How We Get AWIPS to Your Door

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The Automated Weather Interactive Processing System (AWIPS) is utilized by the National Weather Service (NWS) and its forecasting offices. AWIPS is designed to support the NWS mission to provide the nation with complete, accurate, and timely meteorological and hydrological warning and forecast services. Collecting, communicating, processing, displaying, and analyzing hydrometeorological data are fundamental to conducting this mission. AWIPS is the central point for the collection and dissemination of large amounts of hydrometeorological data throughout the NWS. Northrop Grumman IT supplies the integration and testing support for the software releases.

While one software release is in the field, another release is being deployed, a third and often fourth release are in testing, and the next releases are being defined. With so many nearly simultaneous releases, it is imperative that the processes for defining, producing, and deploying AWIPS run efficiently, quickly, and cleanly. To this end, there are four phases involved in getting AWIPS releases to the forecast offices.

1. Determine the release contents
2. Design and implement
3. Build, integrate, and test
4. Deploy and support

The first phase consists of determining the release contents. During this phase, the National Weather Service (NWS) Headquarters works with NWS forecast offices and the various Development Organizations to prioritize requirements determine feasibility, and potential schedule. Requirements come from the Office of Services, representing meteorological forecasting changes (formulas and calculations, new models, and new data streams) and field user needs and desired changes. Working groups like the Software Engineering Group (SwEG), Systems Engineering Team (SET), and Regional AWIPS Conference Call (RACC) provide forums for discussion on feasibility and performance.

The second phase belongs to the Development Organizations to implement the release requirements through code changes. Five different groups are responsible for developing the various aspects of the AWIPS code:

- Forecast Systems Laboratory (FSL)-- responsible for the infrastructure of software that is installed at a Weather Forecast Office (WFO) and the Display 2-Dimensional (D2D) interface.
- Meteorological Development Laboratory (MDL)--responsible for meteorological applications such as the System for Convective Analysis and Nowcasting (SCAN), the Local AWIPS MOS Program (LAMP) and other applications such as Terminal Aerodrome Forecast (TAF) Monitoring and the Hourly Weather Roundup.
- Northrop Grumman IT (formerly Litton PRC) – responsible for the Network Control Facility (NCF) software, most of the communications and monitoring infrastructure at the sites, and commercial off the shelf (COTS) software.
- Office of Hydrologic Development (OHD) – responsible for hydrometeorological applications such as Hydrological Forecast System and River Pro.
- Systems Engineering Center (SEC) – responsible for various applications (i.e., radar, Local Data Acquisition and Dissemination (LDAD)) and interfaces with the text database

Throughout this phase, the actual design and implementation occurs in each Development Organization environment. Occasionally, forecast offices participate in very early prototype or pre-Alpha tests to help focus development and improve the application capabilities before it is delivered to all of the sites in a formal release.

The third phase is the shortest. Within this phase, the entire release is built, the various pieces integrated, and the software tested in a configuration-managed (CM) environment. The software is built under strict CM guidelines for repeatability and auditability. The CM process allows components to be incrementally released so only new code is delivered, preserving old functionality and system customizations. Each Development Organization component is loaded onto a test platform and tested to ensure the basic capabilities of the component work with other components already loaded. The software is installed and tested on four different baselined hardware configurations, located in the Northrop Grumman IT facility in McLean, Virginia:

- WFO
- OCONUS
- Collocated WFO / River Forecast Office (RFC)

The testing and integration occurs in five distinct segments with strict entrance criteria to maintain schedule, cost and quality for each release. These stages are:

- Pre Software Integration Testing (Pre-SwIT)
- Software Integration Testing (SwIT)
- System Integration Testing (SIT)
- System Acceptance Testing (SyAT) Dry Run
- Formal SyAT

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All through the software integration and test process, the integrators write Discrepancy Reports (DRs) when a problem is found. These DRs describe the problem, the effect on the system, and how to recreate the problem if possible. At a daily DR conference call with all the Development Organizations, the new DRs are reviewed and assigned to a developer to analyze and correct. As fixes are checked into the CM system, they are collected and periodically compiled into a new release for installation and testing. DRs are also written against fielded software to influence corrections or modifications in upcoming releases.

During the integration and testing of the software, several external interfaces and communication feeds are verified. Examples of these interfaces include:

- Asynchronous Product Scheduler (APS)
- National Oceanic and Atmospheric Administration (NOAA) Weather Wire Service (NWWS)
- Bulletin Board Server (BBS)
- Local Data Acquisition and Dissemination (LDAD) Web Dissemination PC
- PC-Rosa Interface
- Radar data through 56 KB dedicated Open Radar Product Generator (RPG), 14.4. dedicated RPG, 14.4 dedicated/dial-out, Satellite Broadcast Network (SBN), and Virtual Private Network (VPN) for dial-out
- Satellite data from Geostationary Orbital Earth Satellite (GOES) 10
- National Weather Service Telecommunication Gateway (NWSTG)

During the latter portion of the formal testing, Alpha and Beta site installs are scheduled for site verification of the release. After a formal verification review, the release is approved for the fourth phase – deployment and support. In this final phase, the release deployment is scheduled, installations begun, and active installation monitoring is conducted. Once most of the installation problems have been minimized, full-scale deployment of the release begins in earnest with the NCF and Site Support Team (SST) playing major roles.