

International Test and Evaluation Association

BACK TO THE BASICS

Panel Discussion

12th Test Technology Review
November 3-5, 2015

PANELISTS

Mr. Patrick Lardieri

NCR / Lockheed Martin



- Chief Engineer for Lockheed Martin's National Cyber Range (NCR) and a Lockheed Martin Fellow in Cyber Technologies and Operations
- On the NCR program, designed and executed dozens of DT cyber security evaluations supporting acquisition programs from all four Services
- Over his 25 year career, has served as technical lead for multiple DoD applied research programs in automated cyber testing, distributed real time computing, adaptive networking, SW producibility, and intelligent training
- Has published over 20 published papers and given multiple invited talks and keynotes at refereed conferences
- Has participated in several DoD technology policy planning workshops on software producibility and security challenges
- Currently serves on USAF Scientific Advisory Board

Mr. George Rumford

TRMC



- Deputy Director for Technology Development for the Department of Defense (DoD) Test Resource Management Center (TRMC) and Program Manager for the Test and Evaluation / Science and Technology (T&E/S&T) Program
- Leads the Test and Training Enabling Architecture (TENA) Software Development Activity (TENA SDA), the common integrating software architecture for range systems, simulations, and facilities in the test and training communities
- Senior Technical Advisor for the National Cyber Range (NCR) and the Joint Mission Environment Test Capability (JMETC), an enterprise solution to integrate test facilities and laboratories across the Services and in industry to enable early testing of warfighting systems in an operational Joint context
- Prior to joining the TRMC, worked at the Defense Information Systems Agency (DISA) and for the Army at White Sands Missile Range
- Born in St. Louis, Missouri, received degrees with honors in Electrical Engineering and in Computer Engineering from the University of Missouri

BACK TO THE BASICS

Game-Changing Technologies

Adaptive EW



Autonomy



Hypersonics



- Game-changing technologies
- Changing warfighting environment
- Increased RF spectrum demand

Software & Comms: Key to Modern Warfare Systems

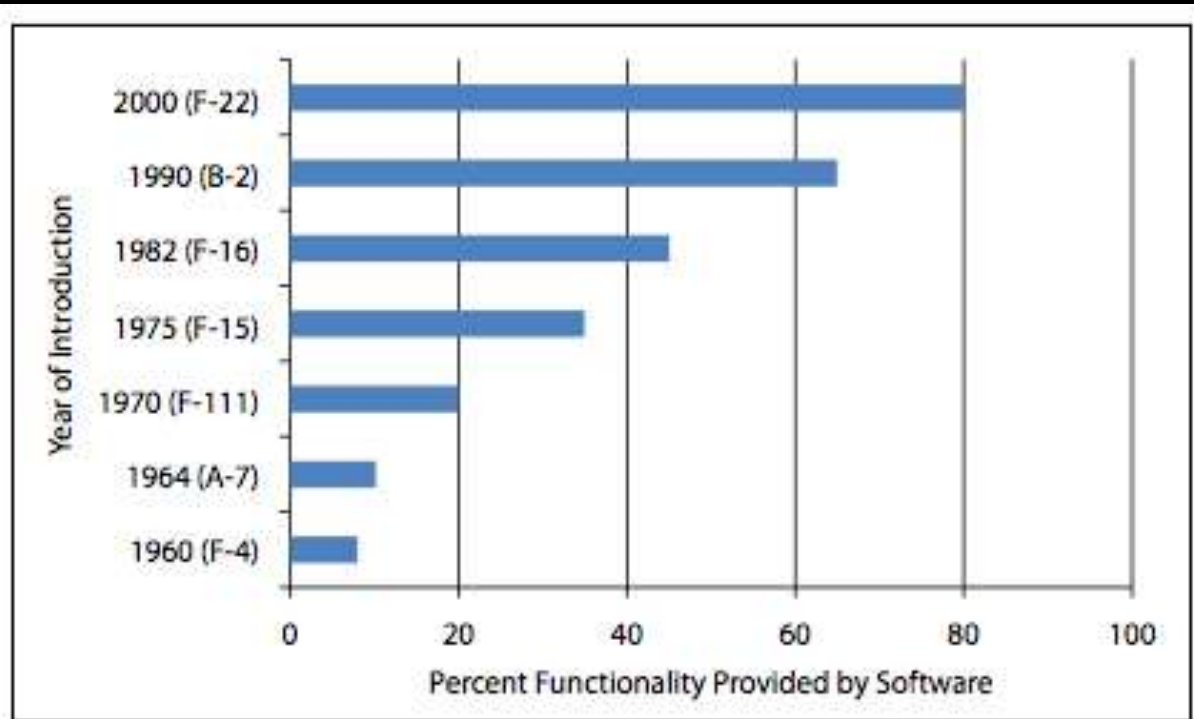
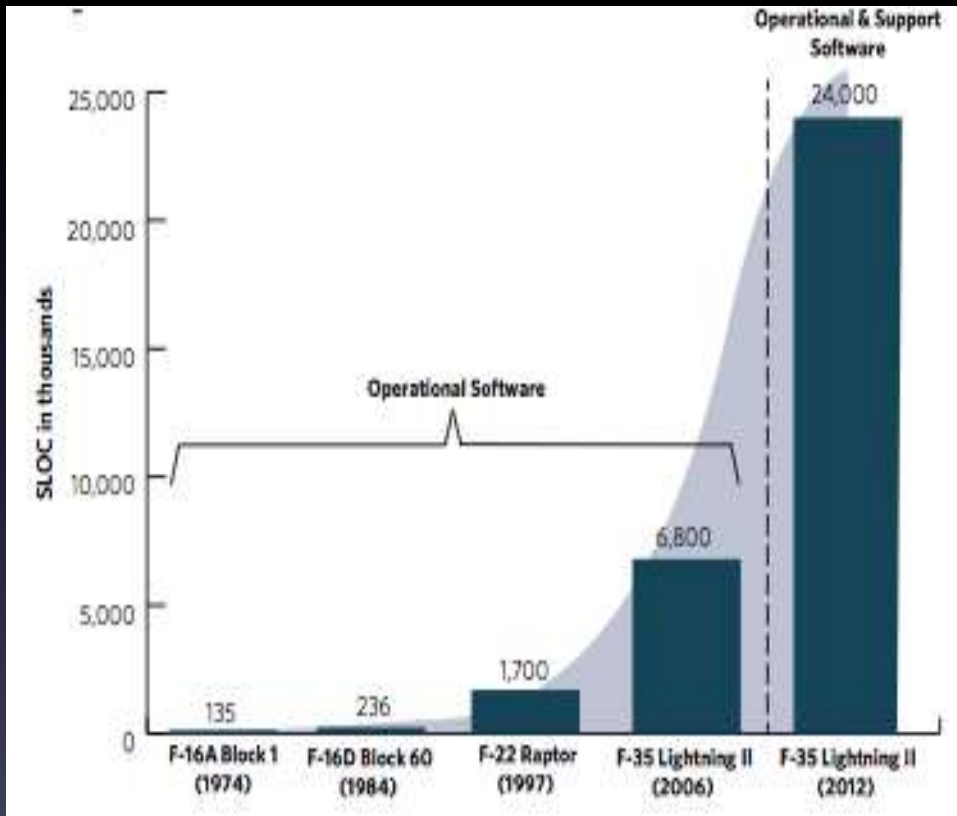


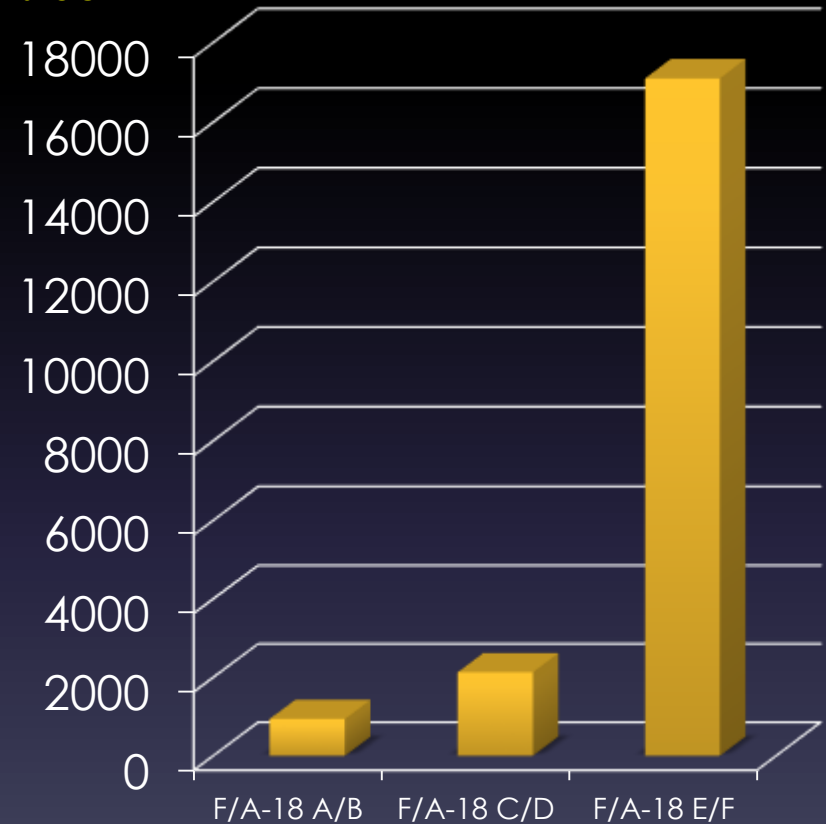
Figure 4. Growth in software functionality of military aircraft software.

(Adapted from Daniel L. Dvorak, ed., *NASA Study on Flight Software Complexity* [Washington, DC: NASA Office of Chief Engineer, 2009], 30, http://www.nasa.gov/pdf/418878main_FSWC_Final_Report.pdf.)

Avionics Software Lines of Code



SLOC in K



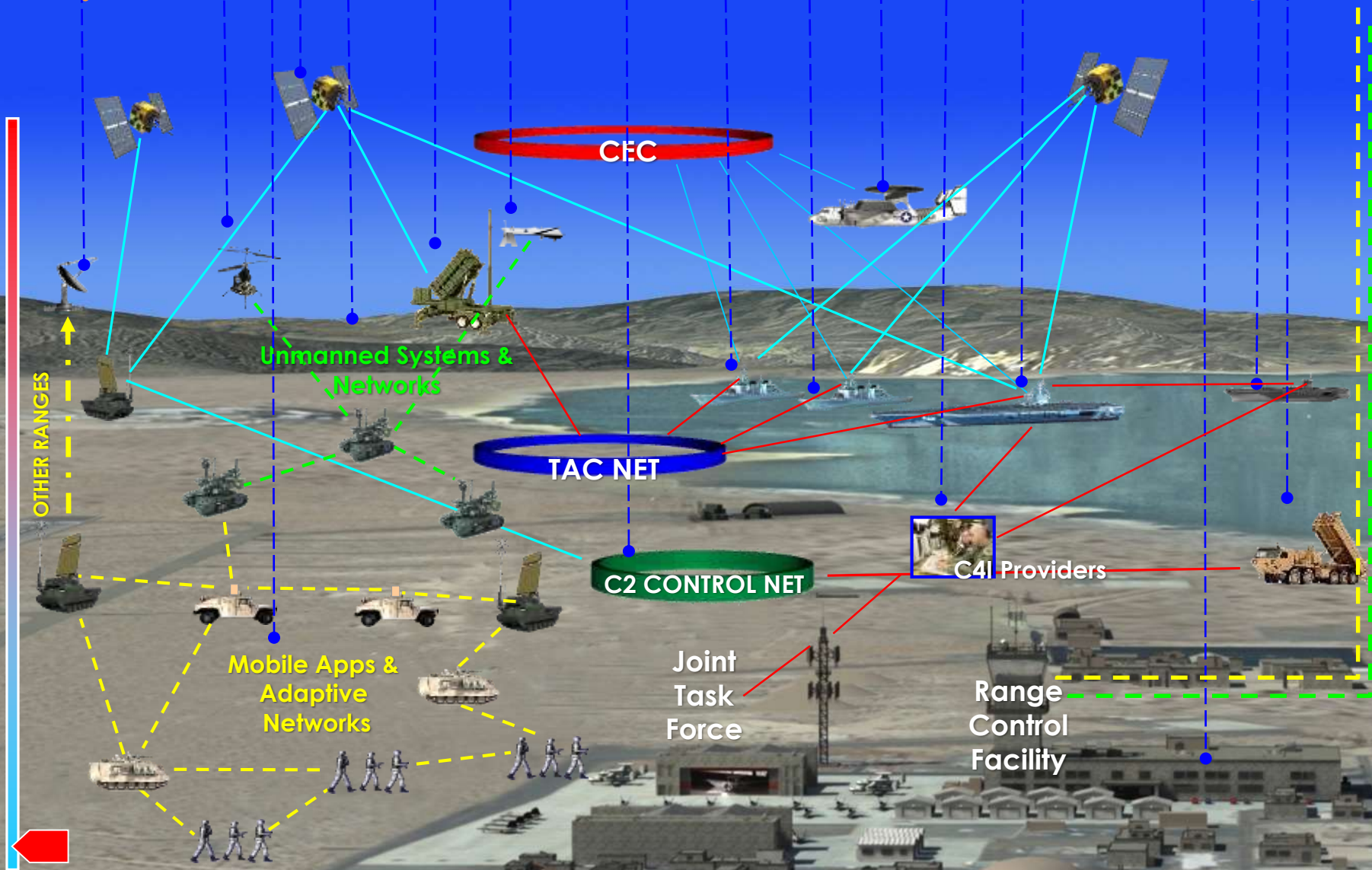
Source: Hagel & Sorenson; Delivering Military Software Affordably; Defense AT&L 2013

Sensor Integration Test

The Range Information Grid

Bidirectional Secure Range Network

SPECTRUM, LAND, SEA, AND AIR RESOURCES



Unmanned Systems & Networks

CEC

TAC NET

C2 CONTROL NET

C4I Providers

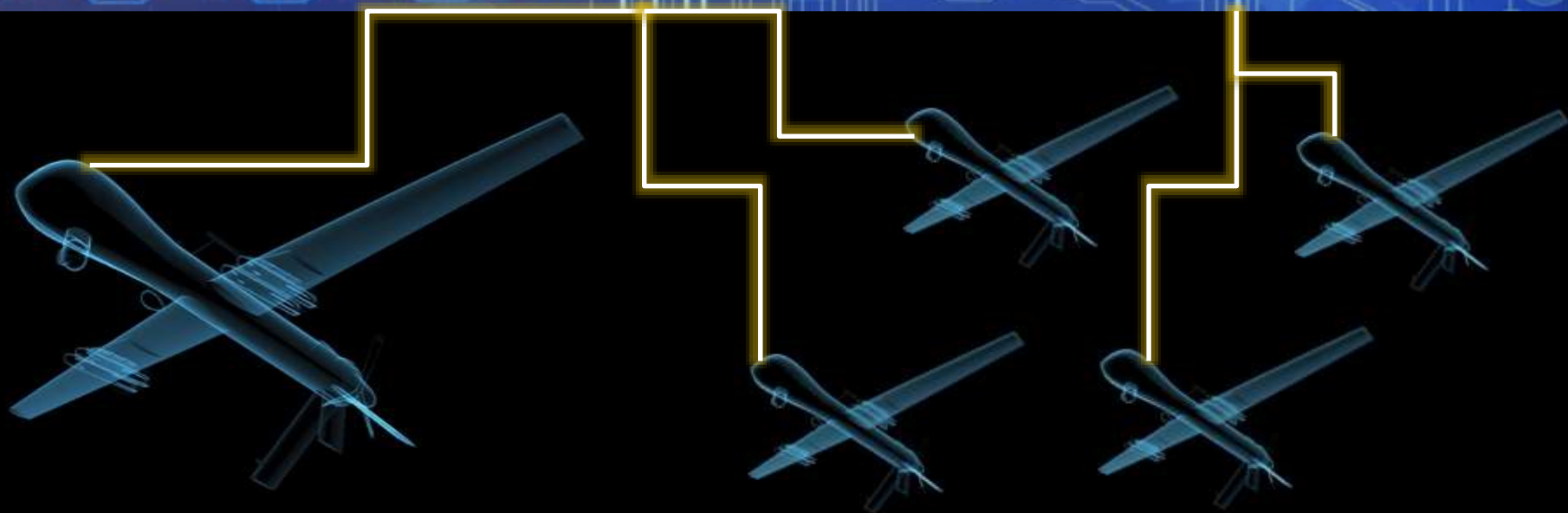
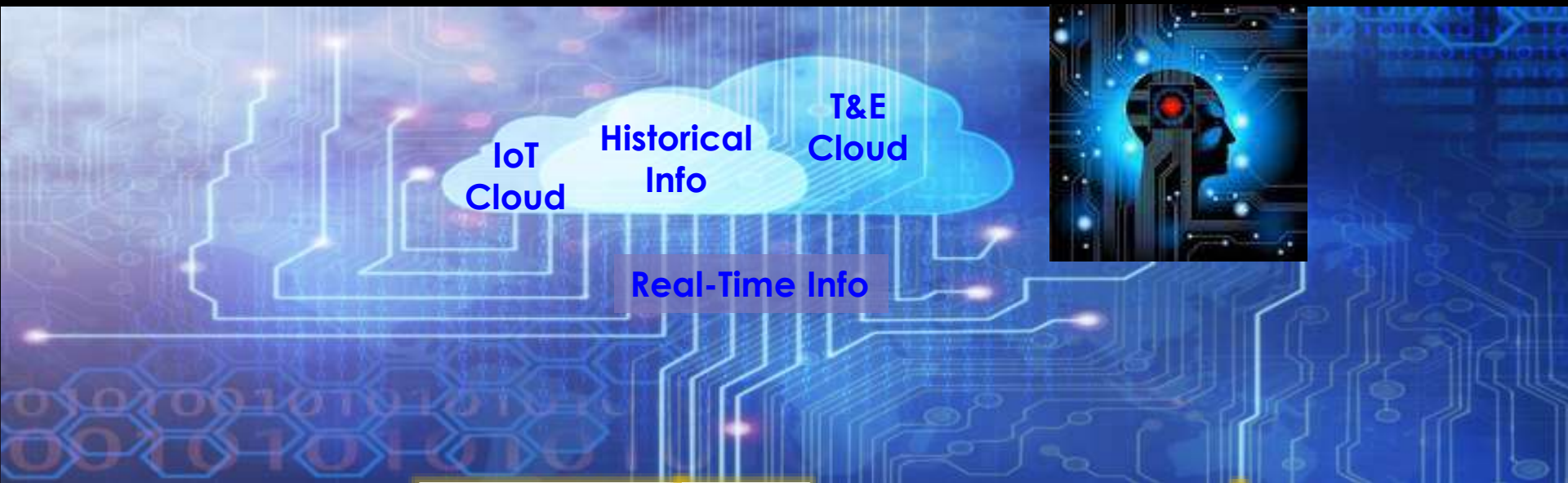
Mobile Apps & Adaptive Networks

Joint Task Force

Range Control Facility

OTHER RANGES

The Future: Intelligent, Learning Systems Connected to the Cloud



Test & Evaluation Drivers

- Pace of Development
- Configuration Complexity
- Interactive Complexity
- Interdependencies Between and Among Warfighting Domains