CGNS Steering Committee
Telecon Minutes
6 January 2008
7:30 PM Pacific Time

1. The meeting was called to order at 7:35 PM. There were 9 attendees (one by telecon), listed in Attachment 1.
2. The minutes of the 28 November 2007 meeting were approved as posted on the web site.
3. Steering Committee Membership changes, updates, and issues
   (a) Thomas Hauser was voted in as the new chair of the CGNS steering committee. This is a 2-year term, through January 2010. Congratulations, Thomas!
   (b) We are still looking for a CGNS Steering committee member willing to assume the role of Vice Chair (2-year position).
4. Status of previous action items
   (a) Hauser and Wedan will put V3.0 with parallel HDF-5 capability as an alpha release on SourceForge when ready.
      i. Wedan has put an alpha release of V3.0 on SourceForge (CVS access only). This version has the new PYRA fixes (see Open Items, item (d)), allows the user to choose between ADF, HDF-5, and XML on the fly, and supports `NGON_n` plus `NFACE_n` (see item (b) below). The parallel HDF-5 capability is not in it yet. Hauser will add HDF-5 parallel capability to V3.0 on SourceForge CVS and will let users know when it is available.
   (b) Allmaras will send Rumsey, Feldman, and Pereira revised face-based proposal for evaluation, comparison with original proposal, and posting on website.
      i. Not done. However, Wedan has implemented the proposal from 1/07 into V3.0 on SourceForge (CVS access only). This is described below in Attachment 2. Users are encouraged to look at this method and see if it suits their needs. Rumsey to send Wedan any existing documentation on `NGON_n` + `NFACE_n` for modification/addition, then posting.
   (c) Rumsey will coordinate bringing the Regions proposal to completion.
      i. Not done yet. This item has been transferred to Allmaras. Allmaras to finalize Regions proposal modification, including proposed additions to `FlowSolution`, `DiscreteData`, `BC`, and `BCDataSet` and send to Rumsey for posting on website.
      ii. There was also discussion regarding potential Boeing involvement in helping the development effort in this regard. Paul, Bussoletti, and Allmaras to look into finding development resources (particularly for MLL implementation) at Boeing.
   (d) Rumsey will develop a proposal to handle sprays of unconnected points.
      i. Not done; Rumsey decided he was not enough of an expert on this subject to do it justice. Duque and Hauser to assume lead on new discussion/proposal for handling sprays of unconnected points.

(e) Hann and Hauser will evaluate the capability for writing HDF-5, ADF, or XML in proposed V3.0.
    i. Done for HDF-5 and ADF. Others may also now evaluate by getting V3.0 alpha from Sourceforge (CVS version). Use of XML is available in V3.0 alpha, but there may be issues related to consistency of the XML grammar. Hauser to have further discussions with Poinot on usage of XML and possible need for changes.

(f) Wedan will look into Weinkauf (9/12/07 CGNSTalk) issues regarding automatically closing linked files, problem with unsuccessful opening leaving data structures undefined, issues with `MAXIMUM_FILES`, and use of relative paths.
    i. Done. These limitations have been fixed. They are currently in the CVS version of V2.5, and will be in the official V2.5.3 when it is released.

(g) Hauser will maintain contact with users interested in parallel HDF-5 capability, and let them know when parallel V3.0alpha version is ready to be tested.
    i. Not done yet. Action item cancelled (absorbed into another action item).

(h) Hauser and Rumsey will contact people in Europe regarding possibility of holding a European CGNS User's Meeting sometime in the future.
    i. Ongoing. Hauser, Rumsey, and Poinot to continue to explore possible CGNS meeting in Europe.

(i) Rumsey will carry several unresolved CGNSTalk issues over to the next meeting: Bussoletti 9/25/07 CGNSTalk), Guzik (10/02/07 CGNSTalk), Miller (10/19/07 CGNSTalk).
    i. Done.

5. Open Items (see number 15 below)

   (a) Purpose of open items is to not lose track of long-term issues that come up.
   (b) Two new open items added (see Software item (c)).

6. CGNS short course for AIAA

   (a) Originally scheduled for Jan 5–6, 2008 in Reno, NV (just prior to Aerospace Sciences Meeting), but had to be cancelled due to insufficient number of advance registrants. AIAA would like to try again for their Summer 2009 conference.

7. ISO/STEP

   (a) Nothing new to report.

8. Documentation

   (a) Nothing new to report.

9. Software

   (a) Issue of the API forcing a copy of the entire CGNS file temporarily (Bussoletti 9/25/07 CGNSTalk) was discussed. This is an ADFViewer issue (the MLL does a compress when closing, so it is not an issue there). Wedan will add a button to ADFViewer to allow user to compress file after deleting nodes.

(b) Issue from Guzik (10/02/07 CGNSTalk) on the use of `cg_configure` to avoid the copy. Currently `cg_config_compress` by default is -1 (only compress if nodes deleted), but it can also be set to 1 (always rewrite) or 0 (never rewrite). Rumsey to check with Towne if documentation is in place for `cg_config_compress`. Guzik also brought up issues on it being not necessary to delete and rewrite entire node when dimensions are the same, and specific issue regarding dereferencing void. Wedan to investigate issue of MLL deleting the entire node even though its new dimensions are the same. Also, Wedan to investigate type casting of int to void pointer then dereferencing (`cg_configure`).

(c) Issue of wanting to write info one element at a time to save memory via `cg_section_write_f`, and issue of possible need for "long" instead of "int" (Miller 10/19/07 CGNSTalk). Issue of writing one element at a time (perhaps using something like `cg_section_partialwrite`) is somewhat difficult and cannot be addressed in the near-term. This item has been added as an "Open Item." Issue of ints & longs is complicated; many aspects are machine dependent. We may need to define our own datatype to allow for greater than 2 Gig signed limit. This item has also been added as an "Open Item."

(d) Need to change Celcius to Celsius (*cgnsKeywords.h*, *cgnslib.c*, *cgnslib.h*, *cgnslib_f.h*) (Lecointe 12/5/07 CGNSTalk). Fixed in CVS version 2.5. Will be in V2.5.3 official version when it is released. In V2.5, it will accept either spelling; but in V3.0, it will only accept the correct spelling (Celsius).

10. HDF-5

(a) Some discussion of HDF-5 linking features (see minutes from November 2007). Poinot to send necessary coding changes for HDF-5 linking to Hauser for implementation into V3.0 alpha version.

11. Extensions

(a) Covered under Status of Previous Action Items.

12. Other issues:

(a) Rumsey reported on "Accomplishments" and "Concerns" for 2007.

i. Accomplishments:

A. Maintenance & Support

- 1 new steering committee member added (total=23)
- Website moved from ICEM to SourceForge hosting

B. Evolution

- September 2007: official release of Version 2.5 (off beta status)
- Fixed HDF5 external links feature (with CGNS mods to be implemented and with a soon-to-be released version of HDF-5)

C. Acceptance

- Latest SIDS finally came out in 2007 in AIAA's Recommended Practice document update: AIAA R-101A-2005

- As of Oct 2007, the CGNSTalk mailing list had 223 participants from 20 different countries and 77 different organizations
- Over 21,000 CGNS downloads from SourceForge since 2003 (average of 496 per month over the last year)

D. Answering questions & Exchanging ideas
- CGNSTalk has regular postings (137 postings in 2007)
- CGNS short course is nearly developed (Alabi, Hauser, Poinot, Wedan, Rumsey) — even though it was cancelled for Jan 2008

ii. Concerns:

A. Maintenance & Support
- We still only have 1 official developer (in his spare time)

B. Evolution
- All recent proposals for extension have been stalled during 2007, either in development or in implementation
- Move toward implementation of V3.0 (with parallel HDF-5) has been very slow

C. Acceptance
- CGNS short course for Jan 2008 (through AIAA) had to be cancelled due to lack of minimum required registrants

D. Answering questions & Exchanging ideas
- CGNSTalk postings mostly only answered by a few people; questions sometimes remain unanswered / unresolved for a long time

(b) Rumsey to look into adding back (optional) registration to website when people download CGNS.
(c) Rumsey to respond to some of the CGNSTalk issues that are now closed.
(d) Hauser to look into methods on SourceForge for getting Poinot developer access: switch from CVS to SVN? or use SSL?
(e) Rumsey to notify people about V3.0 alpha.
(f) Wedan to release 2.5.3.
(g) Hauser to speak to Koziol at HDF5 Group about issues related to developers and funding; and also to ask about when their link-fix release will become official.
(h) Wedan to investigate problem with NFS-mounted soft links when re-write file.
(i) Rumsey and Hauser to work out issues on domain name with ANSYS-ICEM.

13. Meeting was adjourned at 9:15 PM. Next Telecon will be called by Hauser.

14. Summary of **action items**:

(a) Hauser will add HDF-5 parallel capability to V3.0 on SourceForge CVS and will let users know when it is available.
(b) Rumsey to send Wedan any existing documentation on `NGON_n` + `NFACE_n` for modification/addition, then post.
(c) Allmaras to finalize Regions proposal modification, including proposed additions to `FlowSolution`, `DiscreteData`, `BC`, and `BCDataSet` and send to Rumsey for posting on website.

(d) Paul, Bussoletti, and Allmaras to look into finding development (particularly for MLL implementation) resources at Boeing.
(e) Duque and Hauser to assume lead on new discussion/proposal for handling sprays of unconnected points.
(f) Hauser to have further discussions with Poinot on usage of XML and possible need for changes.
(g) Hauser, Rumsey, and Poinot to continue to explore possible CGNS meeting in Europe.
(h) Wedan will add a button to ADFViewer to allow user to compress file after deleting nodes.
(i) Rumsey to check with Towne if documentation is in place for `cg_config_compress`.
(j) Poinot to send necessary coding changes for HDF-5 linking to Hauser for implementation into V3.0 alpha version.
(k) Rumsey to look into adding back (optional) registration to website when people download CGNS.
(l) Rumsey to respond to some of the CGNSTalk issues that are now closed.
(m) Hauser to look into methods on SourceForge for getting Poinot developer access: switch from CVS to SVN? or use SSL?
(n) Rumsey to notify people about V3.0 alpha.
(o) Wedan to release 2.5.3.
(p) Hauser to speak to Koziol at HDF5 Group about issues related to developers and funding; and also to ask about when their link-fix release will become official.
(q) Wedan to investigate problem with NFS-mounted soft links when re-write file.
(r) Wedan to investigate issue of MLL deleting the entire node even though its new dimensions are the same.
(s) Wedan to investigate type casting of int to void pointer then dereferencing (`cg_configure`).
(t) Rumsey and Hauser to work out issues on domain name with ANSYS-ICEM.

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) Keep track of/resolve HDF-5 "to-do" list.
(b) Keep track of progress with ISO/STEP.
(c) Need for official certification process (test for compliance)
(d) Need to make Karman's changes to `PYRA` elements: change `PYRA_14` to `PYRA_13`, without the centroid, and add `PYRA_14` with the base mid-face defined (in software and in SIDS). Need to wait until V3.0 for this due to compatibility issues.
(e) Need to upgrade/update *User's Guide* as appropriate (such as additional specific examples)
(f) Need to resolve slow behavior and larger file sizes that can occur in CGNS files when there are many (thousands) of nodes.
(g) Develop method to write info one element at a time to save memory via something like `cg_section_partialwrite` (Miller 10/19/07 CGNSTalk)

(h) Address issue of possible need for “long” instead of “int” to avoid signed 2 Gig limit (Miller 10/19/07 CGNSTalk).

Attachment 1: Attendees

Steve Allmaras	Boeing Commercial
Earl Duque	Intelligent Light
Thomas Hauser	Utah State
Scott Imlay	Tecplot
Steve Karman	U Tennessee Chattanooga
Ben Paul	Boeing Commercial
Simon Pereira	ANSYS / ICEM CFD
Chris Rumsey	NASA Langley
Bruce Wedan	no affiliation

Attachment 2: New `NGON_n` + `NFACE_n` Capability

The following is a brief description of the proposed extension for storing arbitrary polyhedral cells. This is implemented in the alpha release of V3.0 (currently available on SourceForge under CVS only).

In it, we redefine `NGON_n` to be similar to `MIXED`, but with the element type replaced by the number of nodes for the face. We then eliminate all of the element types `NGON_n+1`, `NGON_n+2`, etc. For face-based storage, this requires exactly the same amount of data for the element definitions, since we replace

```
type = MIXED;
Element = NGON_n+nnodes,node1,node2,...
```

with

```
Type = NGON_n
Element = nnodes,node1,node2,...
```

With this change, we are free to add new element types. To handle volume cells in a face-based system, we define an element type `NFACE_n`, which indicates the element set is defined by number of faces, and the face elements.

```
Type = NFACE_n
Element = nfaces,face1,face2,...
```

This formulation also has the advantage of readily identifying a face-based system, since you only need to check the element set type — if it is `NGON_n` or `NFACE_n`, you know it is face-based. We are also able to add new element types in the future as the need arises without breaking any code. Finally, this also involves only changes to the SIDS, not the MLL.

As an example, consider a grid with a single hexahedral cell (one 6-sided cube with eight vertices) in it. To describe this in a face-based manner, the new method would use:

```
Name = user-specified1 (Elements_t)
   ElementType = NGON_n
   ElementRange (IndexRange_t) = ElemNo1, ElemNo6
   ElementConnectivity (DataArray_t) =
      4, face1node1, face1node2, face1node3, face1node4
      4, face2node1, face2node2, face2node3, face2node4
      4, face3node1, face3node2, face3node3, face3node4
      4, face4node1, face4node2, face4node3, face4node4
      4, face5node1, face5node2, face5node3, face5node4
      4, face6node1, face6node2, face6node3, face6node4


Name = user-specified2 (Elements_t)
ElementType = NFACE_n
   ElementRange (IndexRange_t) = 1,1
   ElementConnectivity (DataArray_t) =
      6, ElemNo1, ElemNo2, ElemNo3, ElemNo4, ElemNo5, ElemNo6
```