



中国科学院
CHINESE ACADEMY OF SCIENCES



HKOEP/HKLight

ONT3, Tokyo

A brief history

- Nov 23, 2004, the Beijing-Hong Kong section of the "China-US-Russia Global Ring Network for Advanced Applications Development (GLORIAD)" has been upgraded to 2.5G.
- On same day, Chinese Academy of Sciences officially announced to public that the next generation light wave "Hong Kong Open Exchange Point(HKOEPP)" was built up.
- Location: Mega-iAdvantage Building in Hongkong.



HKOEP introduction

- It is the Open Exchange Point in Asia of the "China-US-Russia Global Ring Network for Advanced Applications Development" (GLORIAD), a cross-border high-speed information highway that is expected to be the foundation of the next-generation Internet.
- HKOEP will not only be an important exchange point in the GLORIAD network, but will also serve as a key Internet exchange center in the Asia-Pacific region.

Who operates HKOEP

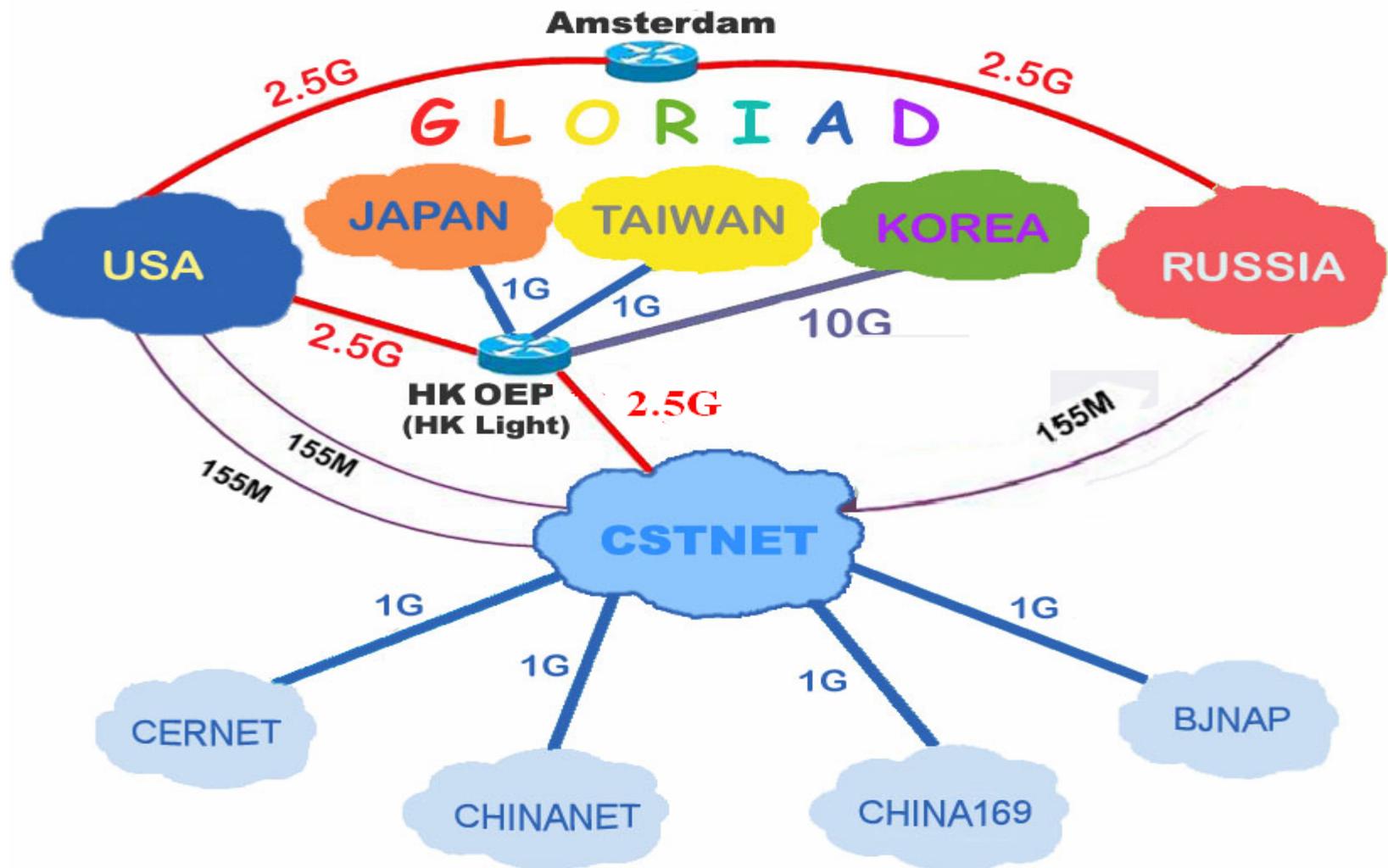


CSTNet at a glance

- Base on the NCFC and the network of CAS
- The first Internet connected network in China
- One of the top large scale networks in China
- .cn top domain service
- Cover more than 20 provinces, 100 institutes, and 1,000,000 end users
- GLORIAD for international connections
 - to US, Russia, and Korea
- GLIF open exchange point
 - HKOEP in Hongkong

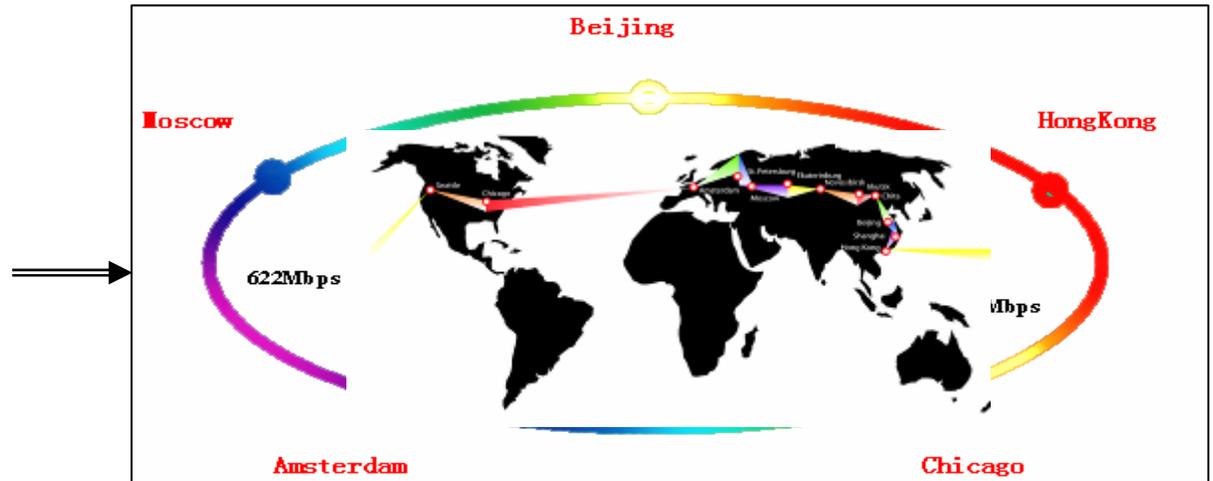


Current Status Of CSTNET Internet Connections

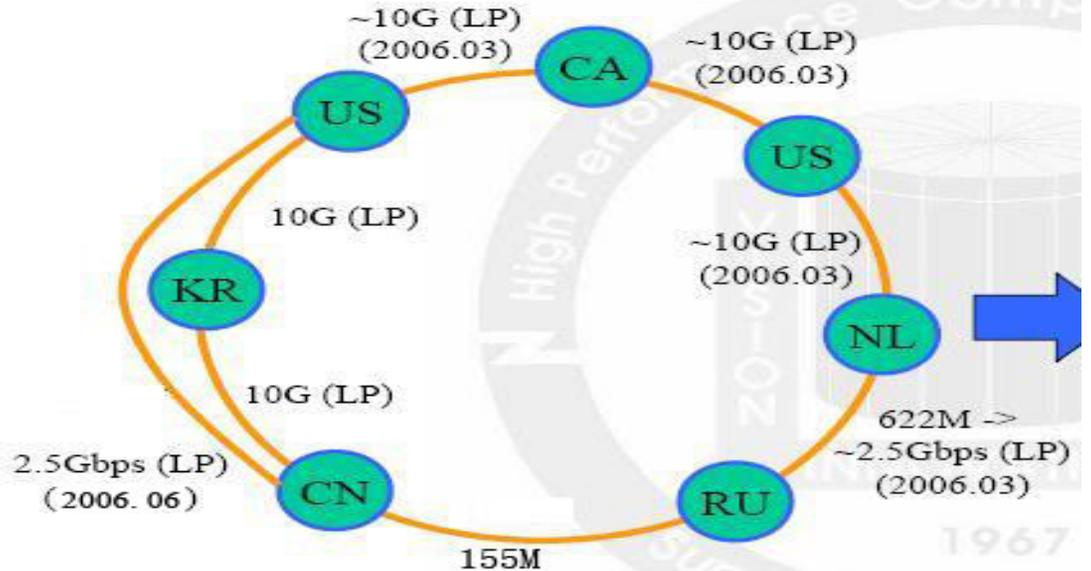


CSTNET in GLORIAD

- GLORIAD
 - Global Ring
 - 10G
 - For R&E

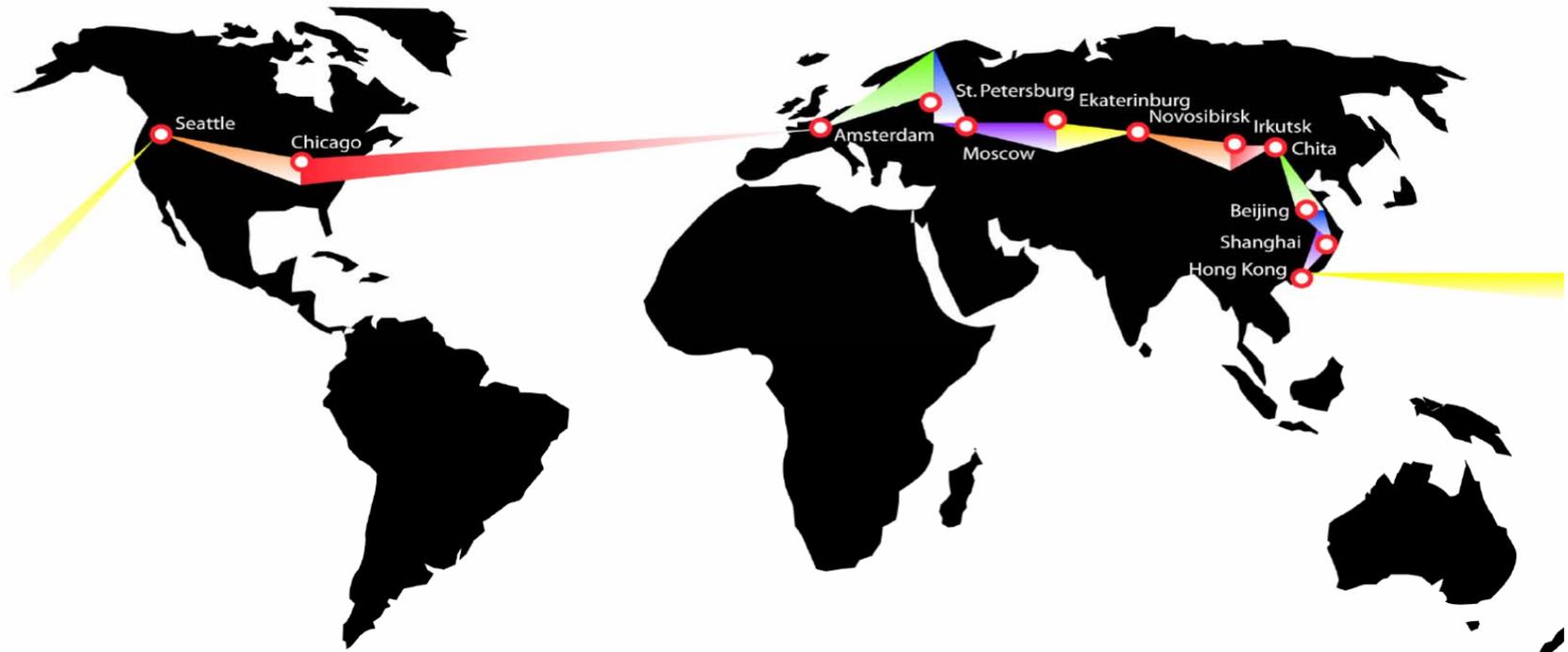


- CSTNET
 - GLORIAD_CN
 - Build HKOEP



GLOBAL RING NETWORK FOR ADVANCED APPLICATIONS DEVELOPMENT (GLORIAD)

Russia-China-USA Science & Education Network

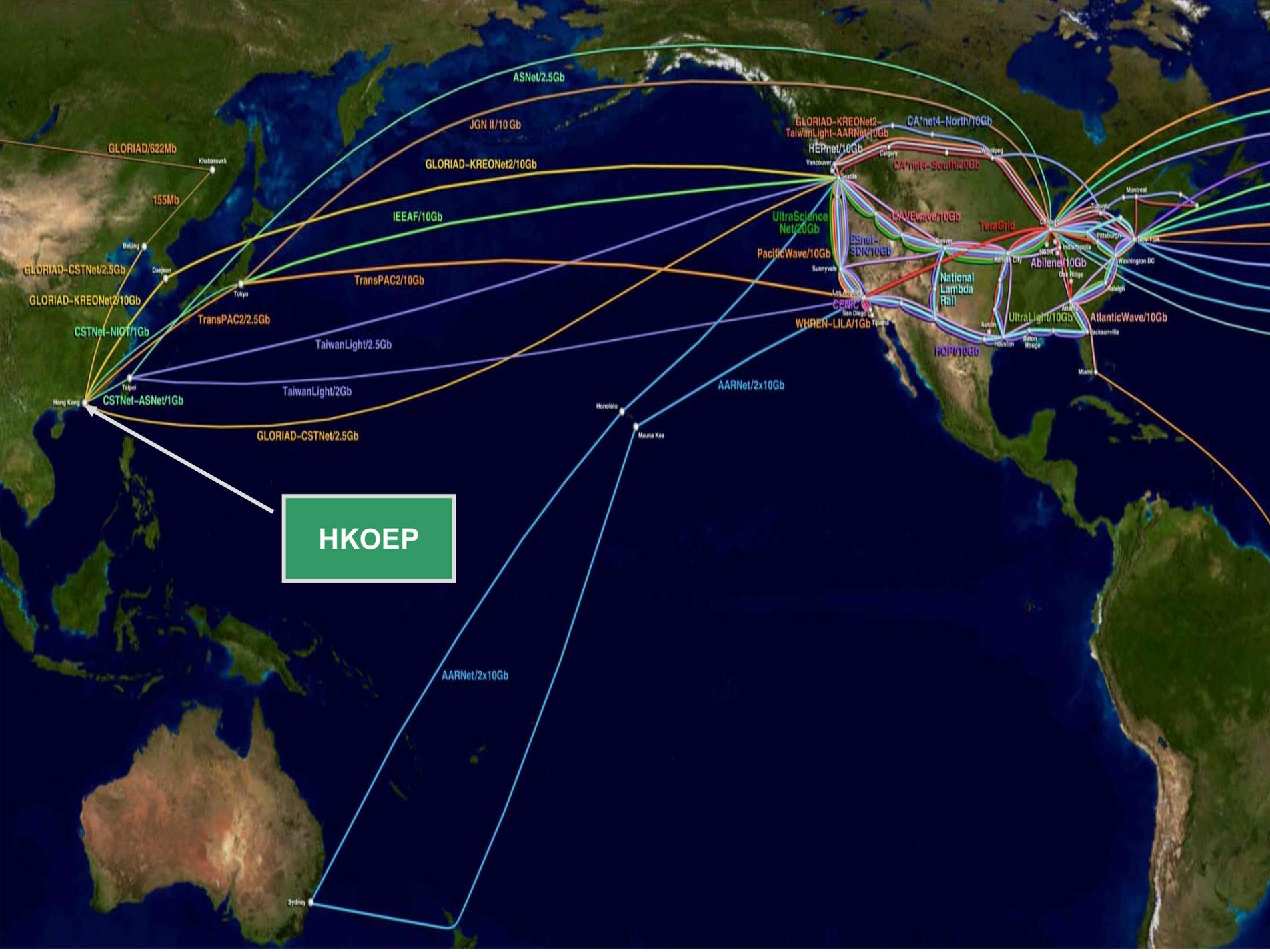


GLORIAD

- Gloriad is an initiative from China, USA and Russia. And now has been extended with Korea, Netherlands, and Canada.
- Gloriad provides expanded capacity for science and education collaboration (10 Gbps).
- Essential for supporting advanced S&E applications (particularly HEP, Astronomy, Atmospheric Sciences, Bioinformatics, optical network research, network security research)

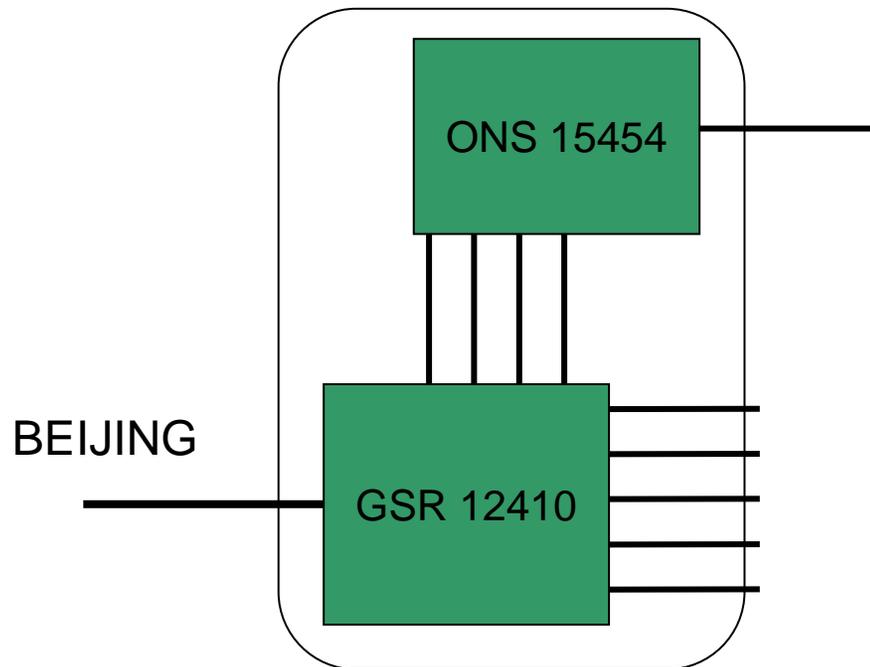
HKOEP Now





HKOEP

HKOEP architecture



•ONS is the node where lightpaths can be exchanged

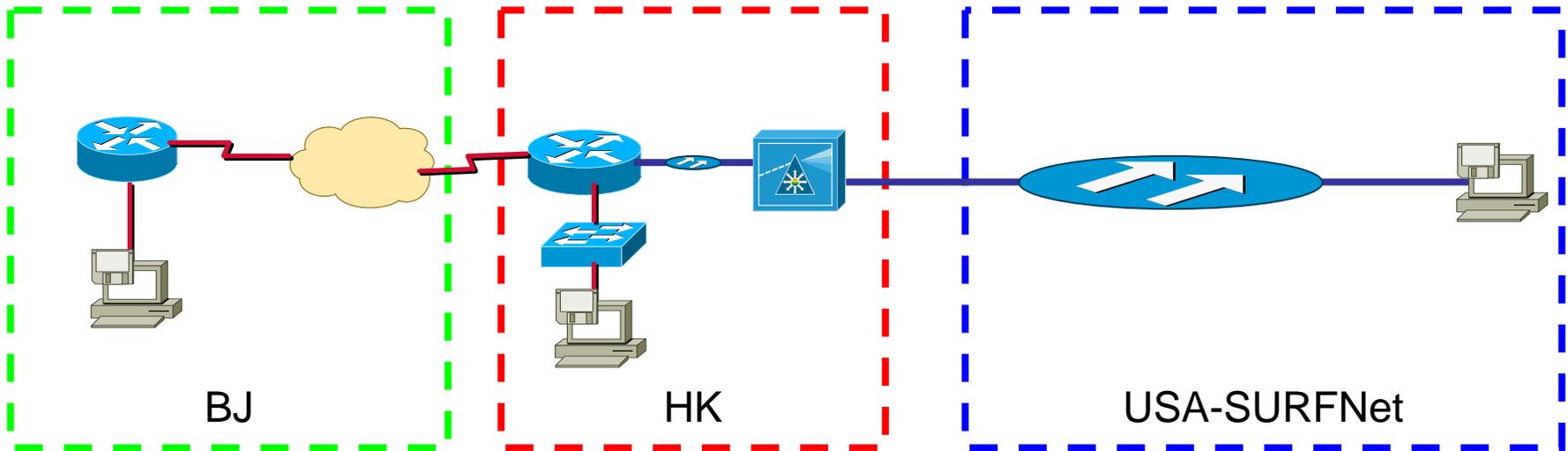
•Router as a client of lightpaths



E-science Applications

- Large amounts bandwidth provisioned and scheduled on-demand
- application management and control of the network resources
- End-to-end Transport protocol Limitations
 - Responsiveness
 - Fairness

BJ/HK-SURFNet Network Condition



- Routing Path from BJ to HK, Bandwidth is 2.5Gbps
- Optical Path from HK-USA-SURFNet, Bandwidth is 622Mbps
- 3 Servers for testing, located in BJ, HK, SURFNet, separately

Key Parameters

- TCP Buffer Size

Linux OS Default: 32KB/64KB

Set it to 16MB in our testing

- Parallel Stream Numbers

- MTU

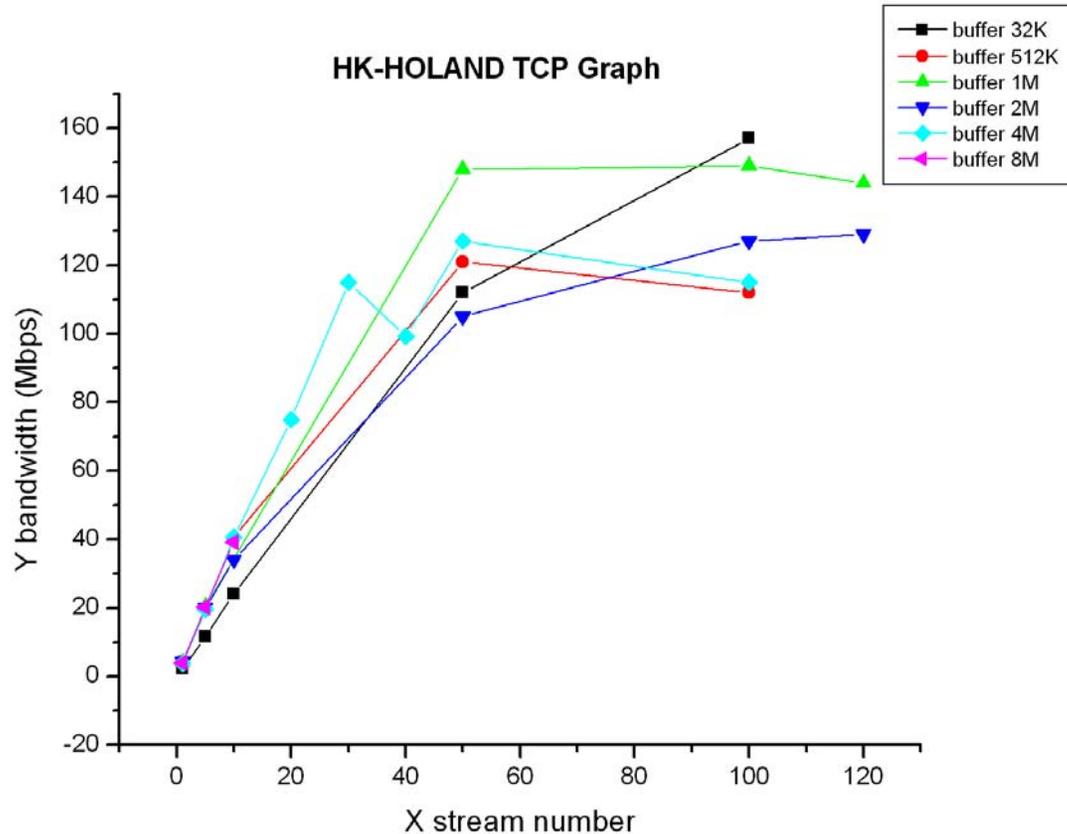
Default: 1500B in Ethernet

Jumbo Frame: ≥ 9000 B in each Ethernet Packet

Testing Results

- HK-SURFNet

Adjust TCP buffer size and Parallel Stream Numbers



•Application

- High Energy Physics Grid(Tier1-2, Cosmic Ray Platform)
- Avian Bird flu Alarming & Predicating System
- Virtual Observatory & e-VLBI
- Global Climate Data Integration
- Resources and Environment Monitoring....

Conclusion

- Future scientific researches need much more new and useful environment, tools and models.
- Optical exchange point will play an important role to supporting e-Science applications.

Thank You