



The AARNet National Video Conferencing Service - NVCS

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QUESTnet 2007
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Agenda

- Video over IP a core component of AARNet traffic
- Survey from July 2006 across R&E sector showed various implementations of VC endpoints:
 - Large room/lecture theatre systems
 - Room implementations (no integration -> fully integrated)
 - Desktop video conferencing
- Invariably all systems need to work together
- AARNet can provide the 'glue' (bridging services)
- Also adding to the picture the 'grey glue' (support)

The “big five”

1. **Increase Interoperability**
(between endpoints, MCUs, Aus & Intl R&E community)
2. **Improve end user Support and Training**
(proactive and reactive support mechanisms, QA, training)
3. **Develop policy**
(for real time and streaming vision – legalities, technical focus)
4. **Document and adopt best practice models**
(service delivery, documentation, profiling emerging trends)
5. **Industry support**
(provide point of contact for vendors to work with R&E)

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Introduction to the National VC Service

“To facilitate and support video conferencing for teaching and learning in the research and education sector”

- <http://www.nvcs.edu.au> – launched TODAY
- Booking service for MCUs – online and on time
- Assistance for CAVEs – back line support for front end
- Provision of gatekeeper hierarchy and services

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Increasing Interoperability – A HowTo

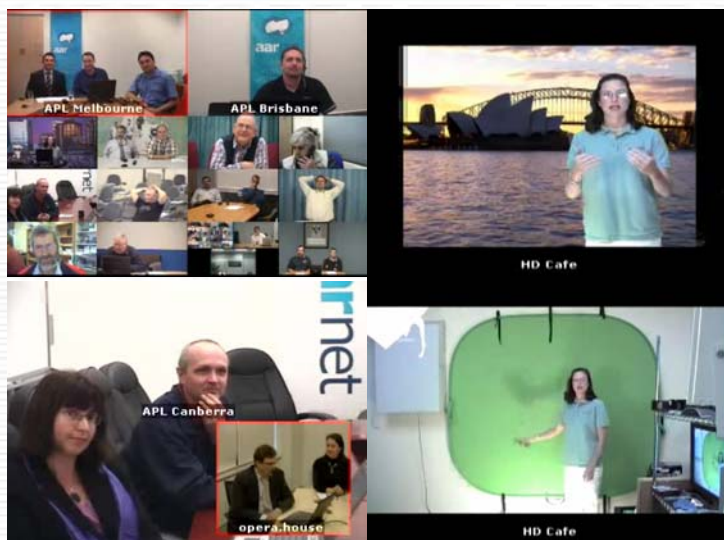
- Not just a technical challenge – also a 'face to name' job
- Videoconferencing a great tool for putting faces to names!
- Mailing lists (Voice-L and Video-L) consolidated in May 07 to single list – Voice, Video and Collaboration (VVC-L) (Peter J & myself as admin)
- Conducting 'OzeConferences'
- 2007: High-definition
- 2006: SIP & Webcasting
- 2005: Streaming/Collaboration



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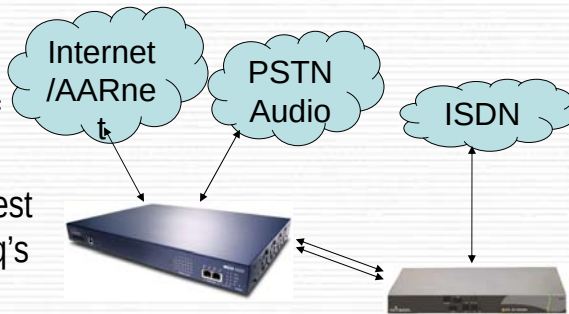
2007 OzeConferences



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The 'medium is the message' (or, how to get the message out there)

- The MCU is the key – what is the MCU?
- The 'big blue box' that initiates, mediates and multiplexes
- Used for video and audio conferences
- Usually first point of contact for external conferences – highest number of support q's



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What about non-realtime?

- Deploying 'YouTube' like functionality for support
- Streaming & recording of conferences to Quicktime files and export to Flash
- Used for technical how-to's and adding interactivity
- Further implications to be assessed for teaching and learning streaming uses



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Training – getting the mix right

- Training currently in development:
- Troubleshooting methodologies/ industry best practices
- H323 Communication: An introduction
- Troubleshooting ISDN conferencing
- Troubleshooting IP endpoints/conferencing



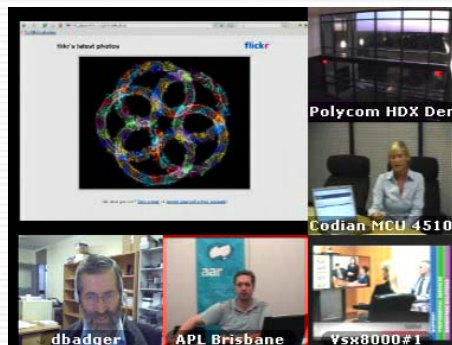
Also, training on abstracting the technology to make it personal

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Support for data collaboration

- Also known as 'H.239 interoperability' – more basically playing PowerPoint files 'down the wire'
- Polycom: People and Content
- Tandberg: DuoVideo
- Also support for VNC through MCU



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So what's this NVCS thing then?

- NVCS is the 'one-stop-shop' for video conferencing information and the focus of development work to date
- Primarily a vehicle for 'the truth, whole truth, nothing but!'
- Sections designed for the proactive and reactive support
- Development area for emerging technologies, such as:

On demand streaming – interactive documentation

RSS (Really Simple Syndication) feeds

The 'VC guy' blog – that's me ☺

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What is a CAVE? (And where do they hide?)

Coordinator of Audio Visual Equipment – who...

- is an experienced person at the site
- knows the technology: H.323 and/or Access Grid
- knows the local environment
- knows local trouble-shooting resources, and
- how to escalate to AARNet support if required
- is given rights to schedule and manage MCU resources

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Current CAVEs in the Community

- Australian Catholic University
- Australian National University
- Central Qld University
- Charles Darwin University
- Charles Sturt University
- CSIRO (Canberra & Twba)
- Deakin University
- Flinders University
- Griffith University
- James Cook University
- Monash University
- Newcastle University
- Qld University of Technology
- University of Adelaide
- University of Ballarat
- University of Melbourne
- University of South Australia
- University of Southern Qld
- University of New England
- University of Tasmania
- University of Western Aust

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NVCS Website – watch this space

The screenshot shows the AARNet website with a navigation bar at the top containing links for Home, Network, Services, Projects, e-Research, News, Blog, Events, About us, Contact us, and Site map. The 'Services' link is highlighted. Below the navigation bar, the breadcrumb trail reads: Home > Services > Support > National Video Conferencing (NVCS). The main content area is titled 'National Video Conferencing (NVCS)' and contains the following text:

The National Video Conferencing Service (NVCS) consolidates support services for video conferencing technologies. It serves as a central repository for both proactive and reactive troubleshooting of video conferencing equipment, as well as a resource for hosting news and reviews relating to current and emerging video conferencing equipment and technologies.

Current Status

AARNet has created a website, blog and mailing list and content via "Ozeconferences" to encourage the exchange of information and development of knowledge on video conferencing so that the Australian Research and Education community can be better informed in decision making on current and future investments and on implementation, integration, operation and usability of video conferencing technologies.

A revamped online conferencing booking service has been created to simplify and automate conferencing services via a distributed Multipoint Control Unit (MCU) structure. Further work via the MCU Review project group is taking place to develop appropriate service processes to support conferencing services; NVCS is participating in both activities.

NVCS is also a partner in ACRME (Australian Community of Rich Media Expertise) whose primary focus is on the use of video conferencing and digital streaming to support teaching and learning. This initiative is funded by The Carrick Institute. Outputs from this project will appear within the NVCS web pages.

On the right side of the page, there is a sidebar with a list of links: Overview, Support, Network Operations Centre (NOC), National Video Conferencing (NVCS), Project Groups Framework, Mailing Lists, Network, Real Time Communication, Content Delivery, and Wireless. The 'National Video Conferencing (NVCS)' link is highlighted in orange.

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The NVCS Sneak Preview (or, the lessons we learnt along the way)

and if you want the whole story you'll have to come to the BoF tomorrow

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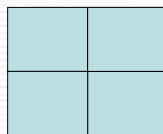
Will the real high-def please stand up?

Standard
Definition



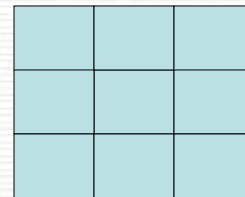
CIF
352x288
(0.1 MP)

"Enhanced Quality"

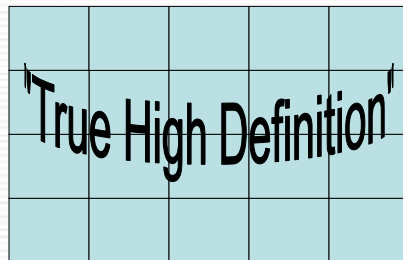


4CIF
704x576 (0.4 MP)

"Higher Quality"



720p
1280x720 (~1.0 MP)



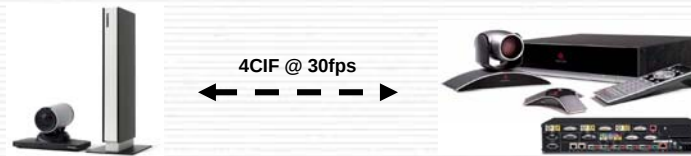
1080i/1080p
1920x1080 (2.0 MP)

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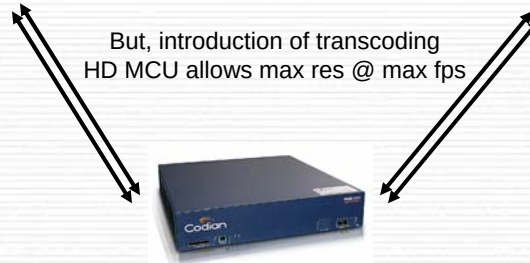
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Not all HD endpoints are created equal

Both 720p endpoints, but interoperate at only 4CIF



But, introduction of transcoding
HD MCU allows max res @ max fps



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H.264/MPEG-4 AVC interpretations

- Baseline codec used most commonly for video conferencing applications
- Less highly specified for non critical video applications at high framerates and pixel resolutions

	Baseline	Extended	Main	High
I and P Slices	Yes	Yes	Yes	Yes
B Slices	No	Yes	Yes	Yes
SI and SP Slices	No	Yes	No	No
Multiple Reference Frames	Yes	Yes	Yes	Yes
In-Loop Deblocking Filter	Yes	Yes	Yes	Yes
CAVLC Entropy Coding	Yes	Yes	Yes	Yes
CABAC Entropy Coding	No	No	Yes	Yes
Flexible Macroblock Ordering (FMO)	Yes	Yes	No	No
Arbitrary Slice Ordering (ASO)	Yes	Yes	No	No
Redundant Slices (RS)	Yes	Yes	No	No
Data Partitioning	No	Yes	No	No
Interlaced Coding (PicAFF, MBAFF)	No	Yes	Yes	Yes
4:2:0 Chroma Format	Yes	Yes	Yes	Yes
Monochrome Video Format (4:0:0)	No	No	No	Yes

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Where should the intelligence reside?

- Modern high definition endpoints are complex and costly devices
- Desired outcomes for product spec sheets is >30fps @ >1 MP resolution (720p) at lowest achievable bandwidth
- Capital cost and bandwidth reduction techniques now common
- Simultaneous H.264 encode and decoding operations requires significant processing power to keep the stream manageable



Two methods introduced by low cost manufacturers to achieve this:

- Reduced Complexity Decoding Operation (RCDO)
- Introduction of Static Macroblock signalling: H.241 *MaxStaticMBPS*

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Tandberg MXP Edge 95



Single Cable Tandberg
HD Camera

Up to 2Mbps @ 30fps
720p resolution



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Aethra X7



Sony HD Camera
CMOS EVI-HD1

Up to 4Mbps @ 30fps
720p resolution



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Sony PCS-HG90

- Up to 8 Mbps @ 720p (50/60i) 60fps
- 3CCD HD Camera



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Systems to be reviewed for NVCS



LifeSize
720p
5Mbps

Polycom HDX 9002 & 9004 – Up to 4Mbps
720p resolution

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BoF details for tomorrow

QUESTnet 2007 Conference Program Page - Mozilla Firefox			
http://www.questnet.net.au/questnet2007/program.htm			
James Cook University & Carlos Isaza Central Queensland University			
5:10pm Coffee and tea for BoF attendees			
5:10 - 6:00	Video Conferencing & Web Streaming Jason Bordujenko & Brett Rosolen AARNet	ENUM National Trial Kevin Sutcliffe & Kevin Stoeckigt AARNet	QRNO Network Architecture and Design Peter kurtz Queensland University of Technology & Merv Connell Central Queensland University
7:00pm Conference Dinner			
Friday 13 July - Conference			
Kuranda		Mossman	Bluewater
8:30 - 8:50 Registration & Coffee			
8:50 - 9:30 Over the Horizon: Global Networking and the Emerging R&E Environment, Jerry Sobieski, Mid-Atlantic Crossroads			
9:30 - 10:10 LHC: Big Science, Big Computing, Big Networks David Foster, CERN			
10:10 - 10:20 Morning tea			

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