

# AUDF Development Grant Application Form

*Please refer to the Guidelines, then complete each section, but be concise!*

*All criteria must be answered.*

*A response to each question is mandatory. If a criterion is not applicable, please write "N/A" and explain why.*

## Instructions:

1. Enter your information for each heading below in the box provided (the box will 'grow' with your text).
2. Save your application form as a Microsoft Word document, (5.1 6/95, 97/98, 2001/Office X)
3. Name it so that it clearly identifies you. e.g. "John Smith – University - Project Name".

## Project Title:

(less than 10 words please)

Access Grid video implementation on Mac OS X

## Principal Developer:

(the person to be contacted for further information)

Chris Willing

## Applicants Details:

Title:	Prof.	Dr.	Mr	Mr
First Name:	Bernard	Nicole	Chris	David
Last Name:	Pailthorpe	Bordes	Willing	Gwynne
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## Macintosh Development Experience:

(what Macintosh applications have you developed, using which development tools)

**Chris Willing:** original development of AccessGrid (AG) software system for Linux environment (Sydney VisLab, 2001) and supervision of on-going AG development for Fedora, FreeBSD and Slackware, which was the first AG distribution outside of Argonne National Lab (ANL). Design and implementation of a multi-user computer lab at UQ (ITEE), based around an Apple X-Serve system as the file server, featuring 3 high capacity computer displays (4, 8.5 and 9 M-pixels). He maintains a close working relationship with the ANL team and contributes to their planning workshops.

**David Gwynne:** extensive Open Source software development experience, especially with OpenBSD: he is responsible for the USB software stack in the OpenBSD Project. He also has developed: database replication under Postgres; and distributed, scalable mail systems (entirescan).

Both have extensive user support experience in academic/educational environments.

## Project Description:

Be comprehensive, but **do not use more than 250 words** for the basic description. The selection panel will not consider lengthy applications. Please be sure to also address each of the selection criteria below. Do not include your research and publication history.

The AccessGrid (AG) is an open source multicast video-conferencing environment that supports collaboration and interfaces to grid middleware and visualisation environments. The AG was developed originally by ANL ([www.mcs.anl.gov](http://www.mcs.anl.gov) and [www.accessgrid.org](http://www.accessgrid.org)). Although it is possible to install some AG software on a Macintosh, it is not possible to run active AG sessions due to the lack of video integration. We plan to develop the software required to interface the Mac OS X video API (QuickTime framework) to the AG video application v.i.c (and to audio applications if required). This work begins with extraction of relevant QuickTime interface code from OpenMash (UC Berkeley) and VRVS (Caltech); this would then be integrated

into relevant portions of ANL's vic source code, and compiled for OS X. Subsequent steps will be informed by the problems encountered in light of the team's experience. As work progresses we will assess requirements for the entire AG toolkit to work robustly under OS X.

Reference to the canonical University College London (UCL) vic will be made as required; it is expected this port will apply to UCL vic – this may have more widespread applicability.

The project will be demonstrated publicly during the APAC'05 national conference (Gold Coast, Qld) in September 2005.

### **Educational Relevance**

Preference is given to projects that have broad educational applicability. For example, computer laboratory administration software could find application at many universities and other educational institutions.

Pailthorpe, Bordes and Willing built the first AG in Australia at the University of Sydney in 2001. Today there are 15 registered sites in Australia alone. AG are routinely used for lecture delivery in universities with distributed campuses (for instance JCU and UQ-UWA). The AG facilitates geographically distributed research collaborations, and graduate student supervision between remote sites.

In addition UQ students will be exposed to both the development and testing phases of this project. We have several undergraduate and postgraduate students in our lab. We also teach undergraduate classes in computational science and data visualisation from 1<sup>st</sup> to 4<sup>th</sup> year level and host related projects in our lab – those students would interact with and benefit from exposure to this proposed project.

### **Developer Commitment**

Because time-to-market is important, preference is given to projects that are appropriately staffed. In general, it is unlikely that support will be given to major undertakings that are allocated only a small percentage of a single developer's time.

C. Willing will devote 20% of his time to this project. The work will take place in a dedicated R&D lab at UQ (ITEE) for advanced IT and High Performance Computing with two academics, 3 technical staff and 4 research students in 2005 (ITEE, Rm 78-617, [www.vislab.uq.edu.au](http://www.vislab.uq.edu.au)). We will provide funds, matching any AUDF grant, for additional technical support (D. Kosovic) to work on this project.

## University Support

The commitment of the nominating institution to support a project is important. Individuals often have great ideas, but without adequate commitment from the developer's department or faculty, progress may be slow or sporadic. Detail the extent to which your university is prepared to support the project.

UQ VisLab provides access to a rich IT and user interface development lab, which hosts an Apple G5 X-serve Raid Array (1TByte) and a G5 video edit system. The lab has a number of tiled computer displays and a Linux-based AG available for related development.

UQ VisLab is the Access Grid development site for the Queensland Parallel Supercomputing Foundation (QPSF) and the Australian Partnership for Advanced Computing (APAC) (Willing and Kosovic).

QPSF will provide \$10,000 technical salary, matching any AUDF grant.

## Defined Deliverables

The AUDF has been established to produce real products. It is not designed to support pure research. Applications should define what the results of the project will be, when they will be completed, and how they will be made available to interested users. Specifically, you should identify who owns the results of your work, and the proposed licensing and distribution arrangements.

- 1) software application (package) to interface vic to relevant Mac OS X API's.
- 2) html documentation
- 3) demonstration of system at APAC'05 national conference in September 2005 (Royal Pines, Gold Coast)

## Novelty

New ideas are strongly encouraged. The AUDF is intended to foster these ideas. Projects that take advantage of, and enhance the value of uniquely Apple technologies such as QuickTime, AppleScript and Java tools for the Macintosh will be given high priority. Projects that focus on Firewire, USB, AltiVec, Airport, Bluetooth and Rendezvous technologies will be important to Apple. Projects are preferred where they will produce a piece of software or hardware that does not replicate an existing solution.

There is currently no working, fully functional port of the AG system for the Mac OS X. Prior work (eg ANU, JCU, ANL) has made partial progress – we now have the opportunity to leverage that work to finalise the required development.

Once the AG can run actively on the Macintosh, the community of Apple users will be able to use and benefit from AG – some of these are creative/media institutions or industries: they are likely to expand the range of AG applications and collaborations.

## Export Potential

Apple Computer has entered into a Partnership for Development with the Australian Government which commits Apple to support R&D which has the potential to earn export revenue for Australia. You should identify the likely export markets for your product, if there is one.

AG is deployed globally in advanced IT (eg High Performance Computing) communities: these provide a natural showcase for both Apple and for Australian ITC R&D. Although the AG is open source, the Red Hat business model could be used to generate income. Another source of export is the use of the AG in domain-specific applications: for instance Japanese researchers developed a karaoke application over the AG (demonstrated at Supercomputing'03 in Phoenix).

## Research Potential

Does this project have any potential for inclusion in the DEST Higher Education Research Data Collection (HERDC)?

Yes. Upon completion this work will be published in a refereed journal or conference proceedings with the acknowledgement of Apple and AUC.

## Development Schedule:

In this section, you are making a commitment to complete your project on time. You should include major project milestones, such as when the software will be available for demonstration, user testing and shipment. The exact nature and timing of such milestones is dependent upon the nature of the project, however you must provide some indication of at least one major milestone. Periodic reviews will be conducted, to ensure that you remain on track. Continued support is contingent on meeting milestones. An unsatisfactory review may result in withdrawal of support.

• Commencement Date:	March'05
• Milestone 1 Description and Date:	July'05: write QuickTime based video capture module for ANL's vic (based on OpenMash vic). Integrate "new" vic ANL into AG toolkit
• Milestone 2 Description and Date:	Augt'05: completed media tools will allow deployment and testing of Mac OS X machines as AG nodes
• Completion Date:	Sep'05: demonstration at APAC'05, submission of changes to ANL, UCL

## Progress to Date:

If your project has commenced, please define its status.

Have successfully compiled and run canonical UCL vic in OS X environment

## Resources Available for this Project:

In this section, you are identifying and quantifying resources that you have at your disposal to work on your project. Do not list equipment unless it is available on a full-time, dedicated basis. Do not list staff unless they are available at least 20% of the time. **Quantify their availability.**

<b>Personnel</b>	Chris Willing (20%), D. Kosovic
<b>Hardware/Software</b>	Apple G5 X-serve Raid Array (1TByte), one G4 laptop, an AG and several Linux systems.
<b>Research Grants and Other Support Obtained/Pending</b>	QPSF: salary support for personnel

**Resources Requested for this Project:**

Identify and quantify resources that you would like the Apple University Development Fund to provide. Please be realistic. It is unwise to ask for equipment which is known to be in short supply, or which is blatantly in excess of reasonable requirements. **Ensure that firm quotations are provided for all third party equipment.**

Apple G4 & G5 for development and testing– see below

**Apple Hardware/Software:**

Provide product codes for all Apple items. Justify each item.

Total: \$9,714.10

- Mac G4 15" Powerbook (Superdrive, 1.5GHz proc): \$3,518.90
- Mac G5 Workstation (Dual 2GHz PowerPC, 1GB DDR400 SDRAM (PC3200) - 2x512, 160GB Serial ATA - 7200rpm, 8x SuperDrive (DVD-R/CD-RW), NVIDIA GeForce 6800 GT DDL, 56K V.92 Modem, Keyboard + Mouse, Mac OS X, Apple Cinema Display 20" flat panel): \$5,783.80
- Two x iSight webcams (@205.70): \$411.4

**Third Party Hardware/Software (must include quotes):**

Provide firm quotations for all third party items. Justify each item.

none

**Other Support:**

e.g. programming support. Please note that such support is allocated on a lower priority.

none

**Please give details of existing work by others, including commercial products. What makes your project unique?**

Willing developed the Linux version of the AG in 2001. In 2004, ANL developed a port for the Mac. We have installed this port on our Macintosh and it does not work because available media tools (especially `vic`) are not yet ported to OS X.

**How will your project promote the Macintosh in Education?**

Describe briefly why your project would make the Macintosh a more compelling solution in Education.

We will demonstrate the project during the APAC'05 conference in September 2005, which attracts researchers from Australian universities.  
The availability of a port of the AG software for OS X, is likely to increase the number of Mac-based AG nodes.

**How will you make the product available to other AUC members?**

Describe briefly the intended distribution arrangements. The AUC has a strong preference for projects with a commitment to share results on a preferential basis within the AUC community (eg through shareware models).

Source code and documentation will be available from the AccessGrid web site ([www.accessgrid.org](http://www.accessgrid.org) and [vislab.uq](http://vislab.uq)). Project description and results will be posted on our web site ([vislab.uq](http://vislab.uq)). We have direct collaborations on related projects with other universities: both in Queensland, via QPSF, and nationally via APAC.

**Please enclose a supporting letter from your Head of Department, and provide the following details for your Head of Department.**

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