

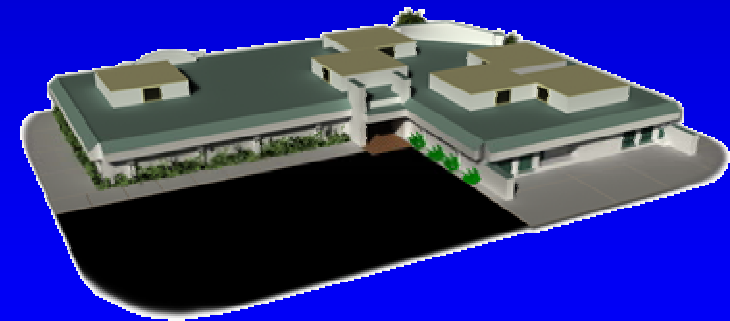
# **Architecture for a Truly Integrated Defense Network**

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**Director, USAF Business Development**  
**Raytheon Solipsys Corporation**

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# Corporate Overview

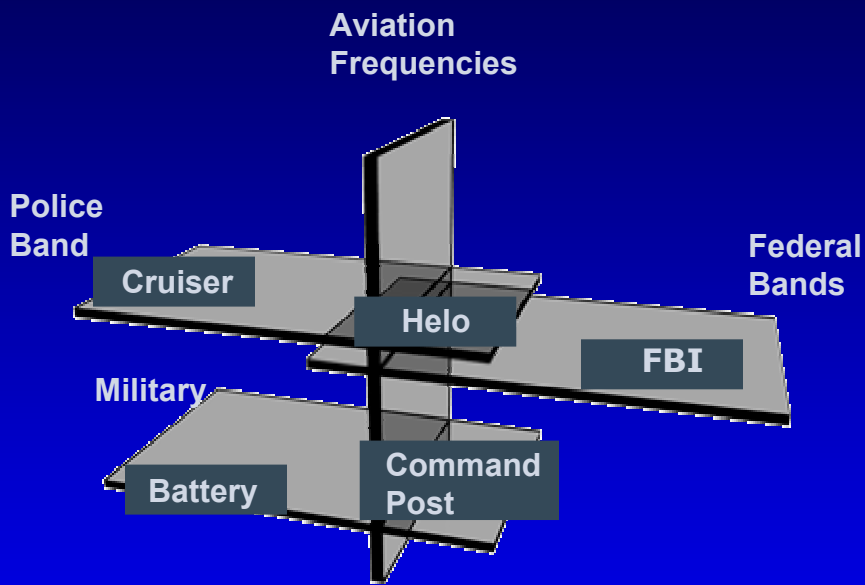
- **Founded in March 1996 by Senior Researchers at Johns Hopkins University/Applied Physics Lab**
- **Core Business is the Design and Development of C4ISR Software Products for Military Use**
- **165 Employees and Growing**
- **Headquarters in Laurel Maryland, Offices in Kauai and Norfolk**
- **Hold Numerous Patents Associated with 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**



# Problem...

- **The need for a truly integrated defense against terrorism on our National Capital Region (NCR)**
  - **Multiple jurisdictions/organizations**
  - **Multiple networks with restricted collaboration**
  - **Limited and diverse communications**
  - **No “single” Command Authority**

# Urban Networking

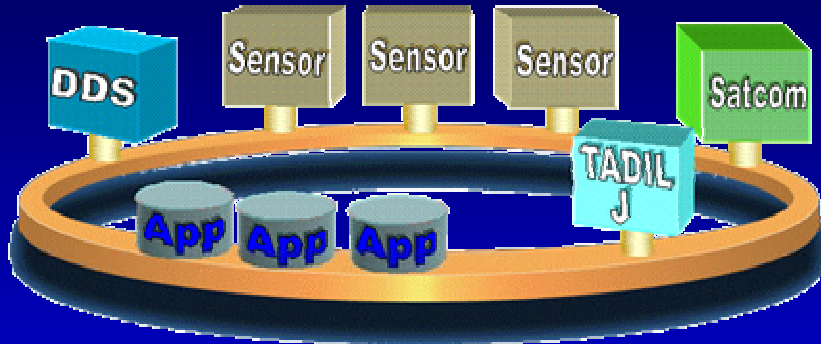


- Platforms must participate on multiple networks
- Each platform must integrate data from different networks
- Change in one network affects all platforms

Platforms seamlessly participate on the same network

# Solution: Tactical Component Network

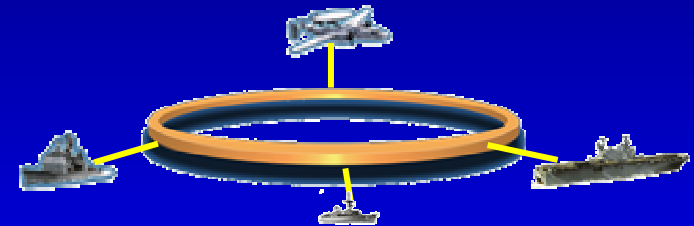
## TCN Architectural Model



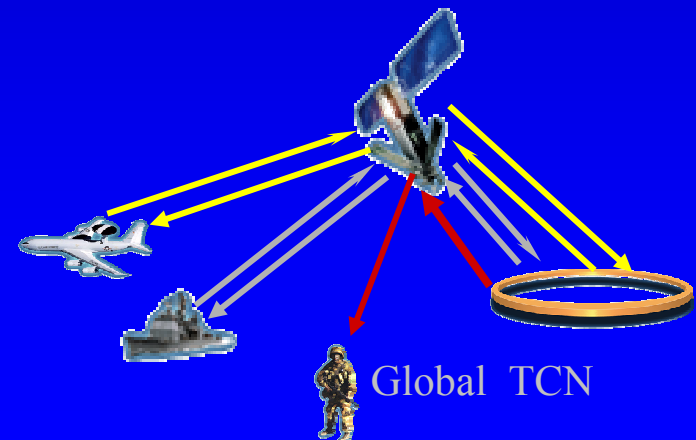
- **Sensors and communications resources collaborate to form a Single Integrated Picture**
- Data distribution based on user-defined accuracy requirements
- Data is created and delivered
  - In a source-independent form
  - Facilitate the addition of new sensors, communications device or application programs
  - Without change to other network participants

## TCN Network Model

- **Supports both LOS and BLOS network operations, with seamless interconnectivity**

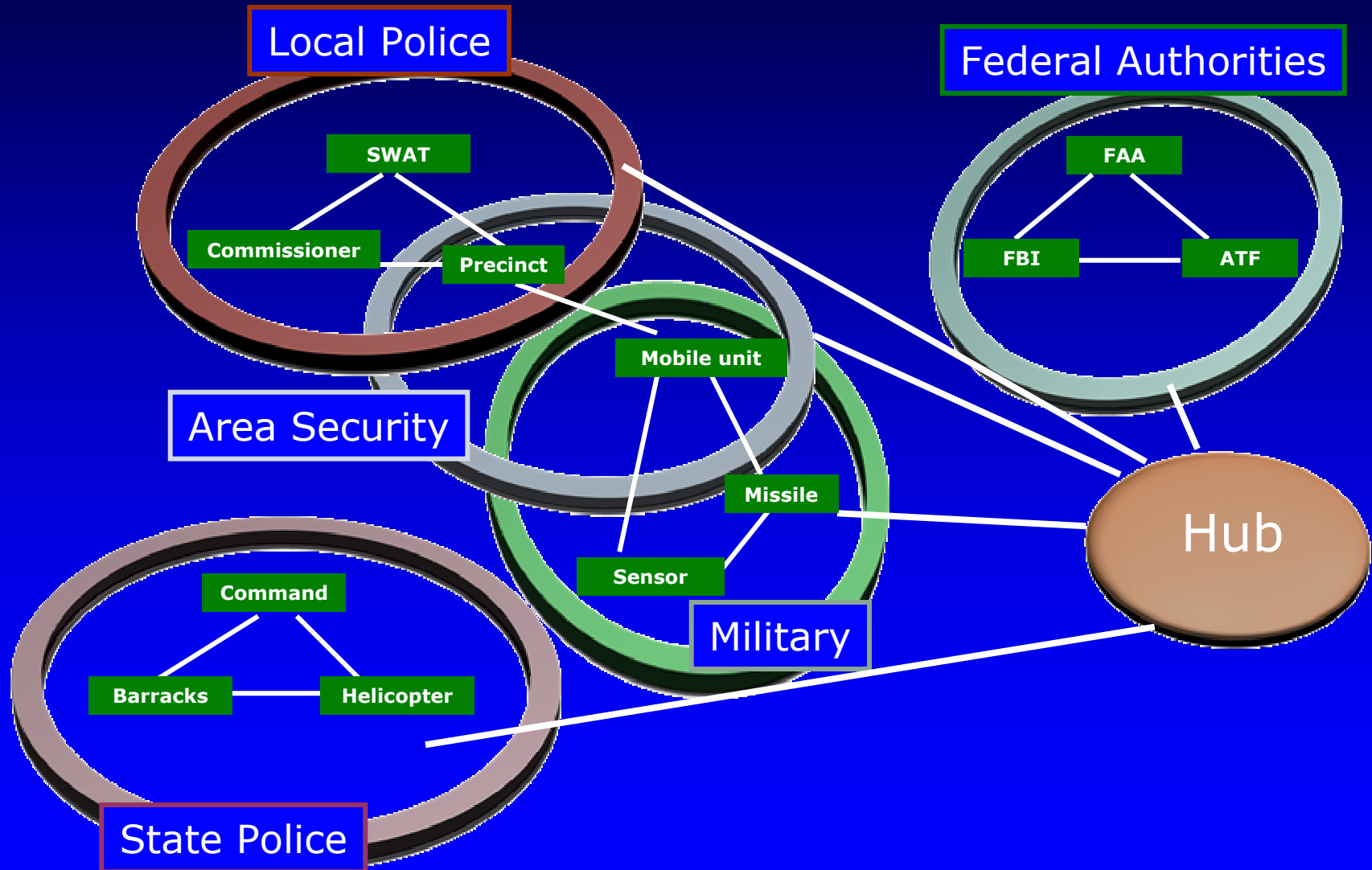


Local TCN

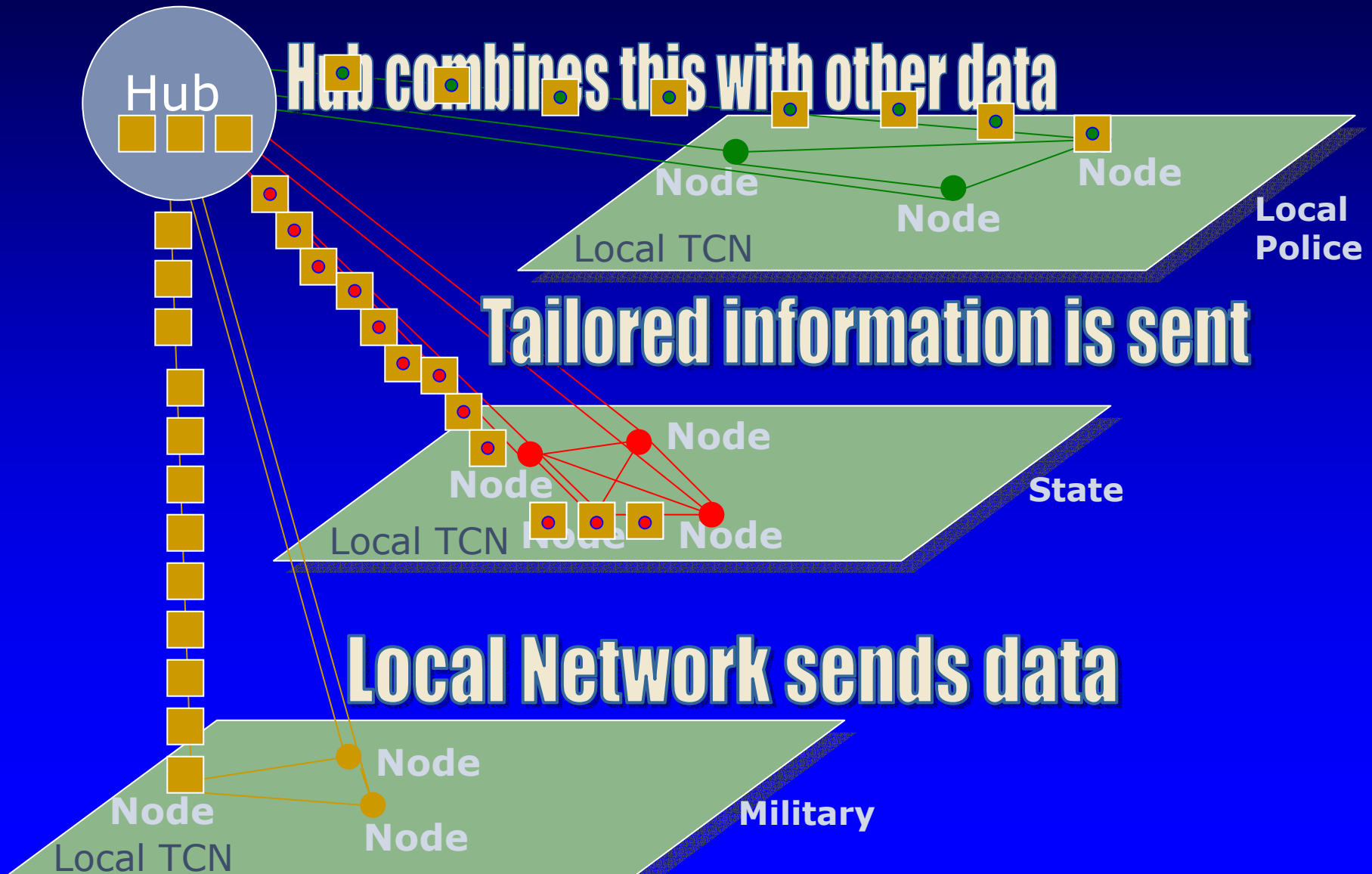


Global TCN

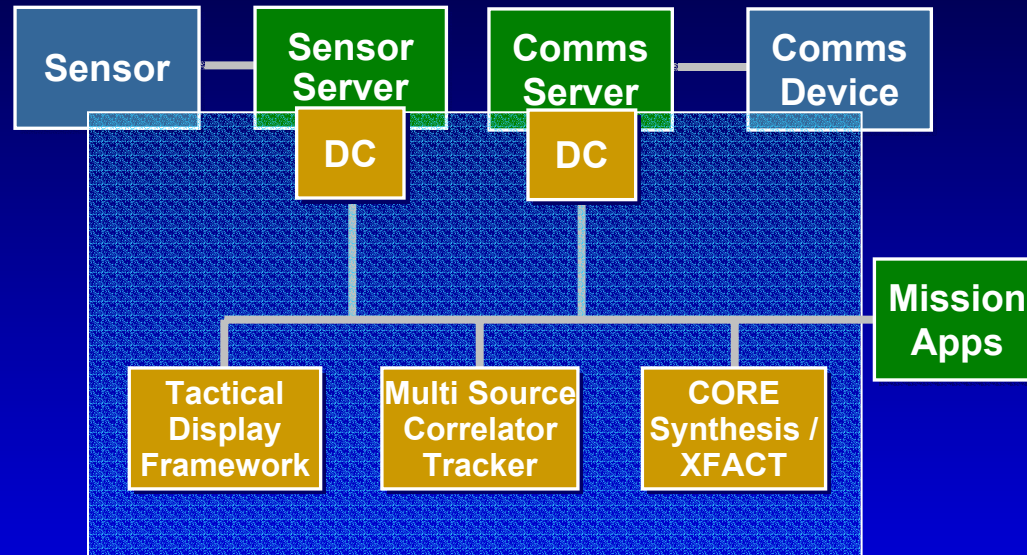
# TCN Urban Networks



# Global TCN Network



# 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.)**



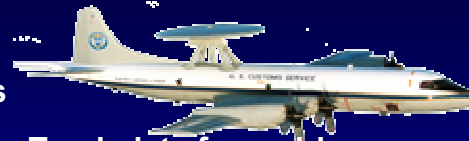
# TCN Solution

Raytheon Solpsys



Mobile Command and Control Sites

Cueing ADA for Point defense applications



Track data from airborne Sensors



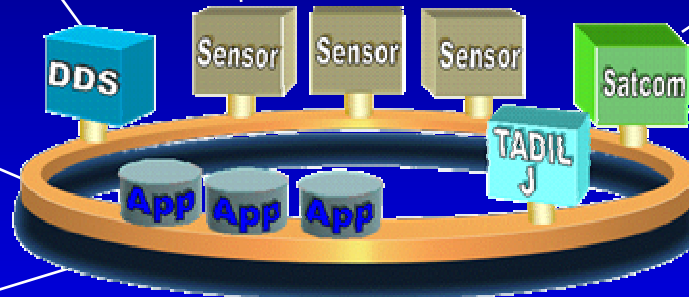
Optical cueing for positive Aircraft ID



Mobile situation awareness For high value assets



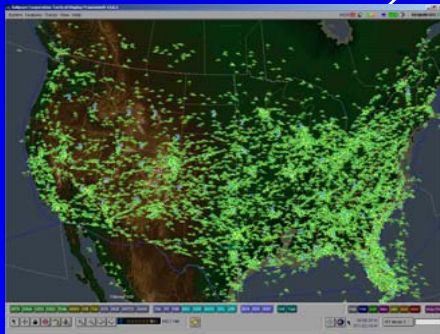
Real-time air surveillance for Fixed point defense and Situation awareness



HUB



Air Traffic Control



Military Air Picture



First Responder's

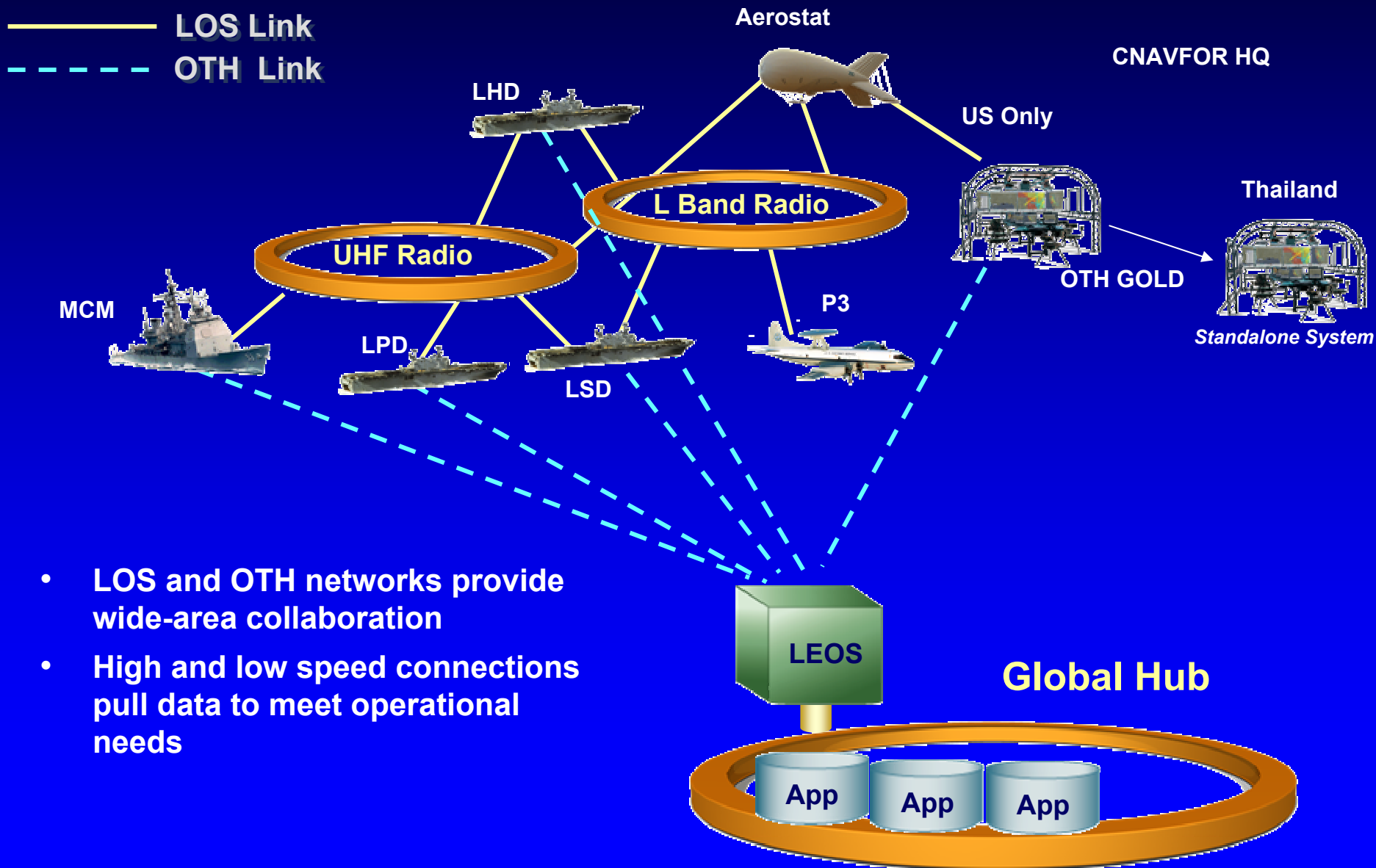


Ground PDA



Command Centers

# Cobra Gold 2002 TCN Connectivity



- LOS and OTH networks provide wide-area collaboration
- High and low speed connections pull data to meet operational needs

# TCN Approach Features

- **Sensors and communications resources collaborate to form a Single Integrated Picture**
  - Data distribution based on user-defined accuracy requirements (**pull not push technique**)
  - Data is created and delivered in a source independent form (**anti-tamper, multi-level secure**)
  - 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 architectural concepts of SIAP SE**
  - **Interoperability** – Data correctness, availability, and processing
  - **Integrated Architecture Behavioral Model** – PIM/PSM

# Summary

- **Solipsys Specializes in High Performance Fully Customizable COTS Software Components**
- **Can be Used Individually for Point Solutions (Displays, Correlators, Simulation Tools, etc.)**
- **Coupled Together to Form a Complete Hardware-Independent C2 System Appropriate for Each Echelon of Command**
- **Components on GSA schedule**

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