National Grid+NRENs in ASEAN region: A snap shot

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ABSTRACT
A proper infrastructure is a necessary and essential ingredient to enable researchers to engage in global research. Two complimentary infrastructures that are needed to facilitate global research engagement are high speed network and Grid. In this paper we will share some of the national initiatives in Grid and Network access of some of the ASEAN countries as well as how the regional has changed considerably.

Keywords
National Research and Education Network, National Grid Initiatives

1. INTRODUCTION
The Association of Southeast Asian Nations (ASEAN) [1], established in 1967, is a grouping of countries that has seen tremendous growths over the past two decades. This growth have also driven the need to strengthen the infrastructure to bridge the Digital Divide. The government in the region has recognized the importance of IT and research to the future of the country with major initiatives.

Two major technologies that have made major impact for the research community are: National Research and Education network and Grid Technology. The National Research and Education Network enables researchers to explore new application and process high speed accessibility to data. It also provides high speed connectivity to the international research community. While Grid technology provides a seamless platform for researchers to work together across geographical distance.

Section 2 will report on some of the national Research and Education Network in the ASEAN region and how they are link together and to other regions. Section 3 will focus on Grid initiatives in the region and the different grid communities and their efforts. Last but not least section 4 will highlight some of some the challenges faced by the research community in the region.

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2. National Research and Education Network
The Internet2 initiatives[2] in the mid-1990s has sparked a number of National Research and Education Network initiatives in South-east Asia, eg. Singapore Advance Research and Education Network[3]. The National Research and Education networks(RENs) has quickly and surely proven their worth. In the case of Singapore, it has grown to support the many distance learning program with reknown institution and universities. It has also enabled researchers to participate in major international initiatives. Table 1 shows a list of the National Research and Education Networks.

	Name of NRENs	Country	Website
1	MYREN	Malaysia	www.myren.net.my
2	ThaiREN(consist of ThaiSARN and UniNet)	Thailand	thaisarn.nectec.or.th and www.uni.net.th/en
3	SingAREN	Singapore	www.singaren.net.sg
4	INHERENT	Indonesia	
5	PREGINET	Phillippines	www.pregi.net
6	VINAREN	Vietnam	www.vinaren.hut.edu.vn

Table 1: NRENs in ASEAN countries

In the early 2000, most of the above NRENs, were connected to Japan and/or Korea as well as the USA. Thus, most of the traffic between neighboring countries were transiting their traffic outside the region with a vast majority at USA. In 2004, there was a big initiative by the European commission to link the region to Europe. The project is called Trans-EurAsia Information network (TEIN-2) project [4]. The network became operational at end-2005. The project transformed the entire international network connectivity landscape in the region. The speed of the links were increased by multiple folds, from 10s Mbps to 100s Mbps and what is more important the traffic between ASEAN countries were transiting within the region. This has reduced the Round Trip-time (RTT) of communication between neighbouring ASEAN countries tremendously. Figure 1 shows the Round Trip Time measurements among TEIN-2 partners country. Example prior to TEIN-2 the Round Trip-time (RTT) between Thailand and Singapore is approxmiately 354 millisecond (transit at USA) while it is 23 milliseconds direct link across the TEIN-2 network. The later reduces the round trip time multiple folds and ensure efficient transfer of information within the region. The other

major impact of the TEIN-2 project in terms of connectivity is the multiple high speed links to Europe. This links enable direct collaboration with Europe, where previously the traffic would have to transverse USA causing high latency delay, eg. Singapore(SG) to Europe via USA is approximately 400 milliseconds while the RTT is 279 milliseconds through the direct link of TEIN-2.

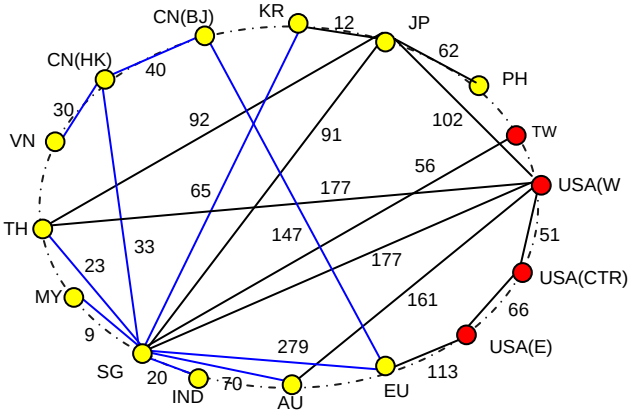

Figure 1: Round Trip Time measurements

3. National Grid Initiatives

Grid Technology has been around for some time but only made a major impact in the region at the turn of the century when Globus Toolkit became more widely known. It has enabled users who are geographically apart to work together collaborative sharing resources as well as access to special equipment. The major research production GRID is the Enabling Grids for E-sciencE project (EGEE) [5]. Although the region may have been slow in adopting the technology at the start, once it is recognized as an important "infrastructure" to support research the different countries in the region moved quickly in its adoption with national initiatives.

In Jan 2003, the National Grid Office(Singapore)[6] was established by the Agency for Science, Technology and Research in Singapore. One of their mission is to facilitate the seamless use of the cyberinfrastructure to advance scientific, engineering, and biomedical research and development with the long term goal of transforming Singapore economy. They have been extremely successful and in one of their program they have also out-reach to the commercial community.

In Thailand, the National ThaiGrid[7] was established in 2005, although Grid activities have already started much earlier. The ThaiGrid is a 4 year project with US$5.5 million funding initially involving 13 universities.

In Malaysia, MIMOS[8] has taken the lead in establishing the KnowledgeGRID Malaysia initiative in Aug 2007. The KnowledgeGrid Malaysia initiative objective is the development national wealth and value creation through the establishment of a national infrastructure that maximizes high performance computing resources to accelerate research and industrial development for national. MIMOS has also leveraged on MYREN links to the local universities as well as international connectivity.

The other countries in the region also have a number of Grid activities and at different level of maturity. On the regional scale, Malaysia, Thailand and Singapore came together in February 2006 to form the Southeast Asia Grid Forum(SGF). It provided a good platform for national level discussion and facilitate collaboration of projects of common interest among member countries.

At the Asia-Pacific region level, a number of the ASEAN grid initiative are members of the Pacific Rim Applications and Grid Middleware Assembly (PRAGMA). PRAGMA[9] provides a good platform for application developers, as well a Grid operation and middleware researchers/developers to work on an international Grid test-beds. As can be seen ASEAN members have not only contributed resources and tool to the management of the Grid Operation Center, eg. SCMSWeb, and MOGAS[xxx]

4. Challenges

ASEAN region has had a number of initiatives in the area Grid and NRENs. Although the network may not have reach lambda level, it has already achieved significant improvements in terms of bandwidth and efficient peering within the region as well as with other region.

Looking at current Usage record and Grid accounting systems, the network is considered free. They are not log users are not charged. This has resulted in some application where data are copied through and from different computation resources consuming additional time[10]. Efficient replication and scheduling of computing power would be a critical factor to maximize the usage of the infrastructure.

One immediate challenge to the community is to provide data access to the information when the Large Hadron Collider comes online in 2008.

5. ACKNOWLEDGEMENTS

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6. REFERENCES

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