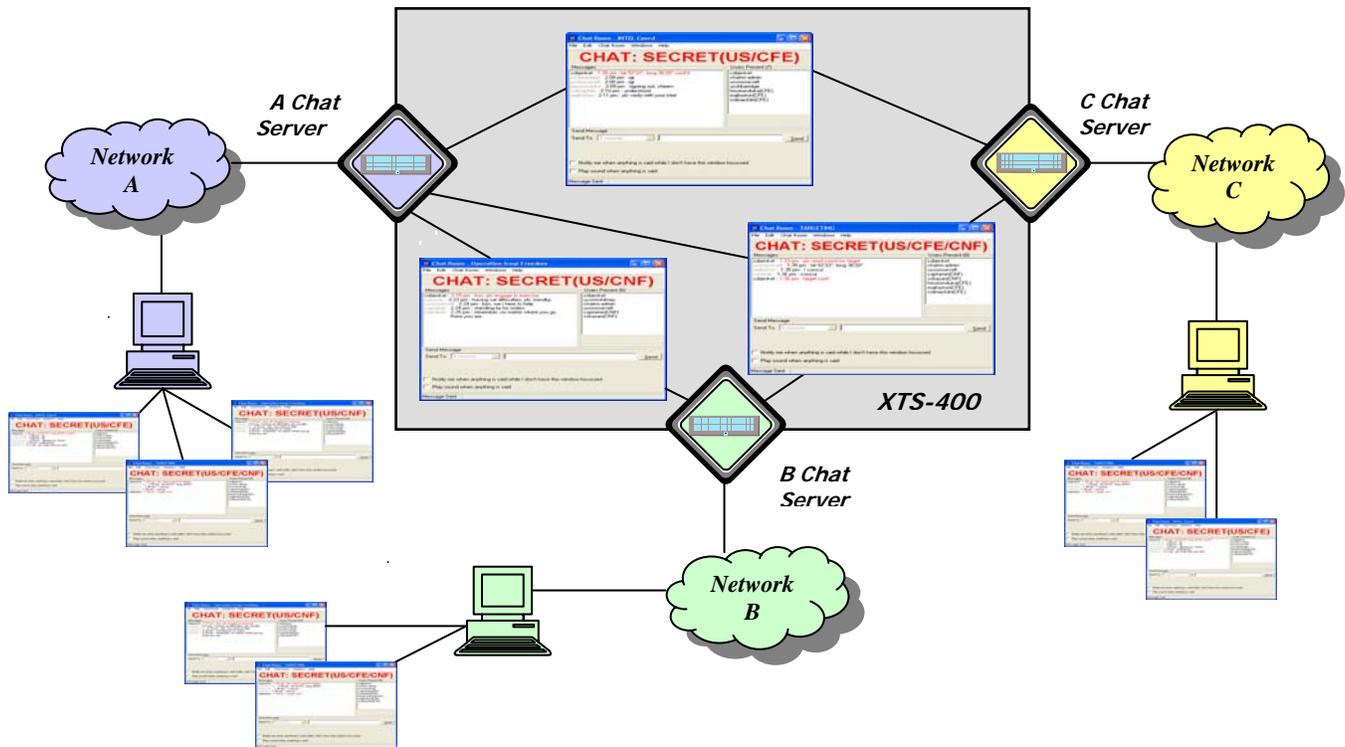




# Multi-Level Chat Server



## Background

The Multi-Level Chat (ML Chat) server supports near real time information exchange between users operating at disparate security levels. Traditionally, voice-based systems have been used for this interaction, but audio intelligibility can be difficult at times and does not lend itself to multiple simultaneous conversations. As inter-networked information technology (IT) systems become more prevalent, chat systems are being used more often to support these collaboration services. Chat is quiet, works well in low bandwidth environments, is easy to understand and allows multiple users to converse simultaneously.

## Required Functionality

Input from users was gathered before undertaking the development of the ML Chat Server. The most important requirements were:

- Operation in low bandwidth environments

- Integration with existing software/services
- Ease of use
- Support for up to 15 simultaneous networks operating at differing security levels

The minimal text strings associated with chat lend it well to low bandwidth environments. Modifying and integrating a commercial application with a trusted operating system provided solutions for the other requirements. The commercial application supports integration with existing software services and ease of use. The trusted operating system supports multiple disparate network connections. The most difficult task in developing the ML Chat server was building a trusted process between the application and operating system and ensuring proper implementation of mandatory and discretionary access controls. Added security is provided through the use of monitoring and data filtering.

## User Interface

There are two user clients for the certified ML Chat system, a windows client and a web client. The windows client must be loaded on the user workstation, supports a persistent connection, operates very well under low bandwidth constraints and allows access to multiple simultaneous chat rooms. The web client uses slightly more bandwidth but can be supported through existing web browsers such as Internet Explorer, Firefox or Netscape. The web client supports a single chat room instance. A high assurance registration process allows users to activate their own accounts. The system administrator enables user privileges based on pre-defined user profiles. Access to multiple chat sessions is granted for each user based on their profile. For instance, user A may have several chat windows operating simultaneously from a single workstation, one window supporting A/B collaboration, a second window supporting A/C collaboration and a third window supporting A/B/C collaboration.

## Additional Developments

A standards based, XMPP client/server was developed in and implemented in a joint task force exercise. No client software is required; the client is spawned when the user connects to the server via their existing web browser.

## Administrator GUI

An administrator GUI allows a system administrator the ability to add or delete chat rooms, add or revoke users and place users on Chat Room Access Control Lists (ACL).

## Approval Process

The underlying Operating System (OS) of the ML Chat Server is STOP, developed by BAE. The hardware platform is the XTS-400/410. The STOP OS has been evaluated at the EAL 5 (Augmented) level. The ML Chat server has successfully undergone formal CT&E testing at NSA and has received DSAWG approval. An initial field trial was conducted on live networks in 2004. The system operated better than expected and supported coalition interoperability for over 100 simultaneous users operating in eleven chat rooms. The system has since been implemented in many joint service and coalition environments. With each implementation the number of users and chat rooms has steadily increased. The most recent implementation included accounts for over 1000 users operating in 52 chat rooms.

## Cross Domain Applicability

The ML Chat server is listed as an approved, cross domain multi-level baseline solution on the UCDMO Cross Domain Inventory Guidance list.

## Development Sponsor

The Multi-Level Chat system was developed by the Naval Research Laboratory through research sponsored by the Office of Naval Research.

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