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 independence of X Window System)

Resulted in the longevity of McIDAS-X
Reliability, Stability
Solid infrastructure
McIDAS-X

Current

- Periodically updates (1-2 times per year)
- Number of supported platforms reduced over last several years
- Capability with newest and future satellites:
  - Himawari-8 AHI (coming soon!)
  - GOES-R ABI (in development)
  - S-NPP VIIRS (prototype ADDE server, not expected to be released unless additional funding is acquired)
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 end date in sight.
McIDAS-XCD Conventional Data

- Ingest conventional weather data from NOAAPORT
- Current version to be supported for at least two more years
- New version beta will be introduced later in 2015
- More information in McIDAS-XCD Replacement
McIDAS-XRD

Research and Development

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

- **Status:** Current support level continues

- **Future:** Coincides with McIDAS-X future
SDI

- **SDI (SSEC Desktop Ingestor)** 1997 - 2005
- **SDI-104 (SSEC Data Ingestor)** 1995 – present
- **SDI-SE (Server Edition)** 2015 - ?

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

- **Future:**
  - SDI-104: supported as long as GOES GVAR satellites are operational or backup
  - SDI-SE: 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:
  - Funding sources
  - Enhancements vs. improving Infrastructure
  - Hardware performance
  - User expectations
McIDAS-V
Internal Review

• Science
  o Who are the users?
  o What functionality is important?

• Technical
  o Identify current technical issues
  o Anticipate future issues
  o Plan a technical direction

• Programmatic
  o Coordinate internal funding sources
  o Mechanism for McIDAS-V infrastructure improvements
Who are the users? New Survey

- **Fall 2014**: A new survey was created for users of McIDAS software.

- **November 2014**: The survey was sent to:
  - All of SSEC
  - Those on McIDAS email lists
  - A large group of scientists where it was uncertain if they ever used McIDAS
**Usage: November 2014 Survey**

<table>
<thead>
<tr>
<th>Polling</th>
<th>Respondents</th>
<th>Do you use computer vis software?</th>
<th>If yes, do you use Mc-V?</th>
<th>If yes, how often?</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>SSEC</td>
<td>257</td>
<td>182 (71%)</td>
<td></td>
<td>119</td>
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<tr>
<td>Non-SSEC</td>
<td>3845</td>
<td>283 (7%)</td>
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<td>273</td>
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</table>
Most popular is GUI driven access and display of geo and polar data in near real time
About ¼ use 3-D data display and hyperspectral data display
Additional feedback:
  - Provides a quick way to load and inspect new data types
  - Works with netCDF files (which McIDAS-X does not)
  - Provides free access to many real-time data sources
  - Used in various trainings and classes.

### 10. What do you use McIDAS-V for? (select all that apply)

<table>
<thead>
<tr>
<th>#</th>
<th>Answer</th>
<th>Response</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Geostationary satellite data display</td>
<td>148</td>
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<tr>
<td>2</td>
<td>Polar satellite data display</td>
<td>120</td>
<td>59%</td>
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<tr>
<td>3</td>
<td>Radar data display</td>
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<td>24%</td>
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<tr>
<td>4</td>
<td>Model data display</td>
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<tr>
<td>5</td>
<td>Observational data display</td>
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<td>24%</td>
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<tr>
<td>6</td>
<td>Hyperspectral data display</td>
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<td>20%</td>
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<tr>
<td>7</td>
<td>3D data display</td>
<td>46</td>
<td>23%</td>
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<tr>
<td>8</td>
<td>Data analysis Creation of images for the web</td>
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<td>31%</td>
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<tr>
<td>9</td>
<td>Other (specify)</td>
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<td>17%</td>
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<td>10</td>
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<td>13</td>
<td>6%</td>
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</table>
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
Technical Summary

- Software layers make use of high-performance drivers, open-source and commercial software, collaborator & SSEC code

- Software components are adequately maintained, however, future of external packages needs monitoring (e.g., Java3D)

- Process is reasonably well executed (better than most SSEC software projects)

- Much feedback (bugs and enhancement requests) have resulted in a lagging in bug fixes

- Some potential infrastructure (architectural) issues need investigation
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
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)

• 2014 (not selected): “The Network is the Lab: Effecting Collaborative Research through Innovative Data Access and Shared Visualization”

• 2015 (to be submitted July 2015): “Interactive Algorithm Development and Product Validation through Innovative Data Access and Visualization Methods”
McIDAS-V Priorities

- Fix Critical bugs (MUG, Unidata)

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

- Ensure new data sources are usable (MUG, CIMSS)
  - 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
  o Until –V can fully function as a replacement for –X (several years), not much will change.

• New development likely done in –V rather than –X, however:
  o We’re still updating –X for OS upgrades
  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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