McIDAS Program Status

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McIDAS Status

- McIDAS-X
- McIDAS-XCD
- McIDAS-XRD
- SDI
- McIDAS-V
McIDAS-X
Introduction

- Ported code from mainframe and DOS- and OS/2-based computers to IBM AIX workstations
- Released April 1992
- A distributed system as opposed to previous mainframe
McIDAS-X

Keys to Success

• Port to Unix

• ADDE (Abstract Data Distribution Environment)

• Infrastructure: Reglue effort (better integration with Unix and isolating of X Window System use)

Resulted in the longevity of McIDAS-X

Reliability, Stability

Solid infrastructure
McIDAS-X
Current

• Periodical updates (1-2 times per year)

• Number of supported platforms reduced over last several years

• Capability with newest and future satellites:
  o Himawari-8, -9 AHI
  o GOES-R ABI and GLM
  o S-NPP and JPSS-1 VIIRS ADDE server (McIDAS-XRD)
McIDAS-X

Future

• MUG bug fixes, adaptive maintenance (updates for current and new satellites), and OS and external library updates

• Enhancements continue to be funded outside the MUG and code contributed by internal projects and external sites

• McIDAS-X is expected to be supported beyond 2020 for current GOES GVAR and upcoming GOES-R series satellites. No sunset date in sight.
McIDAS-XCD
Conventional Data

• Ingest conventional weather data from NOAAPORT
• Current version to be supported for at least another year
• Beta of new version will be available in early 2017
• More information in McIDAS-XCD Status Update
McIDAS-XRD

Research and Development

• A collection of R&D code that is not formally tested by McIDAS User Services:
  o Over 100 McIDAS commands
  o Over 15 ADDE servers
  o Testing is limited to ensuring code builds on supported platforms

• **Status**: Current support level continues

• **Future**: Coincides with McIDAS-X future
ADDE Servers

- **OpenADDE:**
  - Open source version of the McIDAS ADDE servers
  - Last updated in 2006
  - **Status:** Not supported nor maintained

- **Future:** SSEC is investigating Python-based servers and Unidata is looking into packaging the existing ADDE servers in Docker containers
Python ADDE Servers

Why pyADDE:

• Write a new server without McIDAS-X knowledge
• Only *Input Module* will need to be written:
  • Read native file
  • Compute lat/lon for each $n^{th}$ point
  • Reshape into Python Dataset Object
  • pyADDE does the rest
Python ADDE Servers

- Advantages:
  - **Evolution** rather than revolution
    - May make use of McIDAS-X Fortran and C library functions in the short-term
  - **Extensions** more easily implemented
    - Return other formats (e.g., netCDF), not only McIDAS-X Area
    - Perhaps additional geographic projections (using **proj.4**)
- Status:
  - **Prototype server** being developed
    - Reduced functionality
  - Plan is to have first version of **pyADDE** complete by fall 2017
    - Dependent on availability of developers and no technical show-stoppers
SDI

- **SDI (SSEC Desktop Ingestor)** 1997 - 2005
- **SDI-104 (SSEC Data Ingestor)** 2005 – ?
- **SDI-GRB Appliance** 2016 - ?

**Status:** SDI-104 supported; SDI-GRB in development

**Future:**
- SDI-104: supported as long as GOES GVAR satellites are operational or backup
- SDI-GRB Appliance: throughout the GOES-R era

**More details in McIDAS SDI Status Update**
McIDAS-V
Motivation

• McIDAS-X software (currently written in Fortran 77 and C) has a 40-year heritage resulting in limited extensibility potential

• New visualization concepts cannot be incorporated

• Forthcoming environmental satellite data cannot be utilized efficiently (GOES-R & JPSS operational systems)
McIDAS-V Goals

• McIDAS-V shall be a powerful and versatile software system for environmental data processing, analysis and visualization

• McIDAS-V shall support existing and evolving needs of scientific research and algorithm/applications development for new programs, such as NPOESS and GOES-R as well as for retrospective data, such as that from GOES and POES

• McIDAS-V shall support data fusion and algorithm interoperability from existing and future sources

• The McIDAS team shall continue to fully support the MUG and McIDAS-X functionality as users transition to McIDAS-V

• McIDAS-V shall support operational users by providing tools and interfaces that enable a natural transition path for research results into operations

• McIDAS-V shall be used to educate students in remote sensing and physical sciences, and students must be integrally involved in its development, evolution and use
Are we meeting the goals?

• Overall, the work is progressing toward most of the goals, however, there are limiting factors:
  o Funding sources
  o Enhancements vs. improving Infrastructure
  o Hardware performance
  o User expectations
McIDAS-V Internal Review

- **Science**
  - Who are the users?
  - What functionality is important?

- **Technical**
  - Identify current technical issues
  - Anticipate future issues
  - Plan a technical direction

- **Programmatic**
  - Coordinate internal funding sources
  - Mechanism for McIDAS-V infrastructure improvements
Distinctive Features

From the survey and expert input, the key features of McIDAS-V are:

- Freely available
- Read a variety of file formats (netCDF, HDF-4, HDF-5, GRIB, BUFR, ASCII text)
- Time-match and integrate into single 3D display, with animation
- Display 2D fields as point observations and contours
- Display 3D grids as volumes and transects
- Data access of local and remote (ADDE, THREDDS, OPeNDAP) datasets. Also, local access through ADDE
- GUI driven (both a plus and somewhat a minus). Easy for new users to learn due to GUI design, as opposed to scripting or command line programs
Dependency “Layer Cake”

- Major components by Unidata, SSEC, Oracle, open source community
- Additional components include file format libraries, math libraries, packaging and build utilities; all open source
- OS vendors Linux, Windows, Mac
- Hardware drivers from manufacturers
McIDAS-V Funding

• MUG
• Several CIMSS grants for S-NPP/JPSS and GOES-R
• NASA ROSES proposals
MUG Support

- User-level Infrastructure: User Interface, Scripting
- Bug fixes: Prioritize, coordinate internally and with Unidata
- Testing
- Documentation: Includes maintaining tutorials
- Help Desk: Includes maintaining forums
CIMSS Grants
GOES-R

Several CIMSS grants for GOES-R

• Improvements to scripting
• Preparation for GOES-R
• ‘Sandwich product’
• Trajectories
CIMSS Grants
Suomi NPP

CIMSS grant for S-NPP data in collaboration with CIRA

- Improvements for visualization of VIIRS, CrIS, ATMS
- Updates to Time Matching
- Enhancements for Layer Labels
Other Proposals

NASA ROSES (Research Opportunities in Space and Earth Sciences)

• Santek and Kulie (SSEC), and Ramamurthy (Unidata)

• 2015 (not selected): “Interactive Algorithm Development and Product Validation through Innovative Data Access and Visualization Methods”

• No new opportunities in 2016
McIDAS-V Priorities

• Fix Critical bugs (MUG, Unidata)

• Incorporate enhancements from CIMSS projects, especially those that are not possible in McIDAS-X (CIMSS, MUG)
  o Trajectories, VIIRS, CrIS, ATMS

• Ensure new data sources are usable (MUG, CIMSS)
  o Himawari-8 AHI, GOES-R ABI

• Maintain compatibility with Unidata’s IDV (Unidata, MUG)

• Major underlying infrastructure changes are still needed
McIDAS-V
Future

• Continue to engage younger generation:
  o Workshops and training
  o Classroom

• Appeal to researchers:
  o Input/output data formats
  o Scripting
  o More data fusion

• With GOES-R in McIDAS-X, re-evaluate operational requirements:
  o Who is the user?
  o What functionality is needed?
McIDAS-X and –V Summary

• No immediate plans for support fee structure changes
  o MUG members will continue to receive priority support for –X and –V

• New development likely done in –V rather than –X, however:
  o We’re still maintaining –X for compiler changes, OS upgrades, etc.
  o We’re still creating ADDE servers for new satellites
  o If –X works for you, then stay with –X. When new features or data types come along in –V, then do your new development in –V.
  o If you need help with the new development, contact the McIDAS Help Desk

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