



Multi-Level Security for Distributed Test

Ed Tubbs

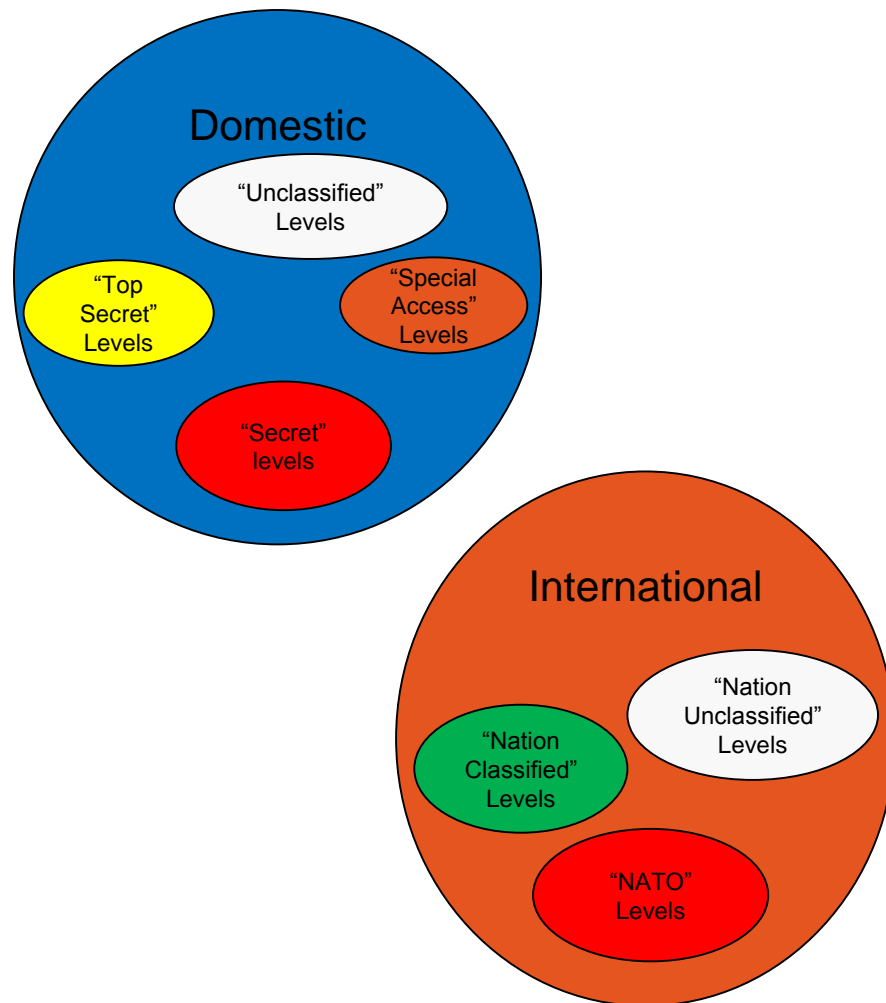
**Rockwell
Collins**

Building trust every day

Context

Sharing Information at Multiple Security Levels is Expanding Globally

"...it is becoming less and less feasible to isolate a system under test, or a training participant, from the information-rich environment in which it operates." - Multiple Independent Levels of Security: The Changing Face of Range Information Management in the 21st Century, G. Derrick Hinton

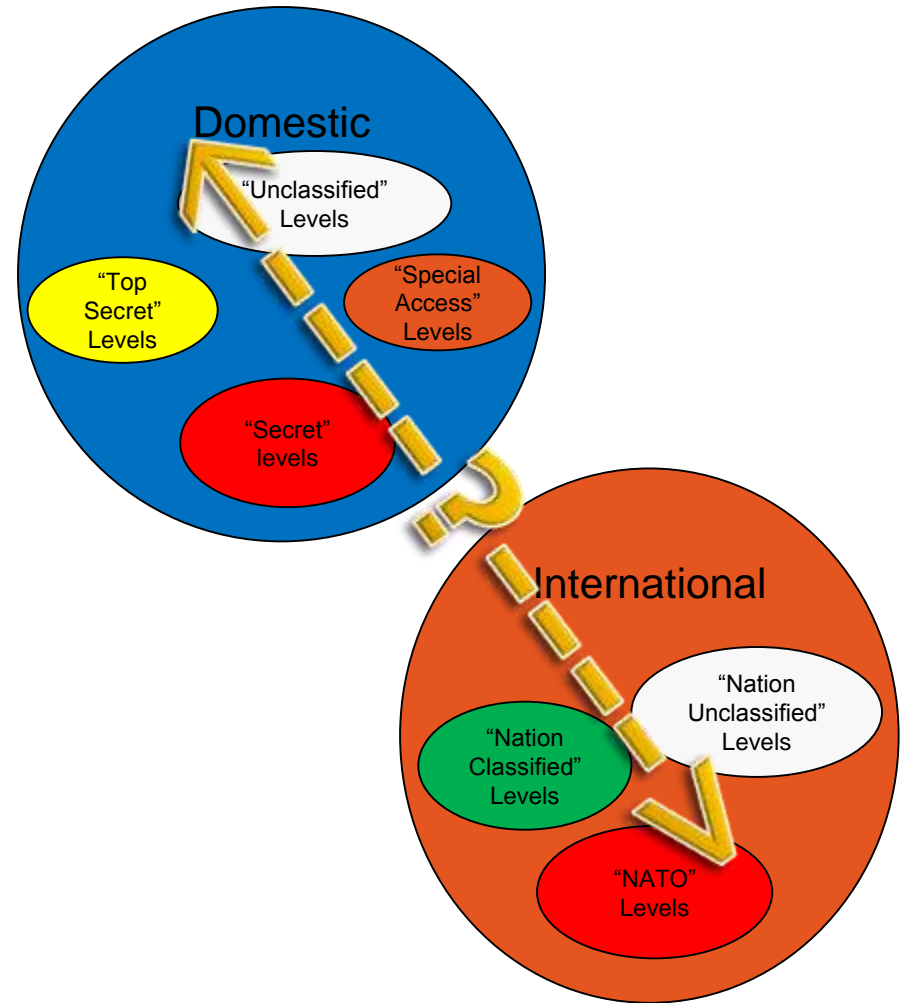


How do you manage multi-level information without compromising security?

Problem

Traditional “Detached Domains” isolate systems and participants that are not “System High”

- Coalition & US
- Unclassified & Classified
- Airborne & Ground Systems
- 5th & 4th Gen Fighter Aircraft

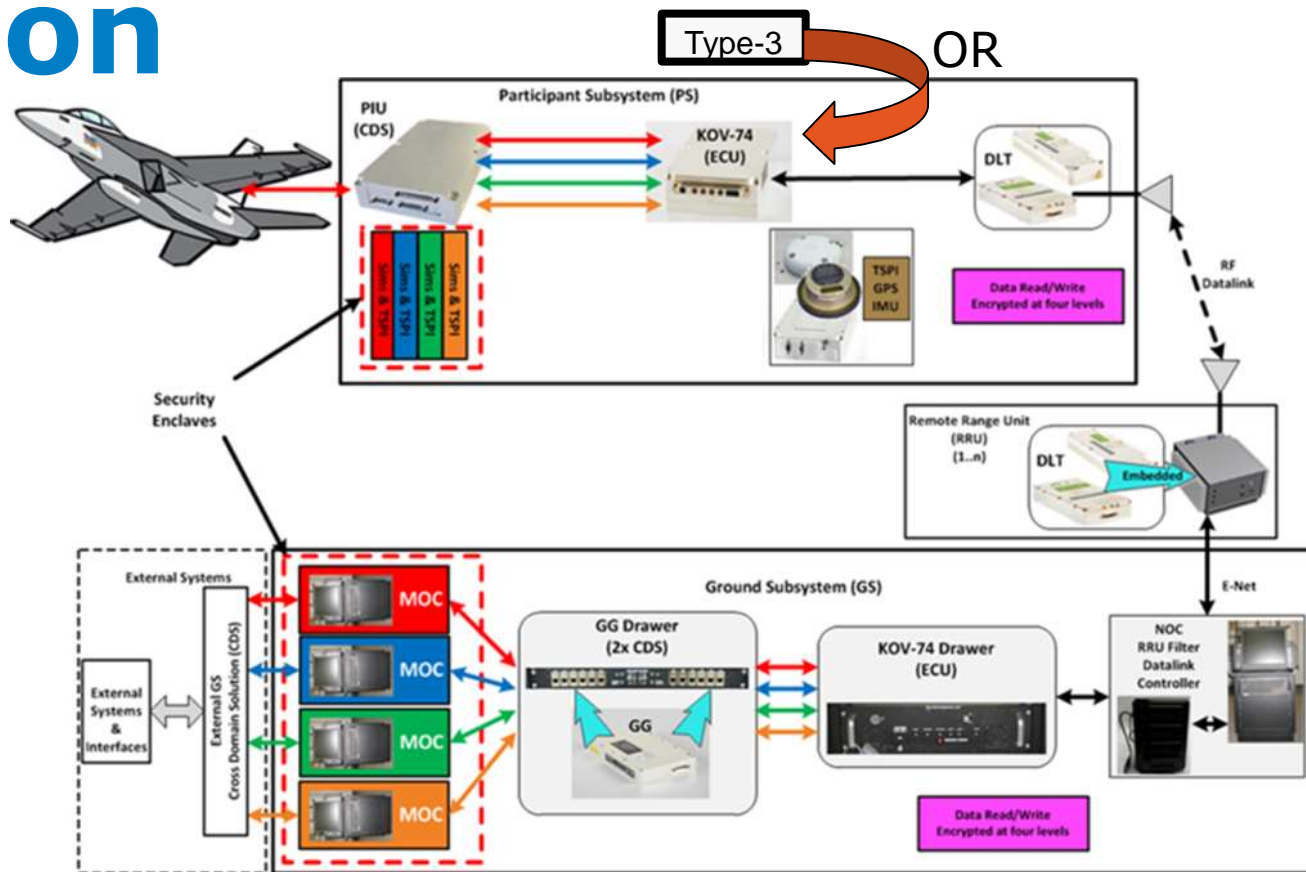


How Do You Share the Right Data, with the Right People, at the Right Time?

Solution

“End-to-End”
Multiple
Independent
Single Levels of
Security

- NSA-Certified Type-1 Encryption
- NSA-Evaluated Trusted Guard
- FIPS 140-2 Validated Type-3 Module



Revolutionize the Distribution of T&E Information at Multiple Security Levels

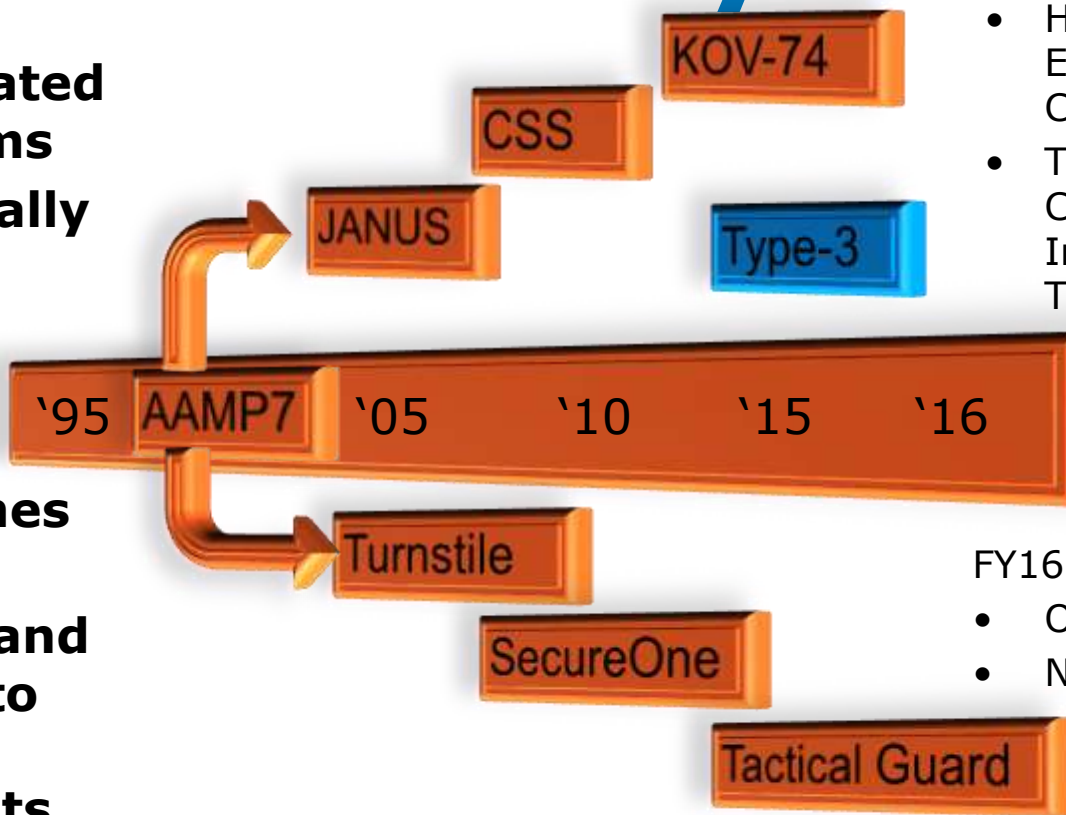
MILS Modules

- Cryptographic Modules
 - NSA Suite A and Suite B algorithms
 - Type-1 and Type-3 Interoperable
 - RED and BLACK Key Architectures
 - NSA-Approved Key Specifications, Vendor/Country-unique
- Guarding Modules
 - MILS Partitioning
 - Trusted Labeling
 - Rule-Based Filtering
- Components
 - Separation Kernel
 - Mission Applications
 - Security Policies/Configuration Files
 - Digital Signatures

Modules Enables Scalable MILS Networks

RC MILS History

- NSA formulated MILS systems
- Mathematically Proved Separation
- Developed Crypto and Guard Engines
- Leveraging knowledge and products into multiple environments



FY 15

- High Performance Embedded Computing Study
- Type-3 Cryptography Interoperable with Type-1

FY16 and Beyond!!!

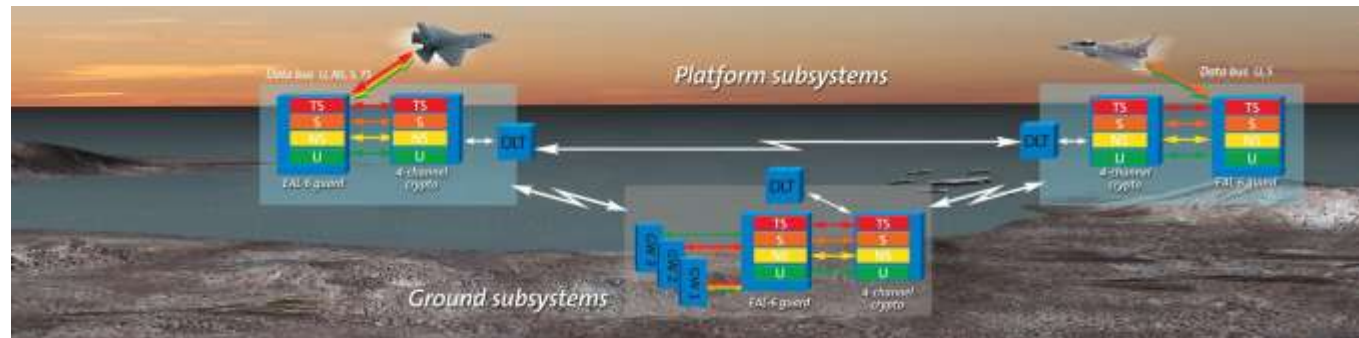
- Open Standards
- New Technology

Many Environments Benefit from MILS Information Sharing



Use Cases

Test



Problems

- Key Distribution
- Multi-Level Data Flows
- Data Integrity

Solutions

- Pre-mission & and Over-the-Network Keying (OTNK)
- Guards Airborne TS to U busses
- Guards Ground Gateways and Mission Rooms at Multiple Classification Levels

MILS Networks

- Eglin AFB & Pax River Atlantic Test Range (ATR)

Airborne subsystems

- US-only 4th and 5th Gen, Type-1
- TSPI, 1553, Fibre Channel, Ethernet

Ground-based subsystems

- US-only Mission Rooms, Type-1
- ARDS and TENA Gateways

MILS supports Distributed Test

Training

Problems

- No Ground
- Lose Keys/Power
- Airborne Computer-generated training simulations (CGTS)

Solutions

- Range-less ignition
- Battery-backed ECU
- PIU High-Performance Host Computing Resource (HCR)
- Guards Coalition
Multiple Level Debrief

MILS Networks

- Range-less

Airborne subsystems

- Coalition and US 4th and 5th Gen, Type-1 and Type-3 Interoperability
- Airborne CGTS on PIU HCR

Ground-base subsystems

- US and Coalition Missions
- Type-1 and Type-3 Interoperability
- Transportable Ground System



MILS supports Distributed Training

LVC

Problem

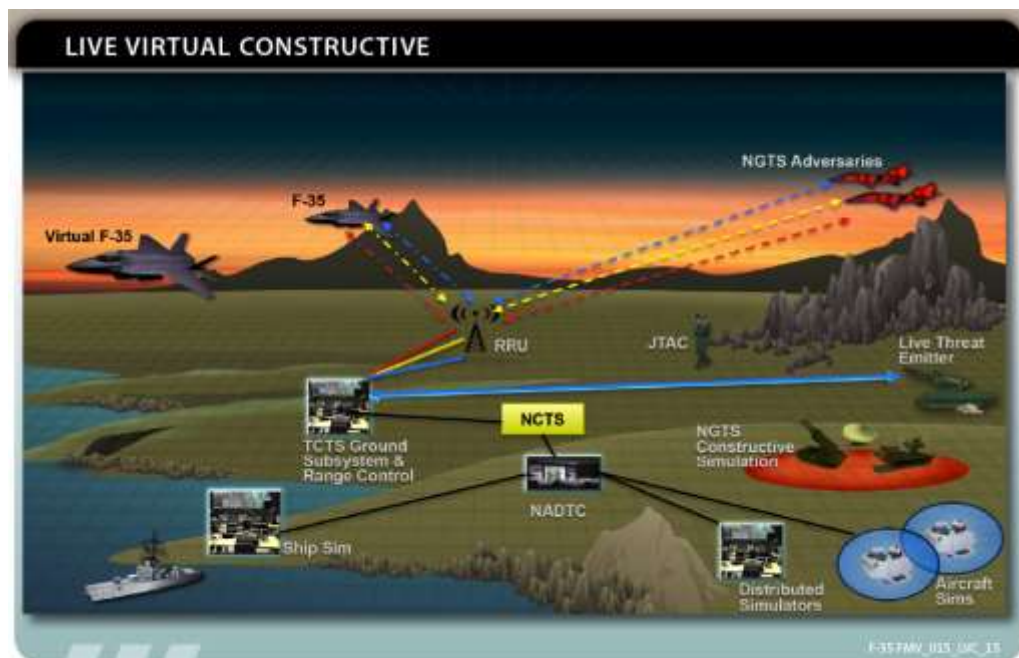
- Many sources of data
- Throughput & bottlenecks
- Distance (Air, Land, and Sea)

Solutions

- Scalable Ground
- Guards Airborne CGTS,
- Ground-based Constructive Simulations,
- Live Threat Emitters and
- Ship-borne Simulations, all at Multiple Classification Levels

Airborne and Shipborne subsystems

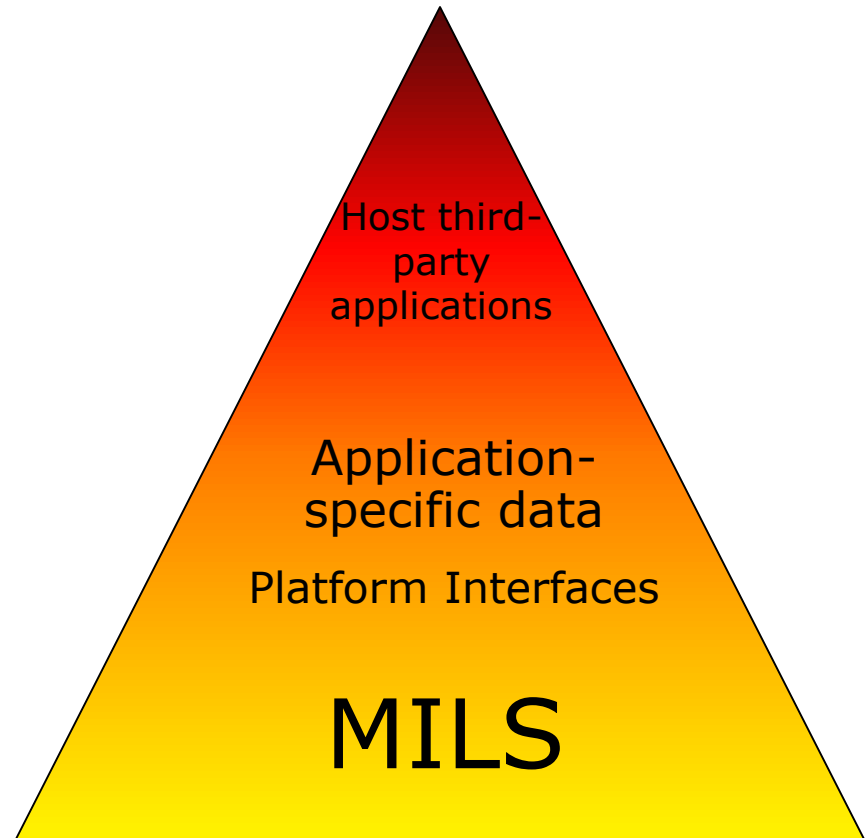
- Coalition and US 4th and 5th Gen, Type-1 and Type-3 Interoperability
 - Distributed Simulations
- ## Ground-based subsystems
- Distributed Simulations
 - ARDS, TENA, DIS, and HLA Gateways



MILS supports Distributed Live Virtual Constructive

Growth

- Aircraft and OFP Unique Applications
- Constructive Simulations
- Computer Generated Training Systems
- Cryptography and High Assurance Guards
- Separations Kernels



Committed to Growth

Conclusion

Interoperability is critical to enabling International Test, Training and LVC Coalitions

Our MILS solution has many benefits:

- NSA-Certified solution
- Authorization to Operate
- Interoperability and Exportability

We are the MILS people

Contact

Chad Spittle

Pr. Systems Engineering

Range & Soldier Solutions Department

chad.spittle@rockwellcollins.com

Ed Tubbs

Sr. Systems Engineer

Range & Soldier Solutions Department

ed.tubbs@rockwellcollins.com