

CGNS Steering Committee Telecon Minutes
25 October 2000, 2:00 Eastern

1. The meeting was called to order at 2:00 Eastern time. There were 14 attendees, listed in Attachment 1.
2. The minutes of the 24 August meeting were reviewed and approved as posted on the web site.
3. Steering Committee Nominations – The process for adding new voting members to the Steering Committee this year will be for the Chairperson to collect nominations and develop a recommended slate of candidates for addition and removal from the list. This slate will be discussed and revised at the December telecon, and approved at the January face to face meeting. At present, there are 13 voting members. Two additional candidates have been put forward: Alexandre Corjon of Aerospatiale Matra Airbus and Greg Power of AEDC (potentially representing the US Air Force). These additions would put the membership at 15, what is called for in the Charter. Additional recommendations are solicited. At present there is no need to expand the number of members beyond the Charter, or to ask organizations to step down.
4. ISO Status – Ray Cosner sent Bob Bush input on the meeting of the ISO committee in October since he was unable to attend the telecon. The meeting went well, although it was decided to postpone Gates 2 and 3. Gate 3 requires full documentation that is not yet in final form. It is hoped that this will be ready for the February meeting, although it may slip into June. There was no difficulty with the CGNS content, the primary remaining actions are to re-format and generate documentation in a form suitable for the ISO community. Ray provided the current drafts for those interested. There was a request to post them on the web site. Bob will ask Ray if it is appropriate to post them on the web, either with a direct link from the CGNS web site, or under an unpublished site to be distributed to the extended Steering Committee.
5. Documentation – Charlie Towne announced that the SIDS Version 2 Beta 1 has been completed and posted. The addition of time accurate and iterative data will be released with the software as Beta 2 in mid November. Beta 3 will include a merging of the file-mapping document into the SIDS, and the current chemistry extensions. This should be ready by the end of the year. It was suggested that we announce and release Version 2 at the January meeting/conference.
6. Chris Rumsey said the draft version of the User's Guide is almost ready. This includes some sample code, which he will also release. The software will be released both with the User's Guide, and under the Utilities web site. Comments are solicited when the Draft User's Guide is released.
7. David Edwards, reporting for Steve Legensky, stated that the paper abstract for a CGNS applications paper should be ready by 31 October. A survey to collect information for the paper was sent to CGNS users with responses due by 7

November. This data will be used for the paper, and **responses by all parties is requested**. We responded to a request from the AIAA Aerospace America year in review – Interactive Computer Graphics for a contribution to an article. The final form can be found in attachment 2.

8. User Support – No volunteers for Support Focal Point have come forward. There are about 400 registered CGNS users at present. A 'ListBot' e-mail user forum has been set up, accessible from the web site. To date only a few people have signed up. Members are encouraged to utilize this site for user support and discussion.
9. Steve Feldman suggested contacting the 'owner' of CFD–Online to see if we could or should add a CGNS forum to that popular site. There being general support for the idea, Steve will contact them.
10. Extensions – Diane Poirier reported that grid motion API programming is almost complete, only testing and documentation remains before an expected mid November release as V2beta2. She also hopes to have the chemistry extension implemented by the end of the year for release of V2beta3. The rest of the extensions are in various states of readiness, and will be implemented in the API for potential release in V3 next year.
11. Hierarchical structures – Michel Delanaye is implementing an application specific version for internal purposes, and would like feedback on the proposal as soon as possible to get general agreement for an official extension to the standard. Diane reported that M. Aftomis (Spelling?) is preparing a counter proposal for review. Fluent has reviewed the proposal, and it looks like it should meet their needs. Adapco will also look more closely at the proposal to ensure it meets their needs.
12. A discussion of the need for summary information followed. After some discussion it became clear there is a need for summary information that describes the content of a particular file. A consensus seemed to form around the idea of a utility that would scan the file for its contents, and another utility that would use this information to classify the information. Given the classification, applications could make assumptions about the file and avoid messy checks for data availability. There is a need for a classification system (e.g. solution with conservation variables, non-dimensional structured grid, hierarchical structures with at most 2 children,?). There were no volunteers to develop this system, but it was agreed that we should continue to pursue the idea, the classification system and the utilities.
13. Chemistry – Ed Hall forwarded some concerns about the proposed extension, primarily centered on missing data (thermodynamic properties of species, reaction rates, etc.). Ed was not available at the telecon, but Bob indicated that he responded that it was hoped that this information would be the subject of future extensions. Bob will contact Ed to inquire if the current extension does not preclude the future (or application specific) addition of the information he requires. Assuming this to be the case, we propose implementing the extension as described, and soliciting future extensions.

14. Misc. extensions – These are ready for implementation, but have had no comment. The implementation will be held for V3.
15. Spray–2phase flow – There is a draft out for comment. The team (Darian) solicits comments on the proposed content. The proposal needs to be refined more fully defining the proposed data structures. Ed Ascoli will request this refinement from Armen Darian.
16. Hanging Nodes – Dave Edwards indicated that they should have a proposal by the first of December.
17. Wall functions and Turbomachinery Boundary Conditions – Bob Bush indicated that he has taken no action on these extensions, but will try to revive and push them forward soon. Anyone interested in more immediate action is encouraged to participate.
18. API Link Support – Chris Rumsey has requested API support for links. He has a rough proposal. Due to priorities, we will try to implement early next year.
19. Additional Items – Bob Bush will arrange the next telecon for the first week of December. We will discuss the agenda for the January meeting.
20. The January meeting is tentatively scheduled for Monday night at Reno.

Attachment 1: Attendees

Bob Bush	UTRC
Chris Rumsey	NASA Langley
Dave Schowalter	Fluent
Don Roberts	Ametec
Ed Ascoli (for Armen Darian)	Boeing
Charlie Towne	NASA Glenn
Dan Dominik	Boeing
Diane Poirier	ICEM CFD Engineering
Francis Enomoto	NASA Ames
David Edwards	Intelligent Light
Doug McCarthy	Boeing Commercial
Todd Michal	Boeing Phantom Works
Michel Delanaye	Numeca
Kevin Mack	Adapco

Attachment 2: Aerospace America Article

Interactive Computer Graphics

Outstanding developments in Y2K included: collaborative systems for better utilization of graphics hardware, co-processing systems for visualizing large-scale simulations, an emerging ISO standard for CFD data exchange, and commercialization of automatic feature extraction tools.

Many aerospace companies and government laboratories have established Visualization Lab's that contain specialized SGI graphics workstations to generate hi-resolution computer graphics images. These labs have been poorly utilized in the past because engineers often had to travel great distances to use the graphics hardware. This situation is rapidly changing as vendors adapt their software to utilize the Internet and corporate intranets. For example, EnLiten is a new product from Computational Engineering International (CEI) that allows high-end visualizations to be easily and cost-effectively shared throughout an enterprise. EnLiten supports 3D stereo viewing and a full range of computing and display systems, from notebook computers to workstations to semi-immersive environments such as the NCSA ImmersaDesk. It plugs into well-known browsers and viewers such as MS Internet Explorer, MS PowerPoint, and Netscape.

Parallel computing is rapidly emerging as the method of choice for visualizing large-scale CFD solutions. Intelligent Light has built upon MIT's pV3 client-server infrastructure with the popular Fieldview software. The result is a fully supported, robust commercial "graphics client" for the pV3 system. pV3 is used throughout the world for visualization co-processing, that is, concurrent simulation and interactive visualization. Intelligent Light's implementation supports systems ranging from laptop Windows PC's through UNIX clusters and supercomputers and enables enterprise-wide visualization.

Every CFD code that enters the marketplace generates datasets with a slightly different format than their competitor. Products that utilize these datasets, i.e., pre- and post-processing software, have to support approximately 50 different file formats at the present time. The lack of standardization forces vendors to spend an inordinate amount of time implementing and maintaining file exchange software. To combat this software crisis, a consortium of CFD users and vendors have adopted a formal standard for exchanging CFD data called the CFD General Notation System (CGNS). The CGNS system facilitates the exchange of data between sites and applications, and stabilizes the archiving of aerodynamic data. An Application Program Interface, implemented by ICEM CFD Engineering, is platform independent and simplifies the installation of CGNS in C, C++, and Fortran applications. CGNS was conceived back in 1994 as a means to promote "plug-and-play" CFD via a file specification standard and supporting code that could be distributed freely. In 2000, the CGNS Steering Committee affiliated with AIAA as a subcommittee, made progress in proposing CGNS as an ISO standard, and added capabilities to the standard to handle increasingly specialized and complex meshes. Currently, there are over 20 CFD applications that support or have translators for CGNS. Further information about this effort can be found at <http://www.cgns.org/>.

Automatic feature extraction tools have transitioned from research institutions to commercial vendors of post-processing software in the past six months. The open-source FX (Feature eXtraction) library released by MIT in June 2000, has been adopted by two leading suppliers of CFD visualization software; Intelligent Light (Fieldview) and CEI (EnSight). Feature extraction tools automatically deduce the location, shape, and strength of specific features without human intervention, and

do so in substantially less time than their human counterpart. This is a different paradigm than typical graphical analysis methods where the engineer has to do the work, interpreting the data from imagery and using their insight or experience to infer and find specific patterns. Feature extraction algorithms are programmed with domain-specific knowledge, so they do not require a-priori knowledge of places to look for interesting behavior. The latest feature extraction tools, developed at MIT and NASA Ames, automatically calculate vortex cores, separation and re-attachment lines, and shock surfaces. These tools will be available in Fieldview 7 and Ensign Gold in the final quarter of Y2K.
David Kenwright

Captions:

Figure 1 [sh_side35.jpg] (to be supplied by CEI)

Figure 2 [f16.jpg] An F16 solution from the USAF Cobalt group. Vortex cores are colored by strength and were used to guide the creation of streamlines. (Image courtesy of Intelligent Light)

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