CGNS Steering Committee
Meeting Minutes
12 January 2005
7:00 PM Pacific Time

1. The meeting was called to order at 7:10 PM. There were 19 attendees, listed in Attachment 1.
2. The minutes of the 17 November 2004 meeting were approved as posted on the web site.
3. Chair and Vice-Chair positions
   (a) The 2-year term for Chair expired. It was moved that Rumsey be reappointed as chair for a second term (Jan 2005 – Jan 2007). The motion carried.
   (b) A discussion was held on the need for a Vice-Chair position. The Vice-Chair would assist the Chair with his or her duties, with the expectation of taking over the Chair position when the current Chair's term expires. Members were encouraged to consider applying for this position; this subject will be further discussed at the next telecon.
4. Status of previous action items:
   (a) Towne will make changes in CGNS Charter document.
      i. Done.
   (b) Hauser will check into parallel issues regarding time-dependent data.
      i. Can do time-dependent fine in parallel as long as set total number of time steps up front
      ii. Need to discuss certain issues with HDF5 people. Hauser will provide Rumsey a list of these.
   (c) Rumsey will circulate CGNS flyer to steering committee for comments.
      i. Done. One-page flyer produced and distributed at Reno conference.
   (d) Poinot will work on completing SIDS-to-HDF5 documentation; Wedan, Rumsey, Towne, Koziol will be reviewers.
      i. In process. Documentation currently under review. Action item carries.
   (e) Michal will check with other Boeing people to see if they can test EM extension.
      i. Not done yet. Action item carries.
   (f) Wedan will look into good way to implement the disabled chunk-search fix in ADF.
      i. Done. Change made permanent. The only down side is that the storage temporarily doubles during the write, with a final slight (10%) increase in file size at the end.
   (g) Van der Weide will try deleting node and then writing (using ADF) on one of his big test cases and report back.
      i. Done. No problems (no increase in file size) with this process.
   (h) Rumsey will send e-mail to CGNSTalk about testing HDF5 version of CGNS, and also will try to develop a list of what users there are and what platforms they have tested on.
      i. Done. Only one response received. Discussion in HDF5 section below.

(i) Wedan and Wall will work out details about extensions & get latest version in place for V2.4.
    i. Done.
(j) Rumsey will initiate documentation on new extensions; Wall and Towne will help.
    i. In process. Action item carries.

5. ISO status/discussion:

(a) Status from Cosner (e-mail):
    i. No realistic prospect of regaining Boeing funding, and thus Boeing participation, for this project. Authority to decide funding for ISO-STEP projects now rests with a Boeing org that is focused on CAD tools for mechanical/structural design. They have no interest in development of a fluid dynamics standard.
    ii. ISO-STEP has decided to merge the draft CGNS-based fluids standard into the existing standard for finite element solid mechanics (AP 209), because there is a high degree of common content. Therefore, the standard will be discrete-element models for both fluids and solids. This effort is being led by Keith Hunten of Lockheed Martin, Fort Worth.
    iii. The combined fluids-solids standard will be released in a new edition (update) of AP 209. A release date has not been established, but it is unlikely to be in 2005.
(b) Committee held brief discussion on compatibility of CGNS with the ISO version now that the ISO version may end up being radically different.
    i. Will CGNS still achieve a certain level of compliance?
    ii. Does the committee need another "ISO representative" to keep track of the new developments?
    iii. Decision for now to try to keep communication lines open. Rumsey to contact Keith Hunten of Lockheed Martin.

6. Documentation issues and CGNStalk issues (Towne):

(a) Status of V2.3 becoming revised AIAA recommended practice
    i. Day and Cawley said most of our committee members have turned in their initial survey forms. So far our committee is made up of: 4 from Government, 6 from Vendors, 7 from Users, and 2 from Academia. Day said that this balance is good (no one group has more than 50%), so there is no problem continuing with the balloting process. The ballots (voting to adopt latest SIDS version as AIAA recommended practice) will be e-mailed to steering committee members soon.
(b) Updated documentation for V2.4beta (SIDS, SIDS-to-ADF, and MLL) is underway. Towne will post changes for everyone to check. Poinot's new SIDS-to-HDF5 document will also need to eventually incorporate these changes.

7. Software status/discussion (Wedan):

(a) V2.4beta still has not been announced. Wedan plans to make some additional changes and then officially announce it (also see discussion in HDF5 section below).

8. HDF-5 status/discussion:

   (a) Rumsey reported that Koziol (NCSA) e-mailed to say that they were planning to implement “creation order” tracking of objects in groups for the 1.8.0 release (due approximately in March 2005). He also continues to work on speedup for the large number (thousands) of zones (which is still significantly slower than ADF).
   (b) Rumsey only received 1 response from users who tried the HDF5 version. The comments were:
      i. it is not backward compatible
      ii. the HDF5 version of the test files were 2-3 times larger than the ADF files
   (c) Discussion of these issues
      i. Backward compatibility should be easily overcome through converters between ADF and HDF5. These converters already exist. Software should be able to incorporate the converters.
      ii. The issue of larger HDF5 files was noticed by other people as well. If only 1 zone, then the ADF and HDF5 files are usually of similar size. It is with many zones that they tend to be different. Rumsey will contact Koziol to make him aware of this issue.
      iii. To summarize, there appears to be 2 issues regarding HDF5 that are “worse” than with ADF files: first is excessively slow I/O when there are many (thousands) of zones; second is larger file sizes, even for “standard” files.
   (d) Discussion of switchover to HDF5
      i. Discussion about HDF5 two problems, and how they affect our switchover.
      ii. Creation ordering in CGNS can probably be thrown away.
      iii. Wedan will make change in CGNS HDF5 software so viewer can read (see) character strings in the HDF5 files.
      iv. IL is looking at compression issues. Legensky plans to keep the committee informed about what they find.
      v. With new version of HDF5, links are a lot faster.
      vi. Hauser currently has some parallel API calls, similar to partial read/writes just added by IL.
      vii. The (unchanged) list of things to do/consider prior to HDF5 switchover is included below.
      viii. Final decision of committee:
         A. Do not formally switchover to HDF5 yet. We need to resolve some of the performance and size issues first.
         B. V2.4beta will be modified by Wedan to include HDF5 as an option (at compile time). This beta release can then undergo further testing. We will re-evaluate formal switchover date in the future.

9. Extensions status/discussion (Wall, Wedan):

   (a) Fiedler (UIUC) made suggestion in CGNSTalk about allowing Rind for unstructured data. Apparently the change is easy. Wedan will look into the change and will contact Rumsey about it. The change would also involve changes to the documentation.

(b) Issue about polyhedral cells brought up. CGNS currently cannot handle them appropriately, and they are more and more in use by commercial CFD codes. It may fit under "N-gon", but additional info is needed (how ordered). Michal will write a first draft proposal to handle polyhedral cells.
(c) Karman mentioned a needed capability for a particular unstructured type that is currently missing. He will write this up and send to Rumsey.

10. Other issues:

(a) Review status of open items - deferred to a later meeting
(b) CGNS user's meeting
    i. tentative time for this will be at Reno 2006
    ii. possibly have a short training session in one of the rooms
    iii. possibly use extra space in exhibit hall (booth?)
    iv. Rumsey will look into these possibilities
(c) Next telecon: in roughly 2 months time
(d) 3 CGNS-related papers were presented at this Reno meeting: 2005-1381, 2005-1155, and 2005-0334. Hauser will send a PDF of his paper to Towne to post. Poinot will send a PDF of his paper to Towne to post. Poinot will contact author of 0334 (Iepan) to obtain PDF to send to Towne to post.

11. Meeting was adjourned at 9:10 PM.

12. Summary of **action items**:

(a) Hauser will provide Rumsey a list of issues that need to be discussed with the NCSA (HDF5) people.
(b) Poinot will work on completing SIDS-to-HDF5 documentation; Wedan, Rumsey, Towne, Koziol will be reviewers. Will need to eventually incorporate new extensions (see (d)).
(c) Michal will check with other Boeing people to see if they can test EM extension.
(d) Towne will complete and post draft documentation on new extensions.
(e) Rumsey will contact Keith Hunten of Lockheed Martin.
(f) Rumsey will contact Koziol to make him aware of issue of larger size (factor 2-3) of HDF5 files.
(g) Wedan will make change in CGNS HDF5 software so viewer can read (see) character strings in the HDF5 files.
(h) Wedan will modify V2.4beta to include HDF5 as an option (at compile time), then will announce it.
(i) Wedan will look into change required to allow Rind data for unstructured, and will contact Rumsey about it.
(j) Michal will write a first draft proposal to handle polyhedral cells.
(k) Karman will write up description of need for a particular unstructured type and send to Rumsey.
(l) Rumsey will look into possibility for CGNS user's meeting in Reno 2006.
(m) Hauser will send PDF of his CGNS Reno paper to Towne to post.

(n) Poinot will send PDF of his CGNS Reno paper to Towne to post.
(o) Poinot will obtain PDF of Iepan's CGNS Reno paper and will forward to Towne to post.

13. 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) With V3.0 release, eliminate the `Pointlist/Range` + `CellCenter` possibility (and thus remove the need for `GridLocation` under `BC_t`). Next major release of API will need to automatically make the alteration (transparent to the user). Documentation (SIDS, User's Guide, other?) will need to be changed.
(b) Resolve HDF-5 "to-do" list (Attachment 2).
(c) Issue of 8 units – need consistency between `DimensionalUnits` and `DimensionalExponents`.
(d) Eventually resolve any differences between SIDS and ISO/STEP.
(e) Question of need (or preference) to have alphanumeric sorting of everything (like is currently done for zones)
(f) Need for developing certification process (official test for compliance)

Attachment 1: Attendees

Theresa Benyo	NASA GRC
Bob Bush	Pratt & Whitney
Craig Day	AIAA
Meredith Cawley	AIAA
Dan Dominik	Boeing - Rocketdyne
Matt Godo	Intelligent Light
Thomas Hauser	Utah State
Steve Karman	UT Chattanooga
Steve Legensky	Intelligent Light
Todd Michal	Boeing - St. Louis
Marc Poinot	ONERA
Chris Reed	Lockheed Martin
Don Roberts	Tecplot
Chris Rumsey	NASA Langley
Greg Stuckert	Fluent
Edwin Van der Weide	Stanford
Stephane Viala	Airbus
Bruce Wedan	ICEM CFD
Nick Wyman	Pointwise

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)
- HDF-5 must fix “creation tracking”
- Assess compression capability of HDF-5
- Create SIDS-to-HDF-5 documentation (Poinot)
- 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