



e-Science Activities Update: Malaysia

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Agenda

- Academic Grid Malaysia
- Development of Next Phase of MYREN
- SIFULAN Identity and Access Management

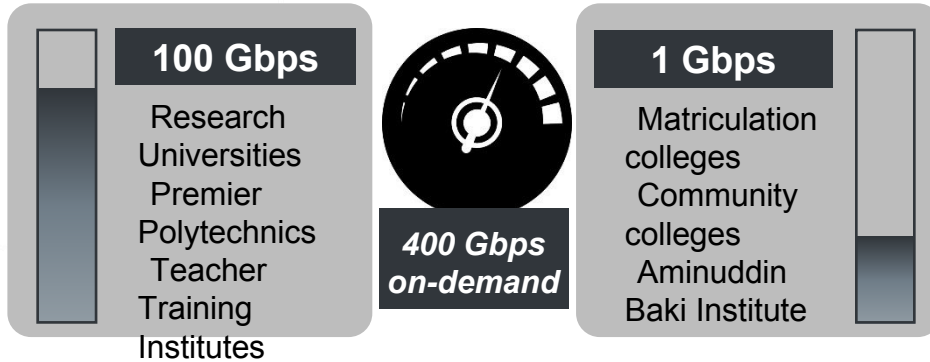
Academic Grid Malaysia

- Clusters from various universities are EGI registered (but lost the EGI site certification due to lack of human resources)
 - Need capacity building of 'amphibious' (know both science and ICT) technical staffs
- Universiti Putra Malaysia clusters running hybrid mode of HPC and spare capacity grid ie accepting HPC and Grid users' job submission but HPC users have higher priority
- University of Malaya [Data Intensive Computing Centre](#)

MYREN-X: The Next Phase

- Finally there is light at the end of fiberoptics for MYREN!
- Next phase of MYREN will be on own fiber and leased darkfiber (mixed)
- Built, Operated and Owned by Not-For Profit Consortium of 20 Public Universities (running telco-grade network without telco price)
- A cyberinfrastructure comprised of Network, Compute and Storage as well as applications and services

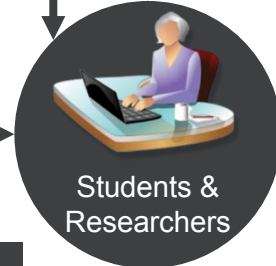
Reflecting Tomorrow's Realities



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



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



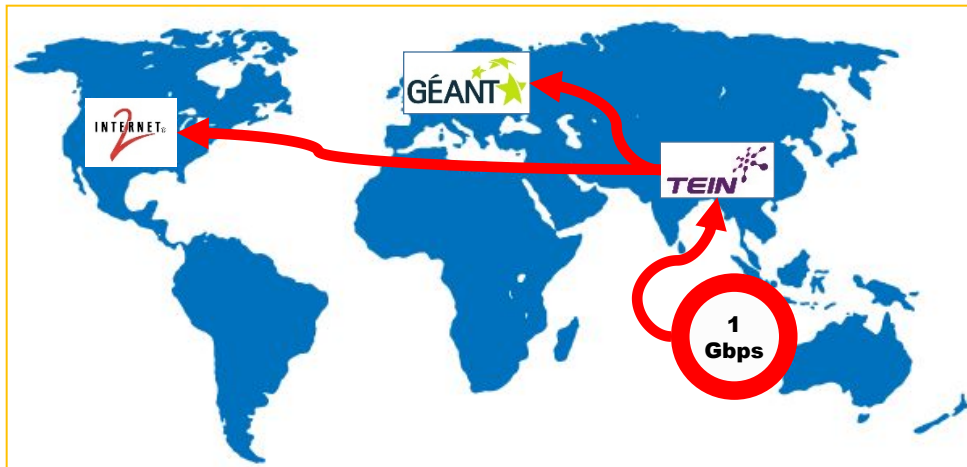
Students & Researchers



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



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



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

Better Bandwidth Overall

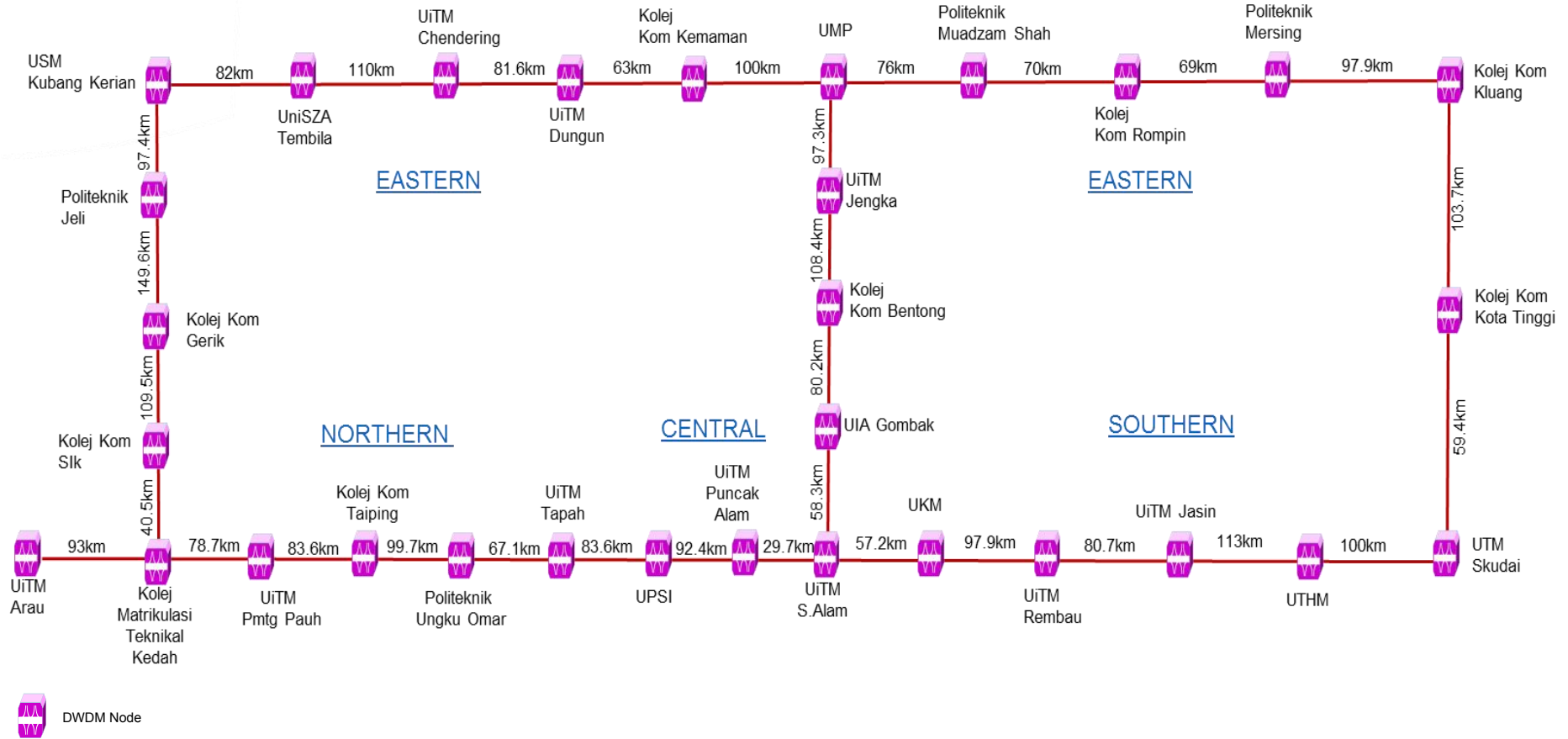
Current Capacity per Institution vs Future Capacity per Campus

Type of Institution	Current Capacity <u>per Institution</u>	Future Capacity <u>per Campus</u> *	Improvement
Research universities	2 Gbps (2,000 Mbps)	Up to 100 Gbps	5,000%
Comprehensive universities	1 Gbps (1,000 Mbps)	Up to 100 Gbps	10,000%
Other public universities	1 Gbps (1,000 Mbps)	Up to 10 Gbps	1,000%
Polytechnics	0.05 Gbps (50 Mbps)	Up to 10 Gbps	20,000%
Other public institutions of higher learning		Up to 1 Gbps	

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



Network Implementation Topology



Nodes are located at selected campuses/branches for sustainability and cost-saving

MYREN-X Cloud

- Focus on providing ICT services related to research and education computing and enterprise computing
- Delivery through a cloud computing platform modelled after Amazon Web Services and /or Microsoft's Azure Cloud
- Single, Agile Cloud Computing Platform that caters for **Research, Education** and **Enterprise** computing needs
- Leverages on Secure Identity Federation on Unified Lightweight Access Management (SIFULAN.id)

Research Computing Services

- High Performance Computing (HPC) in All flavours
 - Science and Engineering research (Molecular docking, nano tech and materials, Particle Physics, Chemistry)
 - Animation Rendering (CGI movies)
 - Big Data (oil palm, Halal, smart city)
- Virtual Servers (VMs) and Storage provisioning for researchers; no more purchasing of individual physical servers
- Virtual Workbench for various domain specific analyses; portals for scientists
- Research Clearing House (Storage) of Research Data



Education Computing Services

- Massive Open Online Courses (MOOC)
- Distance Learning and Life-Long Learning
- Curriculum Management
- Online tutors



Communication and Collaboration Exchange (CXC) Services

- Corporate "Dropbox"
- Secure Documents Collaboration
- Video Conferencing
- Unified Communication
 - IP telephony
 - Corporate chat
 - Email



Service Delivery Model

- Single Consolidated Infrastructure of Agile Cloud Platform using Opensource Technology from our collaborators (Japan, Australia, EU,...)
- Infrastructure optimization for all services
- Operation by back-to-back service and maintenance agreements with local OSS companies
- International corporate partners with proven products

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

- 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 **S**ecure **I**ntity **F**ederation on **U**nified **L**ightweight **A**ccess ma**N**agement
- Working together with GAKUNIN Japanese Academic Access Federation since 2014 to develop AAI for Malaysia.
- Running Pilot Production service with Partners from Czech Republic and GAKUNIN

SIFULAN Benefits

- Real identity vetting at every transaction
- Facilitating consortium for library resources subscription. Eg. by negotiating for better pricing
- 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

SIFULAN Challenges

- Various cloud services for both private community cloud (MYRENCLOUD) as well as public cloud services (Google, MS) to be catered; now google is OK.
- Most IHLs do not have mature Directory Services (LDAP/AD) and SSO not widespread; major cost implications
- A long process of LDAPing all LDAPs
- Draft of the Federation Policy based on REFEDs template is almost complete (need to seek legal office on legal litigation of non-Malaysian entities ie which international court of justice to go)



Concluding Remarks

- We hope to build Science Cloud and DMZ to allow campuses to rise up to the intranet network requirement
- Being a late adopter is sometimes advantageous as we can learn from other countries on best of breeds
- By creating a trust framework, SIFULAN can promote greater and more secure e-Science collaboration activities
- Eventually build Federated Cloud Infrastructure to allow for HPC-On-Demand
- A long Journey Ahead and we always welcome all the help and collaboration

Trust



**No more anonymous access
by Sifulan Bin Sifulan**