

MASTER OF SCIENCE IN SOFTWARE ENGINEERING

SECOND GENERATION ULTRA HIGH FREQUENCY (UHF) SATELLITE PROTOCOL

Robert L. Franco-DoD Civilian

B.S., University of Northern Colorado, 1975

Master of Science in Software Engineering-June 2000

Advisor: Gilbert M. Lundy, Department of Computer Science

Second Reader: John K. O'Leary, Sr., SPAWAR Systems Center-San Diego

An attempt is being made to provide the reader with an appreciation for the complexity required to upgrade an existing Ultra High Frequency (UHF) 25 kHz tactical communications protocol. This thesis defines the satellite discipline and protocols for a second generation of the Officer in Tactical Command Information Exchange Subsystem (OTCIXS II). This thesis provides the detailed information necessary for the implementation of the OTCIXS II communications protocols. It can be used to define and develop the OTCIXS II satellite link software. The OTCIXS II network protocol will consist of distinct protocol layers: Physical, Data Link, and Network layers. The transport layer which provides the actual computer to computer transfer of messages will not be covered in this thesis.

DoD KEY TECHNOLOGY AREAS: Command, Control, and Communications, Other (UHF SATCOM)

KEYWORDS: OTICXS II Satellite Link Protocol

AN ARCHITECTURAL FRAMEWORK FOR INTEGRATING COTS/GOTS/LEGACY SYSTEMS

Karen M. Gee-DoD Civilian

B.S., University of California, Davis, 1987

Master of Science in Software Engineering-June 2000

Advisor: Luqi, Department of Computer Science

Second Reader: Man-Tak Shing, Department of Computer Science

Building distributed systems more effectively and efficiently is an essential goal of the Department of Defense (DoD). We are driven by the push toward greater use of COTS, the need to improve access to legacy data and services, and the new business opportunities offered by web-based technologies and electronic commerce. To fully realize the DoD's goal, a new architectural framework is needed.

This thesis proposes an architectural framework suitable for integrating COTS/GOTS/legacy systems in a distributed, heterogeneous environment. The proposed architectural framework uses The Open Group Architectural Framework (TOGAF) as a basis and includes new tools to support the COTS/GOTS/legacy system development and integration. A case study for the Naval Integrated Tactical Environmental Systems (NITES) program where a prototype is built, demonstrates the effective use of the proposed architectural framework.

DoD KEY TECHNOLOGY AREA: Computing and Software

KEYWORDS: COTS, GOTS, Legacy Systems, Architectural Framework, Distributed Systems, Software Development