IEM Chat: A Public and Private Partnership using the Next Generation of IM/Chat Software

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ABSTRACT

It has been documented that the use of Instant Messaging (IM) software enhances collaboration between the media and the National Weather Service during active weather events. This has resulted in an increase in the timeliness and quality of information distributed to the public, and a better mutual understanding of the forecast and warning process between the public and private sectors. However, legal and technological challenges in the commonly used commercial IM/chat software have been noted and reduced the potential effectiveness of the concept. The Iowa Environmental Mesonet's (IEM) Chat Project has overcome many of these hurdles resulting in an independent and stable system with value-added dissemination services. The project is uniquely capable of supporting every media outlet and National Weather Service office.

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1. Introduction

Commercial instant messaging and chat room software has been used by the Des Moines National Weather Service Office (WFO), Iowa State University's Iowa Environmental Mesonet (IEM), and participating Iowa television stations since the spring of 2004. IM software has been utilized by other National Weather Service (NWS) offices across the country since at least 2000 (Borden 2005) and has proven to be an effective real-time communication method during severe weather events (U.S. Department of Commerce 2003).

Instant messaging has also proven useful in other times of active weather during the convective and winter seasons.

Although the initial configuration was easy for the media and NWS to set up, a number of issues arose during the implementation. These included:

- legal concerns regarding the use of the commercial software beyond personal use (Borden 2005),
- stability problems with the client software ceasing to function for no apparent reason or the chat rooms becoming inaccessible for certain users,
- concerns regarding security with a public IM network (Borden 2005) and the client software containing adware and possibly spyware,
- limits on the number of people that could be in a chat room at once, as well as being restricted to being in one chat room at a time,
- and the exclusion of some media partners not allowed to run commercial IM software on their networks.

For collaboration in this medium to be sustainable, different implementations needed to be evaluated. The IEM Chat Project was a result of efforts to address these issues.

2. IEM Chat

a. Development and policy

Based on the authors' experience with facilitating instant messaging collaboration, it was decided to investigate new platforms to replace the commercial IM solution due to the aforementioned deficiencies. The requirements were that this instant messaging solution should be based on open standards, have freely available clients without adware, provide mechanisms for end to end security, and be extensible to meet our specific needs to facilitate our collaboration. After perusal of the software currently available, we settled on a solution based on the Jabber XML Message Passing Protocol (XMPP). Jabber was chosen based on its community standards process, extensibility of the protocol, and rich set of client implementations. This implementation of Jabber IM has been code named 'IEM Chat Project.'

The IEM Chat Project is administered by the Iowa Environmental Mesonet (IEM) at Iowa State University (http://iemchat.com). The IEM is a data collection and sharing project based at Iowa State. With the local media and NWS offices, the IEM has built a software infrastructure to support our nationally recognized partnership. For the purposes of this instant messaging project, the IEM has agreed to assume full administrative control. Decisions made by the IEM Chat Project administrators are not directed by the NWS nor media partners. Access is granted to groups with operational meteorologists and a mission for public information dissemination. Other groups may be let in at the discretion of IEM Chat Project leaders who take into full consideration concerns of all participating parties.

Policy issues aside, the really exciting features of this project include functionality not found with most commercial IM solutions. These include:

- SSL encryption of screen names, passwords, and communications,
- logically named chat rooms (one per WFO) and the ability for users to simultaneously participate in any number of chat rooms,
- ability to control who has access and administration of the chat server,
- and the ability of users to select the client software that meets their security or platform requirements.

b. Server software and configuration

The IEM Chat Project server contains a running instance of a program called jabberd2, which is software that implements XMPP and many of the Jabber Enhancement Proposals (JEPs). The server software is highly configurable and supports features such as server-2-server communication and multi-user chat (MUC) via an extension. The IEM is able to completely control accounts, chatrooms, and access to the server.

c. Client software

Although dozens of options are available, positive feedback has been received regarding the flexibility and ease of use of Gaim, our preferred and free client software. Setting up and entering chat rooms are much easier than with other commercial chat clients. Once created, the rooms are instantly accessible to all users with no need for personal or group invitations. The availability of tabs with audio and visual alerts makes it easy to simultaneously monitor multiple chat rooms or one-on-one IM conversations, all within the same window (Fig. 1). Gaim also supports other commercial protocols allowing users to participate in the Jabber based IEM Chat project and maintain other commercial IM contacts if they so desire.

d. Iembot

The standards-based Jabber solution has allowed an exciting extension to be built, code named 'iembot.' Iembot (a.k.a., 'bot') is basically a program that can instant message with other users logged into the IEM Chat server. Although not an official NWS dissemination vehicle, iembot parses and delivers products issued by the NWS to the chat room instantly. Currently, iembot ingests: Severe Thunderstorm (SVR), Tornado (TOR), Special Marine (SMW), and non-precipitation (NPW) warnings; Severe Weather Statements (SVS), Local Storm Reports (LSR), Storm Prediction Center's Mesoscale Discussions (MCD) and watches (SAW), and a number of National Hurricane Center products (Fig. 1). Iembot's automated delivery means that NWS forecasters need not generate the warning in the Advanced Weather Interactive Processing System (AWIPS), and then redundantly relay it to the chat room. The bot also is fully aware of the Valid Time Event Code (VTEC) and can easily handle segmented products. This alone has proved very useful for media partners that do not have VTEC-aware product ingesters in their shops.

Iembot is also capable of relaying automated wind and precipitation alerts generated from compatible television station school networks. These alerts can be individually configured per chat room depending on the weather situation or season.

3. Benefits of NWS and Media users

As of this writing, the IEM Chat project has twenty-one media outlets and seven NWS offices participating with an additional eight NWS offices expressing interest in joining. Benefits to NWS offices include the ability to simultaneously relay or collect information from all interested parties in their chat room, view similar conversations from adjacent offices, and immediately quality control and confirm product transmission via iembot if they so desire. Recent chat room history is also included at login, and a full archive is available online for case studies or service assessments. Darone K. Jones, meteorologist with the Birmingham National Weather Service Office, cited the following benefits of utilizing IEM Chat (2005, personal communication).

> Being from the office that pioneered instant messaging within the NWS, I have had plenty of time to contemplate what I would want in a "dream" chat client. The new IEM Chat is my dream come true. Since we've made the switch, it's been nothing but positive feedback all the way around. Our media partners love the fact that the chat is always there. Our forecast staff love the fact of how much time is being saved by the 'bot'. The bot rules! On average, from the time the product is issued to the time the "bot" reports it to the room is about 15 seconds. All we do now is talk about the storm trends. There is no more fumbling to make sure everyone is invited and re-invited. No more having to repeat yourself. No more struggling to type in every warning or storm report. The 'bot' does it all.

IEM Chat has established a greater sense of community between NWS offices and their media partners. Increased collaboration and cooperation has occurred, often during critical weather situations when mutual support is beneficial. Initially, some stations feared that participation in the project would result in a competitive disadvantage since one station's severe weather report or analysis could be read from IEM Chat and used by another station. Instead, local media have participated with the end goal of providing better service to the entire viewing audience. Each television station has a number of severe weather spotters, as well as newsroom resources to seek verification of severe weather. Each report forwarded to IEM Chat, no matter how trivial, can lead to a better understanding of what is really happening on the ground. Each piece of information is helpful to broadcasters as they may be on the air for hours at a time in continuous storm coverage. With viewers often in several NWS county warning areas, the media can monitor information from multiple WFO chat rooms simultaneously.

During extended sessions of live severe weather coverage, iembot is capable of providing near real-time observations and NWS products when the on-air meteorologist has little time to seek out multiple sources of information. In addition to NWS severe weather products from local offices and national centers, media sensor networks have been automated so that

wind gusts or rainfall amounts exceeding programmed thresholds can be distributed to all users through the chat project. David Neal, Chief Meteorologist with WBRC Fox6 in Birmingham noted the usefulness of IEM Chat (2005, personal communication).

> As the Chief Meteorologist for WBRC FOX6 in Birmingham, AL for the last 10 years and a member of the Television Media now for 22 years I am always amazed at what is new with technology to make my job more efficient, and yes easier on me is good too. I have long touted instant messaging as the latest great luxury for my occupation, and being a part of the IM success story, I am proud of the way instant messaging has helped to bring the media and the NWS closer together. Now that our group has switched to IEM Chat, my luxury has gotten even greater. I can't tell you how frustrating it was to get "knocked off" one of the other services in the height of severe weather coverage. With this new client I have had no such problems to date. The icing on the cake is the 'bot' and the speed the information gets to me. In some cases, I receive notification through this before all of the other equipment in my office. Simply stated, this could very well transfer into saving a life.

Two participating Iowa television stations operate C-band Doppler weather radars in a continuous 0.5 degree elevation scan. Rapidly developing storm features have been noted by broadcast meteorologists and described via chat, resulting in an increase of situational awareness by the NWS warning meteorologist. Having many eyes looking at radar and sharing thoughts certainly decreases the chance for a storm to be overlooked during significant convective situations.

4. Summary

An exciting new internet chat messaging project has been fostered in Iowa and is available for use by any NWS office or media outlet in the country. The IEM Chat project resolves many of the security and functionality concerns experienced with commercial chatting solutions in the past. The open nature of the project has allowed an automated piece of software to relay NWS text products to the chat rooms with additional development and enhancements possible. Having administrative control over the server and client components of the IEM Chat Project means that we will have a sustainable and scalable chat solution that should work anywhere in the country.

Acknowledgments

Authors

Daryl Herzmann is currently the Program Assistant for the Iowa Environmental Mesonet at Iowa State University in Ames, Iowa. After receiving his B.S. in meteorology from Iowa State in 2001, he has been working on building and maintaining the IEM ever since.

Brad Small is currently a senior forecaster at the NOAA/National Weather Service office in Johnston/Des Moines, Iowa and has held that position since 1996. After receiving his B.S. in meteorology from Iowa State University in 1990, Brad began his NWS career as an intern at the forecast office in St. Louis, Missouri. In 1994, he moved to his current office in Des Moines as a journey forecaster. Mr. Small is actively involved in the warning and coordination program authoring and presenting numerous spotter training programs since 1995, and currently coordinates the storm spotter program.

John McLaughlin is the chief meteorologist at KCCI-TV in Des Moines, IA. He is a past president (2002) of the NWA and holds the NWA broadcast seal of approval. McLaughlin is also past-chair of the AMS board of broadcast meteorology. He is a 1995 graduate of the Mississippi State University Broadcast Meteorology Program and specializes in the use of Doppler radar systems by the media. McLaughlin is also a certified flight instructor and commercial pilot in helicopters and fixed-wing aircraft.

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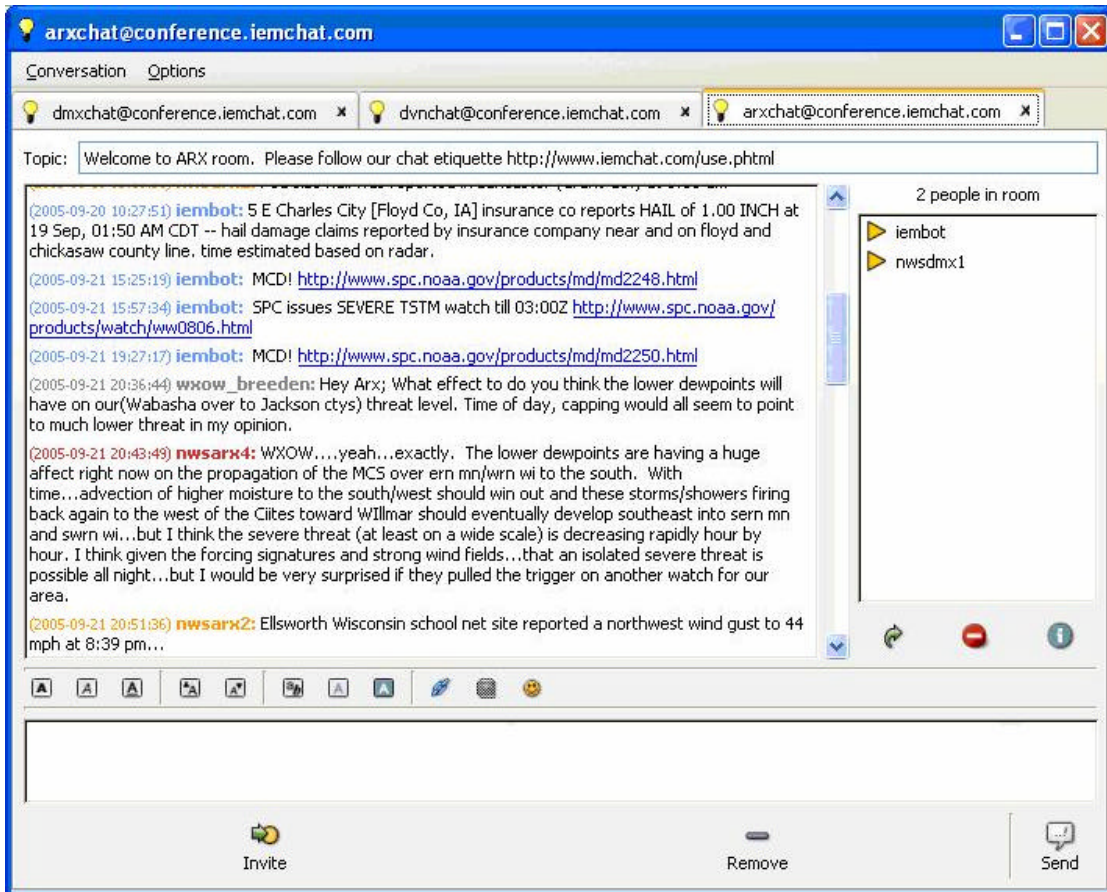
Fig. 1. Screen capture of Gaim showing tabs with multiple WFO chat rooms and users, including interaction between NWS and media, along with iembot posts of local storm reports and Storm Prediction Center products.