# Network (Hong Kong)

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# Agenda

- HARNET
- HKIX
- LHCONE

# HARNET

- Incorporated in 1970, the Joint Universities Computer Centre (JUCC) is a cooperative effort of the Computing/Information Technology Services Centres of the eight government-funded tertiary institutions in Hong Kong.

- The Hong Kong Academic and Research NETwork (HARNET) is the wide area network which links up the campus networks of the eight tertiary institutions in Hong Kong and connects them to the global Internet.

- HARNET is operated and managed by the JUCC to promote the development, deployment, operation and technology transfer of advanced network infrastructure for innovation, research and educational excellence in Hong Kong.

- The HARNET backbone is a 10G 3-ring multi-degree ROADM Optical solution with dual HARNET data centres located at The University of Hong Kong (HKU) and The Chinese University of Hong Kong (CUHK).

# HARNET



HARNET Infrastructure
October 2017
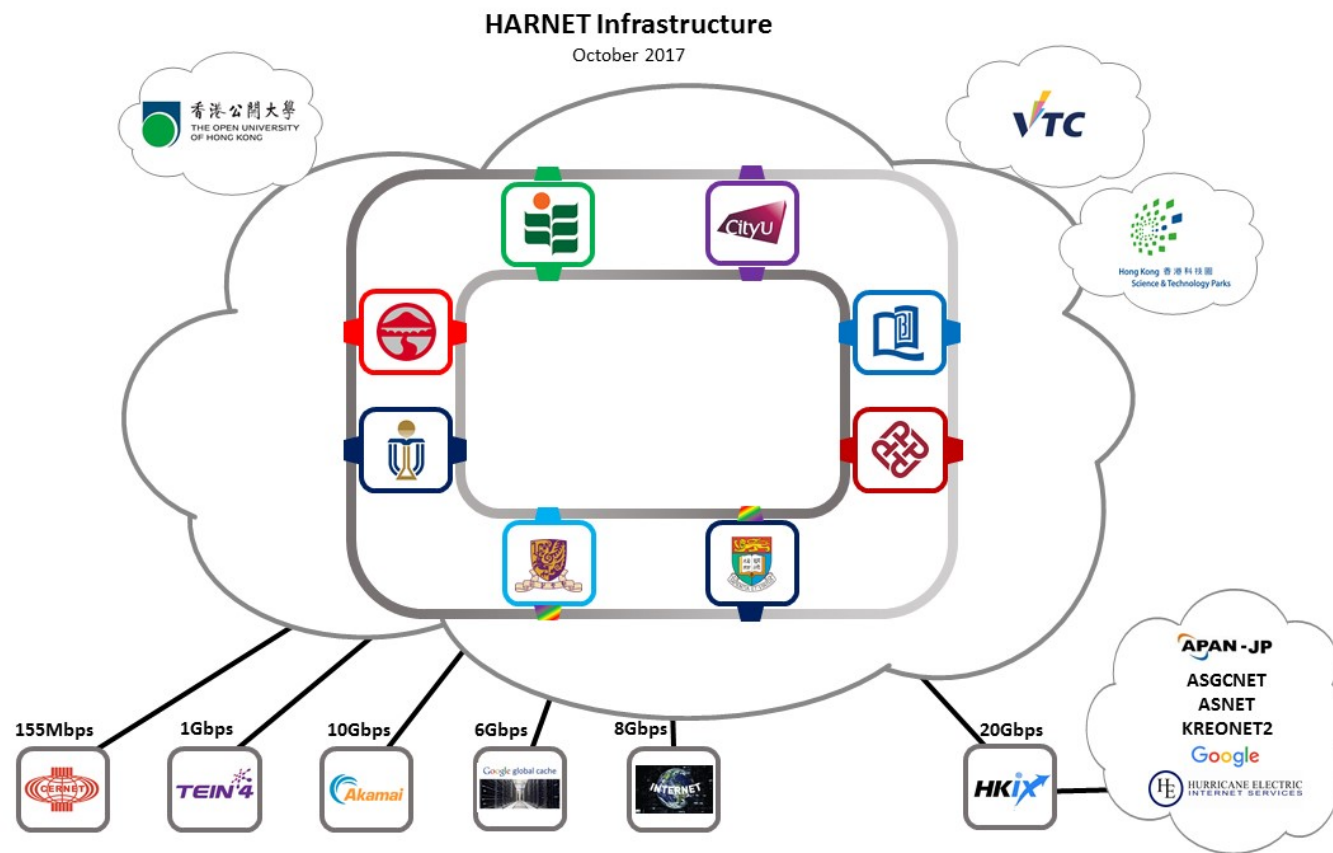
# HKIX

- HKIX (Hong Kong Internet eXchange) is a neutral and professional layer-two settlement-free Internet exchange point based in Hong Kong for faster and cheaper interconnections among different networks on Internet

- Established in April 1995, HKIX is owned and operated by the Hong Kong Internet eXchange Limited (a wholly-owned subsidiary of The Chinese University of Hong Kong Foundation Limited) in collaboration with Information Technology Services Centre (ITSC) of The Chinese University of Hong Kong (CUHK)
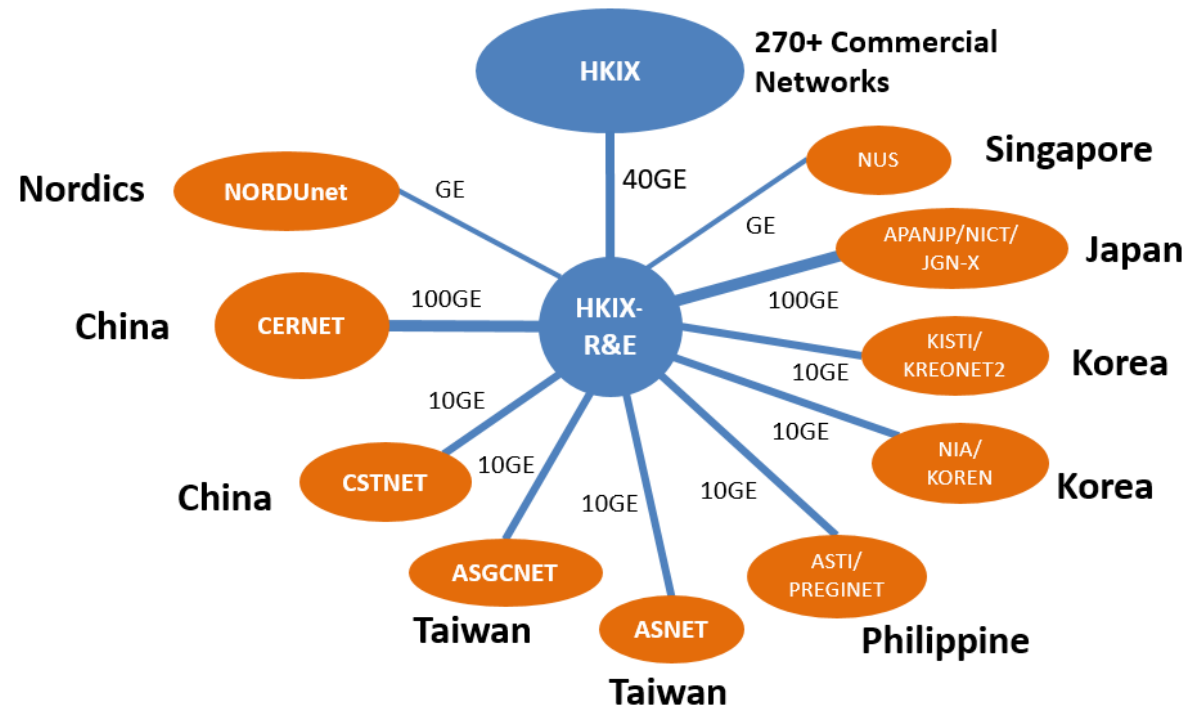
# HKIX Network Diagram

**Upgraded to 4 x 10GE**



HKIX Network Diagram (Jun 2017)
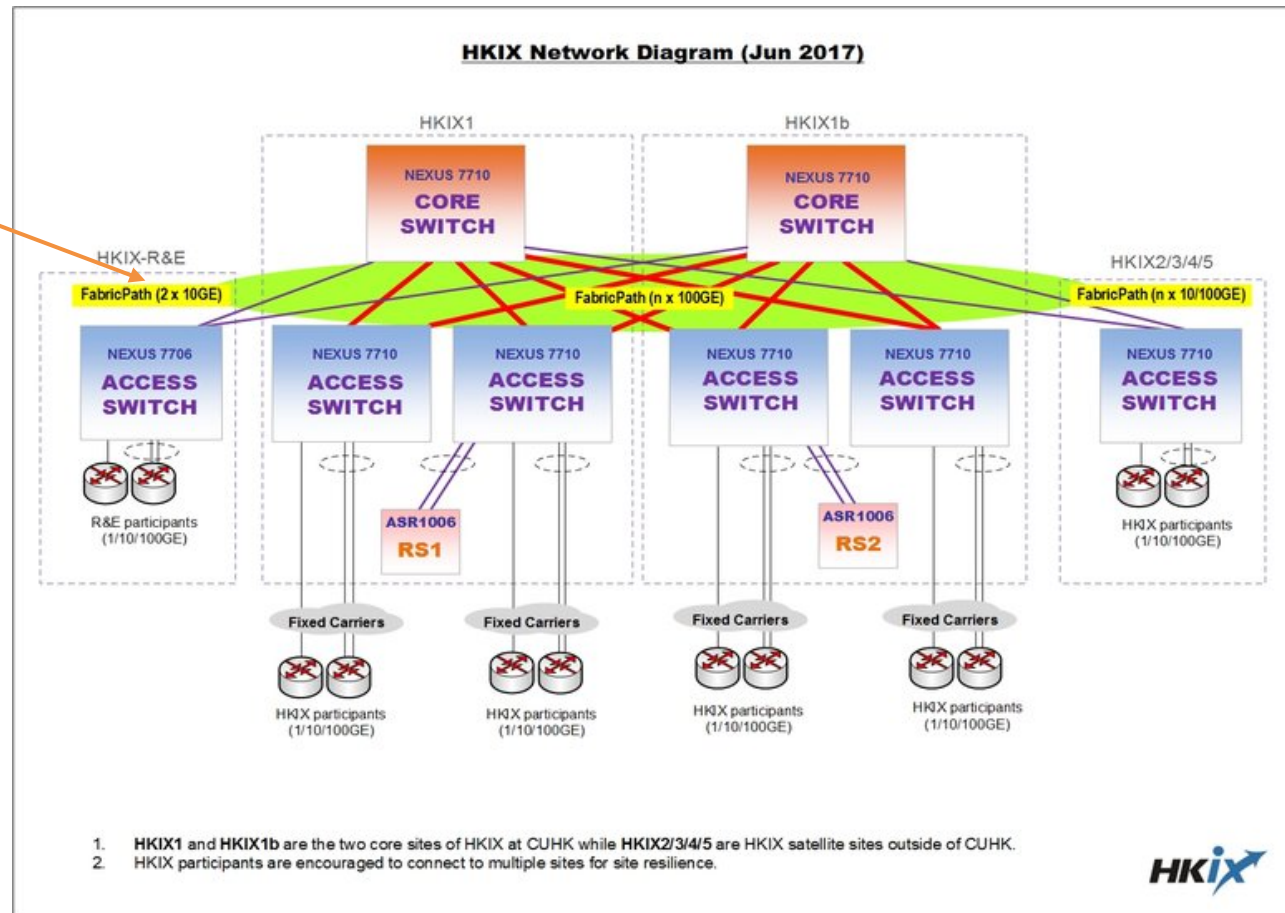
# HKIX-R&E Network Diagram

# 100G Participants at HKIX

- Akamai
- Amazon
- AOFEI Data International
- China Mobile International
- CloudFlare
- Facebook
- Google
- Hong Kong Broadband Network
- Hurricane Electric
- Tencent
- TVB
- Yahoo

# Full list of HKIX participants

- HKIX
  - http://www.hkix.net/hkix/participant.htm
- HKIX-R&E
  - http://www.hkix.net/hkix/RandEparticipant.htm

| Internet Access Provider | GE Link(s) to HKIX-R&E | 10GE Link(s) to HKIX-R&E | 100GE Link(s) to HKIX-R&E | Jumbo Frame Enabled |
|---|---|---|---|---|
| Academia Sinica (ASNet) | | Y | | |
| Academia Sinica Grid Computing Centre (ASGCNet) | | Y | | Y |
| Advanced Science and Technology Institute | | Y | | Y |
| Asia Pacific Advanced Network - Japan (APAN-JP) and JGN-X | | | Y | Y |
| China Science & Technology Network (CSTNet) | | Y | | |
| CNGI-6IX | | | Y | |
| Korea Advanced Research Network | | Y | | Y |
| KREONET | | Y | | Y |
| National University of Singapore (NUS) | Y | | | |
| NORDUnet A/S | Y | | | Y |

# LHCONE

- Start to arrange LHCONE peering from Mar 2018
  - ASGC
    - Agreed the LHCONE peering in mid-Mar 2018 in ISGC 2018
    - Agreed on more detailed arrangement in end of Mar 2018 in APAN meeting
      - CUHK need to use its own IP prefix
      - The announced prefix has no minimum length
      - HKIX carry multiple VLANs from ASGC to CUHK, CUHK may use different layer 3 interface for the VLAN configuration
      - CUHK form v4 and v6 BGP (not VPNv4 BGP, should be unicast v4 and v6 BGP) with ASGC router
      - CUHK need to ensure of symmetric routing between ASGC and CUHK
      - CUHK need to ensure the outgoing packets with valid source in the data plane
      - The VLANs need to support jumbo frame
    - CUHK would study the above arrangement and coordinate with ASGC for LHCONE peering

- Any suggestion/advice/points to note about LHCONE peering for us?

# Next steps about LHCONE

- Shall CUHK peer with IHEP and ICEPP?

- Shall LHCONE peering help the routing between IN2P3 and CUHK?

- Shall CUHK peer with other sites in Asia, e.g. KISTI (though they are ALICE site but not ATLAS site)? Is that beneficial to HK-LCG2 operations?

Thank you!