

Network Centric Warfare for Coalition Integrated Defense Against Terrorism

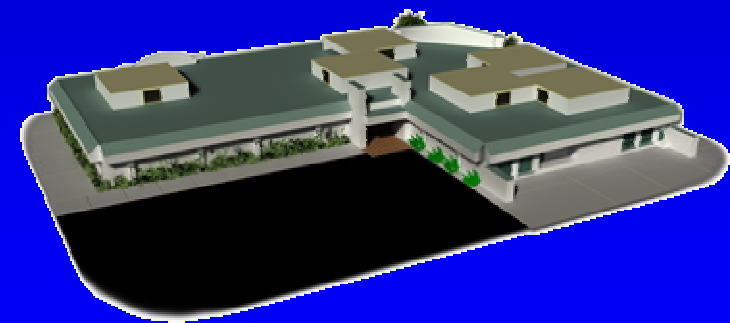
September 2004

**Eric C. Firkin
Director, USAF Business Development
Raytheon Solipsys Corporation**

**Margaret M. McMahon, Ph.D.
Computer Science Department, US Naval Academy**

Corporate Overview

- Founded in March 1996 by Senior Researchers at Johns Hopkins University/Applied Physics Lab
- Core Business is the Design and Development of C4ISR Software Products for Military Use
- 165 Employees and Growing
- Headquarters in Laurel Maryland, Offices in Kauai, HI and Norfolk, VA
- Specializing in Network-Centric Warfare and C2 Systems
- Over 50 Percent of Staff have Advanced Engineering Degrees (MS or PhD)
- Merger with Raytheon made Solipsys a Wholly-Owned Subsidiary in 2003



Problem...

- **Challenge: to provide an integrated international, real-time sensor information dissemination system to defend against terrorism**
 - Multiple governments, jurisdictions, organizations
 - Multiple networks with restricted collaboration
 - Myriad of encryption systems
 - Limited and diverse communications
 - Intelligence Boundaries
 - Real-time data distribution
 - Distributed Command Authority

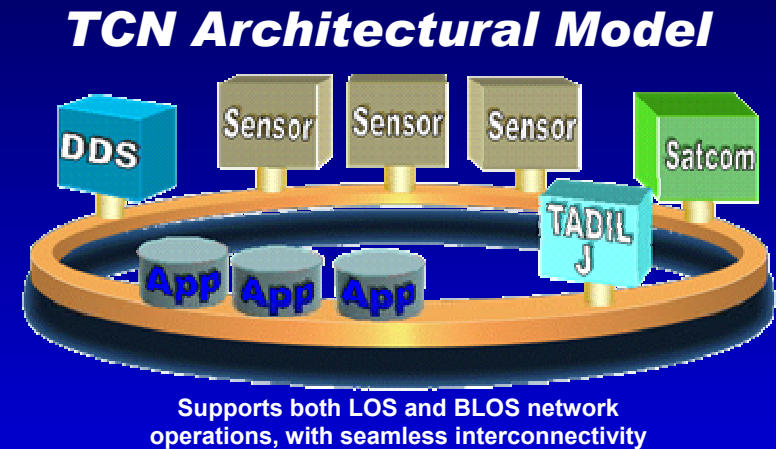
Solution...

Tactical Component Network (TCN)

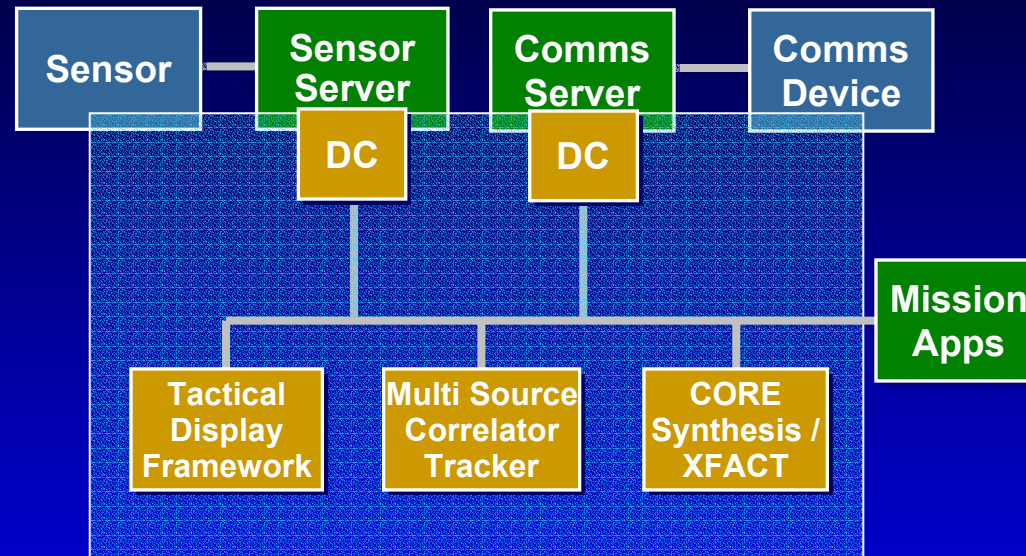
- **A software application suite for real-time sensor collaboration that provides:**
 - **Open Architecture framework**
 - **Employs a well defined API that facilitates component based systems integration**
 - **Hardware independence allows for a scaleable application**
 - **Communications flexibility**
 - **Patented “Goal oriented” algorithms enable data exchange that eliminates redundant information, optimizing use of available bandwidth**
 - **Not tied to a specific radio or device**
 - **Extensible to multiple communication paths**
- **Demonstrated and robust technology**
 - **Four years of lab, land-based and deployed test and assessment**
 - **Meets requirements ranging from target engagement to situation awareness**
 - **Demonstrated support for 3rd party component development**

TCN Approach

- Sensors and communications resources collaborate to form a Single Integrated Picture (SIP)
 - Data distribution based on user-defined accuracy requirements (smart pull vs push technique)
 - Data is created and delivered in a source independent form (supplier can be anonymous and users can be segregated based on a need to know)
 - Addition of new sensor, communications device or application program does not require change to other network participants (extensible, interoperable)
- Supports simultaneous, real-time collaboration between Joint and Coalition network participants in support of the Global Information Grid (GIG)
- Incorporates and extends mission-centric network architectural concepts to meet users needs



TCN Architectural Components



- **TCN Foundation Applications**
 - **Data Conditioner (DC):** Data abstraction layer for sensors and comms devices
 - **CORE Synthesis/XFACT:** TCN fusion and collaboration
 - **Tactical Display Framework (TDF):** Battle management and C2 display
 - **Multi Source Correlator Tracker (MSCT):** Data link integration, legacy system interfaces, dissimilar source correlation and tracking
- **Sensor Server, Comms Server, and Mission Apps (depicted in green) are developed by third party (e.g., LM for AEGIS, NG for E2C, Boeing for AWACS, etc.)**

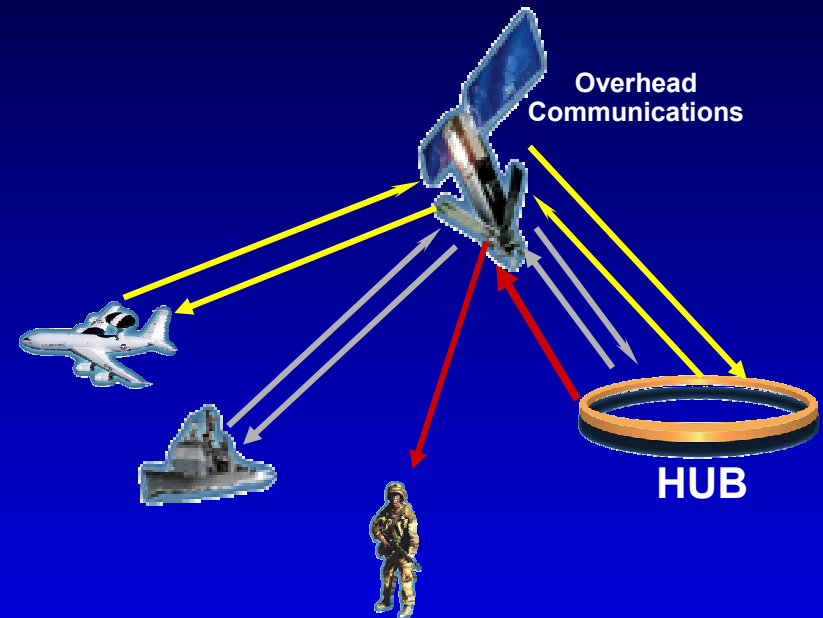
TCN – Coalition Military Application

TCN Local Network



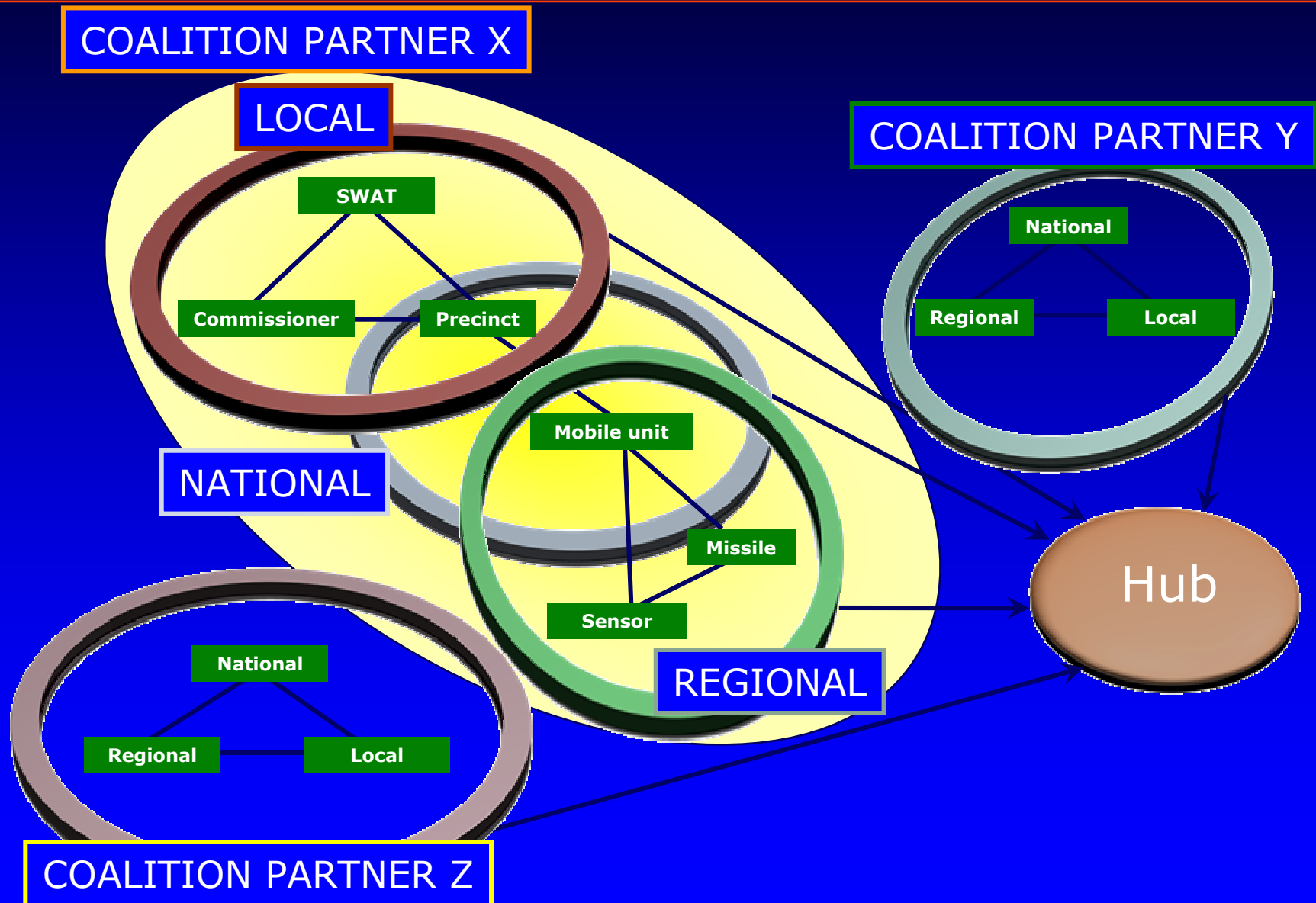
- Support time critical communications among peer-to-peer participants
- Aggregate bandwidth shared between participants based on user needs

TCN Global Network



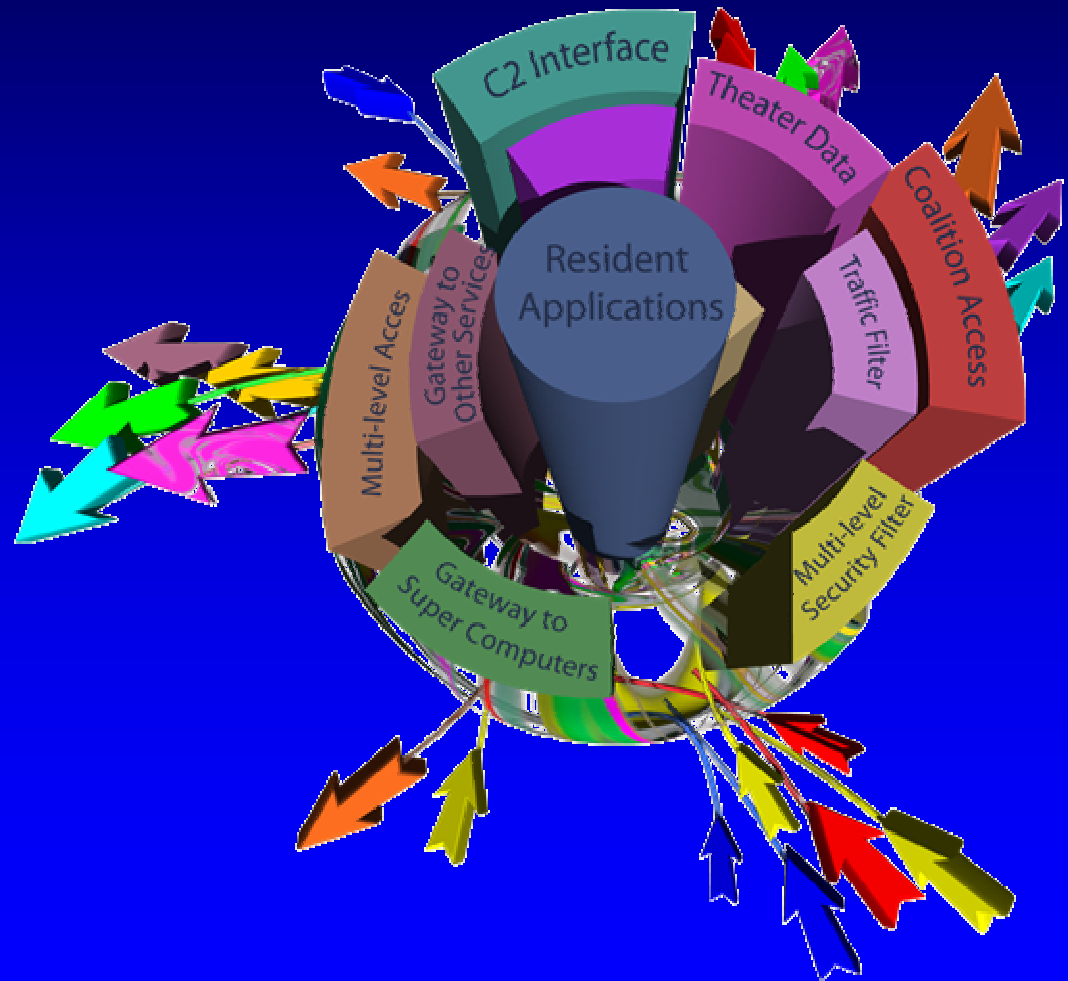
- User connectivity is not constrained by Line of Sight - Global reachback
- Secure real-time data available via LEOs or other overhead assets
- Hub provides access control, database support, processing enhancements and central applications

TCN Hub-and-Spoke Architecture

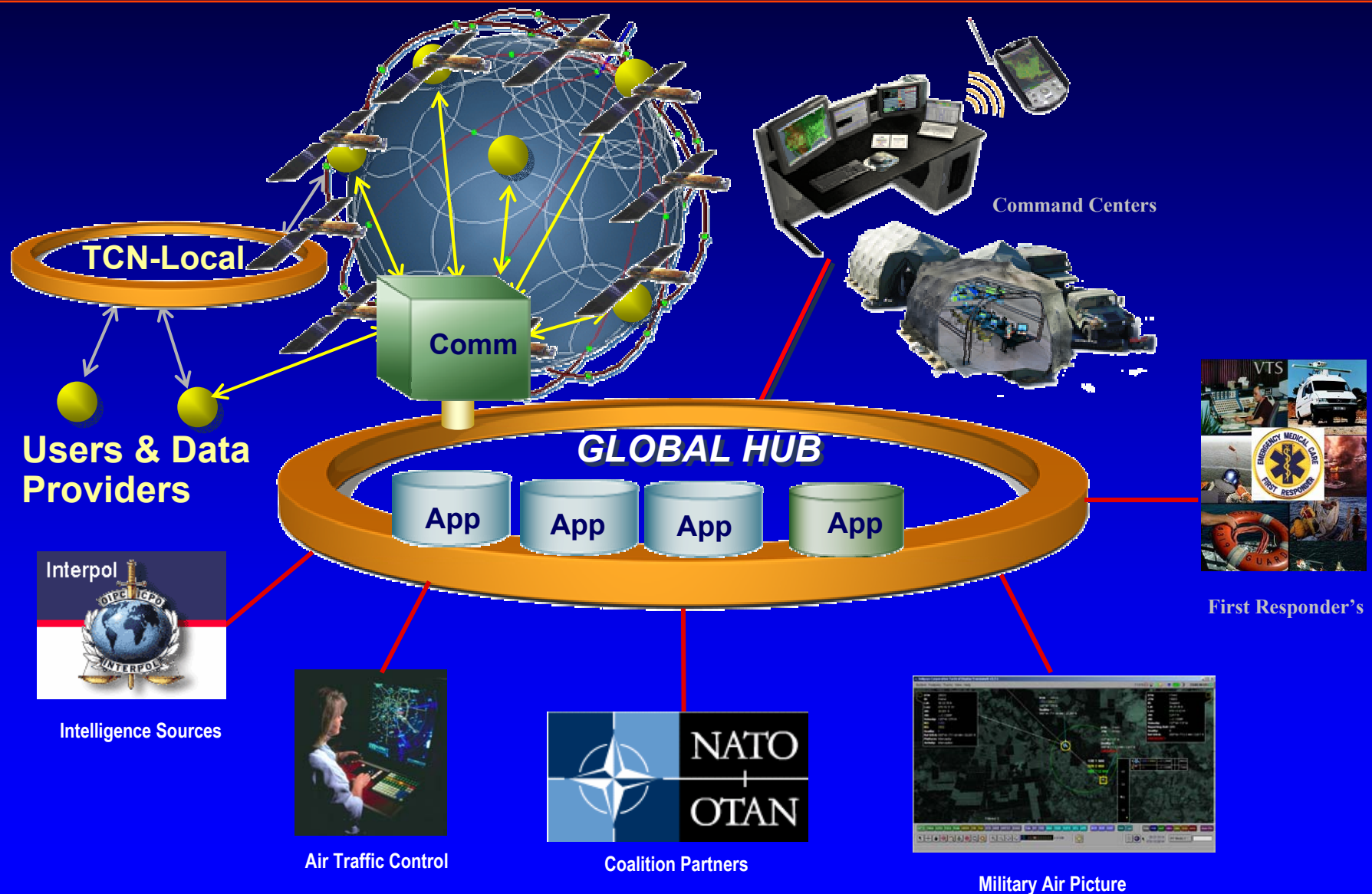


Hub Components/Functions

- Operating System
- Connection Manager
- Database Managers
 - Theater Data
 - Geographic Data
 - Cultural Features
- Data Archive
- Access Control
 - Traffic
 - Multilevel Access
 - Coalition Access
- Gateway Management



TCN Local/Global Operation



Summary

- Solipsys specializes in high performance fully customizable COTS software components that can be used individually for point solutions (displays, correlators, simulation tools, etc.) or coupled together to form a complete hardware-independent C2 system appropriate for each echelon of command
- Full TCN Brief available for download at: www.solipsys.com

Contact Information:

Eric "Frack" Firkin
Director, USAF Business Development
eric.firkin@solipsys.com
757-224-0612 (office)
757-615-1832 (mobile)