

Review of the 2008-2009 Joint Chat Conferences

David W. Aha

Navy Center for Applied Research in Artificial Intelligence;
Naval Research Laboratory (Code 5514); Washington, DC 20375
david.aha@nrl.navy.mil

6 May 2010

1. Summary

The first Joint Chat Conference was held in 2004. The conferences' objectives are to (among others):

- Review and address the requirements for IRC at the tactical and operational levels
- Review the current status of chat across COCOMS
- Reaffirm DISA/DSAWG/CIWG's unofficial "stay the course" position on deployed chat systems
- Review various research, development, and evaluation activities involving chat systems

Speakers in 2008 and 2009 represented SPAWAR, the Naval Network Warfare Command (NNWC), PACOM, PEO C4I, USMC Enterprise IT Services, USAF (multiple groups), Joint forces (e.g., ALSA, DISA), MITRE, the XMPP Standards Foundation, and several contractors. In 2009, this meeting was held 9-11 June at SPAWAR. LorRaine Duffy (SPAWAR) has been the primary organizer of this conference. Many of the presenters at the 2009 conference also presented in 2008; there is a large (but not complete) overlap. I can provide any of the materials summarized below.

The purpose of this short review is to provide context for the 6.2 NRL IT Focus Area project *Chat Attention Management for Enhanced Situation Assessment* (PI: Aha; Co-PI: Brock) (FY10-FY13). Our interest is in identifying contributions to this conference that are particularly relevant to this project.

2. JCC 2008

The theme of JCC-08 was that the military needed to be proactive to prevent crises involving military chat systems, which Duffy claims are the *primary* means of communication in the tactical theater, yet they have no program of record (POR) dedicated to its support. Some senior experts believe that transitions are needed to more modern/secure XML-based protocols. Below are annotated notes from presentations, where **boldface highlights** indicate contributions of probable interest to our project.

- USN SPAWAR
 - **Introduction** (Duffy): Reviewed history of Joint Internet Relay Chat (IRC) use. Original Joint policy was to discourage IRC use. In Feb 2006, the Extensible Messaging and Presence Protocol (XMPP) was approved as the official DoD standard for chat. 2007-2008: The DoD shifted from IBM Sametime to promoting Jabber as its official XMPP NIPR/SIPR chat tool, yet many tools are still in use. Problems remain with server/client proliferation, lack of standards, interoperability, and security.
 - **Review** (Duffy): Reviews proliferation of Joint Chat Systems requirements and efforts towards standardization.
 - **Mako Chat** (Medina): Integrating a chat tool with a Common Operational Picture (COP) tool (e.g., drag/drop formatted data to/from the chat and COP components). Tools for annotating high priority alerts (graphical, audio). Collected Anti-Submarine Warfare (ASW) chat data (10M+ words) and performed significant analysis of it (e.g., topic/thread identification). MakoASW chat prototype due 9/2008 with transition 9/2009.
 - **TSAT** (Rogers): TSAT project review (FY07-FY11). Large team (11+ people). DTRA funding. Focus: A better language for situation assessment (SA) that incorporates icons, gestures, data glove. Seeks to establish research area leads (e.g., computational linguistics, cognitive sciences, nano/bio). Many slides from Duffy (e.g., 500-800 18-month chatrooms in a strikegroup, w/ 2-

Aha, D.W. (2010). *Review of the 2008-2009 Joint Chat Conferences* (Technical Note AIC-10-094). Washington, DC: Naval Research Laboratory, Navy Center for Applied Research in Artificial Intelligence.

4000 users each). Collected (Medina's) chat corpus, performed topic detection and semantic analysis, etc. VisChat platform integrates text chat, objects, icons, and gestures. Several patent efforts.

- USN (–SPAWAR)
 - NNWC (Bilbrey): Laments the usual problems (e.g., lack of standards, tool proliferation) and anticipates a catastrophe. Deployment history given. Reviews status and open problems. Working since 2007 w/ PEO C4I to consolidate chat applications, adopt/mandate DISA's NCES Buttons 1 & 2 (Jabber Extensible Communications Platform (XCP)), and supported SPAWAR's work on Mako Chat (XMPP).
 - PACOM (Runge): Told to use DISA-mandated text chat protocol by 8/2006. They're migrating (C2IP project). **“Text Chat is the most used collaboration capability in the Pacific AOR.”**
 - PEO C4I (Farmer): PMW 160 fields/supports fleets' C4I networks. Focus: Consolidated Afloat Network Enterprise Services (CANES) to reduce acquisition needs/complexity. Also developing a standard/common OS (COMPOSE). Chat: Is tasked to standardize chat within PEO C4I products. Their plan includes deploying NCES Button 2 clients/servers. Active in Collaborative Applications Steering Group (CASG).
- USMC MCEITS (Larsen): Developing enterprise/distributed chat service in Tactical Collaboration work Suite (TCWS) for expeditionary support. Using Jabber's server and client products (283K USMC personnel). Field test (5/2008) found problems. Developed chat service architecture.
- Joint
 - CDCIE JCTD (Fletcher): Describes the Cross Domain Collaborative Info Environment (CDCIE) JCTD (2004-2010); targets DISA transition and **multi-language** real-time translation/use (**Trans Verse**). XMPP chat tool (DoD mandated an XMPP standard for chat in 2/2006). MUC = Multi User Chat. DISA's NCES buttons support XMPP. Uses HTTPS/SOAP/XML standards. **Downloadable with OpenFire plugins: <https://xmpp.je.jfcom.mil>. Keyword monitoring/highlighting, whiteboarding (!)**. Used in exercises since FY06. Installed widely for multi-country collaboration.
 - ALSA (Bogio): Creating a multi-service TTP on tactical C2 using IRC. They see the problem as: no standardization, lack of naming conventions and user discipline, info saturation, etc.
 - DISA UCCE (Thrasher): Multimodal collaborations/COMMS to improve SA and d-making. Unified Capabilities Requirements **mandates XMPP standard for chat**.
 - DISA CIWG (Fox): Standards for naming chat rooms & users for mil and other gov't agencies (<https://www.us.army.mil/suite/page/449149>). Co-chairs: J6 and DoD CIO.
 - DISA NCES (Daigle): Button 2 registration gaining acceptance.
- USAF
 - SAF/XC (Marshall): Lack of DoD policy and text migration plans for chat are problematic. Down-selecting to smaller set of chat tools in COCOMs to support Button 2 while supporting early adopters of Button 1.
 - ARFL (Brungart): **Integration of voice & chat**. Contrasts their strengths/weaknesses. Interest in 3D audio displays. Multimodal Communications (MMC) system includes speech-to-text transcription where “chat windows” represent radio channels. XML rep'n. Audio annotations.
- MITRE (Winkowski & Krutch): Addressing problem of lack of COMMS between IRC and enterprise systems, causing problems with SA and focus. Solution: Structured data (Collaborative Data Objects) to support conversations/collaboration. Would permit hyperlinks in chat, connectivity with enterprise systems (both ways), reducing cognitive disruptions. XMPP-based. (They have a 22-page paper to go along with their presentation.)
- Asynchrony (Ferrigni): Mako chat architecture supports XMPP. Describes Mako platform (e.g., IRC client replacement, no license fees, available via NESI repository). Mako server would sit between onboard clients (e.g., IRC, Mako) and secure satellite comms w/ land-based servers.

Aha, D.W. (2010). *Review of the 2008-2009 Joint Chat Conferences* (Technical Note AIC-10-094). Washington, DC: Naval Research Laboratory, Navy Center for Applied Research in Artificial Intelligence.

- XMPP Standards Foundation (Saint-Andre): Defines XMPP (e.g., history), the foundation, MUC uses and vision, and lots of discussion on federations.

3. JCC 2009

The theme of JCC-09 was similar to that of the previous year, encouraging proactive efforts.

- USN SPAWAR
 - **Introduction** (Duffy): Similar to 2008 presentation. Button 1 stood down 6/2009. Button 2 being used today, which DISA is providing but soon services will have to pay for it. Lists the 12 joint chat systems used today (e.g., IRC, Jabber, CCL+, CDCIE Transverse).
 - **Summary** (Duffy): Recaps primary JCC-09 findings (e.g., three bridge concepts (Mako, Jabber, Universal Collaboration Bridge (UCB)) **are being developed/tested (not fielded)**, Jeff Ellen's work on extraction/fusion and Hamelin's work on interpretation is of interest to us, chat is not being articulated for use for tactical commands, push is on for cross-service chat requirements, Navy is testing XMPP in Trident Warrior 2009 exercise). Conference moves to east coast in 2010! Reviews goals from 2007 and status. Advises that PACOM should provide cross-service leadership on this issue (not surprisingly).
 - **Message and Chat Extractor (MACE)** (Ellen/Sandlin): Goals are increased SA (via alerts and searching), and reducing time spent on repetitive manual updates. They highlight anomalies. Search: Build dictionary of terms from messages. Argues (p9) for three watchstander needs. First step is to build a training corpus, then apply content extraction algs, then use ANNs/SVMs for POS tagging and meta-data extraction. (Ellen's ICMLA-09 paper is more interesting).
 - Coalition Chat Line Plus (CCL+) (Howell): Automatic text language translation system based on MITRE technology. In exercises since 2003, deployments in several COMs.
 - Video: Language translation tool for chat (& MS/Office tools) (Sequoyah Program of Record)
 - **Mako Chat for ASW** (Medina): In 2003, ship bandwidth was 64Kbps; IRC chat had 2Kbps of it. Concerns: (1) too many disparate/disconnected chat sessions, (2) chat info not easily shared on tactical plot, and (3) users not alerted to actionable messages/orders delivered via chat. Requirements are now addressing these problems. Mako Chat for ASW: Integrates COP/C2 tools, including drag & drop between COP and chat windows. It's an IRC to XMPP bridge chat protocol whose interface is similar to MS Chat's. Provides some Chat/COP interactions (e.g., lat/long recognition within chat). "Shout" functionality (for urgent messages) posts text in bold red font. Includes an alert tab that offers SA update based on keyword importance and form recognition (see slide 7). Deputy PM is Guy Leonard, Technical Lead is Jeff Sandlin, and Integration Lead is Joe Ortiz.
 - **VisChat Research** (Rogers): 9 employees contributing to this. VisChat chatroom interface integrates linguistic analysis, visual/iconic languages (VAIL), and technology of inscription (TI) to improve SA among distributed tactical warfighters. Linguistic research involved substantial (e.g., probabilistic statistical) analyses of chat data from five sources (e.g., C2F, Valient Shield 2006). This produced candidate lists for iconic representations/visual imaging. VAIL research focused on augmenting/disambiguating text content w/ visual representations of language, objects, and info. TI has focused on glove interfaces (e.g., to support gesture recognition).
 - PAO Command Overview (Budzyrna): Overviews SPAWAR SSC (not a chat-related brief)
- USN (–SPAWAR)
 - NNWC (Bilbrey): Last time, main points were that they stood up a Program of Record, that chat applications/infrastructures were ad hoc, client security is lacking, and there are several uncoordinated initiatives. Now efforts are aligning (e.g., XMPP testing, Mako phase in). Clients in use now (with future focus underlined): Mako, IRC, InfoWorkSpace (IWS), and Defense Connect Online (DCO) XMPP. They're deploying Mako Chat and transitioning Navy to NCES Button 2 (Jabber XCP).

Aha, D.W. (2010). *Review of the 2008-2009 Joint Chat Conferences* (Technical Note AIC-10-094). Washington, DC: Naval Research Laboratory, Navy Center for Applied Research in Artificial Intelligence.

- PEO C4I (Sweeney): PMW 150 chat status. Integrating Mako Client into Aegis Advanced Capability Baseline 12 into their Common Display System consoles. XMPP/related testing. Want to support 500 chatrooms w/ 5 users each, and several with 100, 500, or 1000 users. Users would log in, log out, and search. Rooms stood up for 9-15 months at a time. Archiving chat comprehensively for 15-20 years minimum, all servers. **Interesting flow chart on decision making wrt fielding chat systems (p7).**
- CCSG 11 Surface Strike (LCDR Cummins): Briefly notes use in planning/execution/debriefing, two camps (mIRC vs. MS Chat). Lacks detail.
- USMC MCEITS (Larsen): Context is MAGTF C2 Framework; MCEITS POR is the enterprise services layer for it, and is responsible for fielding chat systems. Describes limited USMC deployment of chat tools/services.
- Joint
 - CDCIE JCTD (Fletcher et al.): Transitioning to DISA in FY10. Standards-based cross-domain group chat w/ bi-directional language translation. Extends XMPP (e.g., security classification labeling, whiteboarding via Openfire plugin). TransVerse chat client: XMPP, Java, USAF supported, supports keyword highlighting, <https://xmpp.je.jfcom.mil>). Also: CG Web chat client.
 - Joint ALSA (Bogio): Their MTTP will standardize and describe the use of tactical chat for opns. Provides cdrs/units w/ guidelines re: multi-service coordination and integration of TC. Expecting sign-off in 2009.
 - USSTRATCOM (Milligan): Capabilities include Jabber (DCO & ICES), DCO (Chat), etc. Vision is that chat can be dragged/dropped in any admin/COMMs applications.
 - **DISA UCCE** (Thrasher):
 - DISA Collaboration Interoperability Working Group (CIWG) (Dean): Consolidating COMMs tools. DCO use has skyrocketed: 120K NIPR and nearly 500K SIPR as of 5/2009. Migrating from NCEC Button 2 to DCS in 2011. Describes increased Navy use of DCO, which was PACOM theater standard in 3/2008. Significant use for virtual meetings. Advises federating to DCO XMPP.
- USA
 - CERDEC (Carpenter): SEI (?) study suggests it'll be difficult to adopt same chat platform for all DoD, so let's work on a (Java) Universal Collaboration Bridge (UCB) instead. Works now for a few variants of mIRC, Jabber/XMPP, VMF. Like middleware for chat COMMs. Standardizes names. Intended to later facilitate multimodal COMMs.
 - USCENTCOM (McLean, MAJ): Chat used in all COMMs (e.g., air/land/sea, between CONUS and OCONUS, tactical users and HQ, with coalition partners). Want XMPP now; CDCIE almost complete in Afghanistan. Using Trans Verse XMPP client. Placing controls on user actions.
- USAF
 - Global Cyberspace Integration Center (Gunter): Still using IWS & mIRC, but deploying TransVerse client. Jabber client in wide use. Having problems using Button 2 (SATCOM issues).
 - SAF/XC (Marshall):
- Contractors+
 - **MITRE** (Parik et al.): XMPP chat evaluation study for PEO C4I PMW 770 (Submarine Integration) to assess COMMs at speed/depth. Env't poses challenges (e.g., connection time, bandwidth usage, latency). [I didn't understand the results.]
 - Asynchrony (Efanbaum & Ferrigni): They're working for PMW 160 to transition from IRC to XMPP. Steps: Mako IRC client, Makie IRC server, Make IRC-XMPP broker, and Mako client as an IRC/Mako/XMPP hybrid. (Yuck). Moving towards full XMPP compatibility.
 - **Orbis** (Hamelin): Located in Annapolis, working w/ SPAWAR. Proposes a chat multi-INT fusion platform that includes a **rule-based chat extractor** (ontology-supported), an entity extraction service, an HTML client, and semantic discovery services that support NL queries & semantic

Aha, D.W. (2010). *Review of the 2008-2009 Joint Chat Conferences* (Technical Note AIC-10-094). Washington, DC: Naval Research Laboratory, Navy Center for Applied Research in Artificial Intelligence.

- navigation over fused data. **Modeling chat domain to support inference and reasoning** (e.g., concept-based searching) over chat content vs. other sources (HUMINT, OSINT). SOA, RDF.
- XMPP Standards Foundation (Saint-Andre): Not particularly interesting