

CGNS Steering Committee
Telecon Minutes
4 October 2005
11:00 AM Eastern Time

1. The meeting was called to order at 11:05 AM. There were 9 attendees, listed in [Attachment 1](#).
2. The minutes of the 2 Aug 2005 meeting were approved as posted on the web site.
3. Regarding the SIDS Ballot for the AIAA Recommended Practice: we did not achieve a 2/3 response from voting members, so AIAA did not pass the ballot measure! This indicates a problem we are facing on the committee: several members are no longer active. Rumsey will contact all current steering committee members and ask for commitment; no response will result in vote for removal from steering committee.
4. Status of previous action items:
 - (a) Towne will upgrade Poinot's SIDS-to-HDF5 documentation with 2.4 additions and post (along with other 2.4 docs) after V2.4 comes online.
 - Done.
 - (b) Wedan will make change in CGNS HDF5 software so viewer can read (see) character strings in the HDF5 files.
 - done
 - (c) Wedan will complete changes for V2.4 and will announce when ready.
 - done
 - (d) Allmaras will write explicit documentation, for addition to the SIDS, describing face-based storage and providing explicit examples for using the method, and will send to Rumsey and Michal for review.
 - not done yet; action item carries
 - (e) Wedan will change the MLL to return element list instead of point list when appropriate.
 - determined to be unimportant; action item dropped
 - (f) Rumsey and Poinot to coordinate CGNS Panel Discussion and possible tutorial for AIAA's June 2006 meeting in San Francisco.
 - ongoing, with Hauser also helping to coordinate; status given below; action item carries
 - (g) As soon as V2.4 comes on line, Towne will bundle up V2.3 documentation for Wedan to post.
 - done
 - (h) Norris will try to work with the (currently commented) Rind-for-unstructured fixes and see if they meet his needs.
 - done; they are working very well

- (i) Wedan will write documentation for SIDS on Rind-for-unstructured and send to Rumsey and Norris.
 - not done yet; action item carries (docs needed for MLL)
- (j) Poinot and Wedan will work to resolve issue of “link of links” problem with our HDF5 implementation.
 - this item depends on changes in HDF-5 (Koziol of NCSA); this item moved to Tentative to-do list in association with HDF-5 switchover ([Attachment 2](#)). Rumsey will contact Koziol to learn status of HDF-5 beta implementation of “external links” for helping to solve “link of links” problem.
- (k) Wedan will change the license in the software and on the website to zlib, and will forward appropriate wording to Towne.
 - done
- (l) Towne will change the license in the documentation (Charter and anywhere else it appears).
 - done
- (m) Wedan will update the *www.cgns.org* webpage describing CGNSTalk.
 - done

5. San Francisco AIAA meeting

- (a) Current plan calls for 2 major CGNS activities at this meeting: a Panel Discussion and an evening CGNS tutorial
- (b) Panel discussion will occur under the auspices of the Fluid Dynamics Technical Committee. It will occur during the regular sessions, and will be titled something like: “CGNS Practical Applications in CFD”. We will have 5–7 Panelists, who spend 15 minutes (each) making a presentation (no paper), then we open the floor for an hour or so of general discussion and questions at the end. Poinot has several possible panel members he has been working to get a commitment from; also Michal & Hann volunteered (likely); also Wedan could serve.
- (c) The CGNS tutorial will probably occur in the evening. We will be asking for steering committee members to volunteer to help with this event (perhaps contributing to the presentations). A tentative outline for this is (2.5 hrs):
 - Brief intro & overview (10 min)
 - Tutorial on general use of the library, compiling, setting up, use of mid-level calls in CFD codes, etc (20 min)
 - Tutorial for simple structured grids, flow solns, & BCs (30 min)
 - Tutorial for use with unstructured grids (30 min)
 - Advanced topics TBD (30 min)
 - More advanced topics/Discussion/questions (30 min)

6. Open Items (number 15 below):

- (a) Regarding HDF-5 “to do” list ([Attachment 2](#)), Rumsey will review the HDF-5 “to do” list and revise if necessary

- (b) Regarding the issue of resolving differences between SIDS and ISO/STEP, this is still tabled for the foreseeable future
- (c) Regarding certification process: (a) *adfviewer* has a compliance checker that is continually undergoing improvements; (b) another tool, available through PyCGNS and built on XML grammar, is in need of testing and approval of the grammar by the steering committee. Poinot will update the PyCGNS website with regard to the XML compliance tool, then volunteers on the steering committee will be asked to help evaluate it.
- (d) Regarding PYRA element needed for unstructured grids, this change needs to wait for Version 3.0, because it changes the enums, and forward compatibility is lost in a major way.
- (e) Regarding Rind for unstructured: this has been done; item removed from list

7. ISO/STEP

- (a) Hunten sent some planning documents on the AP 209E2 work. [See “**AP209E2 Initial Module Breakdown, V1.1**” (PDF, 7 pages, 20K), and “**AP209E2 Planning Model**” (PDF, 2 pages, 10K).]

8. Documentation issues and CGNSTalk issues:

- (a) V2.4 is available now
- (b) Rumsey will update “Elements and Documentation” section of the CGNS Overview and Entry-Level Document to reflect option of using HDF-5, and send to Towne to post.

9. Software status/discussion:

- (a) CGNSTalk question about `cg_descriptor_read` allocating memory but not deallocating, whereas all other routines make user allocate memory himself. Wedan will look into the issue of memory allocation for `cg_descriptor_read`.

10. HDF-5 status/discussion:

- (a) Draft policy statement regarding HDF-5 ([Attachment 3](#)) was discussed. Committee members decided it would be a good idea to post this conspicuously, as a tentative policy statement, to allow time for feedback, and to give vendors a heads-up. Wedan will post HDF-5 policy statement on website, and include link to HDF-5 site.

11. Extensions status/discussion:

- (a) Issue of mismatched abutting interfaces: the idea was raised in CGNSTalk about having `InterpolantsDonor` be an optional node, rather than required. It is possible (for mismatched interfaces) that a user may want to include some information, but leave details as code-specific information rather than complying fully to the CGNS standard. Rumsey will look into the issue of having `InterpolantsDonor` be an optional node for `GridConnectivity`, and will respond to the committee about it.

- (b) Issue of need for source terms for internal BCs: Poinot found a way to handle this, but it brings up the issue in general that we may need to expand the User's Guide to help show how to handle specific circumstances such as this. Poinot will send Rumsey a copy of his tree to show how he handled source terms for internal BCs. This issue in general is being added as an "Open Item" for the future. Perhaps after the San Francisco meeting we will have additional needs for addition to the *User's Guide*.

12. Other issues:

- (a) Poinot recently presented a CGNS paper at a rotorcraft conference. Poinot will e-mail a copy of his paper to Towne for posting.
- (b) Committee decided to not hold another telecon prior to Reno. Thus, the next meeting will be face-to-face at the Reno AIAA meeting, Jan 11, 2006; 7PM (Wednesday).

13. Meeting was adjourned at 12:10 PM.

14. Summary of **action items**:

- (a) Rumsey will contact all current steering committee members and ask for commitment; no response will result in vote for removal from steering committee.
- (b) Allmaras will write explicit documentation, for addition to the SIDS, describing face-based storage and providing explicit examples for using the method, and will send to Rumsey and Michal for review.
- (c) Rumsey, Poinot, and Hauser to coordinate CGNS Panel Discussion and possible tutorial for AIAA's June 2006 meeting in San Francisco.
- (d) Wedan will write documentation for SIDS and MLL as appropriate on Rind-for-unstructured and send to Rumsey, Norris, and Towne.
- (e) Rumsey will contact Koziol to learn status of HDF-5 beta implementation of "external links" for helping to solve "link of links" problem.
- (f) Rumsey will review the HDF-5 "to do" list and revise if necessary
- (g) Poinot will update the PyCGNS website with regard to the XML compliance tool
- (h) Rumsey will update "Elements and Documentation" section of the *CGNS Overview and Entry-Level Document* to reflect option of using HDF-5, and send to Towne to post.
- (i) Wedan will look into the issue of memory allocation for `cg_descriptor_read`.
- (j) Wedan will post HDF-5 policy statement on website, and include link to HDF-5 site.
- (k) Rumsey will look into the issue of having `InterpolantsDonor` be an optional node for `GridConnectivity`, and will respond to the committee about it.
- (l) Poinot will send Rumsey a copy of his tree to show how he handled source terms for internal BCs.
- (m) Poinot will e-mail a copy of his paper to Towne for posting.

15. Summary of **open items** from prior meetings (these are different from action items, in that they are open or unresolved issues that we want to keep track of, but there are no specific actions required of anyone at this point in time):

- (a) Resolve HDF-5 "to-do" list ([Attachment 2](#)).
- (b) Eventually resolve any differences between SIDS and ISO/STEP.

- (c) Need for official certification process (test for compliance)
- (d) Need to add Karman's additional PYRA element type to allowed list (in software and in SIDS)
- (e) Need for additional specific examples in *User's Guide*, such as how to handle internal BCs

Attachment 1: Attendees

Armen Darian	Boeing - Rocketdyne
Richard Hann	Ansys / CFX
Thomas Hauser	Utah State
Todd Michal	Boeing - St. Louis
John Norris	Ctr for Sim of Advanced Rockets (U of Illinois)
Marc Poinot	ONERA
Chris Rumsey	NASA Langley
Charlie Towne	NASA Glenn
Bruce Wedan	Ansys / ICEM CFD

Attachment 2: Tentative to-do list in association with HDF-5 switchover

- Complete and test parallel implementation
- Complete and test API capability to automatically detect and switch between ADF and HDF-5 (transparent to user?)
- Assess/minimize impact on software vendors using CGNS
- Make changes recommended by HDF-5 to improve usability with HDF-5 (e.g., character strings as opposed to character arrays)
- Assess compression capability of HDF-5
- CGNS configure scripts will need to be modified to check for availability of appropriate HDF-5 libraries.
- Possibly add flag-based options when opening CGNS files. For example: “follow links” vs. “don’t follow links”; “use ADF” vs. “use HDF-5”; “translate file automatically” vs. “leave the file as-is”; “compress” vs. “don’t compress”.
- Look into eliminating need for ID’s from MLL
- Resolve “link-of-links” problem: will require HDF-5 fix by NCSA (beta implementation of “external links” is in the works)

Attachment 3: Draft CGNS Policy Statement regarding HDF-5

The CGNS implementation of SIDS, so-called MLL, was originally built using a file format called ADF (Advanced Data Format). This format was based on a common file format system previously in use at McDonnell Douglas. The ADF has worked extremely well, requiring little repair, upgrade, or maintenance over the last decade.

However, ADF does not have parallel or compression capability, and does not have the support and tools HDF5 offers. Also, HDF5, supported by the National Center for Supercomputing Applications (NCSA), has rapidly grown to become a world-wide format standard for storing scientific data. HDF5 has parallel capability as well as a broader support base than ADF.

Therefore, the CGNS Steering Committee has made the decision to adopt HDF5 as the default (official) data storage mechanism. We are currently in the process of making the switch. In doing

so, however, we have learned that there are some issues associated with usage of HDF5: it has slower I/O for files with many (thousands of) nodes, and its file sizes tend to be significantly larger than ADF files in general. These issues make the switch more complicated, but we have decided to count on NCSA to continue to improve HDF5 and hopefully eliminate the problems at some point in the future.

We have also learned that it is possible to easily support both ADF and HDF5 formats simultaneously, giving the user the capability to choose between them.

Therefore, we have decided to continue forward with the “switch”, with the following as our goal:

The CGNS Steering Committee considers HDF5 to be its official, recommended storage format. However, ADF will continue to be available for use, with the CGNS mid-level library capable of (1) using either format and (2) translating back and forth between the two.