

U.S. Department
of Transportation

**United States
Coast Guard**



Communications System 2010: "Intelligent Gateway" Proof-of-Concept



U.S. Coast Guard
Research & Development Center
Advanced Communications
Technology Project

What is the Intelligent Gateway?

The Intelligent Gateway (IG) is a Research and Development (R & D) effort to design an algorithm to provide computer-aided routing of ACP-123/X.400 messages by a United States Coast Guard (USCG) Communications Area Master Station (CAMS). In short the IG makes the same decision that a Telecommunication Specialist would make. By design the IG acts as a sub-component of the Defense Message System (DMS) profiler user agent (PUA). Although the IG never actually handles the message, the IG directs the PUA to use the most appropriate communications path: high frequency radio (HF), military satellite (MILSATCOM), or commercial satellite systems. The IG only acts on messages that are bound for vessels that are underway and that have multiple communications modes.



How is the IG Implemented?

The IG is a proof-of-concept effort and is not intended to be fielded as a stand alone DMS component. Instead the Coast Guard is working with the Navy and DMS product vendors to incorporate IG functionality into future commercial off-the-shelf (COTS) DMS products. The algorithm is implemented as a rule-based Expert System (ES) that incorporates the message routing expertise of various USCG communications experts. The IG is designed to be implementation independent

Why did the Coast Guard design the IG?

Currently, there are no DMS products that can choose the best path to send messages to underway vessels with multiple modes of communications. Since Coast Guard cutters typically operate independently, each cutter relies on onboard means of communications. Coast Guard cutters have multiple modes to communicate with shore facilities including HF, MILSATCOM, and commercial satellite communications. The problem lies in choosing the best mode. Each mode has drawbacks including cost, bandwidth limitations, timeliness and reliability. The IG automates the time intensive decision making process by choosing the best communications path.

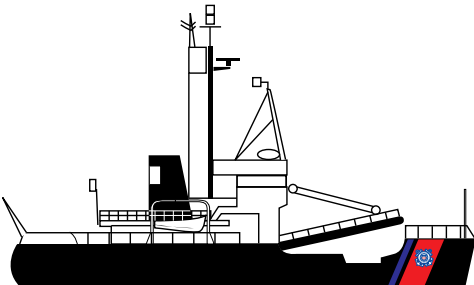
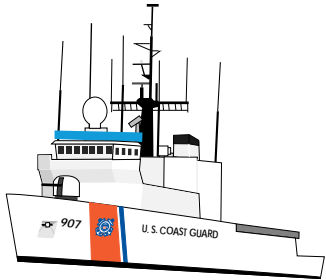
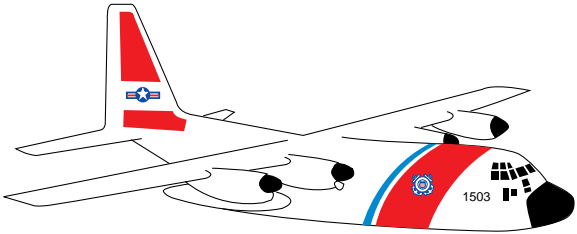
The screenshot shows a window titled "Edit Message" with a blue title bar. The main area is divided into two sections. The left section is a table with two columns: "Military Message Identifier" and "Subject". The right section contains several input fields and dropdown menus: "Mil Message Ident (ORG YYYYMMDDHHMMSS ###)", "Precedence", "Ext Authorization Info (YYMMDDHHMMSS)", "Originator", "Recipient", "Subject", "Latest Del Designation (YYMMDDHHMM)", "Message Type", "Message Length", and "EIT". At the bottom of the window, there are four buttons: "NEW", "SAVE", "DELETE", and "CLOSE".

What parameters does the IG use?

The IG uses the precedence of the message, the size of the message, channel data rates, and the cost associated with using a particular communications mode. In addition, the IG checks two dynamic databases for the equipment status of both the underway unit and local shore facility (CAMS). The IG sends low precedence traffic to a pending database for those messages that cannot be delivered on time without significant cost. Messages in the pending database are then batched with higher priority messages to lower the overall cost of sending a message.

What happens to the IG now?

Since the Coast Guard's message delivery requirements are not unique, the Coast Guard will work with the Navy and commercial vendors to integrate the IG functionality into future DMS COTS products.





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