

ADA - Raytheon Corporation - TCS/MCS

US Navy's Space and Naval Warfare Systems Command (SPAWAR)

Modem Control Software (MCS) - ADA to C++

History: Navy Multi-band Terminal (NMT) is a SATCOM terminal, which expands available bandwidth and provides support for ForceNet, the Navy's approach to network-centric operations. NMT provides an integrated communications capability that supports Extremely High Frequency/AEHF Low Data Rate (LDR)/Medium Data Rate (MDR)/Extended Data Rate (XDR), Super High Frequency band, military Ka band, and Global Broadcast Service (GBS) receive-only communications. Raytheon was defining a modernized NMT hardware and software architecture to support communications above two gigahertz and provide other functions as part of defining an architectural standard for future Navy satellite communications (SATCOM) based on the Software Communications Architecture (SCA).



Challenge: The existing Low Data Rate/Medium Data Rate Modem Control System (MCS) of NMT, written in Ada, was a high-quality, one-of-a-kind, mission critical, information system for which no viable commercial off the shelf (COTS) alternative was available. MCS required modernization into platform independent C++ to support the U.S. Navy's Space and Naval Warfare Systems Command (SPAWAR) NMT architecture and software requirements. To provide SPAWAR with the best modernization approach, Raytheon selected TSRI to transform the existing MCS Ada code into C++ and to re-factor the C++ toward the desired target architecture. TSRI's fixed-price "integrator ready" deliverable was selected by Raytheon for its low technical risk, shortened schedule, and low cost. Raytheon awarded TSRI a sole source contract as the sole provider capable of 100% automated assessment, transformation and re-factoring of MCS while meeting stringent SPAWAR quality standards.

Results: Using their multi-language *JANUS*[™] technology, TSRI transformed MCS into a C++ system compatible with the Wind River Tornado development environment and with a Tornado modified GCC based compiler. The deliverable was 100% free of compilation or linkage errors. Raytheon subsequently carried out installation of the modernized MCS system, embedded it into the target NMT test bed, and carried out system tests. Following successful system tests, TSRI used *JANUS*[™] to carry out a fully automated re-factoring of MCS and redelivered the enhanced MCS system to Raytheon. The re-factored version of MCS operated flawlessly and completed testing without requiring further TSRI assistance. In October 2003 the SPAWAR awarded Raytheon a \$23.3 million addition to NMT that included integration of MCS.