Agenda: Spring 2023 Users Committee Meeting

(Times are Mountain Daylight Time)

Thursday, March 30th

09:00 - 09:15 Open Meeting

09:15 – 09:30 Updates from Members (Committee)

09:30 - 10:30 Director's Report (Mohan Ramamurthy)

10:30 - 10:45 Break

10:45 - 12:00 Staff Status Reports (All)

- Visualization Software/Tools
- Data Access/Formats/Dissemination
- Community Services/Educational Efforts

12:00 - 13:15 Lunch at the Foothills Lab Cafeteria

13:15 - 13:45 Status Report Version Discussion

13:45 - 14:00 Update on the June 2023 Triennial Users Workshop (Planning Chairs)

14:00 - 14:30 NCEP Report and Questions (Margaret Curtis)

14:30 - 15:00 Unidata's Educational Services Going Forward (Nicole Corbin)

15:00 - 15:15 Break

15:15 – 15:45 Unidata Science Gateway Reimagined (Ana Espinoza)

15:45-16:00 Wrap-up Day One

16:00 Adjourn

18:30 Collaborative Discussion on the Day's Proceedings Over Dinner at Boulder Social, 1600 38th Street, Boulder, CO 80301 (map)

Friday, March 31st

09:00 - 09:15 Convene and Outstanding Items from Previous Day

09:15 – 09:45 Unidata Strategic Plan (Tanya Vance)

09:45 - 10:30 DeSouza Award. Discuss Candidates for the 2023 Honor

10:30 - 10:45 Break

10:45 - 11:45 Community and Committee Needs and Challenges Discussion

- What are the needs for research and teaching?
  Use cases, tools currently used/misused, current barriers
- What training is most needed?
  Training that requires teaching by Unidata and training that can be provided by the community with support from Unidata

11:45 - 12:15 Wrap-up Day Two, Action Items, Fall Meeting Dates, etc.

12:15 Close Meeting

13:00 Convene Equipment Award Panel

Status Report: Users Committee Actions

November 2022- March 2023

Unidata Program Center Staff

Actions from the Previous Meeting (June 2-3 2022)

Action 1

During discussion about how the netCDF-C library Zarr implementation can support various backend storage systems/services, the idea of splitting the backend storage support out as a separate library that could be community maintained separate from netCDF-C came up. GDAL was mentioned as a possible partner or maybe already having such a library. The netCDF team to investigate collaboration with outside groups on this front? [netCDF team]

Result

The netCDF team is in collaboration with the ZARR community group, we are members of the Zarr Enhancement Protocol (ZEP) committee, and we are trying to get our foot in the door with the (potentially) rebooted HDF Technical Advisory Board. We will continue investigating the possibility of a back-end storage library.

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Status Reports Executive Summary

November 2022- March 2023

Unidata Program Center Staff

This summary is compiled from the full status reports, available online:
Staff Status Reports: November 2022 - March 2023

Visualization and Analysis Software and Tools

AI/ML

Unidata ML Staff have been working on educational materials, project pythia cookbooks, and blog posts. 2023 will mark more in person events (Triannual meeting, in person workshops, SciPy) along with virtual office hours. ML staff also submitted a NSF proposal with other Unidata staff to fund specific in-classroom training and materials creation around machine learning skills for earth systems scientists.

AWIPS

Over the last year, the AWIPS team has been hard at work to put out its first major version release. The current AWIPS team has been maintaining and adding updates to the last major version released, which was a variant of the NWS' AWIPS v18.1.1. We now have a beta version of AWIPS based off of NWS' v20.3.2, available with key updates such as Python3 and Java11.

At the end of February 2023, we released our first beta of v20.3.2 (called 20.3.2-0.1) with two installation options for CAVE:

- A direct CentOS7 install via RPMs
- A CentOS7 Virtual Machine that runs with VMWare Workstation Player (available on both CentOS and Windows)

We also have a publically accessible beta EDEX available at edex-beta.unidata.ucar.edu. Along with the release, we updated our documentation to have a dedicated page for installing the beta, and a new Google form specifically for reporting bugs/unexpected behavior with v20.

As of early March, we have resolved significant challenges we were having with regards to building CAVE directly for MacOS and Windows. We are hoping to put out a second release of the beta (v20.3.2-0.2) by the end of March that would include:

- Two bug fixes for issues reported with v20.3.2-0.1
- A direct, signed CAVE installation for Windows (.msi)
- A direct, signed, and notarized CAVE installation for Mac (.dmg)

Aside from AWIPS development, the team is proud to have the first two Unidata online training modules in *Learn AWIPS CAVE*, and *Learn Python-AWIPS*. We also just completed two

consecutive years of releasing AWIPS Tips blogs every other week. The AWIPS team is also looking to host a workshop at AMS next year on CAVE.

IDV with RAMADDA

We continue to support, update, and enhance the 3D data visualization and analysis tool IDV for our community. Our current activities include: coordinating with netCDF-Java group to add new data formats, collaborating with the SSEC developers to enhance the VisAD library, and working with our community to promote the usage of the IDV in research and education.

McIDAS

Unidata McIDAS-X/-XCD v2022 is in the last phase of being released (documentation modifications are the last thing remaining).

Python

Unidata's Python efforts continue to encompass: training on the use of Python for the community; development and maintenance of several tools for the community (most notably MetPy but also Siphon and data processing scripts); and participation within the broader scientific Python community. The training aspect continues to be busy with two workshops taught at the AMS Annual meeting. We also continue to plan additional courses along with supporting the 2023 Unidata Users Workshop. We are also furthering development of asynchronous training materials through Project Pythia, where we are working to migrate our existing workshop and gallery materials into a so-called "cookbook" within the broader project. MetPy development continues with the 1.4.0 feature release (largely based around "spherical calculus" support) and a recent 1.4.1 bugfix release. We are planning a 1.5 release at the end of April which will largely consist of work done in fulfillment of our NSF CSSI award. Participation within the broader community continues with anticipated attendance of SciPy and direct participation on the matplotlib, cartopy, and conda-forge projects. It has become increasingly difficult to dedicate time to these efforts given the full portfolio of responsibilities on the team.

Questions for the Committee

1. How can we increase the visibility of our efforts to support use of AI/ML techniques among Unidata's core community?
2. What AWIPS training format would be more beneficial to the community: a short course or a student workshop?
3. We have noticed that many advanced features of the IDV, such as formulas and trajectory displays, have not been widely used in the community and many data servers that the IDV can directly access are less well known to IDV users. We would like to provide help to classes, research groups and project teams. Can committee members help to establish such connections?
4. Unidata will be ceasing support for McIDAS-X use in the community. What efforts should be continued in order to ease the community transition away from McIDAS

(e.g., continuing the mcidas-x email list, continuing to support downloads of the package with clear indication that new development will not be forthcoming, etc.)?

Data Access/Formats/Dissemination

Community Data Standards

Unidata's netCDF teams continues to engage with the Zarr community on:

1. Zarr support in both the netCDF-C and netCDF-Java libraries; and
2. the development of the Zarr version 3 specification.

Unidata continues to be active in efforts to advance the Climate and Forecast (CF) Conventions for netCDF.

Unidata continues to be active in several international standards bodies and other communities focused on data and technology including the World Meteorological Organization (WMO), the Open Geospatial Consortium (OGC), and the Earth System Information Partners (ESIP).

Data Services

Work continues on the RTSTATS revamp project. Once that reaches a stable point work will begin on IDD cataloging, the hope being to have results to showcase for the Fall committee meetings. Additional data has been added to the IDD, and efforts towards building a better LDM/NP monitoring solution are underway. We are also looking for ways to improve communications with data providers, users and partners.

GOES

Unidata continues to operate satellite downlink facilities for the NOAAPort Satellite Broadcast Network (SBN) and GOES-East and GOES-West rebroadcast services on behalf of UCAR/NCAR and the Unidata community. All received products are then provided via the Internet Data Distribution system (IDD) in various feeds and via remote access provided by AWIPS EDEX, McIDAS ADDE and THREDDS Data Servers.

IDD

Unidata continues to support, update, and enhance the data available via the IDD for the benefit of research and education. Included but not limited to adding new data formats, bridging the knowledge gap in newly introduced data, and providing statistics of data flow and composition.

IT

Our role is to maintain and enhance the productivity of the staff and assist with the resolution of issues in service to the community. Primarily, that consists of keeping end-user and developer systems secure, and keeping servers and services highly available, patched, and operational for the community. This report is informational and there are no pressing issues.

LDM

Unidata's LDM team continues to update source code and operating paradigms with ever-changing user demographics and user requirements, particularly in the area of security and inclusiveness of data.

NetCDF

The netCDF team continues to work towards maintaining the reliability of the netCDF libraries, while keeping one eye forward as to the future needs of our community. We have continued our community engagement efforts and collaborations whenever and wherever possible; examples of this include our involvement with the Zarr Community meetings and our membership on the Zarr Enhancement Protocol (ZEP) committee. We have also expressed interest in being part of the forthcoming reboot of the HDF Group's Technical Advisory board.

We continue to address the issues associated with the proliferation of new mainstream architectures (Apple M1/ARM), evolving compilers and standards, and extending our collaborations with tangential, but related, projects (conda-forge libnetcdf feedstock, for example).

THREDDS

TDS version 5 is now the only supported version of the TDS, and inflow of bug reports is slowing. We have started plans for netCDF-Java version 6 and begun development on TDS microservices, to include: gCDM, File Service, and Catalog Service.

Questions for the Committee

1. Regarding data services, what methods of community communication do you prefer? Are the existing email lists adequate? Would consolidating some of the data lists help or hurt? Would additional venues for communication, Discourse for example, help exchange information or would that be too much?
2. It appears that the text product driving our nws-changes e-mail list has been discontinued for some time. Would you desire a replacement, or can this list be discontinued?
3. Does the committee have any recommendations for products or services based on our existing GOES satellite ingest that would be beneficial for the community?
4. Unidata now has access to NEXRAD Level 3 products, some of which are not being distributed in the NOAAPort SBN and others that have been removed from the SBN.

Does the committee think that some of these products should be added back to the IDD? (A full list of all NEXRAD Level 3 products can be found in NCEP Nexrad List.)

5. Do you personally have any data distribution software needs that are not currently fulfilled by use of LDM?
6. Would any of your automated data access workflows be disrupted if the format of the THREDDS catalogs were to change (e.g. from XML to JSON)? (That is, are you explicitly parsing catalogs or relying on a provided API like Siphon?)

Community Services and Educational Efforts

Science Gateway & Cloud Computing Activities

In the science gateway arena, we've experienced a strong increase in use demonstrated by the three workshops we helped at AMS, coupled with the nine universities we are supporting with specialized JupyterHub resources this semester. Moreover, we've had advancements on the technical side that have facilitated teaching. In particular, JupyterHub users now have the ability to access shared data directories across all user environments, a vital capability for instructors who wish to disseminate large case study data to students. In addition, we have several examples of WRF NWP now running on science gateway components discussed below. This acceleration in use and capabilities of the science gateway would not have been possible without the addition of science gateway staff over the last year.

Community Services

In addition to "normal, day-to-day" activities of communication and coordination with community members, the Community Services group's efforts in the past six months have been focused on:

- Outreach to underserved communities and active engagement and activities with tribal colleges and universities and the Data Sovereignty Network project partners
- Outreach to the Earth System Science community through participation at AGU, AMS, SACNAS, and AIHEC conferences and hosted workshops
- Expansion of learning materials, resources, and offerings
- Strategizing actions to make our educational services more discoverable on the web as well as promoting the variety of educational services we are able to provide
- We have also explored external funding to support an innovative low-code learning experience in AI/ML
- Providing support for the planning and implementation of the 2023 Unidata Users Workshop
- Strategic Planning in preparation for for the creation of Unidata's next core funding award proposal

Equipment Awards

The review panel for the 2023 Community Equipment Awards will convene immediately after the March 2023 Users Committee meeting.

Support

The currently-used eSupport package is long in the tooth. A small group of people within Unidata have volunteered to start vetting replacement packages.

Questions for the Committee

1. As we try to bring components of the Science Gateway together into a meaningful presentation on the web, what components do committee members think are missing (e.g., ways to interact with tools and data, ways of sharing material, discussion forums, web forms to ask for resources, etc.)?
2. Would you be interested in early access to an experimental GPU-enabled JupyterHub server?
3. What changes would you like to see in Unidata's support processes or how Unidata conducts support? Are you subscribed to any of the unidata software package mailing lists?

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