AWIPS II Technical Interchange Meeting Status and Planning

Primary audience: GOES-R Proving Ground
Time: 2:30 PM to 3:20 PM EDT
Date: May 9, 2011

Notes prepared by Jordan Gerth.
Bill Campbell took attendance. Raytheon was not on the call.

The goal of this meeting was to look at the set of questions that was previously developed. The idea is to form the basis for a TIM with Raytheon at their facility in the August/September timeframe. The previous action items were also assessed.

The next TIM will be held on Tuesday, 17 May.

In a previous discussion between Bill Campbell and Brian Motta, one of the things that we decided to do was performing a code audit. Questions were solicited from others but few were received. We looked at how the satellite decoder worked, essentially to understand all of the necessary steps in order to make all of our existing satellite imagery and products work. We did not look at the McIDAS plug-in because the visualization end of the code was not complete. There were some dependencies that were not satisfied.

It appears that Raytheon is going to be tasked with writing a netCDF3 decoder. The OCONUS partners are concerned about the McIDAS AREA plug-in. There may be a series of changes made to the software to make it more configurable. Jordan submitted some of his concerns about the code of the AWIPS II decoder to Alaska Region.

Some of the dimensions and data variables in the netCDF3 file may need to be changed or added because some of the netCDF3 files cannot be distinguished between each other, a requirement in the AWIPS II environment.

Jordan recommended that others should open the AWIPS Development Environment (ADE) and attempt to sift through the code.

Greg Grosshans asked a question over the awips2dev list about how the CAVE loads data into the heap space so that the viz is not consistently communicating with the edex. Jordan forwarded this question to Bill Campbell in hopes of obtaining a response for the entire group.

Brian Motta said he talked to Deb Molenar (CIRA) about the ADAM box. Brian recommended we look at the specification for the Weather Event Simulator (WES) hardware. He says they are close to 64-bit. **Brian took the action to get the WES status and schedule from the WES developer.**

During the last TIM, we sought to create some documentation that shows the ingest path and then the decoding path, followed by eventually an archive path. But Brian did not see an end-to-end approach in the questions that came from CIMSS. Jordan said that the questions he posed would help complete his mindset as much as possible as to the process for integrating satellite imagery/products into AWIPS II.

Brian suggests that the goal of the next TIM should be to identify in detail what things are required. You almost have to start with a general question and obtain a specific answer. Without that you assume that everyone is on the same page.

Bill recommended that this end-to-end overall process question would be the introductory overview for the face-to-face TIM and then fill in the blanks with the more specific questions that Jordan has asked depending on the length of the face-to-face meeting. Brian says he is looking for a written response for both specific and general questions.

Ed said you might not get the entire picture now. We are starting to build the puzzle. You need to know how it is all coming together. You can go both ways. When you work from the bottom up, sometimes it works better. We reached a consensus that the next Tuesday meeting should be used to press for more detailed answers and set our expectations for the face-to-face TIM.

NCEP should answer questions about the McIDAS decoder, per the direction of David Plummer. As far as we know, everyone is rallying behind the McIDAS plug-in. The open question was the feasibility of writing a McIDAS plug-in for the WFO/D2D perspective (not the National Centers Perspective). David recommended that Raytheon be tasked with this and it would not be a difficult task. There are other groups that are starting to learn this stuff who may also wish to be involved. Part of the planning is future development. There are folks at SEC and MDL who are familiar with the architecture. Ed's recommendation was that we may want to work on this as a sample project during our face-to-face TIM.

The open action items from previous meetings are as followed:

- **Action: Work to collect, and then distribute information on the McIDAS AREA plugins currently developed by Raytheon, NCEP, and SPoRT so that a unified decoder can be delivered operationally to support the experimental product ingest.**
    - **OPR: Raytheon, NCEP and SPoRT to provide code or pseudo-code so that the group can decide if this is worth pursuing. (Nov 12)**

NCEP has provided as much information as they have had. SPoRT was going to wait to see what NCEP was going to do. We have already seen the NCEP code and have some documentation. That is not a good one for Raytheon to do any additional follow-up work.

Update to action: Let Raytheon know that this is a low-priority action item, but that they may be needed to deal with writing a viz plug-in.

- **Action: Raytheon needs to further describe how the legends are created and displayed. Information on the shader language and process is also important. The maximum and minimum values are parameterized when the data selection occurs, and that controls what you see on the screen as far as color.**
    - **OPR: Raytheon to provide comments on how their code works for the display legends. (Nov 12)**

Update to action: This should be answered, but a developer is going to have to answer it. A status is requested on Tuesday, 17 May.

- **Tell us at what point in the ingest and display process is the conversion between bit space and value space performed. Does/could the interpolation done on the graphics card lead to a false return value?**
  - **OPR: Raytheon to provide this information at the next TIM at Raytheon's Omaha facility.**

This should be addressed on a face-to-face TIM. Brian recommended that we clarify the question.

Update to action: This question has been restated. If they can show us what happens to the data as it goes through the manipulations, first from the edex ingest through the decoder into the data store and from the data store through the units conversion to the display, that is what we are attempting to determine. When we are dealing with image manipulations, how do we know that the image manipulations are correct? Reference the specific questions. We will point this out on Tuesday, 17 May.

- **How do we ensure the transaction of ingesting products into the data repository is complete every time? More broadly, we need to identify fail points in the software. Memory management and execution time should be closely watched to not impact the rest of the system.**
  - **OPR: Raytheon at next TIM.**

Update to action: We need to know where the possible fail points are in the architecture. The memory leaks continue to come and go with recent releases. If there is updated information on this, that would be pertinent to our ongoing development. A status is requested on Tuesday, 17 May.

Ed said that they are looking at performance and data latency on the ingest side from OB11.4. They are using it to guide Raytheon on where the software needs to be improved. **He offered to provide some of this information. Greg Grosshans also requested a copy**. However, Jordan pointed out that it is unclear where the strength of the software resides. Is it on the display side or data ingest side? Where do we need to be careful not to put a memory leak or stress the system? What is our pool size? How they set the threads and pools for the decoders seems arbitrary. Information along those lines would be appreciated.

More investigation is needed to determine if the JAI libraries could be problematic with really large datasets.

- **OPR: Raytheon at next TIM**

Update to action: A status is requested on Tuesday, 17 May.

Brian asked if this is an action that could be used as part of the stress testing plan. Part of the plan is to put AWIPS II through its paces and see how it deals with busy weather scenarios. Large datasets fits into the context. We are trying to figure out how we can load up a large system.

Ed says that NWS has been looking and some automated engineering and trying to measure that. Some of this stuff we actually have to do. **Brian says we could get some file size information for GOES and MODIS. He took the action.**

There was an action item for SPoRT to look at 250 m resolution data. Kevin Fuell says he does not have a good status on that. They have not had a chance to look at the issue. *A status is requested on Tuesday, 17 May.*

- Work with Raytheon to determine how the shader language works with the graphics card for displaying satellite imagery at greater than 8 bits, as well as compositing multiple images.
    - OPR: **Raytheon at next TIM.**

Update to action: A status is requested on Tuesday, 17 May. We need to determine how to accomplish our SREC tasks for 24-bit color. On the viz resources, they are hard-coding some 0 to 255 limitations into the software.

- **Beyond the current capabilities, discussing with Raytheon the exact process in linking colors to value mappings and defining a maximum and minimum for the displayed range. Can more of this be defined in the configurable xml?**
    - **OPR: Raytheon at next TIM.**

Update to action: The question is whether or not we can add configurability to the system in this area without recompiling it (localization). A status is requested on Tuesday, 17 May.

- **Determine what from the metadatabase is actually used for discovery and display.**
    - **OPR: Raytheon at next TIM.**

Update to action: A status is requested on Tuesday, 17 May.

- **Based on our future expectations from NPP and GOES-R, identify what needs to be handled in the metadatabase and what needs to be stored in the HDF5.**
    - **OPR: GOES-R PG Partners need to answer. (Nov 30)**

Update to action: Open.

- **Sample project: Using the display side to combine polar and geostationary data dynamically to create a maximum coverage, maximum resolution product as part of the display. Raytheon says this is probably within the range of what we can do by relaxing the time matching, or using a threshold in the time matching.**
    - **OPR: SPoRT, NCEP, CIRA, CIMSS develop a sample AWIPS II development project that can be executed during the TIM at Raytheon's Omaha facility.**

Update to action: We are going to save this for a face-to-face TIM.

- **Developers should talk about what is done now with image blending. Subsequent TIMs should address capabilities of the graphics card.**
  - **OPR: Raytheon at next TIM.**

Update to action: A status is requested on Tuesday, 17 May.

- **Outline a strategy of how compositing and image subtractions should desirably work.**
  - **OPR: GOES-R Proving Ground Partners (Nov 30)**

Update to action: A status is requested on Tuesday, 17 May. See specific questions and action (#2) above.

- **How does the satellite decoder work? What are the specific class-level interactions within the plug-in. Developer involvement is required on how to implement a new or generalized decoder, and identify any interference with other classes which may result.**
  - **OPR: Raytheon at next TIM.**

Update to action: A status is requested on Tuesday, 17 May. A code audit has resulted in more questions on this topic.

- **We need to find out the specifics of ingesting a local model into AWIPS II.**
  - **OPR: Raytheon at next TIM.**

Update to action: This will be a face-to-face TIM exercise.

To obtain and distribute localization document, visit the ADAM collaborate.nws.noaa.gov wiki.

- **GOES-R Proving Ground Partners: In preparation for the next TIM:**
  - **Submit any specific questions to be considered at next TIM.**
  - **Gather specific topics based on the results of what came out of this TIM.**
  - **Submit items which each participant on the call is working on or concerned about.**
  - **Submit items which require a design-oriented discussion. Think long term.**
  - **See action items above.**

Update to action: Open.

Raytheon has been informed of the new questions and will be reminded of the open action items. Ed will be giving a presentation at the annual Proving Ground meeting.

We are still planning on a face-to-face TIM in late August or early September.

Next meeting: Tuesday, 17 May 2011, from Boulder. Lunch runs from 12:20 PM MDT to 1:50 PM MDT. We anticipate that the meeting will start at 12:45 PM MDT and continue through 1:45 PM MDT.