

# Competitive Edge of NREN and Financial Sustainability

## LEARN's Perspective

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# LEARN: Preamble

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- Define Competitive Edge for an NREN
  - Quality of Services (of your NREN):
    - Availability
    - Network Performance
      - Delay
      - Jitter
      - Packet Loss
  - Competitive advantage of your NREN compared to other ISPs
  - Comparing services offered by your NREN with other Asi@Connect NRENs or Global NRENs (Ref: Asi@Connect Compendium and GEANT Compendium)

# LEARN Association

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- Formulated to establish Lanka Education And Research Network (LEARN), the NREN (National Research and Education Network) of Sri Lanka, as a Limited Guarantee Company 2009.
- Membership
  - 16 Full Members
  - 14 Associated and 13 Affiliated Members
- The Operation of LEARN is Governed by the Articles of Association of LEARN (2009).
- Managed by the LEARN Board of Directors, one member each from the full member institutions.



# : History

[1989] - Lankan Experimental Academic and Research Network

[1990] - LEARNmail - first message from Moratuwa to Colombo

[1995] - LEARN connected to the Internet

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[2009] - LEARN formed into a limited guaranteed company

# LEARN as an Internet Service Provider (ISP)

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- Telecommunications Regulatory Commission of Sri Lanka (TRC, SL) License to Operate as an ISP
- **LEARN is a lot more than a regular ISP**
  - Connects both physically and virtually with the Regional and Global R&E network
  - Access to projects, resources and training programmes targeted for R&E networks
  - Provides \*our own\* services such as LEARN TAC, and LEARN Cloud
  - Provides \*our own\* training and experience sharing
  - Gives us a collecting bargaining power with other service providers (the prices quoted to us are much lower than the commercial rates)

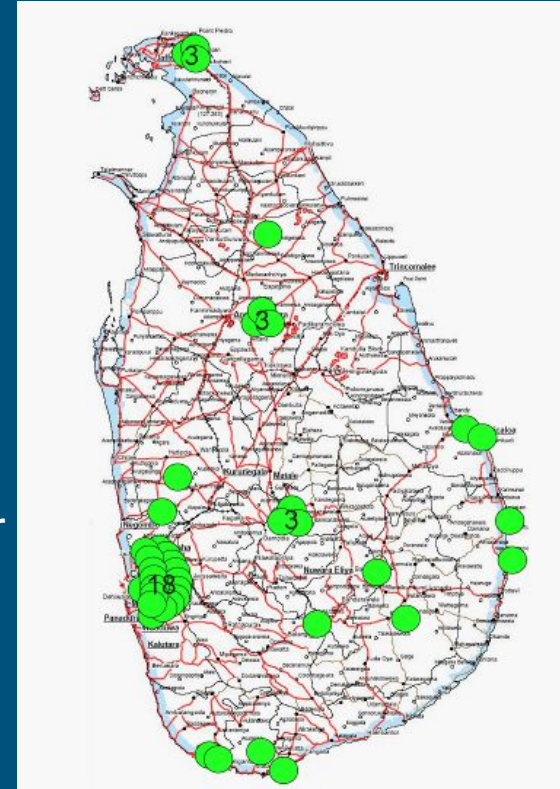
# LEARN - Services

Name of NRENs	Network Services						Security Services			Identity		Hosting/Collocation Services						Other Services				Service Index						
	IP Connectivity	IPv6	Virtual Circuit/VPN	Multicast	NTP Service	Optical Wavelength	24x7 Monitoring	CERT/CSIRT	DDoS Mitigation	Vulnerability Scanning	Anti-Spam Solution	EduRoam	InterFederation	DNS Hosting	Cloud Storage	Filesender	IaaS	SaaS	Web Hosting	Email Server Hosting	Collocation		Consultancy/Training	Videoconferencing	Domain Name Register	IP Address Allocation	Virtual Learning	Web/desktop conference
BdREN	█	█	█			█	█				█			█	█				█	█	█	█	█	█			█	16
LEARN	█	█		█	█	█	█			█	█	█		█	█				█	█		█	█	█	█		█	15
ERNET	█	█	█											█					█	█		█	█	█				07
REANNZ	█	█									█										█	█		█				07
AARnet	█	█	█			█					█				█						█	█	█			█	█	12
NREN	█										█										█	█	█					03
MyREN	█										█				█						█	█	█					07
NKN	█	█	█	█							█			█	█		█	█			█	█	█	█		█	█	16
ErdemNET	█										█			█	█						█	█	█	█				06
PERN	█	█	█								█			█	█						█	█	█	█		█	█	17
PREGINET	█	█	█								█			█	█						█	█	█	█				12
ThaiREN	█	█									█			█							█	█	█			█		14
VinaREN	█	█									█			█	█						█	█	█					07
SingAREN	█	█									█	█		█	█						█	█	█					10
INHERENT	█	█	█	█							█			█	█						█	█	█					7

Source: Mr Tawrit, CTO/BdREN

# LEARN : VPLS

- Total of 77 connections
- Highest local link bandwidth is 2Gbps
  - University of Peradeniya
  - University of Moratuwa
- Lowest local link bandwidth is 20 Mbps
- Members with the higher bandwidths also have separate backup links from a second service provider
  - 300 Mbps - 1 Gbps -> 100 Mbps
  - > 1Gbps -> 200 Mbps
- All are Optical Fiber Links



# Academic and Commodity Internet Backbone

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- Commodity Internet - Service Provider 1 = 10 Gbps
- Commodity Internet - Service Provider 2 = 4 Gbps
- LEARN's Singapore Link = 5 Gbps
  - TIEN (Asi@Connect) Network 1 Gbps
  - Google Node 10 Gbps
  - Internet 2 & SingAREN (SOE) 10 Gbps
- LEARN-India (National Knowledge Network) = 1 Gbps
- LEARN-LGN (Lanka Government Network) = 1 Gbps

*3 Gbps Academic Network and 17 Gbps Commodity Internet and 1 Gbps Government Network*



# LEARN : QoS

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- International Connectivity (average to Chennai and Singapore from Colombo/LEARN core)
  - Availability - 99.8%
  - Delay - 20ms
  - Jitter - 4ms
  - Packet loss - 0 (for non-congested fiber circuits)
- Local Connectivity (End Users to Colombo/LEARN core)
  - Availability - 99.5%
  - Delay - 4 ms (end users to the LEARN core)
  - Jitter - 2 ms
  - Packet loss - 0 (for non-congested fiber circuits)

# Tariff Structure

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- Tariff Structure of your NREN
  - Details of Tariff
  - How it is competitive with the ISPs [Economy, Structure, Services, Packaging]

# LEARN Membership Packages

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- B20 - B2000 (20 Mbps to 2 Gbps)
  - Includes both Commodity Internet and Academic Network
  - Other services such as DNS, IP (as presented in Slide 6)
  - The members are billed as per the packages they are subscribed to
- Different pricing between Government and Private member institutions
- Still our packages are competitive (wrt individual members buying directly from the service providers) as we “bulk buy” from the service providers and share among our members

# Financial Stability

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- Financial Sustainability – How do you look at it?
  - Revenue Streams
  - Expense Accounts
  - If there is any gap what is your suggestion to mitigate
  - Suggest Financing Model for NREN sustainability
- Any other suggestion as regard to sustainability of NREN

# Funds for LEARN Operation

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- A surplus is generated via
  - Keeping an overhead from Internet prices
  - Maintaining an overhead from Local Links (VPLS)
- The surplus (about 10% of the revenue) is used for
  - LEARN infrastructure including Singapore and TEIN link
  - LEARN operations
  - Training and workshops (both LEARN and member institution staff)
  - Membership contributions (Asi@Connect, APNIC, APAN, etc.)
  - Starting new projects for the membership (TAC, Cloud)

# NREN Sustainability

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- Increasing and giving better access to academic network
  - Identity Federation and EduGain
- Improving the NREN Services via internal and external funding sources
- Giving state-of-the-art services
  - Such as Video Conferencing (ex: Asi@Connect fDLuDcf project by BdREN & NORDUNet)

# Thank you!

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