

QUESTnet 2005

Yesterday, Today and Tomorrow

Building a Video-over-IP Network for The University of Sydney

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Coolumb, Queensland - Australia

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Agenda

- Introduction
- History
- VC Standards at Uni of Sydney
- Basic Design of a Lecture Theatre for VC
- Content conferencing
- Multipoint Conferencing
- What's next in Videoconferencing ?
- The Network



The University of Sydney

- Founded in 1850
- Statistics (2004)
- 19 Faculties
- 11 Campuses
- 104 Lecture Theatres
- 50,000 Students
- 5,800 Staff (2,500 Academics)
- 100+ Videoconference Devices



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Brief History of Videoconference at USyd

- Started in the early 90s
- Mainly at Faculties of Medicine & Agriculture
- Network technology: ISDN ONLY (H.320)
- Mix of Vtel and PictureTel
- Late 90s Medicine built ATM-Based VC net (H.321)
- 2002 : Started to move to H.323 (IP)
- 2003 : Convergence to H.323 - Arts, Pharmacy, etc..
- 2004 : Centralised MCU (H.323, H.320, SIP ready)
Focus on Tandberg and Polycom end points
- 2005 : Vet Science and Dentistry VC

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Types of Videoconferencing Systems



Desktop



Compact



Room Systems

System components:

- CODEC (Integrated/Detached)
- Camera (Fixed/Motorised)
- Microphone (Single/ Multiple)
- Display (TV/Projector/Plasma)

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Videoconferencing Standards

ITU Standards	H.320	H.321	H.323
Network Technology	ISDN (Telstra)	ATM	IP (Internet)
Private/Public Network	Public Network	Private Network	Private Network (Public IP ?)
Who Uses it at Uni of Sydney?	Arts, CREO	Medicine (decommissioned)	Medicine, Arts, Orange, Pharmacy, Agriculture, Cumberland, EMU etc..

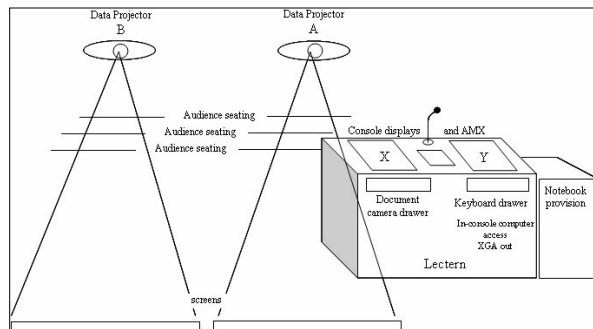
ITU = International Telecommunication Union

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Basic Design of Lecture Theatres for VC

- 2 x projectors
- 2 x Cameras
- Doc Camera
- 2 x Monitors
- 2 x Screens
- Lectern
- Multiple Mics
- Lighting
- Sound proofing



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Remote Lecture Theatre example

- Wireless Mics
- Sound proofing
- Lighting
- Budget

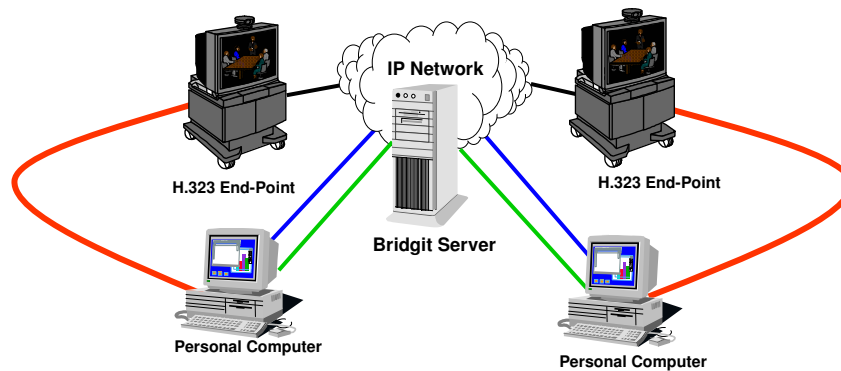


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Content conferencing

- 3 Options:
 - NetMeeting (T.120) for non-H.239 Systems (Blue)
 - H.239 Standards for compliant systems (Red)
 - Bridgit for Multipoint and Voice Conferences (Green)



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MCU and Servers

- Installed April 2004
- Polycom MGC-100
- 24 port MCU and Gateway (H.323/H.320)
- PathNavigator Gatekeeper
- GMS Mgt system
- Bridgit Server



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Applications 1

- Remote Lecturing



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Applications 2

- Remote Tutorials



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Applications 3

- Specialised Teaching



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Applications 4

- Staff Meetings



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Future of Videoconference

- SIP support
- Capture and Stream
- High Resolution Videoconferencing



The Network “SydNet”



- **Mission critical networking**
- **Delay, Jitter and Packet loss need to be controlled.**

How does Video Conferencing impact on the design of a University Network?

- **Mission critical networking**

70's - 80's University networks almost toys.

90's Admin applications moved to IP

00's Video conferencing



Building a mission critical network

- **Building a mission critical network**

- **Main Campus**

- **WAN**



Building a mission critical network

- Main campus networks
 - began with a two level star
 - became a "cart wheel"
 - 5 regions with independent layer3
 - beginnings of redundancy within regions



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Building a mission critical network

- Main campus network - Where to next?
 - Putting in the "hard" fibre links
 - Independent layer3 for buildings that suit it
 - More redundancy within buildings and within regions.
 - Making SERVICES redundant not just connectivity.
 - Codecs that can take advantage of a redundant network?



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Building WAN networks

- **Wide area networks**
 - Multiple paths are expensive to build.
 - but sometimes they come "free"

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Future of WAN for USyd

- **Wide area networks - Where to next?**
 - Many sites with only a single link and some can't do video.
 - Many life expired microwaves
 - Promise of AARNet3 regional network

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Network Quality of Service

- **Controlling Delay, Jitter and Packet loss:**
 - Its surprising what you can get away with
 - Need to classify traffic
 - Need "something" on low bandwidth links
 - Separation
 - QoS
 - Problem of "flaps"
 - Don't always blame the network



Thank You

Q & A

