



IICT, BUET

# BDREN STRUCTURE

&

## CHALLENGES THAT HAD TO BE OVERCOME

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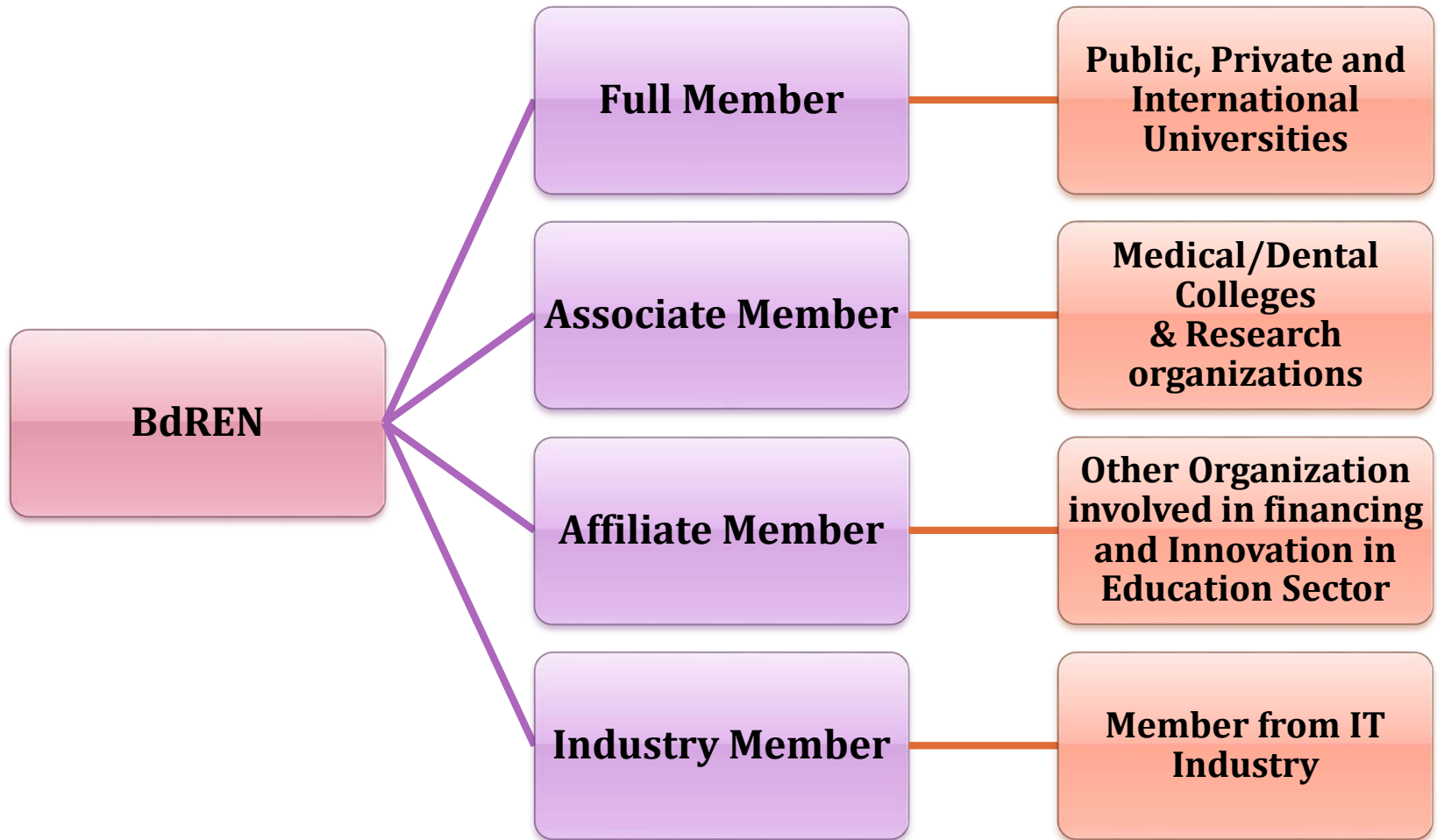
# OUTLINE

- ◉ Introduction
- ◉ Membership & Organization
- ◉ Network structure & Resources
- ◉ Services
- ◉ Applications
- ◉ **Challenges:**
  - Technical
  - Operational
  - Budgetary
  - Training
  - Awareness

## **INTRODUCING BDREN: NATIONAL RESEARCH AND EDUCATION NETWORK OF BANGLADESH**

- BdREN aims to connect all universities, research institutions and healthcare across Bangladesh.
- BdREN went in operation on pilot basis in 2011 in 5 public universities (BUET, DU, BSMMU, JU and SBAU).
- In 2014, BdREN started its full operation and connected to 34 public universities, 2 International universities (IUT & WUC) and 1 private university (NSU).
- BdREN backbone is constructed with country wide OPGW from Power Grid Company of Bangladesh (PGCB) Ltd.

# BDREN STAKEHOLDER



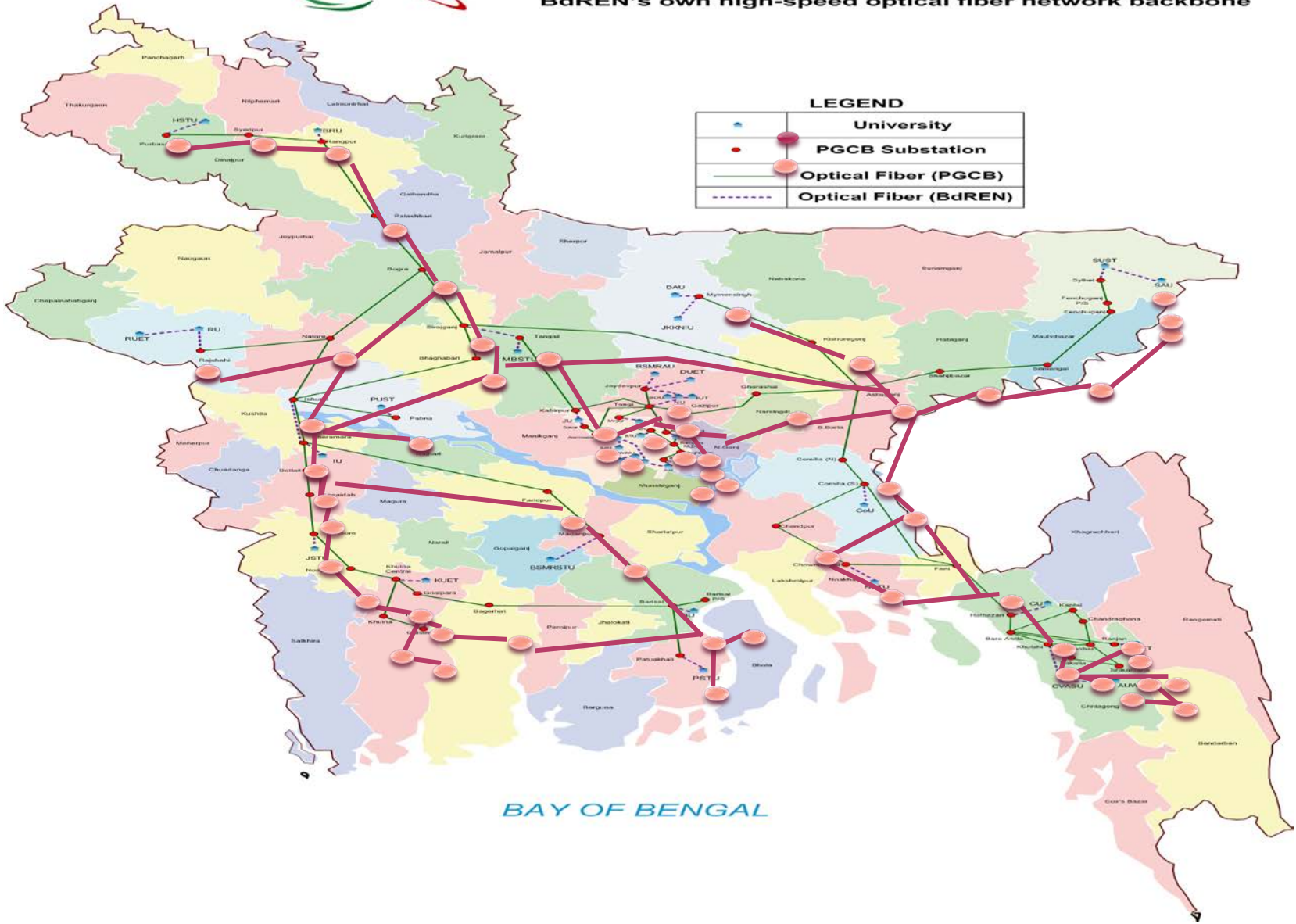
# ORGANIZATION STRUCTURE

- ◉ BdREN is non-profit Trust organization and governed by a board of trustees.
- ◉ BdREN team (existing: 15, near future: 55)
- ◉ Trustee board consists of 11 members.
- ◉ Trustee board members are from:
  - Universities (Public & Private)
  - University Grants Commission (UGC)
  - Ministry of Education (MoE) &
  - Other members co-opted for their expertise and position in relevant organizations.



**The Research and Education Network for Bangladesh**  
 Connecting all universities and research institutions through  
 BdREN's own high-speed optical fiber network backbone

LEGEND	
	University
	PGCB Substation
	Optical Fiber (PGCB)
	Optical Fiber (BdREN)



# NETWORK & RESOURCES AT A GLANCE

## Infrastructure & Capacity

Backbone &  
Access  
Network

PoP

DC & DR

Virtual  
Classroom

Total 3500+ KM  
300 KM last mile

37 Universities &  
11-PGCB Sub  
Station

UGC & BUET 3-  
tier (Availability  
99.999)

34 Virtual  
Classroom

10G Core & 1G  
Access

Supports up to  
1G bandwidth  
for each  
university

400 TB Storage  
Virtual Machine

Simultaneous 34  
sites

# SERVICES

## Bandwidth

Education  
Traffic

Commercial  
Traffic

Inter university  
through BdREN

International through  
TEIN, Internet 2 &  
BdREN

BTCL  
(Bangladesh  
Telecommunication  
Company Limited)

BSCCL  
(Bangladesh  
Submarine cable  
Company Limited)

IIG in future



# SERVICES

## Infrastructure

Blade Server  
(16+8)

Storage

Power Backup

2  
processor,  
10 core  
each

96GB  
memory  
per blade

400 TB  
(200+200)

Sub-  
Station

Generator

24X7 NOC

# SERVICES

## Infrastructure

Collocation

Hosting/ Email/ DNS

Storage

Placement  
of Physical  
Server at  
BdREN

University  
sites

Own email

FTP service

# SERVICES

## Infrastructure

VPS

(Virtual private server)

HPC

Cloud Services

On demand  
(personal and group)

Parallel Computing

Distributed Processing

Virtual Private Cloud

IaaS  
(Infrastructure as service)

# SERVICES

## Network

**VPN**

(Virtual Private  
network)

**QoS**

(Quality of  
Service)

**Security**

# SERVICES

## Communication Services

Voice

Video

Messaging,  
Voice mail,  
FAX

IP phone

Streaming

Conferencing

Recording

IM  
(Instant  
Messaging)

# SERVICES

## Capacity building

Local Training

Foreign Training

Internship/exchange  
visit

Round Robin

Competitive  
(among the  
members)

Round Robin

# APPLICATIONS

## Education

Tele-  
medicine

eLearning

Content

Data Sharing

Demonstration  
of Surgery

Moodle

UMS  
( University  
management  
system)

Class Lecture

Video Lecture

# APPLICATIONS

## Platform

Electronic  
Research  
Gateway

Graduate  
Record  
Verification

Medical  
Data  
Sharing

Thesis/research  
articles in under  
graduate,  
graduate and post  
graduate

An online  
verification of  
graduates

Building a  
platform for  
sharing medical  
data for research  
purpose



# APPLICATIONS

## Campus Network

Campus  
Radio

Campus  
Television

Surveillance

University  
programs

Department  
programs

University  
programs

Department  
programs

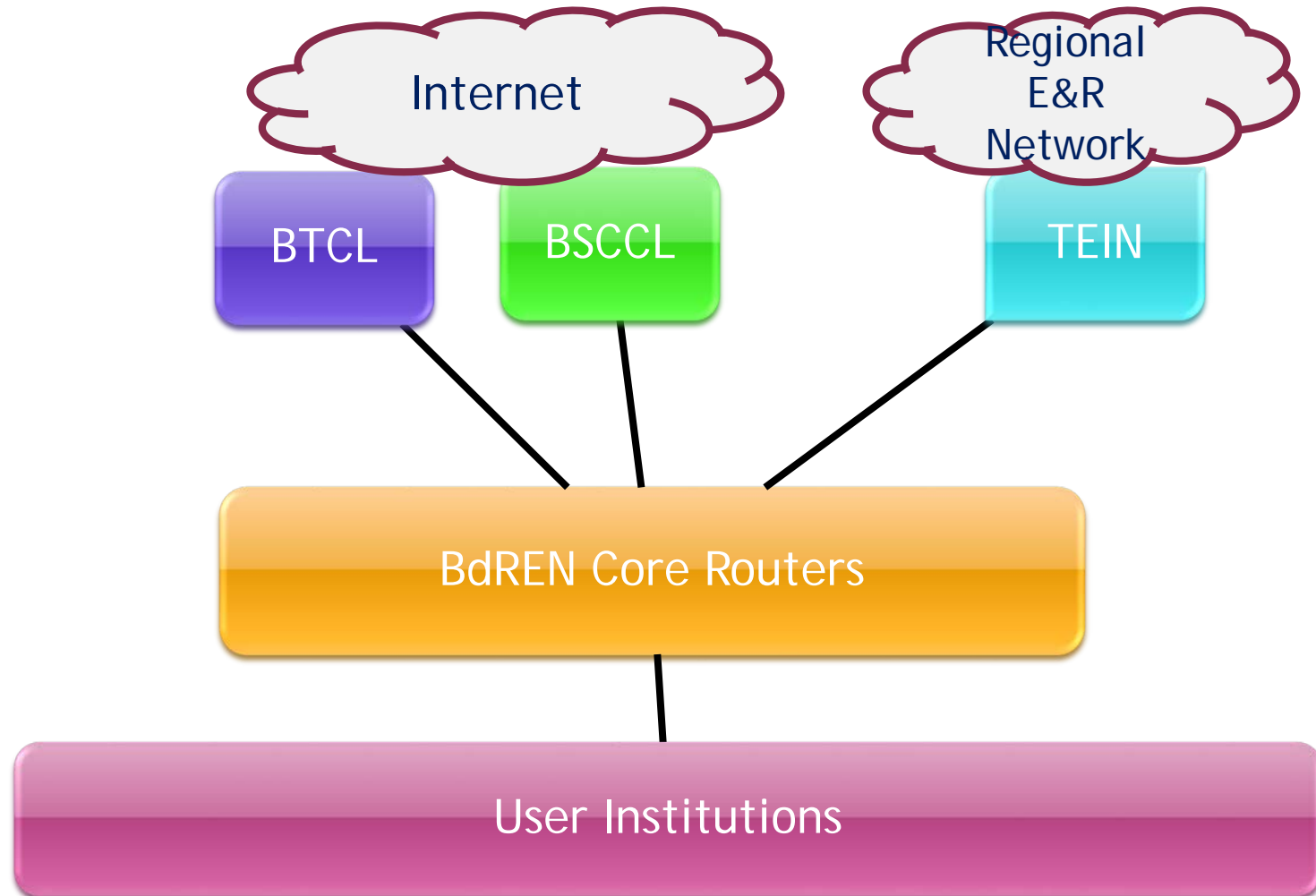
Monitoring

Campus  
Security

# INTERNATIONAL PARTNERS

- OARNet : An OH-Tech Consortium
- KENT State University, Ohio
- HEAnet: Ireland's National REN

# BdREN -International Connectivity

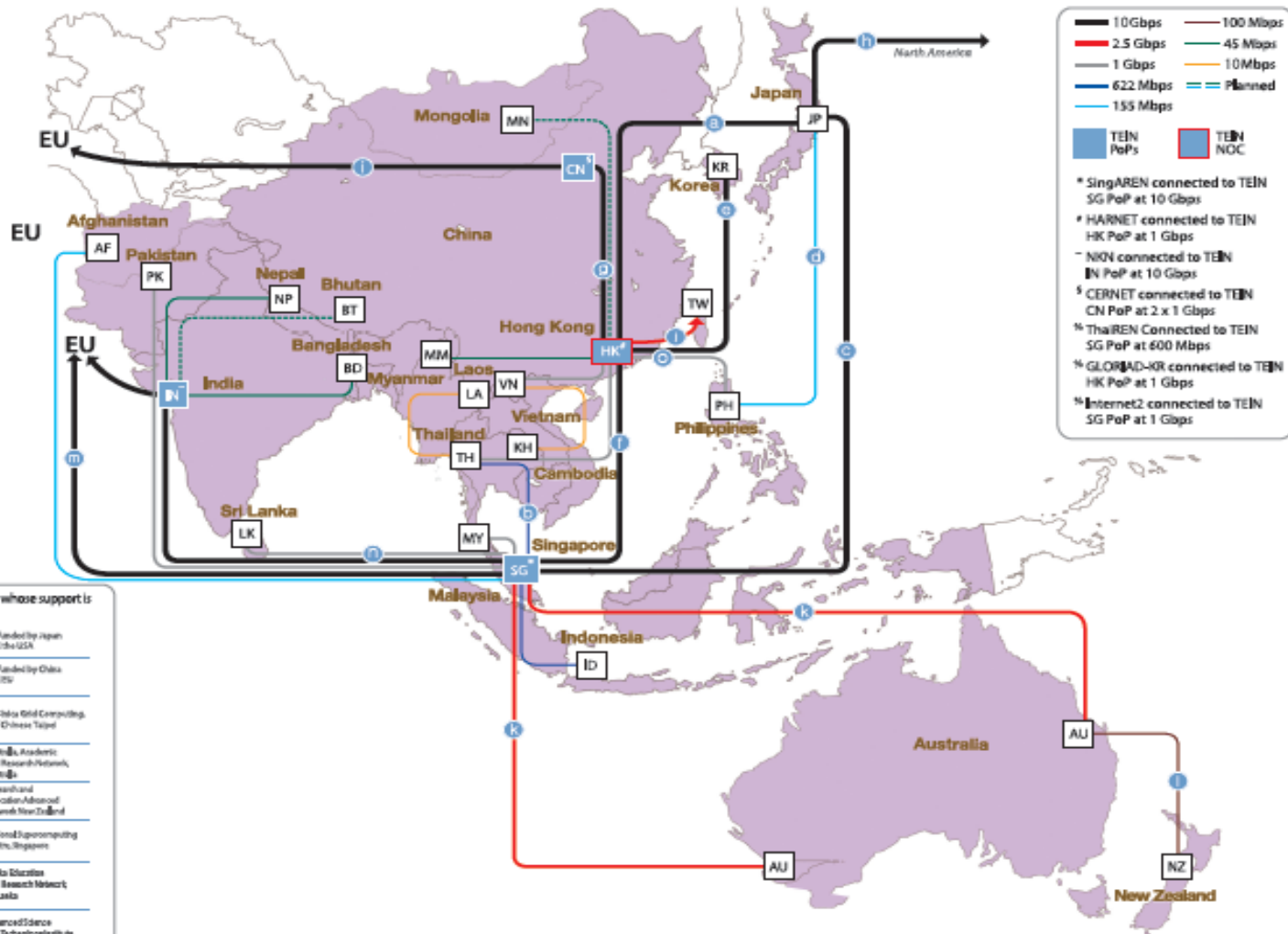


# BdREN CONNECTIVITY TO TEIN



Connecting Asia and Europe's Research and Education Communities

www.tein.asia



**TEIN Project Partners**

AF Afghanistan	ID Indonesia	NZ New Zealand
AU Australia	JP Japan	PK Pakistan
BD Bangladesh	KR Korea	PH Philippines
BT Bhutan	LA Laos	SG Singapore
CA Cambodia	MM Myanmar	SL Sri Lanka
CN China	MN Mongolia	TH Thailand
HK Hong Kong	MY Malaysia	TW Taiwan
IN India	NP Nepal	VN Vietnam

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c NII National Institute of Informatics, Japan	j ASCC Academic Data Grid Computing, Republic of Chinese Taipei
d MAREIN Ministry of Agriculture, Forestry and Fisheries Research Network, Japan	k BARNET Austral. Academic and Research Network, Australia
e NIA National Information Society Agency, South Korea	l REANVZ Research and Education Advanced Network New Zealand
f OITA OITA Education and Research Network, China	m National Supercomputing Centre, Singapore
g TERAN OITA Science & Technology Network, China	n LEARN Lanka Education and Research Network, Sri Lanka
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# **FUTURE PLAN/ACTIVITIES**

- **Infrastructure at Private Universities, Medical Colleges and Research Institutes**
  - **Connectivity Establishment of 1G connectivity by dedicated fiber to 25 new institutions including medical Colleges (12), Universities (3) and Research institutions (10).**
  - **Establishment of Distance learning Theater/ Collaboration Centers in those institutions.**
  - **Establish BdREN Internet PoPs at those institutions.**
  - **Expansion of Cloud System and Establishment of BdREN new DR (Disaster Recovery) Center in another geological area (Jessore University of Science and Technology).**

# CHALLENGES

## ⦿ Technical

- No enough skilled manpower to shoot trouble in the backbone network.
- Dependency on the vendor under service level agreement.
- Even the vendors can't shoot the trouble within short time.

# CHALLENGES

## ◎ Operational

- About half of the universities are in remote place from the divisional town and loadshedding is frequent.
- Needs generator and large online UPS (3/4 hours back up)
- Dearth of skilled manpower in every university.
- In some universities there is separate IT cell to look after the BdREN and other IT activities of the universty.

# CHALLENGES

- ◉ **Redundancy link: Backbone and last mile**
  - At present BdREN's backbone is constructed with PCGB's OPGW, no other redundancy is there.
  - Even in the last mile ( 300 KM+) link, there is no separate other links.
  - Due to lack of redundancy uptime cann't be ensured at the target institution.



# CHALLENGES

## ○ Budgetary

- The total cost is borne by the World bank (project period will end in 2018)
- At present, there are 15 technical personnel and their salary & allowances are paid from the project.
- Personnel at BdREN has relatively high technical skill and there is also higher than the national average.
- After the project ends, the budgetary provisional will be a big issue to look into.

# CHALLENGES

- ◎ **Campus network at the Universities**
  - Most of the public universities do not have campus network.
  - BdREN took a initiative to build campus network at those universities.

# CHALLENGES

## ◎ Awareness and training

- Most of the faculty members and officials are not yet aware about the BdREN and its potentials.
- Need to impart training to the IT personnel to maintain the campus network as well as to provide services to the university.

Q&A