

CGNS Steering Committee  
Telecon Minutes  
2 August 2005  
11:00 AM Eastern Time

1. The meeting was called to order at 11:05 AM. There were 8 attendees, listed in [Attachment 1](#).
2. The minutes of the 25 May 2005 meeting were approved as posted on the web site.
3. Status of previous action items:
  - (a) Towne will incorporate Vice-Chair changes into the charter and post.
    - Done.
  - (b) Rumsey will forward to Hunten the e-mails of the members on the *hdf5cgns@ncsa.uiuc.edu* mailing list.
    - Done.
  - (c) Hunten will send a copy of his planning documentation to Rumsey, for inclusion as an attachment to these minutes.
    - Done. These are attached to the May 2005 minutes.
  - (d) Hauser will provide a list of issues that need to be discussed with the NCSA (HDF5) people.
    - The only remaining major issues are the two already known: (a) HDF5 has slower I/O for files with many (thousands of) nodes and (b) HDF5 files tend to be significantly larger than ADF files. No additional issues need to be raised. Action item dropped.
  - (e) Towne will upgrade Poinot's SIDS-to-HDF5 documentation with 2.4 additions and post after V2.4 comes online.
    - Not done yet. Document needs to be modified to read V2.4 (rather than 3.0), and statement "CGNS versions prior to v3.x used the ADF storage manager" needs to be deleted or modified. Also, SIDS-to-ADF documentation needs to continue to be posted for the foreseeable future. Action item carries.
  - (f) Wedan will make change in CGNS HDF5 software so viewer can read (see) character strings in the HDF5 files.
    - Done, but not tested/available yet. Action item carries.
  - (g) Wedan will complete changes for V2.4 and will announce when ready.
    - Almost ready. Initial download page still needs to be updated. Action item carries.
  - (h) Allmaras will write up an example of how to use existing standard for unstructured face-based connectivity, and send to Rumsey to pass on to the Committee.
    - Done. There was a lot of discussion on this issue, which deals with a method of using face-based data structures with parents defined, for handling polyhedral unstructured cells. This method is apparently SIDS-compliant, although it was not originally an intended method for general use. The method works, but there is still

some missing information that Allmaras currently puts in as `UserDefined` nodes. Continuing to allow this method puts some additional workload on CGNS readers which at this point are probably not looking for it, but on the positive side it does allow users to write polyhedral cells easily without the necessity of adding/coding a new extension. Allmaras said that it is already easy to determine, by looking at the file, whether the face-based method is being used or not. 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.

- (i) Wedan will change the MLL to return element list instead of point list when appropriate.
  - This item had to do with eliminating the `Pointlist/Range + CellCenter` possibility — and thus removing the need for `GridLocation` under `BC_t`. The idea was to have the API automatically make the alteration, transparent to the user. Wedan was not sure if this specific task had been done yet or not. Action item carries.
- (j) Rumsey and Pointot to coordinate some type of “Intro to CGNS” for Reno 2006 or for AIAA’s summer 2006 meeting.
  - Ongoing. Current plan is to do nothing at Reno, but hold a Panel Discussion (something like “CGNS in Industry”) at AIAA’s June 2006 meeting in San Francisco. Pointot is arranging for several industry representatives to attend, give brief talks, and answer questions. Apparently there are not many industrial users yet in the U.S. (other than Boeing to some degree)... most activity is occurring in Europe. Michal said that someone at Boeing would probably be willing to serve on the panel. Rumsey and Pointot also plan to tentatively coordinate an evening tutorial session. Action item carries.
- (k) Towne will check to see if old documentation is stored on SourceForge. He will make sure future “old versions” also get put there.
  - Done. The old documentation is there, starting with Version 2.2. As soon as V2.4 comes on line, Towne will bundle up V2.3 documentation for Wedan to post.
- (l) Norris will try to work with the (currently commented) Rind-for-unstructured fixes and see if they meet his needs.
  - Not done yet. Action item carries. There was some discussion on whether to officially implement this capability now, or to wait (because of loss of forward compatibility). It was decided to wait, to give Norris a chance to try it and also because there is no documentation on this capability yet. Wedan will write documentation for SIDS on Rind-for-unstructured and send to Rumsey and Norris.
- (m) Hann will send his proposed changes for decoupling the MLL from ADF and HDF5 to Pointot, Rumsey, Wedan, and Allmaras, to get their opinion on it.
  - Done. According to our draft policy statement regarding HDF-5 (see [Attachment 3](#)), even once we officially announce HDF-5 as the official recommended storage format, we will continue to support ADF capability for the foreseeable future. Hann’s method may be the best way to handle this in the future. Currently, the user can choose between ADF and HDF-5 at compile time. There

was also some discussion for eventually providing “stubs” so users can avoid HDF-5 entirely if desired, but if HDF-5 is to be our official recommended method, then this probably is not a good idea (the “stubs” could be done for those who ask for it, but not widely advertised and not part of the V3.0 distribution package).

- (n) Poinot and Wedan will work to resolve issue of “link of links” problem with our HDF5 implementation.
  - Not done. Action item carries.
- (o) Rumsey will send McMorris & Brouillet e-mails to Michal, and Michal will contact them about need for `GridLocation = FaceCenter` for zone-to-zone connectivity.
  - Done, but there does not appear to be enough interest (or time) for anyone to propel this idea forward by writing a proposal for extension and following it through. Therefore, this item will be tabled for now.

#### 4. Open Items (number 13 below):

- (a) Regarding HDF-5 “to do” list ([Attachment 2](#)), it is no longer a necessity that HDF-5 fix “creation tracking”, so this item was taken off the list. Also, the SIDS-to-HDF5 documentation is complete, so that item was also removed.
- (b) Regarding the issue of alphanumeric sorting: HDF-5 does this automatically, so this item becomes a non-issue once HDF-5 becomes the recommended official storage mechanism. It does not appear to be worthwhile to pursue it for ADF nodes outside the Zone nodes (for which it is already done). Item removed from list of Open Items.
- (c) Regarding CGNS license, the decision was made (via e-mail voting) to switch to the zlib license. Therefore this item removed from Open Item list. Wedan will change the license in the software and on the website to zlib, and will forward appropriate wording to Towne. Also, Towne will change the license in the documentation (Charter and anywhere else it appears).
- (d) Regarding PYRA element needed, this change definitely needs to wait for Version 3.0, because it changes the enums, and forward compatibility is lost in a major way.

#### 5. ISO/STEP

- (a) Nothing to report.

#### 6. Documentation issues and CGNSTalk issues:

- (a) There are some known errors in the SIDS that have been corrected in the on-line version, which Towne will want to pass on to AIAA for its next Recommended Practice.
- (b) Because NASA Glenn is transitioning its e-mail services to an Agency-level service, the CGNSTalk address is being changed to: *CGNSTalk@lists.nasa.gov* (effective immediately). The old *CGNSTalk@grc.nasa.gov* will disappear Aug 8. All current subscribers should have already received a Welcome message. Anyone can post to this address, not just those who are subscribed. The list archives have been moved to <https://lists.nasa.gov/mailman/private/cgnstalk/> (access is limited to members only).

The CGNSTalk info page is <https://lists.nasa.gov/mailman/listinfo/cgnstalk/>. Also, Wedan will update the [www.cgns.org](http://www.cgns.org) webpage describing CGNSTalk.

7. Software status/discussion:

- (a) Possible bugs reported on CGNSTalk in `family_write` etc. were already fixed by Wedan. Same goes for Fortran90 bugs found by Hauser in V2.4. The fixes are in the latest version.

8. HDF-5 status/discussion:

- (a) Draft policy statement regarding HDF-5 ([Attachment 3](#)) was discussed. Earlier e-mail voting by Steering Committee members gave a thumbs-up to it. Telecon attendees also agreed to it. This Policy Statement will remain unofficial and will not be widely publicized until we make the official move to Version 3.0.

9. Extensions status/discussion:

- (a) Tabling of possible extension `GridLocation = FaceCenter` for zone-to-zone connectivity (for use primarily with unstructured grids) was discussed during action items (item 3(o)).

10. Other issues:

- (a) None.

11. Meeting was adjourned at 12:17 PM.

12. Summary of **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.
- (b) Wedan will make change in CGNS HDF5 software so viewer can read (see) character strings in the HDF5 files.
- (c) Wedan will complete changes for V2.4 and will announce when ready.
- (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.
- (e) Wedan will change the MLL to return element list instead of point list when appropriate.
- (f) Rumsey and Poinot to coordinate CGNS Panel Discussion and possible tutorial for AIAA's June 2006 meeting in San Francisco.
- (g) As soon as V2.4 comes on line, Towne will bundle up V2.3 documentation for Wedan to post.
- (h) Norris will try to work with the (currently commented) Rind-for-unstructured fixes and see if they meet his needs.
- (i) Wedan will write documentation for SIDS on Rind-for-unstructured and send to Rumsey and Norris.

- (j) Poinot and Wedan will work to resolve issue of “link of links” problem with our HDF5 implementation.
  - (k) Wedan will change the license in the software and on the website to zlib, and will forward appropriate wording to Towne.
  - (l) Towne will change the license in the documentation (Charter and anywhere else it appears).
  - (m) Wedan will update the *www.cgns.org* webpage describing CGNSTalk.
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) 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 to allow Rind for unstructured (in software and in SIDS)

## Attachment 1: Attendees

Steve Allmaras	Boeing - Seattle
Bob Bush	Pratt & Whitney
Bob Fiedler	U. Illinois
Thomas Hauser	Utah State
Todd Michal	Boeing - St. Louis
Chris Rumsey	NASA Langley
Greg Stuckert	Fluent
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)
- HDF-5 must fix “creation tracking”
- 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

## 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.