

HKIX Development and HKIX-R&E Updates at APAN 47

Kenneth Lo

HKIX Team

www.hkix.net

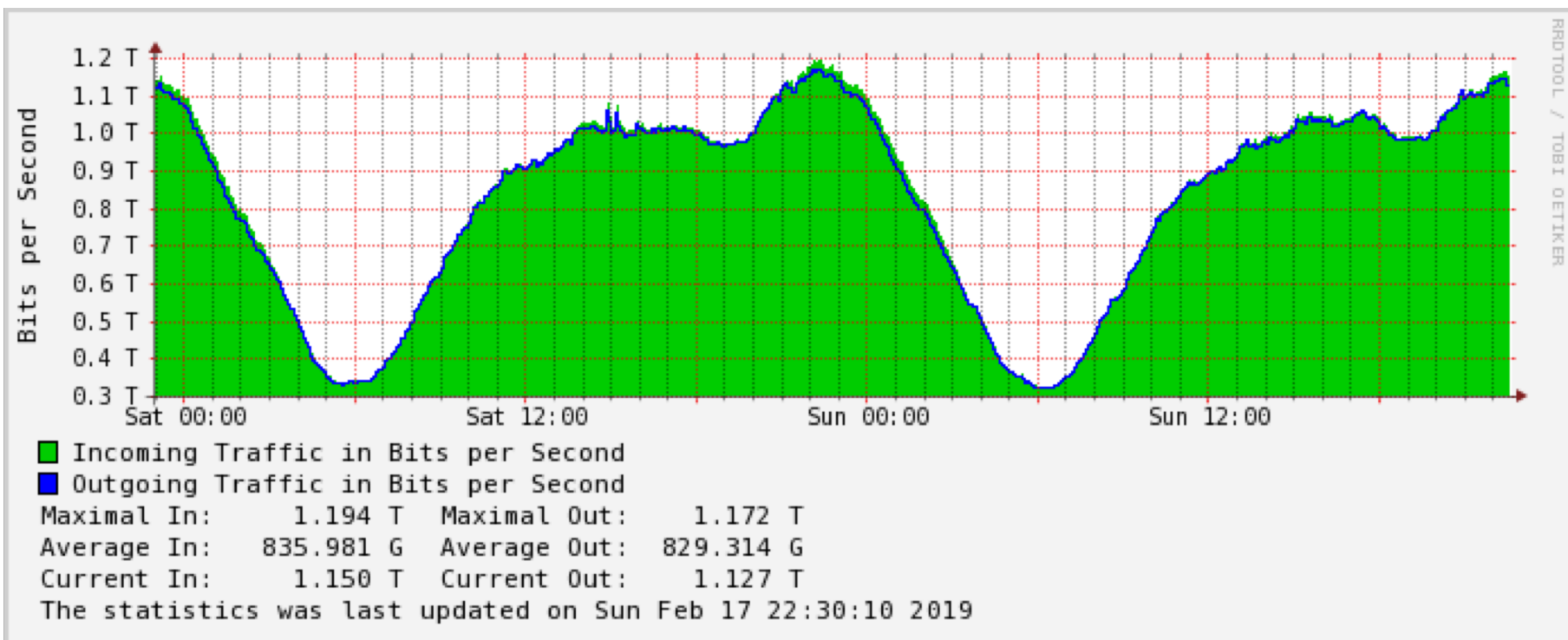
18-22 Feb 2019, Daejeon

HKIX Today

- Supports both MLPA (Multilateral Peering) and BLPA (Bilateral Peering) over layer 2
- Supports IPv4/IPv6 dual-stack
- More and more non-HK participants
- 300+ different networks (autonomous systems) connected
- 510+ physical connections in total
 - 41 **100GE**, 320+ **10GE** & 150+ **GE**
- 1.27+Tbps (5-min) total traffic at peak
- Annual Traffic Growth **~30%**

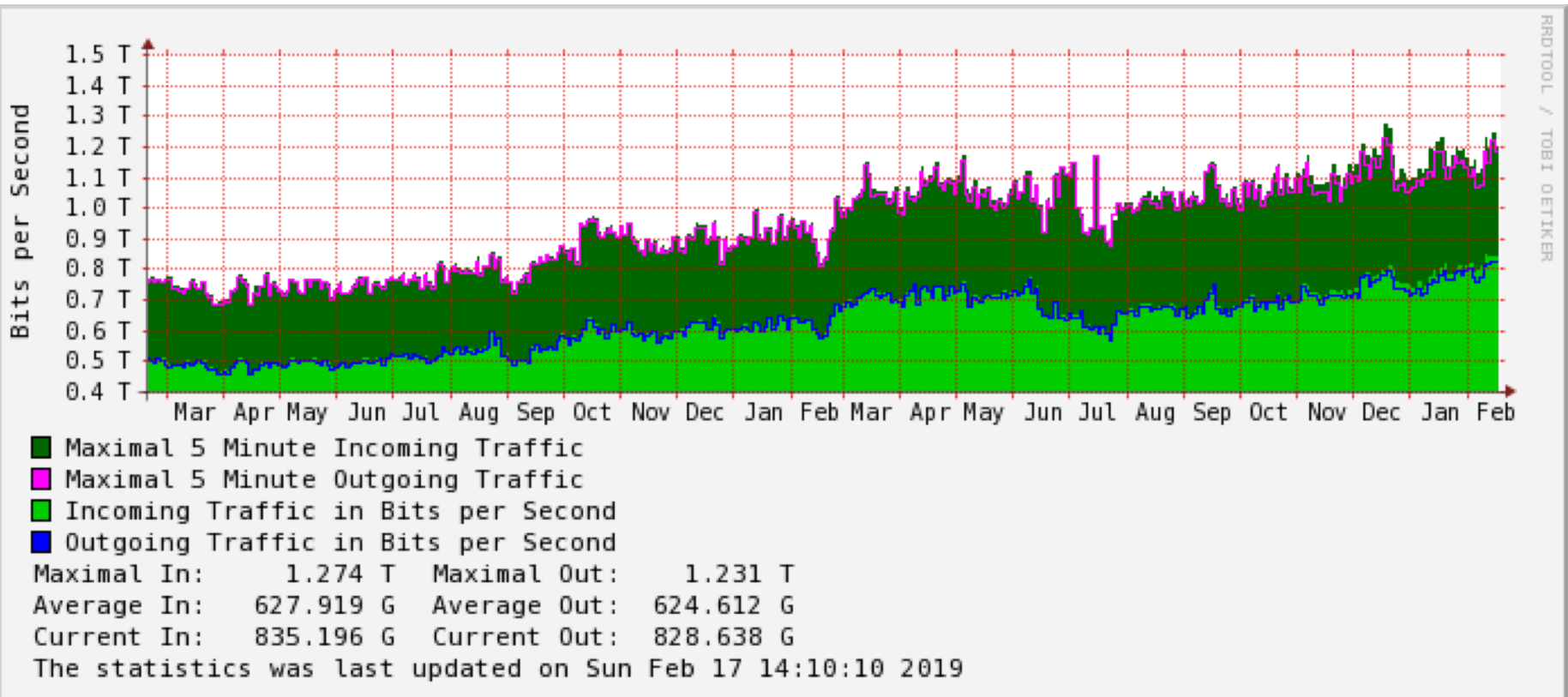
Current HKIX Traffic

Daily Graph (5-min average)



Current HKIX Traffic

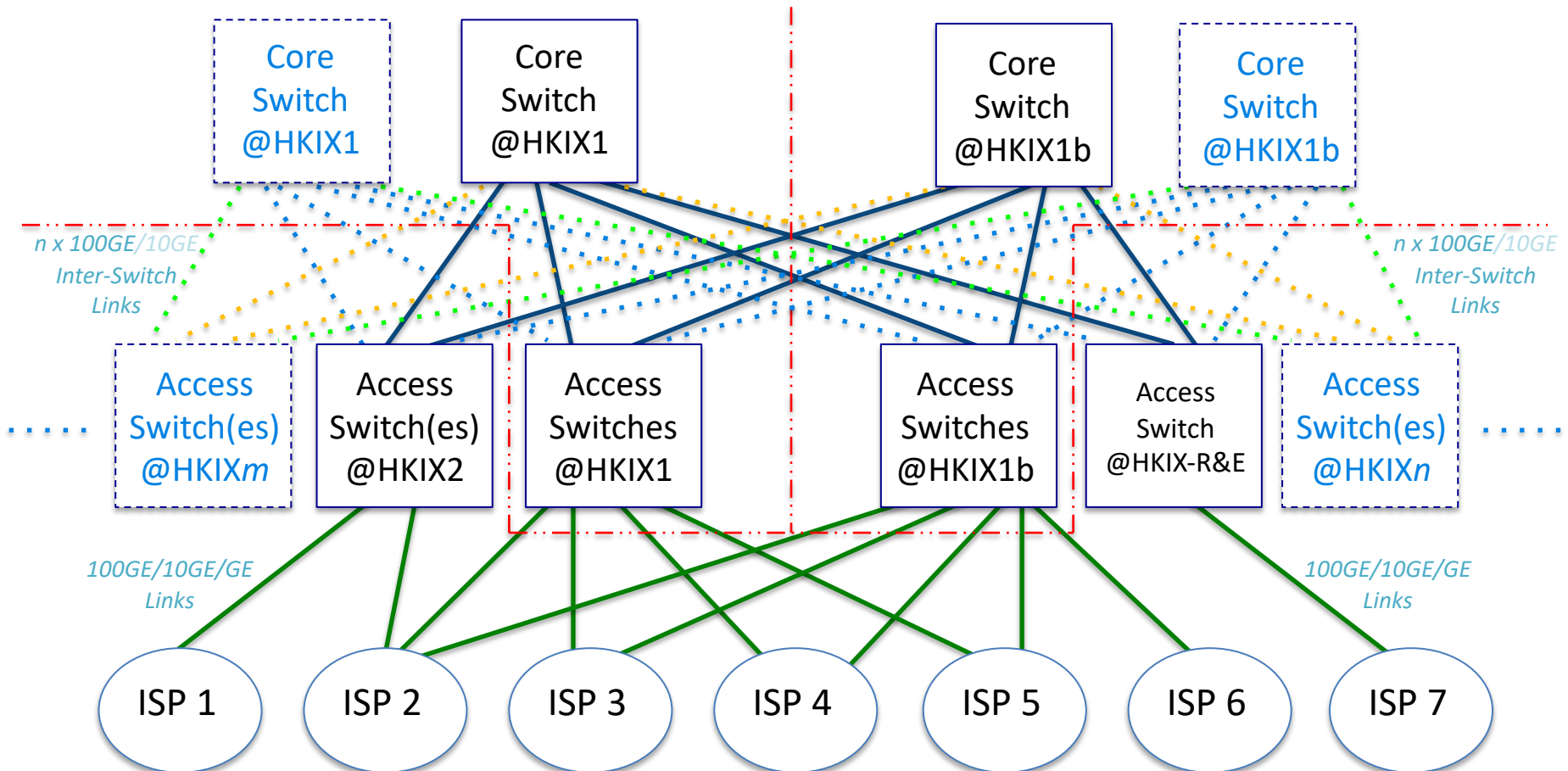
Yearly Graph (1-day average)



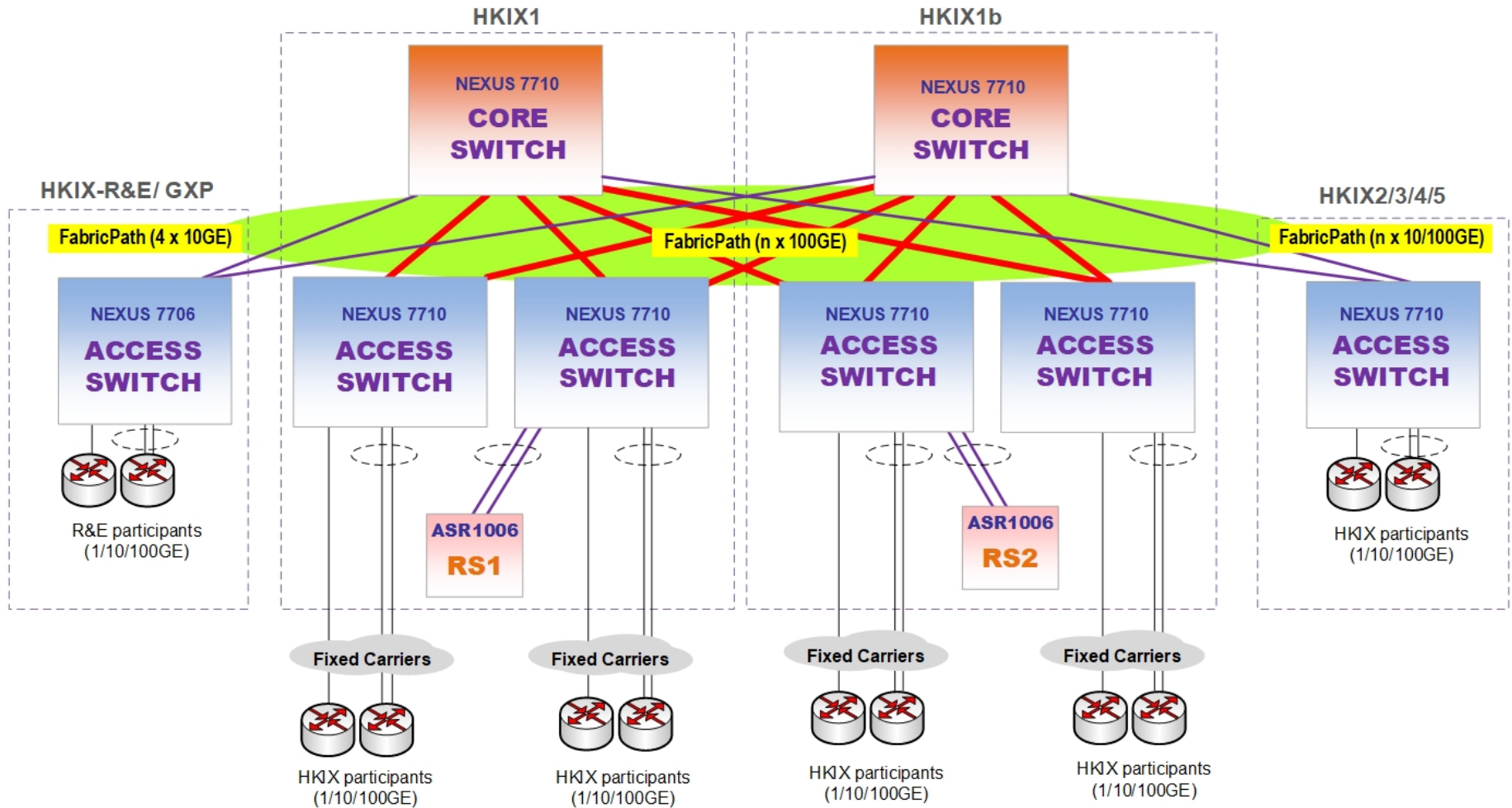
New HKIX Dual-Core Two-Tier Spine-and-Leaf Architecture For 2014 and Beyond



HKIX1 Core Site @CUHK -----(<2km)----- HKIX1b Core Site @CUHK



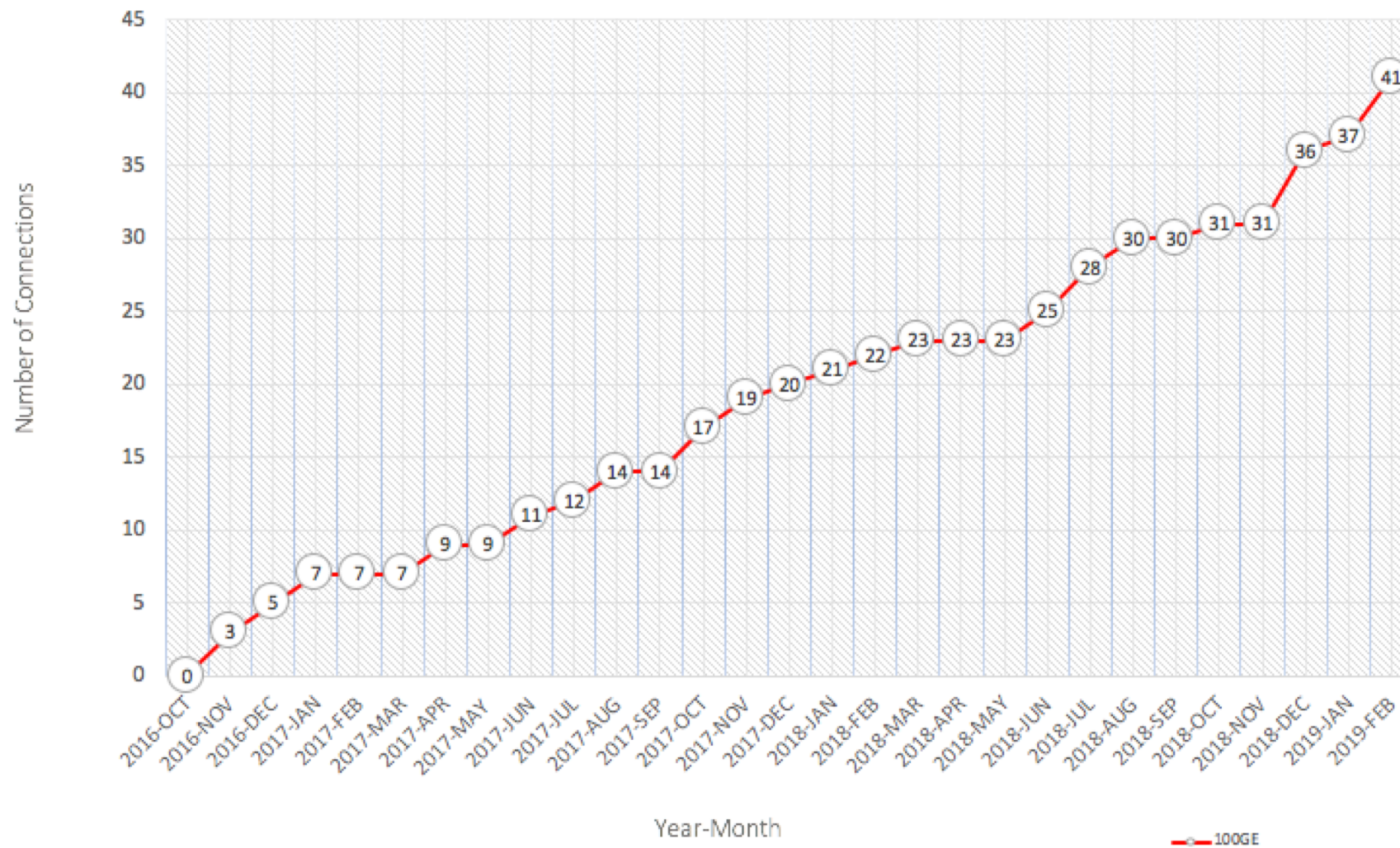
HKIX Network Diagram (Apr 2018)



1. **HKIX1** and **HKIX1b** are the two core sites of HKIX at CUHK while **HKIX2/3/4/5** are HKIX satellite sites outside of CUHK.
2. HKIX participants are encouraged to connect to multiple sites for site resilience.

Trend of 100GE connections

Total HKIX 100G Ports Connected (2016 OCT - 2019 FEB)



—●— 100GE

HKIX 100GE Participants

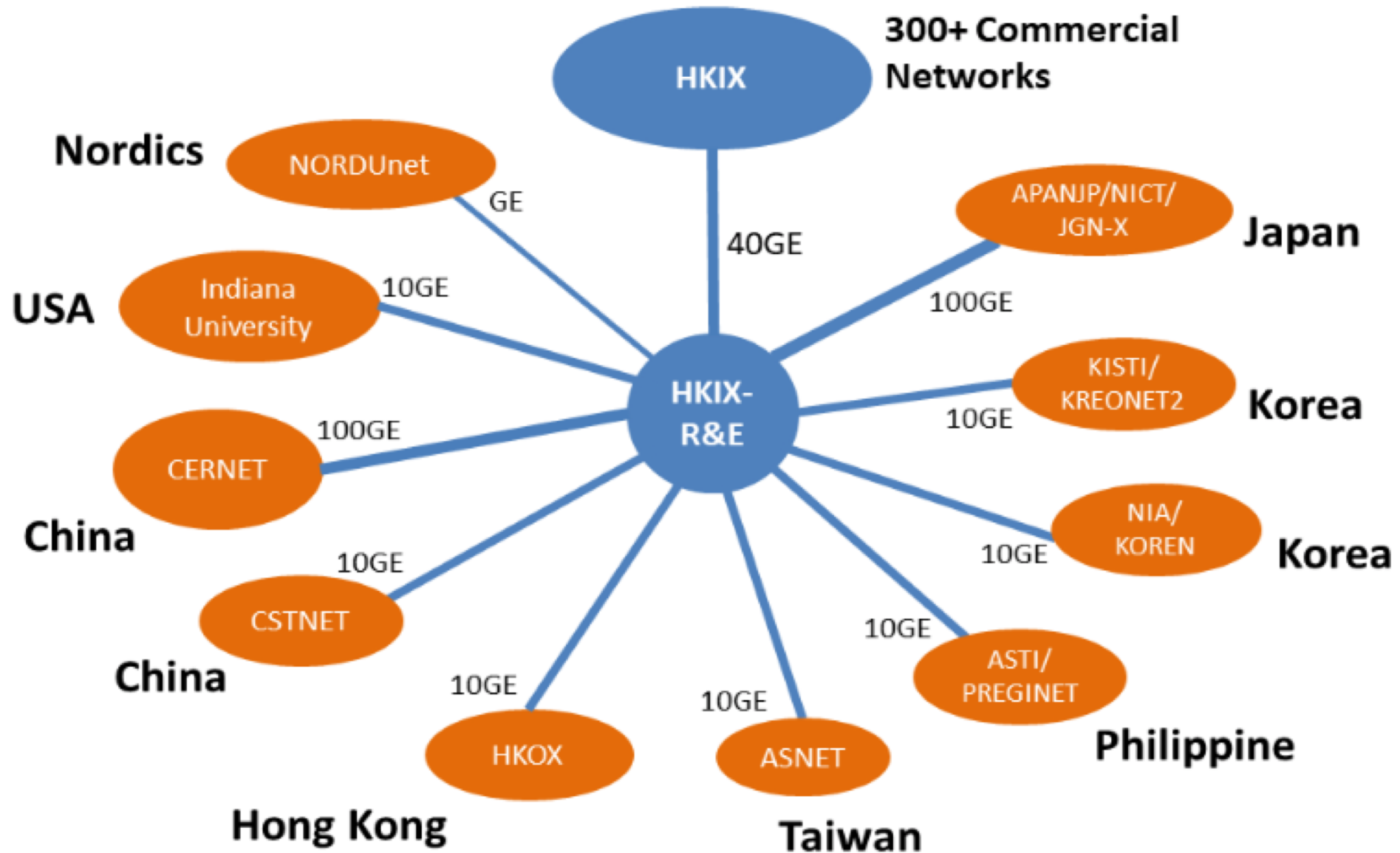
- Akamai
- Amazon
- AOFEI
- BGP Consultancy
- China Mobile HK
- China Mobile International
- CloudFlare
- Facebook
- Google
- HKBN
- Hurricane Electric
- Level 3
- Limelight
- Mytek
- PCCW IMS
- Telin
- Telstra
- Tencent
- TVB
- Udomain
- Valve
- Yahoo



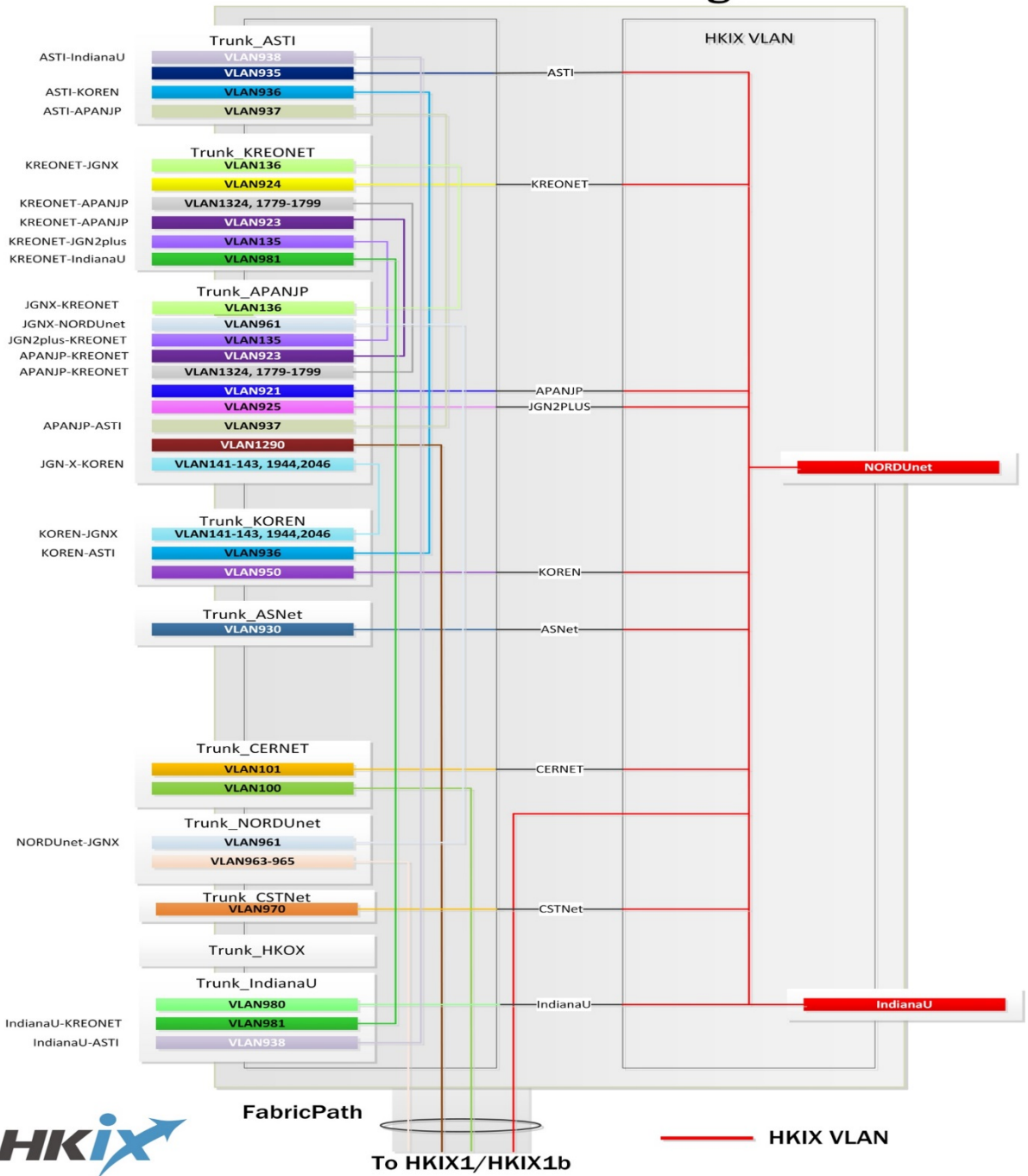
HKIX-R&E – Special Support for R&E Networks Having Presence in HK

- HKIX helps those R&E Networks interconnect among themselves and with commercial networks without restrictions via HKIX-R&E switch at MEGA-i
- The main purpose is to facilitate those National R&E Networks having presence in Hong Kong to do interconnections among themselves *and* do peering with commercial networks at HKIX more easily and at a lower cost.
- Started in 2008
- **Free of charge** (no port charge on HKIX-R&E switch and the connection to HKIX)
- Support GE/10GE/100GE Trunk Ports for R&E networks
- Support Point-to-point VLANs for R&E networks
 - For private interconnections among any 2 R&E networks
 - Jumbo Frame support
- Fiber Cross Connect to be provided by R&E networks
- 7x24 NOC support
- Operate by HKIX with the HKIX-R&E switch at MEGA-i

HKIX-R&E Network Diagram



HKIX-R&E Network Diagram



HKIX-R&E Updates

- KOREN upgrade to 100G at end of Feb/2019
- KISTI/KREONET2 upgrade to 100G at end of June/2019
- HKIX perfSONAR server is ready
 - IP address: 202.45.188.76
 - Will upgrade from GE to 10G
- 100G Connections from MEGA-i to HKIX
 - Upgrade existing 4x10G connections to 2x100G (Ready by end of Feb/2019)

HKIX 100GE R&E Participants

- APANJP/NICT/JGN-X
- CERNET
- KOREN (End of Feb/2019)
- KISTI/KREONET2 (End of June/2019)

HKIX perfSONAR Server

perfSONAR Toolkit on 202.45.188.76

 **202.45.188.76**







[Edit](#)

Organization: the Hong Kong Internet eXchange (HKIX)


Address: HK 00000 HK ([map](#))

Administrator: Ryan Ng (ryan@hkix.net)

Services

SERVICE	STATUS	VERSION	PORTS	SERVICE LOGS
esmond ▾	Running	2.1.3-1.el7		View 
lsregistration	Running	4.1-1.el7		View 
owamp ▾	Running	3.5.8-1.el7	861	View 
pscheduler ▾	Running	1.1.5-2.el7		View 
psconfig	Running	4.1.5-1.el7		View 
twamp ▾	Running	3.5.8-1.el7	862	View 



Test Results (2 Results)

[Configure tests](#) 

Search:

Results for the last...

1 week ▾

▲ SOURCE	⇄ DESTINATION	THROUGHPUT	LATENCY (MS)	LOSS
202.45.188.76 Details Traceroute 	134.75.250.194	→ 766 Mbps ← n/a	→ 18.9 ← 133	→ 0.197% ← 0.000%
202.45.188.76 Details Traceroute 	ps1-1gbps.itsc.cuhk.edu.hk 137.189.192.26	→ 822 Mbps ← 944 Mbps	→ 1.38 ← 0.294	→ 0.001% ← 0.003%

Show entries

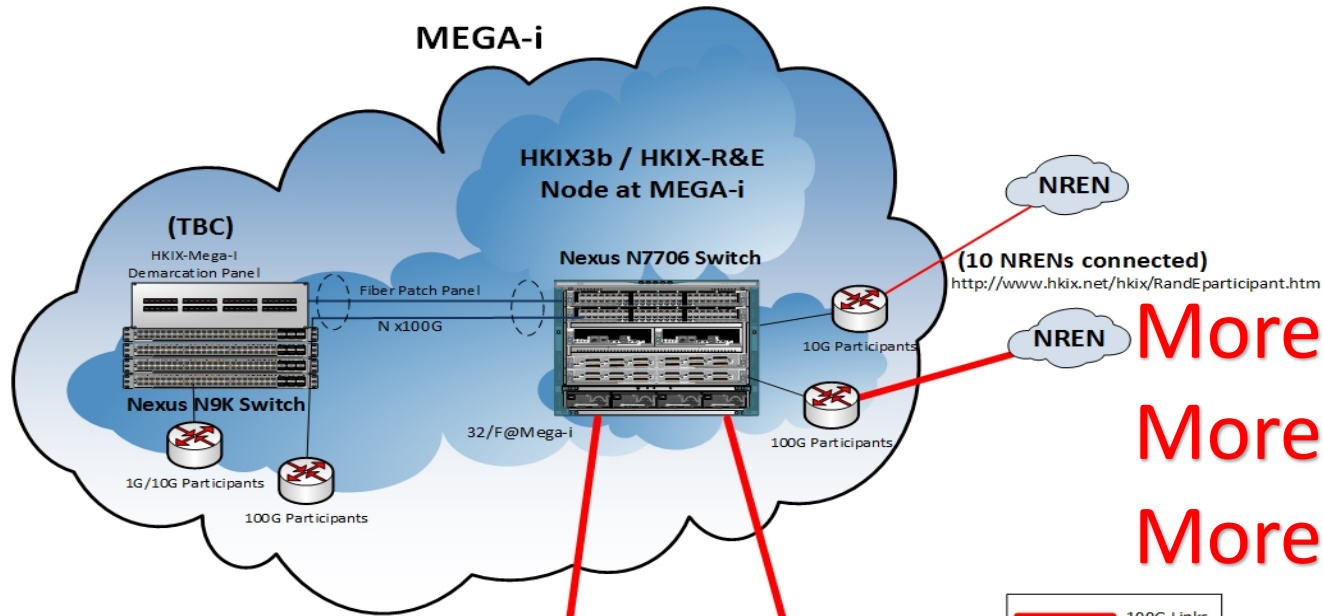
Showing 1 to 2 of 2 entries

Previous **1** Next

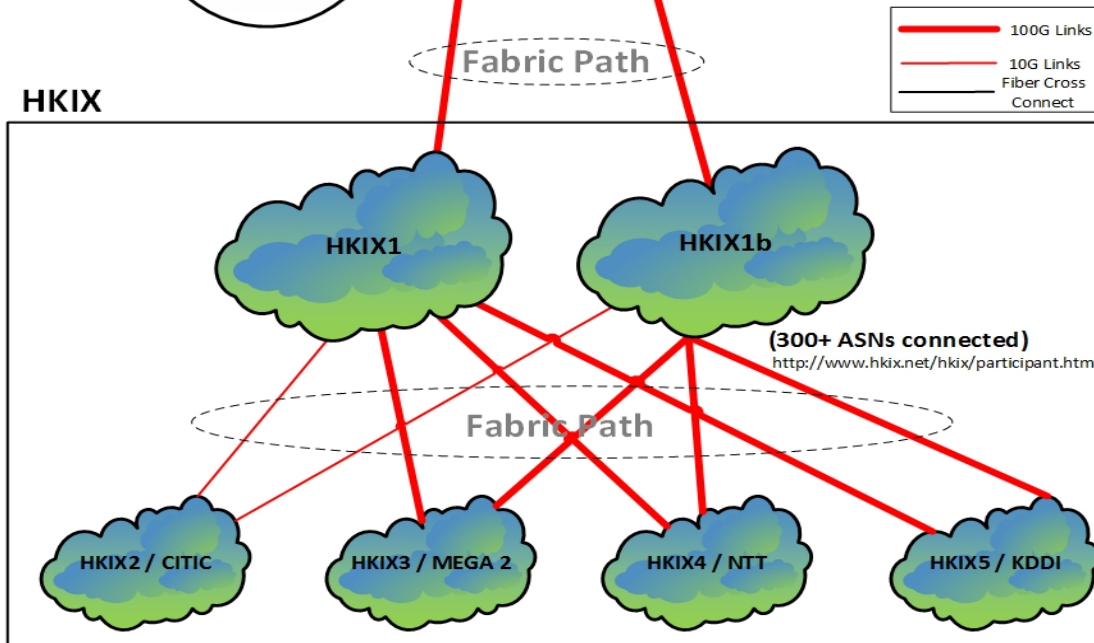
HKIX Planned Works for 2019

- Improved Stability
 - Better Control of Proxy ARP
- Improved Services
 - Rollout portal for HKIX participants / R&E participants
 - True 24x7 NOC (both email & hotline support)
 - Improve after-hour support
 - Introduce advanced Route Server functions
 - Automatic network filter update (support updates from IRR)
 - New HKIX Route Server
 - perfSONAR server
- Improved Security
 - ISO27001
 - Better support for DDoS mitigation
 - Implement MANRS IXP Programme for routing security
 - Implement RPKI on HKIX Route Servers to enhance routing security

HKIX Infrastructure Upgrade Plan @MEGA-i



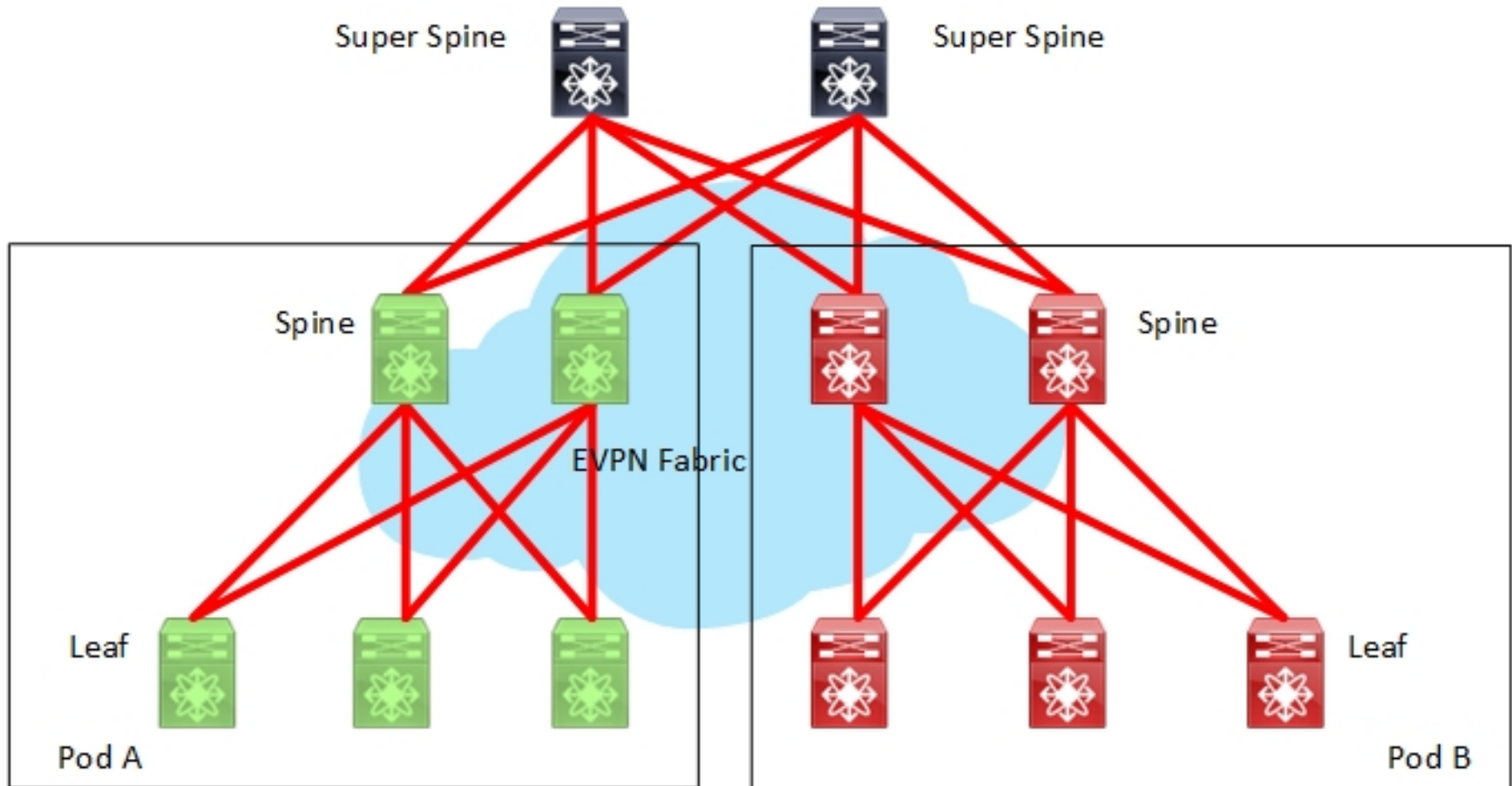
More rack space
More resilience
More bandwidth



HKIX Future Upgrade Plan

- Support of 400G connections
- Network traffic visibility
- Network automation
- EVPN (VXLAN)
 - Multiple vendors support
 - Unknown unicast suppression
 - VLAN translation

EVPN (VXLAN) Topology



IX name	Hong Kong Internet eXchange
City, Country	Hong Kong
Point of Presence	<p>Core Sites: HKIX1 & HKIX1b @CUHK</p> <p>HKIX-R&E: HKIX-R&E@MEGA-i</p> <p>Satellite Sites: HKIX2@CITIC, HKIX3@iAdvantage, HKIX4@NTT, HKIX5@KDDI</p>
# of connected ASN	302
Peak traffic	1.27 Tbps
Route Servers	Yes (Cisco ASR1006)
Remarks	<p>PeeringDB: https://www.peeringdb.com/ix/42</p>

•Information

- <http://www.hkix.net>
- info@hkix.net

Thank You!

For enquiries, please contact us at
info@hkix.net