

# **System of Systems Common Operating Environment (SOSCOE) Support to Net Centricity**

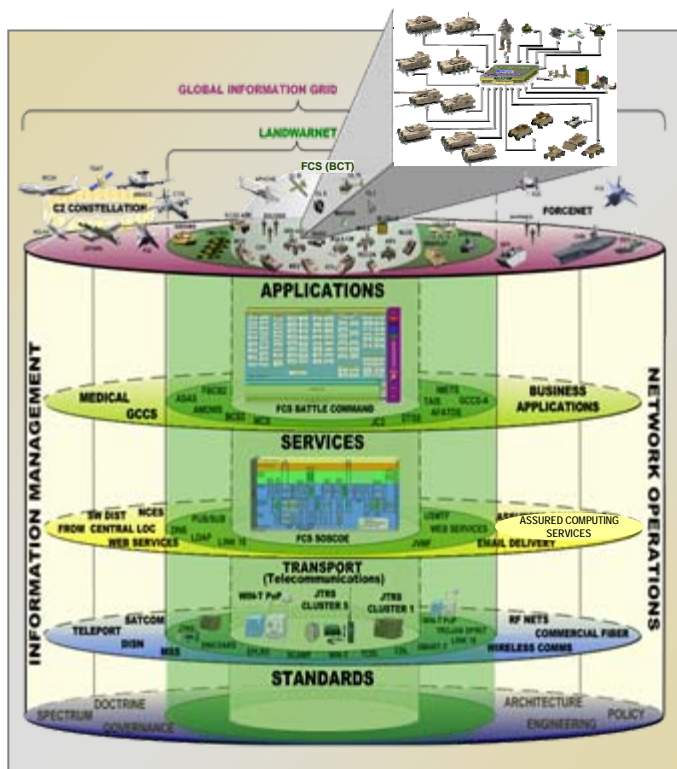
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**FCS LSI , Boeing**

# FCS Layered, Networked Architecture



## Net Ready/Networked Battle Command



Command BCT system elements are commonly developed to integrate FCS platforms into a larger geographically dispersed yet Functionally integrated machine

Battle Command incorporates C2, Intelligence, Surveillance, and Reconnaissance (ISR), Embedded Training, and Sustainment

Net ready information management element of service based architecture - **SOSCOE**

Heterogeneous transport layer enables robustness

Networked battle command, embedded training, and supportability developed Technical View (TV-1) integrated into SoS level TV-1 standards supporting integration

**Integrated Architecture Provides Design-Phase Flexibility and Tactical Adaptability For The Networked FCS (BCT)**

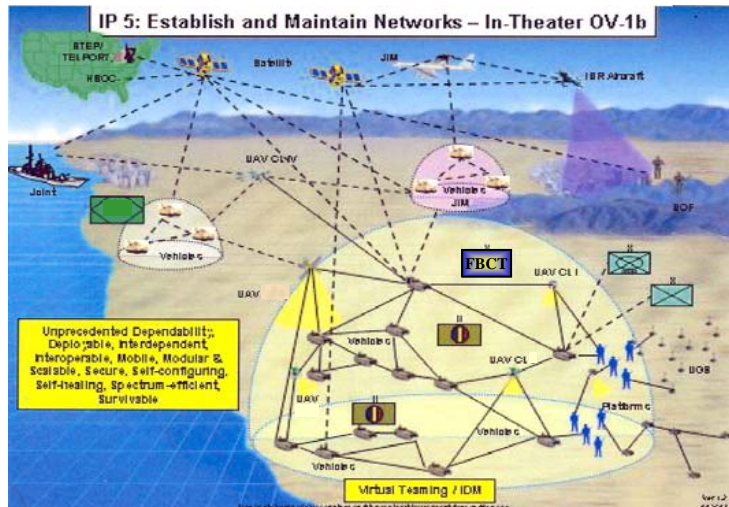
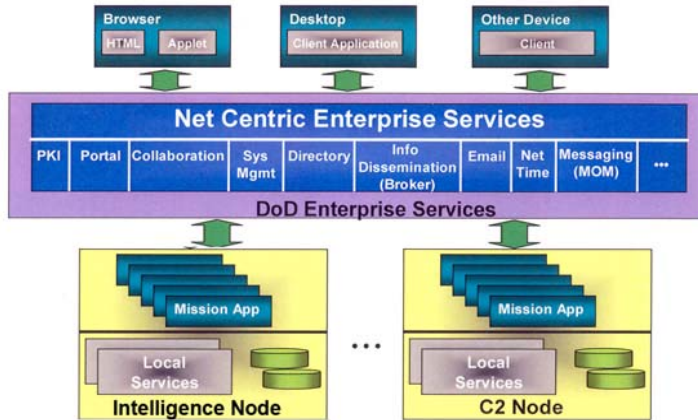
# SOSCOE & NCES – Different Environments

## NCES (Increment 1): High-bandwidth Reliable Network

- **NCES focused on providing enterprise services running within a high bandwidth reliable network infrastructure**
  - Capabilities are **server-based**
  - Leverages **centralized computing** paradigm
  - Emphasis on ‘shared spaces’ **presumes uninterrupted access** to those spaces
  - Acquisition Strategy
    - Adopt before Buy, Buy before Create
    - Acquire via Managed Service Providers

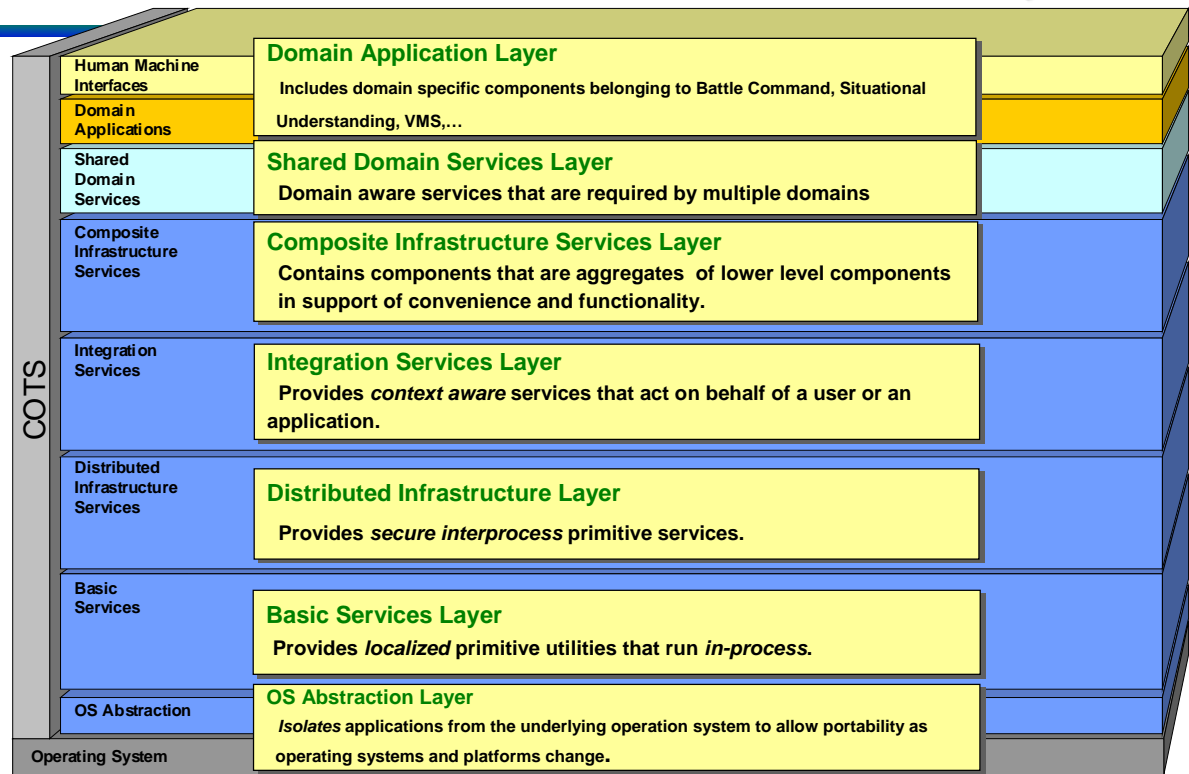
## SOSCOE: Low-bandwidth Ad Hoc Network

- **SOSCOE focused on providing reusable software infrastructure components for Platform and Battle Command Applications on a Bandwidth Constrained Ad Hoc Network**
  - SOSCOE must support decentralized **real-time** and **safety-critical** applications
  - Emphasis on managing **QoS over radio networks**
  - SOSCOE makes wide use of “Proxy” notion for maintaining **seamless communications** with the GIG at WIN-T POPs

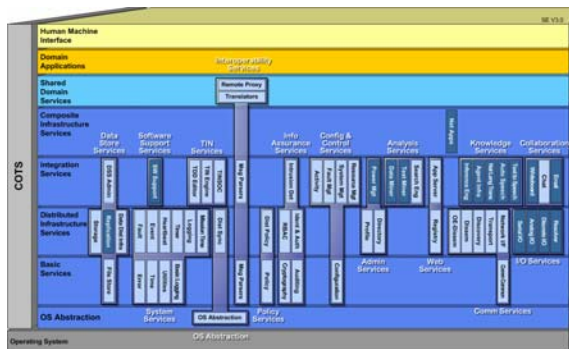


# SOSCOE Architectural Concept

- SOSCOE is a “toolset” of Infrastructure Services that provide a Service Oriented Architecture operating environment for FCS Applications
- Although each Edition may require unique implementations, the Application Interfaces (APIs) will conform to a set standard

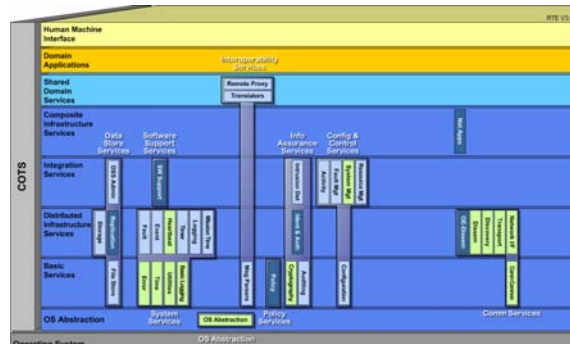


## Standard Edition



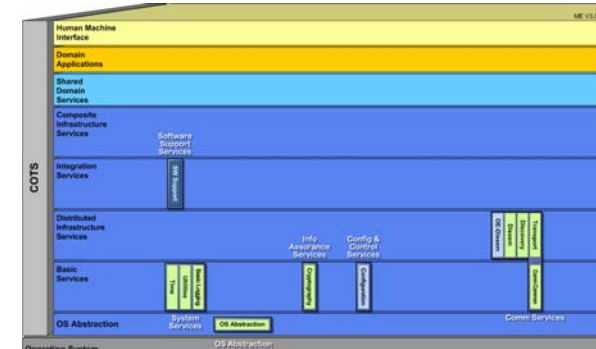
Future Build

## Real Time Edition



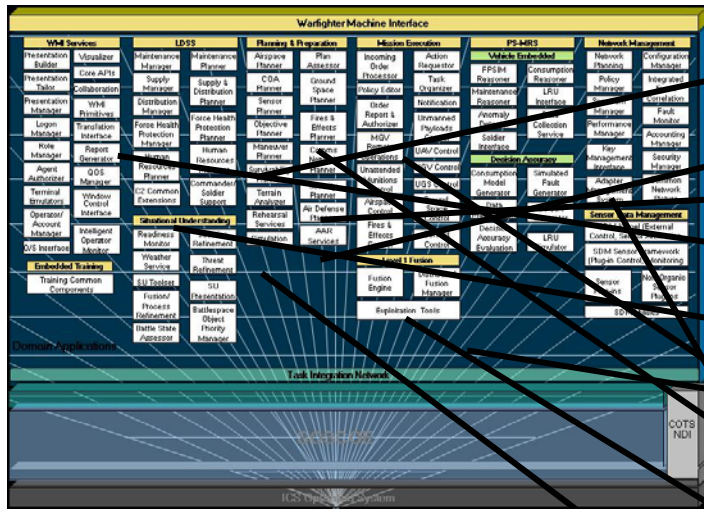
Future Build Safety

## Micro Edition



Future Build Safety

# Task Integrated Network (TIN) “Thread” Application Services to create desired Effects

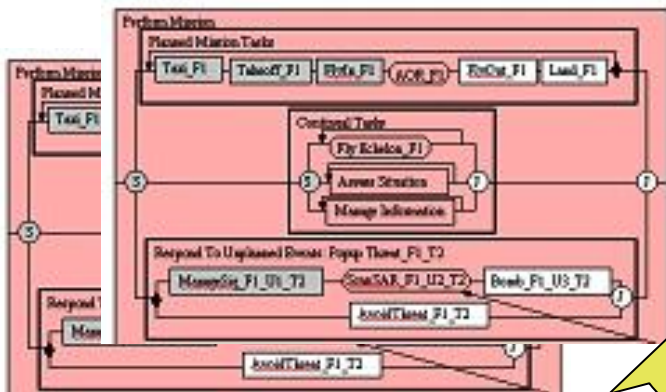


- Object, Situation, Threat & Refinement Service
- Battle State Assessor Service
- SU Presentation Service
- Presentation Builder, Tailor, Manager Service
- Collaborator Service
- Simulation Service
- Plan Assessor Service
- Weather Service
- Terrain Analyzer Service
- Notification Service
- BSO Priority Manager Service

## Process

## TIN Formation

Apply Knowledge, Judgment, and Analysis to Understand the Situation



## Task Sequence

TINs provide adaptable “script” to efficiently implement services

# SOSCOE Integration Groups and Service Families

- **Platform Service Families** provide “basic” Common Operating Environment (COE) capabilities
- **Tactical Service Families** provide Intra and Inter platform networking, data services and info assurance
- **Battle Command Service Families** provide search, agent, policy and TIN engine
- **Enterprise/GIG Service Families** provide ‘Interoperability” with Existing systems as well as Higher organizations (NCES)

Tactical Integration
Communications Services
Data Store Services
Information Assurance Services (Tactical)
Collaboration Services (Tactical)

Enterprise/GIG Integration
Web Services
Interoperability Services
Information Assurance Services (Strategic)
Collaboration Services (Enterprise)

Platform Integration
I/O Services
Administrative Services
Software Support Services
Configuration and Control Services
System Services
OS Abstraction Services

Battle Command Integration
Analysis Services
Knowledge Services
TIN Services
Policy Services

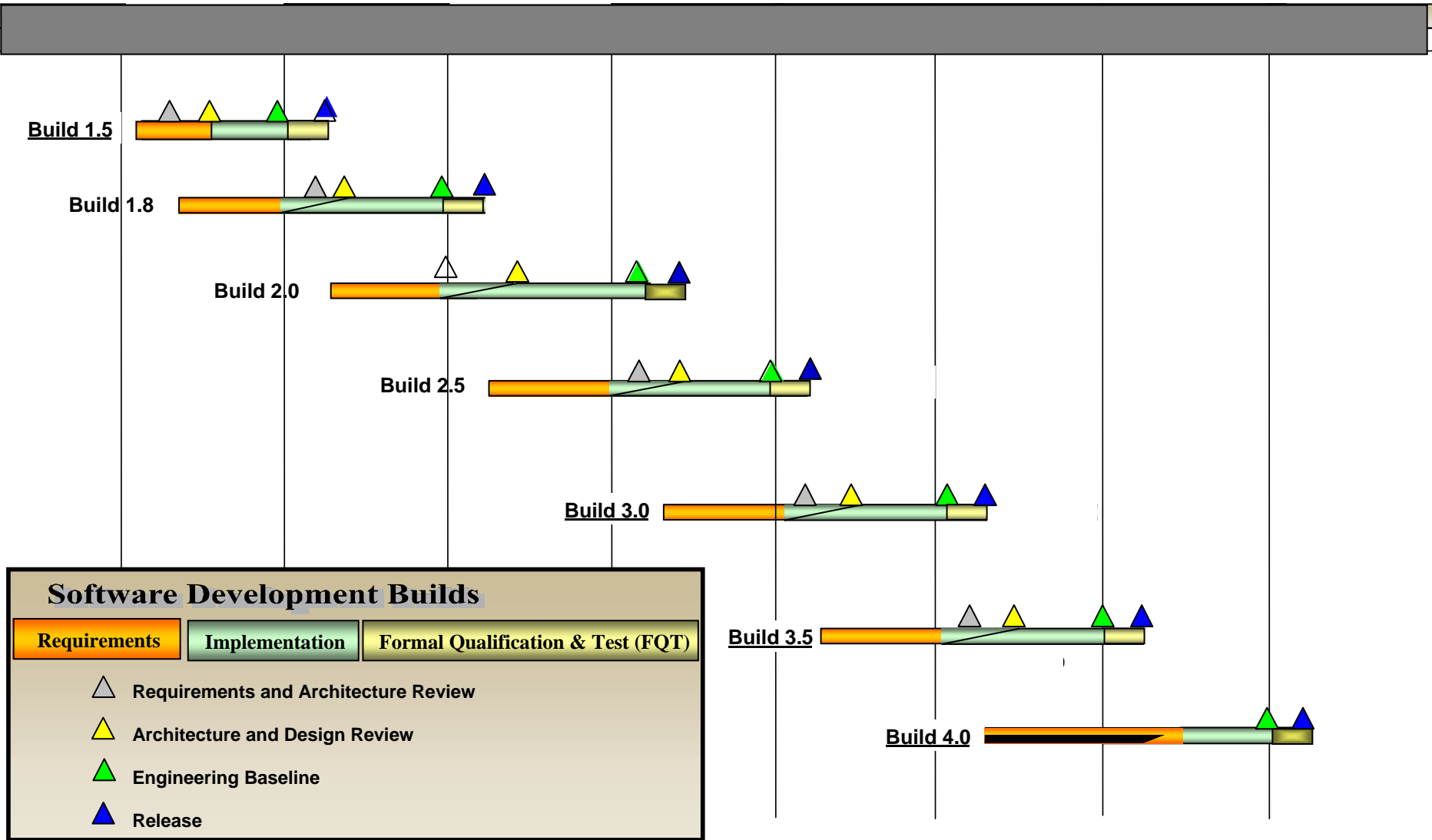
***Software tools provide the war fighter with transparent, interoperable, secure operations***

# FCS Software "TIERS" of Integration

	<u>Integration Goal</u>	<u>Required SOSCOE</u>	<u>Enabling FCS Capabilities</u>	<u>Supported / Req Transport</u>	<u>External Capabilities</u>
Tier 3 Int. BC	Integrated into Battle Command	BC Infrastructure Components (TIN, Policy, ...)	WMI Compliance	↑ ↓	↑ ↓
	Tier 2 Platform Integration	COE Components	ICS OS Compliant Health to PSMRS Co-exist with WMI		
Tier 1 Net-Centric Exchange	Integrated into Tactical NCIE	Tactical Service-based Components	Common Transient Data model Topics FCS SADD Design Patterns NMS	≥ JTRS SRW/WW Waveforms	↓
	Integrated into Strategic NCIE	Strategic SOA Components	COI-coordinated web service interfaces		
Tier 0 Interfacing	Legacy Interoperability	NONE	SOSCOE Interop	Legacy Waveforms (EPLRS, SINGARS, ...)	Native formatted message interface standards

Net-Centric Threshold ←

# SOSCOE is Incrementally being Developed And Fielded





# SOSCOE Distribution Approach

- **Within FCS the Distribution of SOSCOE is governed by a Software License Agreement**
  - Transfers COTS licensing and Open Source Copyright notices
- **External Distributions Managed via Distribution Agreement between Army and other DoD entities**
  - SLA used to transmit Licensing and Copyright notices
- **Boeing FCS LSI negotiates “GPR” for COTS/Open Source**
  - No cost transferred in DA Process to receive SOSCOE
- **SOSCOE is a “managed source” development**
  - Open to Requirements definition
  - Limited access to source code
    - **Program Protection**

***SOSCOE has been Delivered to over 200 companies/sites  
Approximately 30 have been delivered under DA/SLA (GPR)***

# Summary

- **SOSCOE provides the Infrastructure for the Tactical Domain supporting Net Centric Operations paradigms**
- **SOSCOE is being Developed by a Team of Boeing, SAIC and 34 other companies**
- **SOSCOE Development Cycle is 2 years with yearly Releases**
- **SOSCOE is available via Distribution Agreement and SLA under Government Purpose Rights (GPR)**
- **SOSCOE Build 1.8 consists of 95% COTS/Open Source or a Total of 78 products**
  - 14.7M SLOCS delivered

SOSCOE is based on a set of Standardized APIs  
and based on  
COTS/Open Source, modified and developed software