



Update on Advanced Networking in Singapore

L.W.C. Wong

**Singapore Advanced Research &
Education Network**



Background

- **International R&E networking provision through SingAREN**
- **SingAREN Phase 1 – Nov 1997 to Mar 2001**
- **SingAREN Phase 2 – Apr 2001 to Mar 2003 with aim to:**
 - **Ensure continuity of R&E advance networking requirements – SingAREN21 infrastructure**
 - **More diverse R&D activities and improved project management – Broadband21 projects**



SingAREN Peering Arrangements

➤ **Architecture:**

- Peer PVC routers
- Layer 3 via BGP4
- Migration to POS connectivity to Abilene in Sep 2002

➤ **Domestic peering:**

- Connectivity via ATM-based Singapore-ONE
- Tertiary institutions, including NUS, NTU, TP, etc.
- Research centres, including KRDL, NTRC, CIR, etc.

➤ **International peering:**

- US - vBNS+/Abilene (32 Mbps & upgrade to 90 Mbps in Sep)
- Korea & Europe – TEIN (2 Mbps)
- Malaysia – (2 Mbps)
- Asia-Pacific – APAN (2 Mbps)



New Activities

- **SOX - Singapore Open Exchange**
 - Community project initiated in 2001 to facilitate open transit of Internet traffic
- **KRAN – Kent Ridge Advanced Network**
 - Project to set up a small optical network testbed with the aim of facilitating in the definition of a country-wide optical R&E network in Singapore
- **BMG – Bio-Med Grid**
 - Definition and scoping stage of establishing a Singapore BMG in the next 15 months
- **ONFIG – Optical Network ConFIGuration**
 - Multi-party project looking into R&D of optical network related devices
- **NII – Next-generation Info Infrastructure**
 - Spearheaded by InfoComm Development Authority (IDA) to investigate 2nd generation broadband infrastructure



Future Directions

- **Activities in life sciences will significantly increase demand for bandwidth in Singapore**
- **Establishment of autonomous REN in discussion**
- **Rising need for R&E bandwidth – cheaper bandwidth?**
- **How to share resources and costs for inter-REN connectivity?**



SingAREN21



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