Optimising Malaysian Research and Education Network (MYREN-X) for Scholarly Communication

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What is MYREN?

- **Malaysian Research and Education Network (MYREN) is a DEDICATED PRIVATE NETWORK for research and education established in 2005.**

- **It is connected to other RENs to form the largest and most geographically diversed private network**

- **Its like a separate internet where each country has its own Network Operation Centre (NOC) working collaboratively**

- **MYREN has MYRENCLOUD that provides Servers (VMs) and storage since 2010.**

Towards Realising MOHE's 10 Shifts in HE Initiative

Digital Content, Massive Open Online Courses (MOOC), Learning Analytics (Big Data), 21st century classroom

TELEPRESENCE

Cyberinfrastructure, Network, Storage, Collaborative and Application Services

Science Data Access, Ranking, Nobel Laureate Research

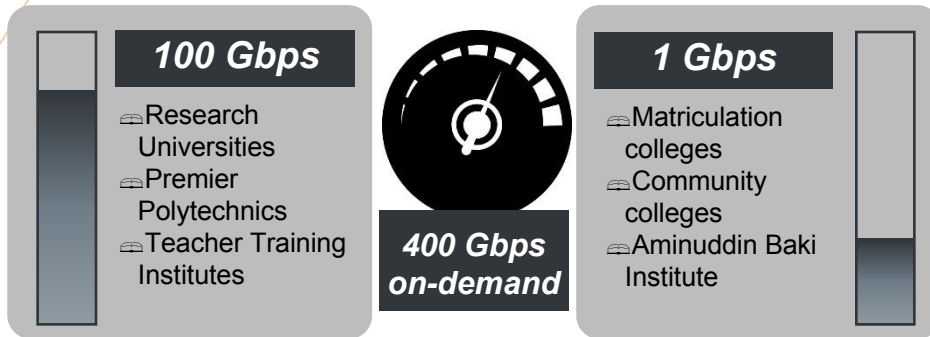**Cyberinfrastructure is the GAME CHANGER**

MYREN-X

- ✦ MYREN-X is now an ISP and as of 1st April, 2018 it is under a company established under Consortium of Public Universities. It is for all research and education entities both public and private. Connectivity to all university campuses and also to all polytechniques and community colleges will be from 10 to 100Gbps.

- ✦ Not just a network but will also provide research and education computing services

- ✦ Broader use of cyberinfrastructure within the research community including the sciences, medicine, arts and humanities and social science

- ✦ Increased capability, expertise and effective use of cyberinfrastructure

- ✦ Enhanced and easier to use Distributed Computing Infrastructure (Grid/High Performance Computing and Federated Cloud) that is production ready with application softwares and scientific gateway portal

Current Capacity per Institution vs Future Capacity per Campus

Type of Institution	Current Capacity per Institution	Future Capacity per Campus*	Improvement
Research universities	~5 Gbps (5,000 Mbps)	Up to 100 Gbps	↗ 5,000%
Comprehensive universities	1~3 Gbps (1~3,000 Mbps)	Up to 100 Gbps	↗ 10,000%
Other public universities	1~2 Gbps (1~2000 Mbps)	Up to 10 Gbps	↗ 1,000%
Polytechnics	0.1~0.5 Gbps (~500 Mbps)	Up to 10 Gbps	↗ 20,000%
Other public Ins of higher learning		Up to 1~2 Gbps	

*Bandwidth provisioned will depend on Research and Education requirements (e.g. on-demand burstable needs, number of students).

Reflecting Tomorrow's Realities

100 Gbps
- Research Universities
- Premier Polytechnics
- Teacher Training Institutes

400 Gbps on-demand

1 Gbps
- Matriculation colleges
- Community colleges
- Aminuddin Baki Institute

More contents by universities (e.g. Massive Open Online Courses)

Increase use of video (e.g. Video Conferencing, Telepresence, VOD)

Students & Researchers

Increase use of technology & collaboration in education (e.g. Global Online Learning)

Increase collaboration in research (e.g. Large Hadron Collider, Big Data)

GÉANT

INTERNET2

Asi@Connect

1 Gbps

1 Gbps international connection for research universities to be at par with other countries connected to Asi@Connect , GEANT and Internet2

Open Science Cloud Computing Services

✦ High Performance Computing (HPC) and Federated Cloud Computing that caters for researchers' requirements for:
  - General Purpose Compute Resource
  - RAM-intensive Compute Resource
  - GPU-Based Compute Resource
  - Desktop Compute Resource

  For Science and Engineering Research, Animation Rendering, Big Data, etc

✦ Virtual Servers (VMs) and Storage provisioning to support higher education institutions' functions including their libraries

✦ Virtual Workbench for various domain specific analyses of researchers

✦ Common Storage Facility for Research Clearing House (Research Repositories (eg. Databases for DNA/Protein, Biodiversity etc), library resources and data in all forms, etc

✦ Adopting Science DMZ model ; A Private Community Cloud that will generate contents and traffic for MYREN-X

SIFULAN:
Malaysia's Authentication and Authorization Infrastructure (AAI) Trust Framework

Malaysian Identity Federation and Access Management (MyIFAM)

- In 2008, individuals were appointed as Registration Authority for Grid User Certificates issued by Academia Sinica Grid Computing Certification Authority (CA).

- In 2011 Malaysian Identity Federation and Access Management (MyIFAM) initiated preparation to become CA for Malaysia by joining APGrid PMA as member which later approved MyIFAM CA membership on 30 April 2012 and became Malaysia's Production CA

- Producing grid user as well as server certificates until today servicing research and education communities

SIFULAN
Malaysian Access Federation

- As a value-added service of MyIFAM expansion, it is natural progression to develop the trust framework for accessing resources and services that do not require highly secure environment (i.e maintain a comfortable level of assurance of at least user identity vetting; better than social identity (FBConnect, Google, etc))

- SIFULAN stands for Secure Identity Federation on Unified Lightweight Access maNagement

- Working together with GAKUNIN Japanese Academic Access Federation since 2014 to develop AAI for Malaysia.

- Running Pilot Production service with Partners from Czech Republic, NII, and now engaging library resource providers

SIFULAN Benefits

- Real identity vetting at every transaction

- Facilitating consortium for library resources subscription. Eg. by negotiating for better pricing; Working closely with Malaysian Citation Centre for Scholarly Output Management and Analytics

- Facilitating worldwide access for mobility of staffs and students; not bound by campus IP

- Easier account management without EZProxy drawbacks

- Possibility to link ORCID with SIFULAN identifier

- Working with library resource providers such as Clarivate/Thompson, Elsevier, EBSCO, and others. In the process of joining eduGAIN

Some Expected Benefits of MYREN-X and SIFULAN

- New ways of retrieving, processing, visualising and archiving data, opening up new areas of research and expanding existing ones whilst allowing the results of research to be shared by a broader community

- This the role that should be taken up by libraries

- With trust framework afforded by SIFULAN it is hoped that the spirit of sharing can be enhanced simply because we know who access what, at what time and for what purpose (ie. auditable) because every "transaction" must go through the Authentication, Authorization and Audit (AAA)

Concluding Remarks

- Single Federated Cloud for Research, Education and Enterprise

- Move towards Shared "decentralised centralised" cyberinfrastructure for optimal use and cost-saving.

- Cyberinfrastructure requirements for research, education and enterprise computing may be included in MYREN-X Project using Science DMZ as a model

- Research Computing requirement is the most demanding requirement in our academic environment. If we can satisfy its requirements we can satisfy requirements of all others like teaching and learning, community engagement and extension activities

Concluding Remarks-cont

- Libraries to leverage and optimise on MYREN-X Cloud services for scholarly communication and collaboration (servers and storage from MYREN-X ...may be MAlaysian Institutional Repositories Online (MAIRO) Cloud?

- JAIRO Cloud managed to tremendously increase the number of IRs joining the consortium; not all universities has the necessary manpower and expertise to support such activities

- Each IR can still maintain own URL which is important to support own institution's Webometric Ranking

Concluding Remarks-cont

- Expanding the IR collection to include Mixed Media Digital Assets will necessitate huge storage requirement and big investment

- These activities are good for MYREN-X in terms of content services by increasing the traffic volume inside the network and also by providing the necessary cyberinfrastructure for all including and especially the library community.

Trust Framework by SIFULAN will pave the way for greater spirit of sharing...

TQ!

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