AWIPS Migration
Status Review

Advanced Weather Interactive Processing System (AWIPS) Program

May 14, 2012

National Weather Service
Office of Science and Technology
NCEP Central Operations
Overview

• AWIPS II Status
• NAWIPS Migration Status
• AWIPS II/NAWIPS Schedule
• Future of GEMPAK
• Partnership between NWS and Unidata
• Support Model and Governance
• AWIPS System and Development Training
• Development Projects
  – NCEP, Extended Projects, NPP
AWIPS II Status
Site Deployment as of May 11

- Operational with AWIPS II
- AWIPS II Installed
- To be Installed within Next Month

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<tr>
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NAWIPS Migration
Activities

Phase II FIT

AMS

GUI Migration
Code Integration

FOTE
AWIPS I to AWIPS II

GEMPAK
6.5 & 6.6

64-bit wkstn

AWIPS II Status - Unidata Policy Committee May 2012
NAWIPS Migration
Challenges and Mitigation

- The overall migration effort has taken significantly longer than originally planned at both the NWS and NCEP levels.
- Delays in the National Migration Program have resulted in delays in the NCP migration and integration of the code by Raytheon.

32-bit vs. 64-bit requirement lies mostly with NCP data set size and usage, and the Gridded Forecast Editor.

NCWCP Move

NCP Performance

NCP startup / Data selection
Database acquisition/display of some datatypes
<table>
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<th>NWS AWIPS II including NCP</th>
<th>Schedule</th>
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<tr>
<td>System OTE</td>
<td>Jan – November 2011</td>
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<td>Field OTE including National Centers</td>
<td>Nov 2011 – June 2013</td>
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<td>Unidata to Receive AWIPS II</td>
<td>Winter 2011</td>
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<td>Unidata Users to Receive AWIPS II</td>
<td>Spring 2013</td>
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<td>NCP Code Baselines in AWIPS II by RTS</td>
<td>January 2012</td>
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<td>FIT - Phase One / Phase Two / Phase Three</td>
<td>Feb 2011 / Nov 2011 / Oct 2012</td>
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<td>Establishing Non-SBN Data Flow to AWIPS II</td>
<td>Oct 2011 (NTBN) / June 2012</td>
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<td>GEMPAK DB Capability (SFFILE, SNFILE, SAT/RAD, XML/GeoTIFF driver, misc data sets)</td>
<td>March 2013</td>
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<td>Removal of NAWIPS at NCEP Centers</td>
<td>Jan – Dec 2013</td>
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* Bold indicates task completed/started
The Future of GEMPAK
NCP Code Updates

GEMPAK will be considered a “local application” for AWIPS II

NCO will continue to support GEMPAK code indefinitely /until further notice

Routines are being reworked to ensure the GEMPAK libraries can read data from either the AWIPS II Data Base or GEMPAK format files

NCO will be uploading NCP to the AWIPS II baseline on a monthly basis

NCO mirrors RTS code from Dimensions (CM Tool) in Silver Spring

NCO anticipates the NCP code integrated with RTS code on a monthly basis

Typically the NCP code will lag about 6 weeks
• **Unidata is our link to the University Community!**

• **NCO** is committed to assisting in AWIPS software configuration and training key personnel at **Unidata** ~ “train the trainers”

• **Unidata** will continue to partner with NCEP to get university developed applications into the AWIPS baseline (AWIPS and NAWIPS)

• **NCEP** and **Unidata** working together to extend Unidata services to the space weather research community

• **NWS** is committed to enabling a collaborative AWIPS II environment to effectively incorporate new science and technology (capabilities) from universities
Support Model and Governance

• **Why are we Governing?**
  – Preserve operational system integrity (performance)
  – Ensure software quality (functionality, science)
  – Ensure efficient use of the architecture (maintainability)
  – Avoid duplication of effort (resources)

• **What are we putting in place**
  – Governance Advisory Board
    • Policy, Standards and Guidelines
  – SREC (development and release planning)
  – Architecture Team
  – Science Review Board (TBD)
  – Development Tools
  – Development Support
Support Model and Governance
Development Planning

- **Software Recommendation and Evaluation Committee (SREC)**
  - **Who?**
    - Regional Focal Points, NWS HQ, NCEP
  - **How?**
    - Submit a SON and CONOPS/ORD to OSIP
    - Submit a request for new infrastructure capability
    - Submit a small enhancements to NCF
    - Submit a local application for inclusion into the AWIPS baseline
  - **Activities**
    - Assign rankings (strategic, infrastructure, and operational) tasking
    - Assign development work and development organization builds a development plan
    - Prepare AWIPS Release Plan in coordination with field, testbeds, training, O&M
  - **Artifacts**
    - AWIPS Release Plan (updated monthly)
    - Development Plans for specific tasks
Support Model and Governance
Draft Strategic and Operational Tasks (2012 and 2013)

AWIPS Release Plan (2012-2013)

- Enhanced NETCDF3 decoder
- Lightning Decoder
- Thin Client
- NAWIPS Enhancements
- NPP - Atmospheric Temperature Profile (CrIS/ATMS)
- Atmospheric Moisture Profile (CrIS/ATMS)
- 64-EDEX WES II CAVE
- 64-CAVE
- NPP - Atmos. Temp. Profile
- NPP - Atmos. Moisture Profile
- Rapid Refresh—add 18 hr cycle
- RTMA - add CONUS and Guam
- High Res. Window for Puerto Rico & Guam
- Additional ARSR4 and ARD11 Radars
- NPP - next product set
- DNG of Sensible Hydro-meteorological Elements
- Fire Weather Spot Forecasting Enhancements
- Establishing an Ecological Forecasting System
- National River Location Data Base
- Real Time Ocean Forecast System Data
- WSR-88D MIGFA Product
- Tropical Storm Surge Needs
- NPP - next product set
- Gridded LAMP
- Gridded MOS QPF Products
- Rapid Refresh DNG
- Fire weather IMET Model Runs
- Enhancement to Wavewatch III
- Hi-Res RAOB
- NAM Nests
- GFS Model 5km DNG
- Sea Surface Height Anomaly, Significant Wave Height, Wind Speed from Altimetry
- Simulated Satellite products from operational NWP
- Additional radars: Canadian Radars
- Data Delivery
- Extrotropical Storm Surge needs
- GFS Gridded MOS
- Additional TDWR Data Central Collection
- Local High-Res Wave Modeling (NWPS)
- Multi-grid Hurricane Wave Model
- NPP - Atmospheric Temperature Profile (CrIS/ATMS)
- NPP - Atmospheric Moisture Profile (CrIS/ATMS)
Support Model and Governance
Architecture Team

• **Membership**
  – Led by OST/SEC Analysis Branch with support from Raytheon and other development organizations

• **Become the caretaker of the AWIPS Infrastructure**
  – Create, maintain, update and oversee architecture standards and guidelines
  – Participate in software designs reviews (high level and low level design)

• **Develop a AWIPS Infrastructure Product Improvement Plan**
  – Enhance infrastructure to support development of new capabilities and keep pace with new science and technology
  – Identify commonalities/increase code reuse for easier maintenance
  – Identify new tools, common utilities, methods of data access, etc.
Support Model and Governance
Development Tools

• **Distributed CM**
  • Open source
  • Control access
  • Track changes and revisions
  • Branch and merge well
  • Accommodate network weakness/separation
  • Configurable
  • Gate keeper
  • Good for large projects

• **Jenkins** – Continuous integration
• **Redmine** – Change management/workflow
• **Gerrit** – Gate keeper/control over changes
• **GIT master** – Repository/version and int. mgmt.
• **GIT Clone** – Local GIT

Note: Briefing on June 7
Support Model and Governance
Development Tools

• Integrate Development and Test Environment
  – ADAM platform (functional and science testing)
  – Runtime development/testing systems (performance)
    • Regions, Silver Spring, Training Center, NCEP
    • Virtualization - Looking at different solutions
  – Automated testing
  – Performance testing procedures
Support Model and Governance
Development Tools

• **Innovation Web Portal (IWP)**
  – Information center and gateway

• **Idea/project repository**
  – All proposed and ongoing projects in one location

• **Provide collaboration tools**
  – Message boards, communities, documentation, publications, conferences, activity tracker, collaboration feature to host events and a catalog of new and enhanced products under development, experimental and operational, matrix of software developers expertise, prototypes to test and evaluate.

• **Central repository for AWIPS Governance Guidance**
  – Searching, rating, comments, most popular, most recent

• **Prototyping in progress led by OST/MDL**
  – Initial prototype available in June
Support Model and Governance
Development Support

• **Technical Interchanges**
  – Architecture Team available for technical interchange (1-4 hours) meetings

• **Developers Forum (Thursdays at 2:30pm EDT/EST)**
  – Look for common areas for collaboration and dependencies.
  – Advertise, sharing, and networking opportunities
  – Training topics requested by developers
  – **Want to be included?** Contact edward.mandel@noaa.gov

• **Near real time developer support to development community**
  – AWIPS II Development Listserver (awips2dev)
  – Awips2AppsChat
  – AWIPS 2 Wiki
Support Model and Governance
Development Support

• **Documentation (available to all users)**
  – Open Source references
  – Most available via the ADE (Eclipse IDE bundled with source code)
  – Source code and auto generated doc (JAVADOC) to maximum extent possible
  – APIs are documented in source, patterns are found by looking at existing code, ADE provides class hierarchies
  – AWIPS II

• **Need addition documentation?**
  – Provide suggestions to edward.mandel@noaa.gov
Support Model and Governance
Short- and Long-Term Goals

- Short term
  - Establish Governance Advisory Board
  - Complete policies (directives)
  - Establish tasking for Raytheon support to the Architecture team
  - Gather feedback on development documentation gaps and correct
  - Complete development tools (Distributed CM in June)
  - Complete 1st phase of IWP
  - Continue to foster training of developers

- Long Term
  - Yield faster and more responsive and transition of new capabilities to operations
  - Maintain quality
  - Effectively incorporate new science and technology (capabilities) into AWIPS II operational baseline from NOAA development organizations, academic and research communities, and private sector
Support Model and Governance
System/Developer Training

• Training Division has developed a series of modules on AWIPS2 training

• NWSTC offering 8 day System Administrative Courses for NWS ESA & ITOs (Contact James.Poole@noaa.gov)
  – 2 classes Completed / 8 additional classes planned
  – Slots for Unidata delayed until last class (Nov 2012) due to aggressive installation schedule at WFOs

• NCO will conduct a webinar in July to provide an overview and variance briefing for the National Center Perspective
  – Open for all Academia
  – Session will be taped and available via Unidata web site

• NASA Sport planning a joint venture with NWSTD for developer training

• NCO Test Bed available for Unidata Community for training purposes
AWIPS II Development
NCP Next Steps…

Spatial/Temporal Sections & Series

Space Weather Requirements

NESDIS
Hazard Mapping System

N-Flow

High Seas Graphic to Text
AWIPS II Development
Extended: Thin Client Project Overview

• **Key Benefits:**
  – Allows AWIPS remote access
  – Improves ability to provide impact-based decision support services from any location
  – Improves support for CWSUs over current AWIPS I approach
  – Provides additional options for COOP scenarios at NCs/RFCs

• **Status:**
  – Prototyping and system analysis of AWIPS II SOA: **Completed**
  – Production development: **In progress, testing being conducted**
  – Deployment to be staged with AWIPS II deployment

• **Schedule/Milestones:**
  – Thin Client Testing at Boulder CWSU: February, 2012 (**Complete**)
  – IOC Deployment Target: 3QFY12 (**Achieved**)
  – FOC Deployment Target: Q1FY13

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ConOPS Dev | Tech Reqmts | Design & Development | Sys Test | Deploy | Installs |
Exploratory Dev | | | | | |
Objective:
- Develop operational robust infrastructure to support “intelligent” access to non-local data provider datasets

Status:
- CONOPS/Technical Requirements: Complete for IOC
- High-level architecture/design, technical requirements, bandwidth analyses: Complete
- IOC Production design and incremental development: In progress

Schedule/Milestones:
- Initial Development Release: April, 2012 (Achieved)
- IOC Deployment Target: Q4FY13
- FOC Deployment Target: Q3FY15
AWIPS II Development
Extended: Collaboration Project Overview

- **Objective:**
  - Improve our ability to communicate NWS forecasts to customers and partners so that the appropriate response is generated.

- **Status:**
  - Requirements and prototyping for internal collaboration (Phase I): **Complete**
  - Production design and development (Phase 1): **In progress**
  - Phase II (External Collaboration) requirements definition: **In progress**

- **Schedule/Milestones**
  - Initial Resource Plan and Schedule: January, 2012 (**Complete**)
  - IOC Deployment Target: Q4FY12
  - FOC Deployment Target: Q3FY15

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**Fiscal Year** | **FY8** | **FY9** | **FY10** | **FY11** | **FY12** | **FY13** | **FY14** | **FY15**
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| Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4

**AWIPS II Extended: Collaboration (CITRB 10/2010)**

**Exploratory Development**

- Reqmts, Phase 1
- Develop, Phase 1
- Sys Test
- Deploy
- Installs

**ConOPS Development**

- Reqmts, Phase 2
- Develop, Phase 2
- Sys Test
- Deploy
- Installs

**AWIPS II Extended: Collaboration (CITRB 03/2012)**

**Exploratory Development**

- Reqmts, Phase 1
- Develop, Phase 1
- Sys Test
- Deploy
- Installs

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AWIPS II Status - Unidata Policy Committee May 2012
AWIPS II Development
Extended: Hazard Services Project Overview

• **Objective:**
  – Improve hazard-based information generation, distribution, and accessibility in support of Impact-based Decision Support Services (IDSS)

• **Status:**
  – Incremental design prototype and development (Phase I): **In progress**
    • Phase I – Integrate and enhance three hazard-based applications under Hazard Services
  – Establish first AWIPS II Integrated Product Team (IPT): **Completed**
    • Includes Raytheon, OAR/ESRL/GSD, and OST

• **Schedule/Milestones:**
  – IOC Deployment Target: Q4FY13
  – FOC Deployment Target: Q2FY15

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• **Objective:**
  – Prepare NCF/MGS/SBN for NPP
  – Provide the ingest and display capability for NPP
    Product Sets 1 and 2

• **Status:**
  – Prototyping and system analysis of AWIPS II SOA: **Completed**
  – Production development (Raytheon): **In progress, testing being conducted**
  – Deployment to be staged with AWIPS II deployment

• **Schedule/Milestones:**
  – **October 2012 (12.8.1)**
    • VIIRS Imagery Channel 1: Alaska & Pacific regions only
    • VIIRS Imagery Channel 4: Alaska & Pacific regions only
    • VIIRS Imagery Channel 5: Alaska & Pacific regions only
  – **January 2012 (12.11.1)**
    • Atmospheric Temperature Profile (CrIS/ATMS)
    • Atmospheric Moisture Profile (CrIS/ATMS)
  – **April 2013 (13.2.1)**
    • Atmospheric Temperature Profile
    • Atmospheric Moisture Profile
Final Thoughts…

- NWS is committed to our partnership with Unidata and the entire Unidata Community
- NCEP Central Operations will remain your primary conduit / POC for software development questions/requirements that pertain to the National Center Perspective
- NWS/OST will be your primary POC for obtaining software releases
- Despite slips in our migration schedule, NWS is focused on delivering software that is reliable, stable, and expandable to meet the needs of our partners for the years to come