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

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FCS LSI, Boeing
FCS Layered, Networked Architecture

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)

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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

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

TINs provide adaptable “script” to efficiently implement services

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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)

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

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## FCS Software “TIERS” of Integration

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<th>Integration Goal</th>
<th>Required SOSCOE</th>
<th>Enabling FCS Capabilities</th>
<th>Supported / Req Transport</th>
<th>External Capabilities</th>
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<tr>
<td>Tier 3 Int. BC Integrated into Battle Command</td>
<td>BC Infrastructure Components (TIN, Policy, …)</td>
<td>WMI Compliance</td>
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<td>Tier 2 Platform Integration Integrated on Platform</td>
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<td>Tier 1 Net-Centric Exchange Integrated into Tactical NCIE</td>
<td>Tactical Service-based Components</td>
<td>Common Transient Data model Topics FCS SADD Design Patterns NMS</td>
<td>&gt;= JTRS SRW/WNW Waveforms</td>
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<tr>
<td>Integrated into Strategic NCIE Integrated into Strategic NCIE</td>
<td>Strategic SOA Components</td>
<td>COI-coordinated web service interfaces</td>
<td>&gt;= WIN-T/JNN Comms</td>
<td>GIG-BE NCES Discovery</td>
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<tr>
<td>Legacy Interoperability Legacy Interoperability</td>
<td>NONE</td>
<td>SOSCOE Interop</td>
<td>Legacy Waveforms (EPLRS, SINCGARS, …)</td>
<td>Native formatted message interface standards</td>
</tr>
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</table>
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

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