Lanka Education and Research Network

Academic Networks

11th March 2019
at

Information Technology Center

Network Operation Center
(LEARN)

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- Introduction

- Well know R&E networks

- APAN network

- TEIN

What is an Academic (R&E) Network

- Research and Education Network

  ‣ To support needs of research and education around the globe

    - Remote teaching/learning, research, research/academic collaboration, R&E content sharing delivery, etc

- National Research and Education Network (NREN)

  ‣ To support needs of research and education community within the country

  ‣ To provide connectivity to outside NRENs

- In General

  ‣ Usually distinguished by support for high-speed backbone network.

  ‣ Offering dedicated channels for individual research project

Internet vs R&E Network

- Do we need separate network for R&E. Can't we use Internet for R&E needs

  ‣ Internet is kind of shared network by the public

  ‣ Speed/bandwidth can not be guaranteed for a given source and destination

  ‣ None of us know what is happening to R&E data on the road

  ‣ Quick provisioning of dedicated bandwidth for specific project may not be easy

  ‣ Regional or local internet policy may affect the R&E needs

Well known R&E Networks

- JANET

  ‣ is the main backbone network for the UK university system of academic and research computers.

  ‣ It is operated by UKERNA (United Kingdom Education & Research Networking Association)

  ‣ Serving over 8 millions users

  ‣ busiest National Research and Education Network (NREN) in Europe, carrying over 1.5 PBytes of information annually

  ‣ more than 30,000 km of access circuits

Well known R&E Networks

- Internet 2

  ‣ Internet2 is a not-for-profit United States computer networking consortium led by members from the research and education communities, industry, and government

  ‣ Has over 500 members including 251 higher education institutions, 9 partners and 76 members from industry

Regional NRENs (well established)

- Asia Pacific

  ‣ Australian research and education network

  ‣ Malaysian Research and Education Network

  ‣ Singapore Advanced Research and Education Network

  ‣ Education & Research Network of India

  ‣ APAN-JP

  ‣ Bangladesh Research and Education Network

  ‣ Pakistan Research and Education Network

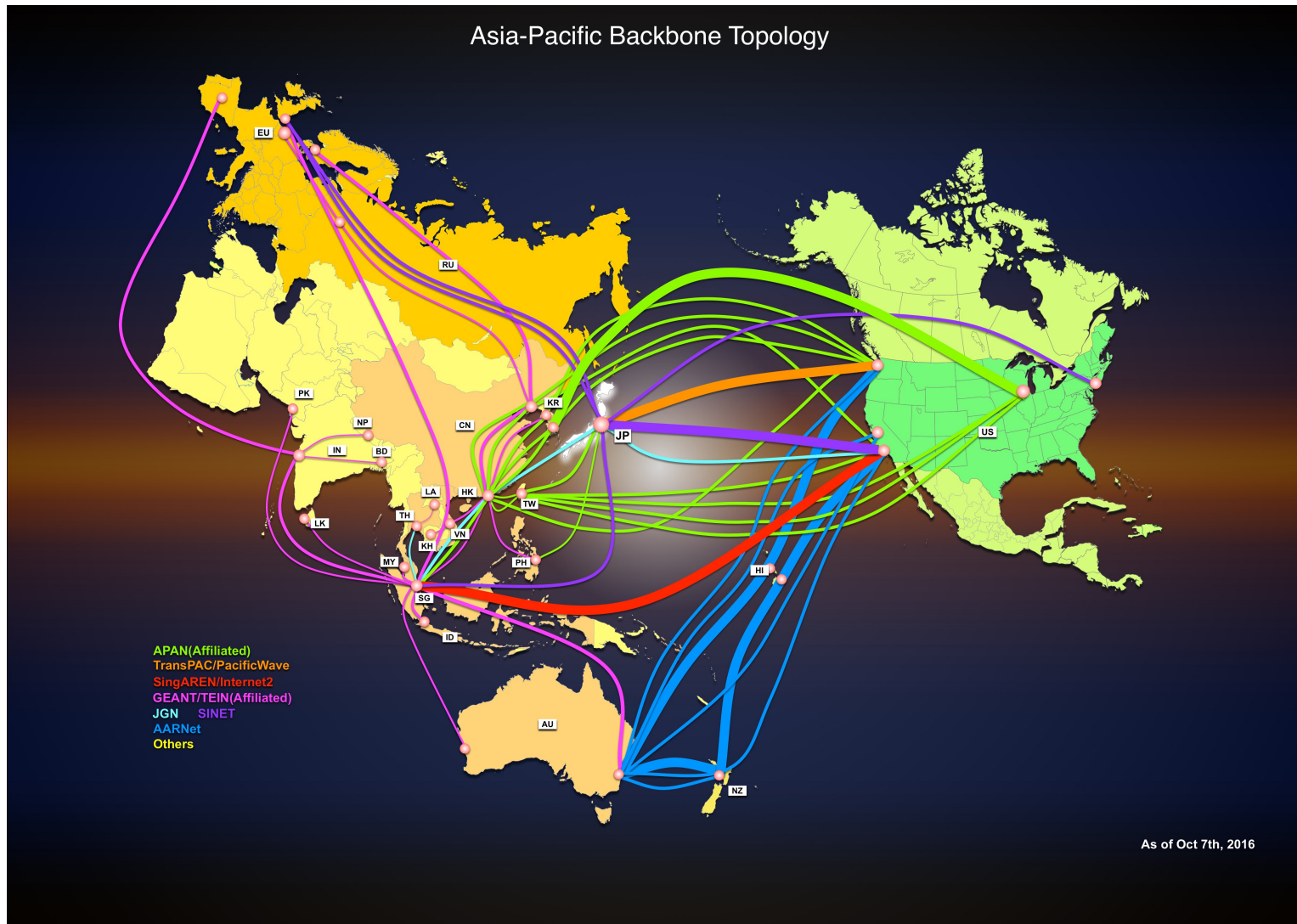 ‣ Nepal Research and Education Network

NREN of Sri Lanka

- Do we have a NREN ?

  LEARN

  ‣ LEARN – Lanka Education and Research Network

- When it was initiated ?

  ‣ 30 years ago, going to celebrate 30th anniversary end of July

- What it does ?

  ‣ interconnects Educational and Research institutions across the country, and provide network related services to them
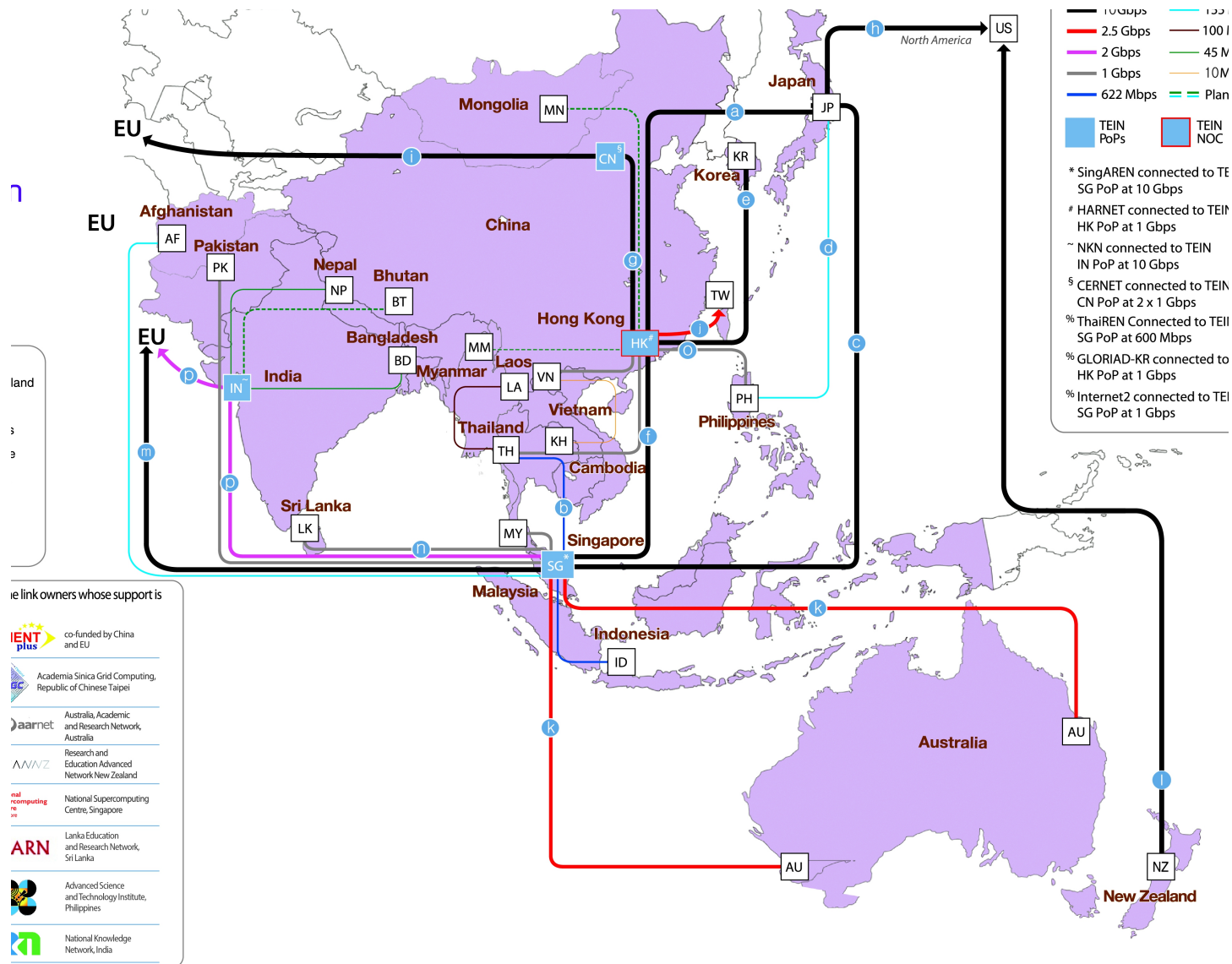
NREN Interconnection

- Isolated NREN in different countries

- Need high speed backbone connect them together

  ‣ APAN

    - APAN (the Asia Pacific Advanced Network) refers to both the organization representing its members, and to the backbone network that connects the research and education networks of its member countries/economies to each other and to other research networks around the world

  ‣ TEIN (Trans-Eurasia Information Network)

    - provides dedicated high-capacity internet connectivity for research and education communities across Asia-Pacific

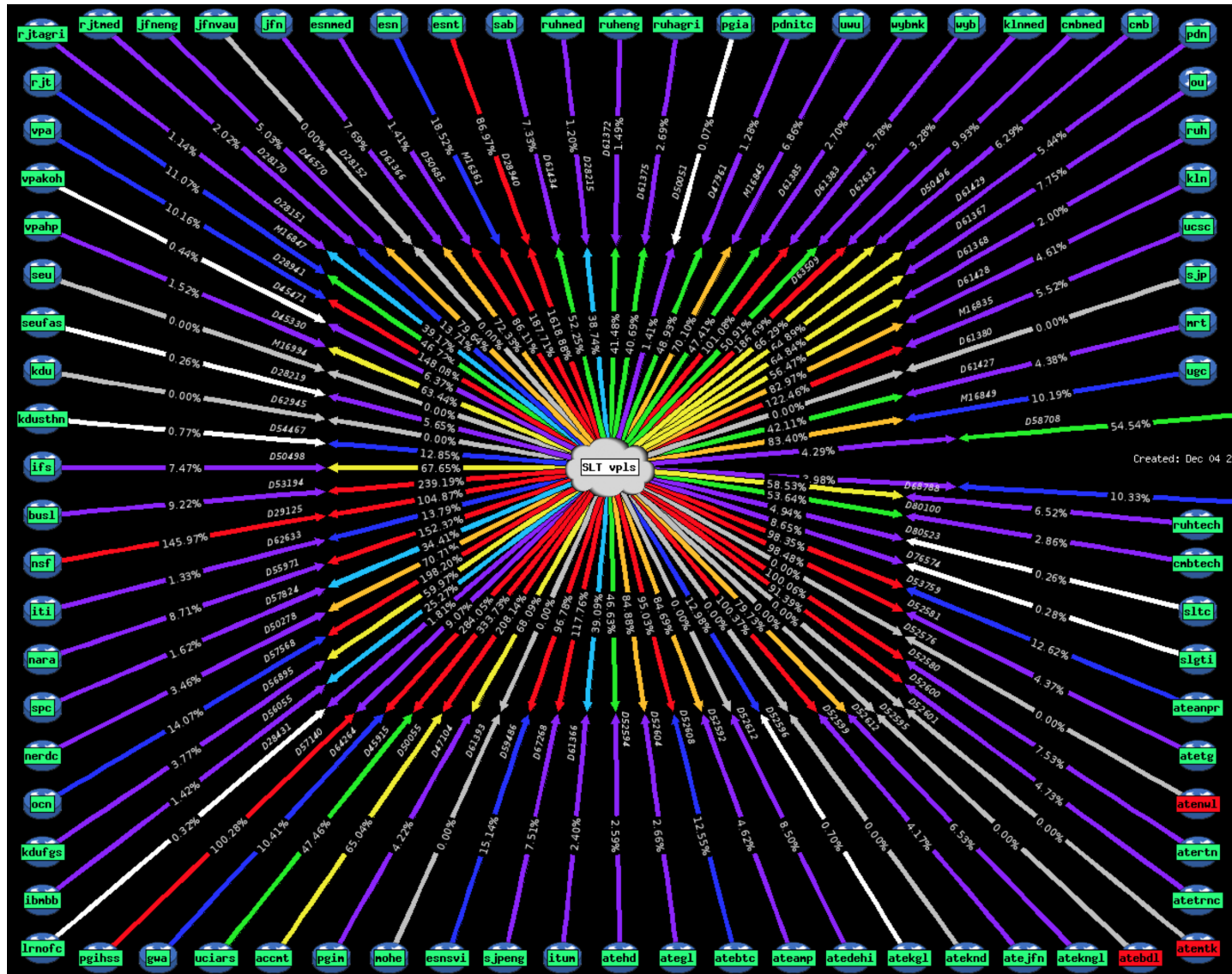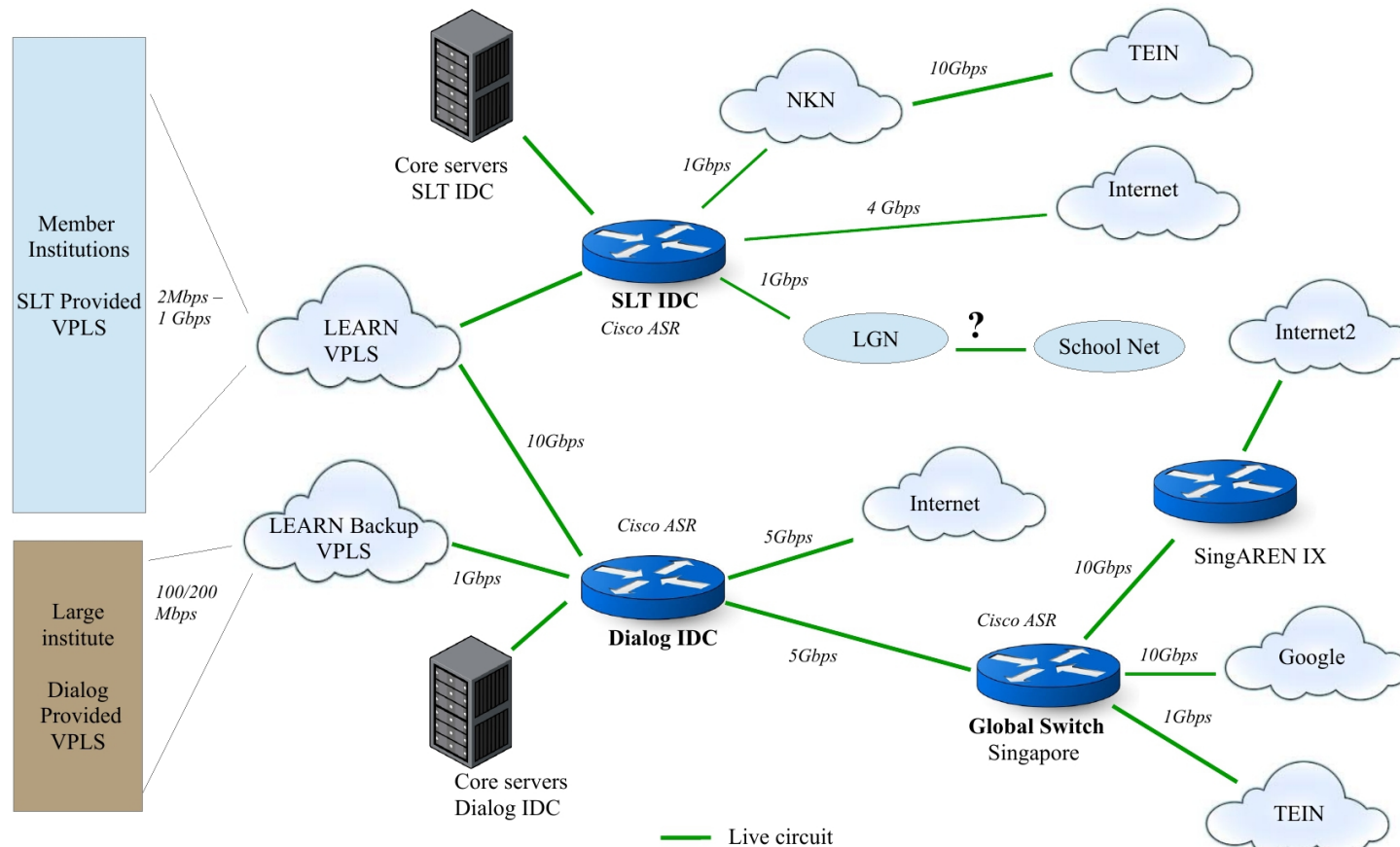# Asia-Pacific Backbone Topology

Asia-Pacific Backbone Topology

APAN(Affiliated)
TransPAC/PacificWave
SingAREN/Internet2
GEANT/TEIN(Affiliated)
JGN   SINET
AARNet
Others

As of Oct 7th, 2016

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TEIN Backbone Topology

Legend:
- 10 Gbps (black)
- 2.5 Gbps (red)
- 2 Gbps (magenta)
- 1 Gbps (grey)
- 622 Mbps (blue)
- 155 Mbps (cyan)
- 100 Mbps (dark red)
- 45 Mbps (green)
- 10 Mbps (tan)
- Planned (green dashed)

TEIN PoPs
TEIN NOC

* SingAREN connected to TEIN SG PoP at 10 Gbps
# HARNET connected to TEIN HK PoP at 1 Gbps
~ NKN connected to TEIN IN PoP at 10 Gbps
§ CERNET connected to TEIN CN PoP at 2 x 1 Gbps
% ThaiREN Connected to TEIN SG PoP at 600 Mbps
% GLORIAD-KR connected to HK PoP at 1 Gbps
% Internet2 connected to TEIN SG PoP at 1 Gbps

e link owners whose support is

- co-funded by China and EU
- Academia Sinica Grid Computing, Republic of Chinese Taipei
- Australia, Academic and Research Network, Australia
- Research and Education Advanced Network New Zealand
- National Supercomputing Centre, Singapore
- Lanka Education and Research Network, Sri Lanka
- Advanced Science and Technology Institute, Philippines
- National Knowledge Network, India

LEARN — *National Research and Education Network of Sri Lanka*

LEARN Backbone

LEARN Network

LEARN Network as at December 2019

LEARN

National Research and Education Network of Sri Lanka

LEARN Services

- Commodity Internet Access

- **Academic Internet**

- Email relaying, spam filtering

- DNS/DNS hosting (.ac.lk)

- VOIP

- Video Conferencing

- Eduroam

- Federated Identity Access (LIAF)

- Technical Assistance Center

- Training

- Collaboration supports

LEARN *National Research and Education Network of Sri Lanka*

Backbone Upgrade (a project ongoing)

- Start from January

- Priority to those you have responded to the LEARN upgrade proposal

- Every institutional circuit is going be **double** with no additional cost

- LEARN provided router in your institutes may be upgraded

- Your assistance to the LEARN is important

Backup Links (a project ongoing)

- To avoid single point of failure at the institutions

- Provide an active low bandwidth backup links (100Mbs, 200Mbps)

- New VPLS from a different ISP

    ‣ New VPLS to connect institute through a complete independent physical network

        - Through Dialog fibers

    • Initially 4 institutions going to be connected at speed of 100Mbs or 200Mbps

        - UoM, PDN, KLN, SJP

        - Others are welcome to accept the given proposal, can be connected at any time

- Every campus owned a primary link over 300Mbps get a backup

    ‣ > 300Mbs – get 100Mbs

    ‣ > 1GMbs – get 200Mbs

    ‣ It is free of charge

Backup Links Implementation Process

‣ Dialog team visit your institute for a survey

‣ You have to show them

 - termination location

 - fiber path deferent from your primary SLT fiber path

‣ Dialog will provide you a cable path map in written

‣ You have to get it approved from the institution

‣ Dialog lay the fiber

‣ LEARN will provide you the connectivity

‣ You can test it and connect to your network to use it in a way you interested.

LEARN TAC

- LEARN Technical Assistance Center

  ‣ To provide remote technical support to LEARN member institutes

    - LEARN may visit an institute not more than three times a year

  ‣ How an institute be qualified to obtain LEARN TAC service

    - have a dedicated person who is in computer application assistance or higher level

    - have a Laptop or a PC with 3G/4G dongle and a mobile phone or a LAN phone for communication

  ‣ Domain to be addressed

    - Assistance to develop institutional infrastructure

    - Design networks, provide technical specifications for them to prepare tenders

    - Remote configuration of network devices, servers which are used for network services (NAT, proxy, email, DNS, VOIP, Eduroam, monitoring)

    - Assistance to handle security incidence

LEARN TAC

‣ Domains not going to be touched

- shall not do physical installation of cables and network/server/computer hardware

- shall not be asked to involve in troubleshooting of servers where

  the institutional confidential/critical data are stored (for examples: LMS, MIS,

  Account system, etc)

- It shall not develop web sites or software for institutions

‣ More interesting on

- deployment of new technologies

  - IPv6
  - eduroam
  - VOIP

LEARN TAC during its first year

- ‣ Onsite help for NIFS in restructuring their network to include VLAN's and IPv6

- ‣ Onsite guidance in merging LEARN subnet with UoP network using pfsense in PGIHS, UoP

- ‣ SIP trunking in KLN

- ‣ Onsite guidance in designing campus network for Faculty of Technology, Ruhuna

- ‣ Guidance in installing eduroam in ITI, Faculty of Medicine- Ragama

- ‣ Guidance in installing IPv6 for ITI

- ‣ Guidance in resolving hacking attempts in multiple institutes

Lanka Education and Research Network

Thank You

Senevi Herath, Network/Systems
Manager, LEARN

Email: senevih@learn.ac.lk
noc@learn.ac.lk

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National Research and Education Network of Sri Lanka