted]5.28.6/32 [19/0] via fe80::2e0:ecff:fe59:2a38, fp0, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2a3c, fp1, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2a40, fp2, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2a44, fp3, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2ab9, fp12, 00:03:08
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  *                            via fe80::2e0:ecff:fe59:2ac5, fp15, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2b3a, fp8, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2b3e, fp9, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2b42, fp10, 00:03:08
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  *                            via fe80::2e0:ecff:fe59:2bbb, fp4, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2bbf, fp5, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2bc3, fp6, 00:03:08
  *                            via fe80::2e0:ecff:fe59:2bc7, fp7, 00:03:08
```
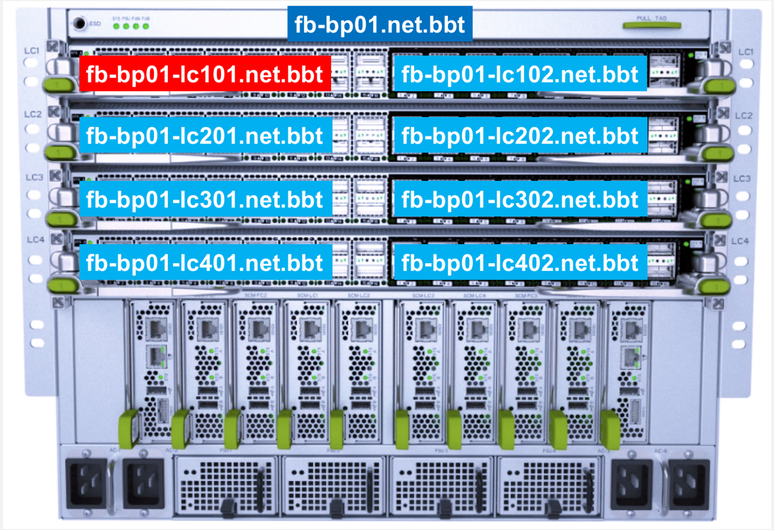
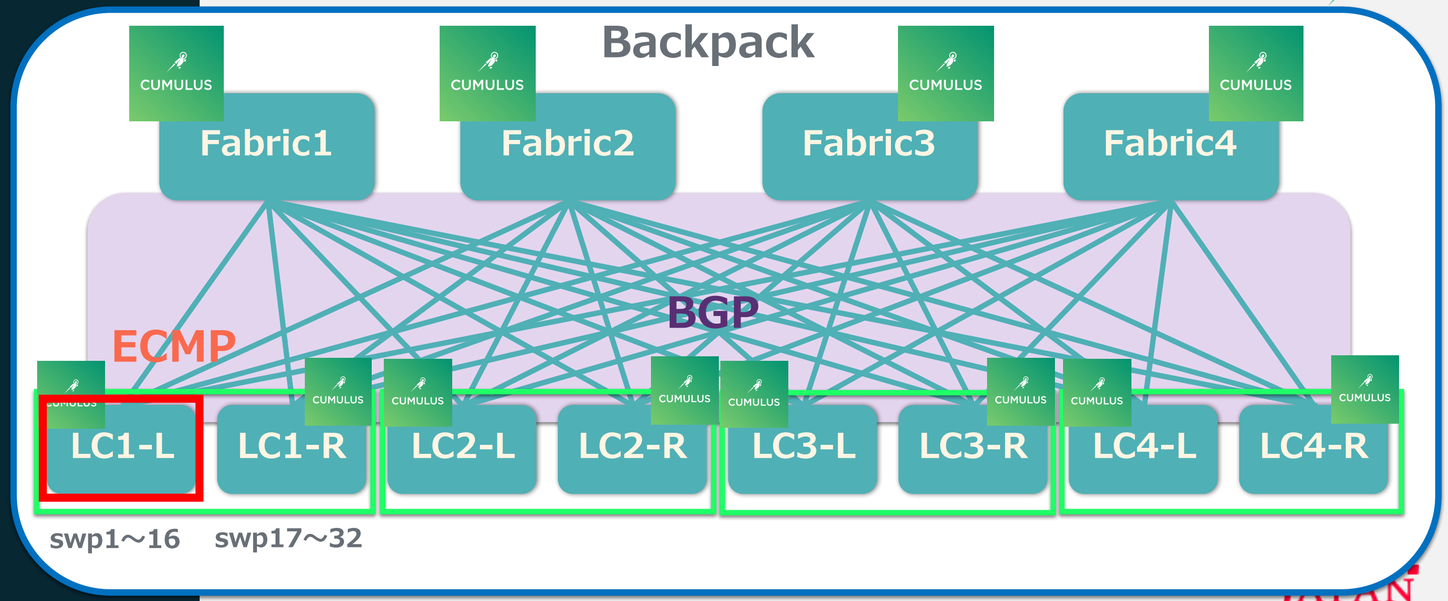



CUMULUS



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- Next Our Plans

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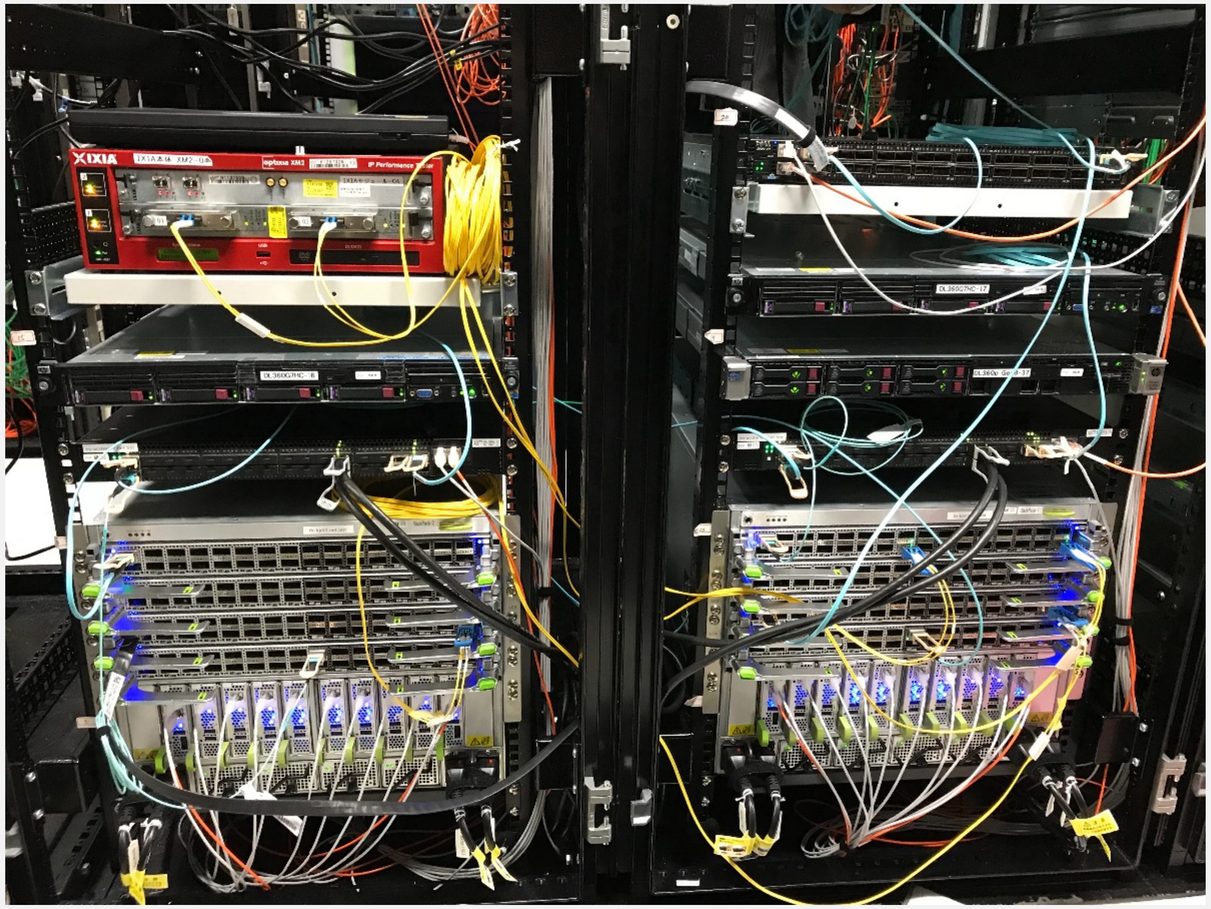
Test results

- Facebook Backpack x2
- 100G SR x8
- Accton AS7712-32X x2
- IXIA 2slot Chassis x1
- IXIA 100G module x1
- IXIA 10G module x1
- DL360G7 HC x2
- DL360p Gen8 x1
- Dell Z9100-ON x1



https://techblog.yahoo.co.jp/advent-calendar-2017/datacenternetwork_backpack/

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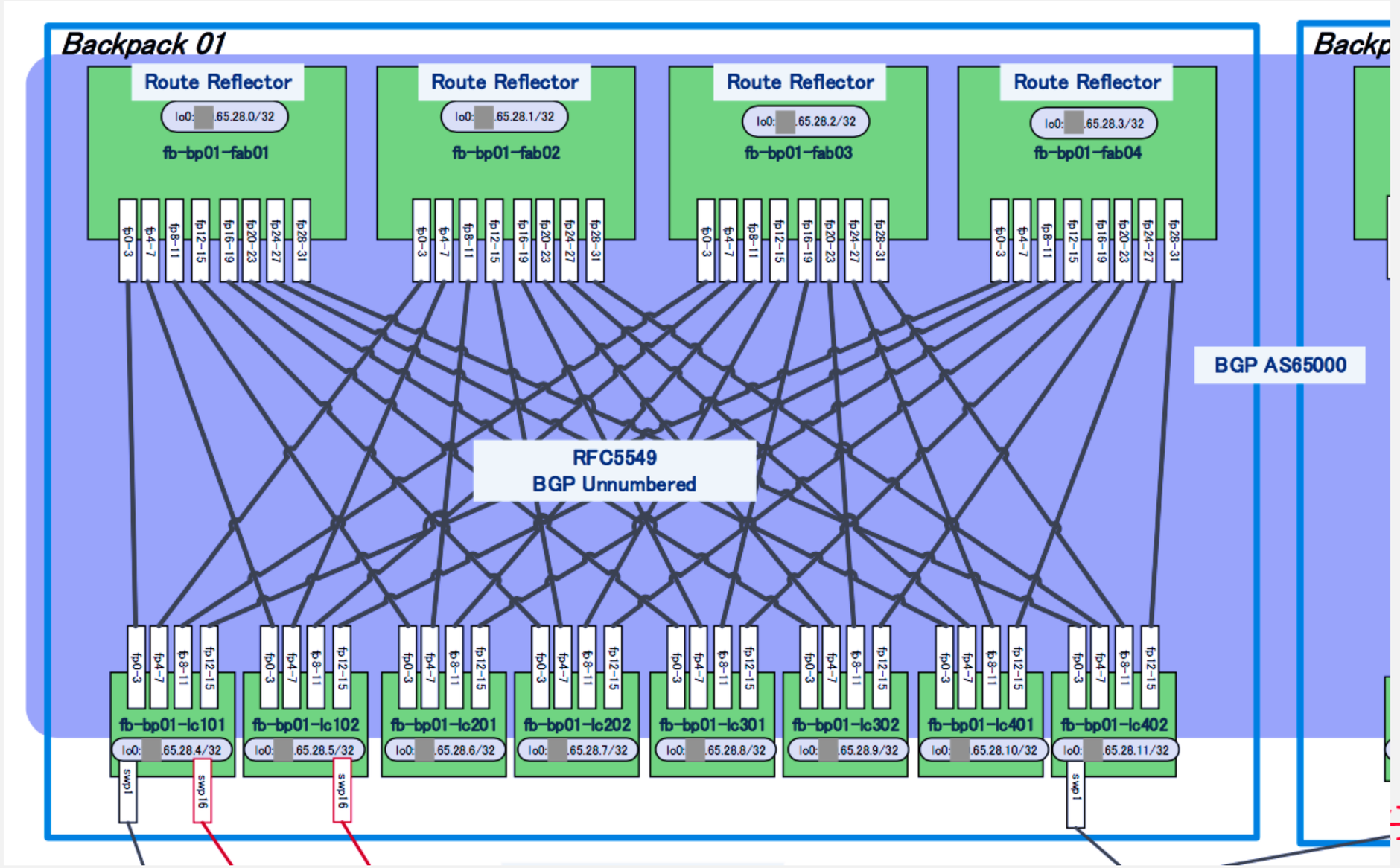
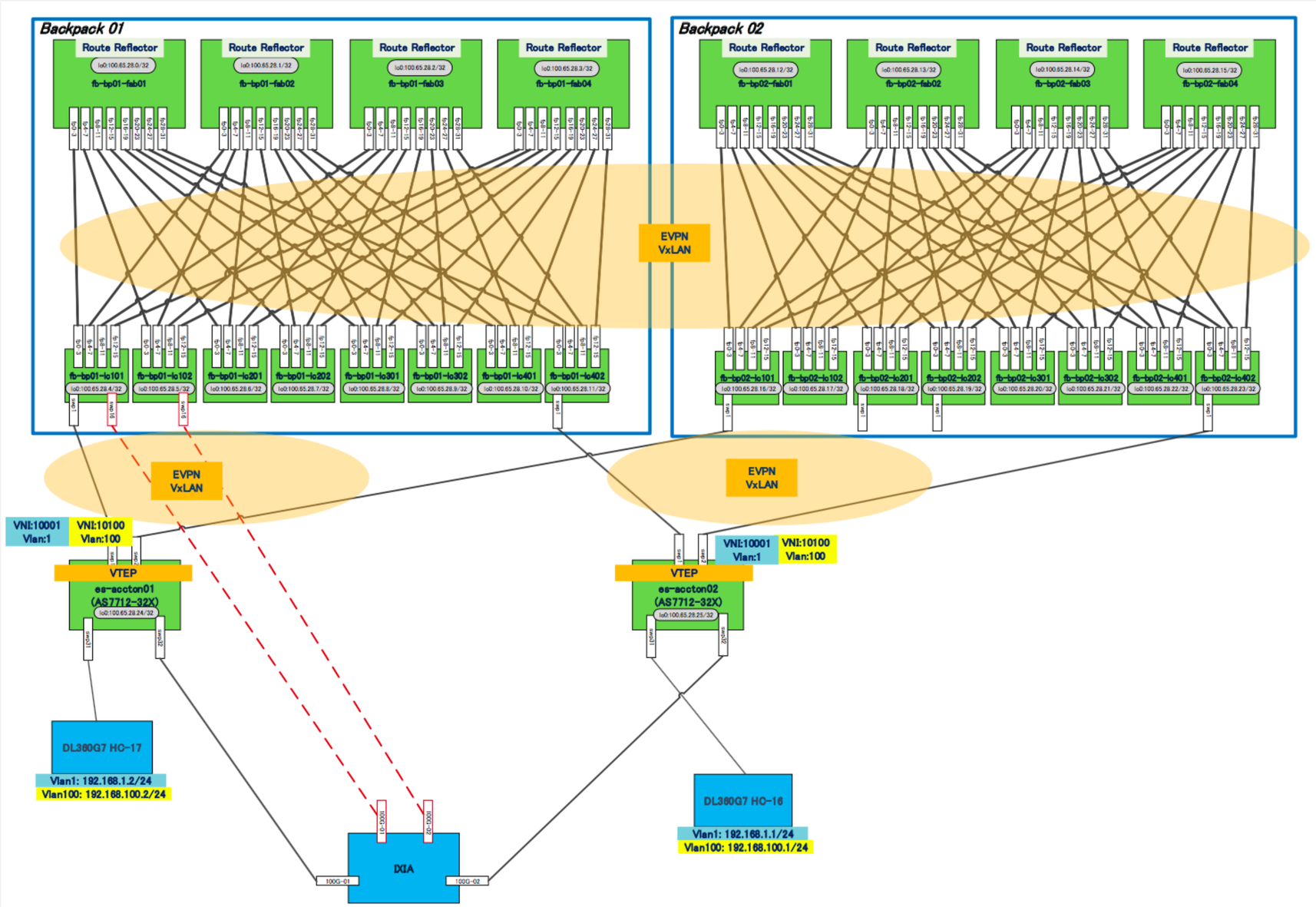
Test results

- Undelay



Test results

- Overlay



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Test results

large classification	middle classification	small classification	Test results
1. BGP EVPN	1-1. Single Home	1-1-1. BGP EVPN Neighbor	PASS
		1-1-2. BGP EVPN Route	PASS
		1-1-3. Mac Mobility	PASS
	1-2. Dual Home	1-2-1. VxLAN Anycast IP	PASS
2. Packet capturing	2-1. Single Home	2-1-1. Control Plane Packet	PASS
		2-1-2. Data Plane Packet	PASS
	2-2. Dual Home	2-2-1. Control Plane Packet	PASS
		2-2-2. Data Plane Packet	PASS
3. RFC2544 test	3-1. Underlay	3-1-1. 1 flow	PASS
		3-1-2. 200 flows	PASS
	3-2. Overlay	3-2-1. 1 flow	PASS
		3-2-2. 2000 flows	PASS

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Future Plans

Plan to use Backpack for data analysis on infra used by science department in summer 2018.

Analyze accumulated data

- Searching log
- Access log
- Audio assist log
- News articles and video browsing history log
- Shopping order log
- etc

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Q&A

OCP SUMMIT