



Medical Applications for Advanced Networking

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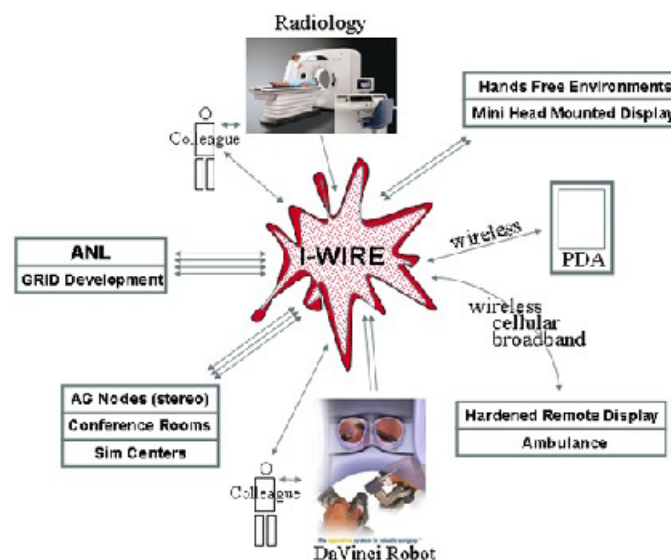


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**Advanced Biomedical Collaboration
Testbed in Surgery, Anesthesia,
Emergency Medicine and Radiology**

BIOMEDICAL INFORMATICS @ THE UNIVERSITY OF CHICAGO





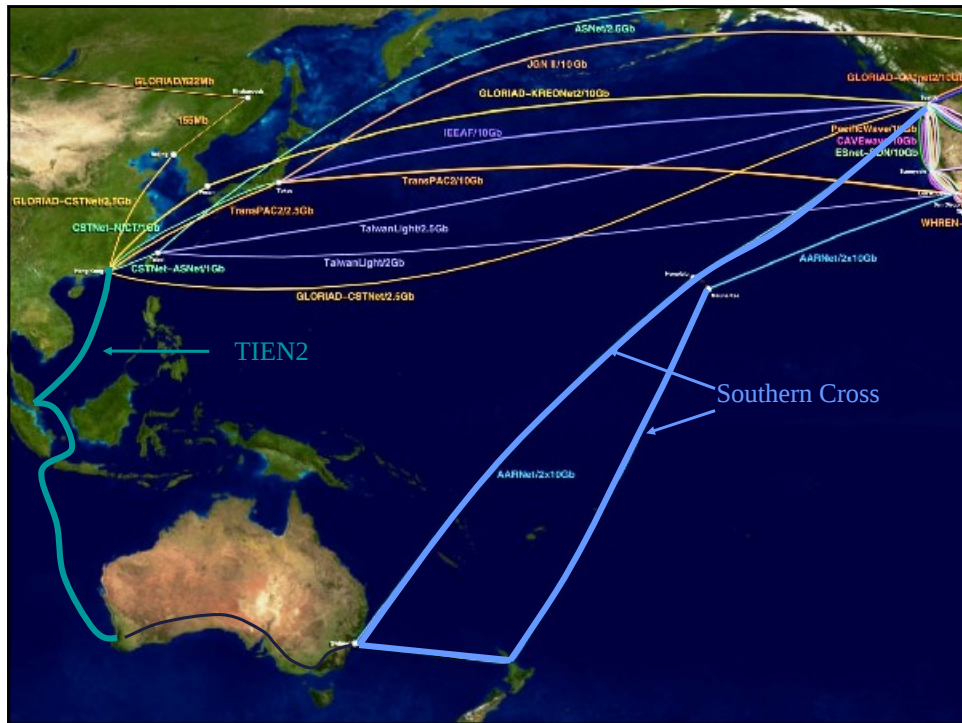
Asia-Pacific Advanced Network

Medical WG
formally approved at APAN-Taipei in Aug 2005.

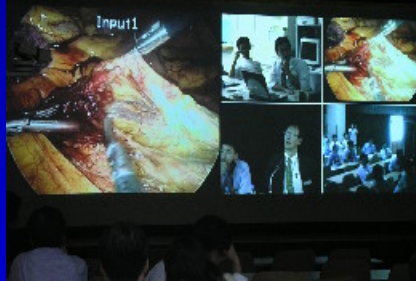


Goals of APAN Medical WG

1. Use high-quality broadband telecommunication for exchange of medical knowledge and techniques.
 2. Develop combined medical and engineering teams, to achieve 1.
 3. Expand advanced medical networks in Asia-Pacific regions.
 4. Improve the networks through developing technologies.
- Provide better healthcare through information sharing.



live demonstration of surgery – Japan - Korea



Kyushu U
↕
NCC, Korea



simple DVTS system

surgical instrument
or camera



DVTS PC



Internet
>30Mbps



IEEE1394

UTP(Ethernet)

DVTS: free software
(<http://www.sfc.wide.ad.jp/>)

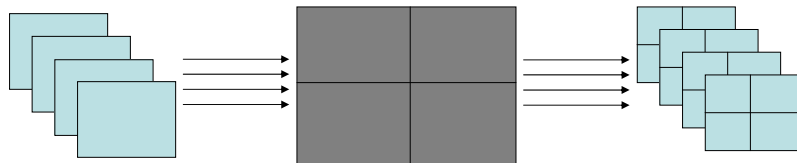
stable, high bandwidth network is essential

options for linking multiple sites

'QUATRE'

Bi-directional communication

up-to 4



'REFLECTOR'

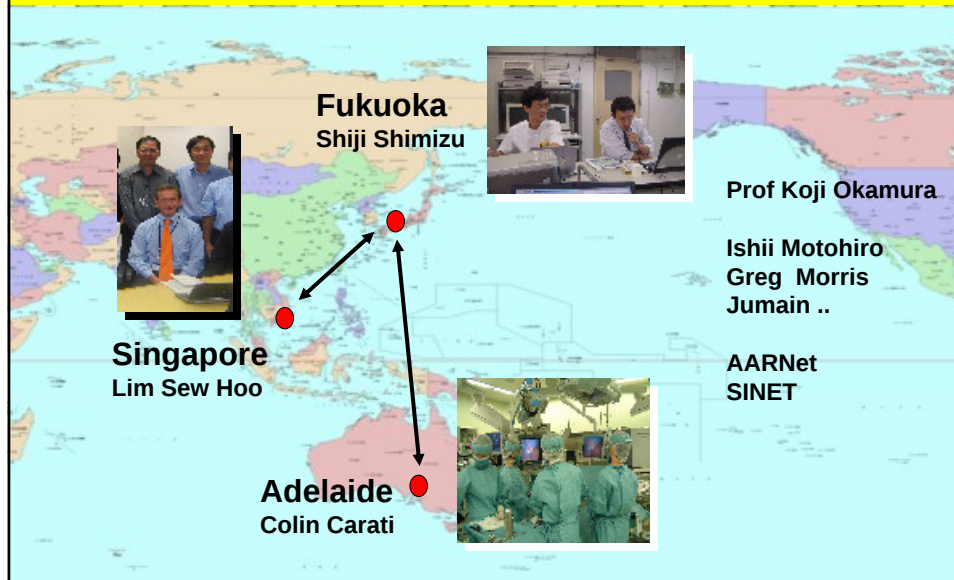
Uni-directional communication

more than 10



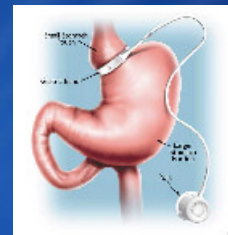
Bariatric Surgery - 3-way live link

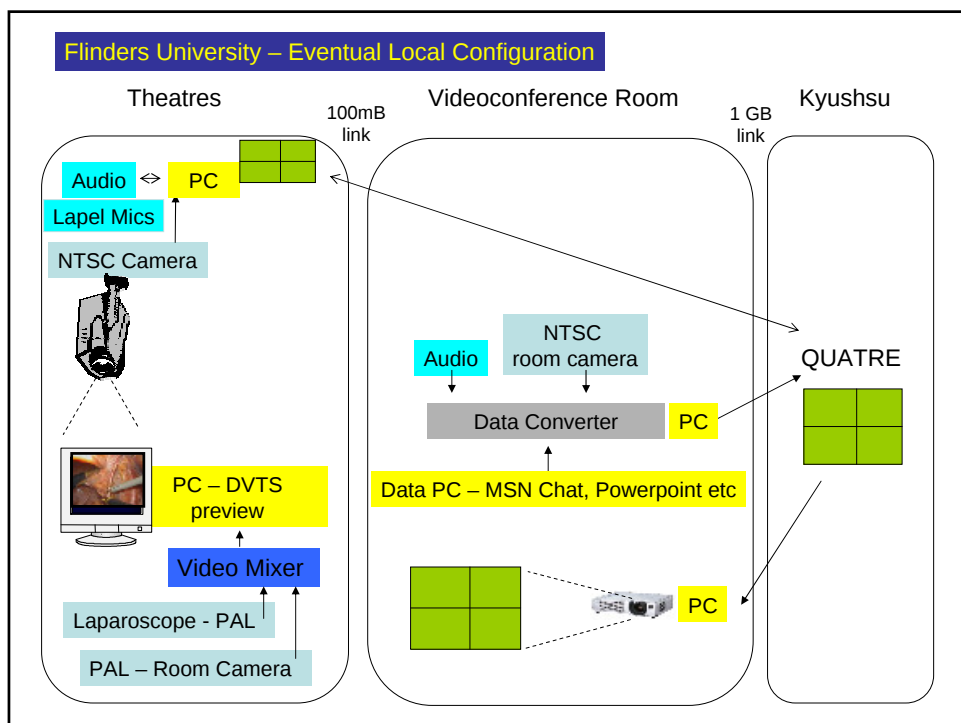
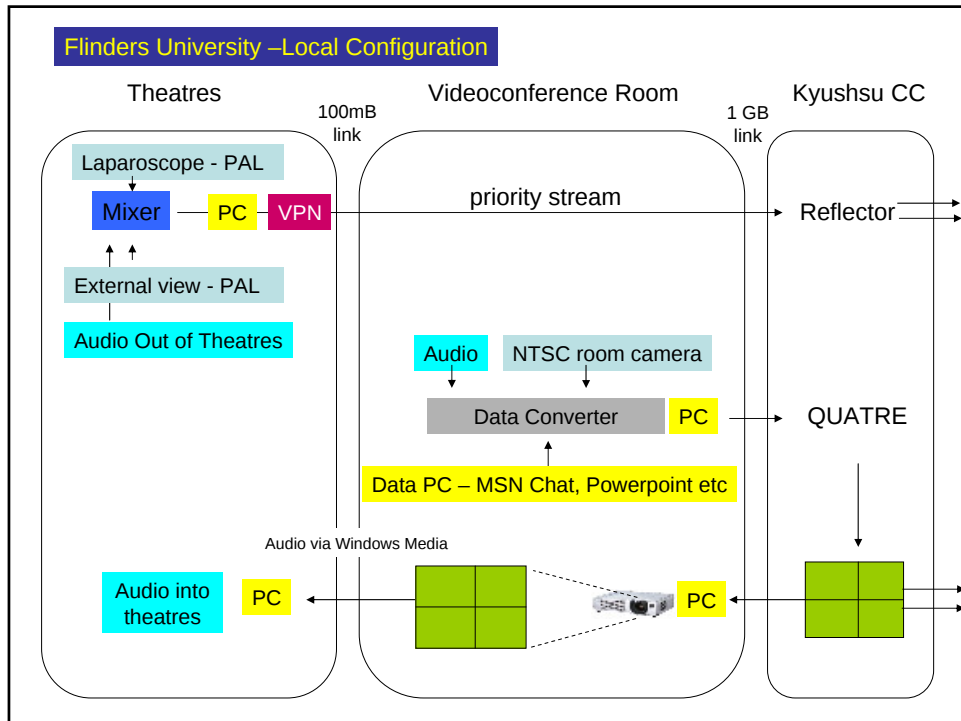
Nov 2005



Advanced Networking for Training in Bariatric Surgery

- Laparoscopic gastric banding
 - Flinders Medical Centre
- training of practising surgeons
- 1-2 day seminars using Access grid / DTVS, 3-4 times per year
- follow-up – mentoring / guidance by real-time HDV of first few operations
- Kyushu University, Flinders University, NUS, others ?

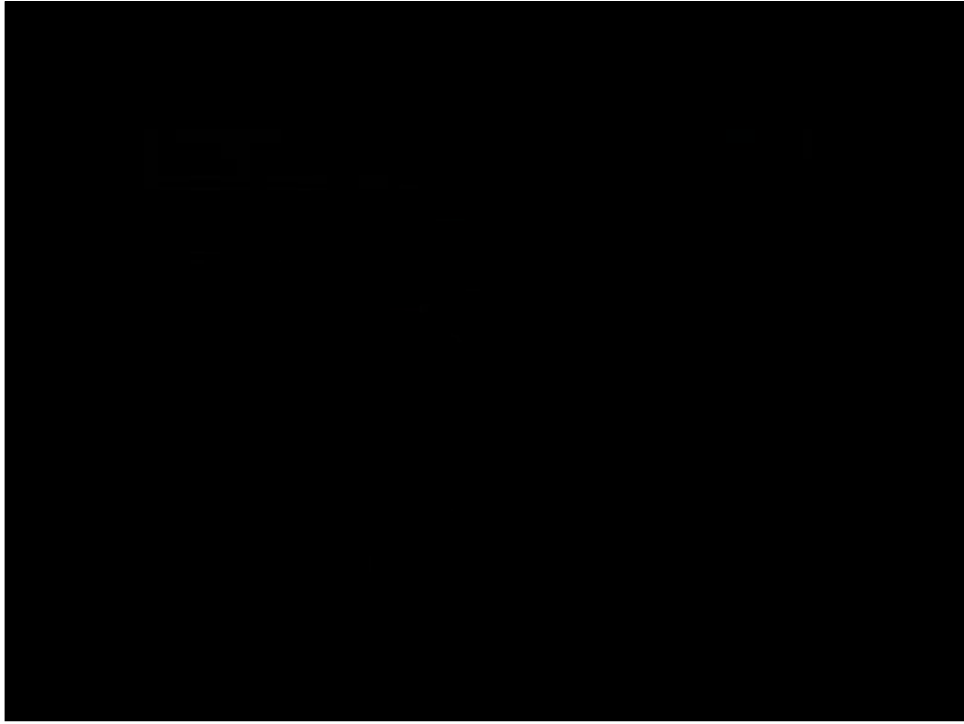








APAN Tokyo – HDTVS with 4 participant sites

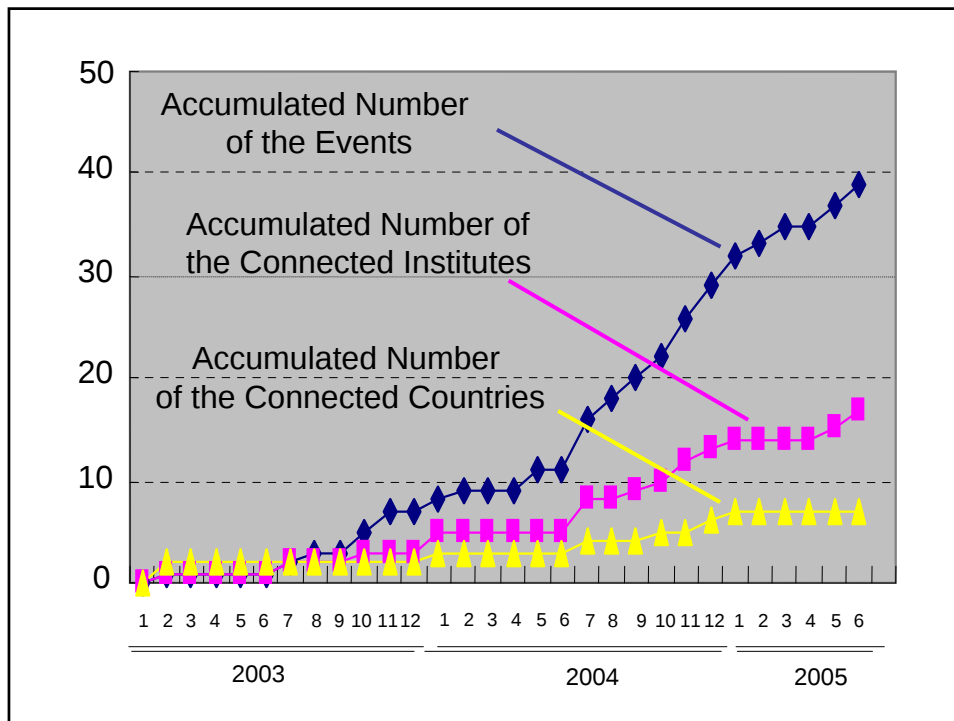


what works well

1. flexibility and reliability of DVTS system
2. good video and sound quality
3. acceptable time delay to Asia-Pacific region
(down to 170 msec with TIEN2)
4. effectiveness of the interactions
5. excellent co-operativity and organisation

problems and solutions

1. network
 - reliability, available bandwidth
 - time delay
 - firewalls
 - audio quality / echo /standardising audio volumes
2. security / patient confidentiality
3. PAL versus NTSC



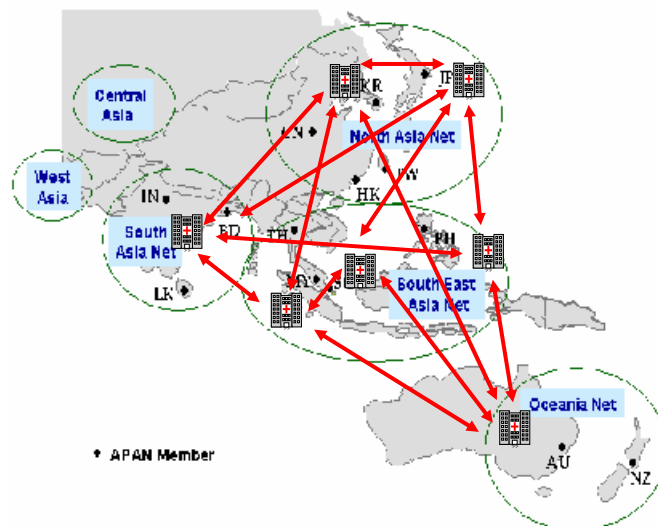
what next ? immediate goals

- more links, better and easier connections,
- how can we add value to the interactions
 - more structured sessions
 - additional data / images / powerpoint
- stop testing and start using – ‘mainstream’ the technology

what next ? medium term

- linked curricula for education and research
- live collaborative projects
- disaster / pandemic management
 - Jan 2006 "Pandemic Influenza Preparedness and Response Virtual Symposium"
- linked databases, more integrated IT
- public / population health
- use of the technology across all sectors of medicine, including in developing countries

the future of medical networks in Asia-Pacific



need easy access to networks

what next ? blue sky ?

- 3-D
- VR
- haptics
- robotic surgery



Medicine Meets Virtual Reality 14

Accelerating Change In Healthcare: Next Medical Toolkit

**January 24 – 27, 2006
Hyatt Regency Long Beach
Long Beach, California**

Sessions on ...

“Surgical Simulation-Didactics, Metrics, Assessment
Haptics; Visualization
Interoperability Standards for MM&S *
Advanced Technologies & Behavioral Healthcare
Surgical Simulation-Validation, Future
Serious Games for Medicine
Virtual Patient
Biodefense”

http://www.nextmed.com/mmvr_program.html



conclusions

- high definition networking is a useful technology for medical education and practice
- need to develop 'expert' teams to facilitate wider use and mainstream the technology
- need to develop better professional networks to take advantage of the physical ones