



The Access Grid

AG seminars: protocols and using VLC media player

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Introduction

There are many competing video-conferencing systems available and the use of video conferencing will increase. It is reassuring that developments in video conferencing confirm that the mathematical communities in Australia, New Zealand, Canada and the UK have made sound choices to use Access Grid (AG) technology.

As end users, our main issues now centre around our local AG IT support and the support of network engineers (specifically with respect to multi-casting). The Australian Research Collaboration Services (ARCS) has chosen two systems to support: AG for large rooms and high bandwidth and EVO¹ which is ideal for desktops and lower bandwidth internet connections. Usually, different video-conferencing systems do not communicate with each other. However, a bridge for EVO to AG is in the final phase of testing by ARCS and is expected to be available very soon. When available to the Australian community, there will be an announcement on the ARCS website (<http://www.arcs.org.au>). This would mean that a researcher at home or office (without the high bandwidth needed for AG) could participate in an AG session. There is now a clear advantage for the mathematical community to adopt EVO for limited video-conferencing collaboration (such as small meetings for planning, or PhD supervision).

The national program of collaborative teaching of advanced mathematics at Honours level at multiple remote sites by using the AG is now established. Although some seminars have been offered via the AG, we will soon have a seminar series established including some high-profile seminars.

Seminars on optimisation

An Optimisation Group has recently been formed as a Special Interest Group of ANZIAM and is planning a comprehensive list of activities in the area of Optimisation. Planning meetings are being held weekly via the AG and the Optimisation Group has agreed to organise and conduct 'The AMSI Optimisation AGR Colloquium Series'. The leaders are Jonathan Borwein (Newcastle), Andrew Eberhard (RMIT) and Regina Burachik (UniSA). They are all experienced with the use of the AG. Protocols for AG sessions and seminars are being developed and tested (the author is assisting with this and has also arranged for expert AG IT advice from Jason Bell of ARCS). 'Test' and 'trial' seminars are already being conducted across the three lead Access Grid Rooms (AGRs). This testing phase is nearly

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¹EVO is a PC-based multipoint collaboration tool which features advanced video-conferencing.

completed and so the seminars will soon be available to others. The Optimisation Group has agreed that any AGR wishing to participate in their activities will be required to have completed the Quality Assurance process. This will help to ensure that AGRs are correctly set up. Given the expertise and strong focus of the Optimisation Group, the planning and organisation of the AGR Colloquium Series should provide much valuable information for other groups to follow. AMSI's main role here is to facilitate collaboration via the AG and to offer web hosting.

AG seminars by Terry Tao

Terry Tao, Fields Medalist, is a Clay-Mahler Lecturer in 2009 and there are plans for him to give some presentations over the AG. Andrew Hassell, at ANU, is coordinating these lectures and will soon be advertising the details widely. AMSI is providing advice. It's expected that the AG lectures will be:

- discrete random matrices, hosted from Monash University, Wednesday 2 September, early- to mid-afternoon;
- compressed sensing, hosted from a large lecture theatre at UWA, equipped as an AGR, Friday 4 September, 1–2 pm;
- TBA, hosted from the Baume AGR, ANU, Wednesday 23 September, 3:30–4:45 pm.

Appropriate protocols for the presentation, and for the AGRs that wish to join, are currently being developed.

AG seminars: protocols

The development of protocols is a work in progress as we draw from our AMSI experience (with AGR Honours teaching and seminars), the AGR IT community (particularly Jason Bell), the Canadian experience (since 2005) with their coast-to-coast seminars, C2C [3] and the experience and experimentation of the newly formed Optimisation Group.

The protocols will include the following elements.

- Quality assurance (QA) of AGRs. This is a process being taken up internationally and is being driven by Jason Bell. The AGR IT people make an appointment (email j.bell@cqu.edu.au) for about an hour to have their AGR setup checked. Once QA-ed, the AGR may join in activities such as the AG Clay-Mahler Lectures and the Optimisation seminars.
- VPCScreen² (and AGVCR) [2]. Most presentations (for Honours lectures and seminars) do not require control of the software to be given to remote nodes. Although VNC is being used, VPCScreen should be used instead: because VPCScreen produces a video stream of the presentation material, it scales up to a large number of AGRs. It also can be recorded by AGVCR.

²See *Gaz. Aust. Math. Soc.* 36(3), 105–109 for more information about VPCScreen (<http://www.austms.org.au/Publ/Gazette/2009/May09/AccessGrid.pdf>).

- VenueVNC [2]. This should be used if remote control of the software is required (for Honours interactive tutorials and interactive research). This works well only for a small number (about five to eight) of nodes. It is possible to use ‘multicast’ versions of VNC, such as used in the C2C seminar series [3] in Canada (where VNC Reflector is used).

A mix of VPCScreen and VenueVNC was used by Jason Bell to run the one-day workshop on mathematics for 21st century engineers hosted by RMIT with 16 remote AGRs participating. The five nodes presenting used VNC and all others used VPCScreen, see Figure 1 for a ‘wall’ screenshot while the presentation was made from Monash. For such an event, expert AG IT support is necessary.



Figure 1. A screenshot of the ‘wall’, where a mix of VPCScreen at receiving AGRs and VenueVNC at presenting AGRs was used in December 2007 by Jason Bell to run the one-day workshop on mathematics for 21st century engineers.

- VLC Media Player. A presentation that requires a video (with audio) to be played presents a challenge for the AG. VPCScreen [2] handles video (without audio) and animations, such as Maple animations, but doesn’t handle videos such as mpeg and mov files. VLC Media Player is open source, cross platform and handles many video formats.

RMIT (with UniSA and W’gong AGRs) successfully tested the use of VLC to stream some video files. Mark Nelson (from W’gong) gave a seminar at RMIT to La Trobe that discussed the use of videos in mathematics teaching. Mark

had many videos to show: the first was successfully shown but then the VLC was accidentally exited! Although we could reinstate VLC, we were unable to restart the web streaming: the player is simple to use, but the web streaming requires expert IT support to set up. This leads to our next two items.

- Specialist AG IT support. It's important that specialist AG IT support staff are available for testing of current hardware and software and maintenance. They should be present throughout any special events and seminars. This should not be necessary once an Honours course is established since the Lecturer is usually the same throughout and the remote sites that are connecting remain unchanged.
- Data Storage (see p.12 of [1]). The Access Grid Toolkit (AGTk) allows users to upload and download files to the Venue Server. This allows those connected via AGRs to have access to various collaborative files or presentation materials. We recommend that presentations be provided at least two days before the presentation, so that they can be tested at the host AGR, placed into the data storage and then downloaded as a local copy at each of the remote AGRs. Providing files for testing and copying into the Data Storage gives a backup capability: for example, mpeg videos (which are tricky to stream properly) would be available at each AGR where playing locally using VLC would be a simple task.
- List of software and versions. For example, we might recommend that all AGRs have Adobe Reader versions 8 and 9 (the two most current versions) and pdf files must be compatible with these. This would have avoided difficulties with a recent pdf presentation where one of the AGRs had Adobe Reader version 4 and could not read the more recent file!

Conclusion

Collaborative teaching of advanced mathematics across Australia via the Access Grid is expanding with the participation of New Zealand. National seminars are also offered over the AG, but specialist seminar series and some of the Clay-Mahler Lectures will be offered very soon. Protocols are being developed and tested so that the seminars proceed with a minimum of problems.

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