



Agenda Item 11: Any other business

NETWORK ENABLED OPERATIONS (NEO) IN WEATHER

(Presented by the United States of America)

Summary

This paper provides information on the progress underway with the development of a Network Enabled Operation for the purpose of supporting weather data exchange between the States.

1. Introduction

1.1 Weather information gathered by one system is not easily shared with other systems. As a consequence, information in use is often redundant, inconsistent, and in many cases not universally available. Network Enabled Operations (NEO) will provide a common weather awareness across the aviation and weather communities. Implementation of NEO will involve identifying, adapting and utilizing standards for system wide weather data formatting and access. This paper will describe the work that has been accomplished at the FAA.

2. Discussion

2.1 The core of the Federal Aviation Administration (FAA) weather NEO concept is to use XML (eXtensible Markup Language) to format and disseminate weather information. XML is a simple, flexible text scheme derived from Standard Generalized Markup Language (ISO 8879). XML allows the weather community to create a tagging scheme that allows elements of a document to be marked according to their content rather than their format. For example, an air temperature of 11 degrees Celsius might be tagged for transmission as <air-temperature-c>11</air-temperature-c>. A machine or a human reading that text does not need to know anything about format, such as they do with METAR or BUFR. Rather, the metadata tags say explicitly what the content of the information is. XML is presently used extensively to communicate information, not only in the weather community, but also in many other domains of business and government.

2.2 The US Government is moving towards implementing NEO starting with a DOD-developed capability called the Joint METOC Broker Language (JMBL). JMBL is an XML-based specification which is used to request and receive a wide variety of meteorological and oceanographic information. The versatility of XML coupled with common naming and formats allows JMBL to be used for transferring data complete with self-defining metadata. JMBL provides for a structured request for data and a structured response that includes standard status messages to the requestor. JMBL is an abstraction of the physical database, where the end user is concerned only with data types and weather/oceanographic parameters.

2.3 The design of JMBL supports the incorporation of new data types, formats, and other choices as needed without breaking compatibility with existing users. Additionally, the use of XML for data and metadata minimizes the need for users to develop specific decoder applications to support the variety of message formats.

JMBL Strengths

- Net-Centricity. JMBL provides users with a standard, Web services interface to meteorological and oceanographic data. JMBL specifies a standard language for the exchange of information between data providers and user applications and uses community of interest semantics to promote interoperability between data consumers and producers. Style sheets can easily be used to transform returned data to support interoperability with legacy system interfaces.
- Technical Maturity. This standard was developed by the United States Department of Defense (DoD) with major participation from Navy, Air Force, Army and Marine Corps. It has been implemented as a Web Services interface by the Air Force Weather Agency, Naval Oceanographic Office and Fleet Numerical Meteorology and Oceanography Center and has been operational for four years. Commercial XML utilities can be used to form JMBL requests and parse the JMBL responses. It is in use by numerous DoD programs as the means for Web Services access to data and is under consideration for adoption as a standard by the National Oceanographic and Atmospheric Administration's National Weather Service and the FAA.
- Public Availability. The JMBL schemas and related documentation are available in the public domain and can be downloaded from <http://www.cffc.navy.mil/metoc/> with no proprietary use restrictions.

Summary of Key JMBL Features

- Robust and comprehensive coverage of meteorological and oceanographic data
- Flexible; supports requests for
 - Decoded, XML tagged data or raw data (e.g., METAR)
 - User-specified spatial (including height and depth) and temporal data coverage
 - User-specified data return formats
- Well-established, well tested, and currently in operational use
 - 4 years of operational use
 - 6 years of development and testing effort
- Established change management process to accommodate proposed improvements
- Implements W3C and WS-I standards, promoting interoperability with industry tools
- Supports data exchange of existing WMO formatted products

Future JMBL Efforts

- United States Next Generation Air Transportation System (NextGen) will leverage JMBL
- Near term evolution of JMBL to incorporate ISO, OASIS, and OGC standards such as Geographic Markup Language (GML), Common Alerting Protocol (CAP) and Unified Code for Units of Measure

3. Action

3.1 The meeting is invited to note the information contained in this paper.